SUPERIOR

WISCONSIN

Living up to our name.

BID DOCUMENT AND CONTRACT VOLUME 2025

Wade Bowl Park
Splash Pad Project

CITY OF SUPERIOR, WISCONSIN
Public Works Department
Todd Janigo, Director

Bid # 25-20-PW

City of Superior, Wisconsin

Contents

Contents

1. ADVERTISEMENT TO BID 3
2. INSTRUCTIONS TO BIDDERS 4
3. BID PROPOSAL 9
4. SUBCONTRACTORS AND SUPPLIERS LISTING 16
5. ADDENDA ACKNOWLEDGMENT 19
6. BID BOND 20
7. BIDDER'S PROOF OF RESPONSIBILITY 21
7a. AFFIDAVIT OF COMPLIANCE 23
8. AFFIDAVIT OF ORGANIZATION AND AUTHORITY 27
9. CONTRACT 28
10. PERFORMANCE AND PAYMENT BOND 31
11. GENERAL SPECIFICATIONS 32
12. ENGINEER CERTIFICATION 45
13. SPECIAL PROVISIONS 46
14. CONTRACT CHANGE ORDER 47

Federal Labor Standards Provisions HUD-4010 (5 pages)
Davis Bacon General Decision Number WI20250008 02/21/2025 (23 pages)
Davis Bacon General Decision Number WI20250036 01/10/2025 (8 pages)
Project Plan Set dated 3-19-2025 (30 pages)
MBE WBE Section 3 and Section 3 Worker Self Certification (4 pages)
BABA sample manufacturer certification letter

1. ADVERTISEMENT TO BID

CITY OF SUPERIOR
SEEKING BIDS FOR THE
Wade Bowl Park Splash Pad Project

1.1 Sealed Bids

Sealed bids will be received by the City of Superior, at 1316 North 14th Street - 2nd Floor, Suite 200, Attention: Contract Analyst, Superior, WI 54880. Bids will be publicly opened and read aloud in the City offices.

1.2 Bid Opening Date: **Monday, April 21, 2025,** Bid Opening Time: **2:30 p.m.**

Bid Project: **The City of Superior, WI, is seeking bids from qualified contractors for the Wade Bowl Park Splash Pad Project. The Wade Bowl Park is located at 1228 Clough Ave, Superior, WI. The work under this project generally consists of site excavation, grading, sidewalks, splash pad installation, plumbing, bioretention basin and structure, plantings, electrical, water, and sewer connections. Project shall be completed by August 29, 2025. This project is funded by a Community Development Block Grant (CDBG).**

All bids must be prepared on the form provided and submitted in accordance with the Instructions to Bidder.

Specifications may be obtained through the internet at www.DemandStar.com. Bidding documents may be viewed at the City of Superior, 1316 North 14th Street - 2nd Floor, Superior, Wisconsin (darwinj@superiorwi.gov) and at the Minnesota Builders Exchange (mbex.org), Builders Exchange of Wisconsin (bxwi.com), Northwest Builders Exchange (nwrbx.com) and LaCrosse Builders Exchange (laxbx.com).

Bid security in the amount of five percent (5%) of the bid must accompany each bid in accordance with the Instructions to Bidders.

The contractor shall submit a list of its subcontractors as a part of the proposal, which list shall not be added to or altered without the written consent of the City of Superior, and as specified in 66.0901 Wisconsin Statutes.

The bidder's attention is called to the requirement of the **Davis Bacon and BABA** standards, to which the Contractor and SubContractors must adhere.

The City of Superior encourages the participation of women and minority owned businesses.

The City of Superior reserves the right to reject any or all bids, to waive irregularities, or to accept such bids, as in the opinion of the City, will be in its best interests.

Todd Janigo, Director of Public Works

Daily Telegram: **Friday, March 28, 2025, and Friday, April 4, 2025**

2. INSTRUCTIONS TO BIDDERS

2.1 Questions regarding this bid may be directed to the City of Superior as follows:
Project specifications & drawings: Kevin Byrne, MSA, kbyrne@msa-ps.com.
Bidding documents: Jane Darwin, Contract Analyst, darwinj@superiorwi.gov.

2.2 Method of Bidding: The only acceptable method of bidding a project with the City of Superior, Wisconsin, is described as follows and must be strictly complied with. The City of Superior reserves the right to determine the low Bidder on the basis of the Base Bid alone or the Base Bid plus any alternates or combinations of alternates, at the City's discretion. Bids shall be valid for 60 days. Please do not bind or staple your submitted documents.

2.3 Bid Packet Components: Each item listed must be included with the bid submission:

a) Bidders must file a **PROPOSAL OR BID** on the form the City has prepared. (See BID PROPOSAL Section 3.) Bidders must also submit with bid **ASSURANCES** (See Section 3a), **EQUAL OPPORTUNITY POLICY STATEMENT** (See Section 3b), **CERTIFICATION REGARDING DEBARMENT** (See Section 3c**), BABA ACKNOWLEDGMENT** (See Section 3d).

b) Bidders shall be required to submit a list of **SUBCONTRACTORS AND SUPPLIERS** with their proposal in accordance with Section 66.0901(7), Wisconsin Statutes, and subsequent amendments. Such list shall not be added to nor altered without the written consent of the City of Superior. (See SUBCONTRACTORS AND SUPPLIERS LISTING Section 4.)

c) Bidders shall be required to submit an **ADDENDA ACKNOWLEDGMENT** with their proposal. Such acknowledgment shall note acknowledgment of receipt of any and all addenda. If no addenda were issued, the bidder shall indicate and sign document. Contractor is responsible to obtain all addenda. (See ADDENDA ACKNOWLEDGMENT Section 5.)

d) The bidder must file, at the time of the opening of the bids, either a **BID BOND or a certified check in the amount of at least five percent (5%)** of the total bid, conditioned that if the bidder is successful the bidder will, within the time allotted by the City, file a properly executed contract and performance bond as per Wisconsin Statutes 62.15(3). (See BID BOND Section 6.)

e) The bid proposal must have attached to it the **BIDDER'S PROOF OF RESPONSIBILITY** identifying the bidder's qualifications. (See BIDDER'S PROOF OF RESPONSIBILITY Section 7.). Prospective bidders are required to furnish a statement of financial ability, equipment and experience in the work prescribed in said public contract in accordance with the provisions of Section 66.0901(2) of the Wisconsin Statutes, at the time of the opening of the bids. The object of the questionnaire and the pre-qualification of bidders is to enable the City to have sufficient information regarding financial ability, equipment and experience in order to reduce the hazards involved in

awarding contracts to parties not qualified to perform them and to select those contractors qualified to properly complete the work proposed.

f) The bid proposal must have attached to it the **AFFIDAVIT OF COMPLIANCE** swearing compliance with the criteria set forth in the Responsible Contractor Criteria in the City Code of Ordinances, Chapter 2, Article XII, (See Section 7a), from the Contractor and all Sub-Contractors.

g) The bid proposal must have attached to it the **AFFIDAVIT OF ORGANIZATION AND AUTHORITY** identifying a corporation, partnership, LLC, or sole trader. The affidavit must contain a sworn statement that the bidder has examined and carefully prepared the proposal from the plans and specifications and has checked the same in detail per Section 66.0901 (7), Wisconsin Statutes. (See AFFIDAVIT OF ORGANIZATION & AUTHORITY Section 8.)

h) The bid proposal packet shall be placed in an envelope and shall be sealed. **ON THE ENVELOPE SHALL BE**, plainly written: the **date of the bid opening**, the **title of the project** and **the name of the bidder**. Such envelope shall be addressed and delivered to: The City of Superior, 1316 North 14th Street - 2nd Floor, Suite 200, Attention: Contract Analyst, Superior, Wisconsin before the time and date specified for opening bids as listed on the Advertisement to Bid.

i) Wisconsin's Public Records Law creates a statutory presumption in favor of complete access to public records and the City of Superior endeavors always to conduct its municipal affairs in strict compliance with Wisconsin Statutes §§ 19.31-19.39. Any entities or individuals who submit materials to the City of Superior in response to this request should avoid submitting any proprietary information.

2.4 Work Site and Contract Document Examination: Bidders must satisfy themselves, by examination of the contract documents, the work site and the conditions and obstacles to be encountered in the field, and by such other means as may be necessary, as to the accuracy of the schedule of quantities of the work to be done and the intent of said contract documents. After the submission of the proposal, no complaint or claim that there was any misunderstanding as to the quantities, conditions or nature of the work will be entertained and no extra compensation shall be allowed by reason of any matter or thing concerning which such bidder might have informed himself prior to the bidding.

Upon award of bid, the Contractor must execute the required Performance and Payment Bond in the total amount of the bid. (see PERFORMANCE AND PAYMENT BOND Section 10.)

2.5 Time of Performance: When not otherwise specified, the bidder must state in the proposal, the least number of calendar days (counting weekends and holidays), after date to commence work given in the Notice to Proceed, in which bidder will start construction and the number of calendar days (counting weekends and holidays), after date to commence work given in the Notice to Proceed, in which bidder will fully complete the work as specified. The bidder should make allowance for all probable difficulties which

may be encountered. In the event of failure completing the work within the time stated or otherwise specified, liquidated damages will be assessed as provided in the specifications.

2.6 Quantities: The estimated quantities of the work are the result of careful calculations but are not to be considered as final. Such estimates will be used as a basis for determining the lowest bidder. After the contract is awarded, the quantity of work listed under any item, or all items, may be increased or decreased according to the specifications at the discretion of the City of Superior without in any way invalidating the bid price (see CONTRACT CHANGE ORDER Section 14).

2.7 Bid Prices: Bidders must submit a bid price, in accordance with the specifications, for each item of the job or branch, in compliance with the bidding units specified for the quantities listed in the proposal. Bid prices must be written out in words and entered in figures. In case of conflict, the written word prices will prevail. Totals must be shown based on unit cost and quantity. In case the figures do not match, the figure resulting in the lower price shall be deemed the price intended and applicable.

2.8 Inadequacies and Omissions: The City of Superior will not be responsible for verbal information or statements made by representatives of the Engineering Department, or any other department for which work will be performed.

Bidders shall bring any inadequacies, omissions, or conflicts to the attention of the City of Superior before the due date for bids. Prompt written clarification will be immediately supplied to all bidders by Addenda before the due date for bids and each Addendum shall be acknowledged on the Addenda Acknowledgment form. Failure to request clarification of any inadequacy, omission or conflict will not relieve the Contractor of responsibility.

2.9 No Double Bidding: Two (2) or more proposals under different names will not be accepted from one firm or association.

2.10 Partial Bidding: Bidders must quote on all items appearing on the bid forms unless specific directions in the advertisement, on the bid form, or in the special specifications allow for partial bids. Failure to quote on all items, unless specifically exempted as set forth above, shall disqualify the bid. When quotations on all items are not required, bidders shall insert the words "no bid" where appropriate.

2.11 Right of Waiver or Rejection: The City reserves the right to reject any or all bids or waive any defects found in bids or proposals submitted.

2.12 Labor Standards: The Contractor agrees to comply with the requirements of the Secretary of Labor in accordance with the Davis-Bacon Act as amended, the provisions of Contract Work Hours and Safety Standards Act, the Copeland "Anti-Kickback" Act (40 U.S.C. Chapter 3,

276a-276a-5; 29 CFR Parts 1, 3, 5, 6, and 7; 40 USC 327 and 40 USC 276c, Chapter 3, Section 276c; 18 USC, Part 1, Chapter 41, Section 874; 29 CFR Part 3; 40 USC, Chapter 5, Sections 326-332; 29 CFR Part 4, 5, 6 and 8; 29 CFR Part 70 to 240), Section 3 of the Housing and Urban Development Act of 1968 and all other applicable Federal, state and local laws and regulations pertaining to labor standards insofar as those acts apply to the performance of this contract. The Contractor shall maintain documentation which demonstrates compliance with hour and wage requirements of this part. Such documentation shall be made available to the City for a minimum period of three years after completion.

The Contractor agrees that, except with respect to the rehabilitation or construction of residential property containing less than eight (8) units, all contractors engaged under contracts in excess of $2,000.00 for construction, renovation or repair work financed in whole or in part with assistance provided under this contract, shall comply with Federal requirements adopted by the City pertaining to such contracts and with the applicable requirements of the regulations of the Department of Labor, under 29 CFR Parts 1, 3, 5 and 7 governing the payment of wages and ratio of apprentices and trainees to journey workers; provided, that if wage rates higher than those required under the regulations are imposed by state or local law, nothing hereunder is intended to relieve the Contractor of its obligation, if any, to require payment of the higher wage. The Contractor shall cause or require to be inserted in full, in all such contracts subject to such regulations, provisions meeting the requirements of this paragraph.

2.13 Wage Rates: – Davis Bacon General Decision Numbers WI20250036 and WI20250008.

2.14 Build America, Buy American Act: The Contractor must comply with the requirements of the Build America, Buy American Act (BABA), enacted as part of the Infrastructure investment and Jobs Act (IIJA). Pub. L. 117-58, 41 U.S.C. § 8301 note, the Federal Financial Assistance used to fund this infrastructure project is required to apply a domestic content procurement preference (the "Buy America Preference" or "BAP") for all construction, alteration, maintenance, or repair of infrastructure, including buildings and real property, unless application of the BAP has been waived by HUD. Additional details on fulfilling the BABA requirements can be found at https://www.hud/gov/baba. If this total project is less than $250,000, BAP is waived.

2.14 Pre-Bid Conference: None scheduled at this time. Questions from contractors are due by 12:00 PM on April 14, 2025. Final addendum will be issued by April 16, 2025.

2.15 Contract Documents: Upon award of the bid the contract documents will consist of the Advertisement to Bid, Instructions to Bidders, Bid Proposal, Subcontractors & Suppliers Listing, Addenda Acknowledgment, Bid Bond, Bidder's Proof of Responsibility, Affidavit of Organization & Authority, Affidavit of Compliance(s), Contract, Performance and Payment Bond, Certificate of Insurance as required, General Specifications, Special Provision, Plan set, and include all other herein bound

attachments and modifications thereof incorporated in the documents as prepared by the City of Superior.

City of Superior, Wisconsin

3. BID PROPOSAL

Wade Bowl Park Splash Pad Project

Date _____
City of Superior, Wisconsin

I/we, the undersigned, being familiar with your local conditions, having made a field inspection and investigation that I/we deemed necessary, having studied the plans and specifications for the work and being familiar with all the factors and other conditions affecting the work, are hereto attaching the following documents:

1) Assurances (see Section 3.a)
2) Equal Opportunity Policy Statement (see Section 3.b)
3) Certification Regarding Debarment (see Section 3.c)
4) BABA Acknowledgement (see Section 3.d)
5) Subcontractors & Suppliers List (see Section 4.)
6) Addenda Acknowledgment (see Section 5.)
7) Certified check or bid bond equal to five percent (5%) of the total amount bid. (Make check payable to: City of Superior, Wisconsin- see Section 6.)
8) Bidder's Proof of Responsibility (see Section 7.)
9) Affidavit of Compliance from Contractor and All Sub-Contractors(see Section 7a.)
10) Affidavit of Organization & Authority (see Section 8.)

I/we, the undersigned, hereby propose to furnish all applicable labor, tools, materials, skills, equipment and all else necessary to execute the work, in accordance with the specifications and are hereby submitting the following bid:

SEE NEXT PAGE

City of Superior, Wisconsin

BID PAGE:

ITEM NO.	ITEM DESCRIPTION	QTY	UNITS	UNIT PRICE	TOTAL PRICE
SITE					
1.	Mobilization, Bonds and Insurance	1	LS		
2.	Traffic Control	1	LS		
3.	Erosion and Sedimentation Controls	1	LS		
4.	Turf and Site Restoration	1,620	SY		
5.	Clearing and Grubbing	1	LS		
6.	Excavation Below Subgrade with Breaker Run and Geogrid	20	CY		
7.	Unclassified Excavation	1	LS		
8.	5-Inch Concrete Sidewalk with Base	1,950	SF		
9.	Medium Riprap with Type R Fabric	3	CY		
10.	Landscaping	1	LS		
11.	Splashpad, Installation	1	LS		
12.	Bio-retention Cell	5,800	SF		
UTILTIES					
13.	Connect to Existing Water Main	1	LS		
14.	Water Service, HDPE, 6-Inch	250	LF		
15.	Fittings,Tee, 4x4x4-Inch	1	EA		
16.	Fittings, HDPE, Bend 45-Degree, 6-inch	3	EA		
17.	Fittings, HDPE, Bend 90-Degree, 6-inch	1	EA		
18.	Combined Sewer Manhole, 48-Inch	1	LS		
19.	Sumped and Trapped Outflow Structure, 48-Inch	1	LS		
20.	Trash Grate, 48-Inch	1	LS		
21.	Public Storm Utility Drainage Piping, PVC, 4-Inch Drain w/Grate	1	EA		
22.	Public Storm Utility Drainage Piping, PVC, 4-Inch	25	LF		
23.	Public Storm Utility Drainage Piping, PVC, 6-Inch	40	LF		
24.	Public Storm Utility Drainage Piping, PVC, 12-Inch	20	LF		
25.	Fittings, Reducer, 3x6-Inch	1	EA		
26.	Fittings, PVC, Reducer, 6x12-Inch	1	EA		
27.	Fittings, PVC, Bend 90-Degree, 6-inch	1	EA		
28.	Fittings, Wye, 4x12-Inch	2	EA		
29.	Storm Utility Cleanout, PVC, 6-Inch	1	EA		

30.	Connection to Existing Combined Sewer	1	LS		
31.	Imported Granular Backfill	220	TON		
32.	Apron Endwall, 12-Inch	1	EA		
33.	Rodent Guard, 12-Inch	1	EA		
34.	Pipe Underdrain, Perforated Drain Tile with Sock, 4-Inch	150	LF		
35.	Site and Splashpad Electrical	1	LS		
	TOTAL: Items #1-#35				

BID TOTAL: $_____

Bid Total in written words:_____

_____

Estimate amount of calendar days to complete project upon Contractor's receipt of Notice to Proceed (time to include all weekends and holidays)_____

Date able to begin the project_____

Completion date_____

SIGNATURE_____
PRINT NAME_____
TITLE_____
COMPANY_____
ADDRESS_____
PHONE_____
E-MAIL ADDRESS_____

3a. ASSURANCES

Bidder MUST submit this completed document with the bid proposal.

- OMB Approval No. 0348-0042

ASSURANCES - CONSTRUCTION PROGRAMS Public reporting burden for this collection of information is estimated to average 15 minutes per response, including time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding the burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to the Office of Management and Budget, Paperwork Reduction Project (0348-0042), Washington, DC 20503. **PLEASE DO NOT RETURN YOUR COMPLETED FORM TO THE OFFICE OF MANAGEMENT AND BUDGET. SEND IT TO THE ADDRESS PROVIDED BY THE SPONSORING AGENCY.**

NOTE: Certain of these assurances may not be applicable to your project or program. If you have questions, please contact the Awarding Agency. Further, certain Federal assistance awarding agencies may require applicants to certify to additional assurances. If such is the case, you will be notified.

As the duly authorized representative of the applicant, I certify that the applicant:

1. Has the legal authority to apply for Federal assistance, and the institutional, managerial and financial capability (including funds sufficient to pay the non-Federal share of project costs) to ensure proper planning, management and completion of the project described in this application.

2. Will give the awarding agency, the Comptroller General of the United States and, if appropriate, the State, through any authorized representative, access to and the right to examine all records, books, papers, or documents related to the assistance; and will establish a proper accounting system in accordance with generally accepted accounting standards or agency directives.

3. Will not dispose of, modify the use of, or change the terms of the real property title, or other interest in the site and facilities without permission and instructions from the awarding agency. Will record the Federal interest in the title of real property in accordance with awarding agency directives and will include a covenant in the title of real property acquired in whole or in part with Federal assistance funds to assure nondiscrimination during the useful life of the project.

4. Will comply with the requirements of the assistance awarding agency with regard to the drafting, review and approval of construction plans and specifications.

5. Will provide and maintain competent and adequate engineering supervision at the construction site to ensure that the complete work conforms with the approved plans and specifications and will furnish progress reports and such other information as may be required by the assistance awarding agency or State.

6. Will initiate and complete the work within the applicable time frame after receipt of approval of the awarding agency.

7. Will establish safeguards to prohibit employees from using their positions for a purpose that constitutes or presents the appearance of personal or organizational conflict of interest, or personal gain.

8. Will comply with the Intergovernmental Personnel Act of 1970 (42 U.S.C. §§4728-4763) relating to prescribed standards for merit systems for programs funded under one of the 19 statutes or regulations specified in Appendix A of OPM's Standards for a Merit System of Personnel Administration (5 C.F.R. 900, Subpart F).

9. Will comply with the Lead-Based Paint Poisoning Prevention Act (42 U.S.C. §§4801 et seq.) which prohibits the use of lead-based paint in construction or rehabilitation of residence structures.

10. Will comply with all Federal statutes relating to nondiscrimination. These include but are not limited to: (a) Title VI of the Civil Rights Act of 1964 (P.L. 88-352) which prohibits discrimination on the basis of race, color or national origin; (b) Title IX of the Education Amendments of 1972, as amended (20 U.S.C. §§16811683, and 1685-1686), which prohibits discrimination on the basis of sex; (c) Section 504 of the Rehabilitation Act of 1973, as amended (29 U.S.C. §794), which prohibits discrimination on the basis of handicaps; (d) the Age Discrimination Act of

1975, as amended (42 U.S.C. §§6101-6107), which prohibits discrimination on the basis of age; (e) the Drug Abuse Office and Treatment Act of 1972 (P.L. 92-255), as amended, relating to nondiscrimination on the basis of drug abuse; (f) the Comprehensive Alcohol Abuse and Alcoholism Prevention, Treatment and Rehabilitation Act of 1970 (P.L. 91-616), as amended, relating to nondiscrimination on the basis of alcohol abuse or alcoholism; (g) §§523 and 527 of the Public Health Service Act of 1912 (42 U.S.C. §§290 dd-3 and 290 ee 3), as amended, relating to confidentiality of alcohol and drug abuse patient records; (h) Title VIII of the Civil Rights Act of 1968 (42 U.S.C. §§3601 et seq.), as amended, relating to nondiscrimination in the sale, rental or financing of housing; (i) any other nondiscrimination provisions in the specific statute(s) under which application for Federal assistance is being made; and, (j) the requirements of any other nondiscrimination statute(s) which may apply to the application.

11. Will comply, or has already complied, with the requirements of Titles II and III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970 (P.L. 91-646) which provide for fair and equitable treatment of persons displaced or whose property is acquired as a result of Federal and federally-assisted programs. These requirements apply to all interests in real property acquired for project purposes regardless of Federal participation in purchases.

12. Will comply with the provisions of the Hatch Act (5 U.S.C. §§1501-1508 and 7324-7328) which limit the political activities of employees whose principal employment activities are funded in whole or in part with Federal funds.

13. Will comply, as applicable, with the provisions of the Davis-Bacon Act (40 U.S.C. §§276a to 276a-7), the Copeland Act (40 U.S.C. §276c and 18 U.S.C. §874), and the Contract Work Hours and Safety Standards Act (40 U.S.C. §§327333) regarding labor standards for federally-assisted construction subagreements.

14. Will comply with flood insurance purchase requirements of Section 102(a) of the Flood Disaster Protection Act of 1973 (P.L. 93-234) which requires recipients in a special flood hazard area to participate in the program and to purchase flood insurance if the total cost of insurable construction and acquisition is $10,000 or more.

15. Will comply with environmental standards which may be prescribed pursuant to the following: (a) institution of environmental quality control measures under the National Environmental Policy Act of 1969 (P.L. 91190) and Executive Order (EO) 11514; (b) notification of violating facilities pursuant to EO 11738; (c) protection of wetlands pursuant to EO 11990; (d) evaluation of flood hazards in floodplains in accordance with EO 11988; (e) assurance of project consistency with the approved State management program developed under the Coastal Zone Management Act of 1972 (16 U.S.C. §§1451 et seq.); (f) conformity of Federal actions to State (Clean Air) Implementation Plans under Section 176(c) of the Clean Air Act of 1955, as amended (42 U.S.C. §§7401 et seq.); (g) protection of underground sources of drinking water under the Safe Drinking Water Act of 1974, as amended (P.L. 93-523); and, (h) protection of endangered species under the Endangered Species Act of 1973, as amended (P.L. 93-205).

16. Will comply with the Wild and Scenic Rivers Act of 1968 (16 U.S.C. §§1271 et seq.) related to protecting components or potential components of the national wild and scenic rivers system.

17. Will assist the awarding agency in assuring compliance with Section 106 of the National Historic Preservation Act of 1966, as amended (16 U.S.C. §470), EO 11593 (identification and protection of historic properties), and the Archaeological and Historic Preservation Act of 1974 (16 U.S.C. §§469a-1 et seq.).

18. Will cause to be performed the required financial and compliance audits in accordance with the Single Audit Act Amendments of 1996 and OMB Circular No. A-133, "Audits of States, Local Governments, and Non-Profit Organizations."

19. Will comply with all applicable requirements of all other Federal laws, executive orders, regulations, and policies governing this program.

Signature of Authorized Certifying Official: _____

Title: _____

Applicant Organization: _____

Date submitted: _____

3b. EQUAL OPPORTUNITY POLICY STATEMENT

Bidder MUST submit this completed document with the bid proposal.

Effective Date: _____

To: City of Superior
Public Works Department
1316 North 14th Street
Superior, WI 54880

Subject: EQUAL EMPLOYMENT OPPORTUNITY

A. PURPOSE

To provide equal employment opportunity for all employees and applicants for employment with _____ Inc., and to outline the procedures that will be followed to ensure accomplishment of the objectives of this policy.

B. EQUALITY OF OPPORTUNITY

All decisions with respect to employment matters and other phases of employer employee relationship will be in keeping with this policy and in accordance with Executive Order 11246 and 11375. The _____,Inc., will:

1. Recruit, hire and promote individuals in all job classifications without regard to race, color, religion, sex, age, handicap, or national origin, except where sex or age is a bona fide occupational qualification.
2. Ensure that promotions are in accord with principles of equal employment opportunity by imposing only legitimate job-related requirements for promotional opportunities.
3. Ensure that all other personal actions such as rates of pay or other forms of compensation, benefits, transfers, layoffs, returns from layoff, demotions, terminations, selection for training (including apprenticeship), social and recreational programs, use of company facilities, and the like will be administered without regard to race, color, religion, sex, age, handicap, or national origin, except where sex or age is a bona fide occupational qualification.

C. GENERAL RESPONSIBILITIES

The President and the Corporate EEO officer will be responsible for the coordination, administration, and implementation of the provisions of this policy.

D. POLICY GUIDELINES

1. The program of Affirmative Action is based on the analysis of all job categories at all Division/Subsidiaries to determine if there is underutilization of minority and female

employees. As a result, specific goals, timetables, and action commitments are developed to correct identifiable deficiencies. The analysis of periodic internal Affirmative Action reports is designed to monitor progress toward established goals and correct deviations for those goals in a timely manner.

2. Bound by the terms of the Vietnam Era Veterans Readjustment Assistance Act, _____ Inc., is committed to take affirmative action to employ, advance in employment or otherwise treat qualified disabled veterans and veterans of the Vietnam era without discrimination based upon their disability or veteran's status in all employment practices.
3. Bound by the terms of Section 503 of the Rehabilitation Act of 1973, _____ Inc., is committed to take affirmative action to employ and advance in employment qualified physically and mentally handicapped individuals in all employment practices.
4. All solicitations or advertisements for employees placed by or on behalf of authorized representatives of the Corporation will state expressly that all qualified applicants will receive consideration for employment without regard to race, color, religion, sex, age, handicap or national origin, or alternative statements such as the phase "an equal opportunity employer" as may be authorized by Executive Order 11246 as amended by 11375. All such solicitations or advertisements will be subject to approval by the President or designate.
5. Applicants for employment with the Corporation will be judged solely in accordance with the job specifications concerned, the applicant's work history, and any other commonly accepted indices of qualification as may be deemed necessary for the position in question.
6. Notices and posters relating to equal employment opportunity will be conspicuously posted on bulletin boards, and information concerning such equal employment opportunity as may be prescribed by national policy will be made readily available to all employees or applicants for employment.

SIGNATURE: _____

TITLE: _____

DATE: _____

3c. Certification Regarding Debarment, Suspension, Ineligibility and Voluntary Exclusion-Lower Tier Covered Transactions

This certification is required by the regulations implement Executive Order 12549, Debarment and Suspension, 7 CFR Part 3017, Section 3017.510, Participant's responsibilities. The regulations were published as Part IV of the January 30, 1989 Federal Register (pages 4722-4733). Copies of the regulations may be obtained by contacting the agency with which this transaction originated.

1. The Contractor certifies that, by submission of this proposal, that neither it nor its principals, or SubContractors:
   a. Is presently debarred, proposed for debarment, declared ineligible, or voluntarily excluded from participation in this transaction by any Federal department or agency.

   b. Have not within a three-year period preceding this date been convicted of or had a civil judgement rendered against you for commission of fraud or a criminal offense in connection with obtaining, attempting to obtain, or performing a public (Federal, State or Local) transaction or contract under a public transaction; violation of Federal or State antitrust statutes or commission of embezzlement, theft, forgery, bribery, falsification or destruction of records, making false statements, or receiving stolen property;

   c. Are not presently indicted for or otherwise criminally or civilly charged by a governmental entity (Federal, State, or local) with commission of any of the offenses enumerated in paragraph 1(b) of this certification; and

   d. Have not within a three-year period preceding this date had one or more public transactions (Federal, State or local) terminated for cause or default.

2. Where the Contractor is unable to certify to any of the statements in this certification, such Contractor shall attach an explanation to this proposal.

Signed:_____
Print Name & Title:_____
Name of Organization:_____
Date:_____

3d. Build America, Buy America

Build America, Buy America (BABA) Act
CDBG Contractor Acknowledgement Form

The Contractor acknowledges to and for the benefit of the City of Superior, WI ("Owner") and the Funding Authority that it understands the goods and services under this Agreement are being funded with federal monies and have statutory requirements commonly known as "Build America, Buy America." The prime contractor and all subcontractors (all tiers) must comply with the requirements of the Build America, Buy America (BABA) Act, 41 USC 830l note, and all applicable rules and notices, as may be amended, as applicable to the Community Development Block Grant (CDBG) infrastructure project. Pursuant to the U.S. Department of Housing and Urban Development's (HUD's) notice, "Public Interest Phased Implementation Waiver for FY2022 and 2023 of Build America, Buy America Provisions as Applied to Recipients of HUD Federal Financial Assistance" (88 FR 17001), any funds obligated by HUD on or after the applicable listed effective dates, are subject to BABA requirements, unless excepted by a waiver.

In accordance with HUD's phased implementation plan for BABA for the CDBG program, iron and steel, manufactured products, and production materials purchased for infrastructure project awarded by DEHCR to a CDBG Grantee/UGLG on or after the dates listed below must be produced in the U.S. unless a waiver or exemption applies.

An article, material, or supply is not to be classified into more than one category and must be made based on the status of the article, material, or supply upon arrival to the work site for use in an infrastructure project. Articles, materials, or supplies must meet the BAP for only the single category in which they are classified and, in some cases, may not fall under any of the categories listed above.

Contractor Name: _____

_____
Name/Title

_____
Signature

4. SUBCONTRACTORS AND SUPPLIERS LISTING - Must be submitted with Bid.

Wade Bowl Park Splash Pad Project

4.1 The undersigned agrees to employ the following listed **subcontractors** for the following enumerated classes of work and not to alter or add to such list without the written consent of the City of Superior, WI as per Wisconsin Statutes 66.0901 (7). (see CONTRACT CHANGE ORDER form attached). Use separate sheet as necessary.

	SUBCONTRACTOR	CLASS OF WORK
1)	_____	_____
2)	_____	_____
3)	_____	_____
4)	_____	_____
5)	_____	_____

4.2 Following is a list of **suppliers** to be used on the above listed project. (Use separate sheet as necessary.)

	SUPPLIER	TYPE OF SUPPLY
1)	_____	_____
2)	_____	_____
3)	_____	_____
4)	_____	_____
5)	_____	_____

Number of years of experience or additional details of subcontractors, supplier or product may be requested for projects as deemed necessary by the City.

Submitted by: COMPANY _____

ADDRESS _____

COMPANY REPRESENTATIVE _____

5. ADDENDA ACKNOWLEDGEMENT (Must be submitted with Bid)

Wade Bowl Park Splash Pad Project

I/we hereby acknowledge receipt of the following addenda(s):

Addendum No. _____ Dated _____
Addendum No. _____ Dated _____
Addendum No. _____ Dated _____
Addendum No. _____ Dated _____

I/we further certify that no agreement has been entered into to prevent competition for said work and that I/we carefully examined the site where the work is to take place, and the plans, specifications, form of contract, bond and all other contract documents.

I/we further agree to enter into the contract, as provided in the contract documents, under all the terms, conditions and requirements of those documents.

* If no addenda were issued, the bidder shall so indicate and sign this document.

_____
Company

_____
Representative Signature

_____
Date

6. BID BOND - (Sample) A 5% bid security must be submitted with Bid

AIA Document A310™ -2010 Bid Bond is the preferred document.

KNOW ALL MEN BY THESE PRESENTS that, _____

of _____ as principal, and _____,

a corporation organized and existing under the laws and authorized to transact business in the State of _____ (herein called "surety") as surety are held and firmly bound unto the City of Superior, Wisconsin, a municipal corporation of the State of Wisconsin, in the penal sum of _____ dollars (five percent of bid), good and lawful money of the United States of America, to be paid to the City of Superior, Wisconsin, its duly authorized attorneys, agents, officers, successors and assigns for which payment, well and truly be made, we bind ourselves, our heirs, administrators, executors, successors and assigns, jointly and severally firmly by these presents.

WHEREAS, the above bounden principal has entered into a proposal for a certain written contract with the City of Superior, Wisconsin, dated on this _____ day of _____, 20____, for the performance of the following work:

_____

NOW THEREFORE, the condition of the above obligation is such that if the above principal shall file and properly execute the proper contract and performance bond within the time limited by the City, which shall provide for the doing of such work upon the terms and conditions of the plans and specifications of the bid, then this obligation is to be void, otherwise be made and remain in full force and effect.

_____
Company

_____
President

_____
Secretary

WITNESS:
Signed and Sealed in the Presence of:

_____

_____

7. BIDDER'S PROOF OF RESPONSIBILITY (Must be submitted with Bid)

Wisconsin Statutes Section 66.0901 (2) requires anyone submitting a bid to complete a sworn statement consisting of information relating to the financial ability, equipment, experience in the work prescribed in the public contract, and other matters that the municipality requires. The City of Superior shall properly evaluate the statement and shall find the maker of the statement either qualified or unqualified.
If the City is not satisfied with the sufficiency of the answers to the questionnaire and financial statement, it may reject the bid or disregard the same or require additional information.

The contents shall be confidential and may not be disclosed except upon the written order of the person furnishing the statement, for necessary use by the public body in qualifying the person, or in cases of actions against, or by, the person or municipality.

STATEMENT OF BIDDER QUALIFICATIONS

1. Name of bidder:_____
2. Bidder's address:_____
3. When organized:_____
4. Where incorporated:_____
5. How many years have you been engaged in the contracting business under the present firm name:_____
6. Have you ever failed to complete any work awarded to you? No _____ Yes_____
   (If yes, please explain)
7. Have you ever defaulted on a contract? No _____ Yes_____
   (If yes, please explain.)
8. Have you ever been sued for services you provided? No _____ Yes_____
   (If yes, please explain.)
9. In the past three years, has your organization had at least a 25% interest, or has another corporation, partnership or other business entity operating in the construction industry controlled it? No _____ Yes_____
   (If yes, please attach a statement explaining the nature of the relationship.)
10. Has your or the controlling company ever been charged with or convicted of a violation of any wage schedule? (Section 66.0903 (12) d Wis Stats) No _____ Yes_____
    (If yes, please provide details, date, claimant, particulars of each instance.)
11. Has the applicant, any of its owners, a subsidiary or corporate parent, or any officer or director thereof; been convicted in the last three years of violating Section 133.01, Wisconsin Statutes (Unlawful Contracts; Conspiracies)? No _____ Yes_____
    (If yes, please provide details, date claimant, particulars of each incident, etc.)
12. Does your firm have a substance abuse policy that complies with Section 103.503 Wisconsin Statutes? No _____ Yes_____
13. Does your firm possess all valid licenses, registrations and certifications required by federal, state, county or city law necessary for the work it seeks to perform?
    No _____ Yes_____
14. Has your organization had any type of business, contracting or trade license, certification or registration revoked or suspended in the last three years?
    No _____ Yes_____ (If yes, please explain.)

15. Does your organization meet all bonding requirements as required by applicable law? No _____ Yes_____

16. Attach a list of the largest contracts completed by your firm, including kind of work and approximate cost.

17. Attach a statement of background and experience of the principal members of your personnel, including your officers.

18. Name, address and telephone numbers of a minimum of two (2) references of others whom you have performed similar work/services to in the past five (5) years.

19. Credit references - attach as applicable

20. Financial (net worth in excess of): $_____

21. Additional information may be submitted if desired.

Company Name _____

I, the below signed, attest all answers to the foregoing questions and all statements contained are true and correct.

Authorized Signature _____

PRINT signature name and title_____

_____

Subscribed and sworn to before me,
this _____ day of _____, 2025

_____
Notary Public

County of _____

My Commission Expires _____

City of Superior, Wisconsin

7a. AFFIDAVIT OF COMPLIANCE

(Must be submitted by Contractor and all Sub-Contractors)

State of _____)
) SS
County of _____)

I, _____, being duly sworn on oath, states as follows:
NAME OF CONTRACTOR/AGENT

1. That I am the contractor or agent of the contractor submitting a bid for

_____; and
NAME OF PROJECT

2. That _____ is a responsible contractor
NAME OF CONTRACTOR/COMPANY
and meets the criteria set forth in Chapter 2, Article XII, Responsible Contractor Criteria, City of Superior Ordinance #O20-4178 (attached hereto).

_____
SIGNATURE Of CONTRACTOR/AGENT

_____
PRINT NAME

_____
TITLE

_____
ADDRESS

_____
PHONE

_____
E-MAIL

Subscribed and sworn to before me this _____ day of _____, 20____.

_____
SIGNATURE

_____
PRINT NAME

My commission expires: _____

City of Superior, Wisconsin

ORDINANCE #O20-4178

ORDINANCE INTRODUCED BY MAYOR JIM PAINE REPEALING SECTION 2, ARTICLE XII PUBLIC WORKS PROJECTS AND RECREATING SECTION 2, ARTICLE XII RESPONSIBLE CONTRACTOR CRITERIA

The Common Council of the City of Superior, Wisconsin, does ordain as follows:

SECTION 1. Chapter 2, Article XII, Public Works Projects of the City Code of Ordinances is hereby repealed and recreated as follows:

ARTICLE XII. RESPONSIBLE CONTRACTOR CRITERIA

Section 2-468. Purpose. Pursuant to Wis. Stats. § 66.0901, whenever the city lets public work by contract, the contract must be awarded to the lowest qualified responsible contractor. What constitutes a qualified responsible contractor is a determination that requires the exercise of discretion by the city and its departments, officials or employees under reasonably consistent responsible contractor criteria when exercising its discretion.

Section 2 -469. Definitions. In this section, the following definitions shall apply.

"Contractor" means a person, corporation, partnership or any other business entity that performs work on a public works contract as a general contractor, prime contractor or subcontractor at any tier.

"Apprenticeship program" means an apprenticeship program that is currently approved by the U.S. Department of Labor or a state apprenticeship agency and has graduated apprentices to journeyperson status for three years.

"Public works contract" means a contract for the construction, alteration, execution, repair, remodeling or improvement of a public work or building, where the contract is in excess of $25,000 and is required to be bid pursuant to Wis. Stats. § 59.52(29).

"Qualified contractor (Bidder)" means a person, corporation, partnership or any other business entity that meets the requirements specified in this ordinance as well as the criteria specified in Wis. Stats. 16.855 (9m) (b) (1) (a & b)

Section 2-470 Responsible Contractor Criteria. In order to be a qualified responsible contractor for purposes of being awarded a public works contract, the contractor must meet the following criteria.

a) The contractor maintains a permanent place of business.

b) The contractor is authorized to do business in the State of Wisconsin.

c) The contractor, or agent, partner, employee or officer of the contractor, is not debarred, suspended, proposed for debarment or declared ineligible from contracting with any unit of federal, state or local government.

d) The contractor is in compliance with provisions of Section 2000e of Chapter 21, Title 42 of the United States Code and Federal Executive Order No. 11246 as amended by Executive Order No. 11375 (known as the Equal Opportunity Employer provisions).

e) The contractor has general liability, workers' compensation, automobile insurance and unemployment insurance.

f) The contractor has complied with all provisions of any prevailing wage laws and federal Davis-Bacon related Acts, and the rules and regulations therein, for projects undertaken by the contractor that are covered by these laws, for the past five (5) years.

g) The contractor participates in an apprenticeship program as referred in section 2-46 9, if the contractor employs more than two (2) employees.

h) The contractor has a written substance abuse prevention program meeting the requirements of Wis. Stat. §103.503.

i) The employees who will perform work on the project are properly classified as employees or independent contractors under all applicable state and federal laws.

j) The contractor has not been the subject to any investigation, order or judgement regarding the construction industry from a state or federal agency or court concerning an employment practice, including but not limited to, classification of employees, unemployment insurance, discrimination or payroll fraud. If the contractor has been the subject of any of the aforementioned, the contractor must provide copies of the investigation, order or judgement and may be disqualified.

k) The contractor's employees who will perform work on the project are:

1) Covered under a current workers' compensation policy; and properly classified under such policy.

2) Covered under a current health insurance policy as required by federal or state law.

l) The contractor possesses all applicable professional and trade licenses required for performing the public works.

m) The contractor has adequate financial resources to complete the public works contract, as well as all other work the bidder is presently under contract to complete.

n) The contractor is bondable for the terms of the proposed public works contract.

o) The contractor has a record of meeting the criteria which will be considered in determining satisfactory completion of projects and may include, but are not limited to:

1) Completion of contracts in accordance with drawings and specifications;

2) Diligent execution of the work and completed contracts according to the established time schedules unless extensions are granted by the owner; and

3) Fulfilled guarantee requirements of the contract documents.

p) The contractor has, and diligently maintains, a written safety program.

Section 2-471. No Restriction on Discretion. If information other than what was disclosed by the contractor in section 2-470 is discovered by the city or the department, official or employee responsible for awarding the public works contract, and such information calls into question the contractor's abilities or competence to faithfully and responsibly comply with the terms of a public works contract, that information shall be considered in determining whether the contractor is a qualified responsible contractor.

Section 2-472. Affidavit of Compliance.

In the event a construction management company is to administer the said contract with general contractors, prime contractors or subcontractors of any tier, the construction management firm shall ensure all the rules and regulations contained in this Responsible Contractors Ordinance are followed by all contractors of any tier.

The general, prime contractor, or sub-contractor of any tier bidding on a public works project must include in its sealed bid:

a) Its own affidavit swearing compliance with the criteria set forth in section 2-470 on the form required by city; and

b) An affidavit swearing compliance with the criteria set forth in section 2-470 on the form required by the city from every subcontractor at any tier who will perform work on the project.

Failure to submit the required affidavit, or providing incorrect, false, or misleading information may disqualify the contractor's bid.

SECTION 2. All ordinances and parts of ordinances conflicting with this ordinance are hereby repealed.

SECTION 3. This ordinance shall be in full force and effect from and after its passage and publication.

City of Superior, Wisconsin

8. AFFIDAVIT OF ORGANIZATION AND AUTHORITY (Must be submitted with Bid)

STATE OF _____)
) SS
COUNTY OF _____)

_____ being duly sworn on oath deposes and states that the bidder on the attached bid proposal is organized as indicated below and that all statements herein made are made on behalf of such bidder and that this deponent is authorized to make them.
Complete Applicable Paragraphs:

1. CORPORATION
The bidder is a corporation organized and existing under the laws of the State of _____ __, its president is _____, its secretary is _____, and it does (does not) have a Corporate Seal. The president is authorized to sign construction contracts and bids for the company by action of its board of directors taken _____ a certified copy of which is hereto attached. (Strike out last sentence if not applicable.)

2. PARTNERSHIP
The bidder is a partnership consisting of _____ and _____ partners doing business under the name of: _____

3. SOLE TRADER
The bidder is an individual and if operating under a trade name, such trade name is:
_____

4. LIMITED LIABILITY COMPANY
The undersigned is the _____ (title) of _____, a Limited Liability Company organized and operated under the laws of the State of _____.

5. ADDRESS
The business address and phone number of bidder is:
_____

6. STATUTORY SWORN STATEMENT
_____ also deposes and states that he has examined and carefully prepared this bid proposal from the plans and specifications and has checked the same in detail before submitting this proposal or bid, and that the statements contained herein are true and correct.

_____
(Authorized Signature)

Subscribed and sworn to before me,
this _____ day of _____, 2025

_____
Notary Public
County of _____
My Commission Expires _____

9. CONTRACT (to be finalized after award)

9.1 Preamble

This contract made this ____ day of _____ 2025, by and between _____, a corporation, herein called "Contractor", and the City of Superior, a municipal corporation, located in Douglas County, Wisconsin, herein called "Owner or City".

WITNESSETH, that the Contractor and Owner for the consideration stated herein, agree as follows:

9.2 Article I - Scope of Work

The Contractor shall perform everything required to be performed and shall provide and furnish all the applicable labor, materials, equipment, necessary tools, expendable equipment, insurance provided by the specifications, contributions to social security and all utility and transportation services required to perform and complete in a workmanlike manner the following work:

Wade Bowl Park Splash Pad

All work shall be in strict compliance with the Contractor's proposal and other contract documents, herein mentioned as component parts of this contract.

9.3 Article II - Contract Price

The Owner shall pay the Contractor for the performance of this contract an amount based upon the unit prices contained in the proposal for the actual measured quantities of work done or lump sum as proposed. Overruns shall not be paid for without prior written approval of the Engineer.

Contractor shall not be entitled to payment for work found deficient or failing to conform to the requirements set forth in this agreement and is not entitled to further payments until corrected to the satisfaction of the Director of Public Works, at the cost of the Contractor. The City will inform the Contractor of any deficiencies and/or items that do not conform to this contract within thirty (30) days of receipt.

Unless otherwise provided in the special provisions, payments are to be made to the Contractor within 30 days of receipt of an approved payment application/invoice on the basis of written approval of estimates by the Owner of the value of the work performed during the preceding billing period. However, in accordance with 66.0901(9) Wisconsin Statutes, the owner will retain five percent (5%) of the amount of each such estimate, until the work has been completed. This retainage will be held until completion and acceptance of all work included in this contract. Payments to contractor will be withheld if certified payroll reports are not received weekly.

Submission of a final payment application/invoice shall be accompanied by final payroll reports and final unconditional lien waivers (from all sub-contractors and suppliers) to the Owner. Prior to release of final payment, the Public Works Department shall review project documents submitted by Contractor to determine the satisfaction thereof; it will be at

the Public Works Department's sole discretion when the final payment is made. Final payment will be made to Contractor within thirty (30) days of the City's acceptance of services as complete.

The Owner, in case the work under this contract is not completed within the time required or within an extended time approved in writing by the Owner, is authorized to take charge of the work and finish it at the expense of the Contractor and his sureties, and to apply the amount retained from estimates to the completion of the work.

9.4 Article III - Component Parts of this Contract

This contract consists of the following component parts, all of which are as fully a part of it as if set out verbatim herein, or if not attached, as if the same were hereto attached:

a. Advertisement to Bid
b. Instructions to Bidders
c. Bid Proposal
d. Assurances
e. Equal Opportunity Statement
f. Statement of Debarment
g. BABA acknowledgement
h. Subcontractors & Suppliers Listing
i. Addenda Acknowledgment and all addenda
j. Bid Bond
k. Bidder's Proof of Responsibility
l. Affidavit of Compliance from Contractor and All Sub-Contractors
m. Affidavit of Organization and Authority
n. Contract
o. Certificate of Insurance
p. Performance and Payment Bond
q. General Specifications
r. Engineer's Certificate
s. Special Provisions
t. Contract Change Order
u. Additional Attachments per Index (as applicable)

The contract documents form a complete unit and requirements called for by one are as binding as if called for by all. In cases of conflict between plans and specifications, the specifications shall govern. Special and/or Technical Specifications shall control over General Specifications.

9.5 Article IV - Payment for Labor & Materials

The Contractor specifically agrees to pay for all claims for labor performed at rates at least equal to the wage scale on file with the Owner for this project and materials furnished, used and consumed in completing the foregoing contract, together with all items enumerated in Section 779.035, of the Wisconsin Statutes, as the obligation of the Contractor. No assignment, modification or change in the contract, or change in the work covered thereby, or any extension of time for completion of the contract shall release the sureties on the bond.

9.6 Article V – Insurance

Within ten (10) days after the execution of the contract, and prior to commencement

of any work, the Contractor shall file with the Owner satisfactory evidence of having adequate worker's compensation insurance and public liability insurance, both personal and property, as outlined in the General Specifications, 11.3.

In Witness Whereof, the parties hereto have caused this instrument to be executed the day and year first written.

9.7 Article VI – Authority

The Contractor represents that it has the authority to enter into this contract. If the Contractor is not an individual, the person(s) signing on behalf of the Contractor represents and warrants that they have been duly authorized to bind the Contractor and sign this Contract on the Contractor's behalf.

9.8 Signatures

SIGNED AND SEALED: COMPANY:
ADDRESS:
PHONE:

Signer	Signer

ATTEST: CITY OF SUPERIOR, WISCONSIN

Jim Paine, Mayor	Heidi Blunt, Clerk
Nicholas Rhinehart, Finance Director	Frog Prell, City Attorney

Provision has been made to pay the liability that will accrue under this contract.

***Approved by the City Council on**

10. PERFORMANCE AND PAYMENT BOND (Sample)

AIA Document A312™ - 2010 Performance and Payment Bond is the preferred document.

KNOW ALL MEN BY THESE PRESENTS THAT _____

of _____, and _____ as principal, and _____ of _____, a corporation and existing under the laws of the State of Wisconsin (hereinafter called "surety"), as surety are held and firmly bound unto the City of Superior, a municipal corporation, of the State of Wisconsin, in the penal sum of $_____ Dollars, good and lawful money of the United States of America, to be paid to the City of Superior, Wisconsin, its duly authorized attorneys, agents, officers, successors and assigns for which payment, well and truly to be made, we bind ourselves, our heirs, administrators, executors, successors and assigns, jointly and severally firmly by these presents.

WHEREAS, the above bound principal has entered into a certain written contract with the City of Superior, Wisconsin, dated this ____ day of _____, 2025, which contract is hereby referred to and made a part hereof as fully and to the same extent as if copied at length herein.

NOW, THEREFORE, the condition of the above obligation is such that if the above bound principal shall well and truly keep, do and perform each and every matter and thing in said contract set forth and specified to be by the said principal kept, done and performed at the time and in the manner in said contract specified, and shall pay over, make good and reimburse to the forenamed City, all loss and damage which said City may sustain by reason of failure or default on the part of said principal and shall pay to every person entitled thereto all claims for labor performed and materials furnished, used or consumed in performing the work provided in said contract including, without limitation because of enumeration, fuel, lumber, building materials, machinery, vehicles, tractors, equipment, fixtures, apparatus, tools, appliances, supplies, electric energy, gasoline, motor oil, lubricating oil, greases, state imposed taxes, premiums for worker's compensation insurance and contributions for unemployment compensation, then this obligation shall be void; otherwise, it shall be and remain in full force and effect.

Contractor _____

Representative _____

Title _____

Insurance Company _____

Representative _____

Attest: _____

11. GENERAL SPECIFICATIONS

11.1 GENERAL

Unless otherwise stated, all work and conditions of this contract shall be performed in accordance with the State of Wisconsin Department of Transportation (WisDOT), Standard Specifications for Highway and Structure Construction (including erosion control), 2025 Edition and current Supplemental Specifications, or in accordance with the Wisconsin Department of Commerce.

State and/or Federal funds may be used to fund all or part of this contract. The City will not be held liable for any damages incurred due to changes in State or Federal funding, including (but not limited to) a reduction or cancellation of the project.

This is a federally assisted project and Davis Bacon requirements will be enforced. Federal Labor Standards provisions HUD-4010 is incorporated into this contract and attached as Attachment A. Contractors, including subcontractors, must be eligible to participate. Federal Wage Determination Number WI20250036 and WI20250008 are incorporated into this contract by reference.

11.2 SUBSTITUTIONS

The following terms shall be substituted in the specifications:

a. "Owner" or "City" is the City of Superior.
b. "Engineer" is the Contracted Engineer/Architect for the City of Superior or the City Engineer assigned to the project.

11.3 INSURANCE

The Contractor shall not commence work on contract until proof of insurance required has been provided to the applicable department before the contract or purchase order is considered for approval by the City.
It is hereby agreed and understood that the insurance required by the City is primary coverage and that any insurance or self-insurance maintained by the City, its officers, council members, agents, employees or authorized volunteers will not contribute to a loss. All insurance shall be in full force prior to commencing work and remain in force until the entire job is completed and the length of time that is specified, if any, in the contract or listed below whichever is longer.

CONTRACTOR—LIABILITY

A. Commercial General Liability coverage at least as broad as Insurance Services Office

Commercial General Liability Form, including coverage for Products Liability, Completed Operations, Contractual Liability, and Explosion, Collapse, Underground coverage with the following minimum limits and coverage:

1. Each Occurrence limit	$1,000,000
2. Personal and Advertising Injury limit	$1,000,000
3. General aggregate limit (other than Products-Completed Operations) **per project**	$2,000,000
4. Products-Completed Operations aggregate	$2,000,000
5. Fire Damage limit — any one fire	$50,000
6. Medical Expense limit — any one person	$5,000

7. Products - Completed Operations coverage must be carried for two years after acceptance of completed work.

B. Automobile Liability coverage at least as broad as Insurance Services Office Business Automobile Form, with minimum limits of $1,000,000 combined single limit per accident for Bodily Injury and Property Damage, provided on a Symbol #1- "Any Auto" basis.

C. Workers' Compensation as required by the State of Wisconsin and Employers Liability insurance with sufficient limits to meet underlying Umbrella Liability insurance requirements. If applicable for the work coverage must include Maritime (Jones Act) or Longshoremen's and Harbor Workers Act coverage.

D. Umbrella Liability providing coverage at least as broad as the underlying Commercial General Liability, Automobile Liability and Employers Liability, with a minimum limit of $2,000,000 each occurrence and $2,000,000 aggregate, and a maximum self-insured retention of $10,000. The umbrella must be primary and non-contributory to any insurance or self-insurance carried by the City.

F. Builder's Risk / Contractor's Equipment or Property - The contractor is responsible for loss and coverage for these exposures. City will not assume responsibility for loss, including loss of use, for damage to property, materials, tools, equipment, and items of a similar nature which are being either used in the work being performed by the contractor or its subcontractors or are to be built, installed, or erected by the contractor or its subcontractors.

INSURANCE REQUIREMENTS FOR SUBCONTRACTOR

All subcontractors shall be required to obtain Commercial General Liability (if applicable Watercraft liability), Automobile Liability, Workers' Compensation and Employers Liability, (if applicable Aircraft liability) insurance. This insurance shall be as broad and with the same limits as those required per Contractor requirements, excluding Umbrella Liability, contained in Section 1 above.

APPLICABLE TO CONTRACTORS / SUBCONTRACTORS / SUB-SUB CONTRACTORS

A. Primary and Non-contributory requirement - all insurance must be primary and non-contributory to any insurance or self-insurance carried by City.

B. Acceptability of Insurers - Insurance is to be placed with insurers who have an **A.M. Best** rating of no less than A- and a Financial Size Category of no less than Class VII, and who are authorized as an admitted insurance company in the state of Wisconsin.

C. **Additional Insured Requirements - The following must be named as** additional insureds **on** all **Liability Policies for liability arising out of project work – City of Superior,** and its officers, council members, agents, employees and authorized volunteers. On the Commercial General Liability Policy, the additional insured coverage must be ISO form CG 20 10 07 04 and also include Products - Completed Operations additional insured coverage per ISO form CG 20 37 07 04 for a minimum of 2 years after acceptance of work. This does not apply to Workers Compensation Policies.

D. Deductibles and Self-Insured Retentions - Any deductible or self-insured retention must be declared to and approved by the City.

E. Evidences of Insurance - Prior to execution of the agreement, the Contractor shall file with the City a certificate of insurance (Accord Form 25-S or equivalent) signed by the insurer's representative evidencing the coverage required by this agreement. In addition form CG 20 10 07 04 for ongoing work exposure and form CG 20 37 07 04 for products-completed operations exposure must also be provided or its equivalent.

F. A waiver of subrogation is required for Workman's Compensation and Liability in favor of the City.

Such liability policies shall contain a provision or endorsement covering any contingent liability of the City of Superior. **The City is to be shown as "additionally insured" and the project is to be listed on the certificate.** The naming of said entities as Certificate Holders will not be acceptable. Certificates of worker's compensation and personal and public liabilities, along with the provision indemnifying the City of Superior must be submitted by the successful bidder.

11.3.5 IDEMNIFICATION

Contractor hereby agrees to indemnify, defend and hold harmless the City its elected and appointed officials, officers, employees, agents, representatives and volunteers, and each of them, from and against any and all suits, actions, legal or administrative proceedings, claims, demands, damages, liabilities, interest, attorneys' fees, costs, and expenses of whatsoever kind

or nature in any manner directly or indirectly caused, occasioned, or contributed to in whole or in part or claimed to be caused, occasioned, or contributed to in whole or in part, by reason of any act, omission, fault, or negligence, whether active or passive, of Contractor or of anyone acting under its direction or control or on its behalf, even if liability is also sought to be imposed on the City, its elected and appointed officials, officers, employees, agents, representatives and volunteers.

The obligation to indemnify, defend and hold harmless the City, its elected and appointed officials, officers, employees, agents, representatives and volunteers, and each of them, shall be applicable unless liability results from the sole negligence of the City, its elected and appointed officials, officers, employees, agents, representatives and volunteers.

Contractor shall reimburse the City, its elected and appointed officials, officers, employees, agent or authorized representatives or volunteers for any and all legal expenses and costs incurred by each of them in connection therewith or in enforcing the indemnity herein provided. In the event that Contractor employs other persons, firms, corporations or entities (subcontractor) or volunteers as part of the work covered by this Agreement, it shall be responsibility of the Contractor to require and confirm that each sub-contractor enters into an Indemnity Agreement in favor of the City, its elected and appointed officials, officers, employees, agents, representatives and volunteers, which is identical to this Indemnity Agreement.

This indemnity provision shall survive the termination or expiration of this Agreement.

11.4 PERFORMANCE AND PAYMENT BOND

Contractor shall execute and furnish a completed PERFORMANCE AND PAYMENT BOND in the total amount of the approved bid, to be supplied to the Owner along with the required signed contract documents. AIA Document A312™ - 2010 is the preferred Performance and Payment Bond document.

11.5 LABOR LAWS AND REQUIREMENTS

Davis Bacon Prevailing Wages. The Davis Bacon Act (40 USC, Chapter 3, Section 276a-5; and 29 CFR Parts 1, 3, 5, 6 and 7) is triggered when any construction work over $2,000 is financed in whole or in part with CDBG funds. The Contractor agrees to comply with the requirements of the Secretary of Labor in accordance with the Davis-Bacon Act as amended, the provisions of Contract Work Hours and Safety Standards Act, the Copeland "Anti-Kickback" Act (40 U.S.C. Chapter 3, 276a-276a-5; 29 CFR Parts 1, 3, 5, 6, and 7; 40 USC 327 and 40 USC 276c, Chapter 3, Section 276c; 18 USC, Part 1, Chapter 41, Section 874; 29 CFR Part 3; 40 USC, Chapter 5, Sections 326-332; 29 CFR Part 4, 5, 6 and 8; 29 CFR Part 70 to 240), Section 3 of the Housing and Urban Development Act of 1968 and all other applicable Federal, state and local laws and regulations pertaining to labor standards insofar as those acts apply to the performance of this contract. The Contractor shall maintain

documentation which demonstrates compliance with hour and wage requirements of this part. Such documentation shall be made available to the City for a minimum period of three years after completion.

The Contractor agrees that, except with respect to the rehabilitation or construction of residential property containing less than eight (8) units, all contractors engaged under contracts in excess of $2,000.00 for construction, renovation or repair work financed in whole or in part with assistance provided under this contract, shall comply with Federal requirements adopted by the City pertaining to such contracts and with the applicable requirements of the regulations of the Department of Labor, under 29 CFR Parts 1, 3, 5 and 7 governing the payment of wages and ratio of apprentices and trainees to journey workers; provided, that if wage rates higher than those required under the regulations are imposed by state or local law, nothing hereunder is intended to relieve the Contractor of its obligation, if any, to require payment of the higher wage. The Contractor shall cause or require to be inserted in full, in all such contracts subject to such regulations, provisions meeting the requirements of this paragraph.

The Copeland Anti-Kickback Act (40 USC, Chapter 3, Section 276c and 18 USC, Part 1, Chapter 41, Section 874; and 29CFR Part 3) requires that workers be paid weekly, that deductions from workers' pay be permissible, and that contractors maintain and submit weekly payrolls.

The Contract Work Hours and Safety Standards Act ($) USC, Chapter 5, Sections 326-332; and 29 CFR Part 4, 5, 6 and 8; 29 CFR Part 70 to 240) applies to contracts over $100,000 and requires that workers receive overtime compensation (time and on-half pay) for hours they have worked in excess of 40 hours in one week.

Section 3 Economic Opportunities (24 CFR 135.3) is a provision of the Housing and Urban Development Act of 1968. Contractor and all subcontractors will be responsible for complying with the provisions of 24 CFR, Part 135. Compliance with the provisions of Section 3 of The Housing and Urban Development Act of 1968 and the HUD regulations set forth in 24 CFR 135, and all applicable rules and orders issued hereunder prior to the execution of this contract, shall be a condition of the Federal financial assistance provided under this contract and binding upon the CITY, the Contractor and any of the Subcontractor's subcontractors. Failure to fulfill these requirements shall subject the CITY, the Contractor and any of the Subcontractor's subcontractors, their successors and assigns, to those sanctions specified by the AGREEMENT through which Federal assistance is provided. The Contractor certifies and agrees that no contractual or other impediment exists which would prevent compliance with these requirements.

The Contractor further agrees to comply with these "Section 3" requirements and to include the following language in all subcontracts executed under this AGREEMENT:

"The work to be performed under this contract is a project assisted under program providing direct Federal financial assistance from HUD and is subject to the requirements of Section 3 of the Housing and Urban Development Act of 1968, as amended, 12 U.S.C. 1701. Section 3 requires that to the greatest extent feasible opportunities for training and employment be given to low- and very low-income residents of the project area and contracts for work in connection with the project be awarded to business concerns that provide economic opportunities for low- and very low-income persons residing in the metropolitan area in which the project is located."

The Contractor further agrees to ensure that opportunities for training and employment arising in connection with a housing rehabilitation (including reduction and abatement of lead- based paint hazards), housing construction, or other public construction project are given to low- and very low-income persons residing within the metropolitan area in which the CDBG funded project is located; where feasible, priority should be given to low- and very low- income persons within the service area of the project or the neighborhood in which the project is located, and to low- and very low-income participants in other HUD programs; and award contracts for work undertaken in connection with a housing rehabilitation (including reduction and abatement of lead-based paint hazards), housing construction. or other public construction project are given to business concerns that provide economic opportunities for low- and very low-income persons residing within the metropolitan area in which the CDBG funded project is located; where feasible, priority should be given to business concerns which provide economic opportunities to low- and very low-income residents within the service area or the neighborhood in which the project is located, and to low- and very low-income participants in other HUD programs.

The Contractor certifies and agrees that no contractual or other legal incapacity exists which would prevent compliance with these requirements.

The Contractor agrees to send to each labor organization or representative of workers with which it has a collective bargaining agreement or other contract or understanding, if any, a notice advising said labor organization or worker's representative of its commitments under this Section 3 clause and shall post copies of the notice in conspicuous places available to employees and applicants.

The Contractor will include this Section 3 clause in every subcontract and will take appropriate action pursuant to the subcontract upon a finding that the subcontractor is in violation of regulations issued by the grantor agency. The Contractor will not subcontract with any entity where it has notice or knowledge that the latter has been found in violation of regulations under 24 CFR 135 and will not let any subcontract unless the entity has first provided it with a preliminary statement of ability to comply with the requirements of these regulations. All subcontractors must be approved by the City prior to execution.

Equal Employment Opportunity. During the performance of this Contract, the contractor

agrees that if the Contract amount is over $10,000, the following conditions apply: Contractor will abide by the rules and regulations of Executive Order 11246, which prohibits employment discrimination by Federal contractors and subcontractors and federal assisted construction contractors and subcontractors.

Inspections & Interviews. Permit the City, CDBG or their designees to examine, inspect the work under this Contract before and after completion and interview workers. Cooperate with the City in completing progress inspections, final inspection of the work and documentation of onsite job interviews.

11.6 DISCRIMINATION AND PROHIBITED INTERESTS

a. The City requires from the Contractor the following and also requires the Contractor to insert into each subcontract the following:
   1.) In connection with the performance of work under this Agreement, the Contractor agrees not to discriminate against any employee or applicant for employment because of age, race, religion, color, handicap, sex, physical condition, developmental disability as defined in s 51.01 (5) Wisc. Stats., sexual orientation or national origin. This provision shall include, but not be limited to the following: employment, upgrading, demotion or transfer; recruitment or recruitment advertising; layoff or termination; rates of pay or other forms of compensation; and selection for training, including apprenticeship. In connection with the performance of its work under the Agreement and except with respect to sexual orientation, Contractor further agrees to take affirmative action to ensure equal employment opportunities. In connection with the performance of its work under the Agreement, Contractor agrees to post in conspicuous places, available for employees and applicants for employment, notices to be provided by WisDOT setting forth the provisions of this nondiscrimination clause.
   2.) No official, officer, or employee of the City of Superior, during his or her tenure or for one (1) year thereafter, shall have any interest, direct or indirect, in this contract or in the proceeds thereof except as permitted under s. 946.13 (2) Wis. Stats.
   3.) No member of or delegate to Congress or to the Wisconsin State Legislature shall share any benefit that may arise from this Agreement.

b. The City requires from the Contractor and also requires the Contractor to insert in each subcontract the following:
   1.) Contractor shall comply with the following laws, policies, regulations and pertinent directions as may be applicable and will require its subcontractor through contractual agreement to similarly comply:
      a. Title VI of the Civil Rights Act of 1964, 78 Stat. 252, 42 U.S.C. 2000d et seq.
      b. Title II and Title III of the Uniform Relocation Assistance and Real Property Acquisition Policies Act of 1970, 42 W.S.C. 4601 et seq.
      c. Federal Occupational Safety and Health Act of 1970, 29 U.S.C. 653, et

seq., and any other applicable occupational safety and health laws or regulations.

2.) Contractor agrees that no otherwise qualified disabled individual in the United States as defined in Section 706 (8) of Title 29 U.S.C., or as specifically provided for in subchapter II of Chapter 111, Wis. Stats., or in Title I of the American With Disabilities Act of 1990, 42 U.S.C. 12111, et seq., shall, solely by reason of disability, be excluded from participation in, be denied benefits of, or be subjected to discrimination under any program or activity receiving benefits under this agreement.

c. MBE/WBE Reporting Requirements. The Contractor will use its best efforts to afford minority- and women-owned business enterprises the maximum practicable opportunity to participate in the performance of this contract. As used in this contract, the term "minority and female business enterprise" means a business at least fifty-one (51) percent owned and controlled by minority group members or women. For the purpose of this definition, "minority group members" are Afro-Americans, Spanish-speaking, Spanish surnamed or Spanish-heritage Americans, Asian-Americans, and American Indians. The Contractor may rely on written representations by businesses regarding their status as minority and female business enterprises in lieu of an independent investigation.

The Contractor shall be required to complete and submit to the City the form “Reporting Requirements – MBE/WBE and Section 3”, attached as Exhibit B. This form shall be completed by the Contractor to include the Contractor’s and all SubContractors’ information. This form is required to be submitted to the City prior to Contractor payment.

The Contractor and all SubContractors shall be required to complete and retain in employee files the form “Section 3 Worker & Targeted Section 3 Worker Self Certification” on EACH employee that works on this project, attached as Exhibit C. This form is required to be completed on each employee once every five years and any new hires that will complete work on this project. This form is not required to be submitted to the City. However, the City may require proof of completion prior to Contractor payment upon request.

11.7 BUY AMERICA PREFERENCE

Build America, Buy American Act: The Contractor must comply with the requirements of the Build America, Buy American Act (BABA), enacted as part of the Infrastructure investment and Jobs Act (IIJA). Pub. L. 117-58, 41 U.S.C. § 8301 note, the Federal Financial Assistance used to fund this infrastructure project is required to apply a domestic content procurement preference (the “Buy America Preference” or “BAP”) for all construction, alteration, maintenance, or repair of infrastructure, including buildings and real property, unless application of the BAP has been waived by HUD. Additional details on fulfilling the BABA requirements can be found at https://www.hud/gov/baba.

Under BABA Section 70911 (c) and the BABA Guidance, construction materials do not

include cement and cementitious materials; aggregates such as stone, sand, or gravel; or aggregate binding agents or additives (known as "section 70917(c) materials"). Precast concrete is subject to BABA.

If this total project is less than $250,000, BAP is waived.

11.8 LICENSES, PERMITS AND APPROVALS

The Contractor warrants that he is properly licensed and possesses all the necessary qualifications as required by the federal, state, and local laws, ordinances, regulations, etc., prior to commencing work, and shall remain in good standing for the duration of the project.

The Contractor is responsible for all local, state, and federal permits and approvals which may apply to this project. The fees for local permits will be waived upon receipt of application of such permits and it is noted that the permit late fee of $750.00 per permit will be the financial responsibility of contractor. Normal local inspections will be required, including final inspection of the project by the applicable local departments.
The Contractor shall give all notices required by law and comply with all laws, statutes, ordinances, rules, and regulations that affect the conduct and prosecution of the project. The Contractor shall be liable for all violations of the law in connection with work furnished by the Contractor. If Contractor performs any work that it knew or should have known to be contrary to such laws, statutes, ordinances, rules and regulations and without giving notice to the City, the Contractor shall be responsible for all costs arising therefrom.

The City will consider no plea of misunderstanding or ignorance of these requirements.

11.9 OBSTRUCTION OF STREETS AND SIDEWALKS

The Contractor shall promptly remove any dirt or debris which is caused by its performance of this contract and clean all streets, sidewalks, alleys, and public property which is soiled by Contractor's actions or omissions. If the Contractor shall, in any manner, obstruct a street or sidewalk or other public grounds, he shall erect, install, maintain and pay for barriers and lights to prevent accidents and shall be liable for damages caused by the obstruction and for any damage or disruption to streets, alleys or public grounds which may result from his intentional or negligent prosecution of such work in accordance with Section 62.15 (11) of the Wisconsin Statutes. The Contractor shall also be bound by any further requirements of the specifications on this point.

11.10 PROSECUTION AND PROGRESS

Prosecution and Progress shall be accomplished in accordance with WisDOT Standard Specifications 2025, Section 108, unless otherwise set forth in the Special Provisions.

Unless otherwise set forth in the Special Specifications, upon receipt of "Notice to Proceed" from the Owner, work under this contract shall commence immediately and be completed by August 29, 2025.

11.11 COORDINATION OF CONTRACTORS

The City may award or may contract for additional work outside the scope of this contract. The Contractor shall fully cooperate with any other Contractor, City employee, and engineer or designated representative of the City, by scheduling its own work with that to be performed under other Contracts as may be directed by the City. The Contractor shall not commit or permit any act which will interfere with the performance of any other Contractor, agent, City employee, engineer or designated representative as scheduled.

Employees of the Contractor must be able to work within a public setting without creating a disruption and conform to all policies, rules and regulations. Contractors shall require that their employees be courteous at all times, not to use loud or profane language, and to work as quietly as possible. The contractor shall require that its employees shall not trespass, loiter, cross property to adjoining premises, or tamper with property not covered by the contract.

The contractor agrees to observe and obey all applicable laws, ordinances, rules and regulations promulgated and enforced by the City and by any other proper authority having jurisdiction over the work performed herein.

Special Conditions Where special conditions or special purposes require the consideration of deviations from these specifications, any such deviations must be authorized by the Owner.

11.12 CHANGE ORDERS

Any change to the signed contract must be approved by the Owner, in writing, prior to the commencement of the change (see CONTRACT CHANGE ORDER, Section 14). All changes/amendments/addition/ deletions to the original contract must be described on the Contract Change Order form (duplicate blank copies as necessary) with the necessary increase/decrease in contract price indicated. Change orders will need to include any invoices and supporting documents. These changes will include applicable project extension time requests. The form is to be numbered and is to be signed by the Contractor and approved by the Engineer and the Owner.

11.13 TIME PENALTIES

Should the Contractor fail to complete the work within the time agreed upon or within such extra time as may be allowed by extensions (see Item 11.9 above), there shall be deducted from any monies due or that may become due the Contractor, for each and every calendar day that the work shall remain uncompleted, a sum assessed as specified in Section 108.11 *Liquidated Damages* of the State of Wisconsin Department of Transportation (WisDOT), Standard Specifications for Highway and Structure Construction (including erosion control), 2025 Edition and current Supplemental Specifications, except that this sum shall be considered a penalty, a fixed and agreed-to-sum due the City from the Contractor by reason of inconvenience to the public, added cost of engineering and supervision, maintenance of detours and other items resulting from the Contractor's failure to complete the work within the time specified in the contract. If the penalties exceed the balance of monies that would otherwise have been due the contractor, the Contractor or the Contractor's Surety shall be responsible for payment of all such penalties to the Owner as liquidated damages.

11.14 GUARANTEE

The Contractor shall assume responsibility for all defects which may develop in any part of the bid project caused by faulty workmanship, material or equipment and agrees to replace any such faulty workmanship, material, and equipment, during the period of two (2) years from date of final payment of the work without cost to the Owner. The contractor shall coordinate any manufacture's warrantees for the Owner during the two-year period, without any cost to the Owner.

Acceptance of the plan shall not waive this guarantee. Final acceptance shall be determined as date of letter from Owner or Engineer approving final payment. The contractor is responsible for coordinating manufacturer warrantee replacements should problems arise in the guarantee period. The warrantee period shall begin upon the contractor's receipt of final payment, unless otherwise agreed upon in writing by the Owner.

11.15 AS-BUILTS and WARRANTY DOCUMENTS

Within ten (10) days of substantial completion and prior to final payment by the Owner, the Contractor is to supply the Owner with project "as-builts" and all product warranty information. As-builts must be submitted in CAD, GIS or adobe file format or another format agreed upon by Owner.

11.16 CONTROL OF THE WORK

Control of the work shall be accomplished in accordance with WisDOT Standard Specifications 2025, Section 105 except as modified below:

Construction staking and providing grade and line is the responsibility of the Contractor.

MANY UTILITY OWNERS HAVE EXISTING FACILITIES NEAR OR AT THE LOCATION OF THE WORK REQUIRED UNDER THIS CONTRACT. The Contractor shall contact **Diggers Hotline at 1-800-242-8511** to determine locations are safe and will make any adjustments recommended by the locator prior to performing any excavation operations under this contract.

11.17 SCOPE OF WORK

The scope of work for this project shall be in accordance with WisDOT Section 104, unless otherwise set forth in the Special Provisions.

The Contractor shall be responsible for the maintenance of traffic control. The Contractor shall provide, erect, and maintain all barricades.

11.18 LEGAL RELATIONS AND RESPONSIBILITY TO THE PUBLIC

The Contractor shall fulfill all legal relations and responsibilities to the public in accordance with WisDOT Standard Specifications 2025, Section 107 and as follows:

The Contractor shall work in cooperation with utility companies in the protection of water and gas mains and other utilities that may be within the limits of construction. It shall be the duty of the Contractor to notify the utility company or companies involved before starting work on this project.

11.19 SAFETY AND SECURITY

The Contractor shall at all times perform in a safe and workmanlike manner to avoid injury or damage to any person or property. The Contractor shall comply with all requirements and specifications relating to the safety, health, and sanitation measures applicable to the project. The Contractor shall exercise all necessary precautions for the safety of its employees, and be in compliance with all applicable federal, state and local laws, statutes, ordinances, rules and regulations, including, but not limited to, the Wisconsin Labor Code, The U.S. Department of Transportation Omnibus Transportation Employee Testing Act, Canadian Pacific – Minimum Safety Requirements for Contractors, and OSHA standards.

The contractor shall provide all necessary safeguards, devices, and protective equipment, including but not limited to adequate life protection and lifesaving equipment, and shall ensure the proper inspection and maintenance of safety measures are current and in compliance.

The City may halt construction on any project where appropriate safety measures and equipment are not being used or any safety regulations are not being followed. Work will not be permitted to resume until required safety provisions have been made and delays as a result of this provision will not be considered a basis for an increase in the contract price or an extension of the completion deadline.

11.20 PRE-CONSTRUCTION CONFERENCE

A preconstruction conference will be required prior to commencing work. The conference may be initiated by the contractor.

11.21 PROJECT DOCUMENT SUBMISSIONS

As a condition of final payment, the following documents must be submitted and accepted by the City:

a. Lien waivers – final unconditional lien waives from each sub-contractor and/or supplier must be submitted to the City.
b. As-builts & product warranties - as noted in Section 11.13, these documents must be submitted to City.
a. Retainage – Contractor's final invoice is to indicate the balance of work completed and/or the total amount of retainage due the Contractor.
c. Local inspections - final inspection reports must be submitted to the City.
d. Project completion documentation - written documentation from the project engineer confirming the completion of the project.
e. MBE/WBE and Section 3 forms completed by Contractor and SubContractors.
f. Weekly certified payroll reports from Contractor and all SubContractors.
g. Section 3 Worker & Targeted section 3 Worker Self Certification completed by Contractor and all SubContractors. These forms will be provided to the City upon request.
h. BABA manufacturer certification letters.

12. ENGINEER CERTIFICATION

See page 1 of plans

13. SPECIAL PROVISIONS

PROJECT MANUAL FOR
WADE BOWL PARK SPLASH PAD
CITY OF SUPERIOR
DOUGLAS COUNTY, WI

March 2025
Project #00628066

Prepared By:

MSA Professional Services, Inc.
60 Plato Blvd. East, Suite 420
St. Paul, MN 55107

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WADE BOWL PARK SPLASH PAD

City of Superior, Douglas County, WI

Project #00628066

Seals Page

GENERAL PROCESS ENGINEER: MSA Professional Services, Inc.	ELECTRICAL ENGINEER: MSA Professional Services, Inc.	LANDSCAPE ARCHITECT MSA Professional Services, Inc.
		

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PROJECT MANUAL FOR
WADE BOWL PARK SPLASH PAD
CITY OF SUPERIOR
DOUGLAS COUNTY, WI

CONTENTS AND PROJECT MANUAL INDEX

DESCRIPTION		PAGE	
DIVISION 00 – PROCUREMENT AND CONTRACTING REQUIREMENTS			
Title Page		00 01 01-1	
Seals Page		00 01 07-1	
Contents and Project Manual Index		00 01 10-1	- 2
DIVISION 01 - GENERAL REQUIREMENTS			
Section 01 11 00	Summary of Work	01 11 00	- 1
Section 01 14 00	Work Restrictions and Provisions	01 14 00	- 1 - 5
Section 01 29 73	Schedule of Values	01 29 73	- 1 - 2
Section 01 31 13	Project Coordination	01 31 13	- 1 - 2
Section 01 31 19	Project Meetings	01 31 19	- 1
Section 01 32 16	Construction Progress Schedule	01 32 16	- 1 - 3
Section 01 32 23	Survey and Layout Data	01 32 23	- 1 - 4
Section 01 33 00	Submittals	01 33 00	- 1 - 3
Section 01 33 23	Shop Drawings, Product Data, and Samples (Submittal Log)	01 33 23	- 1 - 2
Section 01 35 00	Special Procedures	01 35 00	- 1 - 9
Section 01 41 26	Permits	01 41 26	- 1
Section 01 45 00	Quality Control	01 45 00	- 1 - 3
Section 01 45 16.11	Concrete Quality Control	01 45 16.11	- 1 - 4
Section 01 50 00	Temporary Facilities and Controls	01 50 00	- 1 - 5
Section 01 55 26	Traffic Control	01 55 26	- 1 - 2
Section 01 77 00	Closeout Procedures	01 77 00	- 1 - 6
DIVISION 02 - EXISTING CONDITIONS			
Section 02 01 00	Maintenance of Existing Conditions	02 01 00	- 1 - 3
DIVISION 03 - CONCRETE			
Section 03 11 13	Cast-In-Place Concrete Forming	03 11 13	- 1 - 6
Section 03 15 00	Concrete Accessories	03 15 00	- 1 - 6
Section 03 20 00	Concrete Reinforcing	03 20 00	- 1 - 4
Section 03 30 00	Cast-In-Place Concrete	03 30 00	- 1 - 16
DIVISION 13 - SPECIAL CONSTRUCTION			
Section 13 11 13	Splashpad General	13 11 13	- 1 - 4
Section 13 11 14	Splashpad Maintenance and Operations Training	13 11 14	- 1 - 2
Section 13 11 18	Splashpad Concrete	13 11 18	- 1 - 6

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Section 13 11 20	Splashpad Pipe and Fittings	13 11 20	- 1 - 4

DIVISION 26 - ELECTRICAL

Section 26 05 00	Electrical Contract Requirements	26 05 00	- 1 - 8
Section 26 05 19	Wire and Cable	26 05 19	- 1 - 6
Section 26 05 26	Grounding	26 05 26	- 1 - 3
Section 26 05 29	Supporting Devices	26 05 29	- 1 - 3
Section 26 05 34	Raceways	26 05 34	- 1 - 6
Section 26 05 35	Electrical Boxes	26 05 35	- 1 - 4
Section 26 05 37	Location of Outlets	26 05 37	- 1 - 3
Section 26 05 53	Electrical Identification	26 05 53	- 1 - 3
Section 26 27 28	Circuit & Motor Disconnects	26 27 28	- 1 - 3

DIVISION 31 - EARTHWORK

Section 31 05 19.13	Geosynthetics for Earthwork	31 05 19.13	- 1 - 4
Section 31 11 00	Clearing and Grubbing	31 11 00	- 1 - 2
Section 31 22 00	Grading	31 22 00	- 1 - 3
Section 31 23 13	Subgrade Preparation	31 23 13	- 1 - 3
Section 31 23 19	Dewatering	31 23 19	- 1 - 4
Section 31 23 23.14	Granular Fill	31 23 23.14	- 1 - 2
Section 31 23 33	Trenching and Backfilling	31 23 33	- 1 - 6
Section 31 25 00	Erosion and Sedimentation Controls	31 25 00	- 1 - 16
Section 31 37 00	Riprap	31 37 00	- 1 - 2

DIVISION 32 - EXTERIOR IMPROVEMENTS

Section 32 11 23	Aggregate Base and Subbase	32 11 23	- 1 - 3
Section 32 13 10	Concrete Sidewalk, Steps and Driveways	32 13 10	- 1 - 4
Section 32 91 19.13	Topsoil Placement and Grading	32 91 19.13	- 1 - 4
Section 32 92 19	Seeding	32 92 19	- 1 - 3
Section 32 93 00	Landscaping	32 93 00	- 1 - 11

DIVISION 33 - UTILITIES

Section 33 05 16.13	Precast Concrete Utility Structures	33 05 16.13	- 1 - 3
Section 33 05 26.16	Tracer Wire	33 05 26.16	- 1 - 3
Section 33 10 00	Water Utilities	33 10 00	- 1 - 12
Section 33 39 13	Sanitary Sewer Manholes	33 39 13	- 1 - 6
Section 33 41 13	Public Storm Utility Drainage Piping	33 41 13	- 1 - 5
Section 33 41 16.19	Pipe Underdrains	33 41 16.19	- 1 - 4
Section 33 49 13	Storm Drainage Manholes, Frames and Covers	33 49 13	- 1 - 4

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SECTION 01 11 00
SUMMARY OF WORK

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern Work of this section.

1.02 APPLICABLE PUBLICATIONS (NONE)

1.03 DESCRIPTION OF WORK

A. Splash Pad construction at Wade Bowl Park
   1. The work under this contract includes, but is not limited to, the furnishing of all labor, materials, tools, equipment, transportation, certificates, and temporary protection necessary for or incidental to the construction of the overall proposed improvements within Wade Bowl Park as identified on the contract plans.
   2. The project includes, but is not limited to:
      a. Erosion Control
      b. Clearing and Grubbing
      c. Site Excavation and Grading
      d. Unclassified Excavation
      e. Crushed Aggregate Base Course
      f. Concrete Sidewalks
      g. Site and Turf Restoration
      h. Splash Pad
      i. Plumbing
      j. Bioretention Basin and Structure
      k. Planting and Seeding
      l. Electric Service Connection
      m. New Water Service and connection
      n. New combined Sewer connection and manhole

B. Project Management, Coordination, and Meetings.
   1. Bi-weekly progress meetings shall be planned and coordinated by the Contractor. A set agenda shall be established and shared with potential attendees by the general contractor prior to the meetings. The meetings shall be made available to conference call access as well as needed.

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SECTION 01 14 00
WORK RESTRICTIONS AND PROVISIONS

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways, current edition.
   2. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition at time of bid opening.

1.03 DESCRIPTION OF WORK (N/A)

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

1.05 SUBMITTALS (N/A)

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (N/A)

PART 2 PRODUCTS AND MATERIALS (N/A)

PART 3 EXECUTION

3.01 EXAMINATIONS

A. Contractor shall obtain complete data at the site and inspect surfaces that are to receive the work before proceeding with assembling, fitting or erecting his work under this contract. The Contractor shall notify the Engineer in writing in the case of discrepancies between existing work and drawings, and of any defects in surfaces that are to receive the Contractor's work. The Engineer will direct the remedy of applicable surfaces.

B. Information pertaining to existing conditions that appear on the drawings is based on available records. While such data has been collected with reasonable care, there is no expressed or implied guarantee that conditions so indicated are entirely representative of those actually existing or that unexpected developments may not occur. All data included was provided to assist the Contractor in the investigation of conditions. The Contractor is responsible for the interpretation of the data provided.

C. The Contractor shall become acquainted with the location of underground service, utilities, structures, etc., which may be encountered or be affected by the Contractor's work, and shall be responsible for any damage caused by neglect to provide proper precautions or protection.

D. Utility Locations. Contractor shall be responsible for locating and verifying all utilities on the project and also all relocations where necessary. Typically the utilities require the request for locate be made a minimum of three working days before the Contractor begins work in the area. The utilities shown on the contract drawings are approximate in location, depth, number, and type.

E. Contractor shall verify grades, lines, levels, locations, and dimensions as shown on drawings and report any errors or inconsistencies to the Engineer before commencing work. Starting of work by the Contractor shall imply acceptance of existing conditions.

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3.02 STORAGE AND HANDLING

A. Contractor or the Contractor's authorized representative must be present to accept delivery of all equipment and material shipments. The Owner's employees will not knowingly accept, unload, or store anything delivered to the site for the Contractor's use. Inadvertent acceptance of delivered items by any representative of the Owner shall not constitute acceptance or responsibility to assume all liability for any equipment or material delivered to the job site.

B. Any material or equipment removed from the present construction shall be the property of the Owner and disposition shall be as directed by the Owner or stockpiled at locations shown on the contract drawings. All salvaged materials shall be removed in a workmanlike manner and carefully transported to Owner's storage area. The Contractor shall coordinate the salvaging of items with the Owner.

C. Contractor shall confine all operations, equipment, apparatus, and storage of materials to the immediate area of work to the greatest possible extent. Contractor shall ascertain, observe, and comply with all rules and regulations in effect on the project site, including, but not limited to parking and traffic regulations, use of walks, security restrictions and hours of allowable ingress and egress.

D. The storage of materials on the grounds shall be in strict accordance with the instructions of the Owner.
   1. All materials affected by moisture shall be stored on platforms and protected from the weather in accordance with manufacturer recommendations.
   2. Should it be necessary at any time to move material storage platforms, the Contractors shall move same at the Contractor's expense, when directed by the Owner.
   3. Areas used for storage of materials shall be repaired and restored by the Contractor.

E. The Owner assumes no responsibility for materials stored on the site. The Contractor shall assume full responsibility for damage due to the storage of materials.

F. During the construction of this project, materials, storage areas, and earth stockpiles shall be located so as not to interfere with the installation of the utilities nor cause damage to existing structures or utilities.

3.03 WORK RESTRICTIONS AND PROVISIONS

A. Notification. The Contractor shall notify the Owner and the Engineer 72 hours in advance of beginning work. Notice must also be given to the Owner and the Engineer for each subsequent day the Contractor will be working.

B. Operation During Construction. The existing facilities shall remain completely operational during construction. The Contractor shall be responsible to see that the facilities are operating as they should. Sequence of operations or place of commencement may be determined by the Engineer as deemed to best serve the needs and convenience of the Owner, or as necessity of occasion requires.

C. Starting of work implies acceptance of the work of others. Removal and replacement of work applied to defective surfaces, in order to correct defects, shall be done at the expense of the Contractor who applied work to defective surfaces.

D. Access to Work. Representatives of the State and Federal Regulatory Agencies and Owner shall have access to the work and on-site records at all times.

E. Project Log. A project log shall be maintained showing daily progress of work. Engineer and Owner shall have access to this logbook and the project schedule at all times.

F. Existing pipes, electrical work, and all other utilities encountered, which may interfere with new work, shall be rerouted, capped, cut off, or replaced by the Contractor.

G. Dust and Noise. Contractor shall make an effort to keep dust and noise to a minimum during construction. The dispersion of dust from construction related activities shall, until acceptance of work, be minimized by the application of water or other acceptable materials or covers. Noise from any construction activities

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shall only be allowed during approved working hours. This includes preparation, organizational and clean-up work. Work hours are limited to weekdays between 7 a.m. and 7 p.m. unless specifically stated elsewhere in these specifications or approved during construction by the Owner and Engineer in writing. Only maintenance of traffic and/or erosion control activities are allowed outside of these times.

H. Contractor shall confine equipment, apparatus, storage of materials and operations to limits by specific direction of the Owner or Engineer and shall not bring material onto the site until they are needed for the progress of the work.

I. Cleaning. Contractor shall be responsible for all cleaning required within the technical sections of the specifications governing work under the Contractor's jurisdiction as well as for keeping all work areas, passageways, and all other areas of the premises free of rubbish, debris and scrap which may be caused by the Contractor's operations or that of the Subcontractors.

1. Remove rubbish, debris, and scrap promptly upon its accumulation and in no event later than the end of each week.
2. Combustible waste shall be removed immediately or stored in fire resistive containers until disposed of in an approved manner.
3. Spillage of oil, grease, or other liquids which could cause a slippery or otherwise hazardous situation or stain a finished surface, shall be cleaned up immediately.
4. Dust, dirt, and other foreign matter shall be removed completely from all internal surfaces of all mechanical and electrical units, cabinets, ducts, pipes, etc.
5. Dirt, soil, fingerprints, stains and the like, shall be completely removed from all exposed finished surfaces.
6. If rubbish and debris is not removed, or surfaces cleaned as specified above, the Owner reserves the right to have said work done by others and the related cost(s) will be deducted from monies due the Contractor.

J. Disposal of Demolished Materials. Remove from the site all debris, rubbish, and other materials resulting from demolition operations. Storage of removed materials will not be permitted on the site. If burning is allowed, the Contractor shall obtain all required permits.

K. Mail Service.

1. Temporary relocation of mailboxes. If the Postal Carrier cannot deliver mail to the properties affected by the construction of utilities or roadway, the Contractor shall provide temporary mailboxes or shall relocate existing mailboxes to an accessible site. Contractor shall relocate mailboxes to their new location and set to proper height, as directed by an authorized representative of the US Postal Service. Mailboxes shall be reset as close to original location as possible, unless otherwise noted, while maintaining proper height and location requirements of the US Postal Service, upon restoration of regular postal service. If mailboxes, bases or posts are damaged during removal, it shall be the Contractor's responsibility to replace the damaged part prior to reinstallation. Contractor shall not be responsible for correction of existing deficient mailboxes, bases, or posts. Owner and Engineer shall be notified of such instances immediately.
2. Final relocation of mailboxes. If the Postal Carrier can deliver mail to affected properties during construction, Contractor shall maintain reasonable access to said mailboxes. Upon completion of the project, Contractor shall relocate mailboxes to a location and height that meets the US Postal Service requirements along affected roadways.

L. Street Signs. The Contractor shall salvage and reinstall all signs affected by construction. All signs to be removed shall be done in a workmanlike manner and carefully transported to Owner's storage area. If signs, sign bases or posts are damaged during removal, it shall be the Contractor's responsibility to replace said sign, base or post prior to reinstallation.

M. Garbage Collection. Garbage and/or recycling collection will continue throughout the project. Contractor shall provide temporary access to garbage vehicles throughout the project area or assist with garbage collection in areas inaccessible to vehicular traffic during the project.

3.04 OPERATION AND PROTECTION

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A. Contractor shall schedule his work as to minimize the inconvenience to the Owner and residents adjacent to the project.

B. Traffic Control. The Contractor shall meet the requirements for traffic control in accordance with the Manual on Uniform Traffic Control Devices. All structures and equipment shall be constructed, installed, and operated with guards, controls, and other devices in place.

C. The Contractor shall provide protection as follows:

1. Protection. The Contractor shall provide and maintain proper barricades, fences, signal lights, or watchmen to properly protect the work, persons, animal and property against injury. The cost of protection shall be incidental to the contract and no extra payment will be allowed therefore.
2. Provide, erect, and maintain all required barricades, guard rails, temporary walkways, etc., of sufficient size and strength necessary for protection of stored material and equipment; adjacent to or within project area; adjoining property and the building(s) as well as to prevent accidents to the public and the workmen at the job site.
3. Provide and maintain proper shoring and bracing for existing underground utilities encountered during excavation work, to protect them from collapse or other type of damage until such time as they are to be removed, incorporated into the new work, or can be properly backfilled upon completion of new work.
4. Provide protection against rain, snow, wind, ice, storms or heat so as to maintain all work, materials, apparatus, and fixtures, incorporated in the work or stored on the site, free from injury or damage. At the end of the day's work, cover all new work likely to be damaged. Remove snow and ice as necessary for safety and proper execution of the work.
5. Protect the building and foundations from damage at all times from rain and groundwater. Provide all equipment and enclosures as necessary to provide this protection.
6. Damaged property shall be repaired or replaced in order to return it to preconstruction conditions.
7. Protect materials, work, and equipment, not normally covered by above protection, until construction proceeds to a point where the general building protection of the area where located, dispenses with the necessity therefore. Protect work outside of the building lines such as trenches and open excavations, as specified above.
8. Take any and all necessary precautions to protect Owner's property as well as adjacent property, including trees, shrubs, buildings, sanitary sewers, water piping, gas piping, electric conduit or cable, etc., from any and all damage which may result due to work on this project.
9. Repair work outside of property line in accordance with the requirements of the authority having jurisdiction.
10. Repair any work damaged by failure to provide proper and adequate protection to its original state to the satisfaction of the Owner or remove and replace with new work at the Contractor's expense.
11. Tree Protection. Trees shall be protected from damage and scarring. Do not injure trunks, branches, or roots of trees that are to remain. No trees shall be removed without the approval of the Owner. Tree branches in the way of construction operations shall be carefully pruned prior to construction. Do cutting and trimming only as approved and as directed by the Owner. Do not operate equipment or vehicles within the drip line of a tree to be preserved. Any roots exposed during construction shall be cut clean. Ripping of the roots with excavation equipment shall not be allowed.
12. All survey monuments, property stakes, etc., which are encountered during the construction are to be preserved and undisturbed. The Engineer shall be notified of all such items immediately upon discovery. Failure to preserve such monuments will not be allowed and replacement shall be at the Contractor's expense.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Work restrictions and provisions shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

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4.02 WORK RESTRICTIONS AND PROVISIONS

A. Work Restrictions and Provisions, Inclusive. The cost associated with work restrictions and provisions shall be considered inclusive to payment for work related to the associated construction item, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

END OF SECTION

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SECTION 01 29 73
SCHEDULE OF VALUES

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 1 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS (NONE)

1.03 DESCRIPTION OF WORK

A. Provide a detailed breakdown of the Contract Price showing amounts and quantities allocated to each of the various parts of the Work, as specified herein and as required by General Conditions.

B. Upon request of Engineer, support amounts and quantities with data substantiating their correctness.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

1.05 SUBMITTALS (NONE)

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

1.07 FORM AND CONTENT OF SCHEDULE OF VALUES

A. Schedule shall be typed on 8-1/2-inch by 11-inch white paper. Contractor's standard forms and automated printout will be considered for approval by Engineer upon request. Include following:
1. Project title.
2. Project location.
3. Owner.
4. Engineer.
5. Engineer's project number.
6. Name and address of Contractor.
7. Contract designation.
8. Date.

B. Identify installed value of Work in sufficient detail to serve as basis for computing values for progress payments during construction.

C. Provide a separate listing of general items, such as bonds, insurance, mobilization, field supervision, construction facilities, allowances, and record documents.

D. Follow Project Manual table of contents as format for listing component items. At a minimum, listing shall include material cost and total installed cost for each Specification Section for each structure as listed in this Section.
1. Identify each line item with number and title of respective Specification Division and Section.
2. Include directly proportional amount of Contractor's overhead and profit.
3. For items on which progress payments will be requested for stored materials, break down value into:
   a. Cost of materials, delivered and unloaded.
   b. Total installed value.

E. Provide listing of items for each specification section of sitework and for each specification section of structure related construction, each specifications section of piping work, each specification section of process equipment, each specifications section of electrical and instrumentation work. Each item of work

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shall breakdown costs for materials, labor, and installation. General project cost items shall include breakdown of testing, mobilization/demobilization, bonds, insurance, and Contractor's project administration.

F. Sum of values listed shall equal total Contract Price.

PART 2 PRODUCTS AND MATERIALS (N/A)

PART 3 EXECUTION (N/A)

PART 4 MEASUREMENT AND PAYMENT (N/A)

END OF SECTION

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SECTION 01 31 13
PROJECT COORDINATION

GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS (NONE)

1.03 DESCRIPTION OF WORK

A. The General Contractor or his appointed representative shall act as the project coordinator. He shall generally be charged with all duties of a project coordinator including, but not limited to, being responsible for conditions of the contract, administrative requirements, subcontractor's scheduling and cooperation, compliance with specifications and drawings, and all other work related requirements.

B. Contractor shall coordinate the work with adjacent work and shall cooperate with all other Contractors so as to facilitate the general progress of the work. Each Contractor shall afford all other Contractors every reasonable opportunity for the installation of their work and for the storage of their material. In no case will any Contractor be permitted to exclude from the premises or work, any other Contractor or employees thereof, or interfere with any Contractor in the executing or installation of the work.

C. Each Contractor shall perform its work in proper sequence in relation to that of other Contractors and as approved by the Engineer. Any cost caused by defective or ill-timed work shall be borne by the Contractors responsible therefore.

D. Contractor shall arrange the work and dispose of materials so as not to interfere with the work or storage of materials of others and each shall join their work to that of others in accordance with the intent of the drawings and specifications.

E. All Contractors shall work in cooperation with each other and fit their work into the structure as job conditions may demand. All final decisions as to right-of-way and run of pipes and ducts, etc., shall be made by the Engineer or the Owner.

F. It shall be the responsibility of the Contractor to keep constant check on the progress of the work so that each particular trade can insure proper preparation for installation of that Contractor's work and not cause delay in the progress of the work. It shall further be the responsibility of the Contractor to periodically make inspections of work in progress and to notify the Engineer when work is complete in compliance with specifications and drawings.

G. A project log shall be maintained showing daily progress of work. The Engineer and Owner shall have access to this log book and the project schedule at all times.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

1.05 SUBMITTALS (NONE)

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS (N/A)

PART 3 EXECUTION (N/A)

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PART 4 MEASUREMENT AND PAYMENT (N/A)

END OF SECTION

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SECTION 01 31 19
PROJECT MEETINGS

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS (NONE)

1.03 DESCRIPTION OF WORK

A. Preconstruction Meeting. A Preconstruction Meeting will be scheduled and conducted by the Engineer and shall be attended by representatives of the Owner, Contractor and all subcontractors as deemed required by the Engineer. The purpose of the meeting will be to identify all project participants, review project requirements and specifications, establish the method of making pay requests and other matters that may be deemed necessary to be discussed. At this meeting, the Contractor shall submit the proposed construction schedule for review, consensus by the parties and approval. The Contractor shall also submit a schedule of values for the work to be used as the accounting format for all progress payments.

B. Construction Progress Meetings. Brief bi-weekly meetings, as deemed necessary by the Engineer, will be held and shall be attended by all Contractors. The purpose of the meeting will be to coordinate work schedules, review the project progress and other matters that may be deemed necessary to be discussed.
   1. A construction progress meeting agenda shall be prepared as deemed necessary to the Engineer.
   2. All construction progress meeting attendees shall be fully prepared prior to the meeting and shall be ready to discuss issues raised as they relate to their work. This shall include, but not be limited to, providing revised schedules, milestone activities, specific requirements for subordinate construction and any proposed or completed changes required for their work.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

1.05 SUBMITTALS (NONE)

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS (N/A)

PART 3 EXECUTION (N/A)

PART 4 MEASUREMENT AND PAYMENT (N/A)

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SECTION 01 32 16
CONSTRUCTION PROGRESS SCHEDULE

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS (NONE)

1.03 DESCRIPTION OF WORK

A. Submit preliminary Construction Progress Schedule in accordance with General Conditions prior to pre-construction conference.

B. The Contractor shall comply with and the Work shall be completed in accordance with the following construction schedule:
   1. Award Contract: May 20, 2025 (Tentative)
   2. Notice to Proceed: June 1, 2025 (Tentative) upon receipt of executed bonds and insurance.
   3. Milestone A Substantial Completion. Milestone A shall be completed by August 15, 2025. Milestone A shall include all work excluding final turf restoration and project closeout.
   4. Final Completion. The project shall be completed by August 29, 2025. Final Completion shall include all work as shown on the Contract Drawings and detailed in these specifications, including all items addressed in final project closeout punchlist.
   5. Within 10 days of final completion, submit final project closeout documentation inclusive of lien waivers, affidavit of compliance with prevailing wage rate determination, and final pay request.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

1.05 SUBMITTALS

A. Furnish four (4) copies of preliminary schedule, and subsequent revisions thereof, to Engineer three (3) days before each progress meeting.

B. Within three (3) days after monthly progress meetings, furnish four (4) copies of revised schedule to Engineer. Furnish revised schedule to Subcontractors as appropriate.

C. Failure to submit schedules on a timely basis shall be considered cause for withholding progress payments.

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS (N/A)

PART 3 EXECUTION

3.01 FORM OF SCHEDULE

A. Prepare schedule in form of horizontal bar chart.
   1. Provide separate horizontal bar for each trade, activity or operation.
   2. Provide continuous vertical line to identify first working day of each week.
   3. Scale and space to allow for notations and future revisions.

3.02 CONTENT OF SCHEDULE

A. Show complete sequence of construction by activity or operation.

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B. Show dates for beginning and completion of each major element of construction and installation dates for major equipment items. Include:
   1. Each individual task of construction.
   2. Procurement of equipment and systems including Shop Drawing submittals, Engineer's review of submittals, shop tests, and delivery dates.
   3. Identification of Work that will affect existing plant operations.
   4. Services of manufactures' representatives.
   5. Startup dates for major equipment.
   6. Field tests.
   7. Dates of Substantial and Final completion.
   8. Subcontractor Work items.
   9. MBE, WBE, and SBE activities.
   10. O&M data activities
   11. Contractor-provided training.

C. Show projected percentage of completion for each activity as of first day of each month.

3.03 REVISIONS TO SCHEDULE

A. Each month Contractor shall receive update information from Subcontractors and Suppliers that shall be included in current schedule. Revised schedule shall indicate changes such as:
   1. Major changes in scope.
   2. Activities modified since previous submittal.
   3. Revised projections of progress and completion.
   4. Other identifiable changes.

B. Provide narrative report to define following:
   1. Problem area and anticipated delays and their impact on schedule.
   2. Corrective action recommended and its effect.

3.04 MONTHLY PROGRESS MEETINGS

A. Once each month Construction Progress Schedule will be reviewed. Progress will be reviewed:
   1. To identify those activities started and completed during previous period.
   2. For remaining duration required to complete each activity started, but not completed.
   3. For durations of selected activities not yet started.
   4. For effect of Change Orders and proposed sequencing.

B. Update schedule accordingly.

3.05 DELAYS AND RECOVERY

A. If, at any time during the Project, Contractor fails to complete activity by its latest scheduled completion date, Contractor shall, within five (5) working days, submit to Engineer written statement as to how and when work force will be reorganized to return to current construction schedule.

B. If, during schedule review meetings, it becomes apparent that milestone completion dates or Contract completion dates will not be met, Contractor shall take some or all of the following actions:
   1. Increase construction staffing in such quantities and crafts as shall eliminate backlog of Work.
   2. Increase number of working hours per shift, shifts per day, Work days per week, amount of construction equipment or combination of foregoing sufficient to substantially eliminate backlog of Work.
   3. Reschedule Work actives to achieve concurrency of accomplishment

C. Under no circumstances will addition of equipment or construction forces, increasing working hours or other method, manner or procedure to return to current Construction Progress Schedule be considered justification for Contract modification or treated as acceleration.

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PART 4 MEASUREMENT AND PAYMENT

4.01 CONSTRUCTION PROGRESS SCHEDULE

A. General. Construction Progress Schedule shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

1. Construction Progress Schedule, Lump Sum. When so provided, payment for construction progress schedule shall be made at the contract lump sum price bid or as specified in Special Procedures - Division 01.
2. Construction Progress Schedule, Inclusive. When no quantity is provided, construction progress schedule shall be considered inclusive to payment for work associated with administration.

END OF SECTION

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SECTION 01 32 23
SURVEY AND LAYOUT DATA

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 1 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS (NONE)

1.03 DESCRIPTION OF WORK

A. The Contractor will stake and layout all work. The Contractor shall immediately, upon entering the site for purpose of beginning work, locate general reference points and take such action as necessary to prevent their destruction. The Contractor shall layout the work and be responsible for all lines, elevations and measurements. The Contractor must exercise proper precaution to verify dimensions of the drawings before laying out work and will be held responsible for any error resulting from failure to exercise such precaution.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

1.05 SUBMITTALS

A. Automated Machine Guidance (AMG) Control / Staking Plan

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS (N/A)

PART 3 EXECUTION

3.01 AUTOMATED MACHINE GUIDANCE (AMG)

A. Contractor may utilize AMG in lieu of or in addition to conventional staking on all or part of the work. When staking is inclusive to construction, or when the Engineer is supplying line and grade staking, any use of AMG will be considered inclusive to associated work.

B. All AMG work must be coordinated with the Engineer throughout the course of construction to ensure that work performed using AMG conforms to the contract tolerances and that the methods employed conform to the contractor's AMG Control/Staking Plan and accepted industry standards. The contractor will need to revert to conventional staking methods (at no additional cost to the Owner) for all or part of the work at any point during construction if AMG is producing unacceptable results. Acceptable AMG work will be up to the Engineer’s discretion.

C. AMG Control/Staking Plan - Submit a detailed AMG plan to the Engineer for review at least 5 business days before the preconstruction meeting. This plan should explain, at a minimum, how AMG technology will be integrated into the project, what bid items AMG will be associated with and which, if any, will use conventional staking, and the process for verification of tolerances. The plan shall also include:
   1. An explanation of how AMG Technology will be integrated into the project
   2. A comprehensive list of bid items associated with AMG
   3. A list of any items for which conventional staking will be used (either alone or in conjunction with AMG)
   4. The process for verification of tolerances
   5. The designation of a single primary contact person for AMG technology issues.
   6. A list/diagram of all control points intended for use on the project for verification as required.

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7. A description of Contractor's quality control procedures. Include the frequency and type of checks performed to ensure that the work conforms to the contract plans.

Engineer will review the plan for conformance with contract documents. Contractor may not perform AMG work prior to receiving written approval of the AMG plan. All work using AMG shall be performed in accordance with the approved AMG plan. Contractor shall submit plan updates to Engineer throughout the project as necessary, or as directed by the Engineer.

D. AMG Geometric and Surface Information

1. Contractor is responsible for the creating and generating all surface models and any other data required to construct the project to the lines and grades shown on the Contract Drawings. At Contractor's request, Engineer may provide an AutoCad Civil3D file and and/or .XML file of the surfaces used to generate the construction plans. The Contractor shall be responsible for comparing electronic data with available hard copies and Contract Documents. Engineer shall not be held responsible for any discrepancies between the linework, surfaces, or digital data provided to the Contractor. The use of any digital files prepared by Engineer shall not in any way obviate the Contractor's responsibility for the proper checking and coordination of dimensions, details, and other information required to facilitate complete and accurate construction.
2. Develop and maintain a contractor construction model for areas of the project employing AMG. Confirm that the resulting model accurately represents the contract plans. At Engineer's request, provide the construction model to the Engineer in .XML format, or other engineer-approved format.
3. Managing and Updating Information -Notify the Engineer of any errors or discrepancies in Engineer-provided information. Engineer will determine what, if any, revisions may be required. Engineer may revise the contract drawings, if necessary, to address errors or discrepancies that the contractor identifies. If the Engineer requests, provide construction model updates to the Engineer. All Contractor costs for revisions to the surface model, linework, etc. shall be inclusive to the item constructed and no additional money will be paid to the Contractor.
4. Engineer shall contact Contractor if design changes are made after the bid if they will affect the digital model. Contractor shall make the appropriate changes to the model or work with Engineer in the field to ensure design changes are incorporated into final product. Contractor shall be solely responsible for making adjustments or changes to the model as required.
5. Construction Checks - Check the work against the plan elevation at randomly selected points on cross-sections located on the plans at the frequency the Engineer approved as a part of the AMG Control / Staking Plan. Submit the results of these random checks to the Engineer daily. Notify the Engineer immediately if a check variance exceeds the tolerances specified below. Check the work at additional points as the Engineer directs. The Engineer may conduct periodic independent checks to verify accuracy with the plans and contract documents.
6. AMG Construction Tolerances

Item	Horizontal	Vertical
Daily Calibrations	0.10 feet*	0.05 feet*
Subgrade	0.25 feet	0.10 feet
Base Aggregate	0.25 feet	0.04 feet
Curb and Gutter	0.02 feet	0.01 feet
Concrete Pavement	0.02 feet	0.01 feet

*or as directed by the engineer

7. Contractor supplemental staking and dry run required by item to assist completing work within construction tolerances:
   a. Curb and Gutter
      1) Inlets shall be staked to center of inlet at back of curb and minimum 10 ft. each side of inlet at back of curb. Stakes shall provide horizontal and vertical location of structure in the field from the construction documents.
      2) High/low points, and grade breaks shall be staked to substantiate vertical tolerances are met. Stakes shall be a maximum of 25 feet apart.
      3) Intersection curb radii PC, PT, mid-point, and ramp openings shall be staked to confirm intersection details are maintained.
      4) Additional staking as determined in the field by Engineer to avoid possible conflicts.

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5) Contractor to provide at least one experienced staff member to determine that work conforms to the construction documents and allowed tolerances. If at any time work performed is producing unacceptable results contractor shall immediately stop work, notify Engineer, and may be required to revert to conventional staking methods.

6) Contractor to perform dry run (no concrete placed) on a portion of the work, as directed by the Engineer, to ensure that AMG technologies will complete work within the construction tolerances. Allow the engineer to check projected curb grades on the machine during the dry run.

b. Subgrade and Base Aggregate

1) Offset staking required at high/low points, PC, PT, mid-points, and maximum of 400 ft. intervals to ensure necessary accuracy of vertical and horizontal compliance with contract documents.

c. Culverts

1) Culverts require placement of 2 benchmarks placed within 100 ft. of each location where work is to be completed to ensure contractor/engineer can verify drainage of existing ground to best fit and record accurate as-built information.

d. Water Main

1) Water main staking shall include all bends, tee's, hydrants, valves, reducers, etc. and a maximum interval of every 100 feet along the main.

e. Sanitary Sewer

1) Sanitary Sewer staking shall include the structures, wye's, and 25-feet and 50-feet outside the structures along the sewer main being installed.

f. Storm Sewer

1) Storm Sewer staking shall include the manhole and inlet structures, as well as 25-feet and 50-feet outside the structures along the storm sewer being installed. Inlet type structures shall reference the "top of curb" as well as the "back of curb" (if curb and gutter is required).

3.02 CONSTRUCTION SURVEY LAYOUT REQUIREMENTS AND TOLERANCES

A. Tolerances for staking shall be 0.02 feet horizontal and 0.01 feet vertical unless otherwise stated.

Construction Staking Tolerances

Item	Horizontal	Vertical
Slope Stakes	0.25 feet	0.10 feet
Structure Layout	0.02 feet	0.01 feet
Sanitary Sewer	0.02 feet	0.01 feet
Water Main	0.10 feet	0.03 feet
Storm Sewer	0.02 feet	0.01 feet
Pipe Culverts	0.25 feet	0.03 feet
Electrical	0.02 feet	0.01 feet
Subgrade	0.25 feet	0.10 feet
Base Aggregate	0.25 feet	0.04 feet
Curb and Gutter	0.02 feet	0.01 feet
Curb Ramps	0.02 feet	0.01 feet
Concrete Pavement	0.02 feet	0.01 feet

PART 4 MEASUREMENT AND PAYMENT

4.01 CONSTRUCTION LAYOUT

A. General. Construction Layout shall be paid for at the bid price for the work as described above in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 1.

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1. Construction Layout, Inclusive. When no quantity is provided, Construction Layout shall be considered inclusive to payment for the associated work.

END OF SECTION

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SECTION 01 33 00
SUBMITTALS

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS (NONE)

1.03 DESCRIPTION OF WORK

A. The work under this section shall cover furnishing submittal information as required by the contract drawings, other specification sections and as specified herein.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Submittal Log - Section 01 33 23

C. Special Procedures - Section 01 35 00

1.05 SUBMITTALS

A. As soon as possible after Notice to Proceed, submit brochures of catalog cuts and specifications for all new equipment. Submittal of product data shall comply with the requirements for Submittals.

B. Prior to fabrication or installation, submit Submittals for review. Each submittal shall consist of the minimum number of copies as listed on the submittal log. Two will be returned to the Contractor. Should more than two copies of reviewed Submittals be necessary for Contractor's use and distribution, the Contractor shall supply a sufficient additional number of Submittals for review as required.

C. Submittals shall include layout details, schedules, setting instructions, and manufacturer's literature. Concrete reinforcing steel Submittals shall include a concrete pouring sequence for structures with vertical construction joints.
   1. Submittals shall be identified with the name of the project, numbered consecutively and bear the stamp of review of the Contractor as evidence that all drawings have been checked by the Contractor for accuracy and compatibility with contract requirements. Drawings not so checked and noted will be returned without being examined.
   2. Partial lists will not be considered; Submittals for each part of work shall be complete in one submittal.

D. If information on previously submitted Submittals is altered, in addition to the notations made by the Engineer, the Contractor shall bring all changes to the attention of the Engineer. Corrections or changes indicated on reviewed Submittals shall not be considered an order for extra work.

E. Submittals will not be considered reviewed unless they bear the stamp of review and signature of the Engineer. Drawings will be reviewed for general design only. Dimensions and fit of units of various parts shall be the Contractor's responsibility.

F. Prior to work at the site, submit samples allowing reasonable time for review and testing. Submit samples in sufficient quantity (minimum of five), of adequate size showing quality, type, color range, finish and texture. Label each sample stating material, description, applicable specification sections, intended use, project name, and Contractor's name.

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G. Order no materials subject to sample review until receipt of written shop drawing review. Materials installed shall match reviewed samples. No review of samples shall be taken in itself to change or modify contract requirements beyond the expressed stipulations of the review letter.

H. All Submittals for major equipment must be reviewed and delivery dates scheduled prior to performing any work at the site. A revised work schedule shall be submitted weekly showing corrected delivery dates.

I. All Submittals for plant material must be reviewed and delivery dates scheduled prior to performing any work at the site.

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS

A. Prior to startup of the equipment, the Contractor shall provide the Engineer with operation and maintenance manuals as listed on the submittal log. The manuals shall include the following:
   1. Supplier and manufacturer's name, address, telephone number, and local representative's name, address and telephone number. Sources of service and parts and a list of local repair services, supply houses, and potential sources for the types of repairs and equipment parts.
   2. Complete and accurate set of record drawings including drawing dimensions, schematics of hydraulics, wiring, and piping.
   3. Warranties and bonds shall be included in manual.
   4. Catalog literature complete with test data and performance data and ratings.
   5. Specify equipment function, normal operating, and limiting conditions.
   6. Assembly, installation, alignment, adjusting, and checking instructions.
   7. Operating instructions for start-up, shutdown, routine and normal operation.
   8. Emergency operating instructions indicating range and flexibility during emergencies.
   9. Detailed service information including schedule of recommended maintenance.
   10. Troubleshooting, common operating problems, problems that might occur in unit/process. List probable causes and discuss control/prevention.
   11. Detailed safety section covering the operation and maintenance of unit. Contractor shall supply a complete list of equipment service numbers, model numbers, electrical requirements, manufacturer's names, etc.
   12. The correct model number shall be designated where the literature covers more than one model.
   13. For items assembled by the Contractor, the Contractor shall write and provide duplicate operation and maintenance instructions.
   14. Data shall be folded to 8-1/2-inch x 11-inch size and placed into hard cover binders. Material shall be grouped according to specifications section and filed behind individual filing tab pages on which the following is to be typed: Item, Manufacturer, Contractor's Order Number, Supplier's Order Number, Manufacturer's Order Number.
   15. Manuals shall be delivered to the Engineer for approval prior to job completion.

B. Prior to job completion, the Contractor shall provide the Engineer with a schedule of recommended maintenance for all landscape plantings, seed, and sod.

1.07 PERMITS AND APPROVALS

A. Obtain and submit copies of all permits, code inspections, and approval documents, as specified.

1.08 CONSTRUCTION SCHEDULE

A. Submit a minimum of five copies of a schedule of operation prior to construction. The schedule shall provide for activities of the various trades and shall be sequenced to provide a minimum of interruption to the operation of existing facilities. Allow ample time for the Owner to alter operations as required by the construction of the various components of the work. Revised and updated construction schedule shall be provided throughout the construction as deemed necessary and requested by the Engineer.

B. The construction schedule shall be supplemented by a list of Submittals, dates they will be submitted for approval and a reasonable time allowance for review.

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1.09 START-UP REPORTS

A. Where equipment startup by a factory-trained representative is required, a minimum of three copies of the start-up report shall be submitted which describe the representatives' activities and installation approval.
   1. Start-up report shall be a typewritten document containing descriptive information specifically identifying the piece by equipment, all tests conducted, and the results of the tests.
   2. Start-up role log, with the dated signatures of those conducting and accepting all start-up instructions and tests shall be provided as part of the report.

B. Substantial completion will not be issued until all start-up reports have been submitted.

1.10 RECORD DRAWINGS

A. The Engineer will provide the Contractor with a suitable set of contract drawings on which daily records of changes and deviations from contract shall be recorded. All buried or concealed piping, conduit, or similar items shall be located by dimensions and elevations on the record drawings.
   1. The daily record of changes shall be the responsibility of Contractor's field superintendent. No arbitrary mark-ups will be permitted.
   2. At completion of the project, the Contractor shall submit the marked-up record drawings to the Owner.

1.11 SUBMITTAL LOG

A. A submittal log is included as Section 01 33 23 of this Project Manual, which lists the minimum required Submittals, product data, samples, and operation and maintenance manuals. Additional submittals not listed on the log may be required by the Engineer during the course of construction. All submittals to the Engineer shall include the submittal number shown on the log. The minimum number of copies to be submitted is shown on the submittal log. Any additional copies required by the Contractor may be submitted in addition to the number shown on the log.

PART 2 PRODUCTS AND MATERIALS (N/A)

PART 3 EXECUTION (N/A)

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Submittals shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 SUBMITTALS

A. Submittals, Inclusive. The cost for all submittals shall be considered inclusive to payment for work related to the respective equipment, associated construction, or utility, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

END OF SECTION

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SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES SUBMITTAL LOG

PROJECT: Wade Bowl Park Splash Pad

MSA PROJECT NO: 00628066

CONTRACTOR:

						Referred			Action					# copies to			
Spec Section #	Spec Section Title/Product	Date Rec'd	Min. # Req'd	# Submitted	Submittal/Revision #	To	Date Sent	Date Reviewed	Reviewed with no Comments	Reviewed with Comments as	Amend and Resubmit	Rejected	Date Ret'd	Contractor	Owner	Field	File
01 32 16	Construction Progress Schedule		1														
01 33 00	Submittals		1														
01 77 00	Closeout Procedures		1														
02 01 00	Maintenance of Existing		1														
31 37 00	Riprap		1														
32 13 10	Concrete Sidewalk, Steps and Driveways		1														
32 91 19.13	Topsoil Placement Grading		1														
32 92 19	Seeding		1														
32 93 00	Landscaping		1														
33 05 16.13	Precast Concrete Utility Structures		1														
33 05 26.16	Tracer Wire		1														

SHOP DRAWINGS, PRODUCT DATA, AND SAMPLES SUBMITTAL LOG

PROJECT: Wade Bowl Park Splash Pad

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Spec Section #	Spec Section Title/Product	Date Rec'd	Min. # Req'd	# Submitted	Submittal/Revision #	Referred To	Referred Date Sent	Date Reviewed	Action: Reviewed with no Comments	Action: Reviewed with Comments as Amend and Resubmit	Action: Rejected	Date Ret'd	# copies to: Contractor	# copies to: Owner	# copies to: Field	# copies to: File
33 10 00	Water Utilities		1													
33 39 13	Sanitary Sewer Manholes		1													
33 41 13	Public Storm Utility Drainage Piping		1													
33 49 13	Storm Drainage Manholes, Frames, and Covers		1													

SECTION 01 35 00
SPECIAL PROCEDURES

CONTENTS: Work under this section is intended to supplement and/or modify the individual specifications. This section does not relieve the Contractor from fulfilling all items in said sections. The numbers of this section are referenced to those of Specifications Divisions 01 through 33.

DIVISION 00 - PROCUREMENT AND CONTRACTING REQUIREMENTS

00.01 SPECIFICATION EXPLANATION

A. The Special Procedures items will supplement or supersede the standard specifications. The number preceding special provisions refers to standard specifications that are being referenced. Where reference is made to Wisconsin Department of Transportation Specifications, all conditions of said specification will apply except "Payment and Measurement."

00.02 BID QUANTITIES

A. All Bid Quantities are estimated. The Contractor shall field verify all quantities and work prior to submitting a Bid. Final quantities shall be adjusted to reflect the field installed quantities. The unit price in the Bid shall not be adjusted though final quantities may vary. Lump sum prices shall not be adjusted. The Engineer's estimate of quantities as shown in the Bid is approximate and the right is reserved by the Owner to increase or decrease said quantities.

DIVISION 01 - GENERAL REQUIREMENTS

01.01 SECTION 01 14 00 – WORK RESTRICTIONS AND PROVISIONS

A. Work hours are limited to weekdays between 7 a.m. and 7 p.m. unless specifically stated elsewhere in these specifications or approved during construction by the Owner and Engineer in writing. Only maintenance of traffic and/or erosion control activities are allowed outside of these times.

B. Existing Utility Locations.
1. The Contractor is responsible for coordination of all underground utility, utility pole, and pedestal relocations or support on the project if necessary prior to scheduled relocation of said utilities by others. Contractor is also responsible to coordinate all communication between utilities to ensure existing utilities are protected from the proposed work.
   a. Other Utilities may need to relocate their existing utilities while the project is currently under construction to ensure they are properly placed.
2. Payment. All costs associated with coordinating utility relocations and/or utility support shall be considered incidental to the adjacent construction.

C. Storage of Equipment and Materials. The Contractor shall contain their efforts to the construction site/project boundary. If additional space is required, the Contractor shall discuss and work out the agreements with the City for additional areas to utilize or with private property owners outside of this contract. All areas disturbed on the site and offsite due to the construction and storage of materials/equipment shall be restored to equal or better conditions.

D. Temporary Fencing. The Contractor shall utilize temporary fencing to protect their work areas within the park. The park will remain open to the public throughout the duration of the construction. The Contractor shall protect their work area and work at the end of each day by closing off the work zone. Temporary snow fencing or better may be used to enclose areas such as the launch area, excavations and active construction zones. The public shall be blocked from entering the work area and area of stored materials at all times of the day and protected from the movement of equipment and materials to and from the work areas.
1. The fencing shall be maintained each day and be intact and fully standing at all times with no holes in the fencing or gaps on the top/bottom of the fencing.

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2. Payment. All costs associated with the above work shall be considered incidental to the adjacent work of the project.

E. All existing infrastructure and site conditions shall not be disturbed if not approved by the Owner. If they are disturbed and/or damaged, the Contractor shall repair them back to equal or better conditions.
1. Payment. All costs associated with the above work shall be considered incidental to the overall project.

01.02 SECTION 01 50 00 – TEMPORARY FACILITIES AND CONTROLS

A. Site Access shall be off of Clough Avenue.

B. Materials staging area as shown on construction drawings.

DIVISION 02 - EXISTING CONDITIONS

02.01 SECTION 02 01 00 – MAINTENANCE OF EXISTING CONDITIONS

A. Contractor shall restore all roadways, sidewalks, right of ways, parkland/parking areas, and other areas damaged and/or disturbed by construction efforts to an equal or better than pre-existing condition. This includes any areas not intended to be disturbed and shall be restored by the Contractor back to equal or better than pre-existing conditions if determined disturbed by the project and will be no additional cost to the Owner.

B. Driveways and Entrances. Keep driveways and entrances adjacent to the work site clear and available to the property owners, the owner's employees, and emergency vehicles at all times unless alternate owner approved arrangements are made prior. Do not use these areas for parking or storage of materials without prior written approval of the property owner. Schedule deliveries to minimize space and time requirements for storage of materials and equipment on-site.

C. The Park will remain open to the public during the project. The various work areas shall be secured at the end of each workday to protect the project and work. The contractor shall ensure the site is secure in the various work areas throughout the project to ensure the public is kept out of these areas. Temporary fencing may be used to keep areas secure. Snow fencing is acceptable to keep areas closed to the public.
1. Payment. All costs, labor, and materials used to secure the site shall be incidental to the project.

D. All existing infrastructure and site conditions shall not be disturbed if not approved by the Owner. If they are disturbed and/or damaged, the Contractor shall repair them back to equal or better conditions.
1. Payment. All costs associated with the above work shall be considered incidental to the overall project.

DIVISION 03 - CONCRETE

03.01 SECTION 03 30 00 – CAST IN PLACE CONCRETE

A. The contractor shall consider the proposed concrete areas and then propose a full pad jointing plan. The plan shall be proposed to Engineer for consideration and review prior to the concrete pour for the pad at least one (1) week in advance of the pour.

B. Concrete Surfacing. Surfacing for concrete shall be broom finished concrete along all concrete within the project limits.

C. Fly Ash. Fly ash shall not be used in the concrete mix for concrete pavements. Fly ash in the concrete mix is acceptable for concrete collars at storm sewer pipe connections.

D. The concrete shall be installed as per the contract plan detail or manufacturer's recommendations.

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E. Payment. All costs associated with the associated items including but not limited to the labor, materials, and construction methods shall be paid for under their respective items.

DIVISION 13 - SPECIAL CONSTRUCTION

13.01 SECTION 13 11 13 - SPLASHPAD GENERAL

A. Contractor shall furnish and install a fully functional splashpad per the contract documents. All items not described and/or listed to make the proper connections and installation of the overall system shall be included as part of this project.

B. The splashpad and all piping/features shall be installed by a certified splashpad installer/contractor.

C. Payment. All costs, labor, materials, and associated items for the work shown on the Construction Drawings and in related sections, such as, but not limited to, the preparation of the site shall be all included in the associated bid items.

13.02 SECTION 13 11 18 - SPLASH PAD CONCRETE

A. The splashpad concrete shall be installed by a Contractor who has installed at least two (2) splashpads within the last five (5) years.

B. All concrete thicknesses and reinforcement for the project are detailed in the project plans.

C. Jointing of Concrete:
1. Contractor shall consider the proposed pad and associated expansion joints and then propose a full pad jointing plan. The plan shall be proposed to Engineer/Owner for consideration and review prior to the concrete pour for the pad at least three (3) weeks in advance of the pour.
2. All joints installed shall be sealed with non-water absorbing caulk. Caulk color shall match the concrete pad's final concrete. The expansion joints shall be installed across the pad as indicated on the Contract Drawings and shall be installed per the plan detail.
3. Splashpad Dry Zone. Transverse joints for the concrete shall be divided into sections of not less than 5-feet and no more than 8-feet. Transverse joints shall be saw cut into the dry zone as shown on the plans. Contractor shall provide a proposed layout in overall jointing plan.
4. All felt joints installed near the splashpad shall be sealed with caulk to make a watertight joint.

D. Splashpad Finish. The splashpad finish shall be a heavy broomed finish. The level of brooming shall be approved by Owner.

E. The splashpad concrete shall be installed by a Contractor who has installed at least two (2) splashpads within the last five (5) years.

F. All concrete thicknesses and reinforcement for the project are detailed in the project plans.

G. Payment. All costs, labor, materials, and associated items for the above listed work, such as, but not limited to, the reinforced concrete pad, concrete footings for features, mechanical, piping, valves, pipes supports, fittings, drainage basin connections, and pipes under the pad, installation of features, etc. shall be all included in the unit price bid, "Splashpad, Installation."

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DIVISION 26 - ELECTRICAL

26.01 SECTION 26 05 00 - COMMON WORK FOR ELECTRICAL

A. Site and Splashpad Electrical. All the associated work, materials and labor as described in this project shall be considered under one bid item. The electrical connection shall come from the existing restroom as indicated on the plans.

B. Payment. All labor, materials, and work as described in this division shall be considered and paid for under the lump sum bid item, “Site and Splashpad Electrical.”

DIVISION 31 - EARTHWORK

31.01 SECTION 31 11 00 – CLEARING AND GRUBBING

A. Contractor shall perform all clearing and grubbing activities as needed to install the paths, parking areas, utilities, sidewalks and restroom building. Contractor shall clear and grub all trees, shrubs, and stumps within the project grading limits and the temporary construction easements as shown on the drawings and as directed by the Field Engineer. No additional trees shall be removed unless approved by the Engineer and/or Owner.

1. Payment. All labor, materials, and costs for the above work to clear and grub shall be paid for under the respective bid item, “Clearing and Grubbing.”

31.02 SECTION 31 23 13 – SUBGRADE PREPARATION

A. Unclassified Excavation. Unclassified excavation shall include, but is not limited to, all turf, topsoil and pavement removals; base course removal; overall site grading and concrete slab grading/excavation, asphalt excavation, sidewalk grading, sawcutting, site preparation, and any other items requiring shaping/grading for their installation as shown on the contract drawings. Contractor shall consider cut/fill amounts for the proposed project. Some of the excess fill may be wasted on the site as directed by the Owner and the remaining amount shall be removed from the park site. Topsoil shall not exceed 6-inches in depth.

1. Payment. All costs, labor, and materials for earthwork, grading, removals, other items listed above, and fine grading shall be included in the lump sum price bid for “Unclassified Excavation.” This shall include, but not be limited to, the removal of existing pavement, removal of excess material, sawcutting, excavation to subgrade, stripping topsoil, fill, borrow, proper compaction, removal, transport, and placement of all excess material as required.

B. Subgrade Staking and Roll Testing. Contractor shall set “blue tops” off of reference lines established by the site staking. The Engineer will inspect and observe testing of completed subgrade as soon as possible upon notification that “blue top” grade has been achieved. Testing of subgrade shall be performed by the Contractor by means of a “Roll Test” with a loaded tri-axle dump truck or other machinery with equivalent axle weights. Tests shall be performed under the observation of the Field Engineer. Testing of final base course layer shall also be performed via a roll test as described.

1. Payment. All costs associated with subgrade staking and subgrade/base roll testing shall be included in the lump sum price bid for “Unclassified Excavation.”

C. Excavation Below Subgrade (EBS) with Breaker Run and Geogrid. Breaker run shall be used to backfill EBS areas. As directed by the Field Engineer, Contractor shall excavate below subgrade to remove weak or unacceptable soils. The resulting excavation shall be filled with breaker run material and geogrid as per this specification and compacted as required. Geogrid shall be Tensar BX 1100 (or Engineer approved equal) and installed per manufacturer’s recommendations. All areas to be paved in the future shall be proof rolled at subgrade and with base course down to ensure stability as needed for future paving.

1. Payment. All costs associated with excavation, grading and disposal of material from EBS areas, geogrid, breaker run placement, and compaction shall be included in the unit price bid for “Excavation Below Subgrade with Breaker Run and Geogrid”.

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31.03 SECTION 31 23 33 – TRENCHING AND BACKFILLING

A. Imported Granular Backfill. Imported granular backfill shall only be placed upon Field Engineer's request.
   1. Payment. All costs related to the installation of imported granular backfill, shall be included in the unit price bid item for "Imported Granular Backfill."

B. Embedment Material. Class B bedding utilizing granular materials shall be used for all water mains. Clean sand bedding and initial backfill, 3/8" minus imported material, shall be used for all water service lines. Embedment and initial backfill materials shall be compacted with a vibratory compactor.

C. Compaction. Compaction of backfill within two feet of all vertical utility structures including hydrants, valve boxes, cleanouts, manholes and inlets shall be accomplished by hand operated compaction equipment in lift thicknesses of eight inches or less.

D. Imported Granular Backfill. Imported granular backfill shall only be placed upon Field Engineer's request.
   1. Payment. All costs related to the installation of imported granular backfill, shall be incidental to the price of the associated item.

31.04 SECTION 31 25 00 – EROSION CONTROL

A. Erosion Control. The Contractor shall install erosion control measures to prevent siltation of culvert pipes, adjacent property, and the nearby waterways. Cleaning and/or sediment removal from storm sewers, ditches, private property, or the drainage ways due to erosion from the construction site shall be the responsibility of the Contractor at no expense to the Owner. Additional measures shall be installed as necessary to prevent siltation of the culverts, private properties, and the nearby waterways. Contractor shall be responsible for the completion of WisDNR required erosion control inspections and reports. Erosion control measures shown on the plans are project minimum requirements. Additional erosion control measures shall be required per the "State of Wisconsin Department of Natural Resources Storm Water Management Technical Standards" and/or directed by the Engineer in the field. Copies of some of the standards are included in the appendices. All technical standards can be found at:
   1. https://dnr.wisconsin.gov/topic/Stormwater/standards

B. Erosion Mat Stabilization. The Contractor shall install biodegradable erosion matting as directed by the Field Engineer. Owner and Engineer reserve the right to field-adjust quantities as necessary. Erosion mat installation shall be as specified below:
   1. Class I, Type B erosion mats shall be used in all areas. An urban mat shall be used in all locations.
   2. Netting for the matting shall be photodegradable and/or biodegradable.
   3. The weight of the netting shall not exceed 15% of the total blanket weight.
   4. Anchoring devices shall be completely biodegradable as determined by ASTM D 5338-92. Steel wire pins or staples are not acceptable.
   5. The anchoring devices shall be shaped, using barbs, twists, bend, or other methods to provide additional mechanical pull resistance when installed in soil. Anchoring devices shall maintain their mechanical anchoring ability for at least 2 months, and substantially degrade within 4 months of warm soil conditions (above 53 degrees Fahrenheit).
   6. Product Acceptability. Only products listed in "WDOT Erosion Control Product Acceptability Lists," Current Edition, shall be used for the project.
   7. Shop Drawings. Submit shop drawings on erosion matting and anchors to the Engineer for approval prior to any placement on the project

C. All erosion control shall be set prior to any disturbance of the site.

D. Payment.
   1. All costs associate with furnishing, installing, maintaining, and removing erosion control measures as required on the contract drawings or Wisconsin Department of Natural Resources Construction Site Erosion and Sediment Control Technical Standards, and as required by the Field Engineer and applicable standards shall be included in the lump sum price bid for "Erosion and Sedimentation Control"

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31.05 SECTION 31 37 00 – RIPRAP

A. All riprap included in the project shall be light duty in size and installed with a type R fabric that is considered to be inclusive to the cost of the riprap. All riprap onsite shall be from the same source and be installed at thicknesses as specified in the section 606 of the WisDOT Standard specifications.
   1. Payment. All cost associated with prepping the area, placing new fabric and riprap shall be paid for under the bid item “Light Riprap with Type R Fabric”.

DIVISION 32 - EXTERIOR IMPROVEMENTS

32.01 SECTION 32 11 23 – AGGREGATE BASE AND SUBBASE

A. Aggregate Base Course. Contractor shall match the base thickness per the Contract Documents. The aggregate base course shall extend a minimum of 1-foot past the edge of the pavement along all of the driveways and parking lot areas. The aggregate base course shall extend 6-inches beyond the edge of the proposed sidewalk areas.
   1. Payment.
      a. All costs associated with compacted aggregate base course construction shall be included the respective bid item.

B. Breaker Run. Breaker run used to fill EBS areas shall be virgin 3-inch dense graded base meeting the requirements of the Wisconsin DOT Standard Specifications.
   1. Payment. All costs associated with breaker run breaker run placement, and compaction shall be included in the unit price bid for “Excavation Below Subgrade with Breaker Run and Geogrid”.

C. Testing. Testing of shaped base course shall be performed by means of a roll test with a loaded truck or other machinery with equivalent axle weights. The minimum gross vehicle load weight used for roll testing shall not be less than 68,000 pounds. Tests shall be performed under the observation of the Engineer and Owner

32.02 SECTION 32 13 10 – CONCRETE SIDEWALK, STEPS, & DRIVEWAYS

A. 5-inch Concrete Sidewalk.
   1. The Contractor shall verify all dimensions and grades prior to setting and pouring concrete to ensure compliance with ADA requirements for access and slope.
   2. All concrete sidewalk will include 6 -inches of 1 ¼ -Inch Dense grade base as defined by WisDOT standard specifications current at the time of this bid.
   3. Payment. All costs associated with the above work, but not limited to, shall be included in the unit bid price item for. “5-inch Concrete Sidewalk with Base.”

B. Dense Graded Base for Sidewalk Areas. Contractor shall use 1 ¼-inch dense graded base course for the sidewalk areas as defined by WisDOT Standard specifications current at the time of this bid.
   1. Payment. All labor, materials, and costs associated with the base shall be included in the unit price bid item for respective adjacent concrete work item.

32.03 SECTION 32- 91 19.13 – TOPSOIL PLACEMENT AND GRADING

A. Topsoil. Topsoil depth shall be a minimum of 6-inches. The Contractor may use salvaged topsoil to supplement the total amount required. Topsoil shall be screened and per the specifications when placed. If there is not enough topsoil from the site to be salvaged to achieve the minimum 6-inch thickness, the Contractor shall supplement the topsoil with topsoil from offsite to ensure all areas to be restored as turf have the minimum topsoil thickness.
   1. Payment. All labor, materials, and costs with salvaging, suppling new, placing, raking, spreading, etc the topsoil for the site shall be paid for under the unit price bid item, “Turf and Site Restoration.”

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32.04 SECTION 32 92 19 – SEEDING

A. Turf Seed Mixture. Contractor shall use the following seed mixture for the project:
   1. Park Area: A high quality blended grass seed equal to the Madison Parks or LaCrosse Parks seed blend shall be used within the Parks and on all grassed areas to be restored as turf and over the rip-rap area.
   2. A companion crop of Canadian Wild Rye shall be seeded with all seed mixes at a rate of 1 lb per 1,000 square feet.
   3. The Contractor shall submit seed mix design and proposed seeding rate and mulching techniques to Engineer prior to seeding along with results of seeding in similar soil conditions.
   4. Acceptance. Contractor is responsible for obtaining a uniform “substantial” stand of grass, free of patched areas, weeds, rocks, and other undesirable items, with a minimum height of 2 inches. Watering of areas to reach this grass height shall be required of the Contractor to ensure the grass reaches the required restoration height free of weeds.
   5. Payment. All costs associated with placement of topsoil, fertilizer, seed, mulch, mowing, and watering shall be included in the unit bid price for "Turf and Site Restoration". All costs associated with water of the newly restored areas shall be inclusive to the restoration.

DIVISION 33 - UTILITIES

33.01 SECTION 33 10 00 WI WATER UTILITES

A. The bedding, haunching and initial backfill material shall be ¾-inch clear stone. The initial backfill (cover material) shall be installed and compacted to a minimum of 12-inches over the top of the pipe. The remaining trench backfill shall be Type II backfill (suitable native excavated material) as approved by field engineer.

B. Record Drawings. Contractor shall keep an accurate record of installed systems and note any changes to the original contract drawings. Records shall be kept up daily and available on-site to the Engineer at all times throughout construction. Contractor shall provide the Engineer a final set of record drawings upon completion.

C. The contractor shall notify the Owner at least 24 hours prior to any water shut-off that may extend continuously for more than 2 hours. Only the water utility personnel will be allowed to operate all existing water supply valves.

D. Water Service.
   1. The various parts for the water services are shown on the project plans, but are not limited to this list. If they are not shown on the plans, they are incidental to the adjacent work.
   2. Payment. All labor, materials, and work to install the water service as shown on the plans shall be included in the respective bid items.

E. Connect to Existing Water Main.
   1. The water utility will provide the connection to the watermain and a 6” valve and valve box. Contractor to connect to the existing water main using the utility provided valve.
   2. Payment. All labor, materials, and work to install the water service connection as shown on the plans shall be included in the respective bid items.

33.02 SECTION 33 39 13 – WI SANITARY SEWER MANHOLES

A. Combined Sewer Manhole, 48-inch. The contractor shall install a 48” doghouse manhole over the existing combined sewer line. The contractor shall ensure the outflow structure is set at the elevations noted in the contract documents.
   1. Payment. All costs associated with the above backflow preventer shall be included in the respective unit bid price item, “Combined Sewer Manhole, 48-inch”.

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B. 12" Inline Backflow Preventer. The contractor shall install a 12" inline backflow preventer at the outflow end of the 12" storm sewer pipe from the 48" Sumped and Trapped Outflow Structure. The contractor shall ensure the backflow preventer is selected and installed per noted in the contract documents. The 48" Sumped and Trapped Outflow Structure shall be paid under their respective unit price bid items.

1. Payment. All costs associated with the above backflow preventer shall be included in the respective unit bid price item, "Combined Sewer Manhole, 48-inch".

C. Connection to Existing Combined Sewer. The contractor shall connect the combined sewer manhole to the existing combined sewer at the location and elevations noted on the plans. The contractor shall verify elevations prior to proceeding with the work.

1. Payment. All costs associated with the above connection to the existing combined sewer shall be included in the respective unit bid price item, "Connection to Existing Combined Sewer".

33.03 SECTION 33 41 13 – PUBLIC STORM UTILITY DRAINAGE PIPING

A. Storm Sewer Piping.

1. Storm sewer piping indicated shall be HDPE piping.
2. The bedding, haunching and initial backfill material shall be ¾-inch clear stone. The initial backfill (cover material) shall be installed and compacted to a minimum of 12-inches over the top of the pipe. The remaining trench backfill shall be Type II backfill (suitable native excavated material) as approved by Engineer.
3. The Contractor shall dye test and/or provide the necessary inspections to determine if any encountered storm laterals are active and need to be reconnected/relayed. City staff will be available to assist the contractor in making this determination.
4. Prior to acceptance, the Contractor and field engineer shall inspect the new storm structures for this project after the construction activities are complete. The Contractor shall repair and/or completely replace any defects or issues identified by the Owner during the inspection.
5. Payment. All costs related to connecting to existing water main, including all labor and materials, shall be included in the unit price bid for "Connect to Existing Combined Sewer"

B. Storm Sewer Drain. The contractor shall install the 4-inch PVC drain with drop-in PVC grate per the indicated plans and details. The contractor shall coordinate the rim elevation of the drain with the floor of the cabinet.

1. Payment. All costs associate with the above drain and grate shall be included in the respective unit bid price item, "Public Storm Utility Drainage Piping, PVC, 4-Inch Drain w/Grate."

C. Bio-retention Cell. A bio-retention cell is located along the east end of the construction limits. This basin shall be developed per the indicated details and plans. The actual proposed basin will require additional over excavation and the indicated fill shall be placed per the details. The basin shall have pipe underdrain under them and an outlet structure to provide safe overflow of the water from the basin. All downstream water shall be conveyed into public utilities. The planting plugs and seed, engineered fill soil, gravel, excavation, turf restoration, and separation barrier shall be included in this work. Underdrain and storm structures/piping shall be separate from this work.

1. Payment. All labor, special soils and gravel, other materials, and costs per the detail and indicated above shall be paid for under the respective unit bid price item, "Bio-Retention Cell." The underdrain with fabric shall be paid under the respective unit price bid item. The storm sewer structures and piping shall be paid under their respective unit price bid items.

D. Sumped and Trapped Outflow Structure, 48-inch. The contractor shall install outflow structure per plans in the proposed bio-retention cell. The contractor shall ensure the outflow structure is set at the elevations noted in the contract documents. The Trash Grate, 48-inch shall be paid under their respective unit price bid items.

1. Payment. All costs associated with the above structure shall be included in the respective unit bid price item, "Sumped and Trapped Outflow Structure, 48-inch".

E. Trash Grate, 48-inch. The contractor shall install the dome trash grate in the proposed outflow structure per plans in the proposed bio-retention cell. The contractor shall ensure the outflow structure is set at the elevations noted in the contract documents. The Sumped and Trapped Outflow Structure, 48-inch shall be paid under their respective unit price bid items.

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1. Payment. All costs associated with the above grate shall be included in the respective unit bid price item, "Trash Grate, 48-inch".

F. Pipe Endwall. A 12-inch metal pipe endwall shall be installed on the splashpad discharge pipe. Contractor shall submit a shop drawing on the endwall as part of the storm sewer submittals.
1. Payment. All costs associated with the above structure shall be included in the unit bid price item, "Storm Drain Endwall."

G. 12" Rodent Guard. The contractor shall install a 12" rodent (rat)(animal) guard, stainless steel, Agri-Drain #RGSS12 or equivalent, at the outflow of the 12" storm sewer into the proposed bioretention cell. All other bioretention, splashpad, pipe, and apron endwall components shall be paid under their respective unit price bid items.
1. Payment. All costs associated with the above material shall be included in the respective unit bid price item, "12" Rodent Guard".

33.04 SECTION 33 41 16.19 PIPE UNDERDRAIN

A. 6" Pipe Underdrain. The contractor shall install underdrain under the proposed bio-retention cell. Contractor shall ensure the underdrain is set at the elevations noted in the contract documents.
1. Payment. All costs associated with the above piping shall be included in the respective unit bid price item, "Pipe Underdrain, Perforated Drain Tile with Sock, 6".

B. Storm Utility Clean-out PVC 6". The contractor shall install a clean-out at the end of the proposed bio-retention cell 6" pipe underdrain. The contractor shall ensure the cleanout is properly connected and is set at the elevations noted in the contract documents.
1. Payment. All costs associated with the above cleanout shall be included in the respective unit bid price item, "Pipe Underdrain, Perforated Drain Tile with Sock, 6".

C. 4" Pipe Underdrain. The contractor shall install underdrain under the proposed splash pad. The contractor shall ensure the underdrain is set at the elevations noted in the contract documents.
1. Payment. All costs associated with the above piping shall be included in the respective unit bid price item, "Pipe Underdrain, Perforated Drain Tile with Sock, 4".

END OF SECTION

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SECTION 01 41 26
PERMITS

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS (NONE)

1.03 DESCRIPTION OF WORK

A. The Contractor shall comply in all ways with the requirements of the following permits:
Local permits as required, including but not limited to plumbing, electrical, and erosion control. Contractor to coordinate with the city, permits will be administered at no-fee.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

1.05 SUBMITTALS (NONE)

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS (N/A)

PART 3 EXECUTION (N/A)

PART 4 MEASUREMENT AND PAYMENT (N/A)

END OF SECTION

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SECTION 01 45 00
QUALITY CONTROL

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS (NONE)

1.03 DESCRIPTION OF WORK

A. Provide quality control for all work performed under this contract as described in this section.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Submittals - Division 01

C. Material and Equipment - Division 01

1.05 SUBMITTALS (NONE)

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

1.07 QUALITY ASSURANCE

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

B. Comply with manufacturers' instructions, including each step in sequence.

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

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

E. Perform work by persons qualified to produce workmanship of specified quality.

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

1.08 TOLERANCES

A. Monitor tolerance control of installed products to produce acceptable work. Do not permit tolerances to accumulate.

B. Comply with manufacturers' tolerances. Should manufacturers' tolerances conflict with Contract Documents, request clarification from Engineer before proceeding.

C. Adjust products to appropriate dimensions; position before securing products in place.

1.09 REFERENCES

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A. For products or workmanship specified by association, trade, or other consensus standards, comply with requirements of the standard, except when more rigid requirements are specified or are required by applicable codes.

B. Conform to reference standard by date of issue current on date of Contract Documents, except where a specific date is established by code.

C. Obtain copies of standards where required by product specification sections.

D. The contractual relationship, duties, and responsibilities of the parties in Contract nor those of the Engineer shall not be altered from the Contract Documents by mention or inference otherwise in any reference document.

1.10 MOCK-UP

A. Tests will be performed under provisions identified in this section and identified in the respective product specification sections.

B. Assemble and erect specified items with specified attachment and anchorage devices, flashings, seals, and finishes.

C. Accepted mock-ups are representative of the quality required for the work.

D. Where mock-up has been accepted by Engineer and is specified in product specification sections to be removed; remove mock-up and clear area when directed to do so.

1.11 INSPECTING AND TESTING LABORATORY SERVICES

A. Contractor shall be responsible for concrete testing as outlined in Division 03 of these specifications. For other testing, Owner will appoint, contract, and pay for the services of an independent firm to perform inspecting and testing.

B. The independent firm will perform inspections, tests, and other services specified in individual specification sections and as required by the Engineer or the Owner.

C. Inspecting, testing, and source quality control may occur on or off the project site. Perform off-site inspecting or testing as required by the Engineer or the Owner.

D. Reports will be submitted by the independent firm to the Engineer indicating observations and results of tests and indicating compliance or non-compliance with Contract Documents.

E. Cooperate with independent firm; furnish samples of materials, design mix, equipment, tools, storage, safe access, and assistance by incidental labor as requested.
   1. Notify Engineer and independent firm 24 hours prior to expected time for operations requiring services.
   2. Make arrangements with independent firm and pay for additional samples and tests required for Contractor's use.

F. Testing or inspecting does not relieve Contractor from the responsibility to perform Work to contract requirements.

G. Retesting required because of non-conformance to specified requirements shall be performed by the same independent firm on instructions by the Engineer. Payment for retesting will be charged to the Contractor by deducting inspecting or testing charges from the Contract Sum/Price.

1.12 MANUFACTURERS' FIELD SERVICES AND REPORTS

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A. When specified in individual specification sections, require material or product suppliers or manufacturers to provide qualified staff personnel to observe site conditions, conditions of surfaces and installation, quality of workmanship, start-up of equipment, and test, adjust and balance of equipment as applicable, and to initiate instructions when necessary.

B. Report observations and site decisions or instructions given to applicators or installers that are supplemental or contrary to manufacturers' written instructions.

C. Submit report within 30 days of observation to Engineer for information.

PART 2 PRODUCTS AND MATERIALS (N/A)

PART 3 EXECUTION (N/A)

PART 4 MEASUREMENT AND PAYMENT (N/A)

END OF SECTION

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SECTION 01 45 16.11
CONCRETE QUALITY CONTROL

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.

1. American Concrete Institute (ACI), Annual Book of ACI Standards:
   a. ACI 117/177R - Specification for Tolerances for Concrete Construction and Materials and Commentary, Current Edition.
   b. ACI 209.1R - Report on Factors Affecting Shrinkage and Creep of Hardened Concrete, Current Edition.
   c. ACI 301 - Specifications for Structural Concrete, Current Edition.
   d. ACI 302.1R - Guide for Concrete Floor and Slab Construction, Current Edition.
   e. ACI 305R - Hot Weather Concreting, Current Edition.
   f. ACI 306.1 (R2002) - Standard Specification for Cold Weather Concreting, Current Edition.
   g. ACI 311.4R - Guide for Concrete Inspection, Current Edition.
   h. ACI 318/318R - Building Code Requirements for Structural Concrete and Commentary, Current Edition.
   i. ACI 530/530.1/530R/530.1R - Building Code Requirements and Specification for Masonry Structures and Related Commentaries, Current Edition.
   j. ACI ASCC-1(05) - The Contractor's Guide to Quality Concrete Construction, Third Edition.
   k. ACI CP-10/PACK - Craftsman Study Package for ACI Certification of Concrete Flatwork Finisher, Current Edition.
   l. ACI MCP06 - ACI Manual of Concrete Practice, Parts 1 through 6, and Index, 2006 Edition.
   m. ACI SCM-24 - Concrete Repair Basics, Current Edition.
   n. ACI SP-4 - Formwork for Concrete, Current Edition.
   o. ACI SP-15 - Field Reference Manual: Standard Specifications for Structural Concrete ACI 301 with Selected ACI Reference, Current Edition.
   p. ACI SP-71 - ASTM Standards in 318, Current Edition.
2. American Society for Testing and Materials (ASTM), Annual Book of ASTM Standards:
   a. ASTM C31 - Standard Practice for Making and Curing Concrete Test Specimens in the Field, Current Edition.
   b. ASTM C39 - Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens, Current Edition.
   c. ASTM C42 - Standard Test Method for Obtaining and Testing Drilled Cores and Sawed Beams of Concrete, Current Edition.
   d. ASTM C78 - Standard Test Method for Flexural Strength of Concrete (Using Simple Beam with Third-Point Loading), Current Edition.
   e. ASTM C114 - Standard Test Methods for Chemical Analysis of Hydraulic Cement, Current Edition.
   f. ASTM C143 - Standard Test Method for Slump of Hydraulic-Cement Concrete, Current Edition.
   g. ASTM C172 - Standard Practice for Sampling Freshly Mixed Concrete, Current Edition.
   h. ASTM C173 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Volumetric Method, Current Edition.
   i. ASTM C183 - Standard Practice for Sampling and the Amount of Testing of Hydraulic Cement, Current Edition.
   j. ASTM C186 - Standard Test Method for Heat of Hydration of Hydraulic Cement, Current Edition.
   k. ASTM C187 - Standard Test Method for Normal Consistency of Hydraulic Cement, Current Edition.

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l. ASTM C188 - Standard Test Method for Density of Hydraulic Cement, Current Edition.
m. ASTM C192 - Standard Practice for Making and Curing Concrete Test Specimens in the Laboratory, Current Edition.
n. ASTM C219 - Standard Terminology Relating to Hydraulic Cement, Current Edition.
o. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method, Current Edition.
p. ASTM C470 - Standard Specification for Molds for Forming Concrete Test Cylinders Vertically, Current Edition.
q. ASTM C823 - Standard Practice for Examination and Sampling of Hardened Concrete in Constructions, Current Edition.
r. ASTM E329 - Standard Specification for Agencies Engaged in Construction Inspection and/or Testing, Current Edition.

1.03 DESCRIPTION OF WORK

A. The work under this section shall cover sampling and testing of concrete to determine the materials conformance and work conformance to the requirements specified for cast-in-place concrete.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Concrete Accessories - Division 03

C. Cast-in-Place Concrete - Division 03

1.05 SUBMITTALS (NONE)

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS (N/A)

PART 3 EXECUTION

3.01 TESTING FOR ACCEPTANCE

A. Samples of concrete shall be delivered to a location on the site where material conformance tests can be performed.
1. Samples of concrete shall be obtained in accordance with ASTM C172.
2. Test specimens shall be stored without being disturbed for the first 24 hours.
3. Contractor's Sampling and Testing. The Contractor, or independent testing laboratory engaged and paid for by the Contractor, as approved by the Engineer, shall conduct tests on the proposed concrete mixture to determine the slump, entrained air content, compressive strength, or other appropriate tests to determine conformance with these specifications. The Contractor shall supply the standard equipment and molds necessary, and the Contractor shall transport the test specimens to the testing laboratory.
4. Owner's Sampling and Testing. The Owner may conduct tests on the proposed concrete mixture to determine the slump, entrained air content, compressive strength, or other appropriate tests to determine conformance with these specifications, as deemed necessary by the Engineer.

B. Slump and Air Content Tests
1. Slump tests shall be made in accordance with ASTM C143. Air content tests shall be made in accordance with ASTM C173 or ASTM C231. Slump tests and air tests shall always be performed from the same batch from which strength tests are performed.
2. If the measured slump or air content falls outside the limits specified, a check test shall be made immediately on another portion of the same sample. In the event of a second failure, the concrete shall be considered to have failed to meet the requirements of the specifications and shall not be used in the work.

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C. Strength Tests (Contractor's Sampling and Testing for Acceptance). Results from tests conducted by the Contractor shall be considered evidence of compliance of Contractor's materials used in the work, when strength is used as the basis for acceptance.

1. Cylinders for strength tests shall be made in accordance with ASTM C31. During the first 24 hours all test specimens shall be covered and kept at air temperatures between 60 Degrees Fahrenheit and 80 Degrees Fahrenheit in facilities provided on the job site by the Contractor. At the end of 24 hours, specimens will be carefully transported by the Contractor to the testing laboratory, where molds shall be removed, and cylinders shall be cured in a moist condition at 73.4 Degrees Fahrenheit ±3.0 Degrees Fahrenheit until time of test.
2. A strength test for any class of concrete shall consist of four standard cylinders made from a composite sample secured from a single load of concrete in accordance with ASTM C172, with one cylinder tested at 7 days, two at 28 days, and the fourth used as a spare. The test results at 28 days shall be the average of the strength of two specimens determined in accordance with ASTM C39, except that if one specimen in a test shows manifest evidence of improper sampling, molding or testing, it shall be disregarded and the spare cylinder shall be tested.

D. Strength Test (For Early Formwork or Shoring Removal). If the Contractor wishes to remove formwork or shoring prior to the minimum time as specified in Structural Cast-In-Place Concrete Forming - Division 03, they shall, at their expense, prepare test cylinders as evidence of concrete strength as follows:

1. Cylinders shall be made in accordance with ASTM C31. During the period of time from completion of the pour to removal of protective cover and stripping of forms, all test specimens shall be kept with the pour and be subjected to ambient conditions resulting from the curing and protection facilities provided on the job site by the Contractor. At the end of this period, specimens will be carefully transported by the Contractor to the testing laboratory, where molds shall be removed and cylinders shall be stored in outdoor ambient conditions to simulate on job site conditions until time of test.
2. A minimum of two cylinders made from a composite sample secured from a single load of concrete in accordance with ASTM C172. The test results shall be the average of the strength of two specimens determined in accordance with ASTM C39, except that if one specimen in a test shows manifest evidence of improper sampling, molding or testing, it shall be disregarded.

3.02 SELECTION OF TESTING LABORATORY

A. An independent testing laboratory to perform Concrete Quality Control shall meet the requirements of ASTM E329. The laboratory shall be selected by the Contractor as approved by the Engineer.

3.03 TEST REPORTS

A. Test reports will be directly distributed by the laboratory as follows: The original to the Contractor; two copies to the Engineer; one copy to the Owner.

3.04 TESTING REQUIREMENTS

A. The Contractor shall be required to perform one test for each 100 cubic yards of concrete poured, or fraction thereof, for each class of concrete used. Each test shall consist of four (4) cylinders; one (1) to be tested at seven (7) days, two (2) to be tested at twenty-eight (28) days, and one (1) to be a spare.

B. Compliance testing shall be performed on every single load, or portion thereof, where water addition to the single load, or portion thereof, takes place on site.

C. A minimum of one (1) test shall be performed per day for each class of concrete placed.

3.05 CONDITIONS OF COMPLIANCE AND NON-COMPLIANCE

A. Compliance of Contractor's Materials Used in the Work.

1. To conform to the requirements of this specification, every 28-day test representing each mix must be equal to or greater than the specified minimum strength without exception. If a specimen shows manifest evidence of improper sampling, molding, or testing, it will be disregarded. Note,

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however, that the anticipated strength for all mixes is appreciably above the specified minimum strength due to quality required by the water-cement ratio specified.

B. Non-Compliance of Contractor's Materials Used in the Work

1. When strength is used as the basis for acceptance, should individual tests of the Contractor's specimens produce strengths less than 90% of the specified strength (f'c), tests of cores drilled from the area in question may be required in accordance with ASTM C42. Three cores shall be taken for each cylinder test less than 90% of the specified strength (f'c). If the concrete in the structure will be dry under service conditions, the cores shall be air dried (temperature 60 to 80°F, relative humidity less than 60 percent) for seven (7) days before test and shall be tested dry. If the concrete in the structure will be more than superficially wet under service conditions, the cores shall be immersed in water for at least 48 hours and tested wet.
2. Concrete represented by the core tests will be considered structurally adequate and meet the requirements of this specification if the average of the three cores is equal to at least 95 percent of the specified strength (f'c) and if no single core is less than 90 percent of f'c. To check testing accuracy, locations represented by erratic core strengths may be retested. If these strength acceptance criteria are not met by the core tests, the Engineer shall order appropriate action at no additional cost to the Owner.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Concrete quality control shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 CONCRETE QUALITY CONTROL

A. Concrete Quality Control, Inclusive. All required sampling, preparing of specimen and testing, except as modified by these specifications shall be performed by the Contractor, or an independent testing laboratory engaged and paid for by the Contractor and shall be inclusive to payment for work associated with cast-in-place concrete.

1. The cost of any additional testing required because of failure of previous tests to meet specification requirements shall be borne by the Owner for subsequent tests which comply with the specifications.
2. The cost of any additional testing required because of failure of concrete to meet specification requirements shall be borne by the Contractor for tests which fail to comply with the specifications. All tests required under Paragraph 3.05 "Conditions of Compliance and Non-Compliance", above shall be borne by the Contractor.
3. Concrete Quality Control, Lump Sum. When so provided, payment for concrete quality control shall be made at the contract lump sum price bid.

END OF SECTION

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SECTION 01 50 00
TEMPORARY FACILITIES AND CONTROLS

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS (NONE)

1.03 DESCRIPTION OF WORK

A. The work under this section shall cover all materials, equipment, tools, labor and supervision necessary to execute the temporary facilities and controls required for the work.

B. Contractor shall be responsible to obtain from authorities of each respective utility the necessary service for water, electricity, telephone, etc., or make arrangements with the Owner for some or all of these services as specified below.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

1.05 SUBMITTALS (NONE)

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS (NONE)

PART 3 EXECUTION

3.01 TEMPORARY ELECTRIC

A. Provide, maintain and pay for electrical service. Coordinate access to and use of electricity with utility provider, extend and supplement with temporary devices as needed to maintain specified conditions for construction operations.

3.02 TEMPORARY LIGHTING FOR CONSTRUCTION PURPOSES

A. Provide and maintain incandescent lighting for construction operations.

B. Provide and maintain lighting to exterior staging and storage areas after dark for security purposes.

C. Provide and maintain lighting to interior work areas after dark for security purposes.

D. Provide branch wiring from power source to distribution boxes with lighting conductors, pigtails, and lamps for specified lighting levels.

E. Maintain lighting and provide routine repairs.

F. Permanent building lighting may [not] be utilized during construction.

3.03 TEMPORARY HEATING

A. Heat enclosed areas to achieve curing of materials, to dissipate humidity, and to in general provide with environmental conditions required for construction operations.

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1. Provide and pay for heating devices and heat as needed to maintain specified conditions for construction operations.
2. Enclose building prior to activating temporary heat in accordance with Enclosures article in this section.
3. Operation of new permanent equipment for temporary heating purposes is not allowed.
4. Combustion type temporary heating devices shall be vented outside of any temporary enclosure and building envelope. Combustion gas shall not be allowed in any temporary enclosure and building envelope.

3.04 TEMPORARY VENTILATION

A. Ventilate enclosed areas to achieve curing of materials, to dissipate humidity, and to prevent accumulation of dust, fumes, vapors, or gases.
1. Provide and pay for ventilation devices and as needed to maintain specified conditions for construction operations. Provide separate metering and reimburse Owner for cost of energy used.
2. Operation of new permanent equipment for temporary ventilating purposes is not allowed.

3.05 TELEPHONE SERVICE

A. Provide, maintain, and pay for telephone service to field office at time of project mobilization.

3.06 TEMPORARY WATER

A. Contractors may obtain water from the municipal water system at no cost, however, usage shall be metered and a record provided to Owner at the end of the project.
1. Exercise measures to conserve water. Supplement with temporary devices as needed to maintain specified conditions for construction operations.

3.07 TEMPORARY SANITARY FACILITIES

A. Provide and maintain required facilities and enclosures. Existing facility use is not permitted. Provide facilities at time of project mobilization.

3.08 TEMPORARY FIELD OFFICES AND SHEDS

A. Do not use existing facilities for field offices or for storage.

B. Do not use permanent facilities for field offices or for storage.

C. Provide space and facilities for Project as required.

D. Removal: At completion of Work remove buildings, foundations, utility services, and debris. Restore areas.

3.09 VEHICULAR ACCESS

A. Provide unimpeded access for emergency vehicles. Maintain 20 foot wide driveways with turning space between and around combustible materials.

B. Provide and maintain access to fire hydrants and control valves free of obstructions.

C. Provide means of removing mud from vehicle wheels before entering streets.

D. Use designated existing on-site roads for construction traffic.

3.10 TEMPORARY PARKING

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A. Arrange for temporary parking areas to accommodate construction personnel. Use of designated areas of existing parking facilities used by construction personnel is permitted. Locate as approved by Owner. Coordinate specific requirements with Owner.

B. When site space is not adequate, provide additional off-site parking.

C. Use of existing on-site streets and driveways used for construction traffic is permitted. Tracked vehicles not allowed on paved areas.

D. Do not allow heavy vehicles or construction equipment in parking areas.

E. Do not allow heavy vehicle parking on existing pavement.

F. Permanent Pavements and Parking Facilities:
1. Avoid traffic loading beyond paving design capacity. Tracked vehicles not allowed.
2. Use of permanent parking structures is not permitted.

G. Maintenance:
1. Maintain traffic and parking areas in sound condition free of excavated material, construction equipment, products, mud, snow, and ice.
2. Maintain existing paved areas used for construction; promptly repair breaks, potholes, low areas, standing water, and other deficiencies, to maintain paving and drainage in original, or specified, condition.

H. Removal, Repair:
1. Remove temporary materials and construction when permanent paving is usable.
2. Remove underground work and compacted materials to depth of 2 foot fill and grade site as specified.
3. Repair existing facilities damaged by use, to original or better than condition.

I. Mud From Site Vehicles: Provide means of removing mud from vehicle wheels before entering streets.

3.11 PROGRESS CLEANING AND WASTE REMOVAL

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

B. Remove debris and rubbish from pipe chases, plenums, attics, crawl spaces, and other closed or remote spaces, prior to enclosing spaces.

C. Broom and vacuum clean interior areas prior to start of surface finishing, and continue cleaning to eliminate dust.

D. Collect and remove waste materials, debris, and rubbish from site periodically and dispose off-site.

E. Open free-fall chutes are not permitted. Terminate closed chutes into appropriate containers with lids.

3.12 BARRIERS

A. Provide barriers to prevent unauthorized entry to construction areas to allow for Owner's use of site, and to protect existing facilities and adjacent properties from damage from construction operations and demolition.

B. Provide barricades and covered walkways required by authorities having jurisdiction for public rights-of-way [and for public access to existing building].

C. Provide protection for facilities designated to remain. Replace damaged facilities.

D. Protect non-owned vehicular traffic, stored materials, site, and structures from damage.

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3.13 TEMPORARY ENCLOSURES

A. Exterior Enclosures:
   1. Provide temporary insulated weather tight closure of exterior openings to accommodate acceptable working conditions and protection for products, to allow for temporary heating and maintenance of required ambient temperatures identified in individual specification sections, and to prevent entry of unauthorized persons. Provide access doors with self-closing hardware and locks.

B. Interior Enclosures:
   1. Provide temporary partitions and ceilings as indicated on contract drawings to separate work areas from Owner occupied areas, to prevent penetration of dust and moisture into Owner occupied areas, and to prevent damage to existing materials and equipment.
   2. Construction: Framing and plywood sheet materials with closed joints and sealed edges at intersections with existing surfaces:

3.14 TEMPORARY SECURITY

A. Security Program:
   1. Protect Work, existing premises and Owner's operations from theft, vandalism, and unauthorized entry.
   2. Initiate program in coordination with Owner's existing security system at project mobilization.
   3. Maintain program throughout construction period until Owner acceptance precludes need for Contractor security.

B. Entry Control:
   1. Owner will control entrance of persons and vehicles related to Owner's operations.
   2. Coordinate access of Owner's personnel to site in coordination with Owner's security forces.

3.15 TEMPORARY WATER CONTROL

A. Grade site to drain. Maintain excavations free of water. Provide, operate, and maintain pumping equipment.

B. Protect site from puddling or running water. Provide water barriers as required to protect site from soil erosion.

3.16 TEMPORARY DUST CONTROL

A. Execute Work by methods to minimize raising dust from construction operations.

B. Provide positive means to prevent air-borne dust from dispersing into atmosphere.

3.17 TEMPORARY EROSION AND SEDIMENT CONTROL

A. Plan and execute construction by methods to control surface drainage from cuts and fills, from borrow and waste disposal areas. Prevent erosion and sedimentation.

B. Minimize surface area of bare soil exposed at one time.

C. Provide temporary measures including berms, dikes, and drains, and other devices to prevent water flow.

D. Construct fill and waste areas by selective placement to avoid erosive surface silts or clays.

E. Periodically inspect earthwork to detect evidence of erosion and sedimentation; promptly apply corrective measures.

3.18 NOISE CONTROL (N/A)

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3.19 PEST CONTROL (N/A)

3.20 REMOVAL OF UTILITIES, FACILITIES, AND CONTROLS

A. Remove temporary utilities, equipment, facilities, and materials, prior to Substantial Completion inspection.

B. Remove underground installations to minimum depth of 2 feet. Grade site as indicated on contract drawings.

C. Clean and repair damage caused by installation or use of temporary work.

D. Restore existing facilities used during construction to original condition. Restore permanent facilities used during construction to specified condition.

PART 4 MEASUREMENT AND PAYMENT

4.01 TEMPORARY FACILITIES AND CONTROLS

A. Temporary facilities and controls shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

1. Temporary Facilities and Controls, Lump Sum. When so provided, payment for temporary facilities and controls shall be made at the contract lump sum price bid.
2. Temporary Facilities and Controls, Inclusive. When no quantity is provided, temporary facilities and controls shall be in inclusive to payment for work associated with related utility or infrastructure improvement.

END OF SECTION

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SECTION 01 55 26
TRAFFIC CONTROL

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. Manual on Uniform Traffic Control Devices (MUTCD) for Streets and Highways, current edition.

1.03 DESCRIPTION OF WORK

A. The work covered under this section shall include installing and maintaining traffic control devices to safely and efficiently direct traffic through or around the construction site.

B. The work also includes removing temporary traffic control devices at the completion of the project.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Work Restrictions and Provisions – Division 01

C. Submittals – Division 01

1.05 SUBMITTALS

A. If a detailed traffic control plan is not included in the Contract Drawings, the Contractor shall submit a traffic control plan. Information shall be in conformance with requirements of Submittals - Division 01 of these specifications.

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (N/A)

PART 2 PRODUCTS AND MATERIALS

2.01 GENERAL

A. Traffic control devices and materials shall conform to the MUTCD and applicable State Department of Transportation specifications.

PART 3 EXECUTION

3.01 TRAFFIC CONTROL

A. The Contractor shall ensure when all deliveries of materials, equipment, etc. are brought to the site, the Contractor shall provide flaggers to direct trucks and the general public within the park. The park will not be completely closed to the public during the project.

B. When the Contractor is operating equipment, all areas within the bounds of the equipment and construction area shall be fenced off with either snow fencing or more substantial fencing like chain link fencing. All open trenches and holes within the park site shall be secured by fencing at the end of each night and over the weekends.

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1. If fencing falls into disrepair, the Contractor will be contacted and required to send an employee to make repairs to the fencing immediately.

C. All equipment and materials shall be secured each night. This will require the contractor to move all items out of the main public areas that will remain open during the project to ensure they are protected from the public.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Traffic control shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 TRAFFIC CONTROL

A. Traffic Control, Lump Sum. When so provided, payment for traffic control shall be made at the contract lump sum price bid.

B. Traffic Control, Inclusive. When no quantity is provided, traffic control shall be considered inclusive to payment for contract work related to the associated construction.

END OF SECTION

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SECTION 01 77 00
CLOSEOUT PROCEDURES

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS (NONE)

1.03 DESCRIPTION OF WORK

A. The work under this section shall cover: starting of systems; demonstration and instructions; testing, adjusting and balancing; operation and maintenance data; protecting installed and completed construction; final cleaning; manuals for materials and finishes; manual for equipment and systems; spare parts and maintenance products; product warranties, guarantees and bonds; project closeout procedures; and maintenance service.

B. The Contractor shall assume the responsibility for the protection of all finished construction until accepted by the Owner. The Contractor shall repair and restore any and all damage to finished work to the satisfaction of the Engineer.

C. The Contractor shall require each trade to clean the premises of accumulations of surplus materials and rubbish caused by their activities. Burning of rubbish on site will not be permitted.

1.04 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS

A. Provide operation and maintenance manuals covering each item of equipment furnished. Submit manuals to Engineer prior to “Substantial Completion” in accordance with Submittals - Division 01 of these specifications, and as specified herein.

B. Submit data bound in 8-1/2 x 11 inch (A4) text pages, three D side ring binders with durable plastic covers.

C. Prepare binder cover with printed title “OPERATION AND MAINTENANCE INSTRUCTIONS”, title of project, and subject matter of binder when multiple binders are required.

D. Internally subdivide binder contents with permanent page dividers, logically organized as described below; with tab titling clearly printed under reinforced laminated plastic tabs.

E. Drawings: Provide with reinforced punched binder tab. Bind in with text; fold larger drawings to size of text pages.

F. Contents: Prepare Table of contents for each volume, with each product or system description identified, typed on white paper, in three parts as follows:
   1. Part 1: Directory, listing names, addresses, and telephone numbers of Architect/Engineer, Contractor, Subcontractors, and major equipment suppliers.
   2. Part 2: Operation and maintenance instructions, arranged by system and subdivided by specification section. For each category, identify names, addresses, and telephone numbers of Subcontractors and supplier. Identify the following:
      a. Significant design criteria.
      b. List of equipment.
      c. Parts list for each component.
      d. Operating instructions.
      e. Maintenance instructions for equipment and systems.
      f. Maintenance instructions for [special] finishes, including recommended cleaning methods and materials, and special precautions identifying detrimental agents.

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3. Part 3: Project documents and certificates, including the following:
   a. Shop drawings and product data.
   b. Air and water balance reports.
   c. Certificates.
   d. Originals of warranties and bonds.

1.05 FINAL CLEANING

A. Execute final cleaning prior to final project assessment.

B. Clean interior and exterior glass, surfaces exposed to view; remove temporary labels, stains and foreign substances.

C. Clean equipment and fixtures to sanitary condition with cleaning materials appropriate to surface and material being cleaned.

D. Clean filters of operating equipment.

E. Clean debris from roofs, gutters, downspouts, and drainage systems.

F. Clean site; sweep paved areas, rake clean landscaped surfaces.

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

1.06 STARTING OF SYSTEMS

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

B. Notify Engineer and Owner seven days prior to start-up of each item.

C. Verify each piece of equipment or system has been checked for proper lubrication, drive rotation, belt tension, control sequence, and for conditions which may cause damage.

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

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

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

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

H. Submit a written report in accordance with Submittals-Division 01 that equipment or system has been properly installed and is functioning correctly.

1.07 DEMONSTRATION AND INSTRUCTIONS

A. Demonstrate operation and maintenance of products to Owner's personnel two weeks prior to date of Substantial Completion.

B. For equipment or systems requiring seasonal operation, perform demonstration for other season within six months.

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

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

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

F. Required instruction time for each item of equipment and system is specified in individual sections.

1.08 TESTING, ADJUSTING AND BALANCING

A. The completed Work in accordance with requirements of the contract documents when ready in all respects for use by the Owner shall be subjected to a performance test at operating conditions.

B. Submit reports to Engineer indicating observations and results of tests and indicating compliance or non-compliance with requirements of Contract Documents. Make all adjustments necessary to fulfill requirements and to comply with the instructions and recommendations of manufacturers, and to comply with all codes and regulations.

1.09 PROTECTING INSTALLED CONSTRUCTION

A. Protect installed Work and provide special protection where specified in individual specification sections.

B. Provide temporary and removable protection for installed products. Control activity in immediate work area to prevent damage.

C. Provide protective coverings at walls, projections, jambs, sills, and soffits of openings.

D. Protect finished floors, stairs, and other surfaces from traffic, dirt, wear, damage, or movement of heavy objects, by protecting with durable sheet materials.

E. Prohibit traffic or storage upon waterproofed or roofed surfaces. When traffic or activity is necessary, obtain recommendations for protection from waterproofing or roofing material manufacturer.

F. Prohibit traffic from landscaped areas.

1.10 PROJECT RECORD DOCUMENTS

A. Maintain on site one set of the following record documents; record actual revisions to the Work:
   1. Drawings.
   2. Specifications.
   3. Addenda.
   4. Change Orders and other modifications to the Contract.
   5. Reviewed Shop Drawings, Product Data, and Samples.
   6. Manufacturer's instruction for assembly, installation, and adjusting.

B. Ensure entries are complete and accurate, enabling future reference by Owner.

C. Store record documents separate from documents used for construction.

D. Record information concurrent with construction progress, not less than weekly.

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

F. Record Drawings [and Shop Drawings]: Legibly mark each item to record actual construction including:

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1. Measured depths of foundations in relation to finish first floor datum.
2. Measured horizontal and vertical locations of underground utilities and appurtenances, referenced to permanent surface improvements.
3. Measured locations of internal utilities and appurtenances concealed in construction, referenced to visible and accessible features of the work.
4. Field changes of dimension and detail.
5. Details not on original Contract Drawings.

G. Submit documents to Engineer prior to claim for final Application for Payment.

1.11 MANUAL FOR MATERIALS AND FINISHES

A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Engineer will review draft and return one copy with comments.

B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.

C. Submit one copy of completed volumes 15 days prior to final inspection. Draft copy be reviewed and returned after final inspection, with Engineer comments. Revise content of document sets as required prior to final submission.

D. Submit two sets of revised final volumes in final form within 10 days after final inspection.

E. Building Products, Applied Materials, and Finishes: Include product data, with catalog number, size, composition, and color and texture designations. Include information for re-ordering custom manufactured products.

F. Instructions for Care and Maintenance: Include manufacturer's recommendations for cleaning agents and methods, precautions against detrimental agents and methods, and recommended schedule for cleaning and maintenance.

G. Moisture Protection and Weather Exposed Products: Include product data listing applicable reference standards, chemical composition, and details of installation. Include recommendations for inspections, maintenance, and repair.

H. Additional Requirements: As specified in individual product specification sections.

I. Include listing in Table of Contents for design data, with tabbed fly sheet and space for insertion of data.

1.12 MANUAL FOR EQUIPMENT AND SYSTEMS

A. Submit two copies of preliminary draft or proposed formats and outlines of contents before start of Work. Engineer will review draft and return one copy with comments.

B. For equipment, or component parts of equipment put into service during construction and operated by Owner, submit documents within ten days after acceptance.

C. Submit one copy of completed volumes 15 days prior to final inspection. Draft copy be reviewed and returned after final inspection, with Engineer comments. Revise content of document sets as required prior to final submission.

D. Submit two sets of revised final volumes in final form with 10 days after final inspection.

E. Each Item of Equipment and Each System: Include description of unit or system, and component parts. Identify function, normal operating characteristics, and limiting conditions. Include performance curves, with engineering data and tests, and complete nomenclature and model number of replaceable parts.

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F. Panelboard Circuit Directories: Provide electrical service characteristics, control, and communications typed.

G. Include color-coded wiring diagrams as installed.

H. Operating Procedures: Include start-up, break-in, and routine normal operating instructions and sequences. Include regulation, control, stopping, shut-down, and emergency instructions. Include summer, winter, and special operating instructions.

I. Maintenance Requirements: Include routine procedures and guide for preventative maintenance and trouble shooting; disassembly, repair, and reassembly instructions; and alignment, adjusting, balancing, and checking instructions.

J. Include servicing and lubrication schedule, and list of lubricants required.

K. Include manufacturer's printed operation and maintenance instructions.

L. Include sequence of operation by controls manufacturer.

M. Include original manufacturer's parts list, illustrations, assembly drawings, and diagrams required for maintenance.

N. Include control diagrams by controls manufacturer as installed.

O. Include Contractor's coordination drawings, with color-coded piping diagrams as installed.

P. Include charts of valve tag numbers, with location and function of each valve, keyed to flow and control diagrams.

Q. Include list of original manufacturer's spare parts, current prices, and recommended quantities to be maintained in storage.

R. Include test and balancing reports as specified in Quality Control – Division 01.

S. Additional Requirements: As specified in individual product specification sections.

T. Include listing in Table of Contents for design data, with tabbed dividers and space for insertion of data.

1.13 SPARE PARTS AND MAINTENANCE PRODUCTS

A. Furnish spare parts, maintenance, and extra products in quantities specified in individual specification sections.

B. Deliver to Project site and place in location as directed by Owner; obtain receipt prior to final payment.

1.14 PRODUCT WARRANTIES, GUARANTEES AND BONDS

A. Obtain warranties, guarantees and bonds executed in duplicate by responsible subcontractors, suppliers, and manufacturers, within ten days after completion of applicable item of work.

B. Execute and assemble transferable warranty documents and bonds from subcontractors, suppliers, and manufacturers.

C. Verify documents are in proper form, contain full information, and are notarized.

D. Co-execute submittals when required.

E. Include Table of Contents and assemble in three D side ring binder with durable plastic cover.

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F. Submit prior to final Application for Payment.

G. Time of Submittals:
   1. For equipment or component parts of equipment put into service during construction with Owner's permission, submit documents within ten days after acceptance.
   2. Make other submittals within ten days after Date of Substantial Completion, prior to final Application for Payment.
   3. For items of Work for which acceptance is delayed beyond Date of Substantial Completion, submit within ten days after acceptance, listing date of acceptance as beginning of warranty or bond period.

1.15 LOOSE AND DETACHABLE PARTS

A. The Contractor shall retain all loose and small detachable parts of apparatus and equipment furnished under this contract, until completion of the work and shall turn them over to the Owner.

1.16 CLOSEOUT PROCEDURES

A. Submit written certification that Contract Documents have been reviewed, Work has been inspected, and that Work is complete in accordance with Contract Documents and ready for Engineer's review.

B. Provide submittals to Engineer for presentation to Owner required by authorities having jurisdiction.

C. Submit final Application for Payment identifying total adjusted Contract Sum, previous payments, and sum remaining due.

D. Owner will occupy all portions of building as specified in Summary of Work – Division 01.

PART 2 PRODUCTS AND MATERIALS (N/A)

PART 3 EXECUTION (N/A)

PART 4 MEASUREMENT AND PAYMENT (N/A)

END OF SECTION

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SECTION 02 01 00
MAINTENANCE OF EXISTING CONDITIONS

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition at time of bid opening.

1.03 DESCRIPTION OF WORK

A. The work under this section shall cover all materials, equipment, supervision, and labor necessary for surface restoration. The various street surfaces disturbed, damaged, or destroyed during the performance of the work under this contract shall be restored and maintained as shown, specified, and directed. Included in this classification are pavement surfaces of all types, pavement bases, shoulders, and appurtenances as driveways, curb and gutter sections, sidewalks, alleys, and all other miscellaneous surfaces required but not designated under other sections of these specifications.

B. A schedule of restoration of the pavement surfaces shall be worked out by the Contractor and approved by the Engineer. The schedule shall be adhered to unless subsequent changes are approved by the Engineer.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Cast-in-Place Concrete - Division 03

C. Subgrade Preparation - Division 31

D. Trenching and Backfill - Division 31

E. Aggregate Base and Subbase - Division 32

1.05 SUBMITTALS

A. Contractor shall submit such product literature and catalog cuts of materials to be supplied to relate these materials to these specifications. Information shall be in conformance with requirements of Submittals - Division 01 of these specifications.

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 GENERAL

A. Materials shall comply with the respective sections of Divisions 03, 31, and 32 of these specifications, as they are applicable, and those of the State of Wisconsin, Department of Transportation, Standard Specifications to the extent indicated by the reference thereto.

2.02 PAVEMENT SURFACE AND APPURTENANCES

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A. Concrete pavement and appurtenances shall conform to the requirements specified in Cast-in-Place Concrete - Division 03 or as specified in Special Procedures - Division 01.

PART 3 EXECUTION

3.01 GENERAL

A. Workmanship shall comply with the respective sections of Divisions 03, 31, and 32 of these specifications, as they are applicable, and those of the State of Wisconsin, Department of Transportation, Standard Specifications to the extent indicated by the reference thereto.

3.02 TEMPORARY RESTORATION

A. Upon completion of backfilling, the pavement surface damaged or destroyed shall be temporarily restored by the Contractor.
   1. The pavement shall be temporarily restored by placing on a prepared subgrade a base consisting of crushed gravel or crushed stone. The base shall have a minimum thickness of 8 inches plus the thickness of the permanent type of pavement to be replaced, or greater thickness if necessary to conform to the thickness of the base disturbed or removed, and shall be placed at the proper line and grade.
   2. Temporary pavement shall be maintained in a suitable and safe condition for traffic until the permanent pavement is laid.

B. Type I backfill shall be used under all paved streets, paved roads, driveways, sidewalks and curb and gutter sections.

C. Curbs, where possible, shall be temporarily reset in their place as a part of the temporary restoration. Damaged or destroyed sidewalks shall be temporarily restored by placing a 3-inch layer of granular base material, or other approved material.

3.03 PERMANENT RESTORATION

A. Preparation for pavement and appurtenance replacements may proceed after trenches have been compacted in accordance with Trenching and Backfill - Division 31. Level and grade, fill, or re-excavate as necessary. Neatly trim any adjacent permanent pavement by a sawcut joint prior to pavement replacement.
   1. Base material shall be in accordance with Aggregate Base Course - Division 32 and to a depth of 8 inches or as specified in Special Procedures - Division 01.
   2. Concrete pavement and appurtenances shall be in accordance with Cast-in-Place Concrete - Division 03 and shall be to a depth of 8 inches or as specified in Special Procedures - Division 01. Concrete pavement reinforcement shall be equal to or exceeding that existing.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Maintenance of existing conditions shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 MAINTENANCE OF EXISTING CONDITIONS

A. Maintenance of Existing Conditions, Lump Sum. When so provided, payment for maintenance of existing conditions shall be made at the contract lump sum price bid.

B. Maintenance of Existing Conditions, Inclusive. When no quantity is provided, maintenance of existing conditions shall be considered inclusive to payment for work associated.

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END OF SECTION

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SECTION 03 11 13
CAST-IN-PLACE CONCRETE FORMING

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. American Concrete Institute (ACI) Annual Book of ACI Standards:
      a. ACI 117/177R - Specifications for Tolerances for Concrete Construction and Materials and Commentary, Current Edition.
      b. ACI 301 - Specifications for Structural Concrete, Current Edition.
      c. ACI 302.1R - Guide for Concrete Floor and Slab Construction, Current Edition.
      d. ACI 311.4R - Guide for Concrete Inspection, Current Edition.
      e. ACI 318 - Building Code Requirements for Structural Concrete, Current Edition.
      f. ACI 347 - Guide to Formwork for Concrete, Current Edition.
      g. ACI ASCC-1(05) - The Contractor's Guide to Quality Concrete Construction, Third Edition.
      h. ACI SCM-24 - Concrete Repair Basics, Current Edition.
      i. ACI SP-4 - Formwork for Concrete, Current Edition.
      j. ACI SP15 – Field Reference Manual: Standard Specifications for Structural Concrete ACI 301 with Selected ACI Reference, Current Edition.
      k. ACI SP-71 - ASTM Standards in ACI 318, Current Edition.
   2. American Plywood Association (APA) Specifications and Standards:
      a. APA PS1 - Plywood Design Specification, Current Edition.

1.03 DESCRIPTION OF WORK

A. The work covered under this section shall consist of furnishing all materials, equipment and labor required to furnish all formwork for cast-in-place concrete as shown on the contract drawings and specified herein.

B. The work shall include formwork, shoring for cast-in-place concrete, and installation into formwork of items by other such as anchor bolts, setting plates, bearing plates, anchorages, inserts, frames, nosings and other items to be embedded in concrete.

1.04 RELATED WORK ELSEWHERE

A. Concrete Accessories - Division 03

B. Concrete Reinforcing - Division 03

C. Cast-in-Place Concrete - Division 03

D. Joint Sealers – Division 07

1.05 DEFINITIONS

A. Bug Holes: Surface voids that do not exceed size as listed for Rough Form or Smooth Form Finish. These voids shall be considered surface effects, not defects. Quantity of bug holes is not limited.

1.06 SUBMITTALS

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A. Submit such product literature and catalog cuts of materials to be used for the formation of control / construction joint material in the formwork. Information shall be in conformance with requirements of Submittals – Division 01 of these specifications.

PART 2 PRODUCTS AND MATERIALS

2.01 DESIGN

A. The design and engineering of the formwork and its accessories shall be the responsibility of the Contractor. Formwork shall be designed, erected, supported, braced and maintained so as to safely support all vertical and lateral loads until such loads can be supported by the concrete structure.

B. Determination of loads and design shall be in accordance with ACI 301 and ACI 347.

2.02 FORMS

A. Forms may be wood, plywood, concrete-form-grade hardboard, metal or other acceptable material which will produce smooth, true surfaces.
1. Provide lumber dressed on at least two edges and one side for tight fit.
2. Metal forms shall have smooth surfaces free from any pattern, irregularities, dents, bends and sags.

B. Finish-Free Sonotube Concrete Forms for round columns.

2.03 SHORING

A. All shoring members shall be of such design and material to safely support all dead and working loads throughout the placing and curing period. Shoring shall be placed to prevent sagging and settlement.

2.04 FORM TIES AND ACCESSORIES

A. Form ties shall be factory-fabricated, adjustable-length, removable or snapoff metal, designed to prevent form deflection, and to prevent spalling concrete surfaces upon removal.

B. For exposed concrete surfaces, provide ties so that the portion remaining with the concrete after removal is 1 inch to 1-1/2 inches inside the finished face of the concrete. Provide form ties which will not leave holes larger than 1 inch in diameter in concrete surfaces.

2.05 FORM COATING COMPOUND

A. Form coating compound shall be a commercial formulation that will not bond with, stain, nor adversely affect concrete surfaces and not impede the wetting of surfaces to be cured with water or curing compounds. Forms for concrete surfaces requiring subsequent treatment shall receive a type of coating that will not impair bond or adhesion.

B. Form coating compound for steel forms shall conform with all requirements stated above and shall be of rust-preventative type.

2.06 CONTROL / CONSTRUCTION JOINT MATERIALS

A. Provide material to be used for the formation of wall control joints and construction joints as indicated on the contract drawings and in this specification. Submit product literature and catalog cuts of materials to be used for forming joints.

PART 3 EXECUTION

3.01 GENERAL

A. Responsibility. The design and construction of formwork shall be the sole responsibility of the Contractor.

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B. Earth forms are not acceptable or permitted.

C. Construct forms to the exact sizes, shapes, lines and dimensions shown, as required to obtain accurate alignment, location, grades, level and plumb in finished construction and to maintain tolerances in accordance with ACI 301. Provide for openings, offsets, sinkages, keyways, recesses, moldings, rustications, reglets, chamfers, blocking, screeds, bulkheads, anchorages and inserts, and other features required. Chamfer all corners of concrete exposed to view using chamfer strips. Use selected materials to obtain required finishes.

D. Forms shall be sufficiently tight to prevent leakage of concrete. Temporary openings shall be provided in the inside form of all wall forms and in column forms to facilitate cleaning and inspection immediately before placing concrete.

E. Assemble forms so their removal will not damage concrete and adjacent materials.

3.02 FORMWORK

A. Forms shall conform in general to shape, line, grade and dimensions of members as shown on contract drawings, and shall have the strength and stability to insure finished concrete within the tolerances specified in ACI 347.
   1. Provide openings in concrete formwork to accommodate work of other trades. Determine size and location of openings, recesses and chases from those other trades.
   2. Exterior edges of all exposed concrete, unless otherwise specified, shall have a chamfer strip placed in form to provide bevel of sharp edges. Chamfer strips shall be 3/4-inch by 3/4-inch by 45º wood, plastic, or rubber.
   3. Accurately place and secure in position, prior to placing concrete, all anchors, bolts, inserts and other items furnished under other sections of the specifications and for other contractors on the project.

B. Formwork shall be mortar-tight and sufficiently rigid to prevent displacement or sagging between supports.

C. Formwork shall be properly braced or tied together so as to maintain position and shape and insure safety to workman and passersby.

D. Temporary openings may be provided on all wall and column forms to limit the free fall of the concrete to less than 4 feet and should be so located as to facilitate the placing and consolidation of the concrete. The ports shall be spaced no more than 6 feet apart to limit the horizontal flow of concrete.

E. All forms shall be cleaned and rubbed smooth prior to placing to insure true forming surfaces for all concrete surfaces.

F. All surfaces that will be exposed to view shall be provided with a smooth-form finish.
   1. Form-facing materials with raised grain, torn surfaces, worn edges, dents, or other defects that would impair the texture of the concrete are not allowed.
   2. Facing materials shall be set in an orderly and symmetrical arrangement and seams shall be kept to a practical minimum.

3.03 FORM TIES AND ACCESSORIES

A. Internal wall ties shall contain positive stops at the required wall thickness. The exterior clamp portions of the pipe shall be adjustable to permit tightening of forms. Ties shall provide a positive disconnection 1 inch to l-1/2 inches inside the finished face of the concrete. Cutting ties back from face of wall or use of wire ties will not be permitted. All tie and plug holes shall be filled with non-shrink grout after forms are removed.

B. All concrete tie locations shall be watertight. Wall ties shall be fitted with tapered rubber plugs at all water retaining structures.

C. Accessories shall be used only for the purpose intended and shall in no way interfere with the placing of concrete. Removal of accessories shall in no way impair or disturb finish concrete surfaces. Accessories shall be compatible with formwork and ties and shall maintain the watertight integrity of the formwork system.

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D. Design of all form ties and accessories shall be adequate for all concrete placement, horizontal and vertical, to prevent failures and blowouts.

3.04 FORM COATINGS

A. Coat form contact surfaces with form bond breaker compound before reinforcement is placed. Do not allow excess form coating material to accumulate in the forms or to come into contact with surfaces against which fresh concrete will be placed. Apply in compliance with manufacturer's instructions.

B. Coat steel forms with form oil or otherwise protect against rusting. Rust-stained steel formwork is not acceptable.

C. Clean reinforcing steel that has become contaminated with form coating to the satisfaction of the Engineer prior to placing concrete.

3.05 EMBEDDED ITEMS

A. Items embedded in concrete shall be properly cleaned to be free from oil or foreign matter that would weaken the bond of the concrete to these items.

B. Install in the formwork requisite inserts, anchors, sleeves and other items specified under other sections of these specifications; close end conduits, piping and sleeves embedded in concrete with caps or plugs.

3.06 CONSTRUCTION JOINTS

A. Make construction joints where indicated on the contract drawings; additional construction joints are subject to prior approval of the Engineer.

B. Form keyways and joints as indicated on the contract drawings.

C. Continue reinforcing steel and wire fabric across construction joints, unless noted otherwise.

3.07 EXPANSION JOINTS

A. Expansion joints shall be placed where indicated on the contract drawings; reinforcement, corner protection angles or other fixed metal items embedded in or bonded to continuously shall not extend through expansion joints; finish concrete slab edges along expansion joints neatly with slightly rounded edging tool; leave joints in the completed work carefully tooled and free of mortar and concrete.

B. Joints between slabs on earth and vertical surfaces, including columns, piers, walls, machinery foundation and other fixed structures shall have expansion joint material placed on abutting vertical surfaces.

3.08 CONTROL JOINTS

A. Install vertical control joints as indicated on the contract drawings.

B. Install control (contraction) joints in slabs as indicated on the contract drawings.

3.09 WATERSTOPS

A. Install waterstops of the sizes and shapes indicated on the contract drawings; support and protect that portion of the waterstop which extends beyond the bulkhead during placing of concrete and subsequent removal of forms.
   1. Continuous at construction and expansion joints.
   2. Material, size and shape as indicated on the contract drawings and in Concrete Accessories - Division 03.

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B. Make field splices by heat - sealing, maintaining the continuity of the ribs and bulbs, and allow the splice to cool before stressing; field splice must be watertight; repair damaged waterstops.

3.10 FORM/SHORING REMOVAL

A. Arrange forms to allow stripping without removal of principal shores, where required to remain in place.

B. Removal of forms shall be accomplished in such a manner as will prevent injury to concrete and ensure complete safety of structure. Removal times listed below are minimum and may be increased by the Engineer as job conditions warrant.
1. Where structure as a whole is supported on shores, vertical forms such as beam and girder sides, columns, and similar vertical forms may be removed 24 hours after completion of pour, providing concrete has hardened sufficiently to sustain its own weight and to prevent injury.
2. Wall forms shall not be removed in less than 24 hours after pouring, unless otherwise required for curing.
3. Supporting forms and shoring must remain in place until concrete can carry any loads to be imposed upon it and in no case shall be removed in less than seven (7) days.
4. Forms ties, requiring any operation in removal of forms which would tend to destroy bond between tie and concrete in order to remove form, shall not be disturbed for seven (7) days after completion of pour.
5. The time periods stipulated above may be reduced if strength results of concrete so indicate adequate conditions.

C. Notify the Engineer before the forms are removed in order that an examination of the newly-stripped surfaces may be made prior to patching.

3.11 REPAIR TIE HOLES

A. After removal of form tie, the holes shall be filled as follows:
1. Thoroughly clean and dampen.
2. Fill solid with patching mortar.

B. Make repairs uniform in color and finish with surrounding concrete.

3.12 EXPOSED SURFACES

A. Exposed surfaces shall be Carborundum rubbed to take off fins; fill pores, stone pickets, honeycombs, etc., with non shrink grout as follows:
1. Repair immediately after form removal and inspection by the Engineer.
2. Remove concrete surrounding defect to sound concrete, then wet affected area.
3. Brush on bonding agent, mixed and applied in accordance with manufacturer's recommendations.
4. Consolidate patch grout and strike off to leave the patch slightly higher than the surrounding surface.
5. Finish the repaired area flush with the surrounding area after the patch has been in place for one hour, or as prescribed by the manufacturer.

B. Perform patching before curing compound is applied; cure patched areas in the same manner as adjacent concrete; make repairs uniform in color and finish with surrounding concrete.

C. Exposed surfaces shall be protected from excessive sun, wind and rain, and kept wet until curing compound is applied. When ambient temperature falls below 40°F heat aggregate and mixing water; clear all forms, reinforcement and subgrade of snow and ice; cover all freshly placed concrete with tarpaulins, and provide heat to maintain a temperature of 70°F for at least three days or 50°F for five days; rate of cooling after end of protection period shall be accomplished in a manner approved by the Engineer.

3.13 REUSE OF FORMS

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A. Clean and repair surfaces of forms to be re-used in the work. Split, frayed, delaminated or otherwise damaged form facing material will not be acceptable. Apply new form coating compound material to concrete contact surfaces as specified for the new formwork.

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

C. Do not use “patched” forms for concrete surfaces exposed to view.

END OF SECTION

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SECTION 03 15 00
CONCRETE ACCESSORIES

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. American Concrete Institute (ACI), Annual Book of ACI Standards:
      a. ACI 308R – Guide to Curing Concrete, Current Edition.
   2. American Society for Testing and Materials (ASTM), Annual Book of ASTM Standards:
      a. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete, Current Edition.
      b. ASTM C272 - Standard Test Method for Water Absorption of Core Materials for Structural Sandwich Constructions, Current Edition.
      c. ASTM C309 – Standard Specification for Liquid Membrane-Forming Compounds for Curing Concrete, Current Edition.
      d. ASTM C578 - Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation, Current Edition.
      e. ASTM C881 - Standard Specification for Epoxy-Resin-Base Bonding Systems for Concrete, Current Edition.
      f. ASTM C882 - Standard Test Method for Bond Strength for Epoxy-Resin Systems Used with Concrete by Slant Shear, Current Edition.
      g. ASTM C884 - Standard Test Method for Thermal Compatibility Between Concrete and an Epoxy-Resin Overlay, Current Edition.
      h. ASTM D6 – Standard Test Method for Loss on Heating of Oil and Asphaltic Compounds, Current Edition.
      i. ASTM D297 – Standard Test Methods for Rubber Products - Chemical Analysis, Current Edition.
      j. ASTM D994 – Standard Specification for Preformed Expansion Joint Filler for Concrete (Bituminous Type), Current Edition.
      k. ASTM D1751 – Standard Specification for Preformed Expansion Joint Filler for Concrete Paving and Structural Construction (Nonextruding and Resilient Bituminous Types), Current Edition.
      l. ASTM D1752 – Standard Specification for Preformed Sponge Rubber Cork and Recycled PVC Expansion Joint Fillers for Concrete Paving and Structural Construction, Current Edition.
      m. ASTM E154 – Standard Test Methods for Water Vapor Retarders Used in Contact with Earth Under Concrete Slabs, on Walls, or as Ground Cover, Current Edition.
      n. ASTM E1643-98 - Standard Practice for Installation of Water Vapor Retarders Used in Contact with Earth or Granular Fill Under Concrete Slabs.
      o. ASTM E1745 - Standard Specification for Plastic Water Vapor Retarders Used in Contact with Soil or Granular Fill Under Concrete Slabs.
   3. Canadian General Standards Board (CGSB) Standards:
      a. CGSB 41-GP-35M - Performance Standards for Poly Vinyl Chloride (PVC) Waterstops, Types I and III, Current Edition.
   4. Federal Specification TTS 227 and TTS 230, Current Edition.
   5. U.S. Army Corps of Engineers (USACOE), Specifications and Standards:
      a. USACOE CRD-C572 - Specification for Poly Vinyl Chloride (PVC) Waterstop, Current Edition.

1.03 DESCRIPTION OF WORK

A. The work under this section shall cover furnishing and installing concrete accessories as shown on the contract drawings and specified herein.

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1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Structural Cast-In-Place Concrete Forming - Division 03

C. Cast-in-Place Concrete - Division 03

1.05 SUBMITTALS

A. Contractor shall submit such product literature and catalog cuts of materials to be supplied to the rate these materials to the specifications. Information shall be in conformance with requirements of Submittals - Division 01 of these specifications.

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 WATERSTOP

A. Polyvinyl Chloride PVC Waterstop.
   1. Ribbed Centerbulb, for non-moving joints: 4-inch long, minimum 3/16-inch thick with 1/8-inch ribs, 3/8-inch outside diameter centerbulb and shall comply with U.S. Corps of Engineers Specification CRD-C572.
      a. Greenstreak 701 by Sika Corporation
      b. Or equal
   2. Split Flange Type: 6-inch long, minimum 3/8-inch thick with 3/16-inch thick split ends, 5/8-inch outside diameter centerbulb,
      a. Greenstreak 724 by Sika Corporation
      b. Or equal
   3. Retrofit Waterstop: L-shaped PVC waterstop with 3-inch long legs, ribbed on one leg. Stainless batten bar with steel epoxy anchor bolt.
      a. Greenstreak 655 with epoxy 7300 by Sika Corporation
      b. Or equal

B. Gasket Waterstop: Strip-applied non-swelling mastic waterstop for non-moving joints, 3/4-inch by 1-inch wide unless noted otherwise.
   1. Lockstop with Lockstop Primer by Sika Corporation

C. Additional Waterstop at Tanks with Waterproofing Admixture: Use at all joints in water-retaining structures with waterproofing admixture (see Section 03 30 00).
   1. General: Crystalline, cementitious, non-toxic chemical treatment for the water-proofing and protection of concrete.
   2. Product: Use same product provided as admixture in concrete mix – see Section 03 30 00.
   3. Concentration: Concentrated slurry coat, concentration as recommended by manufacturer.

2.02 EXPANSION AND CONTRACTION JOINT FILLER

A. Preformed Bituminous. Bituminous expansion and contraction joint filler shall be preformed bituminous strips which complies with ASTM D994.

B. Preformed Sponge Rubber. Sponge rubber expansion and contraction joint filler shall be preformed which complies with ASTM D1752.

C. Preformed Cork. Cork expansion and contraction joint filler shall be preformed which complies with ASTM D1752.

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D. Thermal Isolation Joint Material (Rigid Insulation). Polystyrene insulation, ASTM C578, Type X, extruded cellular type, 5 year aged R-value of 5.0 minimum at 75°F water absorption in accordance with ASTM C272 of 0.3 percent by volume maximum, minimum 15 psi compressive strength, 0.5 inch thick.

E. Board Insulation. Contractor to choose from one of the following:
   1. Polystyrene insulation: ASTM C578, Type X, extruded cellular type, 5-year aged R-value of 5.0 minimum at 75°F, water absorption in accordance with ASTM C272 of 0.3 percent by volume maximum, minimum 15 psi compressive strength, 0.5-inch thick, square edges.
      a. Owens Corning Foamular Insulating Sheathing
      b. Or equal
   2. Polyisocyanurate insulation: ASTM C1289 Type 1, closed-cell polyisocyanurate foam core bonded to foil facing on each side, R-value of 6 per inch, 0.05 perm water vapor permeable, water vapor absorption of 0.1%; less than 25 flame spread index, less than 450 smoke developed index, 16 psi compressive strength, 40 psi flexural strength.
      a. Dow Thermax Sheathing
      b. Johns Mansville AP Foil Faced Polyiso Board
      c. Sika Rmax Pro Select Polyiso Insulation Board
      d. Or equal.
   3. EPDM Rubber insulation: ASTM C534 Type I and II, ASTM D1056, flexible, closed-cell EPDM-rubber based elastomeric, tube and sheet, UV resistant, indoor/outdoor, mold and fungal growth resistant. k Value: 0.245 at 75 degrees F (ASTM C518/C117). Water Absorption (weight %): 0.2% (ASTM C209). Water Vapor Permeability: 0.03 perm (ASTM E96). Flame Spread/Smoke Developed Ratings: 25/50.
      a. Aerocel by Aeroflex
      b. Or equal.

F. Removable Plastic Expansion Joint Cap: Plastic joint cap, board width by 1/2-inch deep.
   1. Snap-Cap by W.R. Meadows.
   2. Geenstreak Expansion Board Cap by Sika Corporation.

2.03 BOND BREAKER

A. Cast-in-Place Concrete Flatwork. Asphalt impregnated felts, 15 pound.

B. Cast-in-Place Concrete Formwork. Non-staining liquid product which imparts a waterproof film to prevent adhesion of concrete and will not leave a paint-impeding coating on the face of the concrete.

2.04 VAPOR BARRIER

A. Under Slab Vapor Barrier: 15 mil reinforced high-density multi-layer laminated polyethylene film for under slab application.
   1. Must meet the following minimum properties:
      a. Barrier shall meet or exceed all requirements of ASTM E1745 Classes A, B and C.
      b. Water Vapor Permeance (ASTM F1249): 0.038 perms
   2. Products:
      a. Stego Wrap Vapor Barrier (15-mil) by Stego Industries
      b. Griffolyn Type-65 by Reef Industries
      c. Or equal

B. Seam Tape: High density polyethylene tape with pressure sensitive adhesive, minimum 4 inches wide. Tape or Mastic by vapor barrier manufacturer.

C. Pipe Boots: Construct pipe boots from vapor barrier material and pressure sensitive tape per manufacturer's instructions.

2.05 WATERPROOF SHEET MATERIAL FOR CURING

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A. Provide one of the following, complying with ASTM C171: waterproof paper, polyethylene film or polyethylene-coated burlap.

B. Use only materials which are resistant to decay when tested in accordance with ASTM E154, as follows:
   1. Polyethylene sheet not less than 6 mils thick; or
   2. Water resistant barrier paper consisting of heavy papers laminated together with glass fiber reinforcement and overcoated with black polyethylene on each side.

2.06 CONCRETE REPAIR COMPOUND

A. Concrete repair compound shall be as required for the installation as manufactured, Master Builders Solutions, or equal.

2.07 PIPE SLEEVES, ANCHOR BOLTS AND CAST IRON GROOVES

A. Shall be furnished, installed, and anchored solid in their final location.

2.08 CURING AND SEALING COMPOUND - INTERIOR

A. Membrane-forming curing compound shall meet the moisture retention requirements of ASTM C309, Type 1.
   1. MasterKure CC 200WB by Master Builders Solutions.
   2. Sealtight CS-309-25 Curing and Sealing Compound by W.R. Meadows, Inc.
   3. Eucocure VOX by Euclid Chemical Co.
   4. Or equal.

B. Products shall be compatible with surface finish. Where flooring manufacturer allows, use water-based dissipating type.

2.09 CURING COMPOUND - EXTERIOR

A. Curing compound for use on standard exterior concrete shall comply with ASTM C309, Type 2; resin, white pigmented.

B. Curing compound for use on colored exterior concrete shall comply with ASTM C309, Type 1, and shall be compatible with concrete coloring method and surface finish.

2.10 PLATE DOWEL SYSTEM

A. Two-component concrete slab-on-grade construction joint dowel system consisting of plastic sleeves and 3/8 inch thick steel plates meeting ASTM A36. Plates to be set in a dowel form constructed of molded high density ABS plastic.
   1. Diamond Dowel System by PNA Construction Technologies.
   2. Speed Plate by Sika.
   3. T28 Superior Plate Dowel by Dayton Superior.
   4. Or equal.

2.11 DAMPPROOFING MEMBRANE

A. Acceptable Manufacturers:
   1. W.R. Meadows, Inc.
   2. Master Builder Solutions by BASF
   3. Substitutions: per Section 01 60 00.

B. Dampproofing:
   1. Sealmastic Asphalt Emulsion Dampproofing by W.R. Meadows, Inc.
   2. MasterSeal 614 by BASF

2.12 PIPE BOLLARD CAPS

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A. Pipe bollard caps: Precast concrete pipe bollard caps, 5000 psi fiber reinforced concrete with a cast in place anchor, diameter to match the steel pipe diameter: Top Gard concrete bollard caps by TopGard LLC 1125 Brookside Ave, Indianapolis, IN, www.topgardcap.com.

PART 3 EXECUTION

3.01 INSTALLATION

A. Install accessories where shown on contract drawings and as specified herein.

B. Place bond breaker at junctures of slabs-on-grade with vertical walls.

C. Expansion and Contraction Joint Filler: Install at locations noted on the drawings calling for expansion / contraction joint materials.

D. Thermal Isolation Joint Material (Rigid Insulation): Install at the inside perimeter of the exterior wall foundation between the foundation wall and the concrete slab on grade. Place the snap cap on top of the insulation.

E. Seal all exposed surfaces of expansion and contraction joints with joint sealer (3/4 inch deep and hold 1/8 inch below surface of concrete).

F. All splices on PVC waterstops shall be field welded using an indirect heating element. Concrete shall be thoroughly vibrated around the waterstop to avoid honeycombs and to ensure complete embedment of the ribbed flanges.

G. Apply concentrated slurry coat to surface of joints in water-retaining structures with water-proofing admixture. Clean joint as required by manufacturer. Apply slurry coat full width of second pour intersection. Apply per manufacturer's instructions for areas not subject to hydrostatic pressure.

H. Install under-slab vapor barrier at locations shown on Drawings in accordance with manufacturer's instructions and ASTM E1643-98. Unroll vapor barrier with the longest dimension parallel with the direction of the pour. Seal vapor barrier to foundation walls behind perimeter expansion joint, unless shown otherwise on Drawings. Vapor barrier shall be continuous inside building foundation, unless noted otherwise. Overlap joints 6-inches and seal with manufacturer's tape. Seal all penetrations (including pipes) with manufacturer's pipe boot. No penetrations of the vapor barrier are allowed except for reinforcing and permanent utilities. Repair damaged areas by cutting patches of vapor barrier, overlapping damaged area 6-inches and taping all four sides with tape.

I. Concrete Structural Repair Compound: Apply first coat of repair mortar with a stiff bristle brush to apply a scrub coat working the mortar into the honeycomb areas, then use a trowel to completely fill the honeycomb areas and trowel smooth the mortar to flush it out with the face of the concrete.

J. Plate Dowel System: Install plate dowel system at concrete slab-on-grade construction joints per manufacturer's instructions. See Drawings for dowel spacing and slab depth positioning requirements.

K. Dampproofing:
1. Do not apply dampproofing to damp, frozen, dirty, dusty, or deck surfaces unacceptable to dampproofing manufacturer.
2. Clean and prepare surfaces to receive dampproofing in accordance with manufacturer's instructions.
3. Prime surfaces in accordance with manufacturer's instructions.
4. Apply mastic to seal penetrations tie bar penetrations in substrate in accordance with manufacturer's instructions. Extend mastic in minimum 3-inch diameter around penetration. Apply two (2) coats, continuous and uniform. Do not apply where finished surface will be exposed.
5. Protect membrane from damage.

PART 4 MEASUREMENT AND PAYMENT

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4.01 GENERAL

A. Concrete accessories shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 CONCRETE ACCESSORIES

A. Concrete Accessories, Inclusive. When no quantity is provided, concrete accessories shall be considered inclusive to payment for work associated with cast-in-place concrete.

END OF SECTION

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SECTION 03 20 00
CONCRETE REINFORCING

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. American Concrete Institute (ACI) Specifications and Standards:
      a. ACI 315 - Manual of Standard Practice for Detailing Reinforced Concrete Structures, Current Edition.
      b. ACI 318 - Building Code Requirements for Structural Concrete and Commentary, Current Edition.
   2. American Society for Testing and Materials (ASTM), Annual Book of ASTM Standards:
      a. ASTM A82 - Standard Specification for Steel Wire, Plain, for Concrete Reinforcement, Current Edition.
      b. ASTM A184 - Standard Specification for Welded Deformed Steel Bar Mats for Concrete Reinforcement, Current Edition.
      c. ASTM A615 - Standard Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement, Current Edition.
      d. ASTM A1064 - Standard Specification for Carbon-Steel Wire and Welded Wire Reinforcement, Plan and Deformed, for Concrete, Current Edition.
   3. American Welding Society (AWS), Specifications and Standards:
      a. AWS D12.1 - Welding Reinforcing Steel, Metal Inserts, and Connections in Reinforced Concrete Construction, Current Edition.
   4. American Association of State Highway Transportation Officials (AASHTO), Specifications and Standards:
      a. AASHTO M182 - Specification for Burlap Cloth Made from Jute or Kenaf, Current Edition
   5. Concrete Reinforcing Steel Institute (CRSI) Specifications and Standards:
      a. CRSI - Manual of Standard Practice, Current Edition.
      b. CRSI - Recommended Practice for Placing Reinforcing Bars, Current Edition.
      c. CRSI - Recommended Practice for Placing Bar Supports, Specifications and Nomenclature, Current Edition.
      d. CRSI - Recommended Practice for Reinforcing Bar Splices, Current Edition.

1.03 DESCRIPTION OF WORK

A. The work under this section shall cover furnishing and installing concrete reinforcing as shown on the contract drawings and as specified herein.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Concrete Accessories - Division 03

C. Cast-in-Place Concrete - Division 03

1.05 SUBMITTALS

A. Contractor shall submit such product literature and catalog cuts of materials to be supplied to relate these materials to the specification. Information shall be in conformance with requirements of Submittals - Division 01 of these specifications.

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1. Submit detailed reinforcing drawings prepared in accordance with ACI 315, including bar schedule with bar marks and bends indicated.
2. Comply with CRSI Manual of Standard Practice showing bar schedules, stirrup spacing, diagrams of bent bars and arrangements of concrete reinforcement. Include special reinforcement required at openings through concrete.
3. Verify dimensions and make proper allowance for fitting together work of other trades.

B. Submit a certification attesting that reinforcing steel meets the requirements of ASTM A615, including Supplementary Requirements S1, and that welded steel wire fabric meets the requirements of ASTM A185.
1. Submit certified copies of mill reports, tensile and bend tests for reinforcing steel on projects where the quantity of reinforcing exceeds 15 tons.
2. For information only, submit manufacturer's data and instruction for proprietary items, including reinforcement and accessories.

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 REINFORCEMENT

A. Steel Bar Reinforcement. Main reinforcing and stirrups; ASTM A615, Grade 60.

B. Welded Wire Fabric. Welded wire fabric, flat sheets, ASTM A1064, 6x6-W2.9xW2.9, unless otherwise specified or indicated on the contract drawings.

C. Steel Tie Wire. Steel tie wire, ASTM A82, plain, cold-drawn, 16 gauge or heavier.

D. Supports For Reinforcement. Bolsters, chairs, spacers and other devices for spacing, supporting and fastening reinforcement in place complying with CRSI Manual of Standard Practice. For slabs on grade where base material will not support chairs, use supports with sand plates or horizontal runners to locate mesh properly in slab. Provide hot-dipped galvanized or plastic-coated accessories in contact with forms for sight exposed concrete; stainless steel accessories for sandblasted or bushhammered concrete.

PART 3 EXECUTION

3.01 FABRICATION

A. Fabricate and place to shapes and dimensions indicated or required to carry out intent of contract drawings and these specifications.

B. Bends for stirrups and ties shall be made around a pin having a diameter not less than four times the diameter of reinforcing bar. Bends for other bars shall be made around a pin having a diameter not less than six times diameter of bar, except that for bars larger than 1 inch, pin shall be not less than eight times diameter of bar.
1. Perform cutting and bending in the shop; bend and cut steel cold. Heating of reinforcement will not be permitted. Do not bend or straighten bars in a manner that will injure the material.
2. Field bending of bars shall not be allowed without the Engineer's approval.

C. Tagging shall be with metal, linen, or rope fiber tags filled in with machine or waterproof ink. Paper tags shall not be allowed.

D. Reinforcing bars shall conform accurately to the dimensions shown on the contract drawings.

3.02 PRODUCT DELIVERY, STORAGE AND HANDLING

A. For reinforcing steel fabricated on-site, shop from the mill in bundles, limited to one size and length, tagged with a waterproof tag showing the name of the mill, heat number, grade and size of the bars and identifying number.

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B. For reinforcing steel fabricated off-site, deliver in bundles identified as to structure and shop drawing number. Identify each individual bar with a waterproof tag showing the grade, size and bar mark from the approved bar schedule.

C. Protect reinforcing steel and wire fabric from damage and from dirt, oil grease, other foreign matter, and rust-causing condition. Do not store reinforcement in direct contact with the ground.

3.03 CLEANING

A. Before placing and before pouring concrete, all reinforcement shall be thoroughly cleaned of all oil, dirt, loose mill scale, loose rust, or foreign matter that will destroy or reduce bond.

3.04 PLACING REINFORCEMENT

A. Placement. Metal reinforcement shall be accurately placed in accordance with approved Submittals and adequately secured in position by concrete or metal chairs or spacers. Nails shall not be driven into forms to support reinforcement nor shall wire ties come in contact with forms.

B. Splicing. Lap at splices shall be sufficient to transfer stress between bars by bond and shear.
1. Furnish reinforcing bars in full lengths as indicated on the contract drawings and approved Submittals.
2. Do not splice bars unless indicated on the contract drawings or approved by the Engineer in writing. When authorized, make splices in accordance with ACI 318; perform welding in accordance with AWS D12.1.
3. Splices generally shall be avoided at points of maximum stress. Minimum splice lap for stressed bars shall be forty times bar diameter.

C. Offsets in longitudinal bars at change of cross section shall be placed in region of lateral support. Slope of inclined portion of offset shall not be more than one in six and, in tied columns, ties shall be spaced not over 3 inches on centers for a distance of 1 foot below actual point of offset.

D. Embedded Items. The Contractor shall provide for the installation of all items embedded in the concrete, such as coil rod inserts, anchor bolts, dowels, etc., as shown on the contract drawings or as provided for in other Divisions of these specifications.
1. All dowel bars shall be tied securely in place before pouring concrete.
2. Provide for clearances with appurtenant materials and devices.

E. Drilled and Grouted or Epoxy Dowel Installation. Existing concrete which will be incorporated into new work and requiring integration with new concrete will be doweled as indicated on the contract drawings and as follows:
1. Drill hole in existing concrete of size that is 3/4 inch larger in diameter than diameter of dowel bar. Incline the hole in the concrete such that the non-shrink grouting or epoxy will be retained in the hole.
2. Fill hole with non-shrink grouting or epoxy.
3. Immediately place dowel bar into hole.
4. Allow grout or epoxy to take initial set before disturbing dowel bar.

F. Steel Reinforcing Fabric. Reinforce as detailed on the contract drawings; and where not indicated, reinforce with wire fabric, place 2 inches from the top of the slab.
1. Flat sheets shall be used whenever available. Wire fabric shall lap 6 inches on side joints and 12 inches on end joints. Properly secure with annealed wire. Fabric shall be raised and secured in the correct location using permanent supports. Raising the fabric by hook during placement of concrete shall NOT be permitted.
2. Alternately, in tight quarters and around appurtenances and openings, lap mesh reinforcement not less than one mesh space plus 2 inches, and tie.

G. Concrete Cover. The minimum cover of concrete for all reinforcement shall conform to the dimensions indicated on the contract drawings, which indicate the clear distance from the edge and end of the

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reinforcement to the face of the concrete surface. Provide clearance and spacing indicated on the contract drawings and approved Submittals, where so indicated.

1. Where no clearances are indicated, the thickness of the concrete cover over reinforcement shall be as follows:
   a. Concrete cast against and permanently exposed to earth - 3 inches;
   b. Formed concrete exposed to earth or weather - 2 inches;
   c. Formed concrete not exposed to earth or weather - 1-1/2 inches;
   d. Slabs not exposed to earth or weather - 1 inch.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Concrete reinforcing shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 CONCRETE REINFORCING

A. Concrete Reinforcing, Inclusive. When no quantity is provided, concrete reinforcing shall be considered inclusive to payment for work associated with cast-in-place concrete.

END OF SECTION

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SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 GENERAL

1.01 DESCRIPTION OF WORK

A. The work covered under this section shall cover furnishing all materials, equipment and labor required to construct all cast-in-place concrete as shown on the contract drawings and as specified.

1.02 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Submittals - Division 01

C. Concrete Quality Control - Division 01

D. Structural Cast-in-Place Concrete Forming - Division 03

E. Concrete Accessories - Division 03

F. Concrete Reinforcing - Division 03

1.03 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.04 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.

1. American Concrete Institute (ACI), Annual Book of ACI Standards:
    a. ACI 117/177R - Standard Specification for Tolerances for Concrete Construction and Materials and Commentary, Current Edition.
    b. ACI 211.1 - Standard Practice for Selecting Proportions for Normal, Heavyweight, and Mass Concrete, Current Edition.
    c. ACI 209.1R - Report on Factors Affecting Shrinkage and Creep of Hardened Concrete, Current Edition.
    d. ACI 301 - Specification for Structural Concrete, Current Edition.
    e. ACI 302.1R - Guide for Concrete Floor and Slab Construction, Current Edition.
    f. ACI 304R - Guide for Measuring, Mixing, Transporting, and Placing Concrete, Current Edition.
    g. ACI 305R - Hot Weather Concreting, Current Edition.
    h. ACI 306 - Standard Specification for Cold Weather Concreting, Current Edition.
    i. ACI 308R - Guide to Curing Concrete, Current Edition.
    j. ACI 309R - Guide for Consolidation of Concrete, Current Edition.
    k. ACI 311.4R - Guide for Concrete Inspection, Current Edition.
    l. ACI 318/318R - Building Code Requirements for Structural Concrete and Commentary, Current Edition.
    m. ACI 350 – Code Requirements for Environmental Engineering Concrete Structures, Current Edition.
    n. ACI 530/530.1/530R/530.1R - Building Code Requirements for Commentary for Masonry Structures and Specification for Masonry Structures and Related Commentaries, Current Edition.

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o. ACI ASCC MNL-5 - The Contractor's Guide to Quality Concrete Construction, Current Edition.
p. ACI CP-10/PACK - Craftsman Study Package for ACI Certification of Concrete Flatwork Technician/Finisher, Current Edition.
q. ACI MCP - ACI Manual of Concrete Practice, Parts 1 through 7, and Index, Current Edition.
r. ACI SCM-24 - Concrete Repair Basics, Current Edition.
s. ACI SP15 - Field Reference Manual: Standard Specifications for Structural Concrete ACI 301 with Selected ACI Reference, Current Edition.
t. ACI SP-71 - ASTM Standards in ACI 318, Current Edition.

2. American Society for Testing and Materials (ASTM), Annual Book of ASTM Standards:
a. ASTM C33 - Standard Specification for Concrete Aggregates, Current Edition.
b. ASTM C70 - Standard Test Method for Surface Moisture in Fine Aggregate, Current Edition.
c. ASTM C94 - Standard Specification for Ready-Mixed Concrete, Current Edition.
d. ASTM C109 - Standard Test Method for Compressive Strength of Hydraulic Cement Mortars (using 2-inch or [50 mm] Cube Specimens), Current Edition.
e. ASTM C125 - Standard Terminology Relating to Concrete and Concrete Aggregates, Current Edition.
f. ASTM C127 - Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Coarse Aggregate, Current Edition.
g. ASTM C128 - Standard Test Method for Density, Relative Density (Specific Gravity) and Absorption of Fine Aggregate, Current Edition.
h. ASTM C131 - Standard Test Method for Resistance to Degradation of Small-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine, Current Edition.
i. ASTM C143 - Standard Test Method for Slump of Hydraulic-Cement Concrete, Current Edition.
j. ASTM C150 - Standard Specification for Portland Cement, Current Edition.
k. ASTM C171 - Standard Specification for Sheet Materials for Curing Concrete, Current Edition.
l. ASTM C191 - Standard Test Methods for Time Setting of Hydraulic Cement by Vicat Needle, Current Edition.
m. ASTM C219 - Standard Terminology Relating to Hydraulic Cement, Current Edition.
n. ASTM C226 - Standard Specification for Air-Entraining Additions for Use in the Manufacture of Air-Entraining Hydraulic Cement, Current Edition.
o. ASTM C233 - Standard Test Method for Air-Entraining Admixtures in Concrete, Current Edition.
p. ASTM C260 - Standard Specification for Air-Entraining Admixtures for Concrete, Current Edition.
q. ASTM C311 - Standard Test Methods for Sampling and Testing Fly Ash or Natural Pozzolans for use as a Mineral Admixture in Portland-Cement Concrete, Current Edition.
r. ASTM C494 - Standard Specification for Chemical Admixtures for Concrete, Current Edition.
s. ASTM C535 - Standard Test Method for Resistance to Degradation of Large-Size Coarse Aggregate by Abrasion and Impact in the Los Angeles Machine, Current Edition.
t. ASTM C566 - Standard Test Method for Total Evaporable Moisture Content of Aggregate by Drying, Current Edition.
u. ASTM C595 - Standard Specification for Blended Hydraulic Cement, Current Edition.
v. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzlan for Use in Concrete, Current Edition.
w. ASTM C688 - Standard Specification for Functional Additions for Use in Hydraulic Cements, Current Edition.
x. ASTM C989 - Standard Specification for Slag Cement for Use in Cement and Mortars, current edition.

3. Portland Cement Association (PCA) Standards and Specifications:
a. PCA - Design and Control of Concrete Mixtures, Current Edition.

1.05 DEFINITIONS

A. Exposed or Exposed to View: Portion of the structure that can be observed by the "public" during normal operation.

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1. Normal Operation: For tanks, this means when the tank is filled with liquid to the projected design average operating liquid level.

B. Public: Persons allowed on-site and within buildings by the Owner.

C. Liquid-Retaining Structure: A structure intended to hold and contain liquid in various stages of treatment. These structures are designed to be watertight to prevent leakage. Examples include: storage tanks; clarifiers; aeration tanks; digesters; chemical containment.

D. Severe Exposure: Conditions where concrete is subjected to aggressive environments that can significantly impact its durability, such as chemical attacks from substances like acids, alkalis, or other corrosive chemicals.

1.06 SUBMITTALS

A. Submit such product literature and catalog cuts of materials to be supplied to relate these materials to the specification. Information shall be in conformance with requirements of Submittals - Division 01 of these specifications.

B. Concrete Design Mix
1. Prior to the start of placing of concrete, submit the design mix for each class of concrete, indicating that the concrete constituents and proportions will result in a concrete mix meeting the physical requirements for each class of concrete specified.
2. Submit with the design mix, laboratory strength test reports and manufacturer's certificates attesting the conformance of constituents with these specifications.
3. Do not vary the proportions of the constituents or source of material of the approved mix without submitting corresponding test result documentation to the Engineer for review and approval.
4. Design mix shall indicate proportions of cement, aggregate and water, and names and proportions of admixtures and air-entraining agents.
5. Laboratory strength test reports shall contain strength data for the required number of tests as specified in ACI 318 (for non-water retaining concrete) or ACI 350 (for water-retaining concrete) design specifications. If existing data for the required number of tests is not available, then ACI 318/350 allows for alternate data or trial mixture results to be submitted for approval. Provide certification that the design mix complies with all ACI and ASTM requirements.

C. Concrete Installation Submittals
1. Submit proposed plans and methods for cold/hot weather concrete placement procedures.
2. Submit proposed curing and concrete jointing plans that indicate locations of construction joints and control joints for concrete slabs.

1.07 MEETINGS

A. Prior to submitting design mixtures and rebar shop drawings, contractor shall hold a meeting to review detailed requirements for preparing final concrete design mixes and expectations regarding shop drawing quality, to establish procedures for placing, finishing, curing, and protecting concrete to meet required quality under anticipated conditions, to review construction drawing details, and to review proposed construction and control joint locations and layouts. Representatives of each entity directly involved with the cast-in-place concrete shall attend, including the following:
1. Contractor's superintendent
2. Architect of Record or representative
3. Structural Engineer of Record or representative
4. MSA's Resident Project Representative (RPR)
5. Testing laboratory responsible for field quality control
6. Ready-mix concrete supplier
7. Concrete subcontractor
8. Special concrete finish subcontractor

B. Pre-installation concrete meetings shall be held seasonally:

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1. Pre-Installation Concrete Meeting – Fall
    a. Review of cold weather concrete placement procedures, curing methods, and protocols.
2. Pre-Installation Concrete Meeting – Spring
    a. Review of hot weather concrete placement procedures, curing methods, and protocols.

1.08 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 CEMENTITIOUS MATERIALS

A. Cement
1. Cement shall be Portland Cement ASTM C150 Type I or IA or ASTM C595 Class IL, except as otherwise noted or approved.
    a. Type III cement shall only be used for Class L concrete, or when approved by the Engineer.
    b. ASTM C150 Type I or IA, Type II, and Type III, and ASTM C595 blended cement types IL, IP, and IS shall be used for exterior flatwork as approved by the Engineer.
2. A singular brand and manufacturer of cement shall be used for the entire work.

B. Fly Ash and Slag
1. Cement Substitutions:
    a. Contractor may use fly ash or ground granulated blast furnace slag (GGBFS) as a substitute for a portion of Portland cement in the structural concrete. The maximum allowable substitution rates shall be as follows:
        1) Fly Ash: 20%
        2) GGBFS: 30%
        3) Total Mineral Admixture: 30%
2. Fly Ash:
    a. Fly ash shall conform to ASTM C618 Class C.
    b. A singular source of fly ash shall be used for the entire work.
3. Slag:
    a. Slag shall be ground granulated blast furnace slag (GGBFS) conforming to ASTM C989.

2.02 AGGREGATE

A. Aggregate shall consist of clean, hard durable sand, gravel, crushed gravel or crushed rock.

B. Aggregate shall conform to the requirements of ASTM C33. Fine and coarse aggregate shall meet ASTM C33 grading requirements. Coarse aggregates shall be graded in accordance with ASTM gradations as follows:
1. 3/4 inch maximum coarse aggregate - ASTM No. 67
2. 1-1/2 inch maximum coarse aggregate - ASTM No. 467

C. Maximum aggregate size shall be as defined in the Concrete Schedule, or where not defined in the Concrete Schedule, as defined by dimensional constraints for cast-in-place concrete as follows.
1. Not larger than one-fifth of the narrowest dimension between sides of the forms;
2. Not larger than one-third the thickness of the slab;
3. Not larger than three-fourths of the minimum clear spacing between individual reinforcing bars or wire, bundles of bars, or prestressing tendons or ducts.

2.03 MIXING WATER

A. Mixing water shall be natural or treated water, clean and free from injurious amount of oil, acid, alkali, chlorides and sulfates, other common salts, organic matter or other deleterious substances.

B. Mixing water shall yield cement paste complying with the requirements ASTM C109 and ASTM C191.

2.04 ADMIXTURES

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A. All admixtures are subject to the written approval of the Engineer and shall be used in strict accordance with the manufacturer's recommendations.

1. Air-Entraining Admixture
   a. All concrete exposed to weather and freeze-thaw cycles shall be air-entrained, unless otherwise specified.
   b. Air-Entraining admixture shall conform to ASTM C260.
   c. Air-Entrainment shall be as indicated for each class
   d. as in the Concrete Schedule.
2. Water-Reducing, Set-Controlling Admixtures
   a. Water-Reducing, Set-Controlling admixtures shall conform to ASTM C494, Type A for water-reducing, Type C for accelerating, Type D for water-reducing and retarding, and Type E for water-reducing and accelerating. Type F for water reducing, high range, and Type G for water reducing, high range and retarding.
3. Crystalline Water-Proofing Admixture
   a. Where: Water-proofing admixture is typically required in concrete mix for all concrete walls, floor slabs, and top slabs in water retaining structures. See Table 2 Concrete Schedule Uses and Properties.
   b. General: Admixture shall be crystalline, cementitious, non-toxic chemical treatment for the water-proofing and protection of concrete.
   c. Product:
      1) Xypex Admix C-500, C-1000 or C-2000 as manufactured by Xypex Chemical Corporation, 13731 Mayfield Place, Richmond, BC, Canada, V6V 2G9; 800-961-4477 or 604-273-5264; fax 604-270-0451; enquiry@xypex.com; www.xypex.com
      2) MasterLife 300D as manufactured by Master Builders Solutions Admixtures, LLC, 23700 Chagrin Boulevard, Beachwood, OH 44122; 800-628-9990; master-builders-solutions.com.
      3) Penetron Admix SB as manufactured by Penetron USA, Inc., 45 Research Way, Suite 203, East Setauket, NY 11733; 631-941-9700; info@penetron.com; www.penetron.com
      4) Substitutions: None.
   d. Dosing:
      1) Rate as required by manufacturer.
      2) Admixture must be added in accordance with the manufacturer's recommendations. Thorough blending of the admixture throughout the concrete mix is essential for correct performance and care should be taken to ensure a homogeneous mixture is obtained.

B. Admixtures containing calcium chloride or soluble chloride shall not be used.

PART 3 EXECUTION

3.01 COORDINATION

A. Examine the drawings and specifications for work of other sections or other contractors and coordinate such work with the requirements of this Section; make provisions for installation of such items as sleeves, pipes, conduits, inserts and hangers in a manner that will not impair or weaken concrete construction. Verify that preinstallation meetings have occurred per requirements of Part 1.

3.02 READI-MIX CONCRETE

A. Acceptability and Use. Readi-mix concrete shall be designed on the basis of strength, durability, impermeability, and exposure condition, as required for the intended use of the structure by methods specified in ACI 211.1 and ACI 318. All readi-mix concrete shall comply with the water-cement ratio for each specific class of concrete as specified in the Concrete Schedule. Concrete design mix, complete with sample test results shall be submitted to the Engineer for approval prior to placing any concrete.

1. Failure to Meet Strength Requirements. Failure to meet strength requirements shall be as defined in Concrete Quality Control- Division 01 of these specifications.

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2. Watertight Concrete. All concrete exposed to earth or water shall be watertight, shall have a water-cement ratio as specified, and shall be air-entrained as specified in the Concrete Schedule.
   a. Provide damp-proofing membrane as indicated on the contract drawings.
3. Waterproof Concrete. All concrete for water retaining structures shall be waterproof, shall have a water-cement ratio as specified, and shall be air-entrained as specified in the Concrete Schedule.
   a. Install waterstops as indicated on the contract drawings.

B. Mix Proportioning. Mix proportioning shall be the responsibility of the Contractor and shall be submitted for review and approval by the Engineer, in accordance with these specifications.
1. Select proportions for concrete to obtain the quality requirements for the class of concrete as specified in the Concrete Schedule. Contractor, at their expense, shall have an approved independent laboratory prepare design mixes for each specified concrete class.
2. Slump. Slump for class of concrete shall be as specified in the Concrete Schedule. The Contractor shall at their expense, make field slump tests in accordance with ASTM C143 and Concrete Quality Control-Division 01 of these specifications.
3. Adjustment to Concrete Mixes. Design mix adjustments may be requested by the Contractor when characteristics of materials, conditions, weather, test results, or other circumstances warrant. Laboratory test data for revised design mixes and strength results shall be submitted and approved before using in the work. No change in contract price will be allowed for these changes.
4. Addition of Water to the Batch. Addition of water to the batch delivered to the site shall be in strict accordance with ASTM C94. This shall be the Contractor's responsibility and by their direction, following consultation with the Engineer.
   a. Addition of water to the batch shall be one time only. Total gallons of water added to the batch shall be recorded on the load ticket, which shall be supplied to the Engineer prior to that delivery truck leaving the site. If water is permitted to be added to mixed concrete upon arrival at the job, an additional mixing of 30 revolutions of the drum shall be required.
   b. Contractor shall adjust the water-cement ratio of the batch to the corresponding value based on the addition of water to the batch and shall submit this information to the Engineer with adjusted strength data for the final batch proportion.
   c. At no time shall the addition of water cause the water-cement ratio specified in the concrete class schedule to be exceeded.

3.03 GENERAL

A. Unless otherwise specified, conform to ACI 304, 305, and 306 for concrete installation requirements such as preparation, mixing, conveying, depositing, curing, and cold and hot weather requirements; consolidate concrete in accordance with ACI 309.

B. Concrete not placed within 90 minutes or 300 revolutions, whichever occurs first, after the first mixing of the cement and aggregates will be rejected.

C. Contractor shall indicate on record set of Drawings at site, for review prior to installation, a pouring program for concrete work showing unit of operation, method of pouring, installation of construction/control joints, expansion joints and all necessary work.

D. Proper grade marker or stakes shall be used by Contractor to establish grades for ramps, platforms, sidewalks, slopes to drains, inlets, etc.

E. Trenches, forms, conveying equipment shall be prepared to receive concrete in accordance with ACI 304.

F. Place concrete footings upon undistributed clean surfaces, free from frost, ice, mud and water; when foundation is on dry soil or pervious material, lay waterproof sheathing paper over earth surfaces to receive concrete.

G. Rock surfaces upon which concrete is to be placed, make level, clean, free from all objectionable coatings, water, mud, debris, loose semi-detached or unsound fragments; level surfaces to receive sand cushion placed to minimum thickness of 2 inches.

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H. Immediately after placement, protect concrete from premature drying, excessively hot or cold temperature and mechanical injury; maintain with minimum moisture loss and relatively constant temperature for the period necessary for hydration of the cement and hardening of the concrete.

I. All freshly cast concrete shall be protected from damaging effects of the elements freezing, rapid drop in temperature and loss of moisture and from future construction operations.

3.04 PREPARATION OF EQUIPMENT AND PLACE OF DEPOSIT

A. Before placement, clean equipment for mixing and transporting the concrete; remove debris and ice from all surfaces upon which concrete is placed; clean reinforcement of dirt, loose rust, and mill scale, or other coatings.

B. Remove water from all areas before depositing concrete; before depositing new concrete on or against concrete that has set, thoroughly roughen; clean existing surfaces of laitance, foreign matter or loose particles; retighten forms; slush existing surfaces with neat cement grout coat; place new concrete before grout has attained initial set; give horizontal construction joints grout brush coat of cement, fine aggregate, in same proportions as concrete to be placed.

C. Thoroughly wet the stone base on which slabs are to be placed where no vapor barrier is indicated.

D. Check compaction of fill and proper grade for slabs-on-grade. Check screeds and exercise care to prevent disturbing screeds during placement. Provide for construction joints in slabs-on-grade at 20 feet maximum in each direction unless shown otherwise on the contract drawings. Place expansion joint material at junctures of slabs-on-grade with vertical walls and as otherwise shown.

E. Remove debris, excess form oil, and water from formwork; avoid washing newly deposited concrete.

3.05 MIXING

A. Ready-mixed concrete shall be mixed and delivered in accordance with ASTM C94 and ACI 304. The production facilities shall comply with the requirements of the National Ready Mixed Concrete Association Certification Plan as regards materials storage and handling, batching equipment, central mixer, truck mixers, agitators, non-agitating units, ticketing system, etc.

B. Do not over-mix; do not use concrete which is retained in mixers so long as to require additional water in excess of design mix water to permit satisfactory placing; retempering of mix is not permitted.

C. Concrete shall be delivered to the site of the work and the mixed concrete discharged completely within 1-1/2 hours after water has been added to cement. In hot weather, or under conditions contributing to quick stiffening of concrete, this time may be reduced by the Engineer.

D. Concrete delivered shall arrive at the site having a temperature not less than 50 Degrees F nor greater than 85 Degrees F, unless otherwise permitted by the Engineer.

3.06 CONVEYING

A. Convey concrete from the mixer to the final deposit by methods that will prevent segregation or loss of materials.

B. Use of aluminum conveyances is not permitted.

3.07 CONCRETE PLACEMENT

A. Place concrete, including drops greater than 60 inches using recommended practices in accordance with ACI 304 and ACI 318. Once pouring operation commences, it shall be carried out as a continuous operation until a section is completed.

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B. Deposit concrete as nearly as practical in its final position to avoid segregation due to rehandling or flowing; do not use vibrators to move concrete horizontally within the forms.

C. Do not use retempered concrete or concrete contaminated by foreign material.

D. Plan and conduct concrete placement to ensure that the concrete is kept plastic and that the concrete is free of cold joints.

E. Where there is a time delay greater than 45-minutes between adjacent concrete placement, a bulkhead construction joint, complete with waterstops where required, must be installed.

F. Do not commence placing when the sun, heat, wind or limitations of facilities provided prevent proper finishing or curing.

G. Discontinue concreting when the descending natural air temperature falls lower than 40 Degrees Fahrenheit unless preparations are made and in place to heat or insulate concrete in accordance with the cold weather concreting requirements of this specification.

H. Concrete for walls shall be deposited in approximately horizontal layers not to exceed 18 inches in height to avoid segregation due to rehandling and flowing.

I. Concrete shall not be placed or poured in water. Water level shall be removed or lowered in a manner approved by Engineer. Excess water shall not be permitted. Powdering a mixture of cement to absorb excess water shall not be permitted.

J. Concrete shall be placed before initial set has occurred. Placing should be carried on in such manner that the concrete in the form is still plastic and can be integrated with fresh concrete.

K. Contractor shall notify Engineer of concrete pouring schedule one day in advance of pour to allow for inspection of reinforcing and forms.

L. Bottom dump buckets may be used for transporting mixed concrete to the desired location. Particular care shall be taken to avoid jarring or bumping as this may cause segregation.

M. Where chutes are used to transport concrete, they shall be of metal or wood with metal lining and should have a slope not exceeding 1 vertical to 2 horizontal and not less than 1 vertical to 3 horizontal so that the concrete will travel fast enough to keep the chute clean but slow enough to avoid segregation of materials. The end of each chute shall be provided with a baffle to help prevent segregation, or the concrete should be discharged through a tremie or elephant trunk directly into the form.

N. Elephant trunks and/or tremies shall be used in walls and columns to prevent free fall of the concrete and to allow the concrete to be placed through the cage of reinforcing steel.

O. Pumping equipment shall be of suitable type, without Y-sections, and with adequate pumping capacity. Loss of slump in pumping shall not exceed 1-1/2 inches.

3.08 CONSOLIDATION

A. Each concrete layer placed shall be compacted by mechanical internal vibrating equipment supplemented by hand spading, rodding, or tamping.

B. The period of concrete vibration shall not be less than two seconds nor more than five seconds at any one point.

C. Consolidate concrete thoroughly as it is placed in order to secure a dense mass; work concrete well around the reinforcement and embedded items and into the corners of the forms.

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D. Use internal vibrators inserted vertically over the entire area of the placement; form vibrators not permitted; internal vibrators shall maintain a minimum of 5000 impulses when submerged in concrete.

E. Vibrate until voids are eliminated, coarse aggregate is suspended in mortar, and entrapped air bubbles begin to rise to the surface; concrete should move back into the space vacated by the vibrator; vibration duration shall be limited only to the time necessary to produce consolidation without causing segregation.

F. Space vibrator insertions such that the area visibly affected by the vibrator overlaps the adjacent just-vibrated area by a few inches.

G. Penetrate at least 6 inches into previously placed layers in order to bond between layers and avoid cold joints.

H. Take care not to over-vibrate air entrained concrete; place vibrator to eliminate honeycombing but avoid excess vibrating that bleeds all entrapped air from the mix.

I. Do not use vibrators to transport concrete.

3.09 JOINTS

A. Construct expansion, control, and isolation joints only where indicated on the drawings or at additional locations approved by the Engineer (and as shown on the Standard Details).

B. Where the placing of concrete is discontinued, clean off laitance and other objectionable material to a sufficient depth to expose sound concrete as soon as concrete is firm enough to retain its form; smooth the top surface of concrete adjacent to the forms with a trowel to minimize visible joints on exposed faces.

C. Immediately upon completion of the work of placing concrete, remove accumulations splashed upon the reinforcement and the surfaces of the forms; perform this removal before concrete takes its initial set; clean reinforcing steel carefully to prevent damage to the concrete steel bond.

D. Do not halt work within 18 inches of the top of any face.

E. For bonded horizontal joint construction, roughen the surface and expose the aggregate; clean the surface thoroughly by wet sandblasting, by cutting with high-pressure water jet or by other approved methods; perform cleaning after the concrete has hardened to prevent raveling of the surface below the desired depth.

F. Construction and contraction joints shall be constructed with interfaces roughened to 1/4-inch amplitude, cleaned and laitance removed.

G. Before bonding concrete is placed, clean the surface of loose or soft particles or other objectionable materials and keep wet for a minimum period of 12 hours.

H. Cover the cleaned and saturated surface with a coating of neat cement grout and deposit new concrete before the grout has attained its initial set.

3.10 CURING

A. Concrete shall be wet cured by immersion of moisture-retaining covers in conformance with ACI 308 or shall receive curing compound in accordance with ACI 309.

B. Water curing is the preferred method of protection for curing concrete; cover exposed surfaces with a saturated material (burlap or cotton mats) and keep wet continuously with a soil soaker hose for 7 curing days for all concrete except high early strength concrete; leave covering in place, without wetting, for an additional 3 days.

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C. A curing day is defined as 24-hour day when the concrete surfaces are kept moist and the uniform temperature of the concrete mass is between 55 Degrees Fahrenheit and 75 Degrees Fahrenheit.

D. Curing shall start as soon as free surface water disappears after finishing. Where forms are not removed immediately, curing shall be accomplished in a manner acceptable to the Engineer.

E. Curing compounds may not be used on surfaces that are to receive additional concrete, paint or tile, unless approved by the manufacturer for such use.

F. Curing and sealing compound shall not be applied to steel reinforcing anchors, water stops, construction joints, or surfaces to be bonded to other concrete.

G. When using a curing compound, keep surfaces moist after the forms are removed. Preferred sequence: Remove forms in accordance with 03 11 13 Structural Cast-In-Place Concrete Forming of this specification: apply curing compound according to manufacturer's recommendations (if manufacture allows pre-finishing application); repair form tie holes; finish surface. Alternate sequence (if manufacturer does not allow pre-finishing application): Remove forms in accordance with 03 11 13 Structural Cast-In-Place Concrete Forming of this specification; repair form tie holes; finish surface; apply curing compound according to manufacturer's recommendations.

H. Slabs: Immediately following slab finishing, begin water curing before the surface becomes dry or apply liquid membrane-forming curing compound.
   1. For exposed slabs with synthetic fiber reinforcement (fiber mesh), the exposed fibers shall be melted or burned off with a heat source prior to applying the curing compound.

I. Vertical Surfaces: When the forms are removed entirely, spray the surface with water and allow it to reach a uniformly damp appearance with no free water on the surface; apply curing compound or begin water curing.

J. For curing concrete under hot weather conditions, see Hot Weather Requirements in this section.

K. For curing concrete under cold weather conditions, see Cold Weather Requirements in this section.

3.11 CONCRETE SLAB FINISHING

A. Complete screeding and darbying slabs before excess moisture or bleeding water is present on the surface.

B. Do not begin subsequent finishing operations until surface water has disappeared and the concrete will sustain foot pressure with only approximately 1/4 inch indentation.

C. Refer to Concrete Schedule, included in this specification section, for finish type at each location, defined as follows:
   1. Smooth Float Finish: (Type S1)
      a. Consolidate concrete with a power-driven disc-type float or a combination floating-troweling machine with metal float shoes attached.
      b. Machines which have a water attachment for wetting the concrete during the finishing operation are prohibited.
      c. Check and level surface plane to a tolerance not exceeding 1/4 inch in 10 feet when tested with a 10-foot straightedge. Cut down high spots and fill low spots; immediately after re-leveling, refloat surface to a uniform, smooth, granular texture.
      d. Where slab drainage is indicated, take care to maintain accurate slopes for drainage.
   2. Steel Troweled Finish: (Type S2)
      a. Produce a Smooth Float Finish S1.
      b. After float finishing, steel trowel surface as specified in Concrete Schedule to increase the compaction of fines and to provide maximum density and wear resistance.
      c. Steel Troweled Finish: Screed and bull float or darby. Give preliminary float finish, true, even and free from depressions; float surface with hand or machine floats; compact surface with not less than 2 thorough and complete steel troweling operations.

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d. Tolerance on finished steel troweled floors in no instance shall exceed 1/8 inch in 10'-0" on surface; where floor drains occur, slope floors to drains.

e. Buffing: After concrete floors have been properly cured, buff thoroughly to remove soluble salt incrustation or other foreign substances.

3. Integral Finishes: (Type S3)
   a. Use for slabs where some material other than concrete will be the final wearing surface.
   b. Screeded Finish - Place screed blocks at frequent intervals and strike off to surface elevations desired; unless otherwise indicated, use on base slabs upon which grout finish, regular mortar bed ceramic tile, sand cushion terrazzo or similar type wearing surface is applied.
4. Broom Finish: (Type S4)
   a. Produce Smooth Float Finish S1.
   b. Draw stiff broom over surface, to obtain non-slip finish.
      1) At Sidewalks, produce a medium-coarse broom finish.
      2) At Patios and Plazas, produce a medium course broom finish.
      3) At Splash Pad Wet and Dry Zones, produce a heavy broom finish.
      4) At all other areas produce a fine broom finish.
   c. For slabs with synthetic fiber (fiber mesh) reinforcement, broom in one direction only, with a consistent sweeping motion to align the fibers with the broom texture.
5. Abrasive Aggregate Non-slip Finish: (Type S5)
   a. Screed and float concrete to the required finish level with no coarse aggregate visible.
   b. Uniformly sprinkle abrasive aggregate over the floated surface at a rate of not less than 1/4-pound per square foot.
   c. Steel trowel surface to a smooth even finish, uniform in texture and appearance and free from blemishes, including trowel marks.
   d. Immediately after curing remove cement coating covering the abrasive aggregate by steel brushing, rubbing with an abrasive stone or sandblasting to expose abrasive particles.
6. Hardener Floor Treatment: (Type S6)
   a. Hardener shall be installed in strict accordance with manufacturer's printed instructions; experienced workmen shall apply hardener at a minimum of 45 pounds per 100 square feet.

3.12 CONCRETE SIDEWALKS

A. Concrete sidewalk construction shall be as specified in Concrete Sidewalks, Steps, and Driveways - Division 32 of these specifications.

3.13 CONCRETE CURB AND GUTTER

A. Concrete curb and gutter construction shall be as specified in Concrete Curb and Gutter - Division 32 of these specifications.

3.14 HOT WEATHER REQUIREMENTS

A. Comply with ACI 305R unless otherwise specified herein below.

B. Hot weather conditions are deemed to exist when the temperature in the forms is 75 Degrees Fahrenheit or above, or a combination of high air temperature, low relative humidity and wind velocity impair the quality of fresh or hardened concrete; take protective measures for mixing, transporting and placing concrete in accordance with ACI 305R.

C. The temperature of the concrete at the place of discharge may not exceed 85 Degrees Fahrenheit.
   1. If ice is used to lower temperature, place crushed, shaved or chipped ice directly into the mixer as part or all of the mixing water; mix until ice is completely melted.
   2. Record the concrete temperature at the time of discharge.

D. Do not add water that will cause the proportions to exceed the maximum water-cement ratio shown in Table I.

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1. Notify the Engineer before adding any water to the concrete mix.
2. Record the amount of water added to the concrete at the jobsite.

E. Discharge concrete within 45 minutes or 100 revolutions, whichever occurs first, after the first mixing of cement and aggregates.

F. Placing and Curing:
1. Place concrete promptly upon arrival.
2. Provide at least one standby vibrator for each 3 vibrators in use.
3. Protect concrete from direct sunlight; keep forms covered and moist by means of water sprinkling or the application of continuously wetted burlap or cotton mats for a minimum of 24 hours. Windbreaks and/or sunshades shall be provided as directed by the Engineer.
4. When forms are removed, provide wet cover to the newly exposed surfaces to avoid exposure to hot sun and wind.
5. Continue specified water curing methods for 10 days; leave covering in place 4 additional days; do not permit alternate wetting and drying cycles.
6. For slabs on grade, beam and deck concrete, and other horizontal placements protect the surface between finishing operations using one or more of the following methods:
   a. Careful use of a fog nozzle.
   b. Spreading and removing polyethylene sheeting between finishing operations.
   c. Application of mono-molecular film after the strike-off.

G. During extremes in weather, floor slabs shall not be cast unless the slab is protected by a roof and other suitable protective measures are provided. After curing has been completed, the floor shall be exposed to the air for 48 hours prior to allowing traffic on the floors.

3.15 COLD WEATHER REQUIREMENTS

A. Comply with ACI 306.1 (R2002) unless otherwise specified herein below.

B. Cold weather is defined any time when the daily temperature is 40 Degrees Fahrenheit or lower during placement and the protection period. If at any time during the progress of the work, the temperature drops below 40 Degrees F., the Contractor shall make suitable provisions to protect the concrete by use of insulation materials such as blankets, mats, etc., and equipment for providing artificial heat.

C. Combustion type temporary heating devices shall be vented outside of any temporary enclosure and building envelope. Combustion gases shall not be allowed in any temporary enclosure and building envelope.

D. Protect concrete surfaces from freezing for at least 24 hours after placement.

E. All surfaces in contact with newly-placed concrete including formwork, reinforcement and subgrade must be above 35 Degrees Fahrenheit.

F. Use preparation methods capable of producing concrete with a temperature not more than 85 Degrees Fahrenheit, and not less than 55 Degrees Fahrenheit, at the time of placement.

G. Do not heat concrete ingredients to a temperature higher than that necessary to keep the temperature of the mixed concrete, as placed, within the specified temperatures. (Do not heat water in excess of 140 Degrees Fahrenheit.)

H. Concrete shall have a temperature of not less than 55 Degrees Fahrenheit when placed; mix concrete at a temperature between:
1. 60 Degrees Fahrenheit and 70 Degrees Fahrenheit when outside air temperature is above 30 Degrees Fahrenheit.
2. 65 Degrees Fahrenheit and 75 Degrees Fahrenheit when outside air temperature is between 0 Degrees Fahrenheit and 30 Degrees Fahrenheit.

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3. 70 Degrees Fahrenheit and 80 Degrees Fahrenheit when outside air temperature is below 0 Degrees Fahrenheit.

I. Follow concrete placement with tarpaulins or other readily movable coverings, so only a few feet of concrete is exposed to the outside air at any time.

J. Maintain the temperature and moisture conditions specified in all parts of the newly placed concrete by covering, insulating, housing or heating; arrange for protection methods in advance of placement.

K. Maintain concrete at a temperature of not less than 55 Degrees Fahrenheit nor more than 70 Degrees Fahrenheit for a period of 3 days after placement.

L. A thermometer accurate to plus or minus 2 Degrees F shall be placed under the curing blanket. Additional insulation shall be supplied as required to maintain the temperature above 55 Degrees F.

M. After the curing period, the temperature of the exposed surface shall not be permitted to drop faster than 30 Degrees F in 24 hours.

N. Do not remove forms during the initial protection period.

O. Protect insulation against wetting that will impair its insulating value using moisture-proof cover material; keep insulation in close contact with concrete.

P. Construct enclosure to withstand wind and snow loads and be reasonably airtight; provide sufficient space between the concrete and enclosure to permit free circulation of heated air.

Q. Use vented heaters; do not permit heaters to heat or dry concrete locally. Unvented salamanders or other heaters which produce carbon dioxide as by-products shall not be permitted within enclosures or inside buildings. If heaters are used, precautions shall be taken to prevent drying of the slab through the use of water jackets or other suitable methods.

R. Maintain relative humidity above 40% within heated enclosures before construction supports are removed.

S. Monitor temperature to ensure concrete is kept within specified limits recording time and concrete temperature every 8 hours.

T. Assure concrete has developed necessary strength before removing forms; provide additional test cylinders with the same protection as the structure they represent to verify concrete strength before construction supports are removed.

U. If water curing is used, terminate at least 12-hours before end of temperature protection period. Permit concrete to dry.

V. After the required protection period gradually reduce the concrete temperature within an enclosure or insulation at a rate not to exceed 20 Degrees Fahrenheit per day until the outside temperature has been reached.

W. Apply membrane forming curing compound to concrete surfaces during the first period of above-freezing temperatures after forms are stripped and before air temperature rises to 50 Degrees Fahrenheit; apply membrane forming curing compound to slabs as soon as finishing operations are completed, except where live steam curing is used.

3.16 DELIVERY TICKETS

A. With each load of concrete delivered to the job there shall be furnished by the ready-mixed concrete producer duplicate delivery tickets, one for the Contractor and one for the Engineer. Delivery tickets shall provide the following information:

1. Date and serial number of ticket;

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2. Name of ready-mixed concrete plant;
3. Job location;
4. Contractor;
5. Type and brand name of cement;
6. Mix number or specified cement content in bags per cubic yard of concrete;
7. Truck number;
8. Time dispatched stamped by a time clock;
9. Amount of concrete in load in cubic yards;
10. Admixtures in concrete, if any;
11. Maximum size of aggregate;
12. Water added at job, if any;
13. Slump of concrete ordered

TABLE 1
CONCRETE CLASS SCHEDULE

Parameter Value	Compressive Strength (PSI) 28-Day	Water-Cement Ratio Maximum	Air Content Range (%) Minimum-Maximum	Slump Range (Inches) Minimum-Maximum	Coarse Aggregate (Inches) Maximum
Class A	4,000	0.5	1 to 2	2 to 4	3/4
Class B	4,000	0.5	1 to 2	2 to 4	1-1/2
Class C	4,000	0.5	5 to 7	2 to 4	3/4
Class D	4,000	0.5	4 to 6	2 to 4	1-1/2
Class E (Interior)	3,000	0.5	1 to 2	2 to 4	3/4
Class F (Exterior)	3,000	0.5	5 to 7	2 to 4	1-1/2
Class G	2,000	0.67	1 to 2	4 to 6	1-1/2
Class H	5,000	0.45	1 to 2	2 to 4	3/4
Class I	5,000	0.45	1 to 2	2 to 4	1-1/2
Class J	5,000	0.45	5 to 7	2 to 4	3/4
Class K (Exterior)	5,000	0.45	4 to 6	2 to 4	1-1/2
Class L	3,000 psi @24 hours	0.40	5 to 7 4 to 6	2 to 4 2 to 4	3/4 1-1/2

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TABLE 2
CONCRETE SCHEDULE
USES AND PROPERTIES

Use	Finish	Class and Considerations
Standard Concrete (not including liquid-retaining or severe exposure structures)		
Foundations, walls, and footings,	W1	Class A
(Buried and non-exposed)	W1	Class B
Foundations and walls	S2 Top, W5 Sides	Class C
(Exterior and exposed)	S2 Top, W5 Sides	Class D
Exterior exposed retaining walls	S2 Top, W5 Sides	Class C
	S2 Top, W5 Sides	Class D
Slabs and floors,	S4 Top, W5 Sides	Class C
(Exterior)	S4 Top, W5 Sides	Class D
Slabs and floors,	S2Top, W5 Sides	Class A
(Interior)	S2 Top, W5 Sides	Class B
Beams, joists, bond beams, Spandrels, lintels, and columns	W5	Class A
Topping for precast decking, (Interior)	S2 or S4, Top W5 Sides	Class E
Topping for precast decking, (Exterior)	S2 or S4, Top W5 Sides	Class F
Equipment pads and bases	S2 Top, W5 Sides	Class E (Interior)
	S2 Top, W5 Sides	Class F (Exterior)
Curbing, sidewalk, endwalls, plazas,	S4 Top, W5 Sides	Class C
stairs, driveways, patios, and ramps	S4 Top, W5 Sides	Class D
Manhole bases and benches	Special Construction	Class E
Pavement base, cradles	Special Construction	Class E
and inlet walls		Class F
Mass and fill	None	Class G
Traffic areas requiring early access or use	Special Construction	Class L
Liquid-Retaining Structures (provide integral crystalline water-proofing admixture)		
SPLASHPAD		
Slabs and bases	S2 Top, W1 Sides	Class H
(Interior)	S2 Top, W1 Sides	Class I
Slabs, bases, splash pad concrete	S4 Top, W1 Sides	Class J
(Exterior)	S4 Top, W1 Sides	Class K
Elevated slabs and integral beams	S2 Top, W5 Sides, W5 Bottom	Class J
(Exterior)	S2 Top, W5 Sides, W5 Bottom	Class K
Buried walls	W1	Class J
	W1	Class K
Exposed walls	S2 Top, W5 Sides	Class J
	S2 Top, W5 Sides	Class K
Fillets	S2 Top, W5 Sides	Class E
	S2 Top, W5 Sides	Class F
Severe Exposure (Chemical Resistant)		

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

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A. Cast-in-place concrete shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 CAST-IN-PLACE CONCRETE

A. Cast-in-Place Concrete, Lump Sum. When so provided, payment for cast-in-place concrete shall be made at the contract lump sum price bid or as specified in Special Procedures - Division 01.

B. Cast-in-Place Concrete, Inclusive. When no quantity is provided, cast-in-place concrete shall be considered inclusive to payment for work associated with the related structure, utility, or improvement.

END OF SECTION

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SECTION 13 11 13
SPLASHPAD GENERAL

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Project administrative requirements that relate to Division 13 11 Splashpads.

1.02 RELATED DOCUMENTS

A. Drawings and Contracting Requirements, including General and Supplementary Conditions and Division 01 - General Requirements, apply to this Section.

B. The following contain requirements that relate in Division 13 11:

C. Mechanical/Electrical/Equipment Coordination: General Conditions, Supplementary General Conditions and Division 01 General Requirements
1. Earth Work and Excavation: Division 31
2. Concrete Deck Work: Division 32
3. Electrical: Division 26

D. Applicable requirements of the following Codes and Standards apply to Work in Division 13 11:
1. National Spa and Splashpad Institute (NSPI)
   a. Minimum Standard for Public Splashpads
2. National Electrical Code (NEC)
3. National Sanitation Foundation (NSF): Seal of Approval Program
4. American Society for Testing and Materials (ASTM): Specifications referenced herein
5. Governmental Health and Building Codes
6. ADA Accessibility Guidelines for Buildings and Facilities
7. American National Standards Institute

1.03 REFERENCES

A. Refer to individual Division 13 11 sections.

1.04 DESCRIPTION OF WORK

A. Work of Division 13 11 includes, but is not limited to, the following:
1. Layout of all splashpad(s) and splashpad related work required under Division 13 11.
2. Project benchmarks and control points.
3. Excavation and stone fill as required for pipe trenching.
4. Splashpad vessels, as detailed on Contract Drawings and Shop Drawings.
5. Splashpad mechanical systems, including piping and activity mechanical systems.
6. Splashpad finish.
7. Coordination of all electrical interlocks, controllers for splashpad and splashpad related equipment.
8. Miscellaneous splashpad testing, safety and control equipment.
9. Low voltage wiring for splashpad and splashpad related equipment is installed and connected by the Splashpad Contractor unless required otherwise by code. Where code requires that low voltage wiring is installed by a licensed electrical contractor, low voltage wiring is specified in Electrical Documents.

B. Applicable Code, Permit and Inspection Responsibilities.
1. State and/or County Health Department permit fees by Owner. NOTE: DSPS permitting is not required for a flow-through splash pad.
2. Local Departments of Health inspection fees by Contractor.
3. Other permits/fees required paid by Contractor.

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4. Scheduling of Required Inspections – Contractor
5. Documentation and Submission of accepted modifications to approved plans to Permit Authorities – Contractor.

C. Related Work Not in Division 13 11 Specified Elsewhere
1. Splashpad deck construction, including finishes, sealants, and drains.
2. Potable water or freshwater connection to feature manifold (see Contract Drawings).
3. Splashpad electrical work: Electrical connections shall be by the General Construction Contract Electrical Sub-Contractor. The Splashpad Vendor shall provide, controllers, solenoids, relays, motorized valves, etc., as shown on Contract Drawings and required by splashpad systems equipment manufacturer. The Electrical Contractor shall install and wire electrical equipment furnished by the Splashpad Contractor and shall provide motor starters and disconnect switches as indicated or required by Codes. The Electrical Contractor shall provide grounding and bonding per NEC Article 680.

1.05 QUALITY ASSURANCE

A. Qualifications of Splashpad Contractor: Work of Division 13 11 shall be performed by a certified installer/contractor who has a minimum of five (5) projects with a proven minimum three (3) year record of competence and experience in the construction of similar facilities of this size and complexity.

B. Performance Criteria: Certain sections of Division 13 11 contain performance criteria rather than product descriptions. It shall be the obligation of the Splashpad Contractor to ensure that all criteria are satisfied and the burden or proof of conformance shall rest with the Splashpad Contractor. The Architect/Engineer shall require complete calculations, past performance records and, if required, inspection trips of similar facilities to substantiate conformance with these criteria. The Architect/Engineer shall be sole judge of conformance, and the Splashpad Contractor is cautioned that he will be required to provide a finished product meeting all stated criteria and meeting or exceeding Department of Public Health requirements.

C. The following shall be performed during construction of the project.
1. Refer to General Conditions, Division 01, and other Division 13 11 sections for further requirements.

1.06 SUBMITTALS

A. Submittals Required
1. Refer to General Conditions, Division 01, and individual Division 13 11 sections for number required.
2. The Contractor shall submit for approval to the Architect/Engineer complete lists, including descriptions, catalogs, product cut sheets, etc, fixtures and equipment to be furnished and installed as part of Division 13 11.
3. Submittals shall adequately and completely describe the equipment, including where necessary or requested complete construction and installation dimensions, complete capacity and performance data, all accessories and auxiliary equipment and all pertinent details of manufacture.
4. Submittals shall be provided complete and bound in a 3-ring binder or as pre- approved by Architect/Engineer or as required in division 1.

B. Product Data: Provide manufacturer's/installer's written installation instructions.

C. Shop Drawings
1. The drawings accompanying this Specification are diagrammatic in nature and show the general arrangement of all equipment, piping, ductwork, services, etc. Because of the small scale of the drawings, it is not possible to show all offsets, fittings and accessories that may be required. The Contractor shall carefully investigate the structural and finish conditions of his work and shall arrange such work accordingly; furnishing all fittings, pipe and accessories that may be required to meet such conditions. Where conditions necessitate a rearrangement, the Contractor shall obtain the Architect/Engineer's approval.

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2. Shop drawings for equipment shall be submitted, and Engineer's review of shop drawing shall be obtained before proceeding with fabrication. Shop drawings shall not be "doctored" reproductions of Architect/Engineer's drawings.

D. Samples: Submit samples of materials, finishes, and trim as requested by the Architect/Engineer.

E. Furnish to the Architect/Engineer the following:
1. Refer to individual Division 13 11 sections for additional requirements.
2. Submittals
   a. Concrete Mix Design
   b. Non-shrink Grouts
   c. Adhesive Waterstop
   d. Expansion/Construction Joint Materials
   e. Caulking/Sealants
   f. Piping Materials (pipe, fittings, solvents, cements)
   g. Wall Sleeves and Seals for Piping
3. Shop Drawings
   a. Reinforcing Steel
   b. Water Activities
4. Test Results
   a. Compaction
   b. Piping Pressure Testing
5. Samples
6. Guarantees/Warranties
   a. Standard 1-Year
   b. Future 3-Days of Instruction and Operational Checkout
7. Close Out Documents
   a. O & M Manuals
   b. Record Drawings
   c. Owner's Certification of Instruction
   d. Extra Materials

1.07 SUBSTITUTIONS

A. Refer to General Requirements and Division 01.

B. Along with the Shop Drawings, the Contractor shall submit, in duplicate, a certificate properly attested, stating the material, equipment, and construction comply with the requirements of the Contract Documents, for all equipment and materials proposed as a Substitute for the specified equipment and materials.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Refer to General Requirements and Division 01 of the Specifications for additional requirements.

B. Deliver all materials and equipment to the work site in original packages, fully identified with manufacturer's label. Store off ground and protect from weather with a suitable covering.

C. Protect plastic pipe from exposure to chemicals (aromatic hydrocarbons, halogenated hydrocarbons and other esters and keytones) that might attack the material. Protect all pipes from mechanical damage and long exposure to sunlight during storage.

1.09 WARRANTIES

A. Warranty: Provide one (1) year warranty covering all splashpad workmanship, materials, and equipment. Refer to General Requirements and Division 01 of the Specifications for additional requirements.

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B. All standard manufacturer's warranties shall apply to all equipment and products provided by this Contractor.

PART 2 PRODUCTS

2.01 MANUFACTURERS

A. Basis-of-Design Manufacturer: Subject to requirements of this Section, provide listed products of Vortex Aquatic Structures International Inc. (Vortex) or approved equivalent:
   1. Local Representative: Commercial Recreation Specialists (CRS).
      a. Seth Westberg (Seth@crs4rec.com) 608.866.0148

B. Submit requests for substitution in accordance with Instructions to Bidders and Division 01 General Requirements.

PART 3 EXECUTION

3.01 EQUIPMENT BASES AND SUPPORTS

A. Provide for major equipment, reinforced concrete housekeeping bases poured directly on structural floor slabs (or as required by equipment manufacturer) 4 inches thick minimum; unless noted otherwise on plans, extended 4 inches beyond machinery bedplates. Provide templates, anchor bolts, vibration isolators, and accessories required for mounting and anchoring equipment. Anchorage system shall be in accordance with the equipment manufacturer's specifications and local code requirements. Consult with equipment manufacturer for length and installation of anchor bolts.

3.02 CLEAN UP AND PROTECTION

A. After work of Division 13 11 has been completed, clean-up work areas and remove all equipment, excess materials, and debris. Protect splashpad from damage until substantial completion. Remove and replace equipment and finishes that are chipped, cracked, abraded, improperly adhered, or otherwise damaged.

PART 4 MEASUREMENT AND PAYMENT

4.01 Payment. All labor, costs, and materials to install a functional splashpad, shall be included the unit price bid called, “Splashpad, Installation.” This work shall include, but is not limited to, fill material and base, colored concrete and associated reinforcing, drainage structures, features bases/installation, grading, etc.

END OF SECTION

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SECTION 13 11 14
SPLASHPAD MAINTENANCE AND OPERATIONS TRAINING

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Training of the Owner's personnel in Splashpad operations procedures.

1.02 RELATED DOCUMENTS

A. Drawings and Contracting Requirements, including General and Supplementary Conditions and Division 01 - General Requirements, apply to this Section.

1.03 DESCRIPTION OF WORK

A. Operations and maintenance instruction and manuals.

1.04 SUBMITTALS

A. Operations and Maintenance (O&M) Manual
   1. Splashpad Contractor shall deliver to the Architect/Engineer, bound together in a three- ring binder a complete manual, three (3) complete sets of operating and maintenance instructions for the splashpad structure(s), finishes, and all component equipment. O&M Manual shall include, but is not limited to, the following:
      a. Table of contents.
      b. All equipment cut sheets.
      c. Accurate parts lists.
      d. Splashpad start-up, emptying, and winterization instructions.
      e. Splashpad cleaning instructions.
      f. Splashpad maintenance requirements, divided into the following:
         1) Daily
         2) Weekly
         3) Monthly
         4) Seasonally
         5) Annually
      g. Narrative on the splashpad operation through all sequences.
      h. Trouble shooting information and procedures.
      i. A schematic of piping as installed.
      j. Valve charts for each piping system, consisting of isometric drawings or piping layouts showing and identifying each valve and describing its function.
      k. Record Drawings
      l. Warranties

PART 2 MATERIALS (N/A)

PART 3 EXECUTION

3.01 OPERATIONS & MAINTENANCE INSTRUCTION

A. Provide an experienced certified Vortex splashpad installer/instructor/operator for a period of not less than two (2) days; one (1) full day's operations and start-up, and one (1) full day shut-down assistance) after the splashpad has been filled and initially placed into operation.
   1. During this period the Owner's designated representative(s) shall be thoroughly instructed in all phases of the splashpad's operation, including start-up, emptying, and winterizing procedures.
   2. Prior to this instructor leaving the Site, instructor shall obtain written certification from the Owner's designated representative acknowledging that the instruction period has been completed and all

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necessary operating information provided, including but not limited to the activity controller programming.

B. Include the cost of one (1) additional day of instruction and operational checkout/verification by an experienced splashpad operator-instructor during the first year's operation.

C. In addition to initial splashpad instruction listed, the Splashpad Contractor shall perform the first season splashpad closing (winterizing) and the following season splashpad start-up, including all labor and materials required.

PART 4 MEASUREMENT AND PAYMENT

4.01 Payment. All labor, materials and work per this specification shall be included in the unit price bid item, "Splashpad, Installation."

END OF SECTION

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SECTION 13 11 18
SPLASHPAD CONCRETE

PART 1 GENERAL

1.01 SECTION INCLUDES

A. This Section specifies cast-in-place concrete for water features (splashpads) and related structures, including formwork, reinforcement, concrete materials, mix design, placement procedures, and finishes.

B. This Section of the Specifications covers the furnishings of all labor, materials, tools, equipment, and the performance of all Work and services necessary or incidental to furnish and place all concrete necessary as shown on the Drawings and as specified, in accordance with the provisions of the Contract Documents, and completely coordinated with the Work of all other trades.

1.02 RELATED DOCUMENTS

A. Drawings and Contracting Requirements, including General and Supplementary Conditions and Division 01 - General Requirements, apply to this Section.

1.03 REFERENCES

A. The following latest edition reference specifications, guides and standards shall become part of this Specification as if herein written. If provisions conflict, the more stringent provisions shall apply.

1. ACI-318 – Building Code Requirements for Reinforced Concrete
2. ASTM C172 – Methods for Sampling Fresh Concrete
3. ASTM C31 – Making and Curing Concrete Test Specimens in the Field
4. ASTM C39 – Compressive Strength of Cylindrical Concrete Specimens
5. ASTM C143 – Standard Method of Test for Slump of Portland Cement Concrete
6. ASTM C231 – Standard Method of Test for Air Content of Freshly Mixed Concrete by the Pressure Method
7. ASTM C260 – Specification for Air-Entraining Admixtures for Concrete
8. ASTM C494 – Specification for Chemical Admixture for Concrete
9. ASTM C618 – Specification for Fly Ash and Raw or Calcinated Natural Pozzolan for Use as a Mineral Admixture in Portland Cement Concrete
10. ACI-304 – Recommended Practice for Measuring, Mixing, Transporting and Placing Concrete
11. ACI-305 – Hot Weather Concreting
12. ACI-306 – Recommended Practice for Cold Weather Concreting
13. ACI-308 – Standard Practice for Curing Concrete
14. CRD C-527 – Corps of Engineers Specifications for Polyvinylchloride Waterstop
15. CRSI – Manual of Practice
16. CRSI 63 – Recommended Practice for Placing Reinforcing Bars
17. CRSI 65 – Recommended Practice for Placing Bar Supports, Specifications and Nomenclature

1.04 SUBMITTALS

A. Product Data: For each type of manufactured material and product indicated.

B. Design Mixes: For each concrete mix. Include alternate mix designs when characteristics of materials, project conditions, weather, test results, or other circumstances warrant adjustments. Indicate amounts of mix water to be withheld for later addition at Project site.

C. Steel Reinforcement Shop Drawings: Details of fabrication, bending, and placement, prepared according to ACI 315. Include material, grade, bar schedules, stirrup spacing, bent bar diagrams, arrangement, and supports of concrete reinforcement. Include special reinforcement required for openings through concrete structures.

1.05 QUALITY ASSURANCE

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A. Concrete Work: All concrete work in Division 13 11, including formwork and reinforcing, shall comply with applicable requirements of Division 13 11.

B. Qualifications of Splashpad Contractor
   1. Work of this Section shall be performed by a Contractor who has a proven record of competence and experience in the construction of similar facilities of this size and complexity for not less than 5 years. Contractors shall have an established record of reliability.

C. The following tests shall be performed during construction of the project. Refer to General Conditions and Division 01 for further requirements.
   1. Concrete
      a. Tests to measure slump, entrained air content and compressive strength shall be conducted by independent testing laboratory employed by the Owner.
         1) Provide minimum of four (4) test cylinders per 50 cubic yard or fraction thereof for each class of concrete poured each day. Comply with ACI- 318, Subsection 4.3 (samples secured - ASTM C172, cylinders prepared and cured - ASTM C31, and tested - ASTM C39). Identify samples moist cure at 70 degrees F for five (5) days and ship samples to laboratory.
      b. Slump and Air Content Tests
         1) Perform on concrete from same batch as sampled for strength tests and whenever there is consistency of concrete. Slump tests shall be made in accordance with ASTM C143. Air content tests shall be made in accordance with ASTM C231. If measured slump or air content falls outside specified limits, check shall be made immediately on another portion of same sample. In event of second failure, concrete shall not be used in Work.
      c. Compliance
         1) Average of any three (3) consecutive strength tests for each class of concrete shall be equal to or greater than specified strength, and no individual test shall fall more than 500 psi below specified strength.
         2) When tests results are below specified requirements or when tests of field cured cylinders indicate deficiencies in protection and curing, Architect/Engineer may require additional tests in accordance with ACI- 318, Subsection 4.3.
   2. Wet Mix Process Cylinder Sample
      a. Where automated wet mix equipment is used, test cylinders shall be taken from the mixer or ready-mix truck and tested in accordance with the requirements specified in this Section. Wet mix processes shall only be used with approved automated equipment.

1.06 SUBMITTALS

A. Submittals Required:
   1. Refer to General Conditions, Division 01, and Section 13 1101.
   2. Splashpad Finish Experience/Qualification Requirements
   3. Concrete Mix Design
   4. Non-Shrink Grouts
   5. Adhesive Waterstop
   6. Expansion/Construction Joint Materials
   7. Caulking
   8. Provide one (1) 2'x2' onsite mock-ups of each color and finish for Owner's approval. Contractor is responsible to coordinate owner approval of mock ups prior to the concrete placement. These shall incorporate the varied colors as indicated.

B. Shop Drawings Required:
   1. Reinforcing Steel
   2. Jointing Plan

C. Test Results:
   1. Concrete Testing
   2. Compaction

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1.07 SUBSTITUTIONS

A. Refer to General Requirements and Division 01.

1.08 DELIVERY, STORAGE, AND HANDLING

A. Refer to General Requirements and Division 01.

B. Deliver cementitious materials to work site in manufacturer's standard packages. Immediately upon delivery to work site, store in waterproof sheds. Sheds required shall be provided by the Splashpad Contractor. No cementitious or other material that has become caked or hardened will be permitted in the work.

1.09 WARRANTIES

A. Special 2-Year warranty on Concrete Structure: The Contractor shall guarantee for two (2) years repair of the concrete splashpad structure.

PART 2 PRODUCTS

2.01 CAST-IN-PLACE CONCRETE

A. Admixtures: Air Entraining: Refer to ASTM C260.

B. Concrete shall be ready-mixed conforming to ASTM C 94 and these Specifications. The use of non-agitating equipment will not be allowed.

C. Fine Aggregates: Conform to ASTM C 33. Materials finer than the 200 sieve shall not exceed 4 percent. Use only clean, sharp, natural sand.

D. Coarse Aggregate: Conform to ASTM C 33. Use only natural gravels, a combination of gravels and crushed gravels, crushed stone, or a combination of these materials containing no more than 15 percent flat or elongated particles (long dimension more than five times the short dimension). Materials finer than the 200 sieve shall not exceed 0.5 percent. Size of coarse aggregate shall be 3/4 inch on slabs and footings; 3/4 inch for walls. Approval of other aggregate gradations must be received in writing before use on the project.

E. Portland cement shall be Type I, conforming to ASTM C150.

F. Slump range shall be 2 to 4 inches and the air entrainment between 6 percent plus or minus 1.5% by volume. The water-cement ratio shall not exceed 0.49 by weight and the minimum cement content shall be 564 pounds per cubic yard - 6 bag mix. Submit complete data on the concrete mix for approval in conformance with the requirements of ASTM C 94, Alternate 2.

G. Minimum allowable 28-day compressive field strength shall be 4000 psi when cured and tested in conformance with ASTM C 31 and C 39.

2.02 REINFORCING STEEL

A. Use epoxy coated deformed bars of sizes shown on the drawings conforming to ASTM A 615 Grade 60.

2.03 REINFORCEMENT ACCESSORIES

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

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2.04 CONCRETE ADMIXTURES

A. Air-entraining admixture: Provide air-entraining admixture in all concrete. Admixture shall conform to ASTM C 260, except it shall be nontoxic after 30 days and shall contain no chlorides. Furnish manufacturer's compliance statement for these requirements to Architect/Engineer forty days prior to use.

B. Water-Reducing Admixture: All concrete shall contain a water-reducing admixture. The admixture shall conform to ASTM C 494, Type A or Type D; except it shall contain no chlorides, shall be nontoxic after 30 days, and shall be compatible with the air-entraining admixtures. The amount of admixture added to the concrete shall be in accordance with the manufacturer's recommendations. Furnish a compliance statement that the admixture used satisfies all requirements of this Specification to Architect/Engineer forty days prior to use.

C. Waterproofing Admixture: Hycrete W1000, Xypex or equal.

2.05 WATERSTOP

A. Strip applied, non-swell, mastic water stop, as shown on the drawings.

B. Manufacturers and suppliers who have provided samples meeting the specified geometry and who have the specified waterstop readily available are listed below. Other products shall not be used without prior review and acceptance by the Architect/Engineer.

1. Sika Corporation, 201 Polito Avenue, Lynndhurst New Jersey 07071, phone: (201) 933-8800 or fax: (201) 804-1076; 3/4” X 1” X 16’-8” roll

2.06 NON-SHRINK GROUT

A. Upcon High Flow, the Upco Company, Cleveland, Ohio; Master Flow 713, The Master Builder Company, Cleveland, Ohio; Crystex, L & M Construction Chemicals, Inc., Omaha, Nebraska.

2.07 GUN GRADE SEALANTS

A. Two-part polysulfide sealant and primer certified by Manufacturer as suitable for use in splashpads including submerged locations. “Deck-O-Seal” and “P/G” solvent based primer as manufactured by W.R. Meadows or equal. Color shall be selected by Owner/Engineer from Manufacturer’s standard range.

PART 3 EXECUTION

3.01 CAST-IN-PLACE CONCRETE

A. Concrete shall be agitated by at least 70 revolutions of the mixing drum but not by more than 270 revolutions. Concrete shall be placed within 1-1/2 hours after the cement has been added to the mix.

B. Provide concrete blocks of same strength as the concrete mix to support reinforcing bars. Do not use broken concrete, brick or stone.

3.02 WATERSTOP

A. Install per manufacturer’s specifications.

3.03 FORMWORK

A. Forms: Materials shall produce tight forms and an acceptable finish.

3.04 WORKMANSHIP

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A. Forms: Construct forms accurately to dimensions and elevations required and to be strong and unyielding. Construct forms with tight joints to prevent the escape of mortar and to avoid the formation of fins. Brace as required to prevent distortion during concrete placement.

B. Placing reinforcing steel: Place reinforcing steel in conformance with the information on the Contract Drawings and CRSI Recommended Practice for Placing Reinforcing Bars, except as modified herein. Minimum length of splices shall be as shown in table on Contract Drawings. Tie splices with 18-gauge annealed wire as specified in the referenced CRSI standard.

C. Placing concrete:
1. Prior to placing concrete, remove water from excavation and all debris and foreign material from forms. Check the reinforcing steel for proper placement and correct any discrepancies.
2. Place concrete as soon as possible after leaving mixer, without segregation or loss of ingredients, without splashing forms or steel above, and in layers not over 2 feet deep. The vertical drop to final placement shall not exceed 6 feet. Placement shall conform to the requirements of ACI 318, except as modified herein.
3. Do not place concrete when the ambient temperature is below 40 degrees F and falling without special protection. Any concrete damaged by freezing shall be removed and replaced at no additional cost to the Owner.
4. Compaction: Apply approved vibrator at points spaced not farther apart than vibrator's effective radius. Apply close enough to forms to vibrate surface effectively but not damage form surfaces. Vibrate until concrete becomes uniformly plastic. Vibrator must penetrate the fresh placed concrete and into the previous layer of fresh concrete below.

3.05 FINISHING

A. Provide heavy broom slip resistant finish on all exposed concrete-see required mock- up requirements of this section.

B. Screed surfaces of floor slabs and tops of exposed walls to true level planes. After the initial water has been absorbed, float and trowel with steel trowel. Provide heavy broom finish.

C. Do not absorb wet spots with neat cement. Splashpad floors shall not vary from level or true plane more than 1/4 inch in 10 feet when measured with a straightedge.

3.06 FORM REMOVAL

A. Remove after concrete has set sufficiently to carry the dead load and construction load it has to sustain. Remove forms with care to prevent scarring and damaging the surface.

3.07 PROTECTION AND CURING

A. Protect fresh concrete from direct rays of the sun, drying winds and wash by rain.

B. The method of water curing shall be the responsibility of the Contractor; however, the method used shall guarantee that all concrete surfaces remain wet to the touch, (free moisture present), at all times during the cure period.

C. Wet cure shall be used conforming to ACI 308. Keep concrete slabs and wall continuously wet for a 7-day period. Intermittent wetting is not acceptable. Any product used shall be compatible with finish bond requirements. With the wet curing of the colored concrete, the contractor shall ensure no blanket or plastic marks are left on the colored concrete.

3.08 PROTECTION OF ADJACENT SURFACES

A. Contractor shall take every possible precaution to protect adjacent concrete surfaces, equipment, etc., from being damaged by overshooting concrete.

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3.09 FINISHING FORMED SURFACES

A. Areas not subject to water: Cut out all honeycombed and defective areas. Cut edges perpendicular to surface at least 1 inch deep, no feather edge allowed, and patch. Using bonding agent fill holes flush with cement mortar composed of 1 part cement and 2 parts sand. Rub surface with wood float and burlap. Keep patches damp for a minimum of seven days. Fill all form tie holes in same manner.

B. Areas subject to water: Cut out all honeycombed and defective areas, cut edges perpendicular to surface at least 1 inch deep, no featheredge allowed, soak area to be patched for 24 hours, then allow surface to drain free of standing water, then patch with color matched non-shrink grout:

C. The grout used shall be cured as recommended by grout manufacturer.

3.10 EXPANSION JOINTS

A. The pre-molded expansion joint filler shall be of sufficient width to completely fill the joint. Filler shall be accurately cut to butt tightly against the waterstop and the side forms.

B. At locations where joint sealant is to be applied, the pre-molded joint filler shall be precut to the required depth.

C. Cavities for joint sealant shall be formed with either precut, pre-molded joint filler or smooth, accurately shaped material that can be removed.

D. Concrete shall be thoroughly vibrated along the joint form to produce a dense, smooth surface. Surface irregularities along the joint sealant cavity, due to improper concrete consolidation or faulty form removal, shall be repaired with an approved compound compatible with the joint sealant in a manner that is satisfactory to the sealant manufacturer.

E. Installation of Cellular Neoprene: Install in joint accurately as shown. Attach to concrete with a bonding agent approved in writing by the joint sealant and joint filler manufacturer for compatibility.

F. All joints require gun grade sealant.

3.11 PLACING REINFORCING STEEL

A. Place reinforcing steel in conformance with the information on the drawings and CRSI 63 and CRSI, except as modified herein. Minimum length of splices shall be as shown in table on drawings. Tie splices with 18-gauge annealed wire as specified in the referenced CRSI standard. All tie wires shall be “made tight” for electrical bonding purposes, as required by NEC, Article 680.

PART 4 MEASUREMENT AND PAYMENT

4.01 Payment. All labor, materials and work per this specification shall be included in the unit price bid item, “Splashpad, Installation.”

END OF SECTION

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SECTION 13 11 20
SPLASHPAD PIPE AND PIPE FITTINGS

PART 1 GENERAL

1.01 SECTION INCLUDES

A. Pipe, pipe fittings, connections, and wall penetrations.

1.02 RELATED DOCUMENTS

A. Drawings and Contracting Requirements, including General and Supplementary Conditions and Division 01 - General Requirements, apply to this Section.

1.03 REFERENCES/PIPE – FITTING REQUIREMENTS

A. The following latest edition reference specifications, guides and standards shall become part of this Specification as if herein written. If provisions conflict, the more stringent provisions shall apply.
1. ANSI/ASTM D2564 - Solvent Cements and ASTM F656 – Primers for Polyvinyl Chloride (PVC) Plastic Pipe and Fittings
2. ASTM D2855 – Practice for Making Solvent Cemented Joints with PVC Pipe and Fittings
3. ANSI/ASTM D1785 – Standard Specification for Polyvinyl Chloride (PVC) Plastic Pipe Schedules 40, 80 and 120, NSF Seal for Potable Water
4. ASTM D2466 – PVC Plastic Pipe Fittings, Schedule 40, Injection Molded, Sizes Through 12", NSF Listed. As manufactured by Spears Manufacturing Company, "or approved equal".
5. ASTM D2467 – Socket Type PVC Plastic Pipe Fittings, Schedule 80, Injection Molded, Sizes through 12", NSF Listed. As manufactured by Spears Manufacturing Company, "or approved equal".
6. ASTM B88 – Seamless Copper Water Tube
7. Eslon Engineering Manual for Plastic Piping Systems
8. ASTM D2563 – Fabricated, Fiberglass Wrapped PVC Pipe Fittings 12", 14", and above, Schedule 40 or 80 manufactured from PVC pipe conforming to ASTM D1785 and compliant to the most recent publication of the "Spears General Specification for Standard Fabricated Fittings (FAB-7-702)". Butt-fusion welded fabricated fittings are not acceptable. All fittings shall be certified for potable water service by NSF. As manufactured by Spears Manufacturing Company or "approved equal".
9. CLASS 150 - All plastic pipe flanges shall be Class 150 and of the same schedule as the associated pipe with neoprene gaskets where required.

1.04 QUALITY ASSURANCE

A. Qualifications of Splashpad Contractor
1. Work of this Section shall be performed by a Contractor who has a proven record of competence and experience in the construction of similar facilities of this size and complexity for not less than 5 years. Contractors shall have an established record of reliability.

B. The following tests shall be performed during construction of the project. Refer to General Conditions and Division 01 for further requirements.
1. Testing and Flushing of Piping
a. Contractor shall be responsible for discovering leaks and making necessary repairs.
1) Pressure piping and suction piping: After the piece is laid, the joints completed and the trench partially backfilled, leaving joints exposed for examination, subject new lines to a hydrostatic pressure of not less than 50 pounds per square inch. Joints shall remain watertight under this pressure for a period of two (2) hours. All air must be expelled from pipes prior to testing.
2) Gravity lines: A water test shall be applied to all gravity drain piping systems, either in their entirety or in sections. All openings shall be tightly plugged and each system filled with water and tested with at least a 10-foot head of water (4.3 psi). The water shall be kept in the system, or in the portion under test, for at least

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fifteen (15) minutes before the inspection starts. System shall be water tight at all joints.

3) Leaks shall be repaired and tested repeatedly until leakage or infiltration is approved.

b. Provide test results to the Architect/Engineer before covering with concrete.

1.05 SUBMITTALS

A. Refer to General Requirements and Division 01.

B. Product Data: For each type of manufactured material and product indicated.

C. Provide Shop Drawings showing pipe locations, location of pipe penetrating water tight walls, pipe sizes, how the system will be drained and the location of the drain valves.

1.06 SUBSTITUTIONS

A. Refer to General Requirements and Division 01.

PART 2 PRODUCTS

2.01 PIPE and FITTINGS

A. Refer to Section 1.03 for pipe and fitting requirements.

B. Refer to pipe schedule and manufacturer recommendations on the drawings for size and type.

2.02 THREAD TAPE

A. Teflon 2

2.03 SOLVENT CEMENTS AND PRIMERS

A. PVC pipe shall be installed using solvent weld materials including primers, cleaners, and cements. All solvent weld materials, methods, and applicator tools shall conform to all ASTM Standards for solvent cements used for plastic pipe installations.

B. Manufacturer: IPS Corporation, Weld-On Product Line

2.04 WALL SLEEVES

A. Pipes penetrating all water tight walls shall use "Century Line" thermoplastic wall sleeves in combination with “Link Seals” having stainless steel service designation. As manufactured by Thunderline Corporation, or the Metraflex Company, “or approved equal”.

2.05 NON-SHRINK GROUT

A. Upcon High Flow, The Upco Company, Cleveland, Ohio; Masterflow 713, The Master Builder Company, Cleveland, Ohio; Crystex L & M Construction Chemicals, Inc., Omaha, Nebraska.

2.06 PIPE SIGNAGE

A. Brady, B-946, custom legend, self-sticking markers and arrows or equal.

PART 3 EXECUTION

3.01 PIPE INSTALLATION

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A. Excavation and Backfill
   1. Excavation for all splashpad systems and related piping.
      a. Comply with Division 31.
   2. Special backfill and bedding materials.
      a. Existing subsoil materials shall not be used for pipe bedding.
      b. All pipe shall be bedded with a minimum of 6" of clear stone material and a minimum of 2'-0" clear stone material top cover. The balance may be existing site material, provided no organic material, clay or topsoil is used.

B. Piping Placement and Use
   1. All material transitions shall be above-grade, flange to flange connections and include ribbed EPDM type rubber gaskets. Below-grade materials transitions will not be allowed.
   2. Piping must be laid on a grade so it will drain completely by gravity. In all instances where gravity drainage is not provided, the contractor shall install drain valves so that all lines can be drained completely. Shop drawings will be required on any such installation.
   3. No installation shall be made that will provide a cross connection or inter- connection between distribution supply for drinking purposes and the splashpad that will permit a backflow of water into the potable water supply. Pipe openings shall be closed with caps or plugs during installation. Equipment and splashpad fittings shall be tightly covered and protected against dirt, water and chemical or mechanical injury. At the completion of work the fittings, materials and equipment shall be thoroughly clean and adjusted for proper operation.
   4. All above grade outdoor piping shall be painted, in accordance with the manufacturer's recommendations, to protect against ultraviolet degradation.

C. PVC Pipe
   1. Cut all pipe with mechanical cutter without damage to pipe.
   2. Placing and laying: Inspect pipe for defects before installation. Clean the interior of pipe thoroughly of foreign matter and keep clean during laying operation. Pipe shall not be laid in water or when trench conditions are unstable. Water shall be kept out of the trench until the pipe is installed. When Work is not in progress, open ends of pipe and fittings shall be securely closed so that no trench water, earth or other substance will enter the pipes or fittings.
   3. Threaded joints: After cutting and before threading, the pipe shall be reamed and shall have burrs removed. Screw joints shall be made with graphite or inert filler and oil or with an approved graphite compound applied to male threads only. Threads shall be full-cut and not more than 3 threads on the pipe remained exposed. Use Teflon II tape on the male threads of all threaded pipe joints. Caulking of threaded joints to stop or prevent leaks will not be permitted. Unions shall be provided where required for disconnection of exposed piping. Unions will be permitted only where access is provided.
   4. All PVC pipe connections shall be flanged or solvent welded.
   5. Solvent welded joints shall be made in accordance with the manufacturer's printed instructions and the following minimum standards:
      a. All fittings shall fit easily on the pipe before applying cement. The outer surface area of pipe and inner wall of fitting shall be dry and clean. Cleaner is to be applied to the outer surface of the pipe and to the inner surface of the fitting. Cement is to be applied to the outer surface of the pipe, or on the male section of fittings only. When the outside surface area of the pipe is satisfactorily covered with cement allow ten (10) seconds open time to lapse before inserting pipe end into fittings. After full insertion of pipe into fitting, turn fitting about the pipe end approximately 1/8 to 1/4 of a turn. Wipe off excess cement at the joint in a neat cove bead. Follow manufacturer's instructions on solvents. Remove all debris, including, containers, brushes, applicators and other items from premises, dispose of properly. Burying of debris on site is not permitted.
      b. In addition to the requirements outlined above, the solvent weld process for pipe sizes of 6" diameter and larger includes additional requirements outlined below. As pipe diameter increases, so does the difficulty in installing it. Follow all of the solvent weld manufacturer's recommendations for larger diameter pipe.
         1) The installer shall use proper size applicators to ensure enough cement is applied to fill the larger gap that exists between the pipe and fittings.
         2) Use the applicable cement for the size of pipe and fittings being installed.

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3) End of pipe must be cut square and chamfered (beveled).
4) Provide adequate crew size to properly handle and fit pipe installations.
5) It is important in large diameter joining that the primer and cement be applied simultaneously to the pipe and fittings. Apply a second, full layer of cement to the pipe. Pipe must be bottomed into the fitting.
6) Large diameter pipe and fittings require longer set and cure times. Prefabricate as many joints as possible. If pipe is to be buried, fabricate as many joints as possible above ground, after joints have cured, carefully lower into trench.

c. All joints shall remain completely undisturbed for a minimum of 10 minutes from time of jointing the pipe and fitting. If necessary to apply pressure to a newly made joint, limit to 10% of rated pipe pressure, during the first 24 hours after the joint has been made.

d. Make provisions for expansion and contraction by way of swing joints or snaking.

e. Protect plastic pipe from exposure to aromatic hydrocarbons, halogenated hydrocarbons, and most of esters and keytones that attack the material. Protect all pipe from mechanical damage and long exposure to sunlight during storage.

f. PVC welding is not allowed without prior approval of the Architect/Engineer.

D. Field Coordination

1. It is the Contractor's responsibility to provide piping by means that account for all necessary coordination, including, but not limited to: routing, water stops, oversize sleeves, pipe supports, valves and other attachments, over-excavations required for fusion machinery or other equipment, etc.
2. Provide pipe extensions and temporary caps necessary for pressure testing requirements.
3. Contractor is required to provide coordination and adequate protection as needed to all external services (i.e. ducts, pipes, cables) that run throughout the project site. Plumbing shall be located and placed to prevent damage during and after construction from traffic loads above.

E. Pipe Identification

1. Provide identification on all piping located in mechanical equipment, chlorine, acid rooms, heater courts, etc.
2. All piping in Mechanical Room to be labeled with description of line and arrows indicating direction of flow.
3. Mark at least once on each line and at 5 ft. intervals minimum. Consult Health Department Code for minimum marking requirements.
4. Color code per Health Department requirements. If code does not identify color coding requirements consult Architect/Engineer.

PART 4 MEASUREMENT AND PAYMENT

4.01 Payment. All labor, materials and work per this specification shall be included in the unit price bid item, “Splashpad, Installation.”

END OF SECTION

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SECTION 26 05 00
ELECTRICAL CONTRACT REQUIREMENTS

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work under this Section.

1.02 APPLICABLE PUBLICATIONS

A. Publications, standards and listing requirements called out in the Sections of this Division of Labor shall form a part of these specifications as if contained herein.

B. The requirements of the Contract Documents, including the General Conditions, and Supplementary Conditions, and Division 01 - General Requirements, apply to this section except as modified herein.

1.03 DESCRIPTION OF WORK

A. Sections included:
1. Section 26 05 00 - ELECTRICAL CONTRACT REQUIREMENTS
2. Section 26 05 19 - WIRE AND CABLE
3. Section 26 05 26 - GROUNDING
4. Section 26 05 29 - SUPPORTING DEVICES
5. Section 26 05 34 - RACEWAYS
6. Section 26 05 35 - ELECTRICAL BOXES
7. Section 26 05 37 - LOCATION OF OUTLETS AND EQUIPMENT
8. Section 26 05 53 - ELECTRICAL IDENTIFICATION
9. Section 26 27 28 - CIRCUIT AND MOTOR DISCONNECTS

B. Work Included:
1. The work covered by this Division of the specifications includes the furnishing of all labor, materials, tools, equipment, permits, certificates and temporary protection necessary for or incidental to executing and completing the electrical work, and work on related systems.
2. All work shall be as specified and indicated on the drawings unless specifically excepted on the drawings or herein.
3. Read all other Divisions of the Specifications which are applicable to this work, including the General Conditions section applicable to all bidders.
4. The Electrical Contract Requirements section is a supplement to and not a replacement for the project General Conditions section.
5. In cases of conflict with information in the General Conditions, the more stringent of the contract requirements shall be considered applicable.
6. Prior to submitting bid, call to the attention of the Electrical Engineer any material or apparatus believed to be inadequate or any necessary items or work omitted.
7. Address any questions regarding the interpretation of the plans and/or specifications at least 12 days before the bid opening.
8. The Electrical Engineer reserves the right to interpret his own specifications and plans after bids are received, and to demand that the installation conform to his intent.
9. Failure to become acquainted with existing conditions at the site shall in no way relieve the responsibility for making installation in conformance with plans and specifications without additional cost to the owner.

C. Examination of Plans, Specifications and Site:
1. Before submitting a bid, the bidder shall familiarize himself with all features of the building and site which may affect the execution of his work.
2. No extra payment will be allowed for the failure to obtain this information.

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3. If there are omissions or errors in the plans or specifications, they shall be clarified with the architect prior to submitting bid.
4. For all remodeling projects, a site visit to the premises, for the purpose of the noting of all existing conditions which may affect work is required.
5. Knowledge of all existing conditions, which may affect work in a renovation project, shall be included in the preparation of bid.
6. Lack of information on existing conditions shall not be allowed for a valid cause for additional compensation.

D. Codes, Permits, and Inspection Fees
1. All work and materials shall conform in every respect to the current rules and requirements of the National Fire Protection Association, National and State Electrical Codes, Local Codes and Ordinances, Local Utility Regulations and OSHA.
2. Give to the proper authorities all required notices relating to the project, obtain all official permits and licenses required, pay all fees incidental thereto, deliver upon completion of the work and without cost to the Owner all required certificates of inspection and approval.

1.04 RELATED WORK ELSEWHERE

A. Applicable provisions of Division 01: General Conditions shall govern work in this section.

B. All other Divisions of the Specifications which are applicable to or interface with work in Division 26.

1.05 SHOP DRAWINGS

A. Submit shop drawings in accordance with Division 01.

B. Submit shop drawings following Section specific Shop drawing submittal guidelines.

1.06 OPERATION & MAINTENANCE MANUALS

A. Submit operation and maintenance manuals in accordance with Division 01.

B. Submit operation and maintenance manuals following Section specific shop drawing submittal guidelines.

1.07 QUALITY ASSURANCE

A. Provide quality assurance in accordance with Section 26 05 00.

B. All materials, equipment and parts are to be new, undamaged and unused of current manufacture.

C. Acknowledges acquaintance with the plans and specifications and their respective requirements.

D. Guarantee that the electrical system has been installed strictly in accordance with the electrical plans and specifications using only the best of materials available, installed in a substantial manner by experienced labor.

E. Various components of the electrical system shall be placed in service prior to completion date as instructed by Owner. This shall not change the guarantee period which shall be one year after acceptance by Owner.

F. Replace and/or repair any items failing from causes of faulty workmanship, materials or design without cost to Owner at any time within one year from date of final acceptance.

1.08 WARRANTY

A. Equipment shall be warranted for a period of not less than 1 year from the date of commissioning against defects in material and workmanship.

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B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.

PART 2 PRODUCTS

2.01 GENERAL

A. It is the intent of these specifications that all the necessary material, apparatus, and devices to complete the installation as specified herein, except such parts as are specifically excepted, shall be provided.

B. If an item is either shown on the plan or called for in these specifications, it shall be considered sufficient of said item in this contract.

C. All sizes given are as minimum.

D. Material and labor shall be first class and workmanlike and to the satisfaction of the Electrical Engineer and shall be subject to inspection test and approval at all times from commencement until acceptance of completed work.

E. Manufacturers shall be responsible for providing material listed by U.L. or other approved agencies, and all governing codes and ordinances.

F. All material must bear U.L. and/or other approved labels where possible.

G. Items specified by catalog number or brand name and approval of shop drawings will not relieve the manufacturer of this responsibility.

2.02 MATERIALS: ALTERNATE MATERIALS

A. Where materials, equipment apparatus, or other products are specified by manufacturer, brand name, and type of catalog number such designation is to establish standards of desired quality and style and shall be the basis of the bid.

B. Substitutions shall not be made unless there are "equals" listed in the specifications or on the plan.

C. Substitutions may be bid as alternates.

D. Burden of proof that materials are equal shall be upon bidder requesting their use; therefore, bidder shall furnish, with their request for approval all supporting data.

E. Assume responsibility for substituted material and state name of manufacturer, type or brand or equipment and addition to or deduction from base bid.

F. Materials and equipment must meet all requirements as to type, quality, function, appearance and physical dimensions shown.

G. Assume responsibility for any costs to other Divisions as a result of the use of alternate materials.

H. Submit supporting data to Architect/Electrical Engineer within 15 days after the bid date.

PART 3 EXECUTION

3.01 EXAMINATION

A. Equipment Submittal Drawings
   1. Within 45 days after a notice to proceed and prior to ordering equipment, furnish to the Electrical Engineer submittal drawings for review (see Division 01).

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2. Review of any submittal drawings does not waive any condition of the specifications unless specifically noted thereon.
3. No fabrication or ordering of equipment shall be started until reviewed drawings are returned.

3.02 FIELD MEASUREMENTS

A. Job Drawings
1. Maintain, at the job site, one (1) complete set of up-to-date plans and written specifications, complete with all addenda items.
2. This complete plan and specification set shall be reserved for all field markings to show minor revisions and detailed construction notes.
3. These marked plans shall be returned to the Electrical Engineer prior to contract completion and final payment.
4. Assist the Electrical Engineer in transferring applicable field notes to the project drawings for record purposes.

3.03 DELIVERY, STORAGE AND HANDLING

A. Material on Site and Storage
1. Maintain proper care and storage of material and equipment on site.
2. Any material damaged by rust corrosion, warping, breakage, finish damage, etc. shall be replaced by the Contractor to the satisfaction of the Engineer.

3.04 INSTALLATION

A. Field Change Orders
1. No revisions to the contract price shall be allowed unless such revisions have been authorized in writing by both Owner and the change order submitter.
2. All work completed prior to completion of a written contract change order will not be compensated for by the Owner.
3. Any work item that is proposed to perform, on the basis of a proposed contract adder, must be announced in advance such that time is available for the Architect, Owner and the Electrical Engineer to determine if a change in contract price is allowable.

B. Change Orders
1. Change orders may be requested as a part of this project.
2. Assume the following in regards to change orders:
   a. Work and equipment associated with change orders shall be installed per the specified equipment on this project.
   b. All change orders shall be accounted for on as-built drawings.
   c. Change order additions to special systems where riser diagrams have been furnished, shall be included as a part of the riser diagram.
   d. A break down of all costs associated with the change order is required.
   e. The cost breakdown shall be as follows:
      1) Itemized list of all materials.
      2) Materials shall be priced at Best Column in a national pricing service book.
      3) Cost for subcontractor services.
      4) Subcontractor services shall be shown as actual costs from subcontractor.
      5) Material mark-up.
      6) Maximum allowed is 8%.
      7) Number of hours of labor at standard charge out rate.
      8) Tax on material.
      9) Total change order cost.
3. If equipment or materials are deducted as a part of this change order, credit shall also be shown on change order.

C. Installation: General

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1. Use of Existing Electrical Services.
    a. When available, existing electrical services shall be made available for temporary construction electrical power.
    b. All connections to an existing service shall be completed in accordance with all code requirements, and such connections shall not limit or interfere with the operation of the existing plant facilities.
2. Connections to Equipment Furnished by Others.
    a. Included in Division 26 are electrical connections to equipment provided by others.
    b. Refer to final shop drawings for equipment provided by other divisions for exact location of electrical outlets and the connections required.
    c. Provide energization to the equipment furnished by other Divisions only at the request of the providing party.
    d. Assume that once the equipment has been started up, that it shall be shut off unless it is requested that it be left on by the providing party.
    e. Only start up and turn on equipment if requested so by the party providing said equipment.
    f. If required, power shall not be activated to the equipment until qualified starting personnel are on site.
    g. After making a permanent power connection, the breaker shall be left in an off position and a "hold" tag or some other device be utilized to keep the power turned off to the equipment.
3. Equipment Access & Location.
    a. All equipment, junction and pull boxes, and accessories shall be installed to permit access to equipment for maintenance.
    b. Any relocation of conduits, equipment, or accessories required to provide maintenance access shall be accomplished at no additional cost.
    c. Equipment shall be installed with ample space allowed for removal, repair or changes to the equipment.
    d. Ready accessibility to equipment and wiring shall be provided without moving other equipment which is to be installed or which is already in place.
    e. Locate electrical outlets and equipment to fit the details, panels, decorating or finish at the space.
    f. The Architect shall reserve the right to make minor position changes up to 10' of the outlets before the work has been installed.
    g. Verify door swings before installing room lighting switch boxes and install boxes on the latch side of door unless noted otherwise.
    h. Furnish information as to exact location and size of sleeves for openings for new construction.
    i. Provide and set in place all required sleeves, inserts, forms, etc. and coordinate this work with all other divisions of work.
4. Cutting and patching.
    a. Beams or columns shall not be pierced without permission of the Architect and then only as directed.
    b. If any openings are required through walls or floors where no sleeve has been provided, the hole for the sleeve shall be core drilled to avoid all unnecessary damage and structural weakening.
    c. Provide all cutting and patching required for complete installation of systems unless specifically noted elsewhere.
    d. All new or existing work cut or damaged shall be patched and restored to its original condition.
    e. Coordinate the location of sleeves, openings, chases, furred spaces, etc.
    f. Provide during the progress of construction all sleeves, hangers and inserts that are to be built into the structure.
    g. Provide sleeves for cables passing through masonry, concrete or other similar construction.
    h. Sleeves shall be of metal conduit and shall extend completely through the construction.
    i. Conduits or cables penetrating smoke or fire barriers must not destroy the barrier's integrity.
    j. Grout openings between sleeves and concrete or masonry walls and floors.

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k. Pack annular space between sleeves and conduits with fiberglass.
l. Where penetrations occur through fire rated walls or floors, fill space with fire resistive caulk.
m. Wherever cables must pass through fire or smoke rated walls or floors, provide approved, sleeved, foam filled fire stops around cables as manufactured by O.Z., Dow, Square D, or equal.
n. Provide all materials required for patching unless otherwise noted.
o. Where alterations disturb lawns, paving, walks, etc., the surfaces shall be repaired, refinished and left in the condition existing prior to commencement of work.

5. Excavation and backfill.
   a. Backfilling of all trenches beneath concrete floor and stair slabs within building shall be accomplished with gravel fill and shall be specially compacted to same density as surrounding area.
   b. Lines passing under foundation walls shall have a minimum of 1 1/2 inch clearance.
   c. Care shall be taken to insure no disturbance of bearing soil under foundations.
6. Attachments and supports.
   a. Be responsible for proper fittings and support for each item of equipment and materials installed under Division 26.
   b. Be responsible for the proper application, installation and location of all necessary and required inserts, supports and anchor bolts.
   c. Where same are to be installed by other Divisions of work, supply same to the contractor in whose work they occur with instructions for placement and proper installation.
   d. Establish the method and nature and select accessories necessary for proper support appropriate to item and point of attachment with due consideration given to ambient/environmental conditions and service duty.
   e. Attachments, supporting devices and accessories shall be specifically designed for the application, suitable for the duty imposed in service and acceptable to the Architect.
   f. Attachments shall be made to structural components of the structure in such manner not to jeopardize the integrity of the structure and otherwise consistent with trade practices.
   g. Generally, anchors shall be concrete insert type in poured concrete and drilled expansion type in precast concrete.
   h. Powder actuated anchors shall not be used in concrete work.
   i. Provide all mounting backboards as required to mount electrical and electronic equipment.
   j. That equipment which is normally assumed to be mounted on some type of a backboard shall be mounted on backboards provided by Division 26.
   k. All mounting backboards used by the contractor shall be 3/4" AC grade marine duty plywood.
   l. All plywood shall be painted on both sides and edges with two coats of fire resistant white enamel paint.
   m. Provide back mounting panels to meet this specification.
   n. Steel channel interior to be painted or galvanized.
   o. Exterior conduit mounting channel shall be stainless steel.
   p. All sleeves to be furnished and installed by Division 26.

D. Installation: Cooperation/Coordination
1. Coordinate and cooperate with other Divisions of work and Owner by scheduling and installing work to facilitate the construction progresses and the Owners use of the building.
2. Any deviation from contract plans shall be approved by the Electrical Engineer before proceeding.
3. Study the plans of other trade divisions of work and to fit work into the work of others in a coordinated manner.
4. Lay out work and be responsible for measurements.
5. Check facilities provided by others which require electrical connections and provide outlets suitably located for them.
6. Take such measurements as may be necessary to assure approved fitting and proper installation of his work and all other work depending thereon.
7. Cooperate with other contractors to avoid complications between the installation of electrical equipment and equipment installed by others.

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E. Installation: Finish and Painting
1. Equipment and materials such as transformers, panels and switches, shall be furnished with the manufacturer's standard finishes, consisting of a prime coat and baked enamel finish coat, unless otherwise noted.
2. Roof mounted equipment and other exterior materials including support hardware shall have a factory or field applied prime coat and finish coat of color selected by the Owner's Representative.
3. In general painting will be done by other trades. Assume responsibility to coordinate work with the painters so that all equipment is installed prior to painting.
4. Assume responsibility for additional expense required to paint support channels, panel trims, flush junction box covers, fixture hangers and other electrical devices not in place prior to normal routine painting.
5. An undamaged finish is required on all equipment.
6. If finish becomes rusted, corroded, scratched, or flaked during storage or installation, be responsible for refinishing the equipment to the satisfaction of the Architect.
7. Finish painting on the job site is not required by the electrical contractor, except where noted.
8. Refer to other areas of this Division 26 for painting of equipment furnished by the Division 26.
9. Where painting is required to be done by the electrical contractor, the painting shall be done in accordance with the painting portion of the general specification.

F. Installation: Damage to Other Work
1. Assume responsibility for all damages resulting from the execution of work under Section 26 05 00.
2. Assume responsibility to adequately protect Division 26 work at all times.
3. All damages resulting from their operations shall be repaired, or the damaged portions replaced by the party originally performing the work (to the entire satisfaction of the Architect), and all cost thereof shall be borne by those responsible for the damage.

G. Installation: Clean-Up
1. At all times, keep the premises free from excessive accumulation of waste materials or rubbish resulting from work, including tools, scaffolding, and surplus materials and leave work room or it's equivalent, clean.
2. In case of dispute, the Architect may order the removal of such rubbish and charge the cost to the responsible Division of work as determined by the Architect.
3. At the time of final clean-up, all fixtures and equipment shall be thoroughly cleaned and left in proper conditions for their intended use.

H. Installation: Drawing Schedules and Details
1. The electrical drawings include a number of standard and job specific details.
2. These details may or may not be specifically referenced on the drawings and in the specification.
3. Assume that even if the detail is not specifically referenced, that it shall apply to this project. (As an example, if a detail is shown for the exterior mounted receptacles, but the detail is not referenced from the plan sheets, the contractor shall assume that all exterior mounted receptacles shall be installed per the detail.)
4. Details and schedules are shown as a means to aid the electrical contractor and are not meant to be all inclusive of all devices.
5. Assume responsibility for making takeoff of equipment required, (i.e., additional circuit breakers, motor connections, etc.) and ancillary equipment and appurtenances for a complete connection or circuit.
6. Verify all sizes of electrical equipment with shop drawings and nameplate rating of the equipment it serves.

I. Installation: Coordination Drawings
1. Prepare coordination drawings to a scale of ¼" = 1'0 or larger; detailing major elements, components, and systems of electrical equipment and materials in relationship with other systems, installations, and building components.

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2. Indicate locations where space is limited for installation and access and where sequencing and coordination of installations are of importance to the efficient flow of the work, including, (but not limited to) the following:
3. Indicate the proposed locations of major raceway systems, equipment, and materials. Include the following:
    a. Clearances for servicing equipment, including space for equipment disassembly required for periodic maintenance.
    b. Exterior wall and foundation penetrations.
    c. Fire-rated wall and floor penetrations.
    d. Equipment connections and support details.
    e. Sizes and location of required concrete pads and bases.
4. Prepare floor plans, elevations, and details to indicate penetrations in floors, walls, and ceilings and their relationship to other penetrations and installations.
5. Locations include, but are not limited to, electrical rooms and other specialty electrical and communication rooms where equipment is being provided.

J. Installation: Bid Drawings
1. It must be understood that electrical drawings and details bid drawings are diagrammatic.
2. Electrical drawings and details bid drawings are not intended to be shop drawings.
3. It is expected that it may be necessary to move conduit, outlets and/or equipment in some cases to get coordinated installation and such changes are considered a part of the Contract obligation without cost to the Owner.
4. No outlets or equipment shall be located where the usefulness and/or operation will be affected by the work of other trades, door swing, counter, equipment, etc.

K. Installation: Contract Termination Requirements
1. Furnish Owner with service manuals for all items furnished under this Contract.
2. Service manuals shall be complete with drawings, diagrams, operations and installation instructions and parts lists.

3.05 OWNER TRAINING

A. Provide as outlined in each specification section requiring owner training.

END OF SECTION

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SECTION 26 05 19
WIRE AND CABLE

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work of this section.

1.02 APPLICABLE PUBLICATIONS

A. American National Standards Institute/National Fire Protection Agency (ANSI/NFPA), Specifications and Standards, current edition:
   1. NFPA 70 – National Electrical Code.
   2. ANSI/TIA/EIA-568-B.2.

B. National Electrical Contractors Association (NECA), Standard of Installation, current edition.

C. National Electrical Manufacturers Association (NEMA), Specifications and Standards, current edition.

D. Underwriters Laboratories, Inc. (UL).

1.03 DESCRIPTION OF WORK

A. Furnish and install a complete and operable wire and cable system as indicated on the drawings and as specified herein.

1.04 RELATED WORK ELSEWHERE

A. Division 11: Equipment

B. Division 26: Electrical

1.05 SHOP DRAWINGS

A. Submit shop drawings in accordance with Division 01.

1.06 OPERATION & MAINTENANCE MANUALS

A. Submit Operations & Maintenance Manuals in accordance with Division 01.

B. The following information shall be submitted in addition to the items listed above:
   1. Manufacturer literature in scope to demonstrate compliance with the requirements of this specification.
   2. Clearly identify the types of wire and cable proposed.

1.07 QUALITY ASSURANCE

A. Provide quality assurance in accordance with Section 26 05 00.

B. Wire and cable manufacturers shall be certified to ISO 9001 International Quality Standard and shall have third party certification verifying quality assurance in design/development and production in accordance with ISO 9001.

C. All materials, equipment, and parts shall be new and unused of current manufacture.

D. Provide all necessary accessories required for a complete and operable system.

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1.08 WARRANTY

A. Wire and cable shall be warranted for a period of not less than 1 year from the date of commissioning against defects in material and workmanship.

B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.

C. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 PRODUCTS

2.01 GENERAL

A. Approved manufacturer:
   1. Contractor's option.

B. All materials and equipment furnished shall be current production of manufacturers regularly engaged in the manufacture of such items, and for which replacement parts are available. All materials and equipment shall be new (less than 1 year old when turned over to the Owner).

2.02 WIRE AND CABLE – GENERAL PURPOSE (600V)

A. General:
   1. THWN or THHN general purpose building wire insulated with polyvinyl chloride (PVC) and covered with protective sheath of nylon intended for lighting and power circuits at 600 volts or less, in residential, commercial, and industrial buildings.
   2. The wire shall be suitable for 90ºC maximum continuous conductor temperature in dry locations and 75ºC in wet locations and listed by Underwriters Laboratories for use in accordance with Article 310 of the National Electrical Code.

B. Conductors:
   1. Class B or Class C stranded, annealed uncoated copper per UL Standard 83 or 1063.

C. Insulation:
   1. Each conductor shall be insulated with PVC and sheathed with nylon complying with the requirements of UL Standard 83 for Types THHN or THWN and UL Standard 1063 for Type MTW and CSA C22.2 No. 75 for T90 Nylon.
   2. Types THWN or THHN shall comply with the optional Gasoline and Oil Resistance rating of UL Standard 83. The insulation shall also comply with UL requirements for 105ºC Appliance Wiring Material.
   3. The average thickness of PVC insulation, for a given conductor size, shall be as specified in UL Standard 83 for TWHN or THHN. The minimum thickness at any point, of the PVC insulation, shall be not less than 90 percent of the specified average thickness.
   4. The minimum thickness at any point of the nylon sheath shall be as specified in UL Standard 83 for Types THWN or THHN.
   5. The PVC insulation shall be applied tightly to the conductor and shall be free-stripping.

D. Identification:
   1. The wire shall be identified by surface marking indicating manufacturer's identification, conductor size and metal, voltage rating, UL Symbol, type designations, and optional ratings. The wire shall also be identified as C (UL) Type T90 Nylon or TWN 75, FT1.

E. Tests:

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1. Wire shall be tested in accordance with the requirements of UL Standard 83 for Types THWN or THHN wire and for the optional Gasoline and Oil Resistance listing; as Type MTW to UL Standard 1063 (stranded items): as AWM to UL Standard 758 (stranded items); and as C(UL) Type T90 Nylon or TWN75.

F. Usage:
1. General use power wiring, minimum size No. 12 AWG.
2. General use control wiring, minimum size No. 14 AWG.

2.03 WIRE AND CABLE – UNDERGROUND (600V)

A. General:
1. USE-2 or RHH, cross linked polyethylene insulated cables for use in circuits not exceeding 600 volts. Cables listed by UL as Type USE-2 and recognized for underground use in wet locations at a maximum continuous conductor temperature of 90ºC in accordance with Article 338 of the National Electric Code.
2. UL listed as Type RHH or RHW-2 for general purpose wiring applications at maximum continuous conductor temperature of 90ºC in dry locations (RHH) or 90ºC in wet or dry locations (RHW-2).
3. Installed in air, conduit, or other recognized raceways in accordance with Article 310 of the National Electric Code.

B. Conductors:
1. Conductors shall be Class B stranded annealed uncoated copper per UL Standard 854 and 44.
2. A suitable separator over the conductor may be used at the option of the manufacturer.

C. Insulation:
1. Each conductor shall be insulated by surface marking indicating manufacturer's identification, conductor size and metal, voltage rating, UL Symbol, and type designations.

D. Tests:
1. Wire shall be tested in accordance with the requirements of UL Standard 8654 for Type USE-2, UL Standard 44 for Types RHW-2 or RHH.

E. Usage:
1. Underground power wiring, minimum size No. 12 AWG.

2.04 WIRING CONNECTORS

A. Polaris Type Mechanical Connectors:
1. 8 AWG and larger wire for all motor connections.

B. Spring Wire Connectors:
1. 10 AWG and smaller wire.

C. Compression Connectors (T&B Sta-Kon or equal):
1. Fire alarm wiring.
2. Control wiring.
3. For those devices that are not rated to accept stranded wire.

D. Cord Connectors. All cord connectors should be Kellums type using wire mesh cord restraint.

E. Provide watertight Crouse-Hinds or equal cord grips in appropriate areas.

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PART 3 EXECUTION

3.01 EXAMINATION

A. Verify that wire is in compliance with specifications.

B. Verify that interior of building has been protected from weather.

C. Verify that mechanical work likely to damage wire and cable has been completed.

D. Inspect wire for physical damage and proper connection.

E. Measure tightness of bolted connections and compare torque measurements with manufacturer's recommended values.

F. Verify continuity of each conductor.

G. Feeder or branch circuits with ampacity greater than 100 amperes shall be tested after installation to measure insulation resistance of each conductor.
   1. All equipment shall be disconnected and the wire ends shall be cleaned and dried.
   2. Connect Megohmeter between conductor and a grounded point in the enclosure and energize until the reading stabilizes.
   3. The Megohmeter reading for each conductor shall not be less than 10,000 Megohoms.

3.02 FIELD MEASUREMENTS

A. Field verify all measurements. Do not base on contract drawings.

B. Identify conflicts with the work of other trades prior to installation of work.

C. Adjust system to satisfy field requirements.

3.03 DELIVERY, STORAGE AND HANDLING

A. Receive, sign for and store all equipment in this section.

B. Maintain original quality and condition of wire while it is in storage.

3.04 INSTALLATION

A. General:
   1. The complete installation shall be done in a neat, workmanlike manner in accordance with all applicable codes and the manufacturer's recommendations.
   2. Install all materials, assemblies and equipment in strict accordance with manufacturer's recommendations and instructions. Consult manufacturer for all wiring diagrams, schematics, sizes, outlets, etc. before installing.

B. Pre-Installation:
   1. Verify that interior of building has been protected from weather.
   2. Verify that mechanical work likely to damage wire has been completed.
   3. Completely and thoroughly swab raceway prior to installation.
   4. Verify that field measurements are as shown on drawings.
   5. Wire and cable routing shown on drawings is approximate unless dimensioned. Route wire and cable to satisfy project conditions.
   6. Where wire and cable routing is not shown, and destination only is indicated, determine exact routing and lengths required.
   7. Determine required separation between cable and other work.

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8. Determine cable routing to avoid interference with other work.

C. Conductor Sizing:
1. Conductor sizes are based on copper.
2. Use conductor not smaller than No.12 AWG for power and lighting circuits.
3. Use No.10 AWG conductors for 20 ampere, 120-volt branch circuits longer than 75 feet.
4. Where circuit wiring length exceeds 100 feet, increase wire size as needed to maintain a maximum voltage drop of three percent.
5. Use conductor not smaller than No.14 AWG for control circuits.
6. Wire and cable size shall be increased from size indicated or required by code to meet the following voltage drop requirements:
   a. 3% drop for branch circuits.
   b. 5% drop for motor circuits.

D. Wire Pulling:
1. Pull all conductors into raceway at same time.
2. No.4 AWG and larger wire and power cables shall be lubricated with pulling lubricant to reduce pulling tension and abrasion damage. The lubricant shall be water or wax based containing no oils or greases that may adversely affect cable jackets. Follow cable manufacturer's specifications regarding use of lubricant.
3. The minimum bend radius and maximum pulling tension ratings of the wire and cable shall not be exceeded.

E. Splices and Terminations:
1. Splices and terminations shall not be made within raceways.
2. Clean conductor surfaces before splicing or terminating.
3. Make splices, taps, and terminations to carry full amp capacity of conductors with no perceptible temperature rise.
4. Wire nuts, "ScotchLocks", and similar devices may be used to splice 120V power circuits.
5. Control, communication, and data transmission wire and cable shall not be spliced.
6. Support cables above accessible ceiling, using spring metal clips or plastic cable ties to support cables from structure. Do not rest cable on ceiling panels or support for the ceiling suspension system per NEC.
7. Neatly train and lace wiring inside boxes, equipment, and panelboards.
8. Clean conductor surfaces before installing lugs and connectors.
9. Make splices, taps, and terminations to carry full ampacity of conductors with no perceptible temperature rise.
10. Use polaris type mechanical connectors for copper conductor splices and taps, 8 AWG and larger. Tape uninsulated conductors and connector with electrical tape to 150 percent of insulation rating of conductor.
11. Use insulated spring wire connectors with plastic caps for copper conductor splices and taps, 10 AWG and smaller.

F. Wire Marking:
1. The ends of each conductor shall be marked with circuit number, motor number, wire or terminal number.
2. Labels shall be typed in black lettering with indelible ribbons on a white, heat shrink sleeve. Markers shall be shrunk around the wire to provide a tight, non-slip bond with a compatible heat gun.
3. Heat shrink wire markers shall be Brady Bradysleeve Type B-321 or B-322

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G. Color Coding:

1. Color coding shall be as follows:

	120/208V System	120/240 System
Phase A	Black	Black
Phase B	Red	Red
Phase C	Blue	
Neutral	White	White
Ground	Green	Green

H. Ground Wire Color Coding

1. Provide green insulated ground wire for #8 and smaller. #6 wire shall have green band per code.

I. Control Panels:

1. Control panel wiring. Wiring within control cabinets shall be stranded type MTW.

3.05 OWNER TRAINING (NONE)

3.06 SPARE EQUIPMENT (NONE)

END OF SECTION

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SECTION 26 05 26
GROUNDING

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work of this section.

1.02 APPLICABLE PUBLICATIONS

A. Conform to requirements of current ANSI/NFPA 70 - National Electric Code.

B. Conform to current Underwriters Laboratories (UL) Specifications and Standards.

C. Conform to current Telecommunication Industry Association (TIA/EIA).

D. Conform to National Electrical Contractors Association (NECA) “Standards of Installation”.

E. Product specific standards and requirements are included in product specifications.

F. EIA/TIA-607.

1.03 DESCRIPTION OF WORK

A. Furnish and install a complete and operable grounding and bonding system as indicated on drawings and specified herein.

B. Ground and bond all equipment required per all applicable codes whether or not specifically shown on drawings.

C. Bond together exposed non current carrying metal parts of electrical equipment, metal raceway systems, grounding conductor in raceways and cables, branch circuit ground connectors, and plumbing systems.

1.04 RELATED WORK ELSEWHERE

A. Division 26: Electrical

1.05 SHOP DRAWINGS

A. Submit shop drawings in accordance with Division 01.

1.06 OPERATION & MAINTENANCE MANUALS (NONE)

1.07 QUALITY ASSURANCE

A. Provide quality assurance in accordance with Section 26 05 00.

1.08 WARRANTY

A. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.

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C. Submit a written warranty executed by the installer indicating ground test was completed.

PART 2 PRODUCTS

2.01 GENERAL

A. All materials and equipment furnished shall be current production of manufacturers regularly engaged in the manufacture of such items, and for which replacement parts are available. All materials and equipment shall be new (less than 1 year old when turned over to the Owner).

B. Provide a complete and fully functional grounding system using materials and equipment of types, sizes, and rating as required to meet performance requirements. Use materials and equipment that comply with referenced standards and manufacturer's standard design and construction, in accordance with published product information. Coordinate the features of all materials and equipment so they form an integrated system, with components and interconnections matched for optimum performance of specified functions. Provide all accessories necessary for a fully functioning system.

2.02 GROUND RODS

A. Material: Copper-clad steel.

B. Diameter: 3/4" minimum.

C. Length: 8' minimum.

D. Use one or more ground rods to obtain the minimum specified ground resistance. This applies padmount equipment and all other equipment requiring a supplemental grounding electrode.

2.03 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.

C. The connectors shall meet or exceed UL 467 and be clearly marked with the catalog number, conductor size and manufacturer.

2.04 COMPRESSION CONNECTORS

A. The compression connectors shall be manufactured from pure wrought copper. The conductivity of this material shall be no less than 99 percent.

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.

2.05 EXOTHERMIC CONNECTIONS

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A. Select the appropriate kit for specific types, sizes, and combinations of conductors and other items to be connected. Field personnel shall be trained in execution of welds.

2.06 WIRE

A. Material: Stranded copper (aluminum permitted only with aluminum conductors).

B. Grounding Electrode Conductor: Size as shown on drawings, specifications, or required by NFPA 70, whichever is larger.

C. Branch Circuit Equipment Ground: Size as shown on drawings, in specifications, or as required by NFPA 70, whichever is larger.

PART 3 EXECUTION

3.01 EXAMINATION

A. Inspect grounding and bonding system conductors and connections for tightness and proper installation.

3.02 FIELD MEASUREMENTS

A. Field verify exact routing of all backbone cable.

B. Adjust grounding system installation to satisfy field requirements.

3.03 DELIVERY, STORAGE AND HANDLING

A. Receive, sign for and store all equipment in this section.

3.04 INSTALLATION

A. General:
   1. Provide ground wire in all metal raceways.
   2. Branch circuit grounding:
      a. For all circuits, provide separate green ground wire in raceway system.
      b. Provide #12 pigtail to ground all metal boxes.

B. Ground Rod Installation
   1. Install ground rods to be 8’-6” deep.

3.05 OWNER TRAINING (NONE)

3.06 SPARE EQUIPMENT (NONE)

END OF SECTION

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SECTION 26 05 29
SUPPORTING DEVICES

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work of this section.

1.02 APPLICABLE PUBLICATIONS

A. Conform to requirements of current ANSI/NFPA 70 - National Electric Code.

B. Conform to current American National Standards Institute (ANSI) standards.

C. Conform to current American National Standards Institute ANSI B31.1 standards.

D. Conform to National Electrical Contractors Association (NECA) “Standards of Installation”

1.03 DESCRIPTION OF WORK

A. Furnish and install complete and operable support devices as required.

B. Metal supporting devices shall be zinc galvanized or cadmium plated steel or malleable iron.

C. Equipment and materials shall be supported with devices designed for such purpose. Wire or plastic ty-raps not acceptable.

D. Where so specified on the drawings, provide stainless steel, PVC covered, or hot dipped galvanized.

E. Refer to drawings or other portions of the specifications for particular pieces of equipment which may require more stringent equipment specifications than listed in this specification.

1.04 RELATED WORK ELSEWHERE

A. Division 03: Concrete

B. Division 04: Masonry

C. Division 07: Thermal and Moisture Protection

D. Division 26: Electrical

1.05 SHOP DRAWINGS

A. Submit shop drawings in accordance with Division 01.

1.06 OPERATION & MAINTENANCE MANUALS (NONE)

1.07 QUALITY ASSURANCE

A. Provide quality assurance in accordance with Section 26 05 00.

B. All materials, equipment and parts are to be new, undamaged and unused of current Manufacture.

1.08 WARRANTY

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A. Equipment shall be warranted for a period of not less than 1 year from the date of commissioning against defects in material and workmanship.

B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.

C. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 PRODUCTS

2.01 GENERAL

A. All materials and equipment furnished shall be current production of manufacturers regularly engaged in the manufacture of such items, and for which replacement parts are available. All materials and equipment shall be new (less than 1 year old when turned over to the Owner).

2.02 SUPPORTING STRUCTURES

A. Rack supports of galvanized steel channel sections with adequate feet to allow secure mounting. Weld sections, do not use bolts.

2.03 CONDUIT SUPPORTS

A. 1- hole galvanized steel straps for EMT, 2-hole galvanized steel straps for all other conduits. Do not use perforated hanger iron.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify locations prior to rough in.

B. Verify mounting details

3.02 FIELD MEASUREMENTS

A. Verify that field measurements are as shown on Drawings.

3.03 DELIVERY, STORAGE AND HANDLING

A. Receive, sign for and store all equipment in this section.

B. Accept equipment on site. Inspect for damage.

C. Protect equipment from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

3.04 INSTALLATION

A. General:
   1. The complete installation shall be done in a neat, workmanlike manner in accordance with all applicable codes and the manufacturer's recommendations.
   2. Install all materials, assemblies and equipment in strict accordance with manufacturer's recommendations and instructions. Consult manufacturer for all wiring diagrams, schematics, sizes, outlets, etc. before installing.

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B. Provide anchors, fasteners, and supports in accordance with NECA "Standard of Installation".

C. Do not fasten supports to pipes, ducts, mechanical equipment, or other conduit.

D. Do not use spring steel clips on ceiling support wires.

E. Do not use powder actuated anchors.

F. Obtain permission from Architect before drilling or cutting structural members.

G. Fabricate supports from structural steel or steel channel. Rigidly weld members or use hexagon head bolts to present a neat appearance with adequate strength and rigidity. Use spring lock washers under all nuts.

H. Install surface mounted cabinets and panelboards with minimum of four anchors.

I. In wet and damp locations use steel channel supports to stand cabinets and panelboards one inch off wall.

J. Use steel metal channel to bridge studs above and below cabinets and panelboards recessed in hollow partitions.

K. Degrease and clean surfaces to receive nameplates and labels.

L. Install nameplate and label parallel to equipment lines.

M. Secure nameplates to equipment fronts using screws if so specified on drawings.

N. Anchors:
   1. Install anchors at proper locations to prevent stresses from exceeding those permitted by ANSI B31 and transfer of loading and stresses to connected equipment.
   2. Installation methods shall be in conformity with manufacturer's recommendations for maximum holding power.

O. Conduit Supports
   1. Support conduit as follows:
      a. Vertical Surfaces: Galvanized, heavy-duty, sheet steel straps; back straps provided for exposed conduit and conduit on exterior walls.
      b. Horizontal Surfaces: Single or double rack channel trapeze, complete with conduit straps as required; supported with threaded hanger rods.
   2. Support 1 3/4 in. and larger conduit runs passing through floors at each floor with riser pipe clamps.

3.05 OWNER TRAINING (NONE)

3.06 SPARE EQUIPMENT (NONE)

END OF SECTION

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SECTION 26 05 34
RACEWAYS

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work of this section.

1.02 APPLICABLE PUBLICATIONS

A. Conform to requirements of current ANSI/NFPA 70 - National Electric Code.

B. Conform to current National Electrical Manufactures Association (NEMA) Standards.

C. Conform to current Underwriters Laboratories (UL) Specifications and Standards.

D. Conform to current Telecommunication Industry Association (TIA/EIA).

E. Conform to current American National Standards Institute (ANSI) standards.

F. Conform to National Electrical Contractors Association (NECA) “Standards of Installation”.

G. Product specific standards and requirements are included in Product Specifications.

1.03 DESCRIPTION OF WORK

A. Furnish and install a complete and operable conduit/raceway system as indicated on the drawings and as specified herein.

B. All wire shall be in conduit or surface raceway. All conduits in finished areas shall be concealed. In unfinished areas, such as utility and mechanical rooms, the contractor shall conceal the branch wiring such as receptacles and light switches.

C. Where conduit passes through areas of differing temperatures, such as into or out of cool-rooms, freezers, unheated and heated spaces, buildings, provide listed conduit seals to prevent the passage of moisture and water vapor through the conduit.

D. Materials Included:
1. Metal conduit.
2. Electrical metallic tubing.
3. Nonmetallic conduit.
4. PVC covered rigid steel conduit.

1.04 RELATED WORK ELSEWHERE

A. Division 03: Concrete

B. Division 04: Masonry

C. Division 09: Finishes

D. Division 12: Furnishing

E. Division 26: Electrical

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1.05 SHOP DRAWINGS

A. Submit shop drawings in accordance with Division 01.

1.06 OPERATION & MAINTENANCE MANUALS

A. Submit Operations & Maintenance Manuals in accordance with Division 01.

1.07 QUALITY ASSURANCE

A. Provide quality assurance in accordance with Section 26 05 00.

B. All materials, equipment and parts are to be new, undamaged and unused of current manufacture.

1.08 WARRANTY

A. Equipment shall be warranted for a period of not less than 1 year from the date of commissioning against defects in material and workmanship.

B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.

C. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 PRODUCTS

2.01 GENERAL

A. All materials and equipment furnished shall be current production of manufacturers regularly engaged in the manufacture of such items, and for which replacement parts are available. All materials and equipment shall be new (less than 1 year old when turned over to the Owner).

2.02 CONDUIT GENERAL REQUIREMENTS

A. Minimum Size: 1/2 inch.

B. Conduit types not listed below are prohibited.

C. Rigid heavy wall galvanized steel conduits:
   1. Are to be used in the following locations:
      a. Outdoors.
      b. Underground, unless PVC is shown on drawings or called out in other portions of this specification.
      c. In and under ALL concrete slabs, except for where PVC is allowed as stated in nonmetallic conduit portion of this specification.
      d. In sizes 2-1/2" and larger, where the conduit is exposed and where it is installed between the floor and 8' AFF. Above this height EMT conduit may be used.
      e. In areas having moisture, dust or gases.
      f. Exposed conditions where such mechanical protection is required.
   2. Manufacturer: CONTRACTOR option.
   3. Conduit:
      a. Impact and crush resistant mild steel tube with an accurate circular cross section, a uniform wall thickness, a defect free interior surface, and a continuous welded seam.
      b. Interior and exterior surfaces thoroughly and evenly coated with zinc using the hot-dip galvanizing process.

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c. Top-coated with a compatible organic layer to inhibit white rust and increase corrosion resistance.
d. Factory cut threads, 0.75-inch taper per foot, protected after cutting with an application of molten zinc.

4. Conduit Bodies:
a. Ferrous metal construction electro-galvanized inside and out and coated with aluminum acrylic paint.
b. Tapered, threaded hubs with integral bushing.
c. Stainless steel hardware.
d. Cover constructed of same material with solid gasket.

5. Fittings:
a. Ferrous metal construction electro-galvanized inside and out.
b. Components critical to performance such as set screws, split rings, and locknuts constructed of hardened steel or adequately designed to insure positive bonds.

D. IMC (Intermediate Metal Conduit) is applicable in place of rigid heavy wall galvanized steel conduit in the following locations:
1. All areas except primary raceways.

E. Thinwall conduit:
1. May be used in the following locations:
a. Indoors in dry locations (walls, ceilings, exposed).
b. In sizes 2 1/2" and larger, where installed above ceilings or installed more than 8' above the floor. See paragraph B - Rigid heavy wall conduit.

2. Manufacturer: CONTRACTOR option.
3. Conduit:
a. Mild steel tube with an accurate circular cross section, a uniform wall thickness, a defect free interior surface, and a continuous welded seam.
b. Interior and exterior surfaces thoroughly and evenly coated with zinc using the hot-dip galvanizing process.

4. Fittings:
a. Setscrew, steel construction electro-galvanized inside and out.
b. Insulated throat connectors.
c. Components critical to performance such as set screws, split rings, and locknuts constructed of hardened steel or adequately designed to insure positive bonds.

F. Nonmetallic Conduit (PVC):
1. Where indicated on drawings.
2. Where PVC conduit penetrates floor, it must be installed per conduit installation detail.
3. PVC not allowed indoors above slab, except for single ground conductors in non-plenum areas.
4. Manufacturer:
a. Carlon.
b. Or equal.

5. Conduit:
a. Made from polyvinyl chloride compound (recognized by UL), which includes inert modifiers to improve weatherability and heat distortion.
b. Rated for use with 90 degree C conductors. Material shall comply with NEMA Specification TC-2.
c. The conduit and fittings shall be homogeneous plastic material free from visible cracks, holes or foreign inclusions. The conduit bore shall be smooth and free of blisters, nicks or other imperfections, which could mar conductors or cables.
d. Conduit, fittings and cement shall be produced by the same manufacturer to assure system integrity.

6. Conduit Bodies:
a. Made from polyvinyl chloride compound (recognized by UL), which includes inert modifiers to improve weatherability and heat distortion.

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b. Rated for use with 90 degree C conductors. Material shall comply with NEMA Specification TC-3.
c. Stainless steel hardware.
d. Cover constructed of same material with solid gasket.

7. Fittings:
a. Made from polyvinyl chloride compound (recognized by UL), which includes inert modifiers to improve weatherability and heat distortion.
b. Rated for use with 90 degree C conductors. Material shall comply with NEMA Specification TC-3.

2.03 METAL CONDUIT

A. Rigid Steel Conduit: ANSI C80.1.

B. Intermediate Metal Conduit (IMC): Rigid steel.

C. Fittings and Conduit Bodies: ANSI/NEMA FB 1; material to match conduit all steel fittings.

2.04 PVC COATED METAL CONDUIT

A. Description: NEMA RN 1, rigid steel conduit with external PVC coating, 40 mil thick.

B. Fittings and Conduit Bodies: ANSI/NEMA FB 1, steel fittings with external PVC coating to match conduit.

2.05 ELECTRICAL METALLIC TUBING (EMT)

A. Description: ANSI C80.3; galvanized tubing.

B. Fittings and Conduit Bodies: ANSI/NEMA FB 1; steel or malleable iron, insulated throat connectors.

2.06 NONMETALLIC CONDUIT

A. Description: NEMA TC 2; Schedule 40 PVC.

B. Fittings and Conduit Bodies: NEMA TC 3.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify routing and termination locations of conduit prior to rough in.

B. Verify conduit routing. Routing as shown on Drawings is in approximate locations unless dimensioned. Route as required to complete wiring system.

3.02 FIELD MEASUREMENTS

A. Field verify all measurements. Do not base conduit rough-in or equipment locations on dimensions obtained from the contract drawings.

B. Identify conflicts with the work of other trades prior to installation of electrical equipment and conduit work.

C. Adjust conduit system installation to satisfy field requirements.

3.03 DELIVERY, STORAGE AND HANDLING

A. Receive, sign for and store all equipment in this section.

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B. Accept conduit on site. Inspect for damage.

C. Protect conduit from corrosion and entrance of debris by storing above grade. Provide appropriate covering.

D. Protect PVC conduit from sunlight.

3.04 INSTALLATION

A. General:

1. The complete installation shall be done in a neat, workmanlike manner in accordance with all applicable codes and the manufacturer's recommendations.
2. Install all materials, assemblies and equipment in strict accordance with manufacturer's recommendations and instructions. Consult manufacturer for all wiring diagrams, schematics, sizes, outlets, etc. before installing.
3. All conduit shall be installed in building unless indicated otherwise.
4. All conduits stubbed into ceiling shall have end bushings.
5. Install conduit in accordance with NECA "Standard of Installation."
6. Install nonmetallic conduit in accordance with manufacturer's instructions.
7. Arrange supports to prevent misalignment during wiring installation.
8. Support conduit using coated steel or malleable iron straps, lay in adjustable hangers, clevis hangers, and split hangers.
9. Group related conduits: support using conduit rack. Construct rack using steel channel; provide space on each for 25 percent additional conduits.
10. Fasten conduit supports to building structure and surface under provisions of Section 26 05 29.
11. Do not support conduit with wire or perforated pipe straps. Remove wire used for temporary supports.
12. Do not attach conduit to ceiling support wires.
13. Arrange conduit to maintain headroom and present neat appearance.
14. Route exposed conduit parallel and perpendicular to walls.
15. Route conduit in and under slab from point to point.
16. Do not cross conduits in slab.
17. Maintain adequate clearance between conduit and piping.
18. Maintain 12 inch clearance between conduit and surfaces with temperatures exceeding 104 degrees F.
19. Cut conduit square using saw or pipecutter; de burr cut ends.
20. Bring conduit to shoulder of fittings; fasten securely.
21. Join nonmetallic conduit using cement as recommended by manufacturer. Wipe nonmetallic conduit dry and clean before joining. Apply full even coat of cleaner and cement to entire area inserted in fitting. Allow joint to cure for 20 minutes, minimum.
22. Use conduit hubs to fasten conduit to sheet metal boxes in damp and wet locations and to cast boxes.
23. Install no more than equivalent of three 90 degree bends between boxes. Use conduit bodies to make sharp changes in direction, as around beams. Hydraulic one-shot bender may be used to fabricate factory elbows.
24. Avoid moisture traps; provide junction box with drain fitting at low points in conduit system.
25. Provide suitable fittings to accommodate expansion and deflection where conduit crosses control and expansion joints.
26. Provide suitable pull string in each empty conduit, except sleeves and nipples.
27. Use suitable caps to protect installed conduit against entrance of dirt and moisture.
28. Ground and bond conduit under provisions of Section 26 05 26.
29. Identify conduit under provisions of Section 26 05 53.
30. Seal conduit with oakem or duct seal where they leave heated areas and enter unheated areas.
31. Surface raceway shall be installed to run parallel of all existing surfaces. Where raceway is used on ceiling, raceway shall be mounted at ceiling wall junction and extended from the junction box out to ceiling mounted device. Raceway shall be routed in corners and along mouldings to be as least obtrusive as possible.

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32. Exterior cable and conduit installation.
    a. Layout in trench may be started at either end unless the drawings indicate that it is to pitch for drainage. In which case the layout should be started at the lowest end. The cable and conduit shall be pitched 1" per 100 feet.
    b. Include all excavation and backfill.
    c. Cable and conduit shall be a minimum of 30" deep.
    d. Cable and conduit shall be laid in a 6" sand bed and covered with another 6" of sand before backfilling with earth.
    e. Provide Brady identotape 12" above all buried conduits and cables.
    f. Provide #12 pull wire in all empty or spare conduits.
    g. Restore existing surface back to its original condition.
    h. For all excavation, maintain erosion protection per Federal, State, and municipal requirements. All work associated with erosion control for excavation shall be done as per Federal, State and municipal requirements, as well as any plans, meetings, and other special conditions.
    i. For all trenching that is under paved surfaces, backfill with structural material. Material shall be tapped in layers up to the point of the surface paving material.

B. Exterior Wall Penetrations
    1. For all exterior wall penetrations, patch the wall with material to match the existing wall finish. The openings shall be as small as possible to minimize the impact on the existing wall finish. Install duct seal within the conduit to prevent air flow.
    2. When conduits are rising from the ground to penetrate the walls, furnish rigid steel conduit where conduit is exposed, and deep-back LB's condulettes or NEMA 4X stainless steel junction box.

C. Interface with Other Products
    1. Install conduit to preserve fire resistance rating of partitions and other elements.
    2. Route conduit through roof openings for piping and ductwork or through suitable roof jack. Coordinate location with roofing installation.

3.05 OWNER TRAINING (NONE)

3.06 SPARE EQUIPMENT (NONE)

END OF SECTION

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SECTION 26 05 35
ELECTRICAL BOXES

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work of this section.

1.02 APPLICABLE PUBLICATIONS

A. Conform to requirements of current ANSI/NFPA 70 - National Electric Code.

B. Conform to current National Electrical Manufactures Association (NEMA) Standards.

C. Conform to current Underwriters Laboratories (UL) Specifications and Standards.

D. Conform to National Electrical Contractors Association (NECA) “Standards of Installation”.

1.03 DESCRIPTION OF WORK

A. Furnish and install boxes as indicated on drawings and specified herein.

B. The intent of this section is to limit the use of sheet steel boxes to small circuit wiring in dry locations for installations of outlets, switches, exhaust fans, lights, unit heaters, small overhead door units, small power outlets, and limiting the general circuit capacity of 50 amps or less.

C. Outlets, switches, controls and etc., installed on machinery or processes shall be served with FS and NEMA 12 type boxes.

1.04 RELATED WORK ELSEWHERE

A. Division 03: Concrete

B. Division 04: Masonry

C. Division 09: Finishes

D. Division 12: Furnishing

E. Division 26: Electrical

1.05 SHOP DRAWINGS

A. Submit shop drawings in accordance with Division 01.

1.06 OPERATION & MAINTENANCE MANUALS

A. Submit Operations & Maintenance Manuals in accordance with Division 01.

1.07 QUALITY ASSURANCE

A. Provide quality assurance in accordance with Section 26 05 00.

B. All materials, equipment and parts are to be new, undamaged and unused of current Manufacture.

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1.08 WARRANTY

A. Equipment shall be warranted for a period of not less than 1 year from the date of commissioning against defects in material and workmanship.

B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.

C. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 PRODUCTS

2.01 GENERAL

A. All materials and equipment furnished shall be current production of manufacturers regularly engaged in the manufacture of such items, and for which replacement parts are available. All materials and equipment shall be new (less than 1 year old when turned over to the Owner).

2.02 BOXES

A. Pull boxes and junction boxes: Metal construction, conforming to National Electrical Code, with screw on or hinged cover.

B. Small surface type junction boxes to be used in dry locations only for general purpose lighting and outlets shall conform to the following standard sizes and spec's:
1. All boxes and covers shall be made of stamped steel. (No sectional boxes allowed).
2. Minimum sizes:

a.	Handy boxes	4 x 2 1/8 x 2 1/8
b.	Octagon boxes	4 x 1 1/2
c.	4" sq. boxes	4 x 1 1/2 or 4 x 2 1/8
d.	4 11/16" sq. boxes	4 11/16 x 2 1/8

C. Junction and Splice Boxes:
1. Screw covers, galvanized after fabrication and not less than code dimensions.
2. Entry openings in boxes shall be made with knock-out punch tool or hole saws.
3. Burning of entry openings with a torch will not be acceptable.
4. Paint exposed ferrous surfaces, 2 coats rust resisting paint.

D. Provide outlet box divider barriers between 277/480 and 120/208 devices per N.E.C. and between switches for emergency and non-emergency circuits.

E. Raised covers to have square cut corners.

F. Where existing boxes are reused, provide add-a-depth device rings to devices installed without proper box depth to finish surface.

G. Box extensions will not be allowed.

H. Through the wall type outlet boxes not allowed.

I. Junction boxes and pull boxes shall not have knockouts. Enclosure type, material, and dimensions shall be as indicated on the drawings and as stated in these specifications. Where no type or size is indicated for junction boxes and pull boxes, they shall be one size larger than required by NEC.

J. Large junction boxes shall be constructed from steel in the following gauges:

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Box Size	Minimum Steel Gauge
Up to 24" x 30" x 12"	14
24" x 36" x 8" to 36" x 36" x 16"	12
36" x 42" x 8" and larger	11

2.03 WET LOCATION JUNCTION BOXES

A. All deck junction boxes used in submersible and wet locations shall be cast bronze construction with navel brass cord seal, neoprene cover gasket and internal grounding lugs.

B. All conduit entries into the junction box shall be threaded into the junction box housing.

C. All conduit entries shall be sealed with a potting compound and caulking material.

D. Approved equipment.

1.	Above grade double hub	Hydrel 1719
2.	Flush double entry junction box	Hydrel 1703
3.	Flush multiple entry junction box	Hydrel 1705

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify routing and termination locations of conduit prior to rough in.

3.02 FIELD MEASUREMENTS

A. Verify that field measurements are as shown on Drawings.

B. Mounting heights:
1. As shown on drawings and details.
2. Coordinate exact heights with specific manufacturer's recommendations.
3. All mounting heights of keypads and pushbuttons to be ADA compliant.

3.03 DELIVERY, STORAGE AND HANDLING

A. Receive, sign for and store all equipment in this section.

B. Maintain original quality and condition of equipment while it is in storage.

3.04 INSTALLATION

A. General:
1. The complete installation shall be done in a neat, workmanlike manner in accordance with all applicable codes and the manufacturer's recommendations.
2. Install all materials, assemblies and equipment in strict accordance with manufacturer's recommendations and instructions. Consult manufacturer for all wiring diagrams, schematics, sizes, outlets, etc. before installing.

B. All fire alarm pull and junction boxes and their covers shall be painted red and have "fire alarm" written on the cover in large black non-washable ink. The lettering shall be such that it can be read from 10' away. Note that this requirement is in addition to the NEC requirements which requires that the box itself be marked in red.

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C. Boxes that are being installed in rough masonry surfaces (such as split face block) shall be installed in such a manner to allow the wiring device or light fixture and the associated device plate to be seated squarely. Have the masonry opening cut to the size of the plate and then box grouted in, or the rough masonry around the box shall be chiseled away and mortar installed around the box to provide a flat finish.

D. Coordinate with the masonry installation all details of installation on rough masonry surfaces. Without coordination assume responsibility for all costs to provide the flat surface, which will require chiseling the surface of the rough masonry away and providing mortar to obtain this smooth finish.

E. Install electrical boxes as shown on Drawings, and as required for splices, taps, wire pulling, equipment connections and compliance with regulatory requirements.

F. Install electrical boxes to maintain headroom and to present neat mechanical appearance.

G. Install pull boxes and junction boxes above accessible ceilings and in unfinished areas only.

H. Inaccessible Ceiling Areas: Install outlet and junction boxes no more than 6 inches from ceiling access panel or from removable recessed luminaire.

I. Install boxes to preserve fire resistance rating of partitions and other elements, using materials and methods compatible with NFPA.

J. Align adjacent wall mounted outlet boxes for switches, thermostats, and similar devices with each other.

K. Use adjustable steel channel fasteners for hung ceiling outlet box.

L. Do not fasten boxes to ceiling support wires.

M. Support boxes independently of conduit.

N. Use gang box where more than one device is mounted together. Do not use sectional box.

O. Use cast outlet box in exterior locations exposed to the weather and wet locations.

P. Large Pull Boxes: Boxes larger than 100 cubic inches in volume or 12 inches in any dimension.

1. Interior Dry Locations: Use hinged enclosure.
2. Other Locations: Use surface mounted cast metal box.

Q. Grounding
1. All equipment shall be grounded in accordance with NEC, these specifications and drawings, and the equipment supplier's recommendations.

R. Interface with Other Products
1. Coordinate masonry cutting to achieve neat opening.
2. Coordinate mounting heights and locations of outlets mounted above counters, benches and backsplashes.
3. Position outlet boxes to locate luminaires as shown on reflected ceiling plan.

3.05 OWNER TRAINING (NONE)

3.06 SPARE EQUIPMENT (NONE)

END OF SECTION

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SECTION 26 05 37
LOCATION OF OUTLETS AND EQUIPMENT

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work of this section.

1.02 APPLICABLE PUBLICATIONS

A. Conform to requirements of current ANSI/NFPA 70 - National Electric Code.

B. Conform to National Electrical Contractors Association (NECA) “Standards of Installation”.

1.03 DESCRIPTION OF WORK

A. Furnish and install a complete installation as indicated on the drawings and as specified herein.

B. This specification lays out the general requirements for heights of devices. Heights of devices may be required to be changed depending on interferences in the walls or interferences with mechanical or other architectural equipment. Assume responsibility for verifying the existing conditions in the room by reviewing mechanical and architectural drawings so as not to interfere with that equipment.

C. Verification of door swings. Assume responsibility to verify door swings with the architectural plans prior to outlet box installation. Review if the switch location is such that it can be easily accessed upon opening the door.

1.04 RELATED WORK ELSEWHERE

A. Division 03: Concrete

B. Division 04: Masonry

C. Division 09: Finishes

D. Division 12: Furnishing

E. Division 26: Electrical

1.05 SHOP DRAWINGS

A. Submit shop drawings in accordance with Division 01.

1.06 OPERATION & MAINTENANCE MANUALS (NONE)

1.07 QUALITY ASSURANCE

A. Provide quality assurance in accordance with Section 26 05 00.

B. All materials, equipment and parts are to be new, undamaged and unused of current manufacture.

C. All boxes to be plumb and level.

1.08 WARRANTY

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A. Equipment shall be warranted for a period of not less than 1 year from the date of commissioning against defects in material and workmanship.

B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.

C. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 PRODUCTS

2.01 GENERAL

A. All materials and equipment furnished shall be current production of manufacturers regularly engaged in the manufacture of such items, and for which replacement parts are available. All materials and equipment shall be new (less than 1 year old when turned over to the Owner).

2.02 EQUIPMENT

A. Specifications for equipment being installed under conditions set forth in this section shall be found in related work elsewhere.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify installation locations suitability and adjust as directed.

3.02 FIELD MEASUREMENTS

A. Verify that field measurements are as shown on Drawings.

B. Mounting heights:
   1. As shown on drawings and details.
   2. Coordinate exact heights with specific manufacturer's recommendations.
   3. All mounting heights of keypads and pushbuttons to be ADA compliant.

3.03 DELIVERY, STORAGE AND HANDLING

A. Receive, sign for and store all equipment in this section prior to installation.

3.04 INSTALLATION

A. General:
   1. The complete installation shall be done in a neat, workmanlike manner in accordance with all applicable codes and the manufacturer's recommendations.
   2. Install all materials, assemblies and equipment in strict accordance with manufacturer's recommendations and instructions. Consult manufacturer for all wiring diagrams, schematics, sizes, outlets, etc. before installing.

B. Grounding
   1. All equipment shall be grounded in accordance with NEC, these specifications and drawings, and the equipment supplier's recommendations.

C. Location:

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1. Location of outlets and equipment as shown on plans is approximate. Verify exact location determined by:
    a. Construction or code requirements.
    b. Conflict with equipment of other trades.
    c. Equipment manufacturer's drawings.
2. Minor modification to the location of outlets and equipment is considered a part of this specification and shall be made with no additional compensation.

3.05 OWNER TRAINING (NONE)

3.06 SPARE EQUIPMENT (NONE)

END OF SECTION

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SECTION 26 05 53
ELECTRICAL IDENTIFICATION

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work of this section.

1.02 APPLICABLE PUBLICATIONS

A. Conform to requirements of current ANSI/NFPA 70 - National Electric Code.

B. Conform to National Electrical Contractors Association (NECA) “Standards of Installation”.

1.03 DESCRIPTION OF WORK

A. Furnish and install complete labeling as specified herein.

B. All major pieces of electrical equipment shall have engraved labels indicating their functions. This shall include the following:
   1. All disconnects shall have engraved labels indicating their functions.

1.04 RELATED WORK ELSEWHERE

A. Division 26: Electrical.

1.05 SHOP DRAWINGS

A. Submit shop drawings in accordance with Division 01.

1.06 OPERATIONS & MAINTENANCE MANUALS

A. Submit Operations & Maintenance Manuals in accordance with Division 01.

1.07 QUALITY ASSURANCE

A. Provide quality assurance in accordance with Section 26 05 00.

B. All materials, equipment and parts are to be new, undamaged and unused of current Manufacture.

1.08 WARRANTY

A. Equipment shall be warranted for a period of not less than 1 year from the date of commissioning against defects in material and workmanship.

B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.

PART 2 PRODUCTS

2.01 GENERAL

A. All materials and equipment furnished shall be current production of manufacturers regularly engaged in the manufacture of such items, and for which replacement parts are available. All materials and equipment shall be new (less than 1 year old when turned over to the Owner).

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2.02 ENGRAVED LABELS

A. Where the words "provide engraved label" appears on the drawings or in the specifications, it shall mean that the label shall be an engraved 3-layer phenolic label with black letters on white material, unless other colors are called out on the drawings or details.

B. The label size shall be a minimum of 3/4" high and be 3" long. Labels may be attached with double backed adhesive tape unless indicated otherwise.

C. Where references are made on the drawings to provide engraved labels, engraved nameplate or engraved plates, these should be engraved phenolic labels.

2.03 ENGRAVED PLATES

A. Where references are made to engraved plates, this shall mean that the normal device plate shall have an engraving on it with black letters so as to indicate what this switch or device is used for.

2.04 DISCONNECTS

A. Each disconnect furnished by this section shall have an engraved laminated label indicating which piece of equipment it controls.

B. This requirement is waived if the disconnect or starter is attached directly to the piece of equipment that it is controlling or operating.

C. the receptacle.

2.05 MISCELLANEOUS

A. Branch circuits
   1. On branch circuits, use shall be made of all standard wire insulation colors available.
   2. Where wires of different systems junction in a common box, each cable shall be grouped with its own system and identified using tags or identification strips.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify surfaces are cleaned and ready to receive labels.

B. Verify labels are correct.

C. Verify that labels are installed as specified, level and plumb.

3.02 FIELD MEASUREMENTS (NONE)

3.03 DELIVERY, STORAGE AND HANDLING

A. Receive, sign for and store all equipment in this section.

3.04 INSTALLATION

A. General:
   1. Degrease and clean surface prior to installing labels.
   2. Install nameplate and label parallel to equipment lines.
   3. Secure nameplates to equipment fronts using screws if so specified on drawings.
   4. Identify Raceways of Certain Systems with Color Banding:

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a. Band exposed or accessible raceways of the following systems for identification.
b. Bands shall be pretensioned, snap-around colored plastic sleeves, colored adhesive marking tape, or a combination of the two.
c. Make each color band 2 inches wide, completely encircling conduit, and place adjacent bands of two-color markings in contact, side by side.
d. Install bands at changes in direction, at penetrations of walls and floors, and at 40-foot maximum intervals in straight runs.

3.05 OWNER TRAINING (NONE)

3.06 SPARE EQUIPMENT (NONE)

END OF SECTION

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SECTION 26 27 28
CIRCUIT & MOTOR DISCONNECTS

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Drawings and general provisions of contract, including general and supplemental conditions and Division 01 specification sections, apply to work of this section.

1.02 APPLICABLE PUBLICATIONS

A. Conform to requirements of current ANSI/NFPA 70 - National Electric Code.

B. Conform to current National Electrical Manufactures Association (NEMA) Standards.

C. Conform to current Underwriters Laboratories (UL) Specifications and Standards.

1.03 DESCRIPTION OF WORK

A. Furnish and install heavy-duty fusible type disconnect switches of types scheduled at locations shown on the drawings and as specified herein.

B. Furnish and install other disconnect switches as necessary and required with proper number of poles, voltage and enclosure type ratings as required for the application and as required by the National Electrical Code.

C. The drawings may or may not indicate disconnects. Disconnects shown on drawings shall be installed for that piece of equipment, even if the disconnect is not required by code.

D. Provide proper environmental enclosure for disconnect depending on the mounting location.

E. Provide fused or non-fused disconnect as required for proper protection of the equipment.

F. Provide all code required disconnects. Assume responsibility for reviewing equipment connections and starting equipment provided with the equipment and determining if disconnects are required.

G. For fused disconnects, provide appropriately sized fuses for the equipment.

1.04 RELATED WORK ELSEWHERE

A. Division 26: Electrical

1.05 SHOP DRAWINGS

A. Submit shop drawings in accordance with Division 01.

1.06 OPERATION & MAINTENANCE MANUALS

A. Submit Operations & Maintenance Manuals in accordance with Division 01.

1.07 QUALITY ASSURANCE

A. Provide quality assurance in accordance with Section 26 00.

B. All materials, equipment and parts are to be new, undamaged and unused of current Manufacture.

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1.08 WARRANTY

A. Equipment shall be warranted for a period of not less than 1 year from the date of commissioning against defects in material and workmanship.

B. The warranty shall be comprehensive. No deductibles shall be allowed for travel time, service hours, repair parts cost, etc.

C. The warranty shall not deprive the Owner of other rights the Owner may have under other provisions of the Contract Documents and will be in addition to and run concurrent with other warranties made by the Contractor under the requirements of the Contract Documents.

PART 2 PRODUCTS

2.01 GENERAL

A. All materials and equipment furnished shall be current production of manufacturers regularly engaged in the manufacture of such items, and for which replacement parts are available. All materials and equipment shall be new (less than 1 year old when turned over to the Owner).

2.02 DISCONNECTS

A. Disconnect switches shall be heavy duty switch operated type with cover interlock and enclosed arc chamber, quick make and quick break and provision for padlocking in either the open or closed position. All heavy duty, safety switches 30 to 600A, shall be provided with Class R rejection style fuse clips. The combination rating of the heavy-duty switch and R fuse shall be 200,000 symmetrical amps and labeled as such.

B. Approved manufacturers: Square D, Cutler Hammer, General Electric or equal.

PART 3 EXECUTION

3.01 EXAMINATION

A. Verify equipment is in compliance with approved submittal drawings.

3.02 FIELD MEASUREMENTS

A. Field verify locations of disconnects with other trades. Adjust as required to meet field conditions and code requirements.

3.03 DELIVERY, STORAGE AND HANDLING

A. Receive, sign for and store all equipment in this section.

B. Maintain original quality and condition of equipment while it is in storage.

3.04 INSTALLATION

A. General:
   1. The complete installation shall be done in a neat, workmanlike manner in accordance with all applicable codes and the manufacturer's recommendations.
   2. Install all materials, assemblies and equipment in strict accordance with manufacturer's recommendations and instructions. Consult manufacturer for all wiring diagrams, schematics, sizes, outlets, etc. before installing.
   3. Mount per Section 26 05 29.

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B. Cleaning:
   1. Prior to turning the system over to the Owner, the system shall be physically cleaned.
   2. All appearance defects shall be carefully and professionally touched up so that the equipment is in “factory new” condition.
   3. At the completion of the work, remove from the building and the premises all rubbish and debris resulting from the work.

3.05 OWNER TRAINING

A. Provide one hour minimum training on operation and trouble shooting each system in this section.

3.06 SPARE EQUIPMENT

A. Provide one set of spare fuses for each fusible disconnect provided.

END OF SECTION

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SECTION 31 05 19.13
GEOSYNTHETICS FOR EARTHWORK

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. American Society for Testing and Materials (ASTM), Annual Book of ASTM Standards, Current Edition.
   2. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition at time of bid opening.

1.03 DESCRIPTION OF WORK

A. The work under this section shall cover furnishing and installing geotextile fabrics for subgrade separation and stabilization, and under riprap in accordance with the contract drawings and specified herein, and in accordance with Section 645 of the State of Wisconsin, Department of Transportation, Standard Specifications.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Submittals - Division 01

C. Subgrade Preparation - Division 31

D. Riprap - Division 31

1.05 SUBMITTALS

A. Contractor shall submit such product literature and catalog cuts of materials to be supplied to relate these materials to the specifications. Information shall be in conformance with requirements of Submittals - Division 01 of these specifications.

B. The Contractor shall furnish to the Engineer at least ten days prior to use in the work a manufacturer's Certified Report of Test or Analysis that the geotextile fabric delivered for use conforms to this specification. The delivered geotextile fabric shall bear markings to clearly identify it with the applicable test report furnished to the Engineer.

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 GENERAL

A. The geotextile fabric shall consist of either woven or nonwoven polyester, polypropylene, stabilized nylon, polyethylene or polyvinylidene chloride. All fabric shall have the minimum strength values in the weakest principal direction. Nonwoven fabric may be needle punched, heat bonded, resin bonded, or combinations thereof.

B. The geotextile fabric shall be insect, rodent, mildew, and rot resistant.

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C. The geotextile fabric shall be furnished in a wrapping which will protect the fabric from ultraviolet radiation and from abrasion due to shipping and hauling. The geotextile is to be kept dry until installed.

D. The geotextile fabric rolls shall be clearly marked showing the type of fabric.

E. Samples of fabric for testing may be obtained from the job site as specified herein or as determined by the Engineer.

F. If sewn seams are used, the Contractor shall furnish a field sewn seam sample produced from the geotextile fabric and thread and with the equipment to be used on the project, prior to its incorporation into the work.

G. All numerical values specified below represent minimum/maximum average roll values (i.e., the average of minimum test results on any roll in a lot should meet or exceed the minimum specified values).

2.02 GEOTEXTILE FABRIC, TYPE SAS (SUBGRADE AGGREGATE SEPARATION)

A. The fabric shall comply with the following physical properties:

Test	Method	Value
Grab Tensile Strength, lbs	ASTM D 4632	170 min.
Apparent Opening Size, U.S. Standard Sieve	ASTM D 4751	70 max.
Permittivity, SEC^{-1}	ASTM D 4491	0.35 min.

B. Acceptable materials are Geotex 701, Thrace-LINQ 160EX, Mirafi 170N, and US 180 NW, or equal.

2.03 GEOTEXTILE FABRIC, TYPE R (RIPRAP)

A. The fabric shall comply with the following physical properties:

Test	Method	Value
Grab Tensile Strength, lbs	ASTM D 4632	200 min.
CBR Puncture Strength	ASTM D 6241	500 min.
Apparent Breaking Elongation, Percent	ASTM D 4632	20 min.
Apparent Opening Size, U.S. Standard Sieve	ASTM D 4751	30 max.
Permittivity, SEC^{-1}	ASTM D 4491	0.40 min.

B. Acceptable materials are Geotex 801, Thrace-LINQ 180EX, Mirafi 180N, and US NW 205, or equal.

2.04 GEOTEXTILE FABRIC, TYPE HR (HEAVY RIPRAP)

A. The fabric shall comply with the following physical properties:

Test	Method	Value
Grab Tensile Strength, lbs	ASTM D 4632	300 min.
CBR Puncture Strength	ASTM D 6241	800 min.
Apparent Breaking Elongation, Percent	ASTM D 4632	20 min.
Apparent Opening Size, U.S. Standard Sieve	ASTM D 4751	30 max.
Permittivity, SEC^{-1}	ASTM D 4491	0.40 min.

B. Acceptable materials are Geotex 1201, Thrace-LINQ 275EX, Mirafi 1120N, Mirafi HP370, and US 300 NW, or equal.

2.05 GEOTEXTILE FABRIC, TYPE RSF (RECIRCULATING SAND FILTER)

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A. The filter fabric shall be of preferentially orientated isostatic polypropylene. Fabric shall be nonwoven and may be needle punched, heat bonded, resin bonded or combination thereof. Fabric shall have the following characteristics:

Test Property	Test Method	Value Minimum Requirements[1]
Nominal Weight (oz/yd^2)	ASTM D5261	8.0
Grab Tensile (lbs)	ASTM D4632	205
Grab Elongation At Break (%)	ASTM D4632	50
Puncture Resistance (lbs)	ASTM D4833	95
Trapezoidal Tear (lbs)	ASTM D4533	85
Mullen Burst (psi)	ASTM D3786	300
Water Flow Rate (gpm/ft^2)	ASTM D4491	130
Permittivity (sec^{-1})	ASTM D4491	1.6
Permeability kv (cm/sec)	ASTM D4491	0.4
A.O.S.[2] (sieve size)	ASTM D4751	120-80
UV Resistance (500 hrs)[3]	ASTM D4355	>85
pH Resistance		2-13

B. Acceptable manufacturer of filter fabric materials are Phillips 66, Polyfelt, Mirafi, Du Pont, Webtec, or equal.

PART 3 EXECUTION

3.01 GENERAL

A. Installation procedures shall be in accordance with manufacturer's recommendations and as specified herein.

B. Sewing. All factory and field seams shall be sewn with a thread having the same or greater durability as the material in the fabric. A 401 stitch conforming to Federal Standard No. 751a shall be used for all seams. All seams shall develop a tensile strength equal to or greater than 60 percent of the specified grab tensile strength of the fabric, unless otherwise specified.

3.02 GEOTEXTILE FABRIC, TYPE SAS

A. Prior to the placement of the geotextile fabric, the subgrade shall be smoothed, shaped and compacted to the required grade, section, and density. After the fabric has been placed on the subgrade area, no traffic or construction equipment will be permitted to travel directly on the fabric.

B. The fabric shall be rolled out on the roadway and pulled taut manually to remove wrinkles. Separate pieces of fabric shall be joined by overlapping or sewing. The fabric in the overlapped joints shall be placed with a minimum overlap of 18 inches.

C. Weight or pins may be required to prevent lifting of the fabric by wind.

D. After placement, the fabric shall be exposed no longer than 48 hours prior to covering.

E. The base course material shall be placed over the fabric by back dumping with trucks and leveling with a crawler dozer. Construction equipment shall be such that ruts do not exceed 3 inches in depth. All ruts shall be filled with additional material. The smoothing of ruts without adding additional material will not be permitted. Damaged areas shall be covered with a patch of fabric using a 36 inch overlap in all directions.

3.03 GEOTEXTILE FABRIC, TYPE R

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[1] Values in weaker principal direction. All minimum values represent minimum average roll values (i.e., test results from any sampled roll in a lot, tested in accordance with ASTM D 4759 shall meet or exceed the minimum values listed).

[2] Small sieve size number represents the maximum average roll value.

[3] UV resistance testing is based on results from independent conformance testing.

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A. The area shall be graded smooth and all stones, roots, sticks, or other foreign material which would interfere with the fabric being completely in contact with the soil shall be removed prior to placing the fabric.

B. The fabric shall be placed loosely and laid parallel to the direction of the water movement. Pinning or stapling may be required to hold the geotextile in place. Separate pieces of fabric shall be joined by overlapping or sewing. The fabric in the overlapped joints shall be placed with a minimum overlap of 24 inches in the direction of the flow.

C. After placement, the fabric shall be exposed no longer than 48 hours prior to covering.

D. Damaged areas shall be covered with a patch of fabric using a 36 inch overlap in all directions.

E. Placement of riprap shall be from the base of the slope upward. Height of free fall of riprap shall be determined by the Engineer but in no case shall this height exceed 12 inches.

3.04 GEOTEXTILE FABRIC, TYPE HR

A. The construction methods for Type HR fabric shall conform to the requirements of Subsection 3.03, except that the height of freefall of riprap shall not exceed 6 inches.

3.05 GEOTEXTILE FABRIC, TYPE RSF (RECIRCULATING SAND FILTER)

A. The fabric shall be placed directly upon the sand filter liner.

B. After placement, the liner shall be exposed no longer than 48 hours prior to covering.

C. Damaged areas shall be covered with a patch of fabric using a 36 inch overlap in all directions.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Geosynthetics for earthworks shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 GEOTEXTILE FABRIC

A. Geotextile Fabric, Square Yards. The measurement for geotextile fabric of the specified type shall be by the square yard of surface area upon which the geotextile fabric has been placed. Payment shall be made at the contract unit price bid per square yard of geotextile fabric of the specified type installed, as measured.

END OF SECTION

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SECTION 31 11 00
CLEARING AND GRUBBING

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition at time of bid opening.

1.03 DESCRIPTION OF WORK

A. Under this item the Contractor shall furnish all equipment and labor necessary to cut and dispose of any vegetation within the clearing limits as described in this section and specified herein.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

1.05 SUBMITTALS (NONE)

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS (N/A)

PART 3 EXECUTION

3.01 CLEARING AND GRUBBING

A. Clearing and Grubbing shall consist of cutting and disposing of trees, brush, windfalls, logs, and other vegetation occurring within the clearing limits, and the removing and disposing of roots, stumps, stubs, grubs, logs and other timber from within the grubbing limits.

B. All work performed under this section shall be done in accordance with Subsection 201.3 of the State of Wisconsin, Department of Transportation, Standard Specifications, with the following exceptions and additions:
   1. Clearing and Grubbing Limits defined as follows:
      a. Trees/brush as individually marked for removal.
      b. Between lines 3 feet outside the grading limits (slope-intercept line) of the roadway cuts and fills, including intercepting embankments, channels, ditches, borrow pits, and marsh or waste disposal area.
      c. Other parts of the right-of-way as designated in the plans or special provisions.
      d. With Engineer's approval, areas with vegetation that interferes with excavation, embankment, or other construction operations.
      e. At no time shall Clearing and Grubbing operations extend beyond the right-of-way without written approval from both Engineer and Owner.
      f. At no time shall Clearing and Grubbing operations occur on trees, brush, or other vegetation clearly marked for preservation.

3.02 DISPOSAL OF MATERIALS

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A. Material removed shall be removed from the site and disposed of by the Contractor in accordance with all local codes and ordinances.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Clearing and Grubbing shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

C. The following incidental Clearing and Grubbing operations required to perform the work will not be measured, and will be considered inclusive to the work for which the incidental Clearing and Grubbing must occur:

1. Clearing areas of light brush, shrubs, and other vegetation that Contractor removes with a brush scythe or mowing machine.
2. Clearing areas containing logs, tree roots, roots of brush and shrubs, and other vegetation having a woody structure that the Contractor can remove with a rooter.
3. Trimming overhanging limbs and branches to provide required clearance.
4. Clearing and Grubbing borrow pits.

4.02 CLEARING AND GRUBBING

A. Clearing and Grubbing, Inch of Diameter. When so provided, measurement for Clearing and Grubbing will be by the inch of diameter acceptably completed. The diameter of the tree at a distance 4 feet above the existing ground level will be used (diameter will be computed by dividing circumference by 3.14). Only those trees and stumps larger than 3-inches in diameter will be added to the measurement. Measurement will be rounded to the nearest inch. Payment will be made at the contract unit price bid per inch of diameter cleared and grubbed.

B. Clearing and Grubbing, Square Yards. When so provided, measurement for Clearing and Grubbing will be by the square yard of horizontal area bounded by the trunks cut and/or grubbed. Payment for Clearing and Grubbing shall be made at the contract square yard price bid or as specified in Special Procedures - Division 01.

C. Clearing and Grubbing, Lump Sum. When so provided, payment for Clearing and Grubbing shall be made at the contract lump sum price bid or as specified in Special Procedures - Division 01.

D. Clearing and Grubbing, Inclusive. When no quantity is provided, Clearing and Grubbing shall be considered inclusive in the payment for contract work related to the associated construction.

END OF SECTION

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SECTION 31 22 00
GRADING

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition at time of bid opening.

1.03 DESCRIPTION OF WORK

A. The work covered under this section shall consist of furnishing all material, equipment, and labor required to execute the grading for this project.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Structural Excavation for Structures - Division 31

C. Trenching and Backfilling - Division 31

D. Erosion and Sedimentation Controls - Division 31

E. Topsoil Placement and Grading - Division 32

F. Seeding - Division 32

G. Sodding - Division 32

1.05 SUBMITTALS (NONE)

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS (NONE)

PART 3 EXECUTION

3.01 PROTECTION OF EXISTING UTILITIES

A. Locate existing underground utilities in the areas of work before starting grading operations and provide adequate means of protection during earthwork operations. Should uncharted or incorrectly charted piping or other utilities be encountered during grading, consult the Engineer immediately for directions on how to proceed. Cooperate with the Owner, and public and private utility companies in keeping their respective services and facilities in operation.

B. Repair damaged utilities to the satisfaction of the utility owner.

3.02 PRESERVATION OF TREES AND SHRUBS

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A. Trees and shrubs to be preserved shall be thoroughly protected from scarring or other injury during grading operations. Excavation operations shall not disturb the original ground around trees within a distance of one foot or twice the diameter of the tree, whichever is greater. Exposed roots resulting from excavation shall be cut cleanly and covered with humus-bearing soil.

B. When necessary or required by the Contract Documents, trees or shrubs around which embankment is placed shall be protected by tree wells built in accordance with detailed drawings or as laid out in the field by the Owner or Engineer.

3.03 GRADING

A. General. All areas within the project limits shall be graded to the finished grades, lines and details less an allowance for topsoil and/or sod depth, pavement, base and structures.

B. Construction Methods. Grading shall be performed in accordance with Sections 205, 206, 207, and 208, of the State of Wisconsin, Department of Transportation Standard Specifications. If borrow is needed to provide the grades and elevations required, a borrow area will be selected by the Owner. The borrow area shall be restored to smooth lines, topsoiled with a minimum of 6 inches of salvaged topsoil and seeded.

C. Tolerance. Finish earth grades shall be in reasonably close conformity with the lines, grades and thickness shown on the contract drawings or established by the Engineer with particular concern for drainage and appearance. Finish earth grades along buildings or structures, under and adjacent to pavements and in drainageways shall be within 0.10 foot of those staked or shown on the contract drawings. Grades in all other areas shall be within 0.50 foot unless drainage considerations require more accuracy.

3.04 DRAINAGE

A. During construction, ditches and channels shall be drained by keeping the excavation areas and embankment sloped to the approximate section of the final earth grade. If existing surface drainage must be interrupted, temporary drainage shall be provided.

B. Construction in and adjacent to flowing streams shall be performed to avoid washing, sloughing or deposition of materials into the channel which may obstruct or impair stream flow, or which may result in contamination and/or silting of the stream.

C. Precautions shall be taken to preserve, protect, and continue service of all existing tile drains, sewers, and other subsurface utilities; repair any damage to drains, sewers, and utilities.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Grading shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 GRADING

A. Grading, Square Yards. When so provided, payment for grading shall be made at the contract square yard price bid.

B. Grading, Lump Sum. When so provided, payment for grading shall be made at the contract lump sum price bid.

C. Grading, Inclusive. When no quantity is provided, grading shall be in inclusive to payment for work associated with related utility or infrastructure improvement.

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END OF SECTION

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SECTION 31 23 13
SUBGRADE PREPARATION

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition at time of bid opening.

1.03 DESCRIPTION OF WORK

A. The work under this section shall cover furnishing all material, equipment, and labor required to execute the earthwork for this project in accordance with Sections 201 through 214 of the State of Wisconsin, Department of Transportation Standard Specifications.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Erosion and Sedimentation Controls - Division 31

C. Aggregate Base and Subbase - Division 32

D. Topsoil Placement and Grading - Division 32

E. Seeding - Division 32

F. Sodding - Division 32

1.05 SUBMITTALS (NONE)

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS (N/A)

PART 3 EXECUTION

3.01 PRESERVATION OF TREES AND SHRUBS

A. Trees and shrubs to be preserved shall be thoroughly protected from scarring or other injury during grading operations. Excavation operations shall not disturb the original ground around trees within a distance of one foot or twice the diameter of the tree, whichever is greater. Exposed roots resulting from excavation shall be cut cleanly and covered with humus-bearing soil.

B. When necessary or required by the Contract Documents, trees or shrubs around which embankment is placed shall be protected by tree wells built in accordance with Detailed Drawings or as laid out in the field by the Owner or Engineer.

3.02 UNCLASSIFIED EXCAVATION AND GRADING

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A. Excavation to subgrade shall be performed to provide a finished subgrade prepared for the application of crushed aggregate, curb and gutter, sidewalks and topsoil as shown on the typical section.

B. Also included is the removal and disposal of existing stumps, trees, miscellaneous structures and rubble as shown on the contract drawings and any other obstructions encountered which interfere with the proposed construction. Stumps shown on contract drawings to be removed from terraces or backslopes shall be shredded to a minimum of 6 inches below finish subgrade or otherwise removed by the Contractor.

C. Driveways shall be graded to a 10:1 maximum slope to match proposed construction.

D. The Contractor shall adjust all valve boxes, manhole frames, and other utility appurtenances to within 1 inch of the final grade as shown on the contract drawings or as staked in the field by the Engineer.

3.03 FILLING

A. All suitable excavated material shall be used for roadway construction, and at other places shown on the drawings.

B. Fill shall be spread in successive uniform horizontal layers not exceeding 9 inches in depth over entire area before compaction. Each layer shall be worked to break down clods over 6 inches in size and to secure uniform moisture content. Where filling in 9 inch layers is not feasible, as in the case of filling in water or over steep slopes, construct fill in one layer to the minimum elevation at which equipment can be operated. Above this elevation, the fill shall be constructed in layers of the specified depth.

C. Compact each layer of fill material to the following percentage of maximum dry density per modified proctor (ASTM D1557).
   1. 91 percent for fine grained soils (more than 50 percent passing the No. 200 sieve).
   2. 93 percent for coarse-grained soils (less than 50 percent passing the No. 200 sieve).

3.04 PREPARATION OF SUBGRADE

A. The preparation of the subgrade shall consist of bringing the area to be paved to a subgrade conforming to the required grade and cross section, of uniform density, ready to receive the base course. This is to be accomplished by excavating or backfilling as needed, shaping, watering as required, or permitting to dry to proper consistency, and rolling the entire area with an approved self-propelled roller weighing not less than 8 tons. Shaping and rolling shall be continued until the subgrade has been properly prepared and shows that no further compaction of any practical benefit would result from continued compaction. The subgrade shall be tested as to cross section, crown, and elevation. After being properly prepared, it shall be so maintained until the base course is constructed. A completed subgrade shall be maintained sufficiently in advance of the base course operations to permit proper control. Any part of the subgrade area not accessible to a roller shall be thoroughly compacted by hand or mechanical compaction in a manner acceptable to the Engineer. This work shall be in accordance with Section 211 of the State of Wisconsin, Department of Transportation Standard Specifications.

3.05 UNSTABLE SUBBASE/EXCAVATION BELOW SUBGRADE (EBS)

A. Deposits of frost-heave material, unstable soils, topsoil containing considerable amounts of organic matter, or other undesirable foundation material shall be removed from the area within the roadbed depths as shown on the drawings or as directed by the Engineer and shall be replaced as directed by the Engineer in the field.

B. Contractor shall notify the Engineer of any questionable material. The work shall be performed in accordance with Section 205 of the State of Wisconsin, Department of Transportation, Standard Specifications.

3.06 DRAINAGE

A. During construction, ditches and channels shall be drained at all times by keeping the excavation areas and embankments sloped to the approximate section of the final earth grade. If existing surface drainage must be interrupted, temporary drainage shall be provided.

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B. Construction in and adjacent to flowing streams shall be performed to avoid washing, sloughing or deposition of materials into the channel which may obstruct or impair stream flow, or which may result in contamination and/or silting of the stream.

C. Precautions shall be taken to preserve, protect, and continue service of all existing tile drains, sewers, and other subsurface utilities; repair any damage to drains, sewers and utilities.

3.07 TESTING

A. A testing laboratory will perform compaction and density tests at locations determined by the Owner's Authorized Representative. Where tests indicate that the subgrade does not conform to the compaction density specified, the subgrade shall be replaced or re-worked until it does conform.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Subgrade preparation shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 UNCLASSIFIED EXCAVATION

A. Unclassified Excavation, Cubic Yards. The measurement and payment for this item shall be per cubic yard. Measurement shall be taken in the field by cross sections before excavation and after topsoiling is placed, where required. Payment shall be made at the contract unit price bid per cubic yard of unclassified excavation.

B. Unclassified Excavation, Lump Sum. Payment for subgrade preparation shall be made at the contract lump sum price bid for unclassified excavation.

4.03 UNSTABLE SUBBASE/EXCAVATION BELOW SUBGRADE

A. Excavation Below Subgrade, Cubic Yards. The measurement and payment for this item shall be per cubic yard. Measurement shall be taken in the field by cross sections before any excavation below subgrade takes place and after a stable subbase is reached. Payment shall be made at the contract unit price bid per cubic yard of excavation below subgrade.

END OF SECTION

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SECTION 31 23 19
DEWATERING

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern the work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. Wisconsin Administrative Code (WAC), Department of Natural Resources Environmental Protection Regulations, Current Edition.

1.03 DESCRIPTION OF WORK

A. The work under this section shall cover furnishing all materials and labor to keep all excavations free of water during the preparation of the subgrade, to keep all concrete and masonry work free of water through the time period specified herein, and to keep the excavation free of water during backfilling.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Trenching and Backfilling - Division 31

C. Erosion and Sedimentation Controls - Division 31

1.05 SUBMITTALS (NONE)

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

1.07 PERMITS AND APPROVALS

A. The Contractor shall obtain a High Capacity Well Permit from the Wisconsin Department of Natural Resources for all wells installed or operated for pumping groundwater to lower the groundwater table, for which the single or aggregate well capacity may be 70 gallons per minute (gpm) or greater. The Contractor shall submit the High Capacity Dewatering Well Application (Form 3300-258) to the Wisconsin Department of Natural Resources, Private Water Supply Section, P.O Box 7921, Madison, WI 53707, along with any necessary permit fees, and obtain said permit prior to the construction or operation of said high capacity well(s).

B. Permit Fees. Permit fees include, but are not limited to, high capacity well permits and Great Lakes Basin discharge fees.

C. The Contractor shall be responsible for all equipment, labor, materials and supplies required to comply with the requirements of the High Capacity Dewatering Well Permit, if necessary, at no additional cost to the Owner.

HIGH CAP WELL - GENERAL PERMIT APPLICATION INSTRUCTION - https://dnr.wisconsin.gov/sites/default/files/topic/Wells/HighCap/HighCapAppInstructions.pdf

HIGH CAP WELL - GENERAL PERMIT APPLICATION - https://dnr.wi.gov/files/PDF/forms/3300/3300-258.pdf

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A. The Contractor shall apply for and obtain a Dewatering Operations General Permit (Form 3400-201, available from the link below), Wisconsin Pollution Discharge Elimination System (WPDES) Permit No WI-0049344-5. The permit, if required should be submitted on the DNR's website through their online permitting process.

DEWATERING - GENERAL PERMIT AND REQUEST FOR COVERAGE -
Wizard: Wastewater General Permit Eligibility: Dewatering Operations (WI-0049344-05-0) Survey
Application Log-in: https://permits.dnr.wi.gov/water/SitePages/Waste%20Water%20Permit.aspx

HIGH CAP WELL - GENERAL PERMIT APPLICATION INSTRUCTION –
https://dnr.wisconsin.gov/sites/default/files/topic/Wells/HighCap/HighCapAppInstructions.pdf

HIGH CAP WELL - GENERAL PERMIT APPLICATION - https://dnr.wi.gov/files/PDF/forms/3300/3300-258.pdf

A. The Contractor shall apply for and obtain a Dewatering Operations General Permit (Form 3400-201, available from the link below), Wisconsin Pollution Discharge Elimination System (WPDES) Permit No WI-0049344-5. The permit, if required should be submitted on the DNR's website through their online permitting process.

DEWATERING - GENERAL PERMIT AND REQUEST FOR COVERAGE -
Wizard: Wastewater General Permit Eligibility: Dewatering Operations (WI-0049344-05-0) Survey
Application Log-in: https://permits.dnr.wi.gov/water/SitePages/Waste%20Water%20Permit.aspx

B. The Contractor shall be responsible for all requirements of the General Discharge Permit Dewatering Operations, including monitoring, metering, sampling, testing, and reporting, and shall also be responsible for compliance with all discharge limits contained in the General Discharge Permit.

C. The Contractor shall be responsible for all equipment, labor, materials and supplies required to comply with the requirements of the General Discharge Permit for Dewatering Operations, at no additional cost to the Owner.

PART 2 PRODUCTS AND MATERIALS

2.01 GENERAL

A. The Contractor shall furnish dewatering sumps, wells, discharge pipe, and pumping equipment as may be required to adequately dewater the work.

2.02 PUMPING EQUIPMENT

A. Pumping equipment shall be capable of running continuously except for conditions which may be approved by the Engineer.

2.03 WELLS

A. For the purposes of compliance, the provisions of chapter NR 812 apply to all new and existing drill holes to be utilized for the purpose of dewatering and the following:
1. Wells governed under chapter NR 141 do not apply, unless they are high capacity wells, and shall not be used for the purpose of dewatering.

PART 3 EXECUTION

3.01 WATER LEVELS

A. At all times during the excavation period and until its completion and acceptance at final inspection, ample means and equipment shall be provided with which to remove promptly, and dispose of properly, all water

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entering any excavation or other parts of the work. The excavation shall be kept dry and groundwater levels shall be kept low enough to prevent a quicksand condition from ruining the excavation bottom.

B. Water levels shall be maintained at a level below all open excavations for structures and below the level of concrete until the concrete has been in place for 14 days or until test cylinders show the concrete strength to be at least 3,000 pounds per square inch or until high-early-strength concrete has been in place for 6 days or until test cylinders show the strength of the concrete to be at least 3,000 pounds per square inch. Water levels will be allowed to rise on structures prior to the concrete attaining its strength provided that water levels are raised uniformly on each side of walls. At no time shall water be allowed to rise on a structure within 12 hours of the final concrete placement.

C. Concrete immersed in water for the required period of time shall be an acceptable alternative for the concrete curing specified in Cast-in-Place Concrete - Division 03 of these specifications.

D. Water levels shall be maintained at a minimum level of 6 inches below the invert elevation of a pipe during placement.

3.02 WELLS

A. For the purposes of construction and installation, and abandonment, the provisions of chapter NR 812 apply to all drillholes and wells.

B. For the purpose of operation for wells used for dewatering, these operations shall be in accordance with the requirements of these specifications, the Engineer and all local, municipal, and state codes, rules and regulations.

3.03 DISCHARGE LINE

A. Discharge line shall be at a location approved by the Engineer.

3.04 DISPOSAL OF WATER

A. All water discharged from work sites shall be disposed of in such a manner to minimize erosion and sedimentation. Water must be discharged to a hard surface such as metal sheeting, wood sheeting, concrete, etc., so that erosion at the discharge point is eliminated.

B. Temporary and permanent erosion and sedimentation control measures shall be performed by the Contractor during construction to control water pollution, erosion and siltation, through the use of intercepting embankments, berms, dikes, dams, settling basins, sodding, planting and other erosion control devices or methods.

C. No water shall be discharged to sanitary sewers.

D. No water containing settleable solids shall be discharged into storm sewers.

3.05 SAMPLING AND MONITORING

A. Sampling and monitoring shall be performed by the Contractor in accordance with WPDES permit requirements. The cover letter accompanying the permit shall specify which parameters shall be monitored to assure compliance with water quality standards or treatment technology based standards.

B. Samples representative of the discharge shall be collected after treatment and prior to discharge to the environment. When treatment efficiency reporting is required, the influent sample shall be collected before the water passes through the treatment unit.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

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A. Dewatering shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 DEWATERING

A. Dewatering, Lump Sum. When so provided, payment for dewatering shall be made at the contract lump sum price bid.

B. Dewatering, Inclusive. When no quantity is provided, dewatering shall be considered inclusive to payment for work associated with the related utility or construction.

END OF SECTION

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SECTION 31 23 23.14
GRANULAR FILL

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition at time of bid opening.
   2. American Society for Testing and Materials (ASTM), Annual Book of ASTM Standards, Current Edition.

1.03 DESCRIPTION OF WORK

A. The work covered under this section shall consist of furnishing all material, equipment, and labor required to execute the filling, compaction, and testing of all subgrade excavations for this project.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Subgrade Preparation - Division 31

1.05 SUBMITTALS (NONE)

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 GRANULAR FILL

A. All granular subbase and granular fill materials shall conform to Section 209 of the State of Wisconsin, Department of Transportation, Standard Specifications.

B. Unless otherwise noted in the Contract Drawings or specifications, all Granular Backfill material shall be Grade 1 Backfill in accordance with the gradation requirements of Section 209 of the State of Wisconsin, Department of Transportation, Standard Specifications.

PART 3 EXECUTION

3.01 COMPACTION

A. Granular fill materials shall be mechanically compacted in 6 inch to 8 inch lifts to 93 percent maximum dry density per modified proctor (ASTM-D1557).

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Granular fill shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

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B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 GRANULAR FILL

A. Granular Fill, Cubic Yards. The measurement for granular fill shall be by the cubic yard truck volume or as specified in Special Procedures - Division 01. Payment shall be made at the contract unit price bid per cubic yard of granular fill installed, as measured or as specified in Special Procedures - Division 01.

B. Granular Fill, Ton. The measurement for granular fill shall be by the ton or as specified in Special Procedures - Division 01. Weight tickets from approved truck scales shall be provided. Payment shall be made at the contract unit price bid per ton of granular fill installed, as measured or as specified in Special Procedures - Division 01.

END OF SECTION

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SECTION 31 23 33
TRENCHING AND BACKFILLING

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. American Society for Testing and Materials (ASTM), Annual Book of ASTM Standards, Current Edition.
   2. Code of Federal Regulations (CFR), Title 29, Chapter XVII - Occupational Safety and Health Administration (OSHA), Department of Labor, Part 1926 Regulations, Current Edition.
   3. Wisconsin Administrative Code (WAC), Department of Natural Resources, Environmental Protection, Regulations, Current Edition.
   4. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition at time of bid opening.

1.03 DESCRIPTION OF WORK

A. The work under this section shall include all excavating, trenching, and backfilling for utilities as indicated from the contract drawings and as specified herein.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Dewatering - Division 31

C. Rock Excavation – Division 31

D. Structural Excavation for Structures - Division 31

E. Erosion and Sedimentation Controls - Division 31

F. Utility Horizontal Directional Drilling – Division 33

1.05 SUBMITTALS (NONE)

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 INSITU BACKFILL MATERIAL

A. Previously excavated soil free of organic debris, clay balls, and aggregate larger than 1-1/2 inches as approved by the Engineer.

2.02 IMPORTED GRANULAR BACKFILL (TRUCKED BACKFILL) MATERIAL

A. Imported granular fill (trucked backfill) shall be sand conforming to State of Wisconsin, Department of Transportation, Standard Specifications Subsection 209.2.2, Grade No. 1 Granular Backfill or well-graded sand and gravel conforming to Subsection 305.2.2.1 of said State Standard Specification 1-1/4 inch dense graded base with not more than eight percent (8 percent) by weight passing a No. 200 sieve.

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2.03 FLOWABLE BACKFILL

A. A cubic yard of flowable backfill shall consist of 1,350 pounds of sand, 775 pounds of #1 stone, 1,150 pounds of #2 stone, and 25 gallons of water. All weights are damp weights and no additional water will be allowed.

B. The #1 stone shall conform to the gradation of ASTM C33 No. 67 Stone. The #2 stone shall conform to the gradation of ASTM C33 No. 4 stone.

2.04 CONTROLLED LOW STRENGTH MATERIAL (CLSM)

A. The CLSM shall include fine aggregate, cementious material, and water to produce a flowable, non-shrinking backfill. The strength of the CLSM shall be less than 1200 psi. If future excavation of the area is a possibility, the CLSM shall have a maximum strength of 150 psi. The Contractor shall submit a mix design to the Engineer for approval prior to use.

PART 3 EXECUTION

3.01 SURFACE OBSTRUCTIONS

A. Structures, sidewalk, driveways, curb and gutter, trees, shrubs, lawns, signs, fences, utilities, survey monuments, pavements, culverts and other appurtenances which are adjacent to the right-of-way or work easements, shall be carefully protected against damage. In the event of damage or inadvertent injury or removal of these surface features by failure of the Contractor to exercise reasonable precautions or proper construction techniques, he shall bear the full cost and responsibility for resulting damages and shall replace or repair such damage as early as possible. No allowance for extra payment or time lost will be allowed for such interferences that the Contractor could have suspected or anticipated during pre-bid site inspection and interpretation of the bidding documents.

B. Clearing, grubbing, and removal of all pavements, sidewalks, curbs, signs, poles, fences, etc., shall be done only as necessary for the completion of the work. Brush, trees, shrubs, concrete, rubble, and other removals, which are not intended to be replaced, shall be disposed of by the Contractor off the work site.

C. Obstructions, which are intended to be reset, shall be stored and protected by the Contractor. Fences, signs, mailboxes, trees, shrubs, structures, and similar features requiring removal, shall be restored to their original position except where permanent removal is indicated.

D. Monuments for land surveys encountered in the path of work shall be carefully protected from movement. Should removal be necessary, the Contractor shall notify the Engineer in advance. The Contractor will be held responsible for re-establishing monuments lost due to his negligence or failure to notify the Engineer at least 24 hours in advance of disturbing.

3.02 SUBSURFACE OBSTRUCTIONS

A. The approximate location and size of sewers, drains, culverts, gas mains, water mains, survey monuments, electric and telephone conduits and other underground structures shown on the drawings are based on records available to the Owner or surface markings indicating their existence.

B. The Contractor shall use caution in excavating and trenching so that the exact location of underground structures, both known and unknown, may be determined; he shall be held responsible for the repair of such structures when broken or otherwise damaged during construction.

C. The Contractor shall make arrangements with the utility companies for any relocation of interfering utilities. No extra cost due to unexpected delays or coordination work shall be incurred on the Owner except for authorized utility alterations performed by the Contractor as provided below.

D. When the Engineer permits the Contractor to make a change to avoid a utility relocation, the Engineer shall determine whether the change constitutes extra work as defined in the General Conditions.

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E. Any underground utilities or other structures, which the Contractor wishes to have moved to facilitate construction, shall be arranged with the owner of such structures. The Contractor shall pay all costs of the accommodation.

F. In the event that there is any question as to whether any of the above enumerated obstructions, underground utilities or other structures cross or pass through the space occupied by the completed structures of this contract, the Engineer's decision shall be binding upon the Owner and the Contractor.

G. During the construction of the pipe lines, it may be necessary to cross under certain sewers, drains, culverts, water lines, gas lines, electric conduits and other underground structures. Where necessary, the flow in drains or culverts shall be diverted so that the excavation is kept dry during the progress of the construction work. Every effort shall be made to prevent damage to such underground structures. Wherever such structures are disturbed or broken, they shall be restored to good condition at no additional cost to the Owner.

H. The Contractor shall use sand or gravel backfill beneath said structures. This backfill shall be deposited and thoroughly compacted by mechanical means in layers not to exceed 6 inches in depth.

3.03 EXCAVATION

A. General. All excavation of every description and of whatever substances encountered shall be performed to the depths indicated or as otherwise specified.
   1. During excavation, material suitable for backfilling shall be piled in an orderly manner a sufficient distance from the banks of the trench to avoid overloading and to prevent slides or cave-ins. All excavated materials not required or suitable for backfill shall be removed and wasted as specified. Grading shall be done as may be necessary to prevent surface water from flowing into trenches or other excavations and any water accumulated therein shall be removed by pumping or by other approved methods.
   2. Sheeting and shoring shall be placed as may be necessary for the protection of the work and for the safety of personnel. Unless otherwise indicated, excavation shall be by open cut.

B. Trench Excavation. Trenches shall be of the necessary width for proper laying of pipe and shall conform to WAC requirements. The banks of pipe trenches shall conform to OSHA requirements and the Contractor is responsible for all safety requirements of said codes.
   1. Care shall be taken not to overexcavate. The bottom of the trenches shall be accurately graded to provide uniform bearing and support for each section of the pipe. Bell holes and depressions for joints shall be dug after the trench bottom has been graded, and in order that the pipe rest on the prepared bottom for as nearly its full length as practicable, bell holes and depressions shall be only of such length, depth, and width as required for properly making the particular type of joint. Stones shall be removed as necessary to avoid point bearing.
   2. Except as hereinafter specified for wet or other unstable material, overdepths shall be backfilled as and with materials specified for, backfilling the lower portion of trenches. Whenever wet or otherwise unstable material that is incapable of properly supporting the pipe is encountered in the bottom of the trench, such material shall be overexcavated to a depth to allow for construction of a stable pipe bedding. The trench shall be backfilled to the proper grade with suitable approved materials.
   3. Trench Width. The width of the trench at and below the top of the pipe shall be such that the clear space between the barrel of the pipe and the trench wall shall not be less than 6 inches nor exceed 8 inches on either side of the pipe, unless otherwise approved by the Engineer in writing. The width of the trench above that level shall be as wide as necessary for sheeting and bracing and the proper performance of the work.
   4. Excavation for Appurtenances. Excavation for manholes and similar structures shall be sufficient to leave at least 12 inches clear space between the outer surface of structure and the bank or timber that may be used to hold and protect the banks. Any overdepth excavation below such appurtenances that has not been directed will be considered unauthorized and shall be refilled with sand, gravel, or concrete, as directed, at no additional cost to the Owner.
   5. Embedment. Embedment for utilities shall be as specified in the respective utility specification section.

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C. Protection and Removal of Utility Lines. The Contractor shall notify all affected utility companies at least three consecutive working days preceding his construction operations to coordinate his work regarding poles, wires, valve boxes and other surface obstructions and to determine the location of gas, water main, power, light, telephone or telegraph conduit or service connection thereto or any other subsurface structure that crosses or passes through the space occupied by any of the proposed improvements. The Contractor shall make advance arrangements with the utility companies for any relocation of interfering utilities so as not to delay construction.

D. Interruptions of Services. Interruptions of utility services to existing buildings or facilities which become necessary either directly or indirectly due to work required under this contract shall be coordinated with the Owner through the Engineer. If the down time for connections is limited by them as to duration and time (weekend, nights or holidays), the Contractor shall perform the work during the designated period at no additional cost to the Owner.

3.04 BACKFILLING

A. Types of Backfill. Backfill for sanitary sewers, water mains, storm sewers, culverts, and drainpipes is the material placed between the bedding and the ground surface. Debris, frozen material, organic matter, unstable material, or stones greater than 8 inches in diameter shall not be suitable for backfill. Large clods and stones not exceeding 8 inches in diameter, when allowed for use as backfill, shall not be placed within two feet of the top of the pipe. Backfill shall be of the following types:

1. Type I Backfill:
   a. Type I backfill shall be used where shown on the contract drawings or stated in Special Procedures - Division 01, and unless directed otherwise shall extend from the top of the embedment to the underside of surface restoration.
   b. Type I backfill shall be used under and around all existing underground structures, tunnels, conduits, and pipes crossing the excavation. Such backfill shall extend underneath and on all sides to a structure, tunnel, conduit or pipe.
   c. Type I backfill shall be selected fill material consisting of granular subbase course, base course or approved existing sand. The backfill material shall be mechanically compacted in 6-inch layers, from a distance of one foot above the pipe to the surface. The degree of compaction shall be to 95 percent maximum dry density per modified proctor (ASTM D1557).
2. Type II Backfill:
   a. Type II backfill shall be used where shown on the contract drawings or stated in Special Procedures - Division 01.
   b. Type II backfill shall be suitable excavated material, or other approved material, placed in uniform layers and mechanically compacted. The following compaction percentages based on the maximum dry density per modified proctor (ASTM D1557) for the materials are required:
      1) For fine grained soils (more than 50 percent passing the No. 200 sieve).
         Zone III: From bottom of surface restoration to 3 feet below - 91 percent
         Zone II: From bottom of Zone III to top of the embedment - 88 percent
         Zone I: Specified as embedment
      2) For coarse grained soils (less than 50 percent passing the No. 200 sieve).
         Zone III: From bottom of surface restoration to 3 feet below - 93 percent
         Zone II: From bottom of Zone III to top of the embedment - 90 percent
         Zone I: Specified as embedment
3. Type III Backfill:
   a. Type III backfill shall be used in all areas where shown on the Plans or stated in Special Procedures - Division 01. Backfill material shall be suitable excavated material placed, from top of embedment to the bottom of surface restoration, in 12 to 18 inch layers and consolidated by jetting, spading, tamping, or puddling, to the approval of the Engineer, to insure complete filling of the trench.
4. Type IV Backfill:
   a. Utilize Type III Backfill with the following jetting: at least a 1-1/2 inch jetting hose, equipped with a regulating valve which permits the hydrant valve to be fully open during use, with a minimum 1-1/2 inch diameter pipe nozzle at least 6 feet long shall be used. During the flooding operation, the nozzle shall be inserted as deeply into the backfill as is possible

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without damaging the sewers, water mains, or foundations. The insertions shall be made at intervals of 5 feet or less and maintained until the backfill is saturated. Depressions caused by flooding shall be backfilled until there is no further settlement.

5. Flowable Backfill:

a. The materials shall be placed in a clean cement mixer truck and thoroughly mixed. Just prior to placement, the mixer shall be run at mixing speed for one full minute to insure an even mixture. The mixture shall be deposited in the trench directly from the mixer truck. Copies of the load tickets shall be provided to the Engineer.

B. After Settlement. Should after settlement occur, succeeding any of the above backfilling methods, the Contractor shall scarify the surface of the fill material and place additional fill material in the same manner as herein described so that the surface elevation conforms to that shown on the Plans. No additional compensation shall be allowed for repairing filled areas where after-settlement occurs.

C. Backfill Placement. The excavated space around and above underground structures, tunnels, conduits and pipes not filled with embedment material and where select fill backfill is not shown or specified may be backfilled by machine.

D. Backfilling work shall be done in such a way as to prevent dropping of material directly on top of any conduit or pipe through any great vertical distance. In no case shall backfilling material from a bucket be allowed to fall directly on a structure or pipe and in all cases, the bucket shall be lowered so that the shock of falling earth will not cause damage.

E. Lumps shall be broken up and if there are any stones, pieces of crushed rock or lumps, which cannot be readily broken up, they shall be distributed throughout the mass so that all interstices are solidly filled with fine material. Stones, lumps and clods shall also be placed to maintain a 2 foot minimum separation distance from the top of the pipe or structure. No frozen material shall be used for backfilling.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Trenching and Backfilling for utilities shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 TRENCHING AND BACKFILLING

A. Trenching and Backfilling, Inclusive. When no quantity is provided, trenching and backfilling shall be included in the payment for contract work related to the associated utility.

4.03 IMPORTED GRANULAR BACKFILL (TRUCKED BACKFILL)

A. Imported Granular Backfill (Trucked Backfill), Cubic Yard. Measurement for imported granular backfill (trucked backfill) shall be per cubic yard, as in truck volume. Payment shall be made at the contract unit price bid for imported granular backfill (trucked backfill), as measured.

B. Imported Granular Backfill (Trucked Backfill), Ton. Measurement for imported granular backfill (trucked backfill) shall be per ton, as trucked in weight. Payment shall be made at the contract unit price bid for imported granular backfill (trucked backfill) as measured.

C. Imported Granular Backfill (Trucked Backfill), Inclusive. When no quantity is provided, imported granular backfill (trucked backfill) shall be included in the payment for contract work related to the associated utility.

4.04 FLOWABLE BACKFILL

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A. Flowable Backfill. Measurement for flowable backfill shall be per cubic yard, as in truck volume. Payment shall be made at the contract unit price bid for flowable backfill, as measured.

END OF SECTION

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SECTION 31 25 00
EROSION AND SEDIMENTATION CONTROLS

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. State of Wisconsin, Department of Natural Resources (WDNR), Conservation Practice Standards, Current Edition.
   2. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition at time of bid opening.

1.03 DESCRIPTION OF WORK

A. The work under this section shall cover providing the necessary materials, equipment and labor to control erosion and sedimentation controls by the methods specified herein. If no specific quantities are shown on the contract drawings, the Contractor shall use whatever quantities are necessary to prevent sediment transport off the job site, into permanent manmade storm water conveyances or management facilities or to Waters of the State.

B. The Contractor will be required to provide erosion control as per the current edition of the applicable State of Wisconsin, Department of Natural Resources (WDNR), Conservation Practice Standards. Copies of these standards can be obtained by contacting the following:

State of Wisconsin Department of Natural Resources
Non-Point Source and Land Management Section
101 South Webster Street, P.O. Box 7921
Madison, WI 53707-7921

or by visiting the following website:
http://dnr.wi.gov/topic/stormwater/standards/const_standards.html

C. The Engineer has prepared an erosion control plan for this project. The intent of this plan is to identify erosion control provisions for the construction site that comply with local, state, and federal regulations. The Contractor shall submit for approval by the appropriate regulatory agency any changes to the Erosion Control Plan, prior to beginning any construction on the project which may cause erosion in the portion of the site where the change to the Erosion Control Plan is proposed.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Clearing and Grubbing - Division 31

C. Grading - Division 31

D. Subgrade Preparation - Division 31

E. Structural Excavation for Structures - Division 31

F. Trenching and Backfilling - Division 31

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G. Riprap - Division 31

1.05 SUBMITTALS (NONE)

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 TOPSOIL

A. Topsoil shall be fertile, friable, natural loam surface soil, reasonably free of subsoil, clay lumps, brush, weeds and free of roots, stumps, stones larger than 2 inches in any dimension, and other matter harmful to plant growth. Topsoil to supplement insufficient topsoil on the site shall originate from local sources, but not from bogs or marshes.

2.02 LIME

A. Lime used for soil amendment shall be agricultural grade limestone ground sufficiently fine so that 80 percent passes a No. 8 sieve. Lime shall contain 80 percent calcium carbonate equivalent. Moisture shall not exceed 10 percent.

2.03 FERTILIZER

A. Fertilizer used in conjunction with seeding shall be dry, free-flowing granular fertilizer suitable for application by agricultural fertilizer spreaders or blower equipment, or non-volatile liquid commercial fertilizer, having an analysis of 20-10-10 (Nitrogen-Phosphoric Acid-Potash), or equal, unless use of phosphorus based fertilizers are banned by the community where the work is to be completed. In such communities, an analysis of 20-0-10, or equal, shall be used. Fertilizer having other analysis shall be applied at a rate to achieve at least the individual following amounts of nutrient per unit area:

Nutrient	Application Rate (Per Acre)	Application Rate (Per 1000 Sq. Ft.)
Nitrogen (N)	100 pounds	2.3 pounds
Phosphoric Acid (P_2O_5)	50 pounds	1.2 pounds
Potash (K_2O)	50 pounds	1.2 pounds

2.04 SEEDING FOR CONSTRUCTION SITE EROSION CONTROL

A. Seeding for Construction Sites shall conform with Wisconsin DNR Conservation Practice Standard 1059.

B. Seed mixtures shall conform to one of the following:
1. WisDOT, 2003. State of Wisconsin Standard Specifications For Highway and Structure Construction. Section 630, Seeding.
2. United States Department of Agriculture – Natural Resource Conservation Service Field Office Technical Guide Section IV, Standard 342, Critical Area Planting.
3. UWEX Publication A3434 Lawn and Establishment & Renovation.

C. All seed shall conform to the requirements of the Wisconsin Statutes and of the Administrative Code Chapter ATCP 20.01 regarding noxious weed seed content and labeling.

D. Seed mixtures that contain potentially invasive species or species that may be harmful to native plant communities shall be avoided.

E. Seed shall not be used later than one year after the test date that appears on the label.

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F. Seed shall be tested for purity, germination and noxious weed seed content and shall meet the minimum purity and germination requirements as prescribed in the current edition of Rules for Testing Seed, published by the Association of Official Seed Analysts.

2.05 MULCH FOR CONSTRUCTION SITES

A. Mulching for construction sites shall conform with Wisconsin DNR Conservation Practice Standard 1058.

B. Mulch shall consist of natural biodegradable material such as plant residue (including but not limited to straw, hay, wood chips, bark and wood cellulose fiber), or other equivalent materials of sufficient dimension (depth or thickness) and durability to achieve the intended effect for the required time period.

C. Mulch shall be environmentally harmless to wildlife and plants. Materials such as gravel, plastic, fabric, sawdust, municipal solid waste, solid waste byproducts1, shredded paper, and non-biodegradable products shall not be used.

D. Mulch shall be free of diseased plant residue (i.e., oak wilt), noxious weed seeds, harmful chemical residues, heavy metals, hydrocarbons and other known environmental toxicants.

E. Marsh hay shall not be used as mulch in lowland areas but may be used on upland sites to prevent the spread of invasive, nonnative species (i.e., reed canary grass) commonly found in marsh hay.

F. Straw and hay mulch that will be crimped shall have a minimum fiber length of 6 inches.

G. Wood chips or wood bark shall only be used for sites that are not seeded.

2.06 EROSION MAT

A. Non-Channel Erosion Mat products shall conform with Wisconsin DNR Conservation Practice Standard 1052.

B. Channel Erosion Mat products shall conform with Wisconsin DNR Conservation Practice Standard 1053.

C. Erosion mat shall conform to the requirements of the State of Wisconsin, Department of Transportation, Product Acceptability List (PAL) for Erosion Control Revegetative Mat (ECRM) and Turf-Reinforcement Mat (TRM).

D. For mats that utilize netting, the netting shall be bonded to the parent material to prevent separation of the net for the life of the product.

E. For urban class mats the following material requirements shall be adhered to:
   1. Only 100% organic biodegradable netted products are allowed, including parent material, stitching, and netting.
   2. The netting shall be stitched with biodegradable thread/yarn to prevent separation of the net from parent material.
   3. All materials and additive components used to manufacture the anchoring devices shall be completely biodegradable as determined by ASTM D 5338.
   4. Mats with photodegradable netting shall not be installed after September 1st.
   5. Steel wire pins or staples shall not be used in lawns.

2.07 SEEDING AND SODDING

A. Seeding and sodding shall conform to Seeding - Division 32 and Sodding - Division 32.

2.08 STRAW BALE EROSION BARRIERS

A. Straw Bale (Sediment Bale Barriers) shall conform with Wisconsin DNR Conservation Practice Standard 1055.

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B. Bales used for erosion control shall be either hay or straw, shall have rectangular surfaces, and shall be tightly bound with twine, not wire. The material in the bales shall be reasonably free of grain, weed seed and mold, and shall be dry and suitable for the purpose intended.

C. The minimum cross sectional area for wood stakes shall be 2.0 by 2.0 inches nominal.

D. The minimum diameter of steel (rebar) stakes shall be one-half inch.

2.09 SEDIMENT CONTROL FENCE (SILT FENCE)

A. Silt Fence shall conform with Wisconsin DNR Conservation Practice Standard 1056.

B. Silt fence shall be in accordance with Section 628.2.6 of the State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction.

C. Wood Posts:
1. Wood Posts used to support the fabric shall be at least 2 inch x 2 inch in cross-section and shall be a minimum of 12 inches longer than the height of the silt fence. Posts shall be made from kiln-dried hickory or Oak.
2. Staples used to attach silt fence to wood posts shall be at least 0.5-inches in length.

D. Steel Supports:
1. Steel posts shall be at least 5 feet long with a strength of 1.33 pounds per foot and shall have projections for the attachment of fasteners.
2. The silt fence fabric shall be attached in at least three places on the upslope side with 50 pound plastic tie straps or wire fasteners.

E. Silt fence shall have a support cord.

F. The Contractor shall furnish upon request a manufacturer's Certificate of Compliance that the geotextile fabric as furnished meets the above requirements.

G. Silt Fence shall be installed in accordance with Wisconsin DNR Conservation Practice Standard 1056.

2.10 STONE DITCH CHECKS

A. Stone Ditch Checks shall be installed in accordance with Wisconsin DNR Conservation Practice Standard 1062.

2.11 RIPRAP

A. Riprap shall be established in accordance with Riprap - Division 31 of this specification.

2.12 LAND APPLICATION OF POLYACRYLAMIDE

A. Land Application of Polyacrylamide shall be performed in accordance with Wisconsin DNR Conservation Practice Standard 1050.

2.13 STONE TRACKING PAD

A. Stone Tracking Pads shall be established in accordance with Wisconsin DNR Conservation Practice Standard 1057.

B. The aggregate for tracking pads shall be 3 to 6 inch clear or washed stone. All material to be retained on a 3-inch sieve.

2.14 VEGETATIVE BUFFERS

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A. Vegetative Buffers for Construction shall be established in accordance with Wisconsin DNR Conservation Practice Standard 1054.

B. Prior to land disturbance the perimeter of vegetative buffers shall be flagged or fenced to prevent equipment from creating ruts, compacting the soil and to prevent damage to existing vegetation.

C. Trees should not be cut down to establish a vegetative buffer. Other erosion control measures are preferred.

2.15 TEMPORARY SEDIMENT TRAPS

A. Temporary Sediment Traps shall conform with Wisconsin DNR Conservation Practice Standard 1063.

B. The stone outlet of a Sediment Trap shall consist of a stone section of embankment located at the discharge point. Stone shall consist of angular well graded 3 to 6 inch clear washed stone.

C. If filter fabric is indicated for the up-slope side of the stone outlet, a monofilament type fabric shall be used (such as WisDOT Type FF or equivalent).

2.16 TEMPORARY CONSTRUCTION SITE DIVERSION

A. Temporary Construction Site Diversions shall conform to Wisconsin DNR Conservation Practice Standard 1066.

2.17 DUST CONTROL

A. Dust Control measures shall be implemented in accordance with Wisconsin DNR Conservation Practice Standard 1068.

B. Asphalt and petroleum based products shall not be used for dust control.

C. Mulch or seed and mulch may be applied to protect exposed soil from wind erosion according to the provisions of WDNR Conservation Practice Standard 1058 Mulching for Construction Sites and 1059 Seeding for Construction Site Erosion Control.

D. Polymers may be used for dust control according to the provisions of WDNR Conservation Practice Standard 1050 Erosion Control Land Application of Polymers.

E. Tackifiers and Soil Stabilizers Type A – Products must be selected from the WisDOT Erosion Control PAL.

F. Solid board fences, snow fences, burlap fences, crate walls, bales of hay and similar material may be used to control air currents and blown soil.

2.18 CONSTRUCTION SITE DE-WATERING

A. Construction Site Dewatering activities shall be conducted in accordance with Wisconsin DNR Conservation Practice Standard 1061.

2.19 STORM DRAIN INLET PROTECTION

A. Storm Drain Inlet Protection shall conform Wisconsin DNR Conservation Practice Standard 1060.

B. All fabrics used as part of an inlet protection device must be selected from the list of approved fabrics certified for inlet protection, Geotextile Fabric, Type FF in the current edition of the WisDOT Product Acceptability List (PAL).

C. Inlet Protection Barriers include, but are not limited to, straw bales, sandbags, other material filled bags and socks, and stone weepers.

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D. Manufactured bags, when used, shall conform to the standards below:
   1. Minimum Size 14 x 26 inches
   2. Grab Tensile strength of fabric, ASTM D-4632 = 95 lb. min.
   3. UV stability, ASTM D-4355 = 70 % min.
   4. Fabric shall be sewn together with double stitching.

E. Straw Bale installation shall conform to the criteria outlined in the WDNR Conservation Practice Standard (1055) Sediment Bale Barrier (Non-Channel).

F. Stone weeper installation shall conform to the criteria in WDNR Conservation Practice Standard (1063) Sediment Trap.

2.20 DITCH CHECK (CHANNEL)

A. Ditch Checks for erosion and sediment control in drainage ditches and channels shall conform Wisconsin DNR Conservation Practice Standard 1062.

B. Stone ditch checks shall be constructed of a well-graded angular stone, a D50 of 3 inch or greater, sometimes referred to as breaker run or shot rock.

C. Manufactured products listed in WisDOT's PAL are also acceptable for temporary ditch checks.

D. Silt fence and single rows of straw bales are not permitted.

2.21 LAND APPLICATION OF ANIONIC POLYACRYLAMIDE (POLYMERS, PAM).

A. Land Application of Anionic Polyacrylamide (PAM) shall conform Wisconsin DNR Conservation Practice Standard 1050.

B. Anionic PAM mixtures shall be environmentally benign, harmless to fish, aquatic organisms, wildlife, and plants. Anionic PAM mixtures shall be non-combustible.

C. Cationic PAM shall not be used at any level. Anionic PAM mixtures shall have ≤0.05% free acrylamide monomer by weight as established by the Food and Drug Administration (FDA) and the Environmental Protection Agency (EPA).

D. The manufacturer or supplier shall provide a product expiration date for anionic PAM mixtures based on product expiration date of PAM in pure form. PAM shall not be used if the expiration date will be reached prior to establishment of vegetation in areas where PAM is to be used.

E. Contractor shall store and mix polymer in accordance with manufacturer or supplier written instructions.

PART 3 EXECUTION

3.01 EROSION CONTROL REQUIREMENTS

A. The erosion control requirements specified in the project Storm Water Management Plan shall be adhered to at all times.

B. Temporary and permanent erosion control measures shall be performed by the Contractor. The Contractor shall control water pollution, erosion, and siltation through the use of intercepting embankments, berms, dikes, dams, settling basins, slope paving, ditch checks, riprap, mulches, erosion mats, seeding, sodding, plantings and other erosion control devices or methods.

C. The Contractor shall submit for approval his plan of operations for accomplishing temporary and permanent erosion control work relating to grubbing, grading, paving and other work which might create erosion.

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D. The area of erosive land exposed to the elements by grubbing, excavation, borrow and fill operations at any one time shall be minimized to the maximum extent practicable and the duration of such exposure prior to final trimming, finishing and seeding or application of temporary erosion control measures shall be as short as practicable. Construction in and adjacent to rivers, streams, lakes, or other waterways shall be performed in such a manner as to avoid washing, sloughing or deposition of materials into such waterways which would obstruct or impair the flow thereof thus endangering the roadway or stream banks, or which would result in undue or avoidable contamination, pollution or siltation of such waterways.

E. The Owner or Designated Representative shall have full authority to suspend or limit grading and other operations pending adequate performance of such permanent erosion control measures as finish grading, topsoiling, mulching, matting and seeding and any temporary erosion control measures ordered by the Engineer.

F. Grubbing and grading operations shall be performed in proper sequence with other work to minimize erosion. Intercepting ditches or dikes shall be constructed as soon as practical after clearing and grubbing operations are completed and prior to or during the operations of excavating the cuts. Where erosion is likely to be a problem, the permanent erosion control measures shall follow immediately after the grading operations if conditions permit, unless the Engineer shall authorize temporary erosion control measures.

G. Water pumped from the site shall be treated by temporary sedimentations basins, grit chambers, sand filters, upslope chambers, hydro-cyclones, swirl concentrators, or other appropriate controls designed and used to remove total suspended solids (TSS) to 40 mg/l or less for the highest dewatering pumping rate. If the water is demonstrated to contain less than 40 mg/l TSS during dewatering operations, then no control is needed before discharge. Water may not be discharged in a manner that causes erosion of the site or receiving channels. Construction Site Dewatering activities shall be conducted in accordance with Wisconsin DNR Conservation Practice Standard 1061.

H. The Contractor shall take all possible precautions to prevent sediment from being tracked onto public or private roadways. Any sediment reaching a public or private road shall be removed by street cleaning (not flushing) before the end of each workday.

I. All storm drain or culvert inlets shall be protected with appropriate erosion control practices as identified in the appropriate Conservation Practice Standard. Channelized runoff from adjacent areas passing through the site shall be diverted around disturbed areas, if practical. Otherwise, the channel shall be protected. Sheet flow runoff from adjacent areas greater than 10,000 square feet in area shall also be diverted around disturbed areas unless shown to have resultant runoff velocities of less than 0.5 ft/sec across the disturbed area for one-year design storms having a duration of from 0.5 to 24 hours. Diverted runoff shall be conveyed in a manner that will not erode the conveyance and receiving channels.

J. All disturbed ground left inactive for seven (7) or more days shall be stabilized by seeding or sodding (only prior to October 15) or by mulching or covering, or other equivalent control measure.

K. For sites with more than 10 acres disturbed at one time, or if a channel originates in the disturbed area, one or more Temporary Sediment Traps shall be constructed in accordance with Wisconsin DNR Conservation Practice Standard 1063. The basin discharge rate shall also be sufficiently low as to not cause erosion along the discharge channel or the receiving water.

L. For sites with less than 10 acres disturbed at one time, sediment control fences, hay bales, or equivalent control measures shall be placed along all sideslope and downslope sides of the site. If a channel or area of concentrated runoff passes through the site, sediment control fences shall be placed along the channel edges to reduce sediment reaching the channel.

M. Any soil or dirt storage piles containing more than ten cubic yards of material should not be located with a downslope drainage length of less than 25 feet to a roadway or drainage channel. If remaining for more than seven (7) days, they shall be stabilized by mulching, vegetative cover, tarps, or other means. Erosion from piles which will be in existence for less than seven (7) days shall be controlled by placing hay bales or sediment control fence barriers around the pile. In-street utility repair or construction soil; or dirt storage piles located closer than 25 feet to a roadway or drainage channel must be covered with tarps or a suitable

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alternative control must be used if exposed for more than seven (7) days, and storm drain or culvert inlets must be protected with straw bales or other appropriate filtering barriers (CPS 1060).

3.02 TEMPORARY SEEDING

A. Seeding for Construction Sites shall be installed and maintained in accordance with Wisconsin DNR Conservation Practice Standard 1059.

B. Temporary Seeding (Cover Crop) - Areas needing protection during periods when permanent seeding is not applied shall be seeded with annual species for temporary protection. See table below for seeding rates of commonly used species. The residue from this crop may either be incorporated into the soil during seedbed preparation at the next permanent seeding period or left on the soil surface and the planting made as a no-till seeding.

Species	Lbs/Acre	Percent Purity
Oats	131[1]	98
Cereal Rye	131[2]	97
Winter wheat	131[2]	95
Annual Ryegrass	80[2]	97

1 Spring and summer seeding

2 Fall seeding

C. Permanent Seeding - Rates shall be based on pounds or ounces of Pure Live Seed (PLS) per acre. If a nurse crop is used in conjunction with permanent seeding, the nurse crop shall not hinder establishment of the permanent vegetation. A nurse crop shall be applied at 50% its temporary seeding rate when applied with permanent seed.

D. Inoculation - Legume seed shall be inoculated in accordance with the manufacturer's recommendations. Inoculants shall not be mixed with liquid fertilizer.

E. Sowing
1. Seed grasses and legumes no more than 1/4 inch deep. Distribute seed uniformly. Mixtures with low seeding rates require special care in sowing to achieve proper seed distribution.
2. Seed may be broadcast, drilled, or hydroseeded as appropriate for the site.
3. Seed when soil temperatures remain consistently above 53°F. Dormant seed when the soil temperature is consistently below 53°F (typically November 1st until snow cover). Seed shall not be applied on top of snow.

F. Turf seedlings must not be mowed until the stand is at least 6 inches tall. Do not mow closer than 3 inches during the first year of establishment.

G. Alternate plans must be submitted for approval.

3.03 APPLICATION OF STRAW OR HAY MULCH

A. Mulching for Construction Sites shall be installed and maintained in accordance with Wisconsin DNR Conservation Practice Standard 1058.

B. Application Rate:
1. Mulch shall cover a minimum of 80% of the soil surface for unseeded areas. For seeded areas, mulch shall be placed loose and open enough to allow some sunlight to penetrate and air to circulate but still cover a minimum of 70% of the soil surface.
2. Mulch shall be applied at a uniform rate of 1½ to 2 tons per acre for sites that are seeded, and 2 to 3 tons per acre for sites that are not seeded. This application results in a layer of ½ to 1½ inches thick for seeded sites, and 1½ to 3 inches thick for sites not seeded.
3. Wood chips or wood bark shall be applied at a rate of 6 to 9 tons per acre to achieve a minimum of 80% ground cover. This application should result in a layer of wood chips or wood bark ½ to 1½ inches thick.

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C. In areas where mulch is to be placed over seed, mulch shall be placed within 24 hours of seeding.

D. Mulch Anchoring Methods - Anchoring of mulch shall be based on the type of mulch applied, site conditions, and accomplished by one of the following techniques:

1. Crimping: Immediately after spreading, the mulch shall be anchored by a mulch crimper or equivalent device consisting of a series of dull flat discs with notched edges spaced approximately 8 inches apart. The mulch shall be impressed in the soil to a depth of 1 to 3 inches.
2. Polypropylene Plastic, or Biodegradable Netting: Apply plastic netting over mulch application and staple according to manufacturer's recommendations.
3. Tackifier: Tackifier shall be sprayed in conjunction with mulch or immediately after the mulch has been placed. Tackifiers must be selected from those that meet the WisDOT Erosion Control Product Acceptability List (PAL). Asphalt based products shall not be applied.
    a. The tackifiers shall be applied at the following minimum application rates per acre:
        1) Latex-Base: mix 15 gallons of adhesive (or the manufacturer's recommended rate which ever is greater) and a minimum of 250 pounds of recycled newsprint (pulp) as a tracer with 375 gallons of water.
        2) Guar Gum: mix 50 pounds of dry adhesive (or the manufacturer's recommended rate which ever is greater) and a minimum of 250 pounds of recycled newsprint (pulp) as tracer with 1,300 gallons of water.
        3) Other Tackifiers: (Hydrophilic Polymers) mix 100 pounds of dry adhesive (or the manufacturer's recommended rate which ever is greater) and a minimum of 250 pounds of recycled newsprint (pulp) as a tracer with 1,300 gallons of water.

3.04 PLACING EROSION MAT

A. Installation instructions shall be supplied by the manufacturer. The Contractor shall install the mat in accordance with the manufacturer's recommendations and in accordance with Section 628.2 of the State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, and the State of Wisconsin, Department of Transportation general requirements for erosion mat except as may be modified herein.

B. Erosion control revegetative mats shall be installed after all topsoiling, fertilizing, liming and seeding is complete.

C. The mat shall be in firm and intimate contact with the soil. It shall be installed and anchored per the manufacturer's recommendation.

D. The mat shall be unrolled and draped loosely, without stretching, so that continuous ground contact is maintained. In ditches, mat shall be unrolled and applied parallel to the direction of drainage. On slopes, mat shall be applied parallel to the slope direction.

E. Turf-reinforcement mat shall be installed in conjunction with the topsoiling operation and shall be followed by Erosion Control Revegetative Mat installation.

F. At time of installation, document the manufacturer and mat type by retention of material labels and manufacturer's installation instructions. Retain this documentation until the site has been stabilized.

G. In channels and on slopes, each upslope and each downslope end of each piece of mat shall be placed in a 4-inch trench, stapled on 12-inch centers, backfilled and tamped. Where one roll ends and second roll starts, the upslope piece shall be brought over the end of the downslope roll so that there is a 12 inch overlap, placed in a 4 inch trench, stapled on 12 inch centers, backfilled and tamped. In channels, erosion mats shall extend for whichever is greater: upslope one-foot minimum vertically from the ditch bottom or 6 inches higher than the design flow depth.

H. On slopes, where two or more widths of mat are applied, the two edges shall be overlapped according to the manufacturer's installation instructions and stapled at 18 to 24 inch intervals along the exposed edge of the lap joint. The body of the mat shall be stapled in a grid pattern with staples 3 feet on center each way.

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I. Where heavy concentrations of water or extremely erodible soil conditions exist, as noted on the contract drawings, erosion checks shall be installed at intervals of 50 feet, or less. Such a check shall consist of a 4-inch deep trench perpendicular to the flow direction across the entire width of the fabric. The mat shall be stapled at 9-inch intervals along the bottom of the trench across the entire width of the mat. The trench shall then be backfilled and tamped.

J. If anchoring devices become loosened, or if any fabric loosens, is torn or undermined, repairs shall be made immediately without additional compensation.

K. Erosion mat when used in conjunction with fertilizing and seeding done for surface restoration, shall be installed immediately after fertilizing and seeding operations have been completed. Straw or hay mulch shall not be used under the fabric.

L. Erosion mat shall at a minimum be inspected weekly and within 24 hours after every precipitation event that produces 0.5 inches of rain or more during a 24-hour period.
   1. If there are signs of rilling under the mat, install more staples or more frequent anchoring trenches. If rilling becomes severe enough to prevent establishment of vegetation, remove the section of mat where the damage has occurred. Fill the eroded area with topsoil, compact, reseed and replace the section of mat, trenching and overlapping ends per manufacturer's recommendations. Additional staking shall be provided where rilling was filled.
   2. If the reinforcing plastic netting has separated from the mat, remove the plastic and if necessary replace the mat.
   3. Maintenance shall be completed as soon as possible with consideration to site conditions.

3.05 VEGETATIVE BUFFERS

A. Vegetative Buffers for Construction shall be installed and maintained in accordance with Wisconsin DNR Conservation Practice Standard 1054.

B. Trees should not be cut down to establish a vegetative buffer.

C. A stand of dense vegetation shall be maintained to a height of 3 – 12 inches.

D. Vegetative buffers shall at a minimum be inspected weekly and within 24 hours after every precipitation event that produces 0.5 inches of rain or more during a 24-hour period. Vegetative buffers shall be inspected for proper distribution of flows, sediment accumulation and signs of rill formation.

E. If the vegetative buffer becomes silt covered, contains rills, or is otherwise rendered ineffective, other perimeter sediment control measures shall be installed. Eroded areas shall be repaired and stabilized. Repair shall be completed as soon as possible with consideration to site conditions.

3.06 TEMPORARY SOD PLACEMENT

A. The Contractor shall place sod with edges in close contact and with joints staggered. Sod placement on slopes shall commence at the bottom of the slope, and the rows shall be laid perpendicular to the slope. The edge of the sod at the tops of slopes shall be turned slightly under, and a layer of soil shall be compacted over the edge to direct surface drainage over the edge onto the top of the sod. Sod placement in areas other than on slopes shall be made so that the top sod surface is flush with adjoining surfaces.

B. On slopes steeper than 4:1 horizontal to vertical, the Contractor shall stake the sod with split cedar shingles, or other equally effective stakes, spaced from 18 to 36 inches apart along the longitudinal axis of the sod strip. These stakes shall be placed near the top edge of the sod strip and shall be driven flush with the sod.

C. After the sod is placed, it shall be rolled or firmly tamped to press the sod onto the underlying soil. The Contractor shall, at the end of the day in which the sod is laid, thoroughly soak all sodded areas by sprinkling them with water.

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D. Sod shall be maintained in a moist, growing condition. The Contractor shall repair all areas damaged by erosion or traffic of any kind.

3.07 PLACING HAY BALE BARRIERS

A. Straw Bale (Sediment Bale Barriers) shall be installed and maintained in accordance with Wisconsin DNR Conservation Practice Standard 1055.

B. Sufficient bales shall be on the site to create the necessary barriers prior to the start of groundbreaking operations. The bales shall be stacked and covered with plastic sheeting until required for use.

C. At a minimum, sediment bale barriers shall be placed in a single row, lengthwise on the contour, with the ends of adjacent sediment bale barriers tightly abutting one another. The holes between bales shall be chinked (filled by wedging) with straw, hay or equivalent material to prevent water from escaping between the bales.

D. The maximum allowable slope lengths contributing runoff to a sediment bale barrier are specified below:

Slope	Barrier Row Spacing
< 2%	100 feet
2 to 5%	75 feet
5 to 10%	50 feet
10 to 33%	25 feet
33 to 50%	20 feet
> 50%	Not Permitted

E. Sediment bale barriers shall not be placed perpendicular to the contour.

F. The end of the sediment bale barrier shall be extended upslope to prevent water from flowing around the barrier ends.

G. Installed sediment bale barrier shall be a minimum of 10 inches high and shall not exceed a maximum height of 20 inches from ground level.

H. The barrier shall be entrenched and backfilled. A trench shall be excavated the width of a sediment bale barrier and the length of the proposed barrier to a minimum depth of 4 inches. After bales are staked and chinked, the excavated soil shall be backfilled and compacted against the barrier. Backfill to ground level on the down slope side. On the upslope side of the sediment bale barrier backfill to 4 inches above ground level.

I. At least two wood stakes, “T” or “U” steel posts, or 1/2 inch rebar driven through at equidistance along the centerline of the barrier shall securely anchor each bale. The first stake in each bale shall be driven toward the previously laid bale to force the bales together. Stakes shall be driven a minimum 12-inches into the ground to securely anchor the sediment bale barriers.

J. Bales shall be installed so that bindings are oriented around the sides rather than along the tops and bottoms of the bales in order to prevent deterioration of the bindings.

K. Sediment bale barriers shall, at a minimum, be inspected weekly and within 24 hours after every precipitation event that produces 0.5 inches of rain or more during a 24-hour period.

L. Damaged or decomposed sediment bale barriers, any undercutting, or flow channels around the end of the sediment bale barriers shall be repaired.

M. Sediment shall be properly disposed of once the deposits reach 1/2 the height of the sediment bale barrier.

N. Sediment bale barriers and anchoring devices shall be removed and properly disposed of when they have served their usefulness, but not before the upslope areas have been permanently stabilized.

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O. Any sediment deposits remaining in place after the sediment bale barrier is no longer required shall be dressed to conform to the existing grade, prepared, and seeded.

3.08 CONSTRUCTION OF SEDIMENT CONTROL FENCE (SILT FENCE)

A. Silt Fence shall be installed and maintained in accordance with Wisconsin DNR Conservation Practice Standard 1056.

B. When installed as a stand-alone practice on a slope, silt fence shall be placed on the contour. The parallel spacing shall not exceed the maximum slope lengths for the appropriate slope as specified:

Slope	Fence Spacing
< 2%	100 feet
2 to 5%	75 feet
5 to 10%	50 feet
10 to 33%	25 feet
> 33%	20 feet
> 50%	Not Permitted

C. Silt fences shall not be placed perpendicular to the contour.

D. The ends of the fence shall be extended upslope to prevent water from flowing around the ends of the fence.

E. When attached to wooden posts the silt fence fabric shall be stapled, using at least 0.5-inch staples, to the upslope side of the posts in at least 3 places.

F. When attached to steel supports the silt fence fabric shall be attached in at least three places on the upslope side with 50 pound plastic tie straps or wire fasteners. To prevent damage to the fabric from fastener, the protruding ends shall be pointed away from the fabric.

G. The maximum spacing of posts for nonwoven silt fence shall be 3 feet and for woven fabric 8 feet.

H. Where joints are necessary, each end of the fabric shall be securely fastened to a post. The posts shall then be wrapped around each other to produce a stable, secure joint or shall be overlapped the distance between two posts.

I. On the terminal ends of silt fence the fabric shall be wrapped around the post such that the staples are not visible.

J. A minimum of 20 inches of the post shall extend into the ground after installation.

K. Anchoring – Silt fence shall be anchored by spreading at least 8 inches of the fabric in a 4 inch wide by 6 inch deep trench, or 6 inch deep V-trench on the upslope side of the fence. The trench shall be backfilled and compacted. Trenches shall not be excavated wider and deeper than necessary for proper installation.

L. Removal – Silt fences shall be removed once the disturbed area is permanently stabilized and no longer susceptible to erosion.

M. Silt fences shall at a minimum be inspected weekly and within 24 hours after every precipitation event that produces 0.5 inches of rain or more during a 24 hour period.

N. Damaged or decomposed fences, undercutting, or flow channels around the end of barriers shall be repaired or corrected.

O. Sediment shall be properly disposed of once the deposits reach 1/2 the height of the fence.

3.09 STONE TRACKING PAD

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A. Stone Tracking Pads shall be installed and maintained in accordance with Wisconsin DNR Conservation Practice Standard 1057.

B. The tracking pad shall be installed prior to any traffic leaving the site.

C. The aggregate shall be placed in a layer at least 12 inches thick. On sites with a high water table, or where saturated conditions are expected during the life of the practice, stone tracking pads shall be underlain with a WisDOT Type R geotextile fabric to prevent migration of underlying soil into the stone.

D. Tracking pads and tire washing stations shall, at a minimum, be inspected weekly and within 24 hours after every precipitation event that produces 0.5 inches of rain or more during a 24-hour period.

E. The tracking pad performance shall be maintained by scraping or top-dressing with additional aggregate.

F. A minimum 12-inch thick pad shall be maintained.

3.10 STORM DRAIN INLET PROTECTION

A. Storm Drain Inlet Protection shall be installed and maintained in accordance with Wisconsin DNR Conservation Practice Standard 1060.

B. The contributing drainage area to the inlet protection device shall be one acre or less. In instances were a larger contributing drainage area exists, runoff shall be routed through a properly designed sediment trapping or settling device upstream of inlet.

C. Other than Type D inlet protection devices, no gaps shall be left in the material used that would allow the flow of water to bypass the inlet protection device.

D. Filter Fabric Barrier Criteria - See Inlet Protection Detail
   1. Inlet protection Type A devices shall be utilized around inlets and unpaved areas until permanent stabilization methods have been established. Type A devices shall be utilized on inlets prior to installation of curb and gutter or pavement, and where safety considerations are not compromised on the site.
   2. Type B shall be utilized after the casting and grate are in place.
   3. Type D shall be utilized in areas where other types of inlet protection are identified as incompatible with roadway and traffic conditions, causing possible safety hazards when ponding occurs at the inlet. Type D shall only be used after castings are in place on top of the inlet boxes.
   4. Type D inlet protection shall conform to the standard drawing as shown in the contract drawings. There shall be a three-inch space between the bag and the sides of the inlet to prevent the inlet sides from blocking the overflow; and shall only be used in inlets deeper than 30 inches from the top of grate to bottom of the inlet. If such clearance is not available, cinch or tie the sides of the bag (with rope or ties) to provide clearance.

E. Criteria Applicable to the Post-Paving/Curbing Phase of Construction
   1. Inlet protection Types B, C, and D are applicable to post paving construction. See Inlet Protection Detail.
      a. Type B shall be utilized on inlets without curb box.
      b. Type C shall be utilized on street inlets with curb heads. A 1½ inch x 3½ inch (37 mm by 87 mm) minimum, piece of wood shall be wrapped and secured in the fabric and placed in front of the curb head as shown in the contract drawings. The wood shall not block the entire opening of the curb box and be secured to the grate with wire or plastic ties.
      c. Type D.

F. Remove inlet protection devices once the contributing drainage area is stabilized with appropriate vegetation or impervious area.

G. Inlet protection shall be at a minimum inspected weekly and within 24 hours after every precipitation event that produces 0.5 inches of rain or more during a 24-hour period.

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H. Sediment deposits shall be removed and the inlet protection device restored to its original dimensions when the sediment has accumulated between 1/3 to 1/2 the design depth of the device, or when the device is no longer functioning as designed. Removed sediment shall be deposited in a suitable area and stabilized.

I. Any material falling into the inlet shall be removed.

3.11 DITCH CHECK (CHANNEL)

A. Ditch Checks for erosion and sediment control in drainage ditches and channels shall be installed and maintained in accordance with Wisconsin DNR Conservation Practice Standard 1062.

B. Ditch checks shall be utilized during rough grading and shall be removed once the final grading and channel stabilization is applied, unless intended to be part of a permanent storm water management plan.

C. Channel erosion mat or other nonerodible materials shall be placed at the base of a ditch check, and extended a minimum of 6 feet, to prevent scour and washing out the toe of the ditch check. DNR Conservation Practice Channel Erosion Mat (1053) contains criteria for the placement of erosion mat in this location.

D. Stone ditch checks may be underlain by a nonwoven geotextile fabric to ease installation and removal. If the geotextile fabric is extended, it can serve purpose specified in item 3.11 C above.

E. Chink or seal stone and rock ditch checks to minimize the flow through the ditch check.

F. For added stability, the base of a stone or rock ditch check shall be keyed into the soil to a depth of 6-inches.

G. Ditch checks shall, at a minimum, be inspected weekly and within 24 hours after every precipitation event that produces 0.5 inches of rain or more during a 24 hour period.

H. Unless incorporated into a permanent storm water management system, ditch checks shall be removed once the final grading and channel stabilization is applied.

I. Maintenance shall be completed as soon as possible with consideration to site conditions.

3.12 TEMPORARY SEDIMENT TRAPS

A. Temporary Sediment Traps shall be installed and maintained in accordance with Wisconsin DNR Conservation Practice Standard 1063.

B. Sediment traps shall be constructed prior to disturbance of up-slope areas and placed so they function during all phases of construction.

C. The depth of the sediment trap measured from the sediment trap bottom to the invert of the stone outlet, shall be at least three feet to minimize re-suspension and provide storage for sediment.

D. The sediment trap shall have a length to width ratio of at least 2:1. The position of the outlet to the inlet shall be as such to minimize short-circuiting of the water flow path.

E. Side slopes shall be no steeper than 2:1.

F. Embankments of temporary sediment traps shall not exceed five feet in height measured from the downstream toe of the embankment to the top of the embankment. Construct embankments with a minimum top width of four feet, and side slopes of 2:1 or flatter. Earthen embankments shall be compacted.

G. Sediment traps shall be constructed with both a principal and emergency spillway. The stone outlet of a sediment trap shall consist of a stone section of embankment (stone outlet) located at the discharge point. The stone outlet section provides a means of dewatering the basin back to the top of the permanent storage between storm events, and also serves as a non-erosive emergency spillway for larger flow events.

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H. The stone outlet shall have a minimum top width of 2 feet and a maximum side-slope of 2:1.

I. The stone outlet shall be protected from undercutting by excavating a keyway trench across the stone foundation and up the sides to the height of the outlet.

J. Sediment Traps shall, at a minimum, be inspected weekly and within 24 hours after every precipitation event that produces 0.5 inches of rain or more during a 24-hour period. Sediment may need to be removed more frequently.

K. Deposits of sediment shall be removed when they reach a depth of one foot.

L. If the outlet becomes clogged it shall be cleaned to restore flow capacity.

M. Maintenance shall be completed as soon as possible with consideration given to site conditions.

N. Sediment traps shall be removed and the location stabilized after the disturbed area draining to the sediment trap is stabilized and no longer susceptible to erosion.

3.13 TEMPORARY CONSTRUCTION SITE DIVERSION

A. Temporary Construction Site Diversions shall be installed and maintained in accordance with Wisconsin DNR Conservation Practice Standard 1066.

B. The minimum berm cross section shall have side slopes of 2:1 (horizontal:vertical) or flatter, a minimum top width of two feet and a minimum height of 1.5 feet.

C. Diversions that are to serve longer than 30 days shall be stabilized as soon as they are constructed.

D. Diversions shall, at a minimum, be inspected weekly and within 24 hours after every precipitation event that produces 0.5 inches of rain or more during a 24-hour period.

E. Maintenance shall be completed as soon as possible with consideration to site conditions.

F. Accumulated sediment shall be removed when it reaches one half the height of the diversion berm.

G. Diversions shall be removed and the area stabilized according to construction contract drawings.

3.14 DUST CONTROL

A. Dust Control measures shall be installed and maintained in accordance with Wisconsin DNR Conservation Practice Standard 1068.

B. Polymers may be used in areas that do not receive vehicle traffic. Dry applied polymers must be initially watered for activation to be effective for dust control. Polymers shall be utilized in accordance with the provisions of WDNR Conservation Practice Standard 1050 Erosion Control Land Application of Polymers.

C. Tackifiers and Soil Stabilizers Type A – Products must be installed at rates conforming to the WisDOT Erosion Control PAL.

D. Chlorides shall be applied according to the most recent version of the WisDOT Standard Specifications for Highway and Bridge Construction.

E. Barriers - Barriers shall be placed at right angles to prevailing wind currents at intervals of about 15 times the barrier height.

F. Areas that have dust control practices shall at a minimum be inspected daily.

3.15 LAND APPLICATION OF ANIONIC POLYACRYLAMIDE (POLYMERS).

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A. Land Application of Anionic Polyacrylamide (polymers) shall be installed and maintained in accordance with Wisconsin DNR Conservation Practice Standard 1050.

B. Application rates shall not exceed manufacturer's written application rate recommendations that shall not exceed the WDNR use restrictions.

C. Maximum application rates, in parts per million (ppm or mg/L or mg/kg), shall be determined by multiplying 1.4 by the number of pounds applied per acre. This number shall be less than or equal to the WDNR use restriction. Repeated applications of anionic PAM mixtures may be applied, if necessary, to ensure adequate effectiveness.

D. The application method shall provide uniform coverage to the target area and avoid drift to non-target areas.

E. When used on bare soil, without seed or mulch, anionic PAM mixtures shall be used on slopes 2.5:1 or flatter.

F. Anionic PAM mixtures shall not be applied to channel bottoms.

G. The applicator of anionic PAM mixture shall document, at the time of application, the following: name of applicator, application rate per acre, date applied, product type, weather conditions during application, and method of application. Copies of this documentation shall be entered into the contractor's monitoring log or project diary and made available upon request.

H. Unused liquid anionic PAM mixtures shall be minimized. Excess material shall not be applied at a rate greater than the maximum application rate. Disposal shall not occur in storm water conveyance systems (i.e., storm sewer manholes, storm sewer inlets, ditches, and culverts).

I. PAM shall not be used within 30 feet of surface waters of the state.

J. Maintenance will consist of reapplying anionic PAM mixtures to disturbed areas, including high use traffic areas, which interfere in the performance of this practice.

K. AnionicPAM mixtures should be reapplied in areas where wind or rill erosion is apparent and whenever an area has been graded, driven upon, or otherwise disturbed since the anionic PAM mixture was last applied.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Erosion and sedimentation controls shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 EROSION AND SEDIMENTATION CONTROLS

A. Erosion and Sedimentation Controls, Lump Sum. When so provided, payment for erosion and sedimentation controls shall be made at the contract lump sum price bid.

B. Erosion and Sedimentation Controls, Inclusive. When no quantity is provided, erosion and sedimentation controls shall be considered inclusive to payment for contract work related to the associated construction.

END OF SECTION

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SECTION 31 37 00
RIPRAP

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition at time of bid opening.

1.03 DESCRIPTION OF WORK

A. The work covered under this section shall consist of furnishing all material, equipment, and labor required to execute the riprapping for this project and in accordance with the provisions of Section 606 of the Standard Specifications.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Geosynthetics for Earthwork - Division 31

1.05 SUBMITTALS (NONE)

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 MATERIALS

A. Provide riprap stone grade (i.e., light riprap, medium riprap, heavy riprap, extra-heavy riprap) as indicated in the Special Procedures - Division 01 or as shown on the contract drawings, and in conformance with Section 606 of the Standard Specifications. Stone shall be durable field or quarry stone approved by the Engineer prior to placing. It shall be sound, hard, dense, resistant to the action of air and water, and free from seams, cracks or other structural defects.

B. Provide riprap grout as indicated in the Special Procedures - Division 01 or as shown on the contract drawings, and in conformance with Section 606 of the Standard Specifications.

PART 3 EXECUTION

A. The bed for the riprap shall be prepared by excavating, shaping the slopes and constructing the toe for riprap installation. Restore the surface of adjacent work following riprap placement, and dispose of surplus material.

3.02 PLACING LIGHT RIPRAP

A. Stone placed above the waterline shall be placed by hand. It shall be laid with close, broken joints and shall be firmly bedded into the slope and against the adjoining stones. The stones shall be laid perpendicular to the slope with ends in contact. The stone shall be thoroughly compacted as construction progresses and the finished surface shall present an even, tight surface. The larger stone shall be placed in the lower courses. Interstices between stones shall be chinked with spalls firmly rammed into place. Unless otherwise provided,

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light riprap shall be at least 12 inches in thickness, measured perpendicular to the slope. Use Type R geotextile fabric under stone. Stone shall not be placed against or in contact with any concrete surface prior to the completion of the concrete's curing and protection period

3.03 PLACING MEDIUM, HEAVY AND EXTRA-HEAVY RIPRAP

A. Stone may be placed by any mechanical means that will produce a completed job within reasonable tolerances of the typical section shown on the contract drawings. Unless otherwise provided on the contract drawings, medium ripap shall not be less than 18 inches in thickness, heavy riprap shall be not less than 24 inches in thickness and extra-heavy riprap shall not be less than 30 inches in thickness, all measured perpendicular to the slope. Hand work shall be limited to the amount necessary to fill large voids or to correct segregated areas. Use Type HR geotextile fabric under stone. Stone shall not be placed against or in contact with any concrete surface prior to the completion of the concrete's curing and protection period.

3.04 PLACING GROUTED RIPRAP

A. Place stone as indicated above in 3.02 or 3.03, and fill the voids between stones with riprap grout. Use an adequate amount of riprap grout to completely fill the voids, but leave the stone face surface exposed.

B. Install riprap grout from bottom to top and then sweep the surface with a stiff broom. Upon completion of the riprap grouting, cure the surface in conformance with the requirements of Section 606 of the Standard Specifications.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Riprap shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 RIPRAP

A. Riprap (Grade), Cubic Yard. Riprap will be measured by the cubic yard acceptably completed, measured as the volume within the limiting dimensions the contract designates or the engineer establishes in the field. Payment for riprap is full compensation for preparing the bed, providing and placing riprap, restoring adjacent work, and disposing of surplus material.

B. Grouted Riprap (Grade), Cubic Yard. Grouted riprap will be measured by the cubic yard acceptably completed, measured as the volume within the limiting dimensions the contract designates or the engineer establishes in the field. Payment for grouted riprap is full compensation for preparing the bed, providing and placing riprap, placing and curing mortar, restoring adjacent work, and disposing of surplus material.

END OF SECTION

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SECTION 32 11 23
AGGREGATE BASE AND SUBBASE

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition at time of bid opening.

1.03 DESCRIPTION OF WORK

A. The work covered under this section shall consist of furnishing all material equipment and labor required to construct a dense compacted base course composed of one or more courses or layers of coarse aggregate, fine aggregate and binder or filler blended to produce an intimate mixture of the required gradation and stability, in accordance with Sections 301 and 305 of the State of Wisconsin, Department of Transportation, Standard Specifications. This work shall also consist of a furnishing all material equipment and labor required to place breaker run and select crushed material for this project in accordance with Sections 301, 311 and 312 of the State of Wisconsin, Department of Transportation, Standard Specifications.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Subgrade Preparation - Division 31

C. Salvage Existing Pavement and Base - Division 32

1.05 SUBMITTALS (NONE)

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 DENSE GRADED BASE

A. Materials furnished and used in this work shall consist of coarse and fine aggregate with sufficient binder to produce a stable base for the surfacing. Base materials shall be free from vegetative or organic matter, shale and lumps of clay. Dense graded base shall be crushed stone or crushed gravel conforming to the gradations required in Section 305.2.2.1 of the State of Wisconsin, Department of Transportation, Standard Specifications, unless indicated otherwise in Special Procedures - Division 01 or on the contract drawings.

2.02 BREAKER RUN

A. Breaker Run shall be used when shown on typical sections or called for in Special Procedures - Division 01. Breaker run shall be free of organic matter, shale and lumps of clay. The material shall comply with Section 311 of the State of Wisconsin, Department of Transportation, Standard Specifications. If the cross section thickness of breaker run is less than 12 inches, the gradation for breaker run shall conform to 3-inch dense graded base as per Section 305.2.2.1 of the State of Wisconsin, Department of Transportation, Standard Specifications.

2.03 SELECT CRUSHED MATERIAL

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A. Select Crushed Material shall be used when shown on typical sections or called for in Special Procedures - Division 01. Select Crushed shall be free of organic matter, shale and lumps of clay. The material shall comply with Section 312 of the State of Wisconsin, Department of Transportation, Standard Specifications.

PART 3 EXECUTION

3.01 DENSE GRADED BASE

A. Each layer of base shall be compacted over the entire area per Section 301.3 and 305.3 of the State of Wisconsin, Department of Transportation, Standard Specifications.

B. Each layer shall also be compacted and consolidated to the degree that there will be no appreciable displacement of it laterally or longitudinally under compaction equipment or a fully loaded tandem dump truck.

C. Where aggregate base is being placed on top of existing gravel, the existing gravel shall be scarified to a depth of three inches prior to placement of additional base.

D. Aggregate base course beneath and within 10 feet of a structure shall be compacted to 95 percent maximum dry density per modified proctor (ASTM D1557).

E. The aggregate base shall be graded, shaped and rolled to the finished cross section template shown on the contract drawings and to the satisfaction of the Engineer.

3.02 BREAKER RUN

A. Each layer of breaker run shall be compacted over the entire area per Section 301.3 and 305.3.2.3 of the State of Wisconsin, Department of Transportation, Standard Specifications.

B. Each layer shall also be compacted and consolidated to the degree that there will be no appreciable displacement of it laterally or longitudinally under compaction equipment or a fully loaded tandem dump truck.

C. The breaker run shall be graded, shaped and rolled to the finished cross section template shown on the contract drawings and to the satisfaction of the Engineer.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Aggregate base course shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 DENSE GRADED BASE

A. Dense Graded Base, Square Yard. Measurement for dense graded base will be per square yard installed as measured in the field. The dense graded base shall be installed and compacted to the thickness stated on the contract drawings or in Special Procedures - Division 01. Payment shall be made at the contract unit price bid per square yard for dense graded base installed and compacted.

B. Dense Graded Base, Ton. Measurement will be per ton of dense graded base compacted in place. The Contractor shall supply the Engineer with load tickets to verify the amount of material used. Each load shall have its own load ticket showing weights, truck number, time, date, and placement location. Payment shall be made at the contract unit price bid per ton for dense graded base installed and compacted.

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C. Dense Graded Base, Cubic Yard In Place. Measurement for dense graded base will be per cubic yard installed, computed from the square yards measured in the field multiplied by the compacted thickness stated on the contract drawings or in the Special Procedures – Division 01. Payment will be made at the contract unit price bid per cubic yard in place for dense graded base installed.

4.03 BREAKER RUN

A. Breaker Run, Square Yard. Measurement for breaker run shall be per square yard installed as measured in the field. The breaker run shall be installed and compacted to the thickness stated on the contract drawings or in Special Procedures - Division 01. Payment shall be made at the contract unit price bid per square yard for breaker run installed and compacted.

B. Breaker Run, Ton. Measurement shall be per ton of breaker run compacted in place. The Contractor shall supply the Engineer with load tickets to verify the amount of material used. Each load shall have its own load ticket showing weights, truck number, time, date, and placement location. Payment shall be made at the contract unit price bid per ton for breaker run installed.

C. Breaker Run, Cubic Yards. Measurement for breaker run shall be per cubic yard installed as measured in the field. The breaker run shall be installed and compacted to the depth stated on the contract drawings or in Special Procedures - Division 01. Payment shall be made at the contract unit price bid per cubic yard for breaker run installed and compacted.

4.04 SELECT CRUSHED MATERIAL

A. Select Crushed Material, Square Yard. Measurement for select crushed material shall be per square yard installed as measured in the field. The select crushed material shall be installed and compacted to the thickness stated on the contract drawings or in Special Procedures - Division 01. Payment shall be made at the contract unit price bid per square yard for select crushed material installed and compacted.

B. Select Crushed Material, Ton. Measurement shall be per ton of select crushed material compacted in place. The Contractor shall supply the Engineer with load tickets to verify the amount of material used. Each load shall have its own load ticket showing weights, truck number, time, date, and placement location. Payment shall be made at the contract unit price bid per ton for select crushed material installed.

C. Select Crushed Material, Cubic Yards. Measurement for select crushed material shall be per cubic yard installed as measured in the field. The select crushed material shall be installed and compacted to the depth stated on the contract drawings or in Special Procedures - Division 01. Payment shall be made at the contract unit price bid per cubic yard for select crushed material installed and compacted.

END OF SECTION

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SECTION 32 13 10
CONCRETE SIDEWALK, STEPS AND DRIVEWAYS

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition at time of bid opening.
   2. American Society for Testing and Materials (ASTM), Annual Book of ASTM Standards, Current Edition.

1.03 DESCRIPTION OF WORK

A. The work covered under this section shall consist of furnishing all material, equipment, and labor required to execute the concrete sidewalk, driveway and step work for this project.

B. This work shall be in accordance with Section 602 of the State of Wisconsin, Department of Transportation, Standard Specifications, and as indicated on the contract drawings and specifications.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Concrete Quality Control - Division 01

C. Maintenance of Existing Conditions - Division 02

D. Cast-in-Place Concrete - Division 03

E. Subgrade Preparation - Division 31

F. Aggregate Base and Subbase - Division 32

1.05 SUBMITTALS

A. Contractor shall submit such product literature and catalog cuts to relate the materials supplied to the specifications. Information shall be in conformance with requirements of Submittals - Division 01 of these specifications.

B. Mix Designs: for each type of concrete and integrally-colored concrete mix required.

C. Samples for Initial Selection: Manufacturer's color charts

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 CONCRETE

A. Concrete for sidewalk, steps and driveways shall be as specified in Cast-in-Place Concrete - Division 03 of these specifications.

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2.02 BASE MATERIAL

A. Base material shall be as specified in Aggregate Base and Subbase - Division 32 of these specifications or conform with Section 305 of the State of Wisconsin, Department of Transportation, Standard Specifications.

2.03 CURING COMPOUND

A. Curing compound shall be as specified in Cast-in-Place Concrete - Division 03 of these specifications.

PART 3 EXECUTION

3.01 BASE PREPARATION - GRADING

A. Prepare foundation by excavating to the lines, grades and cross section as required. All soft or unstable material shall be removed and replaced with sand or aggregate base course material compacted to a relative field density of 95%, based on the Modified Proctor Density, ASTM D1557. Proof-roll subbase to check for unstable areas needing additional compaction. Finish to a true and firm surface.

B. If not listed as a separate bid item, minor clearing and grubbing shall be considered incidental to the respective concrete work.

C. Disposal locations for all excess or unsuitable excavated material shall be subject to Owner approval.

3.02 BASE MATERIAL

A. A minimum thickness of 4 inches of compacted aggregate base course or granular subbase course material is required under sidewalks and steps, unless indicated otherwise on the contract drawings or Special Procedures - Division 01.

3.03 SIDEWALK

A. Sidewalks shall be constructed to a uniform depth of 4 inches except at alleys and driveways where they shall be constructed to a uniform depth of 6 inches unless otherwise noted.

B. Sidewalks shall slope toward the roadway at 1 foot vertical per 50 feet horizontal (2 percent).

C. The concrete shall be placed on a moist foundation, deposited to the required depth, and consolidated and spaded sufficiently to bring the mortar to the surface, after which it shall be struck off and finished to a true and even surface.

D. The final floating shall be done with a wooden float. Before the mortar has set, the surface shall be brushed or lightly broomed, perpendicular to the direction of travel or as shown on the contract drawings. Before the concrete is given the final surface finish, the surface of the walk shall be checked with a ten-foot straightedge, and any areas which show a variation or departure from the testing edge of more than 1/4 inch shall be corrected by adding or removing concrete as necessary while the concrete is still plastic.

E. Concrete sidewalks may be constructed with suitable, approved slip-form equipment when permitted by the Engineer. The wood floating may be omitted when a suitable finish is produced by the slip-form equipment.

F. Ramps for individuals with disabilities shall be constructed at the locations and in accordance with the details and dimensions shown on the contract drawings, these specifications and the Americans with Disabilities Act (ADA). Ramps shall include detectable warning fields installed per manufacturer's recommendations.

G. Where reinforcement is required, it shall conform to and be placed in accordance with the details shown on the contract drawings.

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H. Joints for sidewalks, including transverse joints, longitudinal joints, contraction joints, expansion joints and joint felts and filler materials shall conform to the requirements of Section 602.3.2.5 of the State of Wisconsin, Department of Transportation, Standard Specifications, except as modified herein.

1. Sidewalks shall be divided into sections not less than 3 feet nor more than 12 feet, unless otherwise indicated on the contract drawings. Transverse joints shall be spaced at 6 foot intervals.
2. Prefabricated expansion joint of 1/2-inch thickness shall be placed where steps or sidewalks abut curbs, pavements, steps, or existing sidewalk. Prefabricated expansion joint of 1 inch thickness shall be placed where sidewalk abuts buildings, retaining walls, or other rigid structures. Expansion joints shall be provided on each side of driveways and at uniform intervals of not more than 96 foot centers for sidewalk construction.
3. Extend joint fillers full-width and depth of joint and not less than 1/4-inch or more than 1/2-inch below finished surface. Furnish joint fillers in one-piece lengths for the full width being placed, wherever possible. Where more than one length is required, lace or clip joint filler sections together. Trim top edge of filler to conform to profile of concrete.

3.04 STEPS

A. Steps shall be constructed and placed as shown on the contract documents.

3.05 DRIVEWAYS

A. Driveways shall be constructed to a uniform depth of 6 inches. Driveways shall be constructed to the limits and slope shown on the contract drawings or as staked by the Engineer.

3.06 CURING COMPOUND

A. Curing compound shall be applied at the recommended coverage requirement and application rate of the manufacturer. The compound shall be applied by sprayer as soon as all free water has disappeared after finishing operations.

B. If the coating is damaged within 72 hours of its application, the damaged surfaces shall be resprayed immediately.

3.07 ADJUSTING UTILITY APPURTENANCES

A. Valves and curb stop boxes shall be adjusted to finished grade of new construction in a manner that the new construction will not interfere with the proper operation of the facility. Catch basins, manholes and inlet covers shall be adjusted to the required elevation by adjusting the top of the existing structure by removing or adding adjusting rings and reinstalling the fixtures firmly in place.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Concrete sidewalk, steps and driveways shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 CONCRETE SIDEWALK

A. Concrete Sidewalk, Square Foot. Measurement for concrete sidewalk shall be per square foot of a specific thickness installed. Payment shall be made at the contract unit price bid per square foot of the specific thickness of concrete sidewalk installed.

4.03 STEPS

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A. Steps, Square Foot. Measurement for concrete steps shall be per square foot of tread surface. Payment shall be made at the contract unit price bid per square foot of tread surface.

4.04 DRIVEWAYS

A. Driveways, Square Foot. Measurement for concrete driveways shall be per square foot of a specific thickness installed. Payment shall be made at the contract unit price bid per square foot of the specific thickness of concrete driveway installed.

END OF SECTION

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SECTION 32 91 19.13
TOPSOIL PLACEMENT AND GRADING

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition at time of bid opening.

1.03 DESCRIPTION OF WORK

A. The work under this section shall cover furnishing all material, equipment, and labor required to salvage and/or furnish, haul, place, and prepare topsoil for this project in accordance with Section 625 of the State of Wisconsin, Department of Transportation Standard Specifications.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Erosion and Sedimentation Controls - Division 31

C. Grading - Division 31

D. Subgrade Preparation - Division 31

E. Seeding - Division 32

F. Sodding - Division 32

1.05 SUBMITTALS

A. Submit a sample of the topsoil material prior to placement. Topsoil material shall be approved by the Owner or Engineer prior to placing on the project.

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 TOPSOIL

A. Topsoil shall be screened and conform to Section 625 of the State of Wisconsin, Department of Transportation, Standard Specifications. A minimum of 100% of the topsoil shall pass through the one-inch sieve (25 mm) and 90% shall pass the No. 10 (2.00 mm) sieve.

B. Topsoil shall conform to Section 625 of the State of Wisconsin, Department of Transportation, Standard Specifications.

2.02 SALVAGED TOPSOIL

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A. Topsoil salvaged from the project site may be used to replace planned quantities of topsoil.

B. Salvaged topsoil shall be screened and conform to Section 625 of the State of Wisconsin, Department of Transportation, Standard Specifications. A minimum of 100% of the topsoil shall pass through the one-inch sieve (25 mm) and 90% shall pass the No. 10 (2.00 mm) sieve.

C. Salvaged topsoil shall conform to Section 625 of the State of Wisconsin, Department of Transportation, Standard Specifications.

2.03 COMPOST

A. Compost shall be a well decomposed, stable, mature, and weed free organic matter source. The compost shall be derived from: agricultural waste, food waste, yard trimmings, or any plant-derived residuals. The compost will not resemble the raw material from which it was derived, have visible free water, produce dust, or objectionable odors. The compost shall have a pH in the range of 6.0 – 8.5, but shall not have added liming agents or ash by-products when used in conjunction with acid loving plants. The compost shall pass 100% through a 1-inch sieve. No biosolid (treated sewerage waste) shall be allowed.

PART 3 EXECUTION

3.01 PRESERVATION OF TREES AND SHRUBS

A. Trees and shrubs to be preserved shall be thoroughly protected from scarring or other injury during placement and grading operations. Excavation operations shall not disturb the original ground around trees within a distance of one foot or twice the diameter of the tree, whichever is greater. Exposed roots resulting from excavation shall be cut cleanly and covered with humus-bearing soil.

B. When necessary or required by the Contract Documents, trees or shrubs around which embankment is placed shall be protected by tree wells built in accordance with Detailed Drawings or as laid out in the field by the Owner or Engineer.

3.02 REMOVING AND SALVAGING TOPSOIL

A. General. Topsoil shall be stripped and salvaged or removed in accordance with Subsection 625.3 of the State of Wisconsin, Department of Transportation Standard Specifications.

B. Salvaged Topsoil. Topsoil shall be stripped to full depth, or a minimum depth of 6 inches (whichever is less), in all areas of cut or fill, except within proposed roadway limits topsoil shall be stripped full depth. Stockpile topsoil in storage piles in areas shown, or where otherwise directed. Construct storage piles to freely drain surface water. Cover or sprinkle water on storage piles if required to prevent windblown dust. Any appreciable volume left in the stockpile after properly placing shall become the property of the Owner and left in the pile. In any event, the pile shall be smoothed and seeded. All piles, which are to be left for seven or more days, shall be stabilized as indicated in the Erosion and Sedimentation Controls - Division 31.

3.03 PLACEMENT AND GRADING

A. General. Topsoil shall be placed in accordance with Subsection 625.3 of the State of Wisconsin, Department of Transportation Standard Specifications.

B. Compost Application.
1. Planting Beds: A minimum of 2.2 inches of compost shall be incorporated into 3.8 inches of soil in bed areas, or the contractor may show proof of compost to soil mixture meets or exceeds the 10% organic content.
2. Turf Areas: A minimum of 1.3 inches of compost shall be incorporated into 4.7 inches of soil for establishing turf areas, or the contractor may show proof of compost to soil mixture meets or exceeds the 5% organic content.
3. Compost Mulch: Compost may be used as a stabilization material to minimize erosion on highly erodible soils or sloped surfaces. Compost shall be applied to a depth of 2-inches uniformly over the

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desired area up to a 2:1 slope. In the case of very unstable soils, steep slopes, or concentrated water flows the contractor shall supply a plan for structural and diversion measures to establish vegetation.

4. All amending or mulching shall be reasonably free of large clods, stones, roots, or other material, which will interfere with planting and maintenance.
5. Contractor shall supply a 4-inch pot of 100% of the supplied compost growing the project specified seed mixture (vegetation height of 3 inches required) to prove viability of the compost.
6. Engineer may require additional testing if the compost is of question.

C. Grading. The Contractor shall grade in back of the curb or walk to provide a smooth surface and a 4:1 maximum slope unless shown otherwise on the plan. Graded surfaces shall be covered with topsoil to finished grade as shown on the typical sections.

D. Utility Adjustment. The Contractor shall adjust all valve boxes, manhole frames, and other utility appurtenances to within 1 inch of the final grade as shown on the contract drawings or as staked in the field by the Engineer.

E. All areas disturbed by the Contractor's activities and intended for seeding or sodding shall be topsoiled to the depth of 6-inches, unless shown otherwise on the Contract Drawings or specified in Special Procedures - Division 01.

F. All areas disturbed by the Contractor's activities and intended for cultivation of vegetation other than turf shall be topsoiled to the depth of the original topsoil, unless shown otherwise in the Contract Drawings.

G. Screened/Sifted Topsoil. In existing urban areas or areas where a lawn-type turf is required, the topsoil shall be top dressed with a minimum of 2-inches of screened/sifted topsoil.

H. Construction in and adjacent to flowing streams shall be performed to avoid washing, sloughing or deposition of materials into the channel which may obstruct or impair stream flow, or which may result in contamination and/or silting of the stream.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Topsoil placement and grading shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. No measurement will be made of corrective actions necessary to address erosion and/or settlement of topsoil.

C. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 SALVAGED TOPSOIL

A. Salvaged Topsoil. Where salvaged topsoil from the project site is used to replace planned quantities of topsoil, no additional payment shall be made for removal and processing of salvaged topsoil. All work to remove, stockpile, process, place and grade salvaged topsoil shall be considered inclusive to Topsoil Placement and Grading.

4.03 TOPSOIL PLACEMENT AND GRADING

A. Topsoil Placement and Grading, Square Yard. Measurement for topsoil placement and grading will be per square yard installed to the depth specified within the limits of construction designated on the plans, or in the contract, or as directed by the Engineer. Payment shall be made at the contract unit price bid per square yard.

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B. Topsoil Placement and Grading, Acre. Measurement for topsoil placement and grading will be per acre installed to the depth specified within the limits of construction designated on the plans, or in the contract, or as directed by the Engineer. Payment shall be made at the contract unit price bid per acre.

C. Topsoil Placement and Grading, Lump Sum. The payment for this item shall be at the contract lump sum price bid for topsoil placement and grading.

D. Topsoil Placement and Grading, Inclusive. When no quantity is provided, topsoil placement and grading shall be considered inclusive to unclassified excavation.

END OF SECTION

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SECTION 32 92 19
SEEDING

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition at time of bid opening.

1.03 DESCRIPTION OF WORK

A. The work covered under this section shall consist of furnishing all material, equipment, and labor required to execute the seeding for this project. All areas disturbed by the construction and not covered with pavement, aggregate base course, sod, or other structures shall be seeded, fertilized and mulched.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Submittals - Division 01

C. Subgrade Preparation - Division 31

D. Trenching and Backfilling - Division 31

E. Erosion and Sedimentation Controls - Division 31

F. Topsoil Placement and Grading - Division 32

G. Sodding - Division 32

1.05 SUBMITTALS

A. Contractor shall submit such product literature and catalog cuts of materials to be supplied to relate these materials to these specifications. Information shall be in conformance with requirements of Submittals - Division 01 of these specifications.

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 SEED

A. Seed shall conform to Section 630 of the State of Wisconsin, Department of Transportation, Standard Specifications.
   1. Mixture. Unless specified otherwise, the Contractor utilize the following seed mixtures:
      a. Lawn areas shall be No. 40
      b. Slope areas shall be No. 20
      c. Native areas and pond slopes shall be No. 75 unless otherwise specified.
   2. Nurse crop shall be annual oats prior to September 1. Nurse crop shall be winter wheat or annual ryegrass for the remainder of the year.

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2.02 FERTILIZER

A. Fertilizer shall contain the following percentages by weight:

Nitrogen	(N)	20%
Phosphorus	(P)	10%
Potash	(K)	10%

B. If local ordinances restrict the use of phosphorus in fertilizer, the local restrictions shall supercede the above percentages.

2.03 MULCH

A. Mulching shall consist of any straw, hay, wood excelsior fiber or other suitable material of a similar nature, which is substantially free of noxious weed seeds and objectionable foreign material.

2.04 WATER

A. Water shall be clean and free of impurities or substances that might injure the seed or grass.

PART 3 EXECUTION

3.01 SEEDING

A. Seeding shall be done in conformance with Subsection 630.3 of the State of Wisconsin, Department of Transportation, Standard Specifications. Seed shall be sown at a rate of four pounds per 1,000 square feet unless otherwise specified.

B. A nurse crop shall be sown with the seeding at a rate of four pound per 1000 square feet of area.

3.02 FERTILIZER

A. Apply fertilizer in conformance with Section 629 of the State of Wisconsin, Department of Transportation, Standard Specifications.

B. Deliver fertilizer to site in original unopened containers showing manufacturer's name, guaranteed analysis and weight. Store in a weatherproof location and use only when dry and free flowing. Apply fertilizer at rate of 10 pounds per 1000 square feet and evenly mix into top 2 inches of topsoil.

C. At the Contractor's option, the Contractor may perform soil tests and apply fertilizer based on the results.

3.03 MULCHING

A. This work shall consist of furnishing, placing, and anchoring a mulch cover over seeded areas.

B. Construction shall be done in conformance with Section 627 of the State of Wisconsin, Department of Transportation, Standard Specifications.

C. In existing developed areas, mulching shall be done in such a manner to prevent dust and mulch from being deposited on non-seeded areas. Acceptable methods are by hand or a small chopper/mulcher with a controlled discharge.

3.04 ACCEPTANCE

A. The work will be considered acceptable after a 3-inch uniform stand of grass is attained and all gullies, rivulets, and washouts have been repaired to the satisfaction of the Engineer. The Contractor shall request the Engineer's inspection and acceptance will be made in writing when the above conditions have been complied with. Contractor shall make all corrective actions necessary to attain acceptance.

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3.05 WATERING

A. If weather conditions are not suitable establishing turf, the seeded areas shall be watered twice weekly. Water shall be applied uniformly and in such a manner as not to waterlog the topsoil, dislodge the seed, or cause erosion.

B. If water is provided by a water utility, the Contract shall maintain a record of the amount of water obtained and provide it to the utility.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Seeding shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. No measurement will be made of corrective actions necessary to address erosion or non-establishment of vegetation.

C. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 SEEDING

A. Seeding, Square Yard. Payment shall be made at the contract unit price bid per square yard for seeding installed. Measurement shall be per square yard installed as measured in the field.

B. Seeding, Acre. Payment shall be made at the contract unit price per acre for seeding installed. Measurement shall be per acre installed as measured in the field.

C. Seeding, Lump Sum. Payment shall be made at the contract lump sum price bid. Measurement shall be to the extent shown on the contract drawings and described in Special Procedures - Division 01.

4.03 WATERING

A. Watering, MGAL. Payment shall be made at the contract unit price bid per MGAL (1000 gallon unit) for watering completed. Measurement shall be per MGAL used for watering purposes. The Contractor shall provide load tickets for the water used.

B. Watering, Each. Payment shall be made at the contract unit price bid per each for watering. Measurement shall be per each watering completed on the entire project restoration area.

C. Watering, Inclusive. When no quantity is provided, payment for watering shall be considered inclusive to payment for seeding.

END OF SECTION

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SECTION 32 93 00
LANDSCAPING

PART 1 GENERAL

1.01 SUMMARY

A. The work under this section shall consist of furnishing and planting plants of the species, varieties and size specified, complete in place at locations designated on the plans or as directed by the Landscape Architect. This shall include furnishing all necessary materials and performing all necessary work such as excavation of plant holes, salvaging topsoil, transplanting, backfilling, pruning, mulching, watering, fertilizing, support staking where necessary, disposing of surplus waste materials, necessary care and required replacements pending acceptance, and such work necessary or incidental to complete the item in accordance with the plans, specifications and contract.

B. Related Sections

1. 01 33 00 Submittal Procedures
2. 31 25 00 Erosion and Sedimentation Controls
3. 31 23 33 Trenching and Backfilling
4. 32 91 19 Topsoil Placement and Grading
5. 32 92 19 Seeding

1.02 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and other Division 00 and 01 Specification Sections, apply to this Section.

1.03 REFERENCES

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
1. American Association of Nurserymen, (AAN), Horticultural Specifications and Standards, Current Edition.
2. American National Standards Institute (ANSI), Specifications and Standards, Current Edition.
a. ANSI Z60.1 - Nursery Stock, Current Edition.
3. Federal Specifications (FS), Specifications and Standards, Current Edition.
1. FS O-F-241 - Fertilizers, Mixed, Commercial, Current Edition.
4. United States Department of Agriculture (USDA), Natural Resource Conservation Service - Wisconsin, Technical Guide:
a. NRCS 612 - Tree/Shrub Establishment, Current Edition.

1.04 QUALITY ASSURANCE

A. All plant material shall conform to the American Standards for Nursery Stock, unless noted otherwise herein.

B. All plant material shall be true to the species and variety/hybrid/cultivar specified, and nursery-grown in accordance with good horticultural practices, and under climatic conditions similar to those of the site location. Nursery dug specimens to be replanted shall have been freshly dug and properly prepared for planting.

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C. Trees and shrubs shall be trained in development and appearance as to be superior in form, compactness and symmetry. Trees with multiple leaders, unless specified otherwise, and shrubs with damaged or cut main stem(s), will be rejected.

D. Trees and shrubs with a damaged, cut or crooked leader, abrasion of bark, sunscald, frost crack, disfiguring knots, insects (including eggs and larvae) or insect damage, cankers/cankerous lesions or fungal mats, mold, prematurely-opened buds, or cuts of limbs over 3/4" diameter that are not completely callused will be rejected.

E. Trees and shrubs shall have healthy, well-developed root systems, and be free from physical damage or other hindrances to healthy growth.

F. Balled and burlapped plants shall be dug with solid balls of a diameter not less than that recommended by the American Standards for Nursery Stock, and of sufficient depth to include both fibrous and feeding roots. Balls shall be securely wrapped with burlap, and tightly bound with rope or twine. No plant shall be bound with rope or wire in such manner as to damage bark or break branches. The root flare should be within the top 2" of the soil ball.

G. Balled and burlapped plants will not be accepted if the ball is dry, cracked, or broken before or during planting.

H. Containerized plants are to be well-established within the container, with a root system sufficiently developed to retain its shape and hold together when removed from the container. Soil within the container should be held together by the roots, in form and whole. Plants shall not be pot-bound, nor have kinked, circling, or bent roots.

I. Bare root plants are to have a healthy, well-branched, and adequately spreading root system characteristic of the species.

J. Herbaceous perennials, annuals and bulbs shall only be supplied from nurseries certified by state plant inspectors. Substitutes or collected material may be used if approved by Owner or Architect/Engineer.

K. Soil-Testing Laboratory Qualifications: An independent laboratory, recognized by the State Department of Agriculture, with the experience and capability to conduct the testing indicated and that specializes in types of tests to be performed

L. Soil Analysis: For each unamended soil type, furnish soil analysis and a written report by a qualified soil-testing laboratory stating percentages of organic matter; gradation of sand, silt, and clay content; cation exchange capacity; sodium absorption ratio; deleterious material; pH; and mineral and plant-nutrient content of the soil.

M. Testing methods and written recommendations shall comply with USDA's Handbook No. 60.

N. The soil-testing laboratory shall oversee soil sampling; with depth, location, and number of samples to be taken per instructions from Architect. A minimum of three representative samples shall be taken from varied locations for each soil to be used or amended for planting purposes.

O. Report suitability of tested soil for plant growth.

P. Based upon the test results, state recommendations for soil treatments and soil amendments to be incorporated. State recommendations in weight per 1000 sq. ft. or volume per cu. yd. for nitrogen, phosphorus, and potash nutrients and soil amendments to be added to produce satisfactory planting soil suitable for healthy, viable plants.

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Q. Report presence of problem salts, minerals, or heavy metals, including aluminum, arsenic, barium, cadmium, chromium, cobalt, lead, lithium, and vanadium. If such problem materials are present, provide additional recommendations for corrective action.

1.05 SUBMITTALS

A. Contractor shall submit such product literature and catalog cuts of materials to be supplied to relate these materials to these specifications. Names of nurseries shall be identified for each plant purchased. Information shall be in conformance with requirements of Submittals - Division 01 of these specifications.

B. Planting soil test results and treatment recommendations (if any).

1.06 MEASUREMENT

A. Plants shall conform to the measurements specified within the contract documents. Specified height and spread dimensions will refer to the main body of the plant, and not from branch tip to branch tip. Plants meeting a specified measurement but judged to lack the balance between height and spread characteristic of the species will be rejected.

B. Plants shall be measured when branches are in their normal position.

C. No plant shall be less than the minimum size specified, and no less than fifty (50) percent of the plants shall be as large as the maximum size specified.
   1. Trees and Shrubs: Measure with branches and trunks or canes in their normal position. Take height measurements from or near the top of the root flare for field-grown stock and container grown stock. Measure main body of tree or shrub for height and spread; do not measure branches or roots tip to tip. Take caliper measurements 6 inches above the root flare for trees up to 4-inch caliper size, and 12 inches above the root flare for larger sizes.

D. Containerized shrubs shall be measured by height and width for conformity with the plant list.

E. Herbaceous perennials shall be measured by pot size, not by top growth.

F. All other measurements, such as number of canes, ball sizes, and quality designations, shall conform to *American Standards for Nursery Stock, current edition*.

1.07 SUBSTITUTIONS

A. The substitution of plant materials is not permitted unless authorized in writing by Owner. If written proof is submitted by the Contractor that a plant of specified species, variety or size is unavailable, consideration will be given towards the nearest available size or variety, or towards an alternate species selection, with a corresponding adjustment of the contract price.

B. Larger plants than those specified can be used upon approval of the Owner or Architect/Engineer. The use of larger plants shall not increase the contract price. The root ball, root spread and container size of the larger specimen shall be proportionally increased, relative to the specified size.

1.08 DELIVERY, STORAGE AND HANDLING

A. The Contractor is to arrange for the acceptance and unloading of plants at the project site.

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B. All plants are to be labeled by plant name and size. Labels shall be attached securely to all plants, bundles, and containers of plant materials when delivered. Labels shall be durable and legible, with information given in weather-resistant ink or embossed process lettering.

C. All plant materials, shipments and deliveries shall comply with current state and federal laws and regulations governing the inspection, shipping, selling and handling of plant stock. If required by law or regulation, a certificate of inspection, or a copy thereof, for injurious insects, plant diseases, and other plant pests shall accompany each shipment or delivery of plant material. The certificate shall bear the name(s) and address(es) of the source of the plant stock.

D. During transport, no plant shall be bound with rope or wire in a manner that damages trunks or breaks branches. Plants shall also not be dragged, lifted or pulled by the trunk, branches or foliage in a damaging way. No plant shall be thrown off of a truck or loader to the ground.

E. Prior to installation, all plants must be protected from sun and drying winds.

F. Containerized or balled and burlapped plants not being installed immediately must be kept in a shaded area, well-covered with wood chips, soil, or other approved material, and kept well-watered. Install all plants within three (3) days of delivery.

G. Cover roots of bare root plants with a moist tarp, burlap, sphagnum moss, or mulch while being transported to, or while being held at the project site. Soak the bare roots overnight in water before planting. Just before planting, extend the roots carefully into a natural position, free of bunching, kinking or circling. Cut back all broken or damaged roots to a point clean and free of rot. No additional root pruning is allowed. Carefully work backfill mix among the roots while simultaneously watering.

H. Fertilizer shall be delivered to the site in original, sealed containers, and stored in a waterproof space. Containers shall bear the manufacturer's name, analysis, trademark and guarantee as per standards of the Wisconsin Department of Agriculture.

1.09 JOB CONDITIONS

A. Protect all plants, lawns, and grass areas from damage at all times. Damaged plants, lawns or grass areas shall be replaced or treated as required to conform with specifications herein for fresh stock.

B. Work areas shall be kept clean and orderly during the installation period. Under no condition shall debris from planting activities result in a safety hazard on-site or to adjacent off-site property.

C. Damage to lawns or grass areas incurred as a result of replacement operations shall be repaired by Contractor at no cost to Owner.

1.10 WARRANTY

A. All plants shall be warranted to be in healthy and flourishing condition by June 30 after the end of one full growing season. The warranty shall not cover damage from vandalism, animals, freezing rains, or winds of sixty (60) miles per hour or greater, if the Contractor burlaps or otherwise protects any plants that he/she feels could be damaged during the warranty period.

B. At any time during the warranty period, the Contractor shall remove or replace, without cost to the Owner, and within a specified planting period, all plants not in a healthy and flourishing condition as determined by the Owner or Architect/Engineer.

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C. Replacement plants shall be subject to the same specified requirements of the contract. The warranty of replacement plants shall extend until June 30 after the end of one full growing season. In the event that a replacement plant is not acceptable during, or at the end, of the said warranty extension period, Owner may choose between subsequent replacement or credit for that item.

D. Include the following remedial actions as a minimum:
1. Immediately remove dead plants and replace unless required to plant in the succeeding planting season.
2. Replace plants that are more than 25 percent dead or in an unhealthy condition at end of warranty period.
3. A limit of one replacement of each plant will be required except for losses or replacements due to failure to comply with requirements.

E. Provide extended warranty for period equal to original warranty period, for replaced plant material.

PART 2 PRODUCTS

2.01 MATERIALS

A. Plant Materials: A complete list of plant materials, including a schedule of quantities, sizes, root condition, quality and source location, shall be included in the contract documents. If discrepancies occur between the printed plant list, and the drawings, the printed list will take precedent.

B. Root Conditions:
1. Bare rooted shrubs shall be dug with adequate fibrous roots. Roots of these plants shall be covered or packed in moist straw, or other water holding material until time of planting.

2. B&B plants shall be dug with firm natural balls of earth of sufficient diameter and depth to include most of the fibrous roots. Root balls shall be wrapped with burlap and secured with twine and/or a wire basket.

3. Container grown stock shall have been grown in a container long enough for the root systems to have developed sufficiently to hold its soil together, firm and whole. No plants shall be loose in the container. Prune roots as needed and prune of any encircling roots once the plant is removed from its container.

C. Owner may request a written list of the proposed sources of nursery stock at the preconstruction meeting. This list may not be added to or otherwise altered without the consent of Owner.

D. Topsoil: Naturally fertile, agricultural soil, capable of sustaining vigorous growth, of uniform composition throughout, without admixtures of subsoil, free of clay, stones larger than 1” inch diameter, roots, trash and debris of any kind, supplied by Contractor at his/her expense, and subject to approval by the Owner or Architect/Engineer.

E. Organic Compost: Well-composted, stable, and weed-free organic matter, pH range of 5.5 to 8; moisture content 35 to 55 percent by weight; 100 percent passing through 1/2-inch sieve; soluble salt content of 5 to 10 decisiemens/m; not exceeding 0.5 percent inert contaminants and free of substances toxic to plantings. Organic Matter Content: 50 to 60 percent of dry weight.

F. Planting Mixture: Material used in tamping around balls and roots during the planting operation shall be prepared on site.
1. Ratio of Loose Compost to Topsoil by Volume: Four (4) parts native topsoil from project site to one (1) part organic compost. Conform to alternate mixes as specified for beds of certain ornamental plants. All mixtures subject to the approval of the Project Representative or Landscape Architect.

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G. Fertilizer: Granular, non-burning product composed of not less than fifty (50) percent organic slow-acting, guaranteed analysis professional fertilizer. Commercial fertilizer shall conform to Wisconsin State Statutes, Section 94.64, and meet the standards of the Wisconsin Department of Agriculture as to registration and labeling. Fertilizer shall be specified in the contract documents as to composition, but is subject to revision to suit project site conditions.

H. Organic Mulch: Shredded Hardwood Bark (Except walnut), free of colorants or material detrimental to healthy plant growth. Organic Mulch shall be 1/8" nominal thickness, with at least fifty (50) percent having an area of not less than 1 sq. inch, and no piece having an area of more than 6 sq. inches.

I. Weed control fabric: Spun-bonded, rot-resistant polypropylene fabric, water and air permeable, and unaffected by freezing and thawing, or by deterioration from fertilizers or pesticides. This should only be used where no plants are installed and decorative gravel mulch is specified.

J. Stakes: 6-8 foot (1.8 - 2.4 m) long sections of unflanged metal, or 2" x 2" hardwood.

K. Flexible Support ties: 2" or wider bands of polypropylene, or elasticized or webbed strapping.

L. Wrapping material: Biodegradable geotextile (fabric) trunk wrap, or waterproofed crepe wrapping paper, secured with 1" wide masking tape.

M. Anti-desiccant: If required as protection for leaf surfaces, anti-desiccant shall be permeable to permit transpiration, and mixed and applied in accordance with manufacturer's specifications.

1. Pre-emergent Herbicide (Selective and Non-Selective): Effective for controlling the germination or growth of weeds within planted areas at the soil level directly below the mulch layer.

N. Post-Emergent Herbicide (Selective and Non-Selective): Effective for controlling weed growth that has already germinated.
   1. Mycorrhizal Fungi: Dry, granular inoculant containing at least 5300 spores per lb. of vesicular-arbuscular mycorrhizal fungi and 95 million spores per lb. of ectomycorrhizal fungi, 33 percent hydrogel, and a maximum of 5.5 percent inert material

O. Slow-Release Fertilizer: Granular or pelleted fertilizer consisting of 50 percent water-insoluble nitrogen, phosphorus, and potassium in the following composition:
   1. Composition: 20 percent nitrogen, 10 percent phosphorous, and 10 percent potassium, by weight.
   2. Composition: Nitrogen, phosphorous, and potassium in amounts recommended in soil reports from a qualified soil-testing laboratory.

P. Metal Edging. If called for in the plans use only metal edging made of steel with a minimum 1/8" thickness and 4" height, capable of being formed to the design of the planting bed edge.

Q. No-Mow Seed Mix – "No Mow Lawn" Seed Mix from Prairie Nursery, or approved equal. Prairie Nursery, Westfield, WI; https://www.prairienursery.com/no-mow-lawn-seed-mix.html
   1. All side slopes of bio-retention cell shall be seeded with the above plant mix, or other approved equal as indicated in the contract documents.
      1) A combination cover crop of Canadian Wild Rye shall be seeded with all native seed mixes at a rate of 1 lb. per 1,000 square feet.
      2) The Contractor shall submit seed mix, proposed seeding rate, and mulching techniques to the Landscape Architect/Engineer prior to seeding along with results of seeding in similar soil conditions.

R. Bio-retention cell basin

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1. Bottom of bio-retention cell shall be planted with plugs of the species found in the plant schedule noted in the contract documents.
    1) Plugged installations shall not have the same species in groupings of 4 or more for contrast of planting.

PART 3 EXECUTION

3.01 PREPARATION

A. Receive Owner or Architect/Engineer approval of staking layout prior to excavation.

B. Stake all planting areas and notify Digger's Hotline (1-800-242-8511 statewide) to verify location of all underground utilities prior to excavation.

C. Excavate planting areas as shown in the contract drawings.

D. Adequately barricade with proper warning devices any planting pit left open when planting work is not in progress, and that poses a hazard to vehicles and/or pedestrians.

E. Notify the Owner in writing of any soil conditions, obstructions, or concerns about water drainage deemed detrimental to healthy plant growth. These conditions or obstructions shall be detailed, along with any suggestions for correction, removal or relocation. Where soil conditions, poor drainage or other obstructions are encountered that cannot be easily remedied, the Owner will designate alternate locations, and will bear the additional costs of such relocation.

F. The planting pit for balled and burlapped plants shall be at least 2 times the diameter of the soil ball, or to a dimension otherwise specified.

G. The planting pit for a single shrub shall be 12" wider than the root ball. Excavate individual shrub pits to the proper depth.

H. Loosen the soil beyond the edge of the planting pit. The soil at the base of the planting pit is to remain undisturbed, the depth of which shall correspond to the distance from the bottom of the soil ball to the root flare, or slightly less.

I. Planting pits for bare root plants shall be only broad enough to receive the full extension of the roots when the plant is set, and only deep enough to set the uppermost roots just below existing grade.

J. Application of Mycorrhizal Fungi: At time directed by Architect/Engineer, broadcast dry product uniformly over prepared soil at application rate recommended by manufacturer.

3.02 PLANTING OF TREES AND SHRUBS

A. Root balled plants shall have rope, string, wire baskets, burlap and other wrapping material removed from the top two-thirds (2/3) of the ball after the plant has been set in the hole. Remaining wrappings, other than those made from plastic or synthetic material, may be left around the bottom half of the ball.

B. If deciduous species are planted in leaf, they may be sprayed with an approved anti-desiccant prior to planting when so directed by the Owner.

C. Trees and shrubs grown using root containment material shall have the containment bag removed prior to setting.

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D. The root flare of trees must be visible and trees shall be set such that the root flare is approximately 2 inches above adjacent soil grades.

E. Set trees and shrubs straight and upright, and in the center of the planting hole and on the unexcavated base of the planting pit, with the most desirable face towards the most prominent view.

F. Root-balled shrubs are to be carried and set in the hole by the root ball.

G. Backfilling: Backfill pits with Planting Mixture. No soil in frozen or muddy condition shall be used for backfilling.

H. When pit is approximately two-thirds backfilled, tamp down and water to eliminate air pockets. After initial watering, add remainder of the soil to the top of pit, water without puddling, and firmly tamp without over compacting. Form a 2-3" high saucer around the outer rim of the pit prior to mulching.

3.03 FINISHING

A. Finish-grade planting areas to required elevations after plants have fully settled.

B. No soil is to cover the top of the root ball. All plants shall be completely mulched over the root system with a 3" layer of specified mulching material immediately after planting. Pull back mulch no less than 3" and no more than 6" from the trunk.

C. Where specified lay weed control fabric over grade prior to mulching as per manufacturer's recommendations. Secure to slopes with pin anchors.

D. Thoroughly water plants immediately after planting and before mulching, primarily within and filling the saucer.

E. Wrapping: Only trees so designated shall be protected with tree wrap. Secure wrapping at a minimum of 5 locations, including the top, middle and bottom of the trunk. Cover the trunk's entire surface in a spiral manner, starting at the tree's base and extending to just below the height of the lowest main branches. Overlap material at 1/2-1". Owner will be responsible for removing the tree wrap after a recommended period.

F. Prune any dead or broken branches. Prune newly-planted hedges as directed by the Landscape Architect or Project Representative.

G. Remove all twine and rope after planting, along with any labels attached around trunks or branches.

3.04 STAKING

A. Stake only those individual plants designated on-site by Owner and Engineer.

B. Space stakes evenly outside of, and driven clear of, the root ball. Stakes are to be driven at an angle then drawn to vertical.

C. Ties made of approved material shall be directly attached to the stakes. Attach ties so as to allow for 1-3" of sway in the trunk. For drooping stems, ties shall be placed at the point on the stem at which the top can then stand on its own.

D. Staking shall conform to any additional directions found in the drawings.

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3.05 PLANTING OF GROUND COVERS, PERENNIALS, ANNUALS AND BULBS

A. Preparation: Loosen soil of the planting bed to a depth of 8" by mechanical or hand tilling while soil is dry. For bulbs, the depth of loosened soil will be determined by the type of bulb planted, and specified in the contract or landscape plan.

B. After soil is loosened, till organic compost into the soil across the planting bed to a uniform depth of 2" for compost.

C. Fertilizer, at amounts determined by the soil test, shall be top dressed to the soil. Liquid fertilizer may be applied to annuals if directed by Owner or Architect/Engineer.

D. Planting: Space as described in the landscape plan.

E. Plugs shall be installed through straw mulch and erosion control blankets.

F. Unless otherwise specified, install plants no closer than 12" to the trunks of trees or shrubs within planting bed, and to within 6" of the edge of the bed.

G. Prior to planting, biodegradable plant containers shall be split and non-biodegradable containers removed. The root systems of all such plants shall be split or crumbled by hand.

H. For small quantities of bulbs, or in sections where bulbs are set within other plants, drive bulb planting holes through mulch using a bulb planter, hand trowel, or power auger. Plant bulb such that its basal plate faces downward, then cover with soil and mulch.

I. For larger quantities of bulbs, excavate designated areas to specified planting depth, place bulbs such that their basal plates face downward, then cover with soil and mulch.

J. When applying stone mulch lay weed control fabric over grade prior to mulching as per manufacturer's recommendations. Secure to slopes with pin anchors.

K. When applying organic mulch apply pre-emergent herbicide per manufacturer's recommendations before applying mulch.

L. Apply approved mulch uniformly across the entire planting bed to a depth of 3", except as noted in the drawings.

3.06 INSPECTION AND ACCEPTANCE

A. Client Project Representative and a representative of the A/E Consultant with the Contractor of all plant material at one (1) week and three (3) week intervals (or other specified interval) after the original planting to note and correct any discrepancies from the contract. Plants that are alive and healthy following the three (3) week (or other time frame specified) inspection shall be accepted.

B. Acceptance of plant material by Owner shall reflect general conformity with the *American Standards for Nursery* Stock as to specified size, character and quality. Acceptance shall not relieve the Contractor of responsibility for full conformity to the contract documents and the guarantee period. Any defects or imperfections appearing in whole or any part of the work caused by or due to any fault or negligence on the part of the Contractor shall be corrected before the work is accepted.

C. Planting work may be accepted in stages when the Contractor and Owner deem that practice to be in their mutual interest. Approval must be given in writing by Owner to the

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Contractor verifying that work may be completed in stages. Acceptance of planting work in stages shall not waive any other provisions of the contract.

3.07 CLEANING

A. Soil, branches, binding and wrapping material, rejected plants, or other debris resulting from plant installation shall be promptly cleaned up and removed. New landscape construction in and around the planting areas are to be especially well-cleaned.

B. The contractor shall repair any damages that occurred during the completion of the work outlined in this section. All areas that are damaged by the contractor during completion of the work shall be repaired by the contractor. The damaged areas are to be restored to the conditions outlined on the plans at no additional cost to the owner.

3.08 PRUNING

A. Prune in accordance with current *American National Standards (ANSI) for Tree Care Operations*. Perform all pruning work in a manner consistent with the landscape design intent. Plants overhanging and blocking pedestrian and/or vehicular paths shall be pruned as needed to allow the desired clearance.

B. Except in the cases of hedges, or to conform to some design intent, all pruning of ornamental trees, shrubs and ground covers should aim to retain their natural shapes. With multiple leader plants, preserve the leader that best promote the plant's symmetry. Prune branches of deciduous stock to improve the branch structure of the plant.

C. Plants that flower before late spring should be pruned immediately after flowering. Those that flower in summer or fall should be pruned in winter or spring before new growth emerges.

D. Prune evergreens only to remove dead, broken or damaged branches. Prune yews, junipers, hemlocks and arborvitae after new growth has hardened off in late summer.

E. Where necessary, repairs to damaged wood shall be performed under the direction of Owner, or a certified arborist.

F. Prune using scissors-style cutting devices, and not anvil-style hand pruners, pole pruners or loppers.

G. The Contractor shall remove all trimmed branches and other debris from the site at the end of each work day.

3.09 MAINTENANCE

A. Fertilizing: Any and all chemical applications are to be performed in accordance with current federal, state and local laws, through EPA-registered materials and application techniques, and performed under the supervision of a licensed certified applicator. Apply fertilizer to planted areas at the specified rate, and as per manufacturer's recommendations.

B. Watering: All plant materials installed under the contract shall be watered within the first 24 hours of initial planting and not less than twice weekly until final acceptance by Owner.

C. Water used shall be of sufficient quality for irrigation and free of materials harmful to plant growth. Contractor responsible to supply water for temporary irrigation.

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D. Pesticide: Any use of pesticides during the contracted maintenance period, as determined by the Owner, shall utilize the minimum amount of approved pesticide needed to control pests on plant materials installed under the contract. Pesticide applications are to be performed in accordance with current federal, state and local laws, through EPA-registered materials and application techniques, and performed under the supervision of a licensed certified applicator. Apply at the specified rate, and as per manufacturer's recommendations.

PART 4 MEASUREMENT AND PAYMENT

4.01 PLANTS

A. General. Landscaping shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. No measurement will be made of corrective actions necessary to non-establishment of plant material.

C. Landscaping, Lump Sum. All items included, but not limited to, that pertain to the furnishing, installation, labor, equipment, and materials to trees, shrubs, planting beds and mulch shall be included under the respective bid item, "Landscaping."

END OF DOCUMENT

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SECTION 33 05 16.13
PRECAST CONCRETE UTILITY STRUCTURES

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. American Society for Testing and Materials (ASTM), Annual Book of ASTM Standards:
      a. ASTM A82 - Specification for Steel Wire, Plain, for Concrete Reinforcement, Current Edition.
      b. ASTM A496 - Specification for Steel Wire, Deformed, for Concrete Reinforcement, Current Edition.
      c. ASTM A615 - Specification for Deformed and Plain Billet-Steel Bars for Concrete Reinforcement, Current Edition.
      d. ASTM A668 - Specification for Steel Forgings, Carbon and Alloy, for General Industrial Use, Current Edition.
      e. ASTM A730 - Specification for Forgings, Carbon and Alloy Steel, for Railway Use, Current Edition.
      f. ASTM C76 - Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe, Current Edition.
      g. ASTM C478 - Specification for Precast Reinforced Concrete Manholes Sections, Current Edition.
      h. ASTM C913 - Specification for Precast Concrete Water and Wastewater Structures, Current Edition.
      i. ASTM C1227 - Specification for Precast Concrete Septic Tanks, Current Edition.
   2. Code of Federal Regulations (CFR), Title 29, Chapter XVII - Occupational Safety and Health Administration (OSHA), Department of Labor, Part 1926 Regulations, Current Edition.
   3. Federal Specifications (FS), Specifications and Standards, Current Edition.
   4. State Department of Commerce (DOC), Administrative Code of Rules and Regulations, Current Edition.
   5. State Department of Natural Resources (DNR), Administrative Code of Rules and Regulations, Current Edition.
   6. State Standard Specifications (SSS), for Sewer and Water Construction, Current Edition.

1.03 DESCRIPTION OF WORK

A. The work under this section shall cover the furnishings of all materials, equipment, tools, labor and supervision necessary to provide precast concrete structures as shown on the contract drawings and as specified herein.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Submittals - Division 01

C. Vault Doors - Division 08

D. Structural Excavation for Structures - Division 31

E. Granular Fill - Division 31

F. Trenching and Backfilling - Division 31

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1.05 SUBMITTALS

A. Contractor shall submit such product literature and catalog cuts of materials to be supplied to relate these materials to the specifications. Information shall be in conformance with requirements of Submittals - Division 01 of these specifications.

B. Contractor shall submit such submittals and details required for the construction and installation of the materials. Submittals and details shall indicate the intended materials arrangement, dimensions, major support requirements, and intricate or detailed construction requirements.

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 GENERAL

A. All precast concrete utility structures shall be watertight.

B. Compressive strength of the concrete shall be 5,000 psi. Minimum concrete thickness shall be 6 inches for walls and 8 inches for floors and ceilings.

C. Reinforcing steel shall meet ASTM A82,ASTM A496, ASTM A615 or ASTM A668, GR60. Minimum concrete cover over reinforcing steel shall be 1 inch. Lap of reinforcement at splices shall be a minimum of two cross wires for wire mesh.

D. Each piece of a structure shall be cast from a one piece mold. The use of connecting form ties which may result in corrosion or leakage points is not acceptable.

E. All joints shall be bell and spigot connections in conformance with ASTM C478.

F. Joint materials shall be plastic gasket material or butyl rubber gasket material. Plastic gaskets shall be preformed, high adhesion material, packaged ready for use between protective paper strips conforming to Federal Spec SS-S-00210, Type I, Rope Form; Ram-Nek by K.T. Snyder Company, Inc.; Kent Seal No. 2 or equal. Butyl rubber gaskets shall be preformed, high adhesion material, packaged ready for use between protective paper strips, conforming to Federal Spec SS-S-210A, Rope Form; CPS-210 by Press Seal Gasket Corporation or equal.

G. Waterstop seals shall be flexible, watertight, rubber wedge ring or O-ring compression seals for pipe entrance holes. Wedge ring type shall be Press-Wedge II by Press-Seal Gasket Corporation, PSX Boot by Press Seal Gasket Corporation, Boot Coupling by KOR-N-SEAL or equal. O-ring type shall have cast iron compression flange, Res-Seal by Scales Manufacturing Corporation or equal.

2.02 CIRCULAR PRECAST CONCRETE UTILITY STRUCTURES

A. Wall thicknesses of structures will vary with diameter in conformance with ASTM C76 for CLASS B concrete tongue and groove joint pipe. Larger diameter circular precast concrete utility structures (7 feet +) shall have wall thickness a minimum of one twelfth the inside diameter of the structure as specified in ASTM C478.

B. Steel reinforcement (sq. in./lin. ft.) shall not be less than 0.0025 times the inside diameter of the structure in inches.

2.03 RECTANGULAR PRECAST CONCRETE UTILITY STRUCTURES

A. Tanks shall meet all the requirements of ASTM C913 and ASTM C1227.

PART 3 EXECUTION

3.01 INSTALLATION

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A. Install all equipment in accordance with manufacturer's instructions and reviewed Submittals.

B. The bottom of the excavation shall be dry and firm. Dewater as necessary to provide these conditions.

C. The precast concrete utility structures shall sit on a layer of 12 inch washed stone wrapped in geotextile fabric Type SAS. Backfill material shall be as specified in Granular Backfill - Division 31.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Precast concrete utility structures shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 PRECAST CONCRETE STRUCTURES

A. Precast Concrete Utility Structures, Lump Sum. When so provided, payment shall be made in accordance with the price bid for the precast concrete utility structures complete and shall include all labor and materials necessary to install.

B. Precast Concrete Utility Structures, Inclusive. When no quantity is provided, precast concrete utility structures shall be considered inclusive to payment for associated work.

END OF SECTION

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SECTION 33 05 26.16
TRACER WIRE

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern the work of this section.

1.02 APPLICABLE PUBLICATIONS (NONE)

1.03 DESCRIPTION OF WORK

A. Contractor shall install tracer wire in conjunction with buried, non-metallic piping in accordance with the contract drawings and the requirements of the Engineer.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Low Pressure Utility Sewerage - Division 33

C. Sanitary Utility Sewerage Force Main - Division 33

D. Public Sanitary Utility Sewerage Pipe – Division 33

E. Water Utilities - Division 33

F. Utility Horizontal Directional Drilling – Division 33

G. Wastewater Process Piping System - Division 40

1.05 SUBMITTALS

A. Contractor shall submit such product literature and catalog cuts of materials to be supplied to relate these materials to these specifications. Information shall be in conformance with requirements of Submittals - Division 01 of these specifications.

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 TRACER WIRE

A. For direct burial installations, tracer wire shall be No. 12 gauge, ASTM D 1248, solid insulated copper wire rated for wet conditions.

B. Tracer wire directionally drilled installations shall be No. 12 gauge, copper clad, steel core, hard drawn, extra high strength wire, 1,150 pound average tensile break load, 45 mil HDPE coated, 30 volt rating. A minimum of two (2) wires is required to be installed.

C. Tracer wire for pipe bursting installations shall be 7 x7 stranded copper clad steel wire with a 4,700 pound average tensile break load, 50 mil HDPE coating, 30 volt rating. A minimum of two (2) wires is required to be installed

D. Tracer wire for sanitary sewerage utilities installation shall have green colored insulator.

E. Tracer wire for water utilities applications shall have blue colored insulator.

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2.02 TERMINAL LOCATION BOXES

A. Tracer wire terminal location boxes shall be Valvco or equal, with a cast iron lockable top. Cast iron tops shall be appropriately labeled, “WATER” or “SEWER” .

PART 3 EXECUTION

3.01 INSTALLATION

A. Tracer wire shall be installed in conjunction with all PVC and HDPE utilities and installed continuous to the greatest extent possible and in accordance with the contract drawings and the requirements of the Engineer.

B. For open cut installations, wire shall be placed along the top of the entire length of the pipe, and taped to the pipe, including hydrant barrels, at intervals not exceeding 10-feet.

C. Wire shall surface at all hydrants. Wire may also surface at valve boxes, above laterals at the property line, or manholes. Where spacing of these appurtances exceeds 400 feet; terminal location boxes shall be installed. Terminal location boxes shall be located by the Contractor to meet the maximum spacing or as called out in Special Procedures, Division 1 or as shown on the Contract Drawings.
1. Within valve boxes, the wire shall be installed in ½-inch PVC conduit beginning below the valve nut terminating six inches below the finished grade.
2. At manholes, the wire transition from outside to inside the manhole shall be watertight.
3. Adjacent to hydrants, the wire shall terminate in a terminal location box.

D. Eighteen inches of extra wire shall be provided at all terminations.

E. Splices in the wire shall be held to a minimum. Where splices are necessary, they shall be made with underground rated mechanical wire connectors or by twisting the wires a minimum of 4 times and soldering, then wrapping with two layers of polyethylene tape to 6-inches beyond the stripped wire. Splicing with wire nuts shall not be allowed.

3.02 TESTING

A. All tracer wire must pass a locating test. Locates shall be done in the presence of the Engineer prior to acceptance of respective pipe installation. All equipment necessary to make the test shall be provided by the Contractor.

PART 4 MEASUREMENT AND PAYMENT

4.01 TRACER WIRE

A. General. Tracer wire shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 1.
1. Tracer Wire, Lump Sum. When so provided, payment for tracer wire shall be made at the contract lump sum price bid or as specified in Special Procedures - Division 1.
2. Tracer Wire, Lineal Foot. When so provided, payment for tracer wire shall be made at the contract unit price bid or as specified in Special Procedures - Division 1.
3. Tracer Wire, Inclusive. When no quantity is provided, tracer wire shall be considered inclusive to payment for work scheduled under this contract.

B. Tracer Wire Testing, Inclusive. All testing shall be inclusive to the payment for the respective utility. Payment for utilities requiring tracer wire will not be issued until an accepted locate has been performed and accepted by the Engineer.

4.02 TRACER WIRE TERMINAL LOCATION BOXES

A. General. Tracer wire terminal location boxes shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 1.

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1. Tracer Terminal Location Boxes, Each. When so provided, payment for tracer wire terminal boxes shall be made at the contract bid price for each box or as specified in Special Procedures - Division 1.
2. Tracer Wire Terminal Box, Inclusive. When no quantity is provided, tracer wire terminal boxes shall be considered inclusive to payment for work scheduled under this contract.

END OF SECTION

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SECTION 33 10 00
WATER UTILITIES

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern the work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.

1. American National Standards Institute (ANSI) and American Water Works Association (AWWA), Specifications and Standards:
   a. ANSI/AWWA C104/A21.4 - American Water Works Standard for Cement-Mortar Lining for Ductile-Iron Pipe and Fittings, Current Edition.
   b. ANSI/AWWA C105/A21.5 – American National Standard for Polyethylene Encasement for Ductile-Iron Pipe Systems, Current Edition.
   c. ANSI/AWWA C110/A21.10 - American National Standard for Ductile-Iron and Gray-Iron Fittings for Water, Current Edition.
   d. ANSI/AWWA C111/A21.11 - American National Standard for Rubber-Gasket Joints for Ductile-Iron Pressure Pipe and Fittings, Current Edition.
   e. ANSI/AWWA C151/A21.51 - American National Standard for Ductile-Iron Pipe, Centrifugally Cast, Current Edition.
   f. ANSI/AWWA C153/A21.53 - American National Standard for Ductile-Iron Compact Fittings for Water Service, Current Edition.
   g. ANSI/AWWA C502- American Water Works Association Standard for Dry-Barrel Fire Hydrants, Current Edition.
   h. ANSI/AWWA C504 - American Water Works Association Standards for Rubber-Seated Butterfly Valves, Current Edition
   i. ANSI/AWWA C509- American Water Works Association Standard for Resilient-Seated Gate Valves for Water Supply Service, Current Edition.
   j. ANSI/AWWA C515 – American Water Works Association Standard for Reduced-Wall, Resilient-Seated Gate Valves for Water Supply Service, Current Edition.
   k. ANSI/AWWA C600 – American Water Works Association Standard for Installation of Ductile-Iron Water Mains and Their Appurtenances, Current Edition.
   l. ANSI/AWWA C605 – Underground Installation of Polyvinyl Chloride (PVC) Pressure Pipe and Fittings for Water, Current Edition.
   m. ANSI/AWWA C651 – American Water Works Association Standard for Disinfecting Water Mains, Current Edition.
   n. ANSI/AWWA C800 – American Water Works Association Standard for Underground Service Line Valves and Fittings, Current Edition.
   o. ANSI/AWWA C900 – American Water Works Association Standard for Polyvinyl Chloride (PVC) Pressure Pipe and Fabricated Fittings, 4-inch through 60-inch, for Water Transmission and Distribution, Current Edition.
   p. ANSI/AWWA C901 – American Water Works Association Standard for Polyethylene (PE) Pressure Pipe and Tubing, ½-inch through 3 inches for Water Service, Current Edition.
   q. ANSI/AWWA C906 – American Water Works Association Standard for Polyethylene (PE) Pressure Pipe and Fittings, 4-inch through 63-inch, for Water Distribution and Transmission, Current Edition.
2. American Society for Testing and Materials (ASTM), Annual Book of ASTM Standards:
   a. ASTM A536 – Standard Specification for Ductile Iron Castings.
   b. ASTM C578 – Standard Specification for Rigid, Cellular Polystyrene Thermal Insulation, Current Edition.
   c. ASTM D1598 – Standard Test Method for Time-to-Failure of Plastic Pipe Under Constant Internal Pressure, Current Edition.

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d. ASTM D1599 – Standard Test Method for Resistance to Short-Time Hydraulic Pressure of Plastic Pipe, Tubing, and Fittings, Current Edition.
e. ASTM D1785 – Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe, Schedules 40, 80 and 120, Current Edition.
f. ASTM D2239 – Standard Specification for Polyethylene (PE) Plastic Pipe (SIDR-PR) Based on Controlled Inside Diameter, Current Edition.
g. ASTM D2241 – Standard Specification for Poly (Vinyl Chloride) (PVC) Pressure-Rated Pipe (SDR Series), Current Edition.
h. ASTM D2321 – Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications, Current Edition.
i. ASTM D2464 – Standard Specification for Threaded Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80, Current Edition.
j. ASTM D2466 – Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 40, Current Edition.
k. ASTM D2467 – Standard Specification for Poly (Vinyl Chloride) (PVC) Plastic Pipe Fittings, Schedule 80, Current Edition.
l. ASTM D2513 – Standard Specification for Thermoplastic Gas Pressure Pipe, Tubing, and Fittings, Current Edition.
m. ASTM D2737 – Standard Specification for Polyethylene (PE) Plastic Tubing
n. ASTM D2837 – Standard Test Method for Obtaining Hydrostatic Design Basis for Thermoplastic Pipe Materials or Pressure Design Basis for Thermoplastic Pipe Products
o. ASTM D2855 – Standard Practice for Making Solvent-Cemented Joints with Poly (Vinyl Chloride) (PVC) Pipe and Fittings, Current Edition.
p. ASTM D3035 – Standard Specification for Polyethylene (PE) Plastic Pipe (DR-PR) Based on Controlled Outside Diameter, Current Edition.
q. ASTM D3139 – Standard Specification for Joints for Plastic Pressure Pipes Using Flexible Elastomeric Seals, Current Edition.
r. ASTM D3261 – Standard Specification for Butt Heat Fusion Polyethylene (PE) Plastic Fittings for Polyethylene (PE) Plastic Pipe and Tubing, Current Edition.
s. ASTM D3350 – Standard Specification for Polyethylene Plastics Pipe and Fittings Material, Current Edition.
t. ASTM F714 – Standard Specification for Polyethylene (PE) Plastic Pipe (SDR-PR) Based on Outside Diameter, Current Edition.
u. ASTM F1055 – Standard Specification for Electrofusion Type Polyethylene Fittings for Outside Diameter Controlled Polyethylene Pipe and Tubing, Current Edition.
v. ASTM B88 – Standard Specification for Seamless Copper Water Tube

3. Factory Mutual Research (FM), Specification and Standards, Current Edition.
4. National Fire Protection Agency (NFPA 24).
5. Underwriters Laboratories, Inc. (UL) Specifications and Standards, Current Edition.

1.03 DESCRIPTION OF WORK

A. The work under this section shall cover furnishing all materials, equipment, labor and supervision required for water main, water service and other appurtenant materials, installed for the transmission and/or distribution of potable water, as shown on the contract drawings and as specified herein.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Submittals - Division 01

C. Geosynthetics for Earthwork - Division 31

D. Trenching and Backfilling - Division 31

E. Erosion and Sedimentation Controls - Division 31

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F. Tracer Wire – Division 33

1.05 SUBMITTALS

A. Contractor shall submit such product literature and catalog cuts of materials to be supplied to relate these materials to the specifications. Information shall be in conformance with requirements of Submittals - Division 01 of these specifications.

B. Contractor shall submit such submittals and details required for the construction and installation of the materials. Submittals and details shall indicate the intended materials arrangement, dimensions, major support requirements, plot area and intricate or detailed construction requirements.

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 PIPE

A. All water main 3 inches in diameter or larger shall meet the following minimum requirements:
1. Ductile Iron Pipe. Shall be Thickness Class 52 meeting the requirements of ANSI/AWWA C151/A21. Standard cement-mortar lining shall meet the requirements of ANSI/AWWA C104/A21.4. Pipe shall have minimum of 1 mil asphaltic outside coating in accordance with ANSI/AWWA C151/A21.51. Spotty or thin seal coating, shall be cause for rejection.

2. Polyvinyl Chloride Pipe. (Not available in 3-inch diameter) PVC pipe 4 inches to 12 inches in diameter shall be manufactured in accordance with ASTM D2241 and meet the requirements of ANSI/AWWA C900-16 or latest edition. Pipe shall be Pressure Class (PC) 235 psi minimum; or Pressure Rating (PR) 250 minimum; and have a Dimension Ration (DR) 18 or less. PVC pipe 14 inches to 60 inches in diameter shall meet the requirements of ANSI/AWWA C900 Pressure Class (PC) 235, minimum and have a Dimension Ratio (DR) of 14 or less.

3. High Density Polyethylene Pipe (HDPE). Polyethylene pipe shall meet or exceed the requirements of ANSI/AWWA C906-15, Polyethylene (PE) Pressure Pipe and Fittings, 4 inch through 63 inch for Water Distribution and Transmission. Pipe furnished shall be approved for potable water and marked with a continuous blue stripe. PE4710, HDPE Pressure Class 200, DR11. Pipe shall have outside diameters similar to ANSI/AWWA C151/A21.51 ductile iron pipe (DIPS). Ends shall be plain for butt fuse joining.

B. All water main 2-inches in diameter or less shall meet the following minimum requirements:
1. Copper pipe shall be Type K copper tubing, ASTM B88, and shall conform to the sizing requirements of ANSI/AWWA C800.
2. High Density Polyethylene Pipe (HDPE) shall meet the requirements of ASTM D2239, D2737 or D3035 and shall have a minimum working pressure of 160 psi.

2.02 FITTINGS

A. All fittings for water main 3 inches in diameter or larger shall meet the following minimum requirements:
1. Ductile Iron Pipe. Full body fittings shall conform to ANSI/AWWA C110/ A21.10 and ANSI/AWWA C111/A21.11 with bituminous coating. Compact fittings shall conform to ANSI/AWWA C153/A21.53 and ANSI/AWWA C111/21.11 with bituminous coating. All fittings shall be provided with cement mortar lining conforming to ANSI/AWWA C104/A21.4.
2. Polyvinyl Chloride Pipe. (Not available in 3-inch diameter) Full body fittings shall conform to ANSI/AWWA C110/ A21.10 and ANSI/AWWA C111/A21.11 with bituminous coating. Compact fittings shall conform to ANSI/AWWA C153/A21.53 and ANSI/AWWA C111/21.11 with bituminous coating. All fittings shall be provided with cement mortar lining conforming to ANSI/AWWA C104/A21.4.
3. All DI fittings shall be manufactured in North America

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4. High Density Polyethylene (HDPE). All fittings shall be molded polyethylene fused-type, PE3408, HDPE Class 160, DR11, DIPS and have outside diameters similar to ANSI/AWWA C151/A21.51 ductile iron pipe. Ends shall be plain for butt fuse joining.

B. All fittings for water main 2 inches or less in diameter shall meet the following minimum requirements:

C. High Density Polyethylene Pipe (HDPE). All fittings shall be molded polyethylene fused-type, PE3408, HDPE Class 160, DR11 and have outside diameters similar to ANSI/AWWA C151/A21.51 ductile iron pipe. Ends shall be plain for butt fuse joining.

D. Bolts shall be stainless steel, Cor-Blue, verify with utility.

E. Live (Hot) Tapping Saddle. The live tap saddle shall be a full ductile iron body with MJ Outlet.

2.03 JOINTS

A. All joints for water main 3 inches in diameter or larger shall meet the following minimum requirements:
1. Ductile Iron Pipe. Joints shall be either push-on or mechanical joint conforming to ANSI/AWWA C111/A21.11 unless specified otherwise. All joints, fittings, etc., shall be equipped to provide electric continuity. The continuity must be provided through the use of a trademarked, well-established method acceptable to the Engineer.
2. Polyvinyl Chloride Pipe. (Not available in 3-inch diameter). Joints shall be push-on type employing rubber gaskets which conform with ASTM F477 and joints which conform with ASTM D3139.
3. High Density Polyethylene (HDPE). Joints shall be butt fusion meeting the requirements of ASTM D3261. Electrofusion meeting the requirements of ASTM F1055 shall be used where necessary for pipe coupling or where approved by the engineer.

B. All joints for water main 2 inches in diameter or less shall meet the following minimum requirements:
1. High Density Polyethylene (HDPE). Joints shall be butt fusion meeting the requirements of ASTM D3261. Electrofusion meeting the requirements of ASTM F1055 shall be used where necessary for pipe coupling or where approved by the engineer.

C. All joints for water main requiring joint restraint shall meet the following minimum requirements:
1. Mechanical Joints. Mechanical joints shall be installed with wedge action restraining glands, Mega-Lug by EBAA Iron Sales, Inc. or equal.
2. Push-on Joints. Restrained push-on joints for straight pipe shall be as shown on the plans or as recommended by Pipe Manufacturer. Restrained joint retainer rings shall be manufactured of ductile iron compatible with pipe. All nuts, bolts, and tie rods shall be stainless steel or with a corrosion-resistant coating. Restraints shall be Mega-Lug by EBAA Iron Sales, Inc. or equal.
3. All restrained joints shall have a pressure rating equal to that of the pipe.

2.04 VALVES

A. All valves for water main 3 inches thru 12 inches in diameter shall meet the following minimum requirements:
1. Valves shall be resilient-seated gate valves, mechanical joint conforming to ANSI/AWWA C509 or ANSI/AWWA C515 unless specified otherwise.
2. Valves shall have non-rising stem, with 2 inch operating nut opening counter-clockwise.
3. The valve wedge shall be ductile iron fully encapsulated with EPDM rubber, shall be symmetrical and seal equally well with flow in either direction.
4. Operating nut extensions shall be provided where required by Contract drawings and/or Special Procedures.

B. All valves for water main 2 inches in diameter or less shall meet the following minimum requirements:
1. Mueller Mark II Oriseal, or equal

C. All valves for water main larger than 12 inches in diameter shall meet the following minimum requirements:
1. Valves shall be rubber-seated butterfly valves, mechanical joint conforming to ANSI/AWWA C504 unless specified otherwise.

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2. Valves shall have non-rising stem, with 2 inch operating nut opening counterclockwise.

D. Valves shall be installed with the following accessories:
1. Valve Box. Valve box shall consist of a top section, bottom section, base, drop lid, and necessary extensions and all shall be cast iron. Lid shall have the word "WATER" cast on the lid.
2. Valve Box Adaptor.
a. Gate Valves: All gate valves 4 inch or larger shall be installed with a Gate Valve Adaptor as manufactured by Adaptor Inc., or equal.
b. Butterfly Valves: All butterfly valves between 6 inch and 36-inch in diameter shall be installed with a Butterfly Valve Adapter as manufactured by Adaptor Inc., or equal.

2.05 WATER SERVICES

A. All water service lines shall be 1 inch unless shown otherwise on the contract drawings or as specified in Special Procedures – Division 01. All service lines for water main shall meet the following minimum requirements:
1. Copper.
a. Service lines shall be Type K copper tubing and shall conform to ASTM B88.
2. High Density Polyethylene (HDPE).
a. Service lines shall be polyethylene CTS (copper tube size) meeting the requirements of ASTM D2737 and AWWA C901. Line shall be rated for use with water at 73.4ºF, have a pressure class of 250 psi, and be NSF/ANSI 61 and NSF/ANSI 14 approved. Service line tubing shall be Polyflex (CTS), DriscoPlex 5100, Ultraline (SDR 9) or approved equal.
b. All HDPE services shall have stiffeners for connection to compression type fittings per manufacturer's recommendations.

B. All corporations for water services shall meet the following minimum requirements:
1. Ductile iron water mains
a. Corporation stops shall conform to ANSI/AWWA C800 for copper service lines.
b. Corporations larger than 1 inch and for pipe smaller than a 6-inch diameter shall be furnished and installed with service saddles.
c. Service saddles shall be rated for 250 psi, have a coated ductile iron body, 304 stainless steel strap and nitrile O-ring gasket. Service saddles shall meet all applicable parts of ANSI/AWWA C800.
d. Corporation stops shall be Mueller Ground Key Conductive Compression, or equal, or as specified in Special Procedures - Division 01.
2. PVC water mains
a. Service line connection to PVC pipe shall be made using a saddle type connection. A simple threaded connection shall not be acceptable.
b. Service saddles shall be rated for 250 psi, have a coated ductile iron body, 304 stainless steel strap and nitrile O-ring gasket. Tapping saddles shall meet all applicable parts of ANSI/AWWA C800.
c. Corporation stops shall be Mueller Ground Key Conductive Compression or equal, as specified in the Special Procedures – Division 01. Stainless steel stiffeners are required for compression fitting connections.
3. High Density Polyethylene (HDPE) water mains
a. Service line connection to HDPE pipe shall be made using a saddle type connection. A simple threaded connection shall not be acceptable.
b. Service saddles
1) Service saddles shall be rated for 250 psi, have a coated ductile iron body, 304 stainless steel dual strap, nitrile O-ring gasket, and spring washers specifically designed for use on HDPE pipe. Service saddles shall meet all applicable parts of ANSI/AWWA C800.
2) Service saddles shall be Smith-Blair 317, or equal for use on HDPE pipe.
c. Corporation stops shall be Mueller Ground Key Conductive Compression, or equal, or as specified in the Special Procedures – Division 01. Stainless steel stiffeners are required for compression fitting connections.

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C. All curb stops for water services shall meet the following minimum requirements:
   1. Copper water services
      a. Curb stops shall be designed for use with copper service lines and shall conform to ANSI/AWWA C800.
      b. Curb stops shall be Mueller Mark II Oriseal, or equal, with conductive compression fittings or as specified in Special Procedures - Division 01.
   2. High Density Polyethylene (HDPE) water services
      a. Curb stops shall be Mueller Mark II Oriseal, or equal, with threaded connections or as specified in Special Procedures - Division 01.
      b. Threaded stainless steel by HDPE transition fittings shall be supplied for each curb stop. Transition fittings shall be butt fused to the service pipe. Transition fittings shall be manufactured by Central Plastics.

D. All curb boxes for water services shall be Mueller, Minneapolis pattern, or equal, 1-1/4 inch upper, pentagon nut opening with stationary rod or as specified in Special Procedures - Division 01.

E. Curb boxes shall be furnished having bury depth consistent with water main depth as shown on the Contract Drawings or as defined in Special Procedures - Division 01.

2.06 HDPE BY MECHANICAL JOINT ADAPTERS

A. The HDPE by MJ Adapters shall be manufactured by Central Plastics Company or equal. The adapter shall comply with ANSI/AWWA C906 and be manufactured for use on pipe conforming ASTM D2513, D3035, F714. The adapter shall be molded from a PPI and NSF listed pre-blended virgin resin in accordance with the material specifications listed in ASTM D3350 with a cell classification of 345464C and be compatible for heat fusion with any pipe manufactured from a like or similar resin.
   1. Adapters shall be tested according to ASTM D1599 and ASTM D1598.
   2. HDPE Adapters shall be sized for use with ductile iron pipe size HDPE pipe.
   3. Adapters shall be used for all transitions from HDPE to valves or ductile iron pipe.
   4. HDPE by MJ Adapters for pipe 12 inch or greater must be designed for use with butterfly valves. Submittals shall specifically indicate this feature.
   5. Adapters must provide thrust restraint.
   6.

2.07 INSULATION

A. Insulation shall be extruded polystyrene insulation (25 psi) conforming to ASTM C578, Type IV in 4 foot x 8 foot sheets with minimum thickness of 2 inches.

PART 3 EXECUTION

3.01 GENERAL

A. All construction shall be done in conformance with ANSI/AWWA C600 unless otherwise specified.

3.02 EXCAVATION

A. Excavation shall conform to Trenching and Backfilling - Division 31 of these specifications except as modified herein.

3.03 FIELD INSPECTION OF MATERIALS

A. Before lowering and while suspended, the pipe or fittings shall be inspected for defects. All materials used in the work must pass field inspection. Contractor shall inspect each segment of pipe for the presence of foreign matter, rough edges or projections within the pipe. Contractor shall take care to prevent any foreign material from entering pipe prior to installation.

3.04 DIRECTION OF LAYING

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A. Unless otherwise ordered, pipe shall be laid with the bell ends facing the direction of laying. When the grade exceeds 30 feet of rise per one hundred feet of trench, the bells shall be face upgrade.

3.05 INSTALLATION

A. The Contractor shall have sufficient and adequate equipment on the site of the work for unloading and lowering pipe and fittings into the trench.

B. Extreme care shall be exercised by the Contractor in handling all pipe, fittings, and special castings so as to prevent breakage. Under no circumstances shall they be dropped into the trench or so handled as to receive hard blows or jolts when being moved.

C. The Contractor shall supply and install pipe fittings, couplings, bends, and appurtenances as required to complete the project.

D. All tees, crosses, bends, and reducers shall be cast or ductile iron. No PVC appurtenances will be allowed.

E. Contractor shall install temporary water service to all users where water service will be interrupted for more than 4 hours. Contractor shall coordinate interruption to business and commercial users so the interruption will not cause a disruption of business or commercial activities. All users shall be given 24 hour notice of service interruption, except during emergencies.

F. Abandoned water mains or hydrant leads shall have their ends plugged with concrete.

G. All existing water mains being replaced are to remain in service until the new water mains are tested and accepted. The Contractor shall make arrangements with the Owner and the Engineer to sequence connection and operation of new mains and abandonment of existing mains. A minimum of 24 hours notice to residents shall be provided prior to shutting off their water.

H. Unless pre-approved by the Owner and Engineer, the maximum allowable duration of water service interruption to water utility customers shall be typically be 4 hours. Customers to whom water service is critical, shall have service interruption limitations and accommodation needs determined on a case by case basis.

3.06 JOINING OF PIPE

A. Every precaution shall be taken to prevent foreign material from entering the pipe while it is being placed in the line. If the crew cannot put the pipe into the trench and in place without getting earth into it, the Engineer may require that before lowering the pipe into the trench, a heavy, tightly woven canvas bag of suitable size shall be placed over each end and left there until the connection is to be made to the adjacent pipe.

B. During laying operations, no debris, tools, clothing, or other materials shall be placed in the pipe.

3.07 Transite Pipe (Asbestos-Concrete)

A. If transite pipe is encountered during construction, contractor shall not disturb pipe and leave in the ground, if possible.

B. If transite pipe must be disturbed during the course of the project, Contractor shall follow all applicable Federal and State laws along with all OSHA requirements for handling and disposing of pipe. Contractor shall apply for all applicable Federal and State permits for removing and handling asbestos containing material.

3.08 CUTTING OF PIPE

A. Pipe shall be cut at right angles to the centerline of the pipe. Cutting shall be done in a neat workmanlike manner without damage to the pipe and so as to leave a smooth end.

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B. All pipes shall be cut with an approved mechanical cutter. The cut end of a pipe to be used with rubber gasket joints shall be tapered by grinding or filing about 1/8 inch back at an angle of approximately 30 degrees with the centerline of the pipe, and any sharp or rough edges shall be removed.

3.09 OBSTRUCTIONS IN LINE OR GRADE

A. Whenever it becomes necessary to lay a main over, under or around a known obstruction, the Contractor will furnish and install the required fittings.

B. If an unknown underground structure interferes with the work to such an extent that an alteration of the plan is required, the Contractor shall notify the Engineer.

3.10 THRUST RESTRAINT

A. Thrust restraint is required for all bends, caps, plugs, tees, and valves adjacent to tees. Thrust restraint shall be provided by use of concrete buttresses and wedge action restraining glands.

B. Concrete buttresses shall be poured against firm, undisturbed ground. When concrete buttresses cannot be placed against undisturbed ground they shall be placed against fill material of composition conforming to the requirements of ASTM C12 or ASTM D2321 as applicable for rigid and flexible pipe respectively, compacted to 95 percent of the modified proctor density for the material. The buttresses shall be constructed to the minimum dimensions as shown on the contract drawings or as required by the Engineer. All buttresses shall be formed to keep the joints free of concrete.

C. Solid precast concrete blocks may be used in lieu of the poured buttresses when approved by the Engineer. When concrete blocks are used, they shall be stepped-out to match the minimum dimensions required for poured concrete buttresses.

D. Ductile iron or PVC pipe connecting to HDPE pipe must be restrained a sufficient distance upstream to prevent joint separation due to contraction of the HDPE pipe. The minimum length of restrained pipe required shall be as shown on the contract drawings or as specified in Special Procedures - Division 01. If no minimum length for restrained joints is specified, the Contractor shall submit the restrained joint calculations to the Engineer for review prior to construction.

E. Restrained joint fittings shall be used in conjunction with concrete buttresses. When restrained joint fittings are used, a sufficient length of pipe on each side of the fitting shall be restrained to resist the thrust forces. The minimum length of restrained pipe required shall be as shown on the contract drawings or as specified in Special Procedures - Division 01.

F. Thrust restraint is not required for HDPE water mains with HDPE fittings except where transitioning to other pipe materials.

3.11 JOINT DEFLECTION

A. The maximum allowable deflection for ductile iron pipe will be as given in ANSI/AWWA C600. If excess deflection is required, special bends shall be furnished to provide angular deflections.

B. The maximum deflection shall be as specified by the manufacturer.

3.12 DEPTH

A. The water main shall be placed at a depth as to prevent freezing. This depth shall provide six and one-half feet (6'-6") of cover over iron/copper pipe and one-half foot more for other materials unless otherwise shown on the contract drawings or required by Special Procedures - Division 01 of these specifications.

B. Insulation shall be installed if ground cover is less than six and one-half feet (6'-6") or utility crossing effectively removes earthen freeze protection. Insulation shall be installed as shown on the contract drawings or as directed by the Engineer in the field.

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3.13 UNSTABLE SOIL

A. If in the opinion of the Engineer the trench bottom is of unstable material, the Engineer may direct the Contractor to excavate the unstable material and replace same with 3/4 inch washed stone. Washed stone used in such cases shall be considered incidental and included in the price bid for water main unless bid or specified otherwise. Where the condition of unstable material is unusually severe, the Engineer may order the placement of a concrete cradle. Materials used for concrete cradles, when not called for in the Contract Documents, shall be paid for by Change Order at a negotiated price.

3.14 EMBEDMENT/BEDDING

A. Class B bedding and initial backfill shall be used for all ductile iron or HDPE pipe installed under this contract in accordance with the contract drawings and ASTM C12, or as indicated in Special Procedures - Division 01 of these specifications.

B. Class II embedment shall be used for all PVC pipe installed under this contract in accordance with the contract drawings and ASTM D2321, or as indicated in Special Procedures - Division 01 of these specifications.

3.15 SETTING VALVES

A. Valves in water mains shall be provided and installed in locations as shown on the contract drawings. A valve box and valve box adaptor shall be provided for every valve unless otherwise specified. The valve box shall not transmit shock or stress to the valve and shall be centered and plumb over the wrench nut of the valve. The box cover shall be 1/4 inch to 1/2 inch lower than the surface of the finished pavement.

B. HDPE by mechanical joint adapters must be used at all valves installed on HDPE pipe.

3.16 SETTING HYDRANTS

A. Hydrants shall be located as shown on the contract drawings or as directed by the Engineer. All hydrants shall stand plumb and shall have the pumper nozzle facing the curb. Hydrants shall be set to the established grade, which shall be hereinafter considered as with nozzles at least 18 inches above the ground such that the following one or more conditions apply:

1. Nozzle center is 18-24 inches above the top of proposed curb.
2. Nozzle center is 18-24 inches above the existing ground line.
3. Nozzle center is 18 inches above the proposed ground surface elevation for that hydrant location.

The above hydrant vertical placement may be accomplished by adding hydrant extensions. The unit price bid for the hydrant shall include the cost of extensions.

B. All hydrant drainport shall be plugged in the following conditions:

1. Hydrant drainport would be installed below groundwater table.
2. Hydrant is placed in area with known soil contamination.
3. Soil materials and coloration indicate groundwater may be above hydrant drainport.
4. Plugging is shown on the contract drawings or is directed by the Engineer the field.

C. Wherever a hydrant is set in soil that is pervious, drainage shall be provided at the base of the hydrant by placing coarse gravel or crushed stone mixed with coarse sand, from the bottom of the trench to at least 6 inches above the waste opening in the hydrant and to a distance of 1 foot around the elbow. The drainage material shall be wrapped with non-woven geotextile fabric Type SAS conforming to the requirements of Geosynthetics for Earthwork - Division 31 of these specifications.

D. All hydrants shall be provided with drainage at the base of the hydrant by placing compacted coarse gravel or compacted crushed stone mixed with coarse sand, under and around the elbow of the hydrant to a level of 6 inches above the waste opening in the hydrant and to a distance 3 feet along the trench back toward the main.

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E. All hydrants shall be constructed with a minimum of six and one-half feet (6'-6") of cover over the lead, or as shown on the contract drawings or specified in Special Procedures - Division 01, and be set on a solid concrete block.

F. All hydrants shall be installed with thrust restraint utilizing concrete buttresses and joint restraint, see thrust restraint this section.

3.17 INSTALLING SERVICES

A. All corporations shall have proper sized tapping saddle furnished with them if used with PVC/plastic water main. All costs related to tapping saddles shall be included in the corporation unit price. Taps shall be cut-in using a "shell cutter" tapping device to capture all loose materials. All services taps shall be made "hot" or with the main under pressure unless authorized by the Engineer and Owner.

B. Contractor shall connect to existing services with a proper manufactured fitting. Contractor shall have various sized fittings/coupling in order to connect existing services with different sizes and materials.

3.18 POLYETHYLENE ENCASEMENT

A. Polyethylene encasement shall be installed where shown in the contract drawings or as required in the Special Procedures - Division 01. Installation of polyethylene encasement shall conform to ANSI/AWWA C105/A21.5l.

B. The polyethylene film shall be fitted to the contour of the pipe creating a snug, but not tight, encasement. Sufficient slack shall be provided in contouring to prevent stretching the polyethylene where it bridges irregular surfaces, such as joints or fittings, and to prevent damage to the polyethylene caused by backfilling operations. Overlaps and ends shall be secured with adhesive tape or plastic tie straps. For installations below the water table, circumferential wraps of tape shall be placed at two foot intervals along the barrel of the pipe.

C. All fittings and valves shall be fully wrapped with polyethylene.

D. Exposure to sunlight of the polyethylene film shall be kept to a minimum.

3.19 TRACER WIRE

A. Trace wire shall be installed in conjunction with all PVC, HDPE, or non-conductive water main and services in accordance with Tracer Wire – Division 33 and with the Contract Drawings and the Special Procedures – Division 01.

3.20 DISINFECTING WATER MAIN

A. All water main and services shall be disinfected in conformance with ANSI/AWWA C651. The main will not be accepted or placed in service until two consecutive satisfactory tests are taken 24 hours apart from samples from the new main following the final flushing.

B. At least one set of samples shall be collected from every 1,200 feet of the new water main, plus one set of samples from the end of the main and a minimum of one set from each water main branch.

C. The testing lab shall furnish copies of lab results from the bacteriological tests run on the water mains to the Engineer.

3.21 WATER SUPPLY DECHLORINATION

A. Chlorinated water discharged directly or indirectly to surface waters as a result of flushing newly installed water mains, discharging water tanks or reservoirs, hydrant flushing, test pumping wells, or any other circumstance shall be dechlorinated in accordance with the current "Hydrostatic Test Water or Water Supply System Water General Permit, WPDES Permit No. WI-0057681". The free chlorine residual of discharged

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water shall be reduced to 0.1 parts per million or less, or to the normal operating concentration of the chlorine residual maintained in the water supply system.

B. The concentration of free chlorine residual shall be measured at the point of surface water entrance.

3.22 TESTING

A. All equipment required for hydrostatic testing shall be furnished and operated by the Contractor subject to the approval of the Engineer. This equipment shall include all sampling taps and necessary flushing appurtenances.

1. Hydrostatic tests shall consist of pressure and leakage test in accordance with ANSI/AWWA C600, Hydrostatic Testing. The hydraulic tests shall be conducted at 150 percent of normal operating pressure or 150 psi, whichever is greater.
    a. Water shall not be added during the pressure test. No pipe section will be accepted if the test pressure drops more than 5 psi within the two-hour test duration.
    b. The leakage is the amount of water required to bring the pressure back up to the starting pressure once the pressure test passes. Contractor shall know and follow the procedures in AWWA C600 for the leakage test and have all required material and equipment necessary to complete this test.
2. Hydrostatic tests shall be conducted on sections of water main recommended as ready by the Contractor and approved by the Engineer. No section shall be less than one block (approximately 400 feet) of water main unless conditions warrant such testing of smaller sections.
3. Where water services are installed to facilities which may include fire sprinkler systems, a pressure test and leakage test shall be performed on the water service in accordance with NFPA 24.

B. Where ductile iron water main is installed, a random section of completed main will be selected by the Engineer for a continuity test. This random section shall be subjected to 300 amps DC for 15 minutes. All equipment necessary to make the test and to establish a closed circuit with the test section of water main providing one leg of the circuit shall be provided by the Contractor at no additional cost to the Owner. The Contractor shall take whatever precautions he deems necessary such as filling the water main with water prior to testing to protect the gaskets and building the amperage up slowly while watching an ammeter.

1. If the random section passes the test, the electrical continuity for the entire water main installation will be considered acceptable.
2. Should the random section fail the test, it shall be repaired by and at the expense of the Contractor until it can pass the test. Also, the remainder of the project will be divided into test sections by the Engineer and tested for compliance by and at the expense of the Contractor.

C. All tracer wire must be tested for electrical continuity. All equipment necessary to make the test and to establish continuity of all tracer wire shall be provided by the Contractor.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Water main shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 WATER MAIN

A. Water Main, Size, Type, Lineal Foot. Measurement for water mains shall be per lineal foot of a specific diameter water main installed. Payment shall be made at the contract unit price bid per lineal foot of the respective diameter for furnishing, installing and testing of water main.

4.03 APPURTENANCES

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A. Fittings (Type), Size, Each. Measurement for fittings shall be for each size and type installed as indicated in the Bid Schedule or Special Procedures - Division 01. Payment shall be made at the contract price bid per each size and fitting installed.

B. Fittings, Inclusive. If no bid items are included with the project, all fittings shall be included in a related bid item. Contractor is responsible for verifying types and numbers of fittings required for the project to include in the bid.

C. Valves (Type), Size, Each. Measurement for valves shall be for each size as indicated in the Bid Schedule or Special Procedures - Division 01. Payment shall be made at the contract price bid per each size valve installed. All costs for HDPE by mechanical joint adapters shall be incidental for valve installation.

D. Hydrants, Each. Measurement for hydrants shall be for each installed. Payment shall be made at the contract price bid per each hydrant installed. All hydrant extensions and appurtenances required to set hydrants to the established grade per this Specification shall be included in the contract price bid per each hydrant installed.

E. Water Services, Size, Lineal Foot. Measurement for services shall be per lineal foot of a specific size services installed. Payment shall be made at the contract unit price bid per lineal foot of each size services installed.

F. Corporation, Curb Box, and Stop, Size, Each. Measurement for these items are included as one bid item and shall be paid per each set of these items installed. The bid price for this item shall include; corporation stop, curb stop, curb box, stationary rod (when required) and all costs necessary to connect new services to the existing curb stop or to connect to the existing water service.

G. Polyethylene Encasement, Lineal Foot. Measurement for polyethylene encasement shall be per lineal foot installed. Payment shall be made at the contract unit price bid per lineal foot of polyethylene encasement.

H. Insulation, Square Foot. Measurement for insulation shall be per square foot of insulation installed. Payment shall be made at the contract unit price bid per square foot of insulation installed.

I. Connect to Existing Water Main, Each. All costs related to connection to existing water mains shall be included in the contract unit price bid per each connection. When a cut-in tee is required, only one connection to the existing main will be paid. The other connection shall be included under a related item and considered inclusive to the project. Valves will be paid separately unless otherwise specified. When HDPE by mechanical joint adapters are required, the cost for the adapters shall be incidental to this item.

J. Transite Pipe Removal, Connection, Handling, and Disposal, Lump Sum. All costs related to removing, connecting to, handling and disposing of transite pipe, shall be included in this item. This includes, but is not limited to, permit fees, specialized asbestos contractors to perform work, bagging, labeling and transporting materials to a certified landfill, tipping fees, and all other applicable construction items related to asbestos containing material handling.

4.04 TESTING

A. Mains shall be installed and pass test for pressure, leakage and safe sample before any water main installation payments shall be made.
   1. The Contractor is responsible for furnishing and operating all water main testing equipment including sampling taps and necessary flushing appurtenances.
   2. After removal, any temporary fittings, valves, and plugs shall become the Contractor's property.

B. Payment for water main requiring tracer wire will not be issued until an accepted continuity test has been performed and approved by the Engineer.

END OF SECTION

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SECTION 33 39 13
SANITARY SEWER MANHOLES

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern the work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.

1. American Society for Testing and Materials (ASTM), Annual Book of ASTM Standards:
   a. ACI 318 – Building Code Requirements for Structural Concrete.
   b. ASTM A48 - Specification for Gray Iron Castings, Current Edition.
   c. ASTM A240 - Specification for Heat-Resisting Chromium and Chromium-Nickel Stainless Steel Plate, Sheet and Strip for Pressure Vessels and General Applications, Current Edition.
   d. ASTM A615 - Specification for Deformed and Plain Carbon-Steel Bars for Concrete Reinforcement, Current Edition.
   e. ASTM A668 - Specification for Steel Forgings, Carbon and Alloy, and for General Industrial Use, Current Edition.
   f. ASTM C76 - Specification for Reinforced Concrete Culvert, Storm Drain, and Sewer Pipe, Current Edition.
   g. ASTM C478 - Specification for Precast Reinforced Concrete Manhole Sections, Current Edition.
   h. ASTM C497 – Standard Test Methods for Concrete Pipe, Manhole Sections, or Tile.
   i. ASTM C890 – Standard Practice for Minimum Structural Design Loading for Monolithic or Sectional Precast Concrete Water and Wastewater Structures.
   j. ASTM C913 - Specification for Precast Concrete Water and Wastewater Structures, Current Edition.
   k. ASTM C923 - Specification for Resilient Connectors Between Reinforced Concrete Manhole Structures, Pipes, and Laterals, Current Edition.
   l. ASTM D4101 - Specification for Polypropylene Injection and Extrusion Materials, Current Edition.
   m. ASTM F593 - Specification for Stainless Steel Bolts, Hex Cap Screws, and Studs, Current Edition.
   n. ASTM F783 - Specification for Staple, Handgrab, Handle, and Stirrup Rung, Current Edition.
2. Code of Federal Regulations (CFR), Title 29, Chapter XVII - Occupational Safety and Health Administration (OSHA), Department of Labor, Part 1926 Regulations, Current Edition.
3. Federal Specifications (FS), Specifications and Standards, Current Edition.
4. Department of Safety and Professional Services (DSPS), Administrative Code of Rules and Regulations, Current Edition.
5. State Department of Natural Resources (DNR), Administrative Code of Rules and Regulations, Current Edition.
6. State Standard Specifications (SSS), for Sewer and Water Construction, Current Edition.

1.03 DESCRIPTION OF WORK

A. The work under this section shall cover furnishing and installing standard manholes constructed of precast concrete sections, circular in horizontal section set on a concrete base and fitted with standard manhole covers, frames, waterproofing, and steps in accordance with the contract drawings and as specified herein.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

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B. Submittals - Division 01

C. Trenching and Backfilling - Division 31

D. Erosion and Sedimentation Controls - Division 31

E. Public Sanitary Utility Sewerage Pipe - Division 33

F. Sanitary Utility Sewerage Force Main - Division 33

1.05 SUBMITTALS

A. Contractor shall submit such product literature and catalog cuts of materials to be supplied. Information shall be in conformance with requirements of Submittals - Division 01 of this specification.

B. Contractor shall submit shop drawings and details required for the construction and installation of the materials. Submittals and details shall indicate the intended materials arrangement, dimensions, major support requirements, plot area and intricate or detailed construction requirements.

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 ACCEPTABLE MANUFACTURERS

A. The products listed are intended to establish a basis for comparison of products of other manufacturers. Substitutions will be permitted but only with the prior written approval of the Engineer. Catalogue reference numbers stated are those of Neenah Foundry Company and are intended to establish a basis for comparing the products of other manufacturers.

2.02 PRECAST MANHOLE SECTIONS

A. Precast concrete manhole sections shall have a minimum inside diameter of 48-inches. Clear opening shall match dimensions of castings. The cone section shall be the eccentric type with a minimum clear opening of 24 inches. Compressive strength of the concrete shall be 4000 psi and shall conform to ASTM C478 for round structures and ASTM C913 for square or rectangular structures. Wall thicknesses of round manholes will vary with diameter in conformance with ASTM C76, Class B concrete tongue and groove joint pipe. Larger diameter manholes (7 feet +) shall have wall thickness a minimum of one-twelfth the inside diameter of the manhole as specified in ASTM C478.

B. Steel reinforcement (sq. in./lin. ft.) shall not be less than 0.0025 times the inside diameter of the manhole in inches.

C. Flat top slabs and reduction flat top slabs shall be designed in accordance with ACI 318 and designed to withstand the anticipated loads from riser sections, soil and hydrostatic loads, surcharge loads, live loads, and impact loads. Required site specific slab thickness shall be determined by the aforementioned calculations with the following minimum requirements:
   1. Minimum slab thickness for 48-inch diameter structures, and less shall be 6 inches.
   2. Minimum slab thickness for structures larger than 48-inches in diameter shall be 8 inches or as necessary as required by design calculations

D. All other design elements for structures shall comply with ASTM C478 and C497 for round structures, and ASTM C913 and ASTM C890 for square or rectangular structures.

E. The Contractor shall verify size, invert elevation, and location of all pipes in existing manholes and inform Engineer of any discrepancies before the replacement manhole is constructed.

2.03 STEPS

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2.04 FRAMES, COVERS AND GRATINGS

A. Frames, covers and gratings shall be of the type and duty as shown in the Contract Documents. Iron castings shall conform to ASTM A48, Class 20. All castings shall be true to pattern in form and dimensions, free from faults, sponginess, cracks, blow holes, and other defects affecting their strength.

B. The standard castings for sanitary sewer manholes shall be Type B with concealed pick holes, self-sealing gasketed non-rocking lids as listed below except as designated otherwise on the contract drawings or in Special Procedures - Division 01.

Wisconsin	Other States
R-1550	R-1692

C. Where bolted lids are specified on the contract drawings or in Special Procedures - Division 01, they shall be Neenah R-1916-F, watertight manhole frames with bolted lids.

D. Where low profile castings are specified on the contract drawings or in Special Procedures - Division 01, they shall be Neenah R-1689 (4-inch casting) with Type B self-sealing gasketed, non-rocking lid.

2.05 SANITARY SEWER MANHOLE JOINT MATERIALS

A. Sanitary sewer manhole joint materials shall be plastic gasket material or butyl rubber gasket material. Plastic gaskets shall be preformed, high adhesion material, packaged ready for use between protective paper strips conforming to Federal Spec SS-S-00210, Type I, Rope Form; Ram-Nek by K.T. Snyder Company, Inc.; Kent Seal No. 2 or equal. Butyl rubber gaskets shall be preformed, high adhesion material, packaged ready for use between protective paper strips, conforming to Federal Spec SS-S-210A, Rope Form; by Press Seal Gasket Corporation or equal.

B. Joint Wrap - Each manhole joint shall be sealed with an external rubber sleeve (9-inch min. width) Infi-Shield Gator Wrap as manufactured by Sealing Systems Inc. or approved equal. The seal shall be made of a stretchable, self-shrinking, intra-curing halogenated based rubber with a minimum thickness of 30 mils. The back side of each unit shall be coatec with a cross linked re-enforded butyl adhesive. The butyl adhesive shall be non-hardening sealant with a minimum thickness of 30 mils. The seal shall be designed to stretch around the joint and then overlapped creating a cross-link and fused bond between the rubber and butyl adhesive.

2.06 WATERSTOP SEALS

A. All pipes connecting to a sanitary manhole shall include an approved watertight rubber boot connection meeting ASTM C-923, and secured to the pipe with a stainless steel band. Waterstop seals shall be PSX: Direct Drive by Press Seal Corporation, Kor-N-Seal I 106 or 406 Series (pipe O.D. less than 15”), Kor-N-Seal II 206 Series (pipe O.D. 15” and greater), QUIK-LOK or Z-LOK connectors by A-LOK Products, Inc. or equal.

2.07 ADJUSTMENT RINGS

A. Polypropylene Adjustment Rings
   1. Adjustment rings shall be manufactured from Expanded Polypropylene (EPP), compliant with ASTM D4819 and tested according to ASTM D3575.
   2. Rings shall be available in heights (thicknesses) which will allow final adjustment of the frame and cover or grate to within ¼” (one quarter inch) to ½” (one half inch) of the specified final elevation.
   3. “Finish” Rings shall be provided with grooves on the lower surface and flat upper surface. “Finish” rings may also have a keyway on the upper surface of the inner diameter to facilitate installation of an “Angle” ring, where “Angle” ring is required.
   4. “Angle” rings may either have an upper and lower keyway (tongue and groove) for vertical alignment and/or an adhesive trench on the underside.

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5. Any adhesive or sealant used for watertight installation of the manhole grade adjustment rings shall meet manufacturers specifications and the requirements of ASTM C-920, Type S, Grade NS, Class 25, Uses NT, T, M, G, A and O Federal Specification TT-S-00230-C Type II, Class A .
6. Adhesive sealant shall be used between the precast concrete and adjustment rings as well as between the adjustment rings and manhole casting. Adhesive sealant shall bond to concrete

2.08 SANITARY SEWER MANHOLE CHIMNEY SEALS

A. Sanitary sewer manhole chimney seal shall be internal or external type, rubber sleeve, unless indicated otherwise in the Special Procedures - Division 01 or the Contract Documents. The sleeve and extension shall have a minimum thickness of 3/16 inches and shall be extruded or molded from a high grade rubber compound conforming to the applicable requirements of ASTM C923, with a minimum 1,500 psi tensile strength, maximum 18 percent compression set and hardness (durometer) of 48±5. The sleeve shall be doubled pleated with a minimum unexpanded vertical height of 8 inches and be capable of vertical expansion of not less than 2 inches when installed.

B. The bands used for compressing the sleeve and extension against the manhole shall be fabricated from 16 gauge stainless steel conforming to ASTM A240 Type 304. All screws, bolts or nuts used on this band shall be stainless steel conforming to ASTM F593 and 594, Type 304.

C. Sanitary sewer manhole chimney seal shall provide a watertight seal from 2 inches above the bottom of the casting to 2 inches below the top of the manhole cone section or flat top.

PART 3 EXECUTION

3.01 MANHOLES, GENERAL

A. All lift holes on sanitary sewer manholes shall be sealed watertight.

B. Manholes shall be installed so that the elevation at the top of the structure allows for a minimum of 4-inches and a maximum of 12-inches of adjustment rings.

3.02 INVERTS AND BENCHES

A. Invert channels shall be smooth and accurately shaped and in accordance with the contract drawings.

B. No horizontal surfaces shall be left on the inside of the manhole. The bench shall be shaped to drain into the floor channel.

3.03 ADJUSTMENT RINGS, FRAMES AND COVERS

A. Adjustment Rings shall be installed so that the frame and cover, when placed, will be at the required grade. A minimum of 4-inches and a maximum of 12-inches of adjustment shall be allowed.

B. Prepare surface and install adjustment rings in accordance with manufacturer's recommendations.

1. For polypropylene rings, mortar shall not be used under the frame.

3.04 JOINT WRAP

A. Expose the area to be sealed and clean the entire area around the joint with a wire brush and whisk broom. Remove any sharp protruding edges around the joint with an abrasive tool. When finished cleaning the entire area must be dry and free of any dirt.

B. Remove the first foot of paper backing from the mastic. Center and place the joint wrap around the joint. Continue to remove paper backing as you apply joint wrap to the entire structure.

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C. Seal the overlapping area with a 6-inch minimum overlab. Be sure not to stretch material at the overlap area.

D. Cut excess material using a utility knife. Using a rubber mallet or hand roller, firmly flatten the joint wrap 360 degrees around the joint

3.05 PROVISION FOR FUTURE CONNECTION

A. Connections for future sewers, when specified, shall consist of a short piece of sewer terminating with a bell end and stopper or bulkhead not more than one full pipe length outside the manhole wall unless otherwise shown. If no elevation is given for future connections, set the invert 1/2 inch above the main sewer invert.

B. ABS and PVC pipe shall be fitted with rubber waterstop seals where they pass through the manhole wall.

3.06 DROP CONNECTIONS

A. Sanitary sewer manhole drop connections shall be outside drops constructed according to detail drawings and the following provisions.
   1. The drop assembly shall consist of a tee or wye connecting to the inflowing sewer, a drop pipe of the same diameter as the inflowing sewer, and a 90-degree bend at the bottom, all encased in concrete.
   2. Ductile iron pipe used for the drop connection need not be encased in concrete if the drop is free of joints between the 90-degree bend and the tee.

3.07 PLUGGING OF ABANDONED LINES

A. Unless otherwise directed by the Engineer, the Contractor shall remove all abandoned pipe lines from each manhole. Each pipe shall be entirely removed from the manhole wall. All loose or defective mortar, concrete block, or concrete shall be removed. The entire area shall then be plugged with non-shrink mortar, packed in place.

3.08 ABANDONMENT OF SEWER AND SANITARY SEWER MANHOLES

A. Sanitary sewer lines to be abandoned shall be plugged at both ends with concrete or sewer brick and mortar. Where a new manhole is to be built or an existing manhole is to remain, the plugged end of the abandoned sewer line shall end no closer than five feet from the manhole and concrete backing shall be poured between the plug and the manhole. Where the manhole and the sewer are to be abandoned, the sewer shall be blocked, and the manhole shall be filled with concrete above the crown of both the inflowing and outflowing sewers to a maximum of 4 feet. Sewers entering the manhole more than 4 feet above the bottom shall be plugged with concrete or brick and mortar. All manholes to be abandoned shall be removed to a minimum of 3 feet below ground level.

B. Backfill shall conform to the requirements of Trenching and Backfilling - Division 31 of these specifications.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Sanitary sewer manholes shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 SANITARY SEWER MANHOLES

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A. Sanitary Sewer Manholes, Complete. The unit price for sanitary sewer manholes shall include all materials and labor to provide the complete manhole in accordance with the contract drawings and specifications.

B. Sanitary Sewer Manholes, Unit Price

1. Vertical Foot. Payment shall include all risers, steps, cone top, and appurtenances and shall be measured from the lowest pipe invert to the bottom of casting.
2. Manhole Casting and Base. Payment shall include the frame and lid, set flush at final grade.
3. Manhole Drop. Payment when included as a bid item shall be per vertical foot measured between the high and low inverts of the drop assembly.

END OF SECTION

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SECTION 33 41 13
PUBLIC STORM UTILITY DRAINAGE PIPING

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. American Association of State Highway and Transportation Officials (AASHTO), Standard Specifications, Latest Edition.
   2. American Society for Testing and Materials (ASTM), Annual Book of ASTM Standards, Current Edition.
   3. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition at time of bid opening.

1.03 DESCRIPTION OF WORK

A. The work covered under this section shall consist of furnishing all material, equipment, and labor required to install the public storm utility drainage piping for this project.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Structural Excavation for Structures - Division 31

C. Dewatering - Division 31

D. Trenching and Backfilling - Division 31

E. Storm Drainage Manholes, Frames, and Covers - Division 33

1.05 SUBMITTALS

A. Contractor shall submit such product literature and catalog cuts of materials to be supplied to relate these materials to the specifications. Information shall be in conformance with requirements of Submittals - Division 01 of these specifications.

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 REINFORCED CONCRETE PIPE (RCP)

A. Reinforced concrete pipe shall conform to the requirements of Section 608 of the State of Wisconsin, Department of Transportation, Standard Specifications.

B. Reinforced concrete apron endwalls shall confirm to the requirements of Section 522 of the State of Wisconsin, Department of Transportation, Standard Specifications. All endwalls 24-inches and larger in diameter require trash guard.

2.02 CORRUGATED METAL PIPE (CMP)

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A. Steel corrugated metal pipe and steel apron endwalls shall conform to the requirements of Sections 520 and 521 of the State of Wisconsin, Department of Transportation, Standard Specifications. All endwalls 24-inches and larger in diameter require trash guard.

B. Aluminum corrugated metal pipe and aluminum apron endwalls shall conform to the requirements of Sections 520 and 525 of the State of Wisconsin, Department of Transportation, Standard Specifications. All endwalls 24-inches and larger in diameter require trash guard.

2.03 HIGH DENSITY POLYETHYLENE PIPE (HDPE)

A. High density polyethylene pipe shall conform to the requirements of Section 530 of the State of Wisconsin, Department of Transportation Standard Specifications. Pipes which are between 42 inch diameter and 48 inch diameter shall meet the requirements of AASHTO M252 and M294, Type D.

B. Couplings and fittings for 4-36 inch pipe shall be suitable for the specific project application and as recommended by the pipe manufacturer. The joint for 42-48 inch pipe shall consist of a bell and spigot, integrally welded to the barrel of the pipe, utilizing a suitable profile gasket located on the spigot end.
   1. The fittings shall not reduce or impair the overall integrity or function of the pipe line. Fittings may be either molded or fabricated. Common corrugated fittings include in-line joint fittings, such as couplers and reducers, and branch or complimentary assembly fittings such as tees, wyes, and end caps. These fittings may be installed by various methods, such as snap-on, screw-on, bell and spigot, and wrap around.
   2. Couplings shall provide sufficient longitudinal strength to preserve pipe alignment and prevent separation at the joints.
   3. Only fittings supplied or recommended by the pipe manufacturer shall be used. Where designated on the contract drawings, a neoprene or rubber gasket shall be supplied.

2.04 POLYVINYL CHLORIDE PIPE (PVC)

A. Four-inch to 15-inch diameter pipe shall be Type PSM SDR-35 and meet the requirements of ASTM D3034. Pipe over 15-inch diameter shall meet the requirements of ASTM F679. Pipe shall be of the bell and spigot type.

2.05 TRASH GUARDS FOR ENDWALLS

A. Trash guards shall be constructed of painted or galvanized steel bars and pipes, spaced no more than 8-inches on center and welded into the configuration shown on the contract drawings. Fasteners shall be zinc-coated stainless steel.

2.06 CONCRETE BRICK OR BLOCK

A. Concrete brick and block masonry units shall conform to the requirements of Section 519 of the State of Wisconsin, Department of Transportation, Standard Specifications.

PART 3 EXECUTION

3.01 GENERAL

A. Construction of the public storm utility drainage piping shall include all excavation, backfilling, compacting of trenches and breaking into existing manholes, inlets or storm sewers required to provide a completed storm sewer at the locations shown on the contract drawings.

3.02 PROTECTION OF EXISTING UTILITIES

A. Utility locations shown on contract drawings are approximate. Contractor shall contact all utility companies at least three working days prior to excavation for locations of all buried utilities owned by them. Should utilities be unexpectedly encountered during excavation, consult Engineer immediately for directions as to procedure.

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Cooperate with the Owner and public and private utility companies in keeping their respective services and facilities in operation. Repair damaged utilities to the satisfaction of the utility owner. Contractor shall be responsible for the cost of repairing damaged utilities.

3.03 CONCRETE STORM SEWER

A. Concrete storm sewer shall be constructed as shown on the contract drawings and in accordance with Section 608 of the State of Wisconsin, Department of Transportation, Standard Specifications, with the following exceptions and additions:

1. Joints shall be of flexible watertight rubber gaskets installed as per manufacturer's instructions and in accordance with Section 608 of the State of Wisconsin, Department of Transportation Standard Specifications.
2. Joints for elliptical storm sewer shall be mortar, gasket, mastic or combination in accordance with Section 608 of the State of Wisconsin, Department of Transportation Standard Specifications.
3. Backfill shall be as indicated on the contract drawings and specified in Trenching and Backfilling - Division 31 and Special Procedures - Division 01. Backfill shall be incidental to storm sewer construction.
4. If no embedment class is specified, then Class B embedment with a shaped subgrade shall be used.
5. Joint ties shall be installed on apron endwall joints and the adjacent two pipe joints.

3.04 CORRUGATED METAL PIPE (CMP) STORM SEWER

A. Corrugated metal pipe shall be constructed as shown on the contract drawings and in accordance with the Special Procedures and Sections 520, 521, and 529 of the State of Wisconsin, Department of Transportation, Standard Specifications, with the following exceptions and additions:

1. Joints shall be of watertight bolted bands installed as per manufacturer's instructions.
2. Backfill and embedment shall be as noted in the Special Procedures and shall be incidental to storm sewer construction.
3. Basis of payment will be per lineal foot in place. Miscellaneous bends, fittings and bands shall be included in the unit bid price of the associated pipe. The footage to be paid for shall not include the construction into or through catch basins, manholes, and inlets.

3.05 HIGH DENSITY POLYETHYLENE PIPE (HDPE)

A. High density polyethylene pipe shall be constructed as shown on the contract drawings and, in accordance with the Special Procedures - Division 01 and Section 608 of the State of Wisconsin, Department of Transportation, Standard Specifications, and in accordance with "Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications" (ASTM D 2321) with the following exceptions and additions:

1. Joints for sewer pipe shall be sealed to be water tight in accordance with AASHTO Standard Specifications for Highway Bridges, Division II, Section 30.4.2.1
2. Embedment shall be Class II or as indicated in Special Procedures - Division 01 and shall be incidental to storm sewer construction.
3. Backfill shall be Type II as specified in Trenching and Backfilling - Division 31 or as indicated in Special Procedures - Division 01. Backfill shall be incidental to storm sewer construction.

3.06 POLYVINYL CHLORIDE PIPE (PVC)

A. PVC pipe shall be constructed as shown on the contract drawings and in accordance with the Special Procedures – Division 01 and in accordance with "Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications" (ASDM D2321) with the following exceptions:

1. Joints for sewer pipe shall be sealed to be water tight in accordance with AASHTO Standard Specifications for Highway Bridges, Division II, Section 30.4.2.1
2. Embedment shall be Class II or as indicated in Special Procedures - Division 01 and shall be incidental to storm sewer construction.

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3. Backfill shall be Type II as specified in Trenching and Backfilling - Division 31 or as indicated in Special Procedures - Division 01. Backfill shall be incidental to storm sewer construction.

3.07 LAYING SEWER PIPE FOR CURVES

A. Sewers laid on curves shall be one of the following types:

1. Deflection of pipe joints will be permitted when the joint opening is less than 1/2 the length of the tongue for mortar joints or 1/4 the length of the tongue with rubber gasket joints; otherwise use cut-off pipe or miter pipe.
2. Cut-off pipe shall be molded with the difference between the longest and shortest sides, measured along the outside of the pipe, conforming to the values given in Table 1. Lengths of pipe other than that shown may be used only with approval of the Engineer.
3. Miter pipe shall be manufactured by the removal of a wedge from the center of the pipe to provide for the required angle of deflection. Sufficient additional reinforcement shall be added at the spring lines and top and bottom of the pipe to prevent shearing after installation. Repairs to complete the pipe shall be such that the concrete shall have the same strength as that of the remainder of the pipe barrel and shall not spall or separate. Miter pipe shall be used for all elliptical pipe laid on a curve. Miter pipe for circular sewers shall be used only with the approval of the Engineer.

Table 1
Cut-Off of Pipe for Curved Sewer (inches)
(4-foot long pipe sections)

Pipe I.D. Inches	Radius of Curve in Feet							
	40	50	57.3	60	70	80	90	100
21	2-5/8	2-1/8	1-3/4	1-3/4	1-1/2	1-3/8	1-1/4	1/1/8
24	2-7/8	2-3/8	2	2	1-3/4	1/1/2	1-3/8	1-1/4
27	3-1/4	2-5/8	2-1/4	2-1/8	1-7/8	1-5/8	1-1/2	1-3/8
30	3-1/2	2-7/8	2-1/2	2-3/8	2-1/8	1-7/8	1-5/8	1-1/2
36	4-1/4	3-3/8	3	2-7/8	2-1/2	2-1/8	1-7/8	1-3/4
42	--	3-7/8	3-3/8	3-1/4	2-7/8	2-1/2	2-1/4	2
48	--	4-3/8	3-7/8	3-3/4	3-1/4	2-7/8	2-1/2	2-1/4
54	--	--	4-3/8	4-1/8	3-5/8	3-1/8	2-7/8	2-1/2
60	--	--	--	--	4	3-1/2	3-1/8	2-3/4
66	--	--	--	--	4-3/8	3-3/4	3-3/8	3-3/8
72	--	--	--	--	--	4-1/8	3-5/8	3-3/8
78	--	--	--	--	--	4-3/8	4	3-5/8
84	--	--	--	--	--	4-3/4	4-1/4	3-7/8
96	--	--	--	--	--	--	4-7/8	4-3/8

3.08 TESTING

A. Leakage Testing. All storm sewers shall be tested for excessive infiltration and sand leakage. All sand leaks shall be repaired by the Contractor at his expense. If in the judgment of the Engineer the infiltration will cause a continued maintenance problem, the sewer shall be repaired by the Contractor at his expense.

B. Alignment and Grade shall be checked by lamping method to detect poor alignment, offset joints, sags, kinks, or open joints; defects shall be corrected by the Contractor before final acceptance. If closer inspection is warranted, the Owner may arrange for a televised inspection. The Owner will assume the cost of televised inspection if no serious defect is found. If defects are found which the Engineer attributes to the failure of proper installation or sound materials, the Contractor shall pay for the test. Defects shall be promptly corrected.

C. Deflection Limitation. Deflections in corrugated metal pipe shall be limited to 5 percent of the nominal pipe diameter. If visual inspection indicates a greater deflection, the Contractor shall supply and pull a rigid ball or

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mandrel with a diameter 5 percent less than the nominal pipe size through the sewer. Failure of the ball to freely pass through shall be cause for rejection of the sewer.

D. Deflection Test. All HDPE and PVC pipe installations shall be tested for deflection by using a rigid ball or mandrel and shall be performed in accordance with ASTM D2321 and without the use of mechanical pulling devices. Deflection may not exceed 5 percent if tested within 30 days of placement of final backfill or 7.5 percent if tested more than 30 days after final backfill is placed. Final backfill must be in place prior to testing.

E. Acceptance. If any of the tests are not met, the Contractor shall, at his own expense, determine the source of the problem and repair or replace all defective work.

3.09 PROTECTING OPENINGS

A. Fences shall be provided around all openings and whenever required for the protection of the public. They shall be neat and substantial. All openings, fences, and surface obstructions shall be guarded and shall be indicated at night by suitable flashers.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Public storm utility drainage piping shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 PUBLIC STORM UTILITY DRAINAGE PIPING

A. Public Storm Utility Drainage Piping, Lineal Foot. Measurement for the public storm utility drainage piping shall be for the lineal foot of storm sewer installed, measured to the center of inlets, catch basins and manholes. Payment shall be made at the contract unit price bid per lineal foot of storm sewer installed. Contractor shall furnish and install all bedding, fittings and appurtenances required to complete the project. All said costs shall be included in the respective storm sewer bid items.

B. Apron Endwalls, Each. Measurement for apron endwalls will be for each endwall installed in accordance with the contract drawings and specifications. Endwall will not be included in lineal foot measurement of storm sewer pipe. Payment will be made at the contract price bid per each.

END OF SECTION

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SECTION 33 41 16.19
PIPE UNDERDRAINS

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. American Association of State Highway and Transportation Officials (AASHTO), Standard Specifications, Latest Edition.
   2. American Society for Testing and Materials (ASTM), Annual Book of ASTM Standards, Current Edition.
   3. ASTM 2680 – Standard Specification for Acrylonitrile-Butadiene-Styrene (ABS) and Poly (Vinyl Chloride) (PVC) Composite Sewer Piping.
   4. Section 612 Underdrains, State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition at time of bid opening.

1.03 DESCRIPTION OF WORK

A. The work covered under this section shall consist of furnishing all material, equipment, and labor required to install the pipe underdrains within public or private lands for this project. Underdrain is assumed to be considered in the pipe size range of 4 to 12 –inch diameter pipe unless noted elsewhere in the contract documents.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Trenching and Backfilling - Division 31

C. Geosynthetics for Earthwork – Division 31

D. Public Storm Utility Drainage Piping – Division 33

1.05 SUBMITTALS

A. Contractor shall submit such product literature and catalog cuts of materials to be supplied to relate these materials to the specifications. Information shall be in conformance with requirements of Submittals - Division 01 of these specifications.

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 HIGH DENSITY POLYETHYLENE PIPE (HDPE)

A. High density polyethylene pipe shall conform to the requirements of Section 530 of the State of Wisconsin, Department of Transportation Standard Specifications. Pipe shall include perforated and unperforated options.

2.02 Corrugated Polyethylene Drainage Pipe

A. Use corrugated polyethylene drainage pipe for underdrains conforming to AASHTO M252, type CP and AASHTO M294, type CP with Class 2 perforations. Pipe shall include perforated and unperforated options.

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2.03 POLYVINYL CHRLORIDE (PVC)

A. Use polyvinyl chloride drainage pipe for underdrains conforming to AASHTO M278. Pipe shall include perforated and unperforated options.

2.04 Fittings and Couplings

A. Couplings and fittings for 4-12 inch pipe shall be suitable for the specific project application and as recommended by the pipe manufacturer.
   1. The fittings shall not reduce or impair the overall integrity or function of the pipe line. Fittings may be either molded or fabricated. Common corrugated fittings include in-line joint fittings, such as couplers and reducers, and branch or complimentary assembly fittings such as tees, wyes, and end caps. These fittings may be installed by various methods, such as snap-on, screw-on, bell and spigot, and wrap around.
   2. Couplings shall provide sufficient longitudinal strength to preserve pipe alignment and prevent separation at the joints.
   3. Only fittings supplied or recommended by the pipe manufacturer shall be used. Where designated on the contract drawings, a neoprene or rubber gasket shall be supplied.

B. Duct tape is not a suitable product to make connections between underdrain. It may only be used to temporarily hold pieces of the underdrain together in field when installing it or over an already installed proper fitting/coupling.

2.05 ENDWALLS FOR PIPE UNDERDRAINS

A. At any exposed end of underdrain, a reinforced concrete apron endwall shall be placed. The endwall shall conform to the WisDOT reinforced concrete apron endwall detail.

B. Trash guards, if required, shall be constructed of painted or galvanized steel bars and pipes, spaced no more than 8-inches on center and welded into the configuration shown on the contract drawings. Fasteners shall be zinc-coated stainless steel.

2.06 GEOTEXTILE FABRIC

A. Geotextile fabric shall be Wisconsin DOT Type DF (Drainage Filtration) or equal. No slit film geotextiles allowed.

2.07 CRUSHED STONE EMBEDMENT

A. The stone embedment for pipe underdrains shall be ¾” clear stone.

PART 3 EXECUTION

3.01 GENERAL

A. Construction of pipe underdrains shall include all excavation, backfilling, compacting of trenches and coring and connecting into existing or proposed manholes, inlets or storm sewers required to provide a completed pipe underdrain system at the locations shown on the contract drawings.

3.02 PROTECTION OF EXISTING UTILITIES

A. Utility locations shown on contract drawings are approximate. Contractor shall contact all utility companies at least three working days prior to excavation for locations of all buried utilities owned by them. Should utilities be unexpectedly encountered during excavation, consult Engineer immediately for directions as to procedure. Cooperate with the Owner and public and private utility companies in keeping their respective services and facilities in operation. Repair damaged utilities to the satisfaction of the utility owner. Contractor shall be responsible for the cost of repairing damaged utilities.

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B. Contractor shall coordinate all work with other respective utility companies to ensure compliance of all required utility offsets, depths, and clearances are met upon completion of the work.

3.03 PIPE INSTALLATION

A. High density polyethylene pipe shall be constructed as shown on the contract drawings and, in accordance with the Special Procedures - Division 01 and Section 608 of the State of Wisconsin, Department of Transportation, Standard Specifications, and in accordance with "Standard Practice for Underground Installation of Thermoplastic Pipe for Sewers and Other Gravity-Flow Applications" (ASTM D 2321) with the following exceptions and additions:

B. Joints for pipe underdrain shall be sealed to be water tight in accordance with AASHTO Standard Specifications for Highway Bridges, Division II, Section 30.4.2.1

C. Embedment shall be crushed stone or as indicated in Special Procedures - Division 01 and shall be incidental to pipe underdrain construction.

D. Backfill shall be Type II as specified in Trenching and Backfilling - Division 31 or as indicated in Special Procedures - Division 01. Backfill shall be incidental to pipe underdrain construction.

E. The perforated side of the pipe shall be installed per the direction of the Engineer.

F. All dead end pipes shall be closed securely with concrete plugs or engineer-approved caps or plugs fabricated from the same material used for the pipe.

3.04 ENDWALLS FOR PIPE UNDERDRAIN

A. Install endwalls in the locations and elevations as shown on the contract documents. Endwalls shall be placed on a stable, compacted subgrade.

B. Contractor to verify if reinforced concrete endwalls will work for proposed underdrain type and size.

3.05 TRENCH CONSTRUCTION

A. The trench for the pipe underdrain shall be a shaped, excavated trench with square sides.

B. The trench profile shall follow the roadway or swale/ditch profile with a tolerance of minimum 0.20-feet +/-.

C. If underdrain is located throughout a site, the underdrain shall follow the minimum grades to connect to the overall storm sewer system. Stone backfill shall be extended up to the bottom of the finished grades topsoil section.

1. Trenches in areas outside of a roadway or ditch shall be constructed with a uniform slope from the end of the pipe to the connection at a storm structure or to the endwall/daylight location and elevation.

3.06 GEOTEXTILE FABRIC

A. The trench shall be lined with a continuous piece of geotextile fabric prior to the clear stone and pipe underdrain installation. After the stone and pipe installation, the geotextile fabric shall wrapped over the top of the pipe underdrain trench. The geotextile fabric shall overlap itself by the width of the trench, minimum.

B. If the plans call for an underdrain in a sock, the trench shall not be wrapped.

3.07 CRUSHED STONE EMBEDMENT

A. The clear stone embedment shall extend a minimum of 8-inches around all edges of the pipe underdrain unless otherwise specified in the special procedures.

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B. Depending on the installation, the clear stone shall extend to the bottom of the topsoil layer if placed throughout a site outside of a paved surface application.

C. Haunch stone around the pipe. Compact initial backfill with a vibratory compactor.

3.08 PROTECTING OPEN TRENCHES AND EXCAVATIONS

A. All work at the end of the day should be backfilled to subgrade elevations unless approved by Owner and Engineer. If excavations are left open during non-work hours, fences shall be provided around all openings for the protection of the public. They shall be neat and substantial. All openings, fences, and surface obstructions shall be guarded and shall be indicated at night by suitable flashers.

3.09 CONNECTION TO STORM STRUCTURES

A. Connect pipe underdrain to existing storm structures by coring an appropriately sized hole in the concrete structure in an open location or by using manufacturer approved connections to the HDPE structure. Connections to new structures shall include a manufactured opening/hole. Connect to precast concrete or block structures with a concrete collar wrapped with geotextile fabric, Type DF, or equal. Elevations for connections shall be as shown in the contract documents or as specified in the special procedures.

3.10 TESTING

A. Contractor to provide photos of all connections of the underdrain and of the installation for documentation of the installation per the contract documents.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Pipe underdrains shall be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein shall be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 PIPE UNDERDRAIN

A. Pipe Underdrain (size), Lineal Foot. Measurement for pipe underdrains shall be for the lineal foot of pipe underdrain installed, measured to the center of inlets, catch basins, manholes, or other structures if connecting to a structure. Measurement shall be to the end of the pipe if connected to an endwall or daylighted without a connecting structure. Payment shall be made at the contract unit price bid per lineal foot of pipe underdrain installed. All excavation, backfill, compaction, fittings required for connections to structures, endwalls and other pipes, crushed stone embedment, and geotextile fabric are considered incidental to the pipe installation. Contractor shall furnish and install all bedding, fittings and appurtenances required to complete the project. All said costs shall be included in the respective pipe underdrain bid items.

B. Endwalls (size), Each. Measurement for endwalls will be for each endwall installed in accordance with the contract drawings and specifications. The endwall will not be included in lineal foot measurement of pipe underdrain. Payment will be made at the contract price bid per each.

END OF SECTION

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SECTION 33 49 13
STORM DRAINAGE MANHOLES, FRAMES AND COVERS

PART 1 GENERAL

1.01 APPLICABLE PROVISIONS

A. Applicable provisions of Division 01 shall govern the work of this section.

1.02 APPLICABLE PUBLICATIONS

A. The following publications of the issues listed below, but referred to thereafter by basic designation only, form a part of this specification to the extent indicated by the reference thereto.
   1. American Society for Testing and Materials (ASTM), Annual Book of ASTM Standards, Current Edition.
   2. Federal Specifications (FS), Specifications and Standards, Current Edition.
   3. State of Wisconsin, Department of Transportation, Standard Specifications for Highway and Structure Construction, Current Edition at time of bid opening.
   4. American Concrete Institute, Annual Book of ACI Standards, Current Edition.

1.03 DESCRIPTION OF WORK

A. The work under this section shall cover design, furnishing and installing catch basins, storm manholes, inlets and similar structures constructed of precast concrete sections, or solid concrete block, set on a concrete base and fitted with standard structure covers, frames and steps, in accordance with the contract drawings and as specified herein.

1.04 RELATED WORK ELSEWHERE

A. Procurement and Contracting Requirements - Division 00 (All Sections)

B. Submittals - Division 01

C. Trenching and Backfilling - Division 31

D. Erosion and Sedimentation Controls - Division 31

E. Public Storm Utility Drainage Piping - Division 33

1.05 SUBMITTALS

A. Contractor shall submit such product literature and catalog cuts of materials to be supplied. Information shall be in conformance with requirements of Submittals - Division 01 of this specification.

B. Contractor shall submit submittals and details required for the design, construction and installation of the materials. Submittals and details shall indicate the intended materials arrangement, dimensions, major support requirements, plot area and or detailed construction requirements.

1.06 OPERATION/MAINTENANCE MANUALS AND INSTRUCTIONS (NONE)

PART 2 PRODUCTS AND MATERIALS

2.01 ACCEPTABLE MANUFACTURERS

A. The products listed are intended to establish a basis for comparison of products of other manufacturers. Substitutions will be permitted but only with the prior written approval of the Engineer. Catalogue reference numbers stated are those of Neenah Foundry Company and are intended to establish a basis for comparing the products of other manufacturers.

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2.02 STRUCTURES

A. The minimum compressive concrete strength for all structures shall be 4000 psi and shall conform to ASTM C478 for round structures and ASTM C913 for square or rectangular structures. Wall thicknesses of round manholes will vary with the diameter in conformance with ASTM C76, Class B concrete tongue and groove joint pipe. Larger diameter round manholes (7 feet +) shall have wall thickness a minimum of one-twelfth of the inside diameter of the manhole as specified in ASTM C478. Flat top slabs and reduction flat top slabs shall be designed in accordance with ACI 318 and designed to withstand the anticipated loads from riser sections, soil and hydrostatic loads, surcharge loads, live loads, and impact loads. Required site specific slab thickness shall be determined by the aforementioned calculations with the following minimum requirements:

1. Minimum slab thickness for 48-inch diameter structures, and less shall be 6 inches.
2. Minimum slab thickness for structures larger than 48-inches in diameter shall be 8 inches or as necessary as required by design calculations.

B. All other design elements for structures shall comply with ASTM C478 and C497 for round structures, and ASTM C913 and ASTM C890 for square or rectangular structures.

C. Materials furnished and used in this work shall conform to the requirements of Section 611 of the State of Wisconsin, Department of Transportation, Standard Specifications and details in the contract drawings.

D. The Contractor shall verify size, invert elevation, and location of all pipes in existing manholes and inform Engineer of any discrepancies before the replacement manhole is constructed.

2.03 STEPS

A. Steps shall be constructed of a 1/2 inch diameter, Grade 60 reinforcing steel bar conforming with ASTM A615 completely encased in polypropylene conforming with ASTM D4101 to obtain a minimum thickness of 1-1/8 inch and minimum width of 12 inches. They shall be securely and permanently set in the manhole wall. Steps shall be set at 16 inches on center and have a 5-3/4 inch projection from the wall. Steps shall conform with ASTM F783.

2.04 FRAMES, COVERS AND GRATINGS

A. Frames, covers and gratings shall be of the type and duty as shown on the contract drawings. Iron castings shall conform to ASTM A48, Class 20. All castings shall be true to pattern in form and dimensions, free from faults, sponginess, cracks, blow holes, and other defects affecting their strength.

B. The standard castings for storm sewer manholes shall be Type B with non-rocking lids as listed below except as designated otherwise on the contract drawings or in Special Procedures - Division 01.

Wisconsin	Other States
R-1550	R-1642

C. Where bolted lids are specified on the contract drawings or in Special Procedures - Division 01, they shall be Neenah R-1916-F, manhole frames with bolted lids.

D. Where low profile castings are specified on the contract drawings or in Special Procedures - Division 01, they shall be Neenah R-1689 (4-inch casting) with Type B non-rocking lid.

E. The standard casting for inlet structures located in curb lines shall be Neenah R-3067 inlet casting, or equal, except as designated on the contract drawings or in the Special Procedures - Division 01. Grate shall be as designated on the contract drawings or in the Special Procedures - Division 01. If none is indicated, provide as follows:

1. Type R, or equal – Low points
2. Type L, or equal – On grade

2.05 JOINT MATERIALS

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A. Joint materials shall be plastic gasket material or butyl rubber gasket material. Plastic gaskets shall be preformed, high adhesion material, packaged ready for use between protective paper strips conforming to Federal Spec SS-S-00210, Type I, Rope Form; Ram-Nek by K.T. Snyder Company, Inc.; Kent Seal No. 2 or equal. Butyl rubber gaskets shall be preformed, high adhesion material, packaged ready for use between protective paper strips, conforming to Federal Spec SS-S-210A, Rope Form; by Press Seal Gasket Corporation or equal.

2.06 ADJUSTMENT RINGS

A. The manholes shall be built so that a minimum of four inches is allowed for adjustment. A maximum of 12 inches of adjustment will be allowed.

B. Concrete Adjustment Rings
1. Adjustment rings shall be concrete with steel reinforcement in conformance with ASTM C478. Rings shall be either 2 inches or 4 inches in thickness, but the top two rings shall be of 2 inches thickness.
2. Precompressed butyl gasket, 3/8 inch x 3-1/2 inch or mortar shall be used between the manhole, manhole casting, and all adjustment rings. Butyl material shall be ez-stick or equal.

C. Polypropylene Adjustment Rings
1. Adjustment rings shall be manufactured from Expanded Polypropylene (EPP), compliant with ASTM D4819 and tested according to ASTM D3575.
2. Rings shall be available in heights (thicknesses) which will allow final adjustment of the frame and cover or grate to within ¼" (one quarter inch) to ½" (one half inch) of the specified final elevation.
3. "Finish" Rings shall be provided with grooves on the lower surface and flat upper surface. "Finish" rings may also have a keyway on the upper surface of the inner diameter to facilitate installation of an "Angle" ring, where "Angle" ring is required.
4. "Angle" rings may have an upper and lower keyway (tongue and groove) for vertical alignment and/or an adhesive trench on the underside.
5. Any adhesive or sealant used for watertight installation of the manhole grade adjustment rings shall meet manufacturers specifications and the requirements of ASTM C-920, Type S, Grade NS, Class 25, Uses NT, T, M, G, A and O Federal Specification TT-S-00230-C Type II, Class A .
6. Repair mortar and cementitious grout shall meet manufacturer's specifications.

PART 3 EXECUTION

3.01 STORM DRAINAGE MANHOLES, FRAMES AND COVERS, GENERAL

A. All lift holes on structures shall be sealed watertight.

3.02 ADJUSTMENT RINGS

A. Surface preparation and installation shall be in accordance with manufacturer's recommendations.

3.03 FRAMES AND COVERS

A. Structures shall be built up so that the frames and cover, when placed, will be at the established required grade.

3.04 PROVISION FOR FUTURE CONNECTION

A. Connections for future sewers, when specified, shall consist of a short piece of sewer terminating with a bell end and stopper or bulkhead not more than one full pipe length outside the structure wall unless otherwise shown. Other structure components and requirements are indicated on detail drawings. If no elevation is given for future connections, set the invert 1/2 inch above the main sewer invert.

3.05 ABANDONMENT OF STORM SEWER AND STRUCTURES

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A. Storm sewer lines to be abandoned shall be plugged at both ends with concrete or sewer brick and mortar. Where a new structure is to be built or an existing structure is to remain, the plugged end of the abandoned sewer line shall end no closer than five feet from the structure and concrete backing shall be poured between the plug and the structure. Where the structure and the sewer are to be abandoned, the sewer shall be blocked and the structure shall be filled with concrete above the crown of both the inflowing and outflowing sewers to a maximum of 4 feet. Sewers entering the structure more than 4 feet above the bottom shall be plugged with concrete or brick and mortar. All structures to be abandoned shall be removed to a minimum of 3 feet below ground level.

B. Backfill shall conform to the requirements of Trenching and Backfilling - Division 31 of these specifications.

PART 4 MEASUREMENT AND PAYMENT

4.01 GENERAL

A. Storm drainage manholes, frames and covers will be paid for at the bid price in accordance with one of the following methods, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

B. All work specified herein will be considered in each of the measurement and payment method(s) stipulated, unless indicated otherwise in the Bid Schedule or Special Procedures - Division 01.

4.02 STORM DRAINAGE MANHOLES, FRAMES AND COVERS

A. Storm Drainage Manholes, Frames and Covers, Complete. The unit price for storm drainage manholes, frames and covers shall include all materials and labor to provide the complete storm sewer structure, for each type of structure, in accordance with the contract drawings and specifications. Payment will be made for each type of structure at the respective contract price bid per each.

B. Storm Drainage Manholes, Frames and Covers, Unit Price
1. Vertical Foot. Payment will include base and poured inverts, all risers, steps, cone or flat top, and appurtenances and will be measured from the lowest pipe invert to the top of adjustment.
2. Storm Sewer Structure Casting and Base. Payment will include the frame and lid, set flush at final grade.

END OF SECTION

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14. CONTRACT CHANGE ORDER

Wade Bowl Park Splash Pad Project

Change Order No. _____

Contractor: _____
_____
_____

Item No.	Description of Change	DECREASE in contract price	INCREASE in contract price
- - - -	**Total DECREASE in contract price**		**XXXXXXXXXX**
- - - -	**Total INCREASE in contract price**	**XXXXXXXXXX**	
- - - -	**NET decrease/increase in contract price**	-	+

The current contract total is $_____. The sum of $_____ is hereby added to/ deducted from the total contract price and the total adjusted contract price is thereby $_____.

Change orders over $5,000.00: City Finance Department Initial:_____

The time provided for completion of the contract is (check one):

___ unchanged
___ increased by _____ calendar/working days
___ decreased by _____ calendar/working days

Necessity for change:

This document shall become an amendment to the contract and all provisions of the contract will apply hereto.

Change order recommended by: _____ Date: _____
(owner, architect, contractor - circle one)

Change order accepted by:_____ Date: _____
(contractor)

Change order approved by:_____ Date: _____
(owner - City of Superior)

Applicability

The Project or Program to which the construction work covered by this contract pertains is being assisted by the United States of America and the following Federal Labor Standards Provisions are included in this Contract pursuant to the provisions applicable to such Federal assistance.

A. 1. (i) Minimum Wages. All laborers and mechanics employed or working upon the site of the work, will be paid unconditionally and not less often than once a week, and without subsequent deduction or rebate on any account (except such payroll deductions as are permitted by regulations issued by the Secretary of Labor under the Copeland Act (29 CFR Part 3), the full amount of wages and bona fide fringe benefits (or cash equivalents thereof) due at time of payment computed at rates not less than those contained in the wage determination of the Secretary of Labor which is attached hereto and made a part hereof, regardless of any contractual relationship which may be alleged to exist between the contractor and such laborers and mechanics. Contributions made or costs reasonably anticipated for bona fide fringe benefits under Section l(b)(2) of the Davis-Bacon Act on behalf of laborers or mechanics are considered wages paid to such laborers or mechanics, subject to the provisions of 29 CFR 5.5(a)(1)(iv); also, regular contributions made or costs incurred for more than a weekly period (but not less often than quarterly) under plans, funds, or programs, which cover the particular weekly period, are deemed to be constructively made or incurred during such weekly period.

Such laborers and mechanics shall be paid the appropriate wage rate and fringe benefits on the wage determination for the classification of work actually performed, without regard to skill, except as provided in 29 CFR 5.5(a)(4). Laborers or mechanics performing work in more than one classification may be compensated at the rate specified for each classification for the time actually worked therein: Provided, That the employer's payroll records accurately set forth the time spent in each classification in which work is performed. The wage determination (including any additional classification and wage rates conformed under 29 CFR 5.5(a)(1)(ii) and the Davis-Bacon poster (WH-1321) shall be posted at all times by the contractor and its subcontractors at the site of the work in a prominent and accessible, place where it can be easily seen by the workers.

(ii) (a) Any class of laborers or mechanics which is not listed in the wage determination and which is to be employed under the contract shall be classified in conformance with the wage determination. HUD shall approve an additional classification and wage rate and fringe benefits therefor only when the following criteria have been met:

(1) The work to be performed by the classification requested is not performed by a classification in the wage determination; and

(2) The classification is utilized in the area by the construction industry; and

(3) The proposed wage rate, including any bona fide fringe benefits, bears a reasonable relationship to the wage rates contained in the wage determination.

(b) If the contractor and the laborers and mechanics to be employed in the classification (if known), or their representatives, and HUD or its designee agree on the classification and wage rate (including the amount designated for fringe benefits where appropriate), a report of the action taken shall be sent by HUD or its designee to the Administrator of the Wage and Hour Division, Employment Standards Administration, U.S. Department of Labor, Washington, D.C. 20210. The Administrator, or an authorized representative, will approve, modify, or disapprove every additional classification action within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB control number 1215-0140.)

(c) In the event the contractor, the laborers or mechanics to be employed in the classification or their representatives, and HUD or its designee do not agree on the proposed classification and wage rate (including the amount designated for fringe benefits, where appropriate), HUD or its designee shall refer the questions, including the views of all interested parties and the recommendation of HUD or its designee, to the Administrator for determination. The Administrator, or an authorized representative, will issue a determination within 30 days of receipt and so advise HUD or its designee or will notify HUD or its designee within the 30-day period that additional time is necessary. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

(d) The wage rate (including fringe benefits where appropriate) determined pursuant to subparagraphs (1)(ii)(b) or (c) of this paragraph, shall be paid to all workers performing work in the classification under this contract from the first day on which work is performed in the classification.

(iii) Whenever the minimum wage rate prescribed in the contract for a class of laborers or mechanics includes a fringe benefit which is not expressed as an hourly rate, the contractor shall either pay the benefit as stated in the wage determination or shall pay another bona fide fringe benefit or an hourly cash equivalent thereof.

(iv) If the contractor does not make payments to a trustee or other third person, the contractor may consider as part

of the wages of any laborer or mechanic the amount of any costs reasonably anticipated in providing bona fide fringe benefits under a plan or program, Provided, That the Secretary of Labor has found, upon the written request of the contractor, that the applicable standards of the Davis-Bacon Act have been met. The Secretary of Labor may require the contractor to set aside in a separate account assets for the meeting of obligations under the plan or program. (Approved by the Office of Management and Budget under OMB Control Number 1215-0140.)

2. Withholding. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld from the contractor under this contract or any other Federal contract with the same prime contractor, or any other Federally-assisted contract subject to Davis-Bacon prevailing wage requirements, which is held by the same prime contractor so much of the accrued payments or advances as may be considered necessary to pay laborers and mechanics, including apprentices, trainees and helpers, employed by the contractor or any subcontractor the full amount of wages required by the contract In the event of failure to pay any laborer or mechanic, including any apprentice, trainee or helper, employed or working on the site of the work, all or part of the wages required by the contract, HUD or its designee may, after written notice to the contractor, sponsor, applicant, or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds until such violations have ceased. HUD or its designee may, after written notice to the contractor, disburse such amounts withheld for and on account of the contractor or subcontractor to the respective employees to whom they are due. The Comptroller General shall make such disbursements in the case of direct Davis-Bacon Act contracts.

3. (i) Payrolls and basic records. Payrolls and basic records relating thereto shall be maintained by the contractor during the course of the work preserved for a period of three years thereafter for all laborers and mechanics working at the site of the work. Such records shall contain the name, address, and social security number of each such worker, his or her correct classification, hourly rates of wages paid (including rates of contributions or costs anticipated for bona fide fringe benefits or cash equivalents thereof of the types described in Section l(b)(2)(B) of the Davis-bacon Act), daily and weekly number of hours worked, deductions made and actual wages paid. Whenever the Secretary of Labor has found under 29 CFR 5.5 (a)(1)(iv) that the wages of any laborer or mechanic include the amount of any costs reasonably anticipated in providing benefits under a plan or program described in Section l(b)(2)(B) of the Davis-Bacon Act, the contractor shall maintain records which show that the commitment to provide such benefits is enforceable, that the plan or program is financially responsible, and that the plan or program has been communicated in writing to the laborers or mechanics affected, and records which show the costs anticipated or the actual cost incurred in providing such benefits. Contractors employing apprentices or trainees under approved programs shall maintain written evidence of the registration of apprenticeship programs and certification of trainee programs, the registration of the apprentices and trainees, and the ratios and wage rates prescribed in the applicable programs. (Approved by the Office of Management and Budget under OMB Control Numbers 1215-0140 and 1215-0017.)

(ii) (a) The contractor shall submit weekly for each week in which any contract work is performed a copy of all payrolls to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee. The payrolls submitted shall set out accurately and completely all of the information required to be maintained under 29 CFR 5.5(a)(3)(i) except that full social security numbers and home addresses shall not be included on weekly transmittals. Instead the payrolls shall only need to include an individually identifying number for each employee (e.g., the last four digits of the employee's social security number). The required weekly payroll information may be submitted in any form desired. Optional Form WH-347 is available for this purpose from the Wage and Hour Division Web site at *http://www.dol.gov/esa/whd/forms/wh347instr.htm* or its successor site. The prime contractor is responsible for the submission of copies of payrolls by all subcontractors. Contractors and subcontractors shall maintain the full social security number and current address of each covered worker, and shall provide them upon request to HUD or its designee if the agency is a party to the contract, but if the agency is not such a party, the contractor will submit the payrolls to the applicant sponsor, or owner, as the case may be, for transmission to HUD or its designee, the contractor, or the Wage and Hour Division of the Department of Labor for purposes of an investigation or audit of compliance with prevailing wage requirements. It is not a violation of this subparagraph for a prime contractor to require a subcontractor to provide addresses and social security numbers to the prime contractor for its own records, without weekly submission to HUD or its designee. (Approved by the Office of Management and Budget under OMB Control Number 1215-0149.)

(b) Each payroll submitted shall be accompanied by a "Statement of Compliance," signed by the contractor or subcontractor or his or her agent who pays or supervises the payment of the persons employed under the contract and shall certify the following:

(1) That the payroll for the payroll period contains the information required to be provided under 29 CFR 5.5 (a)(3)(ii), the appropriate information is being maintained under 29 CFR 5.5(a)(3)(i), and that such information is correct and complete;

(2) That each laborer or mechanic (including each helper, apprentice, and trainee) employed on the contract during the payroll period has been paid the full weekly wages earned, without rebate, either directly or indirectly, and that no deductions have been made either directly or indirectly from the full wages earned, other than permissible deductions as set forth in 29 CFR Part 3;

(3) That each laborer or mechanic has been paid not less than the applicable wage rates and fringe benefits or cash equivalents for the classification of work performed, as specified in the applicable wage determination incorporated into the contract.

(c) The weekly submission of a properly executed certification set forth on the reverse side of Optional Form WH-347 shall satisfy the requirement for submission of the "Statement of Compliance" required by subparagraph A.3.(ii)(b).

(d) The falsification of any of the above certifications may subject the contractor or subcontractor to civil or criminal prosecution under Section 1001 of Title 18 and Section 231 of Title 31 of the United States Code.

(iii) The contractor or subcontractor shall make the records required under subparagraph A.3.(i) available for inspection, copying, or transcription by authorized representatives of HUD or its designee or the Department of Labor, and shall permit such representatives to interview employees during working hours on the job. If the contractor or subcontractor fails to submit the required records or to make them available, HUD or its designee may, after written notice to the contractor, sponsor, applicant or owner, take such action as may be necessary to cause the suspension of any further payment, advance, or guarantee of funds. Furthermore, failure to submit the required records upon request or to make such records available may be grounds for debarment action pursuant to 29 CFR 5.12.

4. Apprentices and Trainees.

(i) Apprentices. Apprentices will be permitted to work at less than the predetermined rate for the work they performed when they are employed pursuant to and individually registered in a bona fide apprenticeship program registered with the U.S. Department of Labor, Employment and Training Administration, Office of Apprenticeship Training, Employer and Labor Services, or with a State Apprenticeship Agency recognized by the Office, or if a person is employed in his or her first 90 days of probationary employment as an apprentice in such an apprenticeship program, who is not individually registered in the program, but who has been certified by the Office of Apprenticeship Training, Employer and Labor Services or a State Apprenticeship Agency (where appropriate) to be eligible for probationary employment as an apprentice. The allowable ratio of apprentices to journeymen on the job site in any craft classification shall not be greater than the ratio permitted to the contractor as to the entire work force under the registered program. Any worker listed on a payroll at an apprentice wage rate, who is not registered or otherwise employed as stated above, shall be paid not less than the applicable wage rate on the wage determination for the classification of work actually performed. In addition, any apprentice performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. Where a contractor is performing construction on a project in a locality other than that in which its program is registered, the ratios and wage rates (expressed in percentages of the journeyman's hourly rate) specified in the contractor's or subcontractor's registered program shall be observed. Every apprentice must be paid at not less than the rate specified in the registered program for the apprentice's level of progress, expressed as a percentage of the journeymen hourly rate specified in the applicable wage determination. Apprentices shall be paid fringe benefits in accordance with the provisions of the apprenticeship program. If the apprenticeship program does not specify fringe benefits, apprentices must be paid the full amount of fringe benefits listed on the wage determination for the applicable classification. If the Administrator determines that a different practice prevails for the applicable apprentice classification, fringes shall be paid in accordance with that determination. In the event the Office of Apprenticeship Training, Employer and Labor Services, or a State Apprenticeship Agency recognized by the Office, withdraws approval of an apprenticeship program, the contractor will no longer be permitted to utilize apprentices at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(ii) Trainees. Except as provided in 29 CFR 5.16, trainees will not be permitted to work at less than the predetermined rate for the work performed unless they are employed pursuant ',to and individually registered in a program which has received prior approval, evidenced by formal certification by the U.S. Department of Labor, Employment and Training Administration. The ratio of trainees to journeymen on the job site shall not be greater than permitted under the plan approved by the Employment and Training Administration. Every trainee must be paid at not less than the rate specified in the approved program for the trainee's level of progress, expressed as a percentage of the journeyman hourly rate specified in the applicable wage determination. Trainees shall be paid fringe benefits in accordance with the provisions of the trainee program. If the trainee program does not mention fringe benefits, trainees shall be paid the full amount of fringe benefits listed on the wage determination unless the Administrator of the Wage and Hour Division determines that there is an apprenticeship program associated with the corresponding journeyman wage rate on the wage determination which provides for less than full fringe benefits for apprentices. Any employee listed on the payroll at a trainee rate who is not registered and participating in a training plan approved by

the Employment and Training Administration shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In addition, any trainee performing work on the job site in excess of the ratio permitted under the registered program shall be paid not less than the applicable wage rate on the wage determination for the work actually performed. In the event the Employment and Training Administration withdraws approval of a training program, the contractor will no longer be permitted to utilize trainees at less than the applicable predetermined rate for the work performed until an acceptable program is approved.

(iii) Equal employment opportunity. The utilization of apprentices, trainees and journeymen under 29 CFR Part 5 shall be in conformity with the equal employment opportunity requirements of Executive Order 11246, as amended, and 29 CFR Part 30.

5. Compliance with Copeland Act requirements. The contractor shall comply with the requirements of 29 CFR Part 3 which are incorporated by reference in this contract

6. Subcontracts. The contractor or subcontractor will insert in any subcontracts the clauses contained in subparagraphs 1 through 11 in this paragraph A and such other clauses as HUD or its designee may by appropriate instructions require, and a copy of the applicable prevailing wage decision, and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for the compliance by any subcontractor or lower tier subcontractor with all the contract clauses in this paragraph.

7. Contract termination; debarment. A breach of the contract clauses in 29 CFR 5.5 may be grounds for termination of the contract and for debarment as a contractor and a subcontractor as provided in 29 CFR 5.12.

8. Compliance with Davis-Bacon and Related Act Requirements. All rulings and interpretations of the Davis-Bacon and Related Acts contained in 29 CFR Parts 1, 3, and 5 are herein incorporated by reference in this contract

9. Disputes concerning labor standards. Disputes arising out of the labor standards provisions of this contract shall not be subject to the general disputes clause of this contract. Such disputes shall be resolved in accordance with the procedures of the Department of Labor set forth in 29 CFR Parts 5, 6, and 7. Disputes within the meaning of this clause include disputes between the contractor (or any of its subcontractors) and HUD or its designee, the U.S. Department of Labor, or the employees or their representatives.

10. (i) Certification of Eligibility. By entering into this contract the contractor certifies that neither it (nor he or she) nor any person or firm who has an interest in the contractor's firm is a person or firm ineligible to be awarded Government contracts by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(ii) No part of this contract shall be subcontracted to any person or firm ineligible for award of a Government contract by virtue of Section 3(a) of the Davis-Bacon Act or 29 CFR 5.12(a)(1) or to be awarded HUD contracts or participate in HUD programs pursuant to 24 CFR Part 24.

(iii) The penalty for making false statements is prescribed in the U.S. Criminal Code, 18 U.S.C. 1001. Additionally, U.S. Criminal Code, Section 1 01 0, Title 18, U.S.C., "Federal Housing Administration transactions", provides in part: "Whoever, for the purpose of . . . influencing in any way the action of such Administration..... makes, utters or publishes any statement knowing the same to be false..... shall be fined not more than $5,000 or imprisoned not more than two years, or both."

11. Complaints, Proceedings, or Testimony by Employees. No laborer or mechanic to whom the wage, salary, or other labor standards provisions of this Contract are applicable shall be discharged or in any other manner discriminated against by the Contractor or any subcontractor because such employee has filed any complaint or instituted or caused to be instituted any proceeding or has testified or is about to testify in any proceeding under or relating to the labor standards applicable under this Contract to his employer.

B. Contract Work Hours and Safety Standards Act. The provisions of this paragraph B are applicable where the amount of the prime contract exceeds $100,000. As used in this paragraph, the terms "laborers" and "mechanics" include watchmen and guards.

(1) Overtime requirements. No contractor or subcontractor contracting for any part of the contract work which may require or involve the employment of laborers or mechanics shall require or permit any such laborer or mechanic in any workweek in which the individual is employed on such work to work in excess of 40 hours in such workweek unless such laborer or mechanic receives compensation at a rate not less than one and one-half times the basic rate of pay for all hours worked in excess of 40 hours in such workweek.

(2) Violation; liability for unpaid wages; liquidated damages. In the event of any violation of the clause set forth in subparagraph (1) of this paragraph, the contractor and any subcontractor responsible therefor shall be liable for the unpaid wages. In addition, such contractor and subcontractor shall be liable to the United States (in the case of work done under contract for the District of Columbia or a territory, to such District or to such territory), for liquidated damages. Such liquidated damages shall be computed with respect to each individual laborer or mechanic, including watchmen and guards, employed in violation of the clause set forth in subparagraph (1) of this paragraph, in the sum of $10 for each calendar day on which such individual was required or permitted to work in excess of the standard workweek of 40 hours without payment of the overtime wages required by the clause set forth in sub paragraph (1) of this paragraph.

(3) Withholding for unpaid wages and liquidated damages. HUD or its designee shall upon its own action or upon written request of an authorized representative of the Department of Labor withhold or cause to be withheld, from any moneys payable on account of work performed by the contractor or subcontractor under any such contract or any other Federal contract with the same prime contract, or any other Federally-assisted contract subject to the Contract Work Hours and Safety Standards Act which is held by the same prime contractor such sums as may be determined to be necessary to satisfy any liabilities of such contractor or subcontractor for unpaid wages and liquidated damages as provided in the clause set forth in subparagraph (2) of this paragraph.

(4) Subcontracts. The contractor or subcontractor shall insert in any subcontracts the clauses set forth in subparagraph (1) through (4) of this paragraph and also a clause requiring the subcontractors to include these clauses in any lower tier subcontracts. The prime contractor shall be responsible for compliance by any subcontractor or lower tier subcontractor with the clauses set forth in subparagraphs (1) through (4) of this paragraph.

C. Health and Safety. The provisions of this paragraph C are applicable where the amount of the prime contract exceeds $100,000.

(1) No laborer or mechanic shall be required to work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his health and safety as determined under construction safety and health standards promulgated by the Secretary of Labor by regulation.

(2) The Contractor shall comply with all regulations issued by the Secretary of Labor pursuant to Title 29 Part 1926 and failure to comply may result in imposition of sanctions pursuant to the Contract Work Hours and Safety Standards Act, (Public Law 91-54, 83 Stat 96). 40 USC 3701 et seq.

(3) The contractor shall include the provisions of this paragraph in every subcontract so that such provisions will be binding on each subcontractor. The contractor shall take such action with respect to any subcontractor as the Secretary of Housing and Urban Development or the Secretary of Labor shall direct as a means of enforcing such provisions.

"General Decision Number: WI20250008 02/21/2025

Superseded General Decision Number: WI20240008

State: Wisconsin

Construction Types: Heavy (Sewer and Water Line and Tunnel)

Counties: Wisconsin Statewide.

TUNNEL, SEWER & WATER LINE CONSTRUCTION PROJECTS

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	Executive Order 14026 generally applies to the contract. The contractor must pay all covered workers at least $17.75 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	Executive Order 13658 generally applies to the contract. The contractor must pay all covered workers at least $13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2025.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this

wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at http://www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/03/2025
1	02/07/2025
2	02/21/2025

BRWI0001-002 06/03/2024

CRAWFORD, JACKSON, JUNEAU, LA CROSSE, MONROE, TREMPEALEAU, AND VERNON COUNTIES

	Rates	Fringes
BRICKLAYER	$ 38.86	27.00

BRWI0002-002 06/01/2024

ASHLAND, BAYFIELD, DOUGLAS, AND IRON COUNTIES

	Rates	Fringes
BRICKLAYER	$ 46.60	27.01

BRWI0002-005 06/01/2024

ADAMS, ASHLAND, BARRON, BROWN, BURNETT, CALUMET, CHIPPEWA, CLARK, COLUMBIA, DODGE, DOOR, DUNN, FLORENCE, FOND DU LAC, FOREST, GREEN LAKE, IRON, JEFFERSON, KEWAUNEE, LANGLADE, LINCOLN, MANITOWOC, MARATHON, MARINETTE, MARQUETTE, MENOMINEE, OCONTO, ONEIDA, OUTAGAMIE, POLK, PORTAGE, RUSK, ST CROIX, SAUK, SHAWANO, SHEBOYGAN, TAYLOR, VILAS, WALWORTH, WAUPACA, WAUSHARA, WINNEBAGO, AND WOOD COUNTIES

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 41.62	27.03

BRWI0003-002 06/01/2024

BROWN, DOOR, FLORENCE, KEWAUNEE, MARINETTE, AND OCONTO COUNTIES

	Rates	Fringes
BRICKLAYER	$ 38.45	27.41

BRWI0004-002 06/01/2024

KENOSHA, RACINE, AND WALWORTH COUNTIES

	Rates	Fringes
BRICKLAYER	$ 43.21	27.90

BRWI0006-002 06/01/2024

ADAMS, CLARK, FOREST, LANGLADE, LINCOLN, MARATHON, MENOMINEE, ONEIDA, PORTAGE, PRICE, TAYLOR, VILAS AND WOOD COUNTIES

	Rates	Fringes
BRICKLAYER	$ 38.33	27.53

BRWI0007-002 06/01/2024

GREEN, LAFAYETTE, AND ROCK COUNTIES

	Rates	Fringes
BRICKLAYER	$ 39.34	28.15

BRWI0008-002 06/01/2024

MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
BRICKLAYER	$ 46.16	27.33

BRWI0009-001 06/01/2024

GREEN LAKE, MARQUETTE, OUTAGAMIE, SHAWANO, WAUPACA, WASHARA, AND WINNEBAGO COUNTIES

	Rates	Fringes
BRICKLAYER	$ 38.45	27.41

BRWI0011-002 06/01/2024

CALUMET, FOND DU LAC, MANITOWOC, AND SHEBOYGAN COUNTIES

	Rates	Fringes
BRICKLAYER	$ 38.45	27.41

BRWI0013-002 06/01/2024

DANE, GRANT, IOWA, AND RICHLAND COUNTIES

	Rates	Fringes
BRICKLAYER	$ 40.17	27.32

BRWI0019-002 06/01/2024

BARRON, BUFFALO, BURNETT, CHIPPEWA, DUNN, EAU CLAIRE, PEPIN, PIERCE, POLK, RUSK, ST. CROIX, SAWYER AND WASHBURN COUNTIES

	Rates	Fringes
BRICKLAYER	$ 38.18	27.68

BRWI0021-002 06/01/2024

DODGE AND JEFFERSON COUNTIES

	Rates	Fringes
BRICKLAYER	$ 39.10	28.37

BRWI0034-002 06/01/2024

COLUMBIA AND SAUK COUNTIES

	Rates	Fringes
BRICKLAYER	$ 40.17	27.32

CARP0068-011 05/02/2022

BURNETT (W. of Hwy 48), PIERCE (W. of Hwy 29), POLK (W. of Hwys 35, 48 & 65), AND ST. CROIX (W. of Hwy 65) COUNTIES

	Rates	Fringes
Carpenter & Piledrivermen	$ 41.19	27.05

CARP0231-002 06/05/2023

KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
CARPENTER	$ 41.91	29.72

CARP0310-002 06/03/2024

ADAMS, ASHLAND, BAYFIELD (Eastern 2/3), FOREST, IRON, JUNEAU, LANGLADE, LINCOLN, MARATHON, ONEIDA, PORTAGE, PRICE, SHAWANO (Western Portion of the County), TAYLOR, VILAS, AND WOOD COUNTIES

	Rates	Fringes
CARPENTER	$ 42.44	28.44
Piledriver	$ 42.44	28.44

CARP0314-001 06/05/2023

COLUMBIA, DANE, DODGE, GRANT, GREEN, IOWA, JEFFERSON, LAFAYETTE, RICHLAND, ROCK, SAUK, AND WALWORTH COUNTIES

	Rates	Fringes
CARPENTER	$ 38.86	27.06
Piledriver	$ 39.43	27.02

CARP0361-004 05/01/2018

BAYFIELD (West of Hwy 63) AND DOUGLAS COUNTIES

	Rates	Fringes
CARPENTER	$ 36.15	20.43

CARP0731-002 06/03/2024

CALUMET (Eastern Portion of the County), FOND DU LAC (Eastern Portion of the County), MANITOWOC, AND SHEBOYGAN COUNTIES

	Rates	Fringes
CARPENTER	$ 42.44	28.44
Piledriver	$ 42.44	28.44

CARP0955-002 06/03/2024

CALUMET (Western Portion of the County), FOND DU LAC (Western Portion of the County), GREEN LAKE, MARQUETTE, OUTAGAMIE, WAUPACA, WAUSHARA, AND WINNEBAGO

	Rates	Fringes
CARPENTER	$ 42.44	28.44
PILEDRIVER	$ 42.44	28.44

CARP1056-002 06/01/2024

ADAMS, ASHLAND, BARRON, BAYFIELD , BROWN, BUFFALO, BURNETT ,CALUMET, CHIPPEWA, CLARK, COLUMBIA, CRAWFORD, DANE, DODGE, DOOR, DUNN, EAU CLAIRE, FLORENCE, FOND DU LAC, FOREST, GRANT, GREEN, GREEN LAKE, IOWA, IRON, JACKSON, JEFFERSON, JUNEAU, KEWAUNEE, LA CROSSE, LAFAYETTE, LANGLADE, LINCOLN, MANITOWOC, MARATHON, MARINETTE, MARQUETTE, MENOMINEE, MONROE, OCONTO, ONEIDA, OUTAGAMIE, PEPIN, PIERCE (E. of Hwy. 29 & 65), POLK (E. of Hwy. 35, 48 & 65), PORTAGE, PRICE, RICHLAND, ROCK, RUSK, SAUK, SAWYER, SHAWANO, SHEBOYGAN, ST. CROIX (E. of Hwy. 65), TAYLOR, TREMPEALEAU, VERNON, VILAS, WALWORTH, WASHBURN, WAUPACA, WAUSHARA, WINNEBAGO, AND WOOD COUNTIES

	Rates	Fringes
MILLWRIGHT	$ 42.00	28.85

CARP1074-002 06/03/2024

BARRON, BURNETT, CHIPPEWA, CLARK, DUNN, EAU CLAIRE, PEPIN, PIERCE (E. of Hwy. 29 & 65), POLK (E. of Hwy. 35, 48 & 65), RUSK, SAWYER, ST. CROIX (E. of Hwy. 65), AND WASHBURN

	Rates	Fringes
CARPENTER	$ 42.44	28.44
PILEDRIVER	$ 42.44	28.44

CARP1143-002 06/03/2024

BUFFALO, CRAWFORD, JACKSON, LA CROSSE, MONROE, TREMPEALEAU AND VERNON COUNTIES

	Rates	Fringes
CARPENTER	$ 42.44	28.44
PILEDRIVER	$ 42.44	28.44

CARP1146-002 06/03/2024

BROWN, DOOR, FLORENCE, KEWAUNEE, MARINETTE, MENOMINEE, OCONTO, AND SHAWANO (Western Portion of the County) COUNTIES

	Rates	Fringes
CARPENTER	$ 42.44	28.44
PILEDRIVER	$ 42.44	28.44

CARP2337-009 06/03/2024

KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WASHINGTON, AND WAUKESHA

	Rates	Fringes
PILEDRIVERMAN	$ 42.21	34.07

CARP2337-010 06/03/2024

KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WASHINGTON, AND WAUKESHA

	Rates	Fringes
MILLWRIGHT	$ 42.31	32.21

ELEC0014-002 05/26/2024

ASHLAND, BARRON, BAYFIELD, BUFFALO, BURNETT, CHIPPEWA, CLARK (except Maryville, Colby, Unity, Sherman, Fremont, Lynn & Sherwood), CRAWFORD, DUNN, EAU CLAIRE, GRANT, IRON, JACKSON, LA CROSSE, MONROE, PEPIN, PIERCE, POLK, PRICE, RICHLAND, RUSK, ST CROIX, SAWYER, TAYLOR, TREMPEALEAU, VERNON, AND WASHBURN COUNTIES

	Rates	Fringes
Electricians:	$ 42.73	23.99

ELEC0127-002 06/01/2023

KENOSHA COUNTY

	Rates	Fringes
Electricians:	$ 46.05	30%+13.15

ELEC0158-002 06/01/2024

BROWN, DOOR, KEWAUNEE, MANITOWOC (except Schleswig), MARINETTE(Wausuakee and area South thereof), OCONTO, MENOMINEE (East of a ine 6 miles West of the West boundary of Oconto County), SHAWANO (Except Area North of Townships of Aniwa and Hutchins) COUNTIES

	Rates	Fringes
ELECTRICIAN	$ 40.25	29.75%+11.17

ELEC0159-003 05/26/2024

COLUMBIA, DANE, DODGE (Area West of Hwy 26, except Chester and Emmet Townships), GREEN, LAKE (except Townships of Berlin, Seneca, and St. Marie), IOWA, MARQUETTE (except Townships of

Neshkoka, Crystal Lake, Newton, and Springfield), and SAUK COUNTIES

	Rates	Fringes
ELECTRICIAN	$ 48.55	25.91

ELEC0219-004 06/01/2019

FLORENCE COUNTY (Townships of Aurora, Commonwealth, Fern, Florence and Homestead) AND MARINETTE COUNTY (Township of Niagara)

	Rates	Fringes
Electricians:		
Electrical contracts over $180,000	$ 33.94	21.80
Electrical contracts under $180,000	$ 31.75	21.73

ELEC0242-005 06/02/2024

DOUGLAS COUNTY

	Rates	Fringes
Electricians:	$ 46.23	69.19%

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* ELEC0388-002 06/01/2024

ADAMS, CLARK (Colby, Freemont, Lynn, Mayville, Sherman, Sherwood, Unity), FOREST, JUNEAU, LANGLADE, LINCOLN, MARATHON, MARINETTE (Beecher, Dunbar, Goodman & Pembine), MENOMINEE (Area West of a line 6 miles West of the West boundary of Oconto County), ONEIDA, PORTAGE, SHAWANO (Aniwa and Hutchins), VILAS AND WOOD COUNTIES

	Rates	Fringes
Electricians:	$ 40.19	26%+12.45

ELEC0430-002 06/01/2024

RACINE COUNTY (Except Burlington Township)

	Rates	Fringes
Electricians:	$ 48.50	26.25

ELEC0494-005 05/26/2024

MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
Electricians:	$ 49.48	27.34

ELEC0494-006 05/26/2024

CALUMET (Township of New Holstein), DODGE (East of Hwy 26 including Chester Township), FOND DU LAC, MANITOWOC (Schleswig), and SHEBOYGAN COUNTIES

	Rates	Fringes
Electricians:	$ 42.77	24.66

ELEC0577-003 05/26/2024

CALUMET (except Township of New Holstein), GREEN LAKE (N. part including Townships of Berlin, St Marie, and Seneca), MARQUETTE (N. part including Townships of Crystal Lake, Neshkoro, Newton, and Springfield), OUTAGAMIE, WAUPACA, WAUSHARA, AND WINNEBAGO COUNTIES

	Rates	Fringes
Electricians:	$ 40.00	22.69

ELEC0890-003 06/01/2024

DODGE (Emmet Township only), GREEN, JEFFERSON, LAFAYETTE, RACINE (Burlington Township), ROCK AND WALWORTH COUNTIES

	Rates	Fringes
Electricians:	$ 43.65	25.95%+12.26

ENGI0139-003 06/03/2024

REMAINING COUNTIES

	Rates	Fringes
Power Equipment Operator		
Group 1	$ 48.78	27.14
Group 2	$ 47.53	27.14
Group 3	$ 44.23	27.14
Group 4	$ 43.70	27.14
Group 5	$ 41.63	27.14
Group 6	$ 40.10	27.14

HAZARDOUS WASTE PREMIUMS:
EPA Level ""A"" Protection: $3.00 per hour
EPA Level ""B"" Protection: $2.00 per hour
EPA Level ""C"" Protection: $1.00 per hour

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Cranes, Tower Cranes and Derricks with or without attachments with a lifting capacity of over 100 tons; Cranes, Tower Cranes, and Derricks with boom, leads and/or jib lengths 176 ft or longer.

GROUP 2: Backhoes (Excavators) weighing 130,00 lbs and over; Cranes, Tower Cranes and Derricks with or without attachments with a lifting capacity of 100 tons or less; Cranes, Tower Cranes, and Derricks with boom, leads, and/or jib lengths 175 ft or less; Caisson Rigs; Pile Driver

GROUP 3: Backhoes (Excavators) weighing under 130,000 lbs; Travelling Crane (bridge type); Milling Machine; Concrete Paver over 27 E; Concrete Spreader and Distributor; Concrete Laser Screed; Concrete Grinder and Planing Machine; Slipform Curb and Gutter Machine; Boring Machine (Directional); Dredge Operator; Skid Rigs; over 46 meter Concrete Pump.

GROUP 4: Hydraulic Backhoe (tractor or truck mounted); Hydraulic Crane, 10 tons or less; Tractor, Bulldozer, or End Loader (over 40 hp); Motor Patrol; Scraper Operator; Bituminous Plant and Paver Operator; Screed-Milling Machine; Roller over 5 tons; Concrete pumps 46 meter and under; Grout Pumps; Rotec type machine; Hydro Blaster, 10,000 psi and over; Rotary Drill Operator; Percussion Drilling Machine; Air Track Drill with or without integral hammer; Blaster; Boring Machine (vertical or horizontal); Side Boom; Trencher, wheel type or chain type having 8 inch or larger bucket; Rail Leveling Machine (Railroad); Tie Placer; Tie Extractor; Tie Tamper; Stone Leveler; Straddle Carrier; Material Hoists; Stack Hoist; Man Hoists; Mechanic and Welder; Off Road Material Haulers.

GROUP 5: Tractor, Bulldozer, or Endloader (under 40 hp); Tampers -Compactors, riding type; Stump Chipper, large; Roller, Rubber Tire; Backfiller; Trencher, chain type (bucket under 8 inch); Concrete Auto Breaker, large; Concrete Finishing Machine (road type); Concrete Batch Hopper; Concrete Conveyor Systems; Concrete Mixers, 14S or over; Pumps, Screw Type and Gypsum); Hydrohammers, small; Brooms and Sweeeprs; Lift Slab Machine; Roller under 5 tons; Industrial Locomotives; Fireman (Pile Drivers and Derricks); Pumps (well points); Hoists, automatic; A-Frames and Winch Trucks; Hoists (tuggers); Boats (Tug, Safety, Work Barges and Launches); Assistant Engineer

GROUP 6: Shouldering Machine Operator; Farm or Industrial Tractor mounted equipment; Post Hole Digger; Auger (vertical and horizontal); Skid Steer Loader with or without attachments; Robotic Tool Carrier with or without attachments; Power Pack Vibratory/Ultra Sound Driver and Extractor; Fireman (Asphalt Plants); Screed Operator; Stone Crushers and Screening Plants; Air, Electric, Hydraulic Jacks (Slip Form); Prestress Machines; Air Compressor, 400 CFM or over; Refrigeration Plant/Freese Machine; Boiler Operators (temporary heat); Forklifts; Welding Machines; Generators; Pumps over 3""; Heaters, Mechanical; Combination small equipment operator; Winches, small electric; Oiler; Greaser; Rotary Drill Tender; Conveyor; Elevator Operator

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ENGI0139-007 06/03/2024

DODGE, FOND DU LAC, JEFFERSON, KENOSHA, MILWAUKEE, OZAUKEE, RACINE, SHEBOYGAN, WALWORTH, WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
Power Equipment Operator		
Group 1	$ 45.04	26.80
Group 2	$ 44.26	26.80
Group 3	$ 43.31	26.80
Group 4	$ 42.26	26.80
Group 5	$ 40.86	26.80

HAZARDOUS WASTE PREMIUMS:
EPA Level ""A"" Protection: $3.00 per hour
EPA Level ""B"" Protection: $2.00 per hour
EPA Level ""C"" Protection: $1.00 per hour

POWER EQUIPMENT OPERATORS CLASSIFICATIONS

GROUP 1: Cranes, Tower Cranes, and Derricks with or without attachments, with a lifting capacity of over 100 tons; or Cranes, Tower Cranes, and Derricks with boom, leads, and/or jib lengths measuring 176 feet or longer; Backhoes (Excavators) 130,000 lbs and over; Caisson Rigs and Pile Drivers

GROUP 2: Cranes, Tower Cranes and Derricks with or without attachments with a lifting capacity of 100 tons or under; or Cranes, Tower Cranes, and Derricks with boom, lead, and\or jib lengths measuring 175 feet or under; Backhoes (Excavators) under 130,000 lbs; Skid Rigs; Dredge Operator: Traveling Crane (Bridge type); Concrete Paver over 27 E; Concrete Spreader and Distributor; Concrete Pumps and Boring Machines (directional)

GROUP 3: Material Hoists; Stack Hoists; Tractor or Truck mounted Hydraulic Backhoe; Tractor or Truck Mounted Hydraulic Crane, 5 tons or under; Manhoist; Tractor over 40 hp; Bulldozer over 40 hp; Endloader over 40 hp; Forklift, 25 ft and over; Motor Patrol; Scraper Operator; Sideboom; Straddle Carrier; Mechanic and Welder; Bituminous Plant and Paver Operator; Roller over 5 tons; Percussion Drill Operator; Rotary Drill Operator; Blaster; Air Track Drill; Trencher (wheel type or chain type having over 8 inch bucket); Elevator; Milling Machine and Boring Machine (horizontal or vertical); Backhoe Mounted Compactor

GROUP 4: Backfiller; Concrete Auto Breaker (large); Concrete Finishing Machine (road type); Roller, Rubber Tire; Concrete Batch Hopper; Concrete Conveyor System; Concrete Mixers (14S or over); Screw type Pumps and Gypsum Pumps; Grout Pumps; Tractor, Bulldozer, End Loader, under 40 hp; Pumps (well points); Trencher (chain type 8 inch or smaller bucket; Industrial Locomotives; Roller under 5 tons; Fireman (Piledrivers and Derricks); Robotic Tool Carrier with or without attachments.

GROUP 5: Hoists (Automatic); Forklift, 12 ft to 25 ft; Tamper-Compactors, riding type; A-Frame andWinch Trucks; Concrete Auto Breaker; Hydrohammer, small; Brooms and Sweepers; Hoist (Tuggers); Stump Chipper, large; Boats (Tug, Safety, Work Barges and Launch); Shouldering Machine Operator; Screed Operator; Farm or Industrial Tractor; Post Hole Digger; Stone Crushers and Screening Plants; Firemen (Asphalt Plants); Air Compressor (400 CFM or over); Augers (vertical and horizontal); Generators, 150 KW and over; Air, Electric Hydraulic Jacks (Slipform); Prestress Machines; Skid Steer Loader with or without attachments; Boiler operators (temporary heat); Forklift, 12 ft and under; Screed Operator Milling Machine; Refrigeration Plant/Freeze Machine; Power Pack Vibratory/Ultra Sound Driver and Extractor; Generators under 150 KW; Combination small equipment operator; Compressors under 400 CFM; Welding Machines; Heaters, Mechanical; Pumps; Winches, Small Electric; Oiler and Greaser; Conveyor; High pressure utility locating machine (daylighting machine).

IRON0008-002 06/02/2024

BROWN, CALUMET, DOOR, FOND DU LAC, KEWAUNEE, MANITOWOC, MARINETTE, OCONTO, OUTAGAMI, SHAWANO, SHEBOYGAN, AND WINNEBAGO COUNTIES:

	Rates	Fringes
IRONWORKER.....	$ 43.02	32.32

Paid Holidays: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day & Christmas Day.

IRON0008-003 06/02/2024

KENOSHA, MILWAUKEE, OZAUKEE, RACINE, WALWORTH (N.E. 2/3), WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
IRONWORKER	$ 44.79	32.32

Paid Holidays: New Year's Day, Memorial Day, July 4th, Labor Day, Thanksgiving Day & Christmas Day.

IRON0383-001 06/02/2024

ADAMS, COLUMBIA, CRAWFORD, DANE, DODGE, FLORENCE, FOREST, GRANT, GREENE, (Excluding S.E. tip), GREEN LAKE, IOWA, JEFFERSON, JUNEAU, LA CROSSE, LAFAYETTE, LANGLADE, MARATHON, MARQUETTE, MENOMINEE, MONROE, PORTAGE, RICHLAND, ROCK (Northern area, vicinity of Edgerton and Milton), SAUK, VERNON, WAUPACA, WAUSHARA, AND WOOD COUNTIES

	Rates	Fringes
IRONWORKER	$ 42.00	31.93

IRON0498-005 06/01/2024

GREEN (S.E. 1/3), ROCK (South of Edgerton and Milton), and WALWORTH (S.W. 1/3) COUNTIES:

	Rates	Fringes
IRONWORKER	$ 46.59	48.80

IRON0512-008 04/28/2024

BARRON, BUFFALO, CHIPPEWA, CLARK, DUNN, EAU CLAIRE, JACKSON, PEPIN, PIERCE, POLK, RUSK, ST CROIX, TAYLOR, AND TREMPEALEAU COUNTIES

	Rates	Fringes
IRONWORKER	$ 44.85	35.22

IRON0512-021 04/28/2024

ASHLAND, BAYFIELD, BURNETT, DOUGLAS, IRON, LINCOLN, ONEIDA,
PRICE, SAWYER, VILAS AND WASHBURN COUNTIES

	Rates	Fringes
IRONWORKER	$ 41.19	34.68

LABO0113-004 06/03/2024

MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

	Rates	Fringes
Laborers: (Open Cut)		
Group 1	$ 19.14	23.90
Group 2	$ 21.61	23.90
Group 3	$ 25.47	23.90
Group 4	$ 35.66	23.90
Group 5	$ 35.83	23.90
Group 6	$ 35.89	23.90
Group 7	$ 40.09	23.90
Group 8	$ 43.16	23.90
Group 9	$ 43.85	23.90

LABORERS CLASSIFICATIONS [OPEN CUT]

GROUP 1: Yard Laborer

GROUP 2: Landscaper

GROUP 3: Flag Person

GROUP 4: Paving Laborer

GROUP 5: General Laborer on Surface; Top Man

GROUP 6: Mud Mixer

GROUP 7: Mucker; Form Stripper; Bottom Digger and Misc; Bottom Man and Welder on Surface

GROUP 8: Concrete Manhole Builder; Caisson Worker; Miner; Pipe Layer; Rock Driller and Joint Man; Timber Man and Concrete Brusher; Bracer in Trench Behind Machine & Tight Sheeting; Concrete Formsetter and Shoveler; Jackhammer Operator

GROUP 9: Blaster

LABO0113-005 06/03/2024

SEWER, TUNNEL & UNDERGROUND

KENOSHA AND RACINE COUNTIES

	Rates	Fringes
Laborers:		
Group 1	$ 26.40	23.90
Group 2	$ 32.87	23.90
Group 3	$ 37.44	23.90
Group 4	$ 39.37	23.90

TUNNEL WORK UNDER COMPRESSED AIR: 0-15 lbs add $1.00, 15-30 lbs add $2.00, over 30 lbs add $3.00

LABORERS CLASSIFICATIONS

GROUP 1: Flagperson

GROUP 2: Top Man, General Laborer, Wellpoint Installation, Wire Mesh and Reinforcement, Concrete Worker, Form Stripper, Strike-off Work

GROUP 3: Machine and Equipment Operator, Sheeting, Form Setting, Patch Finisher, Bottom Man, Joint Sawer, Gunnite Man, Manhole Builder, Welder-Torchman, Blaster, Caulker, Bracer, Bull Float, Conduit Worker, Mucker and Car Pusher, Raker and Luteman, Hydraulic Jacking of Shields, Shield Drivers, Mining Machine, Lock Tenders, Mucking Machine Operator, Motor Men & Gauge Tenders and operation of incidental Mechanical Equipment and all Power Driven Tools

GROUP 4: Pipelayer, Miner and Laser Operator

LABO0113-008 06/03/2024

MILWAUKEE, OZAUKEE, WASHINGTON & WAUKESHA COUNTIES

	Rates	Fringes
Laborers: (Tunnel-Free Air)		
Group 1	$ 25.47	23.90
Group 2	$ 35.83	23.90
Group 3	$ 35.89	23.90
Group 4	$ 40.09	23.90
Group 5	$ 40.23	23.90
Group 6	$ 43.15	23.90
Group 7	$ 43.85	23.90

LABORERS CLASSIFICATIONS [TUNNEL - FREE AIR]:

GROUP 1: Flagperson

GROUP 2: General Laborer on surface; Tower Man

GROUP 3: Saw Man; Top Man

GROUP 4: Form Stripper; Car Pusher

GROUP 5: Mucker; Dinkey; Welder (rate on surface)

GROUP 6: Concrete Manhole Builder; Mucking Machine; Miner; Mining Machine; Welder; Rock Driller; Concrete Buster; Jack Hammer Operator; Caisson Worker; Pipelayer and Joint Man; Bracerman

GROUP 7: Blaster

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* LABO0113-009 06/03/2024

MILWAUKEE, OZAUKEE, WASHINGTON & WAUKESHA COUNTIES

	Rates	Fringes
Laborers: (Tunnel -		
*COMPRESSED AIR 0 - 15 lbs.)		
Group 1	$ 25.47	23.90
Group 2	$ 35.83	23.90
Group 3	$ 40.67	23.90
Group 4	$ 41.54	23.90
Group 5	$ 41.68	23.90
Group 6	$ 44.62	23.90
Group 7	$ 45.29	23.90

LABORERS CLASSIFICATIONS [TUNNEL - COMPRESSED AIR]:

*Compressed Air 15 - 30 lbs add $2.00 to all classifications
*Compressed Air over 30 lbs add $3.00 to all classifcations

GROUP 1: Flagperson

GROUP 2: General Laborer on surface

GROUP 3: Lock Tender on surface

GROUP 4: Form Stripper; Car Pusher

GROUP 5: Mucker; Dinkey

GROUP 6: Mucking Machine; Miner; Mining Machine; Welder & Rock Driller; Lock Tender in tunnel; Concrete Buster; Jack Hammer Operator; Caisson Worker; Pielayer and Joint Man; Bracerman; Nozzle Man on Gunite; Timber Man; Concrete Brusher

GROUP 7: Blaster

NOTE: Hazardous & Toxic Waste Removal: add $0.15 per hour.

LABO0140-005 06/03/2024

ADAMS, ASHLAND, BARRON, BROWN, BUFFALO, CALUMET, CHIPPEWA, CLARK, COLUMBIA, CRAWFORD, DODGE, DOOR, DUNN, EAU CLAIRE, FLORENCE,FOND DU LAC, FOREST, GRANT, GREEN, GREEN LAKE, IOWA, JACKSON, JEFFERSON, JUNEAU, KEWAUNEE, LACROSSE, LAFAYETTE, LANGLADE, LINCOLN, MANITOWOC, MARATHON, MARINETTE, MARQUETTE, MENOMINEE, MONROE, OCONTO, ONEIDA, OUTAGAMIE, PEPIN, PIERCE, POLK, PORTAGE, PRICE, RICHLAND, ROCK, RUSK, ST CROIX, SAUK, SAWYER, SHAWANO, SHEBOYGAN, TAYLOR, TREMMPEALEAU, VERNON, VILAS, WALWWORTH, WASHBURN, WAUPACA, WAUSHARA, WINNEBAGO, AND WOOD COUNTIES

	Rates	Fringes
LABORER (SEWER & WATER)		
Group 1	$ 35.63	19.45
Group 2	$ 37.48	19.45
Group 3	$ 37.68	19.45
Group 4	$ 38.43	19.45

FOR ALL TUNNEL WORK UNDER COMPRESSED AIR: 0-15 lbs add $1.00, 15-30 lbs add $2.00, over 30 lbs add $3.00

LABORER CLASSIFICATIONS:

GROUP 1: Flagperson

GROUP 2: General Laborer, Wellpoint Installation; Form Stripper; Strike Off worker

GROUP 3: Sheeting Formsetting; Patch Finisher; Bottom Man; Joint Sawer; Gunnite Man; Manhole Builder; Welder; Torchman; Blaster; Caulker Bracer; Bull Float; Mucker and Car Pusher; Raker and Luteman; Hydraulic jacking of shields, Shield Drivers; Mining Machine; Lock Tenders; Mucking Machine Operators; Motor Men and Gauge Tenders; Power Tool Operators

GROUP 4: Pipelayer, Miner, and Laser Operator

LABO0464-002 06/03/2024

DANE AND DOUGLAS COUNTIES

	Rates	Fringes

LABORER

Group 1	$ 35.53	19.45
Group 2	$ 37.73	19.45
Group 3	$ 37.93	19.45
Group 4	$ 38.68	19.45

FOR ALL TUNNEL WORK UNDER COMPRESSED AIR: 0 - 15 lbs add $1.00, 15- 30 lbs add $2.00, over 30 lbs add $3.00

LABORERS CLASSIFICATIONS:

GROUP 1: Flagperson

GROUP 2: General Laborer; Wellpoint Installation; Concrete Worker; Form Stripper; Strike Off worker

GROUP 3: Sheeting Formsetting; Patch Finisher; Bottom Man; Joint Sawer; Gunnite Man; Manhole Builder; Welder; Torchman; Blaster; Caulker Bracer; Bull Float; Mucker and Car Pusher; Raker and Luteman; Hydraulic jacking of shields, Shield Dirvers; Mining Machine; Lock Tenders; Mucking Machine Operators; Motor Men and Gauge Tenders; Power Tool Operators

GROUP 4: Pipelayer, Miner, and Laser Operator

LABO1091-010 06/03/2024

BAYFIELD, BURNETT, IRON, SAWYER, AND WASHBURN COUNTIES

	Rates	Fringes
Laborers: (SEWER & WATER)		
Group 1	$ 35.32	19.45
Group 2	$ 37.38	19.45
Group 3	$ 37.58	19.45
Group 4	$ 38.33	19.45

FOR ALL TUNNEL WORK UNDER COMPRESSED AIR: 0 - 15 lbs add $1.00, 15-30 lbs add $2.00, over 30 lbs add $3.00

LABORERS CLASSIFICATIONS:

GROUP 1: Flagperson

GROUP 2: Laborers, Wellpoint Installation; Form Stripper; Strike Off worker

GROUP 3: Sheeting Formsetting; Patch Finisher; Bottom Man;

Joint Sawer; Gunnite Man; Manhole Builder; Welder; Torchman; Blaster; Caulker Bracer; Bull Float; Mucker and Car Pusher; Raker and Luteman; Hydraulic jacking of shields, Shield Dirvers; Mining Machine; Lock Tenders; Mucking Machine Operators; Motor Men and Gauge Tenders; Power Tool Operators

GROUP 4: Pipelayer, Miner, and Laser Operator

PLAS0599-002 06/01/2024

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER		
Area A	$ 47.17	30.35
Area B	$ 41.62	26.34
Area C	$ 42.74	25.91
Area D	$ 43.16	25.49
Area E	$ 42.25	26.39
Area F	$ 38.98	29.67

AREA DESCRIPTIONS

AREA A: ASHLAND, BURNETT, BAYFIELD, DOUGLAS, IRON, PRICE, SAWYER, AND WASHBURN COUNTIES

AREA B: ADAMS, BARRON, BROWN, CALUMET, CHIPPEWA, CLARK, COLUMBIA, DODGE, DOOR, DUNN, FLORENCE, FOND DU LAC, FOREST, GREEN LAKE, JEFFERSON, KEWAUNEE, LANGLADE, LINCOLN, MANITOWOC, MARATHON, MARINETTE, MARQUETTE, MENOMINEE, OCONTO, ONEIDA, OUTAGAMIE, POLK, PORTAGE, RUSK, ST. CROIX, SAUK, SHAWANO, SHEBOYGAN, TAYLOR, VILAS, WALWORTH, WAUPACA, WAUSHARA, WINNEBAGO, AND WOOD COUNTIES

AREA C: BUFFALO, CRAWFORD, EAU CLAIRE, JACKSON, JUNEAU, LA CROSSE, MONROE, PEPIN, PIERCE, RICHLAND, TREMPEALEAU, AND VERNON COUNTIES

AREA D: MILWAUKEE, OZAUKEE, WASHINGTON, AND WAUKESHA COUNTIES

AREA E: DANE, GRANT, GREEN, IOWA, LAFAYETTE, AND ROCK COUNTIES

AREA F: KENOSHA AND RACINE COUNTIES

TEAM0039-001 06/01/2024

	Rates	Fringes
TRUCK DRIVER		
1 & 2 Axles	$ 37.57	27.41
3 or more Axles; Euclids, Dumptor & Articulated,		

Truck Mechanic.....$ 37.72 27.41

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council

number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007

01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION"

"General Decision Number: WI20250036 01/10/2025

Superseded General Decision Number: WI20240036

State: Wisconsin

Construction Type: Residential

Counties: Douglas, Fond Du Lac and Marathon Counties in Wisconsin.

RESIDENTIAL CONSTRUCTION PROJECTS (consisting of single family homes and apartments up to and including 4 stories).

Note: Contracts subject to the Davis-Bacon Act are generally required to pay at least the applicable minimum wage rate required under Executive Order 14026 or Executive Order 13658. Please note that these Executive Orders apply to covered contracts entered into by the federal government that are subject to the Davis-Bacon Act itself, but do not apply to contracts subject only to the Davis-Bacon Related Acts, including those set forth at 29 CFR 5.1(a)(1).

If the contract is entered into on or after January 30, 2022, or the contract is renewed or extended (e.g., an option is exercised) on or after January 30, 2022:	Executive Order 14026 generally applies to the contract. The contractor must pay all covered workers at least $17.75 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on the contract in 2025.
If the contract was awarded on or between January 1, 2015 and January 29, 2022, and the contract is not renewed or extended on or after January 30, 2022:	Executive Order 13658 generally applies to the contract. The contractor must pay all covered workers at least $13.30 per hour (or the applicable wage rate listed on this wage determination, if it is higher) for all hours spent performing on that contract in 2025.

The applicable Executive Order minimum wage rate will be adjusted annually. If this contract is covered by one of the

Executive Orders and a classification considered necessary for performance of work on the contract does not appear on this wage determination, the contractor must still submit a conformance request.

Additional information on contractor requirements and worker protections under the Executive Orders is available at http://www.dol.gov/whd/govcontracts.

Modification Number	Publication Date
0	01/03/2025
1	01/10/2025

CARP0310-004 06/01/2024

MARATHON COUNTY

	Rates	Fringes
CARPENTER	$ 29.86	20.71

CARP0361-011 05/03/2021

DOUGLAS COUNTY

	Rates	Fringes
CARPENTER	$ 39.71	26.01

CARP0731-005 06/01/2024

FOND DU LAC (Eastern Portion of the County)

	Rates	Fringes
CARPENTER	$ 29.86	20.71

CARP0955-007 06/01/2024

FOND DU LAC (Western Portion of the County)

	Rates	Fringes
CARPENTER	$ 29.86	20.71

ELEC0242-004 06/02/2024

DOUGLAS COUNTY

	Rates	Fringes
ELECTRICIAN	$ 46.23	69.19%

ELEC0388-006 05/31/2021

MARATHON COUNTY

	Rates	Fringes
ELECTRICIAN	$ 23.16	15.725+10.10

ELEC0494-009 05/26/2024

FOND DU LAC COUNTY

	Rates	Fringes
ELECTRICIAN	$ 33.00	14.97

ENGI0139-006 06/03/2024

	Rates	Fringes
OPERATOR: Power Equipment		
Backhoe/Excavator 130,000 lbs. and over	$ 43.67	26.00
Backhoe/Excavator under 130,000 lbs	$ 42.92	26.00
Bulldozer over 40 h.p.; Roller over 5 tons	$ 43.67	26.00
Bulldozer under 40 h.p.; Roller 5 tons and under; Rubber Tire Roller	$ 42.62	26.00

LABO0330-002 06/01/2024

FOND DU LAC & MARATHON COUNTIES

	Rates	Fringes
LABORER		
Common or General; Mason Tender - Brick	$ 22.81	15.96

LABO1091-009 06/01/2024

DOUGLAS COUNTY

	Rates	Fringes
LABORER		
Common or General; Mason Tender - Brick	$ 22.81	15.96

PLUM0011-005 05/06/2024

DOUGLAS COUNTY

	Rates	Fringes
PLUMBER	$ 49.32	27.18

PLUM0400-007 06/01/2024

FOND DU LAC COUNTY

	Rates	Fringes
PLUMBER	$ 45.86	21.73

PLUM0434-008 06/16/2024

MARATHON COUNTY

	Rates	Fringes
PLUMBER	$ 39.91	24.38

ROOF0096-001 04/01/2024

MARATHON COUNTY

	Rates	Fringes
ROOFER	$ 32.37	9.16

ROOF0096-005 05/01/2024

FOND DU LAC COUNTY

	Rates	Fringes
ROOFER	$ 30.98	15.34

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* ROOF0096-016 01/06/2025

DOUGLAS COUNTY

	Rates	Fringes
ROOFER	$ 42.12	22.40

SHEE0010-032 05/01/2008

DOUGLAS COUNTY

	Rates	Fringes
SHEET METAL WORKER (Including HVAC Duct Installation)	$ 23.12	10.56

SHEE0018-013 06/01/2024

MARATHON COUNTY

	Rates	Fringes
SHEET METAL WORKER (Including HVAC Duct Installation)	$ 27.31	20.32

SHEE0018-031 06/01/2024

FOND DU LAC COUNTY

	Rates	Fringes
SHEET METAL WORKER (Including HVAC Duct Installation)	$ 24.26	22.67

SUWI2012-020 04/04/2012

	Rates	Fringes
CEMENT MASON/CONCRETE FINISHER	$ 24.37	7.29
OPERATOR: Bobcat/Skid Steer/Skid Loader	$ 24.95	9.05
OPERATOR: Loader	$ 25.70	9.58

WELDERS - Receive rate prescribed for craft performing operation to which welding is incidental.

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Note: Executive Order (EO) 13706, Establishing Paid Sick Leave for Federal Contractors applies to all contracts subject to the Davis-Bacon Act for which the contract is awarded (and any solicitation was issued) on or after January 1, 2017. If this contract is covered by the EO, the contractor must provide employees with 1 hour of paid sick leave for every 30 hours they work, up to 56 hours of paid sick leave each year. Employees must be permitted to use paid sick leave for their own illness, injury or other health-related needs, including preventive care; to assist a family member (or person who is like family to the employee) who is ill, injured, or has other health-related needs, including preventive care; or for reasons resulting from, or to assist a family member (or person who is like family to the employee) who is a victim of, domestic violence, sexual assault, or stalking. Additional information on contractor requirements and worker protections under the EO is available at https://www.dol.gov/agencies/whd/government-contracts.

Unlisted classifications needed for work not included within the scope of the classifications listed may be added after award only as provided in the labor standards contract clauses (29CFR 5.5 (a) (1) (iii)).

The body of each wage determination lists the classifications and wage rates that have been found to be prevailing for the type(s) of construction and geographic area covered by the wage determination. The classifications are listed in alphabetical order under rate identifiers indicating whether the particular rate is a union rate (current union negotiated rate), a survey rate, a weighted union average rate, a state adopted rate, or a supplemental classification rate.

Union Rate Identifiers

A four-letter identifier beginning with characters other than ""SU"", ""UAVG"", ?SA?, or ?SC? denotes that a union rate was prevailing for that classification in the survey. Example: PLUM0198-005 07/01/2024. PLUM is an identifier of the union whose collectively bargained rate prevailed in the survey for this classification, which in this example would be Plumbers. 0198 indicates the local union number or district council number where applicable, i.e., Plumbers Local 0198. The next number, 005 in the example, is an internal number used in processing the wage determination. The date, 07/01/2024 in the example, is the effective date of the most current negotiated rate.

Union prevailing wage rates are updated to reflect all changes over time that are reported to WHD in the rates in the collective bargaining agreement (CBA) governing the classification.

Union Average Rate Identifiers

The UAVG identifier indicates that no single rate prevailed for those classifications, but that 100% of the data reported for the classifications reflected union rates. EXAMPLE: UAVG-OH-0010 01/01/2024. UAVG indicates that the rate is a weighted union average rate. OH indicates the State of Ohio. The next number, 0010 in the example, is an internal number used in producing the wage determination. The date, 01/01/2024 in the example, indicates the date the wage determination was updated to reflect the most current union average rate.

A UAVG rate will be updated once a year, usually in January, to reflect a weighted average of the current rates in the collective bargaining agreements on which the rate is based.

Survey Rate Identifiers

The ""SU"" identifier indicates that either a single non-union rate prevailed (as defined in 29 CFR 1.2) for this classification in the survey or that the rate was derived by computing a weighted average rate based on all the rates reported in the survey for that classification. As a weighted average rate includes all rates reported in the survey, it may include both union and non-union rates. Example: SUFL2022-007 6/27/2024. SU indicates the rate is a single non-union prevailing rate or a weighted average of survey data for that classification. FL indicates the State of Florida. 2022 is the year of the survey on which these classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 6/27/2024 in the example, indicates the survey completion date for the classifications and rates under that identifier.

?SU? wage rates typically remain in effect until a new survey is conducted. However, the Wage and Hour Division (WHD) has the discretion to update such rates under 29 CFR 1.6(c)(1).

State Adopted Rate Identifiers

The ""SA"" identifier indicates that the classifications and prevailing wage rates set by a state (or local) government were adopted under 29 C.F.R 1.3(g)-(h). Example: SAME2023-007 01/03/2024. SA reflects that the rates are state adopted. ME refers to the State of Maine. 2023 is the year during which the state completed the survey on which the listed classifications and rates are based. The next number, 007 in the example, is an internal number used in producing the wage determination. The date, 01/03/2024 in the example, reflects the date on which the classifications and rates under the ?SA? identifier took effect under state law in the state from which the rates were adopted.

WAGE DETERMINATION APPEALS PROCESS

1) Has there been an initial decision in the matter? This can be:

a) a survey underlying a wage determination
b) an existing published wage determination
c) an initial WHD letter setting forth a position on a wage determination matter
d) an initial conformance (additional classification and rate) determination

On survey related matters, initial contact, including requests for summaries of surveys, should be directed to the WHD Branch of Wage Surveys. Requests can be submitted via email to davisbaconinfo@dol.gov or by mail to:

Branch of Wage Surveys
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

Regarding any other wage determination matter such as conformance decisions, requests for initial decisions should be directed to the WHD Branch of Construction Wage Determinations. Requests can be submitted via email to BCWD-Office@dol.gov or by mail to:

Branch of Construction Wage Determinations
Wage and Hour Division
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

2) If an initial decision has been issued, then any interested party (those affected by the action) that disagrees with the decision can request review and reconsideration from the Wage and Hour Administrator (See 29 CFR Part 1.8 and 29 CFR Part 7). Requests for review and reconsideration can be submitted via email to dba.reconsideration@dol.gov or by mail to:

Wage and Hour Administrator
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210

The request should be accompanied by a full statement of the interested party's position and any information (wage payment data, project description, area practice material, etc.) that the requestor considers relevant to the issue.

3) If the decision of the Administrator is not favorable, an interested party may appeal directly to the Administrative Review Board (formerly the Wage Appeals Board). Write to:

Administrative Review Board
U.S. Department of Labor
200 Constitution Avenue, N.W.
Washington, DC 20210.

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END OF GENERAL DECISION"

2024 Reporting Requirements – MBE/WBE Only

Name And Address		Fed ID #	Payment amount to prime contractor or each sub on current pay application	Race/ Ethnicity of Business Owner (see below)	Minority or Woman Owned Business? (Y OR N, Please specify)	Section 3 Business? (Y OR N)
Contractor						
Subcontractor						
Subcontractor						
Subcontractor						
Subcontractor						
Subcontractor						
Subcontractor						
Subcontractor						

Race / Ethnicity Codes:

1 = White American
2 = Black American
3 = Native American
4 = Hispanic American
5 = Asian/Pacific American
6 = Hasidic Jew

This report must be submitted with each request for reimbursement, for projects funded by CDBG funds, through the City of Superior.

DEFINITIONS

1. A **Minority-owned Business Enterprise (MBE)** is a business that is both owned and controlled by minorities. This means that there must be not less than 51% minority ownership of the business (a business in which more than 50% of the ownership or control is held by one or more minority individuals, and more than 50% of the net profit or loss which accrues is to one or more minority individuals), and that the minority ownership must control the management and daily operations of the business. When 51% or more of the business is not owned and controlled by any single racial/ethnic category, enter the race/ethnicity code which best classifies the majority of employees working for the Contractor or Sub-Contractor.

2. A **Woman-owned Business Enterprise (WBE)** is a business that is both owned and controlled by women. This means that there must be not less than 51% women ownership of the business (a business in which more than 50% of the ownership or control is held by one or more female individuals, and more than 50% of the net profit or loss which accrues is to one or more female individuals), and that the women ownership must control the management and daily operations of the business.

3. A **Section 3 Business Concern** is business that meets at least one of the following criteria, documented within the last six-month period:

- At least 51% owned and controlled by low or very low-income persons (see income table below);
- Over 75% of the labor hours performed for the business over the prior three-month period are performed by Section 3 workers; or
- A business is at least 51% owned and controlled by current public housing residents or residents who currently live in Section 8-assisted housing.

4. A **Section 3 Worker** is any worker who currently fits, or when hired within the past five years fit, at least one of the following categories, as documented:

- The worker's income for the previous calendar year is below the income limit established by HUD (see income table below)
- The worker is employed by a Section 3 Business concern;
- The worker is a YouthBuild Participant

5. A **Targeted Section 3 Worker** is a Section 3 Worker who:

- is employed by a Section 3 business concern; OR
- currently fits or when hired fit at least one of the following categories, as documented within the past five years:

  (i) Living within the service area or neighborhood of the project, as defined in 24 CFR 75.5; OR
  (ii) A YouthBuild participant.

INCOME LIMIT TABLE

Household Size	1	2	3	4	5	6	7	8
Less Than	$53,350	$60,950	$68,550	$76,150	$82,250	$88,350	$94,450	$100,550

_____ _____ _____

Signature and Title of Person Completing Report | Date | Phone Number

BABA Certification Letter

The following information outlines the language the must be included as the manufacturer's certification of compliance with BABA compliance. **The letter must be provided on the manufacturing company's letterhead and include all information as shown below. Insert additional rows as needed for the table.**

Build America, Buy America Act (BABA) Manufacturer Certification Letter

Date:
Company Name:
Company Address:
City, State Zip:

By the statements, information, and signature provided below, Company Name is acknowledging the following:

- All articles, materials, products, and/or supplies meet the definitions as defined in 2 CFR § 184.3;
- All articles, materials, products, and/or supplies listed in the table below are being used for the purpose of a federally funded infrastructure project (Project Name/Address);
- All articles, materials, products, and/or supplies listed in the table below are manufactured by Company Name, meaning that that the company named in this part performs the final manufacturing process that produces a manufactured product;
- All articles, materials, products, and/or supplies listed in the table below are produced in the United States by Company Name;
- All articles, materials, products, and/or supplies meet the requirements of the Build America, Buy America Act as signed into law with the Infrastructure Investment and Jobs Act (IIJA), Pub. L. No. 117-58.

Article, Material, Product, and/or Supply Name	Location Where Manufacturing Occurred

Items that consist of two or more of the listed construction materials that have been combined through a manufacturing process, and items that include at least one of the listed materials combined with a material that is not listed through a manufacturing process, should be treated as manufactured products, rather than as construction materials. For example, a plastic framed sliding window should be treated as a manufactured product while plate glass should be treated as a construction material. Accordingly, should any of the listed construction materials be combined with a second listed material or with a non-listed item, then the product should be considered a manufactured product.

_____

Printed Name of Certifying Company Representative and Title

_____

Signature of Certifying Company Representative Date

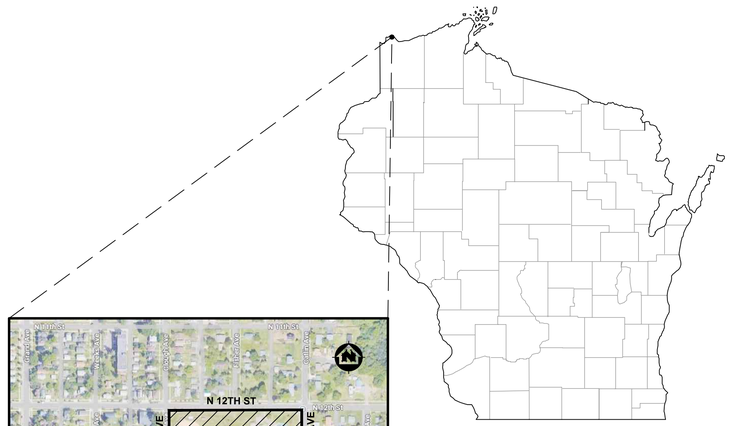
WADE BOWL PARK SPLASH PAD

CITY OF SUPERIOR

DOUGLAS COUNTY, WISCONSIN

GENERAL NOTES

1. CONTRACTOR IS RESPONSIBLE TO FURNISH AND INSTALL ALL MATERIALS NECESSARY TO COMPLETE THE PROJECT NOTED IN THE PLANS AND SPECIFICATIONS, INCLUDING BUT NOT LIMITED TO A FULLY FUNCTIONING SPLASHPAD AND BIORETENTION CELL.
2. ALL CONTRACTORS SHALL COORDINATE WITH OTHER CONTRACTORS, OWNER, OWNER'S CONTRACTORS, UTILITY OWNERS, ETC., INCLUDING BUT NOT LIMITED TO UTILITY CONTRACTOR, EXCAVATION CONTRACTOR, ELECTRICAL CONTRACTOR, SPLASH PAD VENDOR/CONTRACTOR, ETC..
3. CONTRACTOR SHALL REVIEW ALL PLANS, SPECIFICATIONS, DETAILS, ETC.. IF DISCREPANCIES ARE DISCOVERED, CONTRACTOR SHALL BRING THEM TO THE ENGINEER'S ATTENTION PRIOR TO START OF CONSTRUCTION.
4. WORK COMPLETED BY OTHERS IS NOTED WHERE APPLICABLE ON THE PLAN.
5. ALL DISTURBED AREAS TO BE RESTORED WITH TURF UNLESS OTHERWISE NOTED.
6. ALL CAD INFORMATION WILL BE MADE AVAILABLE TO THE CONTRACTOR.
7. ALL EROSION CONTROL SHALL BE IN PLACE PRIOR TO SITE CONSTRUCTION OR DISTURBANCE.



LOCATION MAP

NOT TO SCALE

SHEET INDEX

G - GENERAL SHEETS

G001 - TITLE SHEET

C - CIVIL SHEETS

C101 - OVERALL EXISTING SITE CONDITIONS PLAN
C201 - SITE EROSION CONTROL AND REMOVALS PLAN
C301 - SITE PLAN
C302 - SITE DIMENSION PLAN
C401 - OVERALL SITE GRADING PLAN
C402 - ENLARGED SITE GRADING PLAN
C501 - SITE UTILITY PLAN
C901-C902 - EROSION CONTROL DETAILS
C903 - GENERAL DETAILS
C904-C905 - UTILITY DETAILS
C906 - BIORETENTON POND DETAILS

E - ELECTRICAL SHEETS

E101 - SITE ELECTRICAL PLAN
E901 - ELECTRICAL DETAILS

F - SPLASH PAD SHEETS

F101 - SPLASH PAD PLAN
F901 - F910 - VORTEX SPLASH PAD PLANS

L - LANDSCAPE SHEETS

L101 - OVERALL SITE LANSCAPE PLAN
L102 - ENLARGED SITE LANDSCAPE PLAN
L901 - LANDSCAPE DETAILS

LEGEND

W	EXISTING WATER MAIN
W GV	EXISTING WATER MAIN, VALVE & HYDRANT
W	EXISTING WATER SERVICE & CURB STOP
WS	PROPOSED WATER MAIN, VALVE, & HYDRANT
SAN MH	EXISTING COMBINED SEWER & MANHOLE
SAN	PROPOSED COMBINED SEWER STRUCTURE
SS CB	EXISTING STORM SEWER & INLET/CATCH BASIN
ST	PROPOSED STORM SEWER
ST	PROPOSED STORM SEWER STRUCTURE
E	BURIED ELECTRIC
G	BURIED GAS & VALVE
TV	BURIED CABLE TELEVISION
T	BURIED TELEPHONE
FO	BURIED FIBER OPTIC
OH	OVERHEAD UTILITY
CP	EXISTING CULVERT PIPE
X X X	FENCE LINE
	DRAINAGE ARROW
	SILT FENCE
	RIGHT-OF-WAY
	PROPERTY LINE
	TREE LINE
	BENCHMARK
	IRON PIPE
	IRON ROD
	CONTROL POINT
	UTILITY POLE & GUY
	LIGHT POLE
	PEDESTAL
	STREET SIGN
	TREE - DECIDUOUS
	TREE - CONIFEROUS

UTILITY CONTACTS

GAS:
SUPERIOR WATER, LIGHT, & POWER
2915 HILL AVENUE
SUPERIOR, WI 54880
(715)-394-2200
WWW.SWLP.COM

ELECTRIC:
SUPERIOR WATER, LIGHT, & POWER
2915 HILL AVENUE
SUPERIOR, WI 54880
(715)-394-2200
WWW.SWLP.COM

COMMUNICATION:
BRIGHTSPEED
(801)-364-1063

CONSOLIDATED COMMUNICATIONS INC.
(262)-446-9821

MERIT NETWORK
(616)-393-0138

SEWER:
CITY OF SUPERIOR
DEPARTMENT OF PUBLIC WORKS - ENVIRONMENTAL SERVICES DIVISION
51 E. 1ST STREET
SUPERIOR, WI 54880
(715)-394-0392
WWW.SUPERIORWI.GOV/592/ENVIRONMENTAL-SERVICES-DIVISION

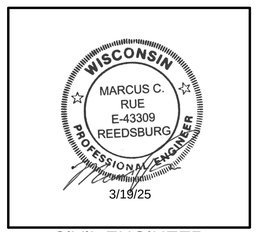
WATER:
SUPERIOR WATER, LIGHT, & POWER
2915 HILL AVENUE
SUPERIOR, WI 54880
(715)-394-2200
WWW.SWLP.COM

MAP LINK

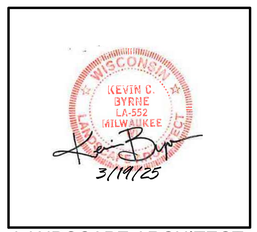
STAMPS



ELECTRICAL ENGINEER



CIVIL ENGINEER



LANDSCAPE ARCHITECT

DIGGERS HOTLINE

Dial 811 or (800) 242-8511

www.DiggersHotline.com

UTILITY LOCATIONS SHOWN ON PLANS ARE APPROXIMATE AND CONTRACTOR SHALL HAVE APPROPRIATE UTILITY MARK EXACT LOCATIONS PRIOR TO CONSTRUCTION.

			NO.	DATE	REVISION	BY
PROJECT DATE: MARCH 19, 2025	DRAWN BY:	KEF	.	.	.	.
	DESIGNED BY:	KEF	.	.	.	.
	CHECKED BY:	KCB	.	.	.	.

PLOT DATE: 3/20/2025 2:52 PM, G:\00\00628\00628066\CADD\Construction Documents\00628066 Title Sheet.dwg

MSA

ENGINEERING | ARCHITECTURE | SURVEYING
FUNDING | PLANNING | ENVIRONMENTAL
1230 South Boulevard, Baraboo WI 53913
(608) 356-2771 www.msa-ps.com

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WADE BOWL PARK SPLASH PAD
CITY OF SUPERIOR
DOUGLAS COUNTY, WISCONSIN

TITLE SHEET

PROJECT NO. 00628066

SHEET G001

LEGEND

- WATER MAIN
- WATER MAIN, VALVE & HYDRANT
- WATER SERVICE & CURB STOP
- COMBINED SEWER
- STORM SEWER
- CULVERT PIPE
- BURIED ELECTRIC
- BURIED GAS & VALVE
- BURIED CABLE TELEVISION
- BURIED TELEPHONE
- BURIED FIBER OPTICS
- OVERHEAD UTILITY
- LIGHT POLE
- UTILITY POLE
- GUY ANCHOR
- HYDRANT
- WATER VALVE
- WATER CURB STOP
- TREE STUMP
- TREE - DECIDUOUS
- TREE - CONIFEROUS
- STREET SIGN
- CONTROL POINT

N 12TH STREET

N 13TH STREET

CLOUGH AVE

CATLIN AVE

PROPERTY LINE

CONTROL POINT: CP 6

EX. BALL DIAMOND LIGHT POLE

EX. ELECTRIC METER

EX. BASEBALL FIELD

EX. COMBINED SEWER MANHOLE
RIM 620.61±
21" N IE 612.7±
21" S IE 612.7±
6" NW IE 617.0±
8" SE IE UNKNOWN
BENCH 613.4±
PIPE SIZE PER CITY AS-BUILT

EX. OUTFIELD FENCE

EX. TRASH RECEPTACLE

EX. BENCH PAD

EX. SCORE BOARD

EX. FENCE

EX. BALL DIAMOND LIGHT POLE

EX. TRASH RECEPTACLE

EX. PICNIC TABLE

EX. GRAVEL DRIVE

EX. GRAVEL PARKING LOT

EX. HOCKEY RINK LIGHT POLES

EX. HOCKEY RINK

EX. HOCKEY RINK LIGHT POLES

CONTROL POINT: CP 9

EX. CATCH BASIN

EX. CATCH BASIN

EX. ASPHALT WALK

EX. POWER POLE AND GUY WIRE

EX. BASKETBALL COURT

EX. OPEN AIR SHELTER

EX. TREES

EX. TRASH RECEPTACLES

EX. CATCH BASIN

EX. BENCH PAD

EX. TREE

TREE LINE

EX. CULVERT PIPE

EX. TREES

EX. LIGHT POLE

EX. SHELTER
FFE: 623.57±

EX. SKATING RINK

EX. 1.5" HOSE BIB

EX. GAS METER

EX. CHAIN LINK FENCE

EX. BURIED COMBINED SEWER MANHOLE
APPROX. RIM 620.9±
APPROX. GRADE: 622.7±
21" N IE 613.1±
18" SW IE 613.1±
APPROXIMATE LOCATION, INVERTS, AND PIPE SIZE PER CITY AS-BUILT PLAN.

CONTROL POINT: CP 3

EX. HYDRANT

EX. TREES

PROPERTY LINE

TREE LINE

EX. MONUMENT SIGN

EX. TREE

EX. TRASH RECEPTACLES

EX. TREE

EX. BENCH PAD

EX. PICNIC TABLE

EX. CATCH BASIN

EX. BIKE RACKS

EX. PLAYGROUND

EX. BENCH PAD

PROPERTY LINE

EX. LIGHT POLE

EX. ELECTRIC METER

EX. BENCH PAD

EX. TREE

TREE LINE

EX. POWER POLE AND GUY WIRE

EX. UTILITY POLE AND GUY WIRE

EX. COMBINED SEWER MANHOLE

ID: 05-805-00133-00
MARION J ARNOLD

ID: 05-805-00134-00
MARION J ARNOLD

ID: 05-805-00135-00
MACKIE FAMILY REVOCABLE TRUST

ID: 05-805-00136-00
JOSEPH EDWARD OLIVER

ID: 05-805-00138-00
MAXWELL P KENNEDY

ID: 05-805-00158-00
JOANN AIKEN

ID: 05-805-01703-00
JOANN AIKEN

ID: 05-805-01704-00
BLAINE BUSINESS CENTER LLC

ID: 05-805-00291-00
BLAINE BUSINESS CENTER LLC

ID: 05-805-00349-00
SUPERIOR GLASS INSTALLERS INC

ID: 05-805-00313-00
SUPERIOR GLASS INSTALLERS INC

ID: 05-805-00292-00
CHAD RICHARD BALCER

ID: 05-805-00294-00
DEBRA A VOGT

0 30 60

DIGGERS HOTLINE
Dial 811 or (800) 242-8511
www.DiggersHotline.com
UTILITY LOCATIONS SHOWN ON PLANS ARE APPROXIMATE AND CONTRACTOR SHALL HAVE APPROPRIATE UTILITY MARK EXACT LOCATIONS PRIOR TO CONSTRUCTION.

BENCHMARK TABLE

NO.	NORTHING	EASTING	ELEVATION	DESCRIPTION
10	310018.51	151309.74	613.34	MGPS *NGS PEAVEY
3	306332.26	150942.91	624.92	CP *IP - IRON PIPE
6	306647.80	150761.28	621.39	CP *IP - IRON PIPE
9	306313.37	150427.66	627.97	CP *IP - IRON PIPE

DOUGLAS COUNTY COORDINATE SYSTEM

NO.	DATE	REVISION	BY
.	.	.	.
.	.	.	.
.	.	.	.

PROJECT DATE: MARCH 19, 2025
DRAWN BY: KEF
DESIGNED BY: KEF
CHECKED BY: KCB

PLOT DATE: 3/20/2025 2:52 PM, G:\00\00628\00628066\CADD\Construction Documents\00628066 Existing Site Plan.dwg

MSA
ENGINEERING | ARCHITECTURE | SURVEYING
FUNDING | PLANNING | ENVIRONMENTAL
332 W Superior Street, Duluth MN 55802
(218) 722-3915 www.msa-ps.com
© MSA Professional Services, Inc.

WADE BOWL PARK SPLASH PAD
CITY OF SUPERIOR
DOUGLAS COUNTY, WISCONSIN

OVERALL EXISTING SITE CONDITIONS PLAN

PROJECT NO. 00628066

SHEET C101

NOTES:

1) PROTECT ALL EXISTING ELEMENTS/STRUCTURES WITHIN DISTURBED AREA EXTENTS UNLESS OTHERWISE NOTED.
2) ALL EROSION CONTROL SHALL BE IN PLACE PRIOR TO SITE CONSTRUCTION OR DISTURBANCE.
3) PROTECT ALL EXISTING TREES UNLESS OTHERWISE NOTED.
4) ALL EXISTING FACILITIES SHALL BE PROTECTED AND MAINTAINED UNLESS OTHERWISE NOTED. CONTRACTOR TO RESTORE ANY DAMAGED SURFACES TO THE CONDITION PRIOR TO CONSTRUCTION START.

LEGEND

DISTURBED AREA: REMOVE AND DISPOSE OF EXISTING VEGETATION OFFSITE. EXISTING TOPSOIL TO BE REMOVED TO SUB-BASE. IF SUITABLE FOR REUSE, STOCKPILE TOPSOIL FOR RE-INSTALLATION. UNUSED AND UNSUITABLE TOPSOIL TO BE REMOVED AND DISPOSED OF OFFSITE AT PROJECT COMPLETION. OWNER RESERVES THE RIGHT TO RETAIN SOME OR ALL OF THE TOPSOIL AT A LATER DATE. COORDINATE WITH OWNER BEFORE REMOVAL. EXISTING TOPSOIL THICKNESS MAY VARY.

CLOUGH AVENUE

PROJECT LIMITS

CONSTRUCTION ACCESS: CLOUGH AVENUE

TEMPORARY STONE TRACKING PAD, TRACKING PAD SHALL ADHERE TO WDNR BEST MANAGEMENT PRACTICES, CONTRACTOR TO DETERMINE FINAL LOCATION, SIZE, ETC.

CONSTRUCTION STAGING AREA

CONTRACTOR TO REPAIR GRAVEL PARKING AREA AND ACCESS ROAD IN-KIND AFTER CONSTRUCTION AND RESTORE TO PRE-CONSTRUCTION STATE

EXISTING ASPHALT PATH TO REMAIN, SAWCUT CLEAN EDGE AS NECESSARY FOR ABUTTING PROPOSED PAVEMENT.

TEMPORARY SEDIMENT LOG

TEMPORARY SEDIMENT LOG

PROJECT LIMITS

EX. SHELTER/ RESTROOMS TO REMAIN FFE: 623.57±

EXISTING LIGHT POLES TO REMAIN, PROTECT DURING CONSTRUCTION

EX. HOCKEY RINK

DISTURBED AREA LIMITS

TOPSOIL STOCKPILE

TEMPORARY SILT FENCE

CAUTION: EXISTING ABOVE AND BELOW GROUND UTILITIES LOCATED IN DISTURBED AREA EXTENTS.

EXISTING LIGHT POLE TO REMAIN, CONTRACTOR TO PROTECT DURING CONSTRUCTION

TEMPORARY SILT FENCE

DISTURBED AREA LIMITS

EX. SKATING RINK

DISTURBED AREA LIMITS

EX. CHAIN LINK FENCE TO REMAIN. PROTECT DURING CONSTRUCTION.

INLET PROTECTION

PROPERTY LINE

EXISTING CULVERT PIPE TO REMAIN, PROTECT DURING CONSTRUCTION

EXISTING UTILITY POLE AND GUY WIRE TO REMAIN, PROTECT DURING CONSTRUCTION, COORDINATE WITH UTILITY OWNER FOR SUPPORT, ETC.

EXISTING HYDRANT TO REMAIN, PROTECT DURING CONSTRUCTION, COORDINATE WITH UTILITY OWNER. REMOVE VEGETATION AND PAVEMENT AS NECESSARY FOR WATER SERVICE INSTALLATION AND CONNECTION TO THE WATER MAIN.

PROPERTY LINE

PROJECT LIMITS

0 10 20 40

DIGGERS HOTLINE

Dial 811 or (800) 242-8511

www.DiggersHotline.com

UTILITY LOCATIONS SHOWN ON PLANS ARE APPROXIMATE AND CONTRACTOR SHALL HAVE APPROPRIATE UTILITY MARK EXACT LOCATIONS PRIOR TO CONSTRUCTION.

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PROJECT DATE: MARCH 19, 2025	DRAWN BY: KEF	.	.	.	.
	DESIGNED BY: KEF	.	.	.	.
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PLOT DATE: 3/20/2025 2:53 PM, G:\00\00628\00628066\CADD\Construction Documents\00628066 Erosion Control and Removals Plan.dwg

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WADE BOWL PARK SPLASH PAD
CITY OF SUPERIOR
DOUGLAS COUNTY, WISCONSIN

SITE EROSION CONTROL AND REMOVALS PLAN

PROJECT NO. 00628066

SHEET C201

1. CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL MATERIALS AND LABOR NECESSARY TO COMPLETE AN ALL-INCLUSIVE, FULLY FUNCTIONING SPLASHPAD AND ALL OTHER ELEMENTS NOTED ON PLANS.
2. ALL CONTRACTORS SHALL COORDINATE WITH WITH OTHER CONTRACTORS, OWNER, OWNERS CONTRACTORS, UTILITY OWNERS, ETC., INCLUDING BUT NOT LIMITED TO UTILITY CONTRACTOR, EXCAVATION CONTRACTOR, ELECTRICAL CONTRACTOR, SPLASH PAD VENDOR/CONTRACTOR, ETC.
3. ALL NEW SIDEWALK AND CONCRETE SLABS SHALL BE 5-INCH THICK UNLESS NOTED OTHERWISE ON PLAN AND DETAIL SHEETS, SPLASH PAD WET ZONE AND DRY ZONE SHALL BE 6-INCH THICK.
4. ALL DISTURBED AREAS TO BE RESTORED WITH TURF UNLESS OTHERWISE NOTED.
5. SUBGRADES SHALL BE PER DETAIL DRAWINGS OR SPECIFICATIONS, A MINIMUM OF 6-INCHES OF TOPSOIL SHALL BE INSTALLED IN ALL LAWN AND LANDSCAPE AREAS.
6. CONTRACTOR SHALL MEET GRADES AT PROJECT OR PROPERTY LIMITS WITH A SMOOTH AND CONTINUOUS TRANSITION.
7. ALL EROSION CONTROL SHALL BE IN PLACE PRIOR TO SITE CONSTRUCTION OR DISTURBANCE.
8. FFE = FINISHED FLOOR ELEVATION

CLOUGH AVENUE

PROPERTY LINE

CONCRETE SPLASHPAD DRY ZONE

CONCRETE SPLASHPAD WET ZONE

CONCRETE SLAB SEATING AREA

SPLASHPAD EQUIPMENT, (TYP.) REFER TO SPLASH PAD DETAILS

DISTURBED AREA LIMITS

EXISTING LIGHT POLE TO REMAIN, PROTECT DURING CONSTRUCTION. DURING FIELD LAYOUT, ENSURE OUTER EDGE OF SPLASH PAD DRY ZONE IS A MINIMUM 5-FEET FROM LIGHT POLE. PLAN LOCATION IS APPROXIMATELY 6-FOOT - 4-INCHES FROM CENTER OF POLE TO DRY ZONE OUTER EDGE.

SPLASH PAD CONTROLLER CABINET. REFER TO UTILITY PLAN, ELECTRICAL PLAN, AND SPLASH PAD DETAILS. CONTRACTOR RESPONSIBLE TO SUPPLY AND INSTALL CABINET, FOUNDATION, CONTROLER, WATER METER, RPZ BACKFLOW PREVENTER, MANIFOLD, INTERNAL COMPONENTS, TUBING, ETC. TO COMPLETE A FULLY FUNCTIONING SPLASH PAD.

CONCRETE SIDEWALK

LANDSCAPE PLANTING AREA. REFER TO LANDSCAPE PLAN.

CONTRACTOR TO REPAIR/REPLACE ASPHALT PAVEMENT IN-KIND IF DAMAGED DURING CONSTRUCTION. CONTRACTOR TO DOCUMENT CONDITION BEFORE AND AFTER CONSTRUCTION. OWNER WILL MAKE FINAL DETERMINATION FOR REPAIR/REPLACEMENT.

PROJECT LIMITS

10-INCH DEEP LIGHT RIP RAP OVER TYPE R GEOTEXTILE FABRIC

12-INCH APRON ENDWALL REFER TO UTILITY PLAN

EX. SHELTER/ RESTROOMS TO REMAIN FFE: 623.57±

BIORETENTION CELL
BOTTOM SURFACE: ELEV. 618.50
APPROX. 1,110 SQUARE FEET
WATER SURFACE PONDING: ELEV. 620.00
APPROX. 2,960 SQUARE FEET
REFER TO GRADING, UTILITY, AND LANDSCAPE PLANS

PROJECT LIMITS

CONSTRUCTION ACCESS: CLOUGH AVENUE

DISTURBED AREA LIMITS

STORM WATER/SEWER STRUCTURES REFER TO UTILITY PLAN

EXISTING UTILITY POLE AND GUY WIRE TO REMAIN, PROTECT DURING CONSTRUCTION, COORDINATE WITH UTILITY OWNER FOR SUPPORT, ETC.

EXISTING HYDRANT TO REMAIN, PROTECT DURING CONSTRUCTION, COORDINATE WITH UTILITY OWNER. REPLACE REMOVED SURFACES, INCLUDING VEGETATION AND PAVEMENT, AS NECESSARY FOR WATER SERVICE INSTALLATION AND CONNECTION TO THE WATER MAIN.

CONSTRUCTION STAGING AREA

CONTRACTOR TO REPAIR GRAVEL PARKING AREA AND ACCESS ROAD IN-KIND AFTER CONSTRUCTION AND RESTORE TO PRE-CONSTRUCTION STATE

EXISTING LIGHT POLES TO REMAIN, PROTECT DURING CONSTRUCTION

EX. HOCKEY RINK

EX. FIGURE SKATING RINK

EXISTING CHAIN LINK FENCE TO REMAIN, PROTECT DURING CONSTRUCTION

DISTURBED AREA LIMITS

PROPERTY LINE

PROJECT LIMITS

0 10 20 40

DIGGERS HOTLINE

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UTILITY LOCATIONS SHOWN ON PLANS ARE APPROXIMATE AND CONTRACTOR SHALL HAVE APPROPRIATE UTILITY MARK EXACT LOCATIONS PRIOR TO CONSTRUCTION.

LEGEND

- KENTUCKY BLUE GRASS LAWN SEED, (TYP.) WITH 6-INCHES TOPSOIL. REFER TO LANDSCAPE PLAN.
- NO MOW FESCUE SEED, (TYP.) WITH 6-INCHES TOPSOIL AND EROSION MATTING. REFER TO LANDSCAPE PLAN.
- 3-INCH PLUGS, 15-INCH O.C. WITH HARDWOOD SHREDDED BARK MULCH 2-INCHES THICK AND EROSION MATTING. REFER TO LANDSCAPE PLAN.
- PLANTING BED WITH METAL EDGING AND HARDWOOD SHREDDED BARK MULCH, 3-INCHES THICK. REFER TO LANDSCAPE PLAN.
- 5-INCH CONCRETE PAVEMENT (SIDEWALK AND SLAB)
- WET ZONE
- DRY ZONE
- 6-INCH SPLASH PAD CONCRETE PAVEMENT: WORK INCLUDES CONCRETE, JOINT WATERPROOFING, REINFORCEMENT, BONDING GRID, EBS, EXCAVATION, AND COORDINATION WITH SPLASH PAD VENDOR.

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WADE BOWL PARK SPLASH PAD
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SITE PLAN

PROJECT NO. 00628066

SHEET C301



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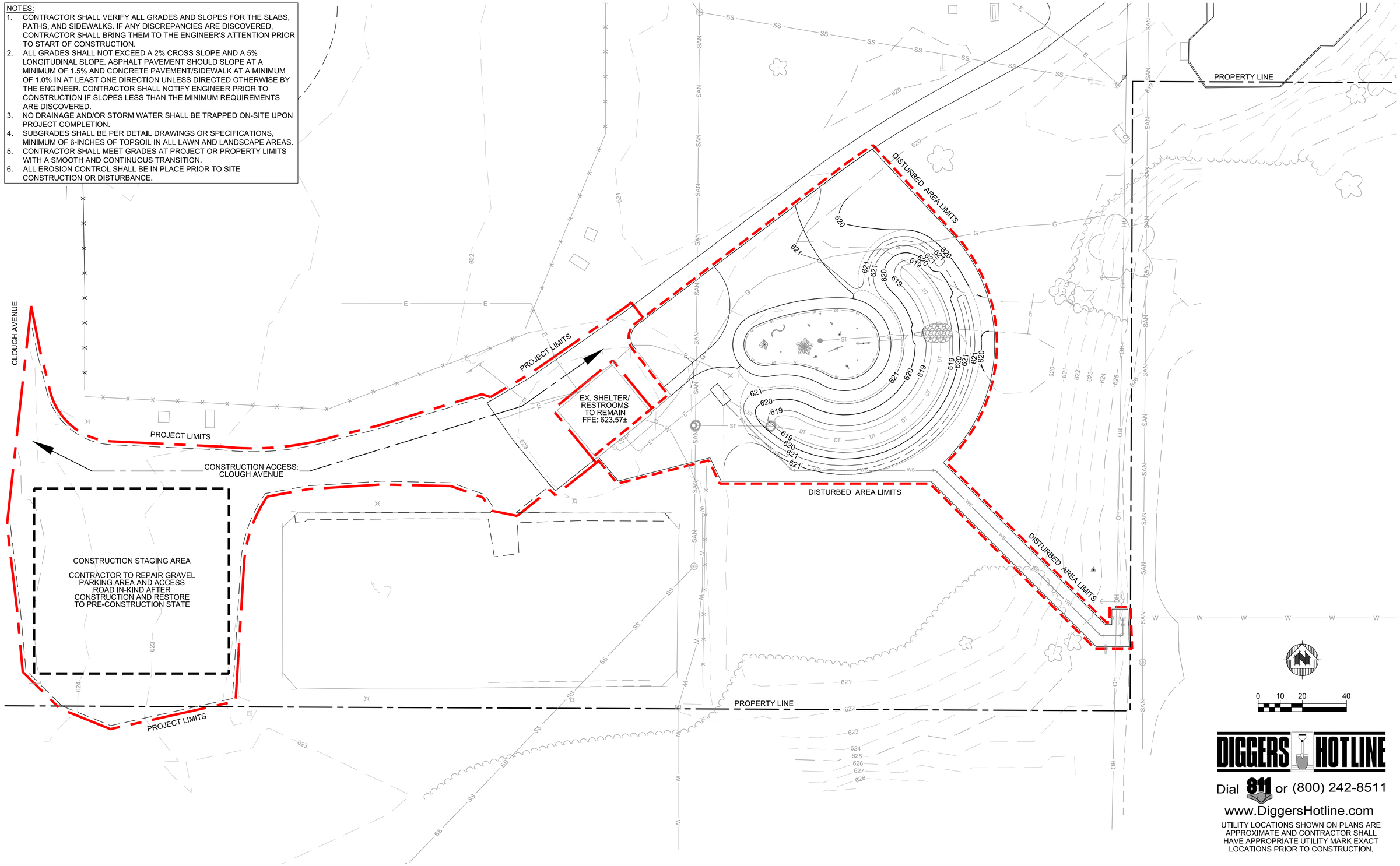
SITE DIMENSION PLAN

PROJECT NO. 00628066

SHEET C302

NOTES:

1. CONTRACTOR SHALL VERIFY ALL GRADES AND SLOPES FOR THE SLABS, PATHS, AND SIDEWALKS. IF ANY DISCREPANCIES ARE DISCOVERED, CONTRACTOR SHALL BRING THEM TO THE ENGINEER'S ATTENTION PRIOR TO START OF CONSTRUCTION.
2. ALL GRADES SHALL NOT EXCEED A 2% CROSS SLOPE AND A 5% LONGITUDINAL SLOPE. ASPHALT PAVEMENT SHOULD SLOPE AT A MINIMUM OF 1.5% AND CONCRETE PAVEMENT/SIDEWALK AT A MINIMUM OF 1.0% IN AT LEAST ONE DIRECTION UNLESS DIRECTED OTHERWISE BY THE ENGINEER. CONTRACTOR SHALL NOTIFY ENGINEER PRIOR TO CONSTRUCTION IF SLOPES LESS THAN THE MINIMUM REQUIREMENTS ARE DISCOVERED.
3. NO DRAINAGE AND/OR STORM WATER SHALL BE TRAPPED ON-SITE UPON PROJECT COMPLETION.
4. SUBGRADES SHALL BE PER DETAIL DRAWINGS OR SPECIFICATIONS, MINIMUM OF 6-INCHES OF TOPSOIL IN ALL LAWN AND LANDSCAPE AREAS.
5. CONTRACTOR SHALL MEET GRADES AT PROJECT OR PROPERTY LIMITS WITH A SMOOTH AND CONTINUOUS TRANSITION.
6. ALL EROSION CONTROL SHALL BE IN PLACE PRIOR TO SITE CONSTRUCTION OR DISTURBANCE.



DIGGERS HOTLINE

Dial 811 or (800) 242-8511

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UTILITY LOCATIONS SHOWN ON PLANS ARE APPROXIMATE AND CONTRACTOR SHALL HAVE APPROPRIATE UTILITY MARK EXACT LOCATIONS PRIOR TO CONSTRUCTION.

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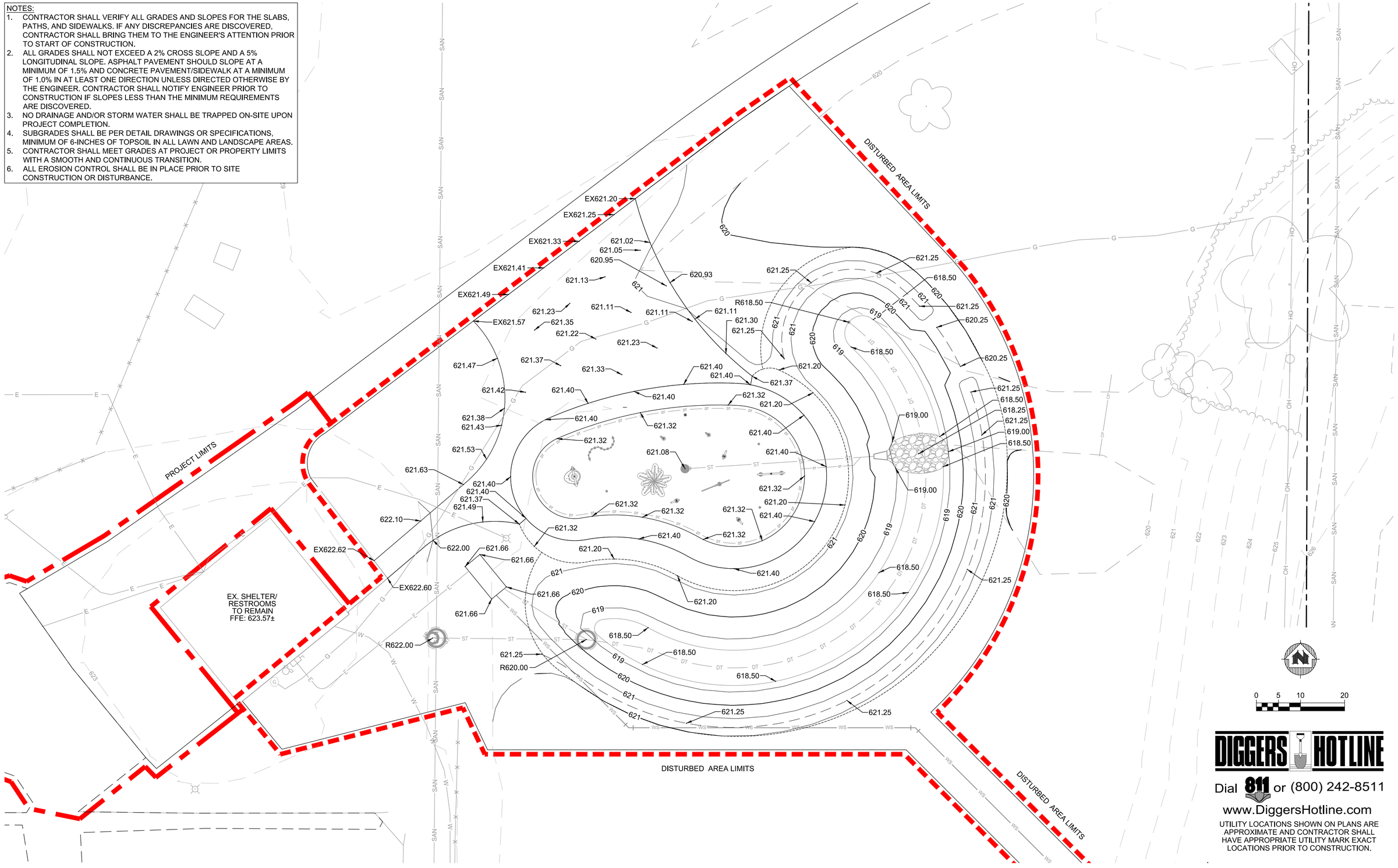
OVERALL SITE GRADING PLAN

PROJECT NO. 00628066

SHEET C401

NOTES:

1. CONTRACTOR SHALL VERIFY ALL GRADES AND SLOPES FOR THE SLABS, PATHS, AND SIDEWALKS. IF ANY DISCREPANCIES ARE DISCOVERED, CONTRACTOR SHALL BRING THEM TO THE ENGINEER'S ATTENTION PRIOR TO START OF CONSTRUCTION.
2. ALL GRADES SHALL NOT EXCEED A 2% CROSS SLOPE AND A 5% LONGITUDINAL SLOPE. ASPHALT PAVEMENT SHOULD SLOPE AT A MINIMUM OF 1.5% AND CONCRETE PAVEMENT/SIDEWALK AT A MINIMUM OF 1.0% IN AT LEAST ONE DIRECTION UNLESS DIRECTED OTHERWISE BY THE ENGINEER. CONTRACTOR SHALL NOTIFY ENGINEER PRIOR TO CONSTRUCTION IF SLOPES LESS THAN THE MINIMUM REQUIREMENTS ARE DISCOVERED.
3. NO DRAINAGE AND/OR STORM WATER SHALL BE TRAPPED ON-SITE UPON PROJECT COMPLETION.
4. SUBGRADES SHALL BE PER DETAIL DRAWINGS OR SPECIFICATIONS, MINIMUM OF 6-INCHES OF TOPSOIL IN ALL LAWN AND LANDSCAPE AREAS.
5. CONTRACTOR SHALL MEET GRADES AT PROJECT OR PROPERTY LIMITS WITH A SMOOTH AND CONTINUOUS TRANSITION.
6. ALL EROSION CONTROL SHALL BE IN PLACE PRIOR TO SITE CONSTRUCTION OR DISTURBANCE.



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WADE BOWL PARK SPLASH PAD
CITY OF SUPERIOR
DOUGLAS COUNTY, WISCONSIN

ENLARGED SITE GRADING PLAN

PROJECT NO. 00628066

SHEET C402

NOTES:

2. ALL CONTRACTORS SHALL COORDINATE WITH OTHER CONTRACTORS, OWNER, OWNER'S CONTRACTORS, UTILITY OWNERS, ETC., INCLUDING BUT NOT LIMITED TO UTILITY CONTRACTOR, EXCAVATION CONTRACTOR, ELECTRICAL CONTRACTOR, SPLASH PAD VENDOR/CONTRACTOR, ETC..
3. CONTRACTORS SHALL REVIEW ALL EXISTING AND PROPOSED UTILITIES TO CONSIDER ANY UNFORESEEN CHALLENGES/ CONFLICTS. IF ANY CHALLENGES/ CONFLICTS ARE IDENTIFIED, CONTRACTOR TO NOTIFY ENGINEER IMMEDIATELY.
4. CONTRACTORS TO COORDINATE ALL UTILITY CONNECTION ACTIVITIES, PERMITS, INSPECTIONS, ETC. WITH AUTHORITIES HAVING JURISDICTION.
5. CONTRACTOR SHALL INSTALL WATER UTILITIES PER SUPERIOR WATER, LIGHT, AND POWER SPECIFICATIONS AND THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN.
6. CONTRACTOR SHALL INSTALL CONCRETE THRUST BLOCKING ON WATER UTILITY JOINTS IN ACCORDANCE WITH SUPERIOR WATER, LIGHT, AND POWER SPECIFICATIONS AND THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN.
7. CONTRACTOR SHALL INSTALL SEWER UTILITIES PER CITY OF SUPERIOR SPECIFICATIONS AND THE STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN.
8. CONTRACTOR SHALL INSTALL UTILITY INSULATION BETWEEN ALL CROSSING UTILITY LINES.
9. CONTRACTOR SHALL COORDINATE DRAIN TILE INSTALLATION WITH SPLASH PAD AND BIORETENTION CELL CONSTRUCTION.
10. CONTRACTORS SHALL VERIFY ALL UTILITY STRUCTURES AND PIPES AND PROVIDE SHOP DRAWING SUBMITTALS FOR REVIEW.

EXISTING COMBINED SEWER MANHOLE: RIM EL = 620.6± I.E. = 617.0± (6-INCH STEEL, NW) I.E. = 612.7± (EX. 21-INCH RCP, N-S)

6-INCH TO 12-INCH PVC ENLARGER/REDUCER 6-INCH I.E. 619.36 12-INCH I.E. 619.11

37-LINEAR FEET - 6-INCH PVC @ 1.04%

CONTRACTOR SHALL INSTALL SPLASH PAD DRAIN, RIM 621.08. AND CONNECT AND INSTALL 6-INCH PVC PIPE 6-INCH I.E. 619.75

150-LINEAR FEET - 4-INCH HDPE PERFORATED DRAINTILE W/SOCK @ 0.0%

EXISTING LIGHT POLE TO REMAIN

CONTRACTOR TO INSTALL 4-INCH PVC DRAIN WITH DROP-IN PVC GRATE. COORDINATE RIM ELEVATION OF DRAIN WITH FLOOR OF CABINET

SPLASH PAD CONTROLLER CABINET

CONTRACTOR TO REDUCE 6-INCH HDPE WATER SERVICE TO 4-INCH WATER SERVICE OUTSIDE OF SPLASH PAD CONTROL CABINET AND STUB 4-INCH WATER SERVICE UP THROUGH BOTTOM OF CABINET FLOOR. TERMINATE WATER SERVICE ABOVE CABINET FLOOR WITH FLANGE, COORDINATE WITH SPLASH PAD CONTRACTOR AND UTILITY OWNER. UTILITY OWNER TO PROVIDE 2-INCH WATER METER. CONTRACTOR TO PROVIDE ALL COMPONENTS, PIPING, VALVES, ETC. IN CABINET, INCLUDING BUT NOT LIMITED TO 3-INCH RPZ, CONNECTIONS FROM SUPPLY TO WATER METER, CONNECTIONS FROM WATER METER TO RPZ, SPLIT TO DUAL 2-INCH SUPPLY TO SPLASH PAD MANIFOLD, ALL TUBING TO SPLASH PAD COMPONENTS, ETC..

PROJECT LIMITS

PROJECT LIMITS

PROPOSED ELECTRICAL SERVICE TO SPLASH PAD CONTROLLER CABINET, REFER TO ELECTRICAL PLANS

EX. SHELTER/ RESTROOMS TO REMAIN FFE: 623.57±

12-INCH APRON ENDWALL WITH RODENT GUARD I.E. AT END OF ENDWALL 619.00

3-LINEAR FEET - 12-INCH PVC @ 1.04%

12-INCH X 4-INCH WYE, 12-INCH I.E. 619.06

3-LINEAR FEET - 12-INCH PVC @ 1.04%

DISTURBED AREA LIMITS

PROPERTY LINE

6-INCH PVC CLEANOUT, SET CAP FLUSH WITH GRADE, RIM 618.50, 90° 6-INCH VERTICAL BEND I.E. 616.00, CONNECT TO 6-INCH HDPE PERFORATED DRAINTILE

142 - LINEAR FEET - 6-INCH HDPE PERFORATED DRAINTILE W/SOCK @ 0.52%

EXISTING CULVERT PIPE TO REMAIN

13-LINEAR FEET 4" SOLID PVC WITH 45° ANGLE @ 0.52%, CONNECT TO 12-INCH PVC AT WYE CONNECTION.

4-INCH TEE CONNECTION HDPE TO PVC I.E. 620.00± REFER TO DETAILS FOR HDPE INSTALLATION

65-LINEAR FEET - 6-INCH HDPE WATER SERVICE

106-LINEAR FEET - 6-INCH HDPE WATER SERVICE

EXISTING HYDRANT TO REMAIN, PROTECT DURING CONSTRUCTION, COORDINATE WITH UTILITY OWNER

EXISTING UTILITY POLE AND GUY WIRE TO REMAIN, PROTECT DURING CONSTRUCTION, COORDINATE WITH UTILITY OWNER FOR SUPPORT, ETC.

WATER UTILITY TO PROVIDE AND INSTALL 6-INCH TEE AND 6-INCH VALVE AND VALVE BOX. CONTRACTOR TO CONNECT 6-INCH WATER SERVICE TO 6-INCH VALVE PROVIDED BY WATER UTILITY. FIELD VERIFY EXISTING SIZE, DEPTH, AND EXACT LOCATION AND NOTIFY ENGINEER OF ANY DISCOVERED DISCREPANCIES.

8-LINEAR FEET - 6-INCH HDPE WATER SERVICE

6-INCH 90° FUSED HORIZONTAL BEND

EXISTING 6-INCH WATER MAIN

EXISTING COMBINED SEWER

DISTURBED AREA LIMITS

DISTURBED AREA LIMITS

(3) 6-INCH 45° FUSED HORIZONTAL BENDS

43-LINEAR FEET - 6-INCH HDPE WATER SERVICE

10-LINEAR FEET - 6-INCH HDPE WATER SERVICE

COMBINED SEWER MANHOLE, 48-INCH, OVER EXISTING COMBINED SEWER (REFER TO INCLUDED CITY DETAILS): RIM EL = 622.00 I.E. = 614.82 (12-INCH HDPE N12, E) INSTALL RED VALVE CHECKMATE ULTRAFLEX IN-LINE 12-INCH BACKFLOW PREVENTER OR EQUIVALENT IN 12-INCH PIPE I.E. = 613.0± (PER AS-BUILT)(EX. 21-INCH RCP, N-S) CONTRACTOR TO EXPLORATORY EXCAVATE AND VERIFY INVERT

34-LINEAR FEET - 12-INCH HDPE N12 STORM SEWER @ 0.52%

22-LINEAR FEET - 4-INCH PVC @ 1.04%

CAUTION: UTILITY CROSSING INSTALL WATER UTILITY UNDERNEATH SEWER UTILITY INVERT OF SEWER AT CROSSING: 614.95 INVERT OF WATER AT CROSSING: 612.95 INSTALL WITH 18-INCHES OF SEPARATION BETWEEN UTILITIES

48-INCH PRECAST CONCRETE OUTLET STRUCTURE WITH 48-INCH DOMED TRASH GRATE: RIM EL = 620.00 I.E. = 615.25 (6-INCH HDPE, E) I.E. = 616.00 (4-INCH PVC, NW) I.E. = 615.00 (12-INCH HDPE, W)

PROJECT LIMITS

PROPERTY LINE

0 10 20 40

DIGGERS HOTLINE

Dial 811 or (800) 242-8511

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UTILITY LOCATIONS SHOWN ON PLANS ARE APPROXIMATE AND CONTRACTOR SHALL HAVE APPROPRIATE UTILITY MARK EXACT LOCATIONS PRIOR TO CONSTRUCTION.

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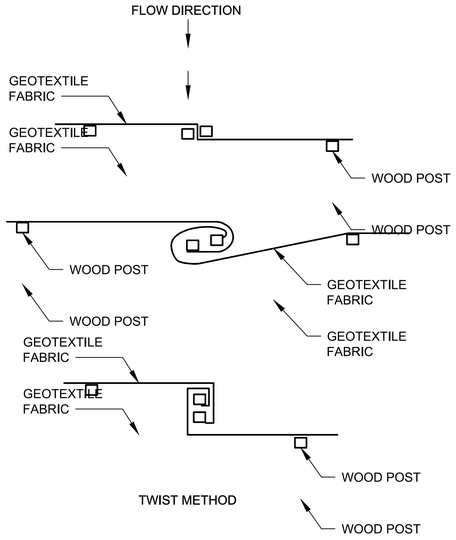
SITE UTILITY PLAN

PROJECT NO. 00628066

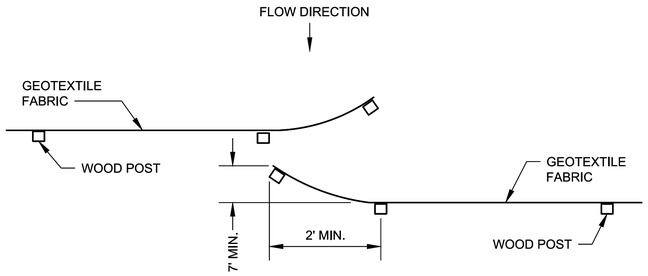
SHEET C501

1. SECTION NR216.46 OF WISCONSIN STATE ADMINISTRATIVE CODE IDENTIFIES REQUIREMENTS FOR CONSTRUCTION SITE AND POST-CONSTRUCTION EROSION CONTROL. IT IS THE INTENT OF THESE PLANS TO SATISFY THESE REQUIREMENTS. THE METHODS AND STRUCTURES USED TO CONTROL EROSION SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. CONTRACTOR SHALL IMPLEMENT AN APPROPRIATE MEANS OF CONTROLLING EROSION DURING SITE OPERATION AND UNTIL THE VEGETATION IS RE-ESTABLISHED. ADJUSTMENTS TO THE CONTROL SYSTEM SHALL BE MADE AS REQUIRED.
2. ALL WORK SHALL BE IN ACCORDANCE WITH THE LATEST EDITION OF THE WISCONSIN DNR'S CONSERVATION PRACTICE STANDARDS. THESE STANDARDS ARE PERIODICALLY UPDATED AND IT IS THE CONTRACTOR'S RESPONSIBILITY TO OBTAIN AND REFERENCE THE MOST RECENTLY RELEASED STANDARD.
3. THIS INFORMATION IS ONLY ONE PART OF THE OVERALL EROSION CONTROL REQUIREMENTS. ADDITIONAL REQUIREMENTS MAY ALSO BE SHOWN ON THE CONTRACT DRAWINGS AND IN THE ACCOMPANYING SPECIFICATIONS.
4. ADDITIONAL EROSION CONTROL MEASURES, AS REQUESTED IN WRITING BY THE STATE OR LOCAL INSPECTORS, OR THE OWNER'S ENGINEER, SHALL BE INSTALLED WITHIN 24 HOURS.
5. THE AREA OF EROSIVE LAND EXPOSED TO THE ELEMENTS BY GRUBBING, EXCAVATION, TRENCHING, BORROW AND FILL OPERATIONS AT ANY ONE TIME SHALL BE MINIMIZED TO THE MAXIMUM EXTENT PRACTICABLE. FOR ANY DISTURBED AREA THAT REMAINS INACTIVE FOR GREATER THAN 7 WORKING DAYS, OR WHERE GRADING WORK EXTENDS BEYOND THE PERMANENT SEEDING DEADLINES, THE SITE MUST BE TREATED WITH TEMPORARY STABILIZATION MEASURES SUCH AS SOIL TREATMENT, TEMPORARY SEEDING AND/OR MULCHING. ALL DISTURBED AREAS SHALL BE TREATED WITH PERMANENT STABILIZATION MEASURES WITHIN 3 WORKING DAYS OF FINAL GRADING.
6. ALL EROSION CONTROL MEASURES AND STRUCTURES SERVING THE SITE MUST BE INSPECTED AT LEAST WEEKLY OR WITHIN 24 HOURS OF THE TIME 0.5 INCHES OF RAIN HAS OCCURRED. ALL NECESSARY REPAIR AND MAINTENANCE WILL BE DONE AT THIS INSPECTION TIME.
7. ALL EROSION CONTROL DEVICES AND/OR STRUCTURES SHALL BE PROPERLY INSTALLED PRIOR TO CLEARING AND GRUBBING OPERATIONS WITHIN THEIR RESPECTIVE DRAINAGE AREAS. THESE SHALL BE PROPERLY MAINTAINED FOR MAXIMUM EFFECTIVENESS UNTIL VEGETATION IS RE-ESTABLISHED.
8. ALL EROSION CONTROL DEVICES SHALL BE PROPERLY INSTALLED PRIOR TO ANY SOIL DISTURBANCE.
9. ANY SLOPES STEEPER THAN 3H:1V SHALL BE STAKED WITH EROSION CONTROL FABRIC UNLESS INDICATED ON THE PLAN.
10. ALL WASTE AND UNUSED BUILDING MATERIALS (INCLUDING GARBAGE, DEBRIS, CLEANING WASTES, WASTEWATER, TOXIC MATERIALS, OR HAZARDOUS MATERIALS) SHALL BE PROPERLY DISPOSED OF AND NOT ALLOWED TO BE CARRIED OFF-SITE BY RUNOFF OR WIND.
11. WIND EROSION SHALL BE KEPT TO A MINIMUM DURING CONSTRUCTION. WATERING, MULCH, OR A TACKING AGENT MAY BE REQUIRED TO PROTECT NEARBY RESIDENCES AND WATER RESOURCES.
12. CHANNELIZED RUNOFF ENTERING THE PROJECT SITE FROM ADJOINING LANDS SHALL BE DIVERTED THROUGH NATURALLY OR ARTIFICIALLY EROSION-RESISTANT CONVEYANCES. IF CHANNELIZED RUNOFF CANNOT BE DIVERTED, SITE BEST MANAGEMENT PRACTICES MUST ACCOUNT FOR THE ADDITIONAL FLOW RATES AND EROSION POTENTIAL THAT SUCH RUNOFF PRESENTS.
13. THE CONTRACTOR SHALL TAKE ALL POSSIBLE PRECAUTIONS TO PREVENT SOILS FROM BEING TRACKED ONTO PUBLIC OR PRIVATE ROADWAYS. PAVED SURFACES ADJACENT TO CONSTRUCTION SITE VEHICLE ACCESS SHALL BE SWEPT AND/OR SCRAPED (NOT FLUSHED) PERIODICALLY TO REMOVE SOIL, DIRT, AND/OR DUST.
14. EROSION CONTROLS SHALL BE INSTALLED ON THE DOWNSTREAM SIDE OF TEMPORARY STOCKPILES. ANY SOIL STOCKPILE THAT REMAINS FOR MORE THAN 30 DAYS SHALL BE COVERED OR TREATED WITH STABILIZATION PRACTICES SUCH AS TEMPORARY OR PERMANENT SEEDING AND MULCHING. ALL STOCK PILES SHALL BE PLACED AT LEAST 75 FEET FROM STREAMS OR WETLANDS.
15. ADDITIONAL EROSION CONTROL FOR UTILITY CONSTRUCTION (STORM SEWER, SANITARY SEWER, WATER MAIN, ETC.) SHALL INCLUDE THE FOLLOWING:
    a. PLACE EXCAVATED TRENCH MATERIAL ON THE HIGH SIDE OF THE TRENCH.
    b. BACKFILL, COMPACT, AND STABILIZE THE TRENCH IMMEDIATELY AFTER PIPE CONSTRUCTION.
    c. DISCHARGE OF TRENCH WATER OR DEWATERING EFFLUENT MUST BE PROPERLY TREATED TO REMOVE SEDIMENT IN ACCORDANCE WITH THE WDNR CONSERVATION PRACTICE STANDARD 1061 - DEWATERING OR A SUBSEQUENT WDNR DEWATERING STANDARD PRIOR TO DISCHARGE INTO A STORM SEWER, DITCH, DRAINAGEWAY, OR WETLAND OR LAKE.
16. ALL DRAINAGE CULVERTS, STORM DRAIN INLETS, MANHOLES, OR ANY OTHER EXISTING STRUCTURES THAT COULD BE DAMAGED BY SEDIMENTATION SHALL BE PROTECTED ACCORDING TO THE VARIOUS METHODS PROVIDED IN THE PRINTED CONSERVATION PRACTICE STANDARDS.
17. ANY SOIL EROSION THAT OCCURS AFTER FINAL GRADING AND/OR STABILIZATION MUST BE REPAIRED AND THE STABILIZATION WORK REDONE.
18. THE FIRST SIX WEEKS AFTER INITIAL STABILIZATION, ALL NEWLY SEEDED AND MULCHED AREAS SHALL WATERED WHENEVER 7 DAYS ELAPSE WITHOUT A RAIN EVENT.
19. WHEN THE DISTURBED AREA HAS BEEN STABILIZED BY PERMANENT VEGETATION OR OTHER MEANS, TEMPORARY BMP'S SUCH AS SILT FENCES, STRAW BALES, AND SEDIMENT TRAPS SHALL BE REMOVED AND THESE AREAS STABILIZED.
20. ALL TEMPORARY BEST MANAGEMENT PRACTICES SHALL BE MAINTAINED UNTIL THE SITE IS STABILIZED.
21. ALL DISTURBED AREAS SHALL BE PERMANENTLY STABILIZED WITH SEED AND MULCH UNLESS OTHERWISE SPECIFIED. A MINIMUM OF SIX INCHES OF TOPSOIL SHALL BE APPLIED TO ALL AREAS TO BE SEEDED OR SODDED.

1 CONSTRUCTION SITE EROSION CONTROL REQUIREMENT NOTES
C901 NTS

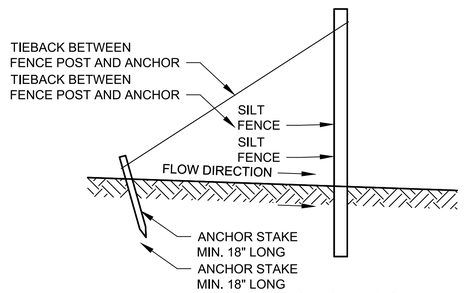


TWIST METHOD

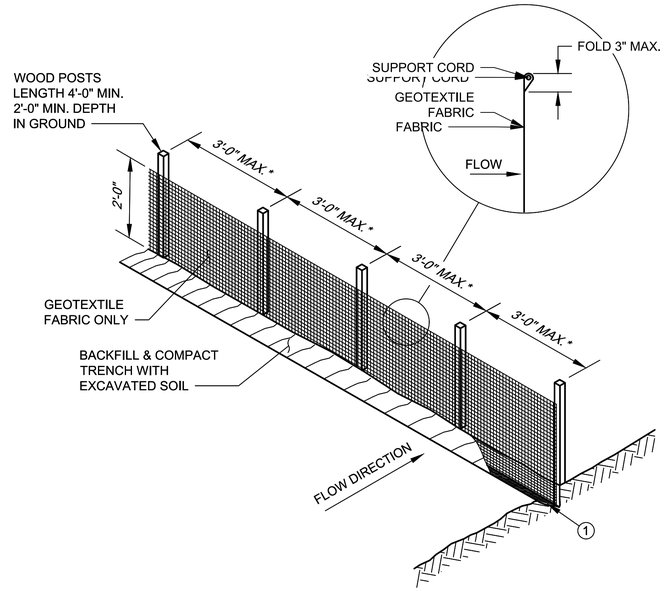


HOOK METHOD

JOINING TWO LENGTHS OF SILT FENCE



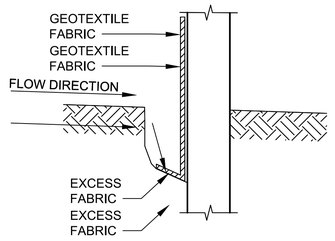
SILT FENCE TIE BACK
(WHEN REQUIRED BY THE ENGINEER)



SILT FENCE

GENERAL NOTES

1. TRENCH SHALL BE A MINIMUM OF 4" WIDE & 6" DEEP TO BURY AND ANCHOR THE GEOTEXTILE FABRIC. FOLD MATERIAL TO FIT TRENCH AND BACKFILL & COMPACT TRENCH WITH EXCAVATED SOIL.
2. WOOD POSTS SHALL BE A MINIMUM SIZE OF 1 $\frac{1}{8}$" x 1 $\frac{1}{8}$" OF OAK OR HICKORY.
3. 3'-0" POST SPACING MAXIMUM, TYP. 8'-0" POST SPACING IS ALLOWED IF A WOVEN GEOTEXTILE FABRIC IS USED, OR IF SILT FENCE IS PREMANUFACTURED.
4. ATTACH THE FABRIC TO THE POSTS WITH WIRE STABLES OR WOODEN LATH AND NAILS. STAPLE FABRIC WITH $\frac{1}{2}$ INCH (MINIMUM) STAPLES TO THE UPSLOPE SIDE OF THE POSTS.
5. CONSTRUCT SILT FENCE FROM A CONTINUOUS ROLL IF POSSIBLE BY CUTTING LENGTHS TO AVOID JOINTS. IF A JOINT IS NECESSARY USE ONE OF THE FOLLOWING TWO METHODS: A) TWIST METHOD -- OVERLAP THE END POSTS AND TWIST, OR ROTATE, AT LEAST 180 DEGREES, B) HOOK METHOD -- HOOK THE END OF EACH SILT FENCE LENGTH.
6. ADDITIONAL POST DEPTH OR TIE BACKS MAY BE REQUIRED IN UNSTABLE SOILS.
7. ENDS OF FENCE SHALL BE TURNED UPSLOPE 1 TO 2 FEET IN ELEVATION TO PREVENT FLANKING



TRENCH DETAIL

2 TYPICAL SILT FENCE INSTALLATION
C901 NTS

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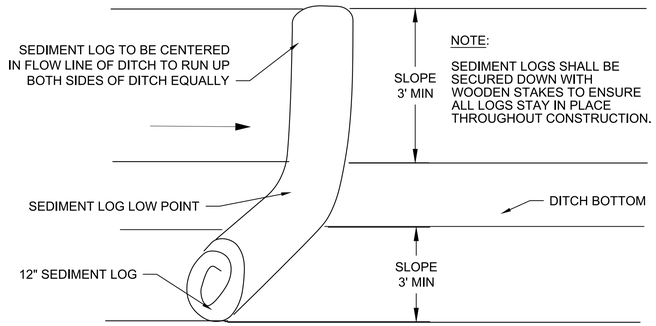
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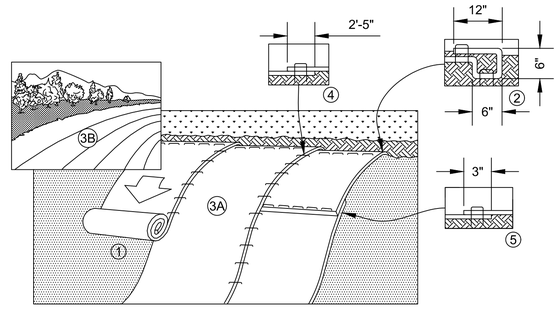
WADE BOWL PARK SPLASH PAD
CITY OF SUPERIOR
DOUGLAS COUNTY, WISCONSIN

EROSION CONTROL DETAILS

PROJECT NO. 00628066
SHEET C901



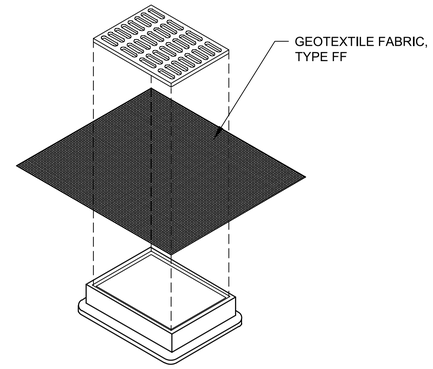
1 C902 SEDIMENT LOG DETAIL
NTS



1. PREPARE SOIL BEFORE INSTALLING BLANKETS, INCLUDING ANY NECESSARY APPLICATION OF LIME, FERTILIZER, AND SEED.
2. BEGIN AT THE TOP OF THE SLOPE BY ANCHORING THE BLANKET IN A 6" (15 CM) DEEP X 6" (15 CM) WIDE TRENCH WITH APPROXIMATELY 12" (30cm) OF BLANKET EXTENDED BEYOND THE UP-SLOPE PORTION OF THE TRENCH. ANCHOR THE BLANKET WITH A ROW OF STAPLES/STAKES APPROXIMATELY 12" (30 CM) APART IN THE BOTTOM OF THE TRENCH. BACKFILL AND COMPACT THE TRENCH AFTER STAPLING. APPLY SEED TO COMPACTED SOIL AND FOLD REMAINING 12" (30 CM) PORTION OF BLANKET BACK OVER SEED AND COMPACTED SOIL. SECURE BLANKET OVER COMPACTED SOIL WITH A ROW OF STAPLES/STAKES SPACED APPROXIMATELY 12" (30 CM) APART ACROSS THE WIDTH OF THE BLANKET.
3. ROLL THE BLANKETS (A) DOWN OR (B) HORIZONTALLY ACROSS THE SLOPE. BLANKETS WILL UNROLL WITH APPROPRIATE SIDE AGAINST THE SOIL SURFACE. ALL BLANKETS MUST BE SECURELY FASTENED TO SOIL SURFACE BY PLACING STAPLES/STAKES IN APPROPRIATE LOCATIONS AS SHOWN IN THE STAPLE PATTERN GUIDE.
4. THE EDGES OF PARALLEL BLANKETS MUST BE STAPLED WITH APPROXIMATELY 2"-5" (5 CM-12.5 CM) OVERLAP DEPENDING ON BLANKET TYPE.
5. CONSECUTIVE BLANKETS SPLICED DOWN THE SLOPE MUST BE PLACED END OVER END (SHINGLE STYLE) WITH AN APPROXIMATE 3" (7.5 CM) OVERLAP. STAPLE THROUGH OVERLAPPED AREA, APPROXIMATELY 12" (30 CM) APART ACROSS ENTIRE BLANKET WIDTH.

NOTE:
*IN LOOSE SOIL CONDITIONS, THE USE OF STAPLE OR STAKE LENGTHS GREATER THAN 6" (15 CM) MAY BE NECESSARY TO PROPERLY SECURE THE BLANKETS.

2 C902 EROSION CONTROL BLANKET DETAIL
NTS



INSTALLATION NOTES:

TRIM EXCESS FABRIC IN THE FLOW LINE TO WITHIN 3" OF THE GRATE. THE CONTRACTOR SHALL DEMONSTRATE A METHOD OF MAINTENANCE, USING A SEWN FLAP, HAND HOLDS OR OTHER METHOD TO PREVENT ACCUMULATED SEDIMENT FROM ENTERING THE INLET.

WITHOUT CURB BOX. CAN BE INSTALLED IN ANY INLET WITHOUT A CURB BOX.

3 C902 INLET PROTECTION, TYPE B
NTS

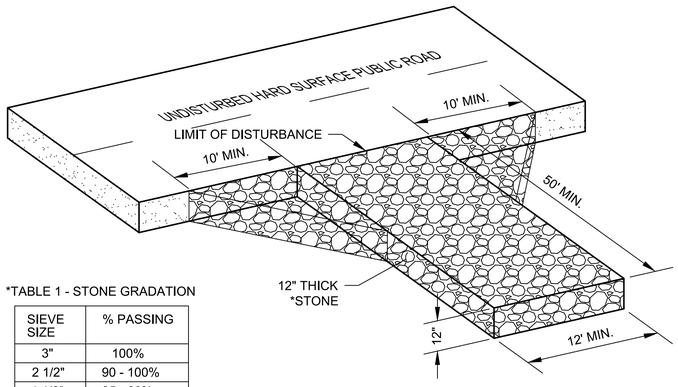


*TABLE 1 - STONE GRADATION

SIEVE SIZE	% PASSING
3"	100%
2 1/2"	90 - 100%
1 1/2"	25 - 60%
3/4"	0 - 20%
3/8"	0 - 5%

NOTES:
1. TRACKING PAD WIDTH SHALL BE AT LEAST THE FULL WIDTH OF THE EGRESS POINT OR 12' WIDE MINIMUM.
2. TRACKING PAD LENGTH SHALL BE 50' FOR CONSTRUCTION SITES, 30' FOR SINGLE FAMILY RESIDENTIAL, OR AS SPECIFIED IN THE CONTRACT DOCUMENTS. LENGTH OF TRACKING PAD MAY NEED TO BE INCREASED OR ADDITIONAL SEDIMENT CONTROL PRACTICES INSTALLED BY THE CONTRACTOR IF SEDIMENT TRACK-OUT OCCURS.
3. GEOTEXTILE FABRIC TYPE R SHALL BE INSTALLED BETWEEN THE STONE AND SUBGRADE ON SITES WHERE HIGH GROUND WATER IS OBSERVED.
4. CONTRACTOR SHALL CLEAN STREET/ROADWAY ADJACENT TO ALL CONSTRUCTION ACCESS POINTS AT THE END OF EACH WORKDAY OR MORE FREQUENTLY IF REQUESTED.

4 C902 TEMPORARY STONE TRACKING PAD
NTS

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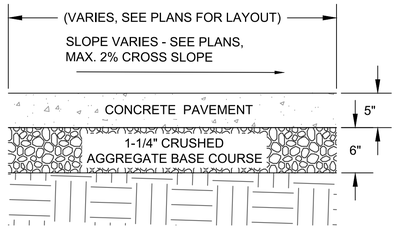
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WADE BOWL PARK SPLASH PAD
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EROSION CONTROL DETAILS

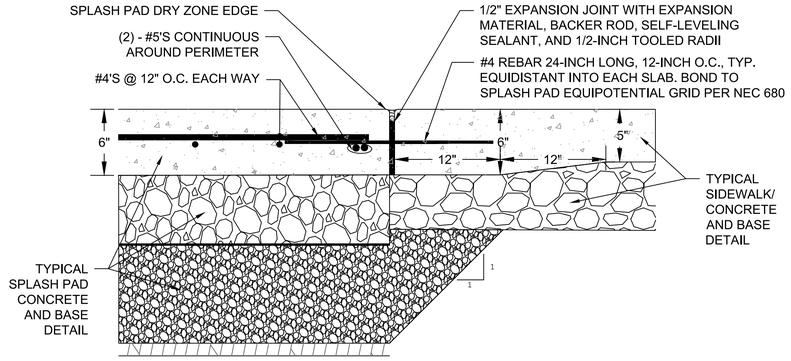
PROJECT NO. 00628066
SHEET C902



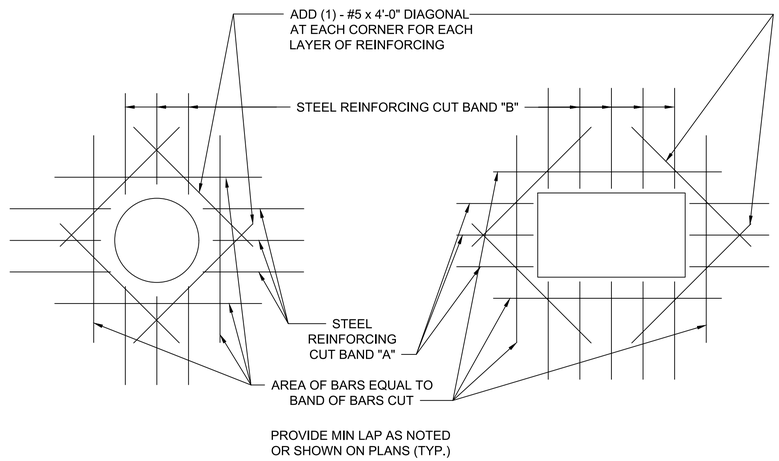
NOTES:

1. ALL CONCRETE SIDEWALK SHALL NOT EXCEED A 2% CROSS SLOPE OR 5% LONGITUDINAL SLOPE.

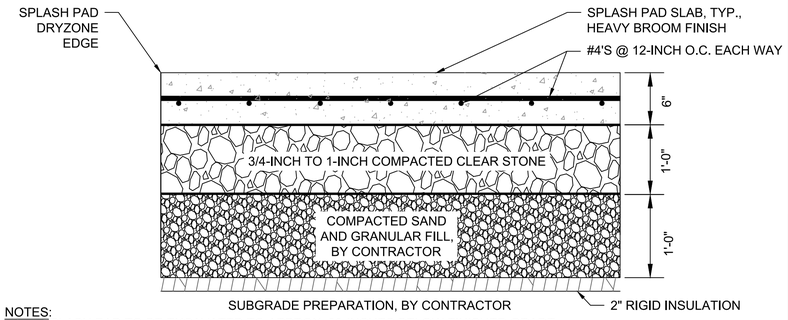
1 C903 TYPICAL SIDEWALK/CONCRETE AND BASE DETAIL
NTS



2 C903 SPLASH PAD EDGE - ADJACENT SIDEWALK/SLAB EDGE DETAIL
NTS



PROVIDE MIN LAP AS NOTED
OR SHOWN ON PLANS (TYP.)



NOTES:

1. SPLASH PAD TO BE EXCAVATED TO APPROX. 30-INCHES BELOW FINISHED GRADE.
2. SPLASH PAD SLAB SHALL BE CONCRETE PAVEMENT WITH A HEAVY BROOMED FINISH FOR SLIP RESISTANCE. LANDSCAPE ARCHITECT, ENGINEER, AND/OR OWNER TO APPROVE FINISH SAMPLE PRIOR TO INSTALLATION.
3. ALL JOINTS SHALL BE SAWCUT 1/4-INCH WIDE AND SEALED WITH SELF-LEVELING SEALANT OF NO LESS THAN 1/8" FROM SURFACE OF PAVEMENT.
4. HAND TOOLED JOINTS, INCLUDING CONSTRUCTION JOINTS, TO RECEIVE 1/2-INCH RADIUS
5. CONTRACTOR TO INSTALL EQUIPOTENTIAL BONDING GRID THROUGHOUT SPLASH PAD WET AND DRY ZONE.

3 C903 6-INCH SPLASH PAD CONCRETE AND REINFORCEMENT DETAIL
NTS

NOTES:

1. UNLESS OTHERWISE INDICATED, CONCRETE SLABS SHALL BE REINFORCED AS FOLLOWS: #4'S @ 12-INCHES EACH WAY CENTER OF 6-INCH SECTIONS; #4'S @ 8-INCHES EACH WAY CENTER OF 8-INCH SECTIONS; #4'S @ 12-INCHES EACH WAY, EACH FACE OF 12-INCH SECTIONS. SINGLE MAT REINFORCEMENT SHALL BE AT CENTER OF SECTION, UNLESS OTHERWISE INDICATED.
2. MIN CLEARANCE FOR REINFORCEMENT BARS, UNLESS OTHERWISE INDICATED, SHALL BE 3-INCHES WHEN PLACED ON GROUND; FOR SURFACES EXPOSED TO WATER, EARTH, OR WEATHER - 1 1/2-INCHES CLEARANCE. 2-INCHES AROUND ALL PIPES, LIGHT NICHES, & OTHER EMBEDDED ITEMS.
3. DETAILS OF STRUCTURAL REINFORCEMENT INDICATED FOR A MIN SOIL BEARING PRESSURE OF 3000 PSF.
4. ALL REINFORCEMENT TO BE EPOXY COATED.

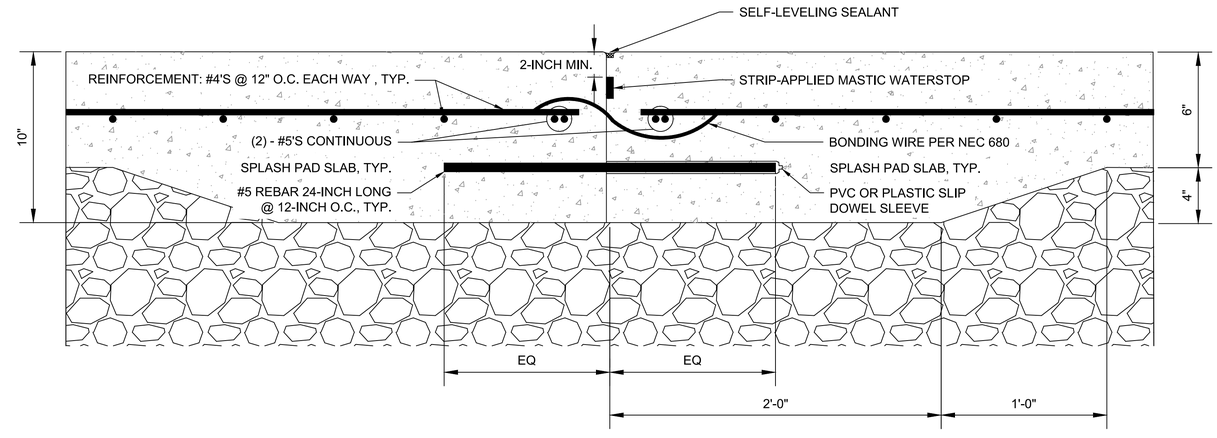
REINFORCEMENT LAP LENGTHS - DESIGN STRENGTH: CONCRETE 4000 PSI / SHOTCRETE 5000 PSI									
BAR SIZE	#3	#4	#5	#6	#7	#8	#9	#10	#11
GR-60 TOP BAR	1'-7"	2'-1"	2'-7"	3'-1"	4'-6"	5'-2"	5'-10"	6'-7"	7'-3"
GR-60 OTHER BAR	1'-3"	1'-7"	2'-0"	2'-5"	3'-6"	4'-0"	4'-6"	5'-1"	5'-7"
STANDARD HOOK DIMENSION									
BAR SIZE	#3	#4	#5	#6	#7	#8	#9	#10	#11
HOOK LENGTH	0'-7"	0'-9"	1"-0'	1'-2"	1'-4"	1'-6"	1'-11"	2'-2"	2'-5"

4 C903 REINFORCEMENT LAP LENGTHS
NTS

NOTES:

1. TYP. FOR ALL OPENINGS IN CONCRETE SLABS INCLUDING DRAINS UNLESS INDICATED OTHERWISE ON PLANS.
2. DO NOT WELD REINFORCEMENT TO PIPE SLEEVES AND INSERTS.

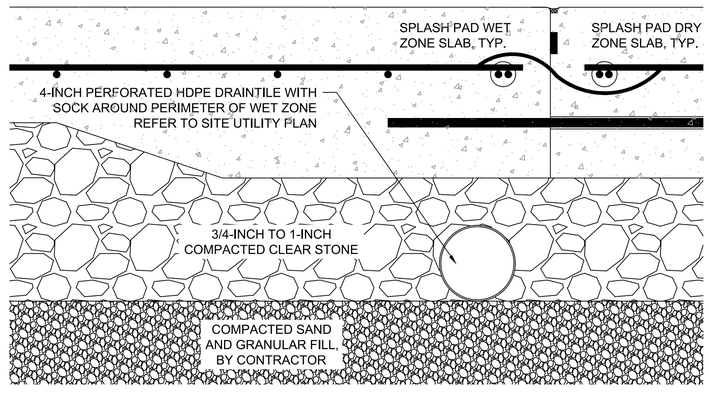
5 C903 REINFORCEMENT AT OPENINGS DETAIL
NTS



NOTES:

1. DETAIL APPLIES TO WET ZONE TO WET ZONE AND WET ZONE TO DRY ZONE JOINTS.
2. WATERSTOPS SHALL BE SIKA LOCKSTOP STRIP-APPLIED MASTIC OR APPROVED EQUIVALENT INSTALLED PER MANUFACTURERS' SPECIFICATIONS. INSTALL WATERSTOP ON PREVIOUSLY POURED CONCRETE. ENSURE CLEAN SURFACES AND APPLY PRIMER/ ADHESIVE PER MANUFACTURERS' SPECIFICATIONS. INSTALL WATER STOP 2-INCHES DOWN FROM CONCRETE SURFACE.
3. CONTRACTOR SHALL INSTALL AN EQUIPOTENTIAL BONDING GRID CONFORMING TO ALL NEC 680 REQUIREMENTS.
4. PER NEC 680, THE GRID SHALL:
   - 4.1. BE ARRANGED IN A 12"X12" (OR LESS) NETWORK OF CONDUCTORS IN A UNIFORMLY SPACED PATTERN.
   - 4.2. BE BONDED TO THE SPLASHPAD REINFORCING STEEL.
5. THE BONDING GRID SHALL EXTEND THROUGH THE ENTIRE WET AND DRY ZONES OF THE SPLASHPAD AND CONNECT TO TIE BARS INTO ADJACENT UN-REINFORCED CONCRETE. ANY ADJACENT CONCRETE WITH STEEL REINFORCING REQUIRES AN INTERCONNECTED BONDING GRID.

6 C903 SPLASH PAD EXPANSION JOINT, JOINT REINFORCEMENT, AND EQUIPOTENTIAL BONDING GRID DETAIL
NTS



7 C903 SPLASH PAD WET ZONE PERIMETER DRAINTILE DETAIL
NTS

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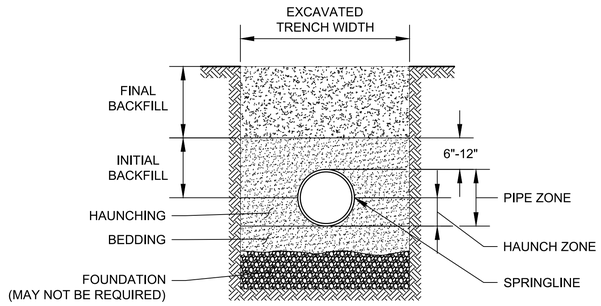
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GENERAL DETAILS

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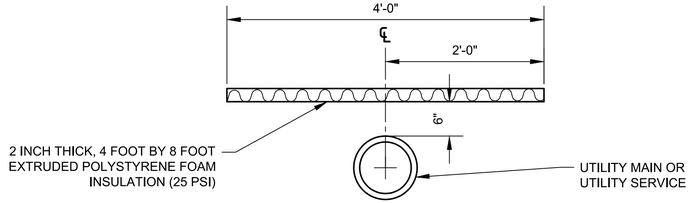


GENERAL NOTES:

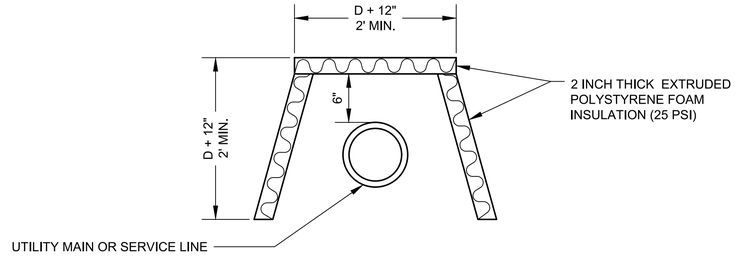
1. DETAILS OF CONSTRUCTION NOT SHOWN ON THIS DRAWING SHALL CONFORM TO ASTM D2321.
2. CLASS II EMBEDMENT MATERIAL SHALL BE CLEAN, COARSE-GRAINED SOILS WITH LITTLE-TO-NO FINES. NO PARTICLES LARGER THAN 1 1/2 -INCHES SHALL BE USED IN THE PIPE EMBEDMENT.
3. WHERE HYDRAULIC GRADIENT EXISTS, USE A WELL-GRADED MIXTURE TO MINIMIZE MIGRATION OF FINES FROM ADJACENT SOIL.
4. CLASS II MATERIAL IS SUITABLE AS A FOUNDATION AND FOR REPLACING OVER-EXCAVATED AND UNSTABLE TRENCH BOTTOM MATERIAL. INSTALL AND COMPACT IN 6-INCH MAXIMUM LAYERS.
5. INSTALL AND COMPACT BEDDING IN 6-INCH MAXIMUM LAYERS. LEVEL FINAL GRADE BY HAND. MINIMUM DEPTH 4 INCH (6 INCH IN ROCK CUTS.)
6. INSTALL AND COMPACT HAUNCHING IN 6-INCH MAXIMUM LAYERS. WORK MATERIAL AROUND PIPE BY HAND TO PROVIDE UNIFORM SUPPORT.
7. INSTALL AND COMPACT INITIAL BACKFILL TO A MINIMUM OF 6 INCH ABOVE PIPE CROWN.
8. EMBEDMENT COMPACTION: MINIMUM DENSITY 85% STANDARD PROCTOR. USE HAND TAMPERS OR VIBRATORY COMPACTORS.
10. EMBEDMENT INCLUDES BEDDING, HAUNCHING, AND INITIAL BACKFILL.

1 C904 CLASS II - FLEXIBLE PIPE EMBEDMENT DETAIL

NTS



STANDARD INSTALLATION



SIDE PROTECTION INSTALLATION

GENERAL NOTES:
1. THE SIDE PROTECTION INSTALLATION SHALL BE USED WHERE FROST WILL PENETRATE BELOW THE PIPE INVERT.
2. CONTRACTOR TO INSTALL AS NEEDED.

2 C904 PIPE INSULATION DETAIL

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PROJECT DATE: MARCH 19, 2025	DRAWN BY: KEF	.	.	.	.
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	CHECKED BY: KCB	.	.	.	.

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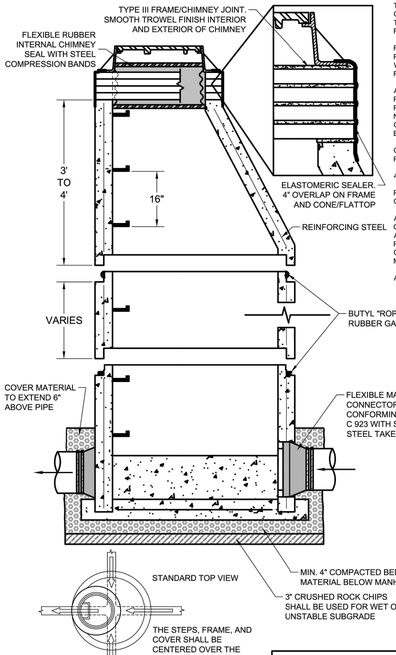
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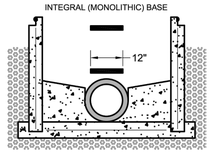
WADE BOWL PARK SPLASH PAD
CITY OF SUPERIOR
DOUGLAS COUNTY, WISCONSIN

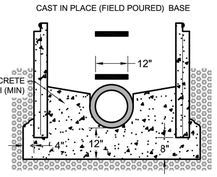
UTILITY DETAILS

PROJECT NO. 00628066

SHEET C904







STANDARD PRECAST CONCRETE MANHOLE

TYPE III FRAME/CHIMNEY JOINT REQUIRED ON ALL SANITARY MANHOLES UNLESS OTHERWISE SPECIFIED. ELASTOMERIC WATERPROOFING SEALER SHALL BE APPLIED TO EXTERIOR OF CHIMNEY, OVERLAPPING FRAME FLANGE AND PRECAST SECTION OR FLATTOP.

FLAT TOP SLAB MAY ONLY BE USED FOR 5'-0" AND 6'-0" DIA. MANHOLES AND WITH PERMISSION OF THE ENVIRONMENTAL SERVICES DIVISION OF PUBLIC WORKS OR WHERE SHOWN ON THE PLANS. FLAT TOP SLAB MUST HAVE A MINIMUM 6" ADJUSTING RING (1 FULL RING) INSTALLED.

ADJUST FRAME TO GRADE WITH CONCRETE RINGS OF VARIABLE THICKNESS, MAXIMUM RING HEIGHT = 6", MINIMUM RING HEIGHT = 2", CONCRETE RINGS SHALL BE REINFORCED WITH ONE LINE OF STEEL CENTERED WITHIN THE RING. WHERE NECESSARY, RINGS SHALL BE GROOVED TO RECEIVE STEP. THE CHIMNEY SHALL BE CONSTRUCTED SO THAT AS FEW ADJUSTING RINGS AS POSSIBLE SHALL BE USED TO BRING MANHOLE TO GRADE.

CONCRETE AND STEEL REINFORCEMENT SHALL CONFORM TO DESIGNATION C-478 REQUIREMENTS OF ASTM SPECIFICATIONS.

4" MIN. 3/4" DENSE GRADED BASE UNDER CONCRETE BASE.

PRECAST BASE RISER SECTION WITH A SEPARATE PRECAST BASE SLAB SHALL NOT BE CONSIDERED GENERALLY ACCEPTABLE UNDER THIS SPECIFICATION.

ALL JOINTS SHALL BE WATERTIGHT AND SEALED USING BUTYL RUBBER, RUBBER GASKETS CONFORMING TO ASTM-C443, OR OTHER MATERIAL APPROVED BY ENGINEER. ALL SEALS SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURE RECOMMENDATION. VARIATIONS IN DIAMETER, DEFECTIVE OR DAMAGED ENDS, OR OTHER CONDITIONS WHICH, IN THE OPINION OF THE PROJECT ENGINEER, PREVENT MAKING A SATISFACTORY JOINT SHALL BE CONSIDERED CAUSE FOR REJECTION.

AREA OF CIRCUMFERENTIAL STEEL = 0.12 SQ INCH PER LINEAL FOOT.

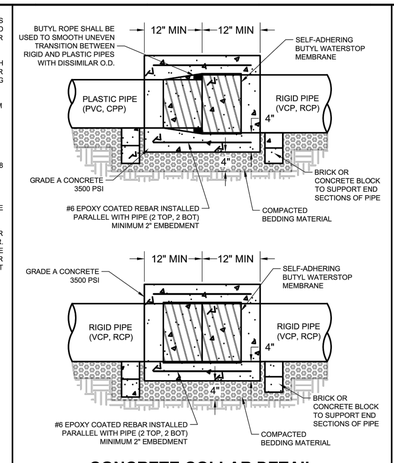
SOLID CIRCULAR COVER

VENTED CIRCULAR COVER

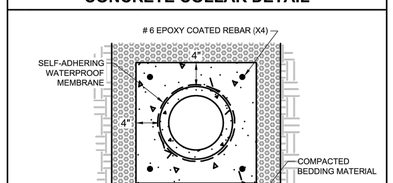
ALL MANHOLE CASTINGS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A-48, CLASS NO. 30-B AND SHALL BE FREE FROM CRACKS, HOLES, SWELLS, AND COLD SHUTS.

NON-VENTED COVERS SHALL BE "SELF-SEALING", "T-SEAL" OR "GASKET SEALED" COVERS. COVERS SHALL HAVE "SANITARY" OR "STORM" LABELS AS APPLICABLE, OR OTHER LABELS APPROVED AS EQUAL BY THE ENVIRONMENTAL SERVICES DIVISION.

STANDARD STORM AND SANITARY FRAME DETAILS



CONCRETE COLLAR DETAIL



CONCRETE COLLAR SECTION DETAIL

PIPE TRENCH DETAIL

8-INCH - 12-INCH COUPLING DETAIL

FACTORY FABRICATED PVC WYE - LATERAL

GENERAL
THE CONTRACTOR SHALL COMPLY WITH THE FOLLOWING. IN CASE OF CONFLICT, THE FIRST LISTED STANDARD SHALL TAKE PRECEDENCE.
1. COMPLY WITH ALL APPLICABLE SECTIONS OF "STANDARD SPECIFICATIONS FOR SEWER & WATER CONSTRUCTION IN WISCONSIN, SIXTH EDITION WITH ADDENDUM NO.1 AND NO.2". REQUESTS FOR COPIES OF THE "STANDARD SPECIFICATIONS" SHOULD BE FORWARDED TO: PUBLIC WORKS INDUSTRY IMPROVEMENT PROGRAM, 2835 NORTH MAYFAIR ROAD, MILWAUKEE, WISCONSIN 53222 OR REQUESTED BY TELEPHONE AT (414) 778-1050.
2. COMPLY WITH ALL APPLICABLE SECTIONS OF "STATE OF WISCONSIN DEPARTMENT OF TRANSPORTATION STANDARD SPECIFICATIONS FOR HIGHWAY AND STRUCTURE CONSTRUCTION".
3. COMPLY WITH ALL APPLICABLE SECTIONS OF WISCONSIN ADMINISTRATIVE CODE.
4. COMPLY WITH ALL APPLICABLE SECTIONS OF CITY OF SUPERIOR ADMINISTRATIVE CODE.

SEWER DIAMETER
SEWERS SHALL BE SIZED SUFFICIENT FOR FUTURE EXTENSION IN ACCORDANCE WITH CITY OF SUPERIOR SEWER SERVICE AREA PLANNING AND SHALL NOT BE LESS THAN 8 INCHES IN DIAMETER.

MANHOLE DIAMETER
THE MINIMUM DIAMETER OF MANHOLES SHALL BE 48 INCHES. LARGER DIAMETER MANHOLES SHALL BE USED AS INDICATED ON THE PLAN AND PROFILE DRAWINGS.

DEPTH
SEWERS SHALL BE LAID AT A DEPTH SUFFICIENT FOR FUTURE EXTENSION IN ACCORDANCE WITH CITY OF SUPERIOR SEWER SERVICE AREA PLANNING. SEWERS SHALL BE LAID AT A DEPTH TO PREVENT FREEZING AND TO PROVIDE GRAVITY BASEMENT DRAINAGE FOR SANITARY WASTE.

SLOPE
SEWERS SHALL BE LAID WITH UNIFORM SLOPE BETWEEN MANHOLES. ALL SEWERS SHALL BE DESIGNED AND CONSTRUCTED TO GIVE AVERAGE VELOCITIES OF NOT LESS THAN 2 FEET PER SECOND. MINIMUM DESIGN SLOPE SHALL BE AS SHOWN BELOW. SEWERS ON SLOPES OF 20% OR GREATER SHALL BE APPROVED ON A CASE BY CASE BASIS BY THE ENVIRONMENTAL SERVICES DIVISION OF PUBLIC WORKS (ESD) AND SHALL BE ANCHORED SECURELY WITH CONCRETE ANCHORS.

SEWER SIZE	MINIMUM SLOPE %
8"	0.45
10"	0.32
12"	0.25
15"	0.17
18"	0.14
21"	0.11
24"	0.09

LINE AND GRADE
LINE AND GRADE SHALL BE CONTROLLED AND MAINTAINED BY USE OF A LASER BEAM. GRADE BOARDS AND BANJO STRINGS ARE NOT ACCEPTABLE UNDER THIS SPECIFICATION.

SANITARY PIPE AND JOINT MATERIALS
MATERIALS USED IN OPEN TRENCH CONSTRUCTION OF NONPRESSURE SANITARY SEWERS SHALL BE RESTRICTED TO THE FOLLOWING: REINFORCED CONCRETE PIPE (RCP), DUCTILE IRON PIPE (DI), AND POLYVINYL CHLORIDE PIPE (PVC). ALL MATERIAL USED FOR SANITARY SEWER CONSTRUCTION SHALL BE FREE FROM DEFECTS THAT IMPAIR SERVICE. EACH LENGTH OF PIPE AND FITTING USED IN A SANITARY SEWER SHALL BE STAMPED OR INDELIBLY MARKED WITH THE MANUFACTURER'S NAME OR MARK. THE SUBSTITUTION OF ANY OTHER TYPE OF PIPE, OR MONOLITHIC SECTION, MAY ONLY BE USED WITH THE APPROVAL OF THE ESD.

STORM PIPE AND JOINT MATERIALS
MATERIALS USED IN OPEN TRENCH CONSTRUCTION OF STORM SEWERS SHALL BE RESTRICTED TO THE FOLLOWING: RCP, POLYETHYLENE PIPE WITH A SMOOTH LINER AND CORRUGATED STEEL PIPE (CSCP). ALL MATERIAL USED FOR STORM SEWER CONSTRUCTION SHALL BE FREE FROM DEFECTS THAT IMPAIR SERVICE. EACH LENGTH OF PIPE AND FITTING USED IN A STORM SEWER SHALL BE STAMPED OR INDELIBLY MARKED WITH THE MANUFACTURER'S NAME OR MARK. THE SUBSTITUTION OF ANY OTHER TYPE OF PIPE, OR MONOLITHIC SECTION, MAY ONLY BE USED WITH THE APPROVAL OF THE ESD.

FITTINGS FOR ALL BUILDING SEWER (LATERAL) CONNECTIONS
FITTINGS FOR ALL BUILDING SEWERS SHALL BE FACTORY-FABRICATED WYES, UNLESS OTHERWISE SPECIFIED ON THE PLANS. THESE FITTINGS SHALL BE PLACED AT AN ANGLE OF 45 DEGREES ABOVE THE HORIZONTAL UNLESS OTHERWISE SPECIFIED. ON SEWERS 12 INCHES OR LARGER IN DIAMETER, TEES MAY BE SUBSTITUTED FOR WYES. THE WYE OR TEE SHALL HAVE A DIAMETER OF 6 INCHES UNLESS OTHERWISE SPECIFIED. FITTINGS ON THE MAIN SEWER FOR THE CONSTRUCTION OF RISERS SHALL BE IN-LINE, FACTORY FABRICATED TEES PLACED WITH THE BRANCH VERTICAL. THE CONTRACTOR SHALL NOT CONNECT ANY BUILDING SEWERS OR DRAINS TO NEW SEWERS OR MANHOLES PRIOR TO THEIR ACCEPTANCE BY THE ESD, EXCEPT IN RELAY WORK.

PIPE & FITTING MATERIALS
THE FOLLOWING ARE MINIMUM STANDARDS FOR NONPRESSURE PIPE:
3. POLYVINYL CHLORIDE (PVC) BELL AND SPIGOT SEWER PIPE SHALL MEET THE REQUIREMENTS OF ASTM D3034 (1981). PVC SHALL BE TYPE PSM SDR-35 UNLESS OTHERWISE SPECIFIED. JOINTS SHALL BE RUBBER GASKET BELL AND SPIGOT JOINTS UNLESS OTHERWISE SPECIFIED.
4. REINFORCED CONCRETE PIPE (RCP) BELL AND SPIGOT SEWER PIPE SHALL MEET THE REQUIREMENTS OF C76 (1992). RCP SHALL BE CLASS III UNLESS OTHERWISE SPECIFIED. JOINTS SHALL BE RUBBER GASKET BELL AND SPIGOT JOINTS CONFORMING TO ASTM C443 (1979) UNLESS OTHERWISE SPECIFIED.
5. STEEL PIPE SHALL BE WELDED FROM STEEL PLATE OR SPIRAL WELDED FROM STEEL COIL. THE MINIMUM YIELD STRENGTH SHALL BE 36,000 PSI. FOR CASING PIPE THE MINIMUM WALL THICKNESS SHALL BE 0.625 INCHES. THE MINIMUM INSIDE DIAMETER OF THE STEEL CASING SHALL BE NOT LESS THAN 8 INCHES GREATER THAN THE MAXIMUM OUTSIDE DIAMETER OF THE CARRIER PIPE. THE STEEL CASING PIPE SHALL BE EPOXY COATED ON INSIDE AND OUTSIDE SURFACES.
6. DUCTILE IRON (DI) BELL AND SPIGOT SEWER PIPE, FITTINGS, AND JOINTS SHALL MEET THE REQUIREMENTS OF AWWA C100 (1977).
7. CORRUGATED POLYETHYLENE PIPE (PE) WITH A SMOOTH LINER SHALL CONFORM TO ASTM F894 OR AASHTO M294, TYPE S. PE PIPE CONFORMING TO ASTM F894 SHALL BE NOT LESS THAN CLASS 100 (RING STIFFNESS CONSTANT = 100) AND CARRIER PIPE SHALL BE NOT LESS THAN CLASS 160. JOINTS SHALL BE WATERTIGHT, BELL AND SPIGOT TYPE WITH RUBBER GASKETS CONFORMING TO ASTM F477. SOIL-TIGHT JOINTS WHICH ARE NOT WATERTIGHT ARE NOT ADEQUATE UNDER THESE SPECIFICATIONS. PIPEFITTINGS SHALL CONFORM TO AASHTO M294 OR ASTM F894. FITTINGS SHALL BE SUITABLE FOR SPECIFIED PIPE JOINTS. PE PIPE SHALL CONFORM TO ASTM F894 (E.G. SPIROLITE AS MANUFACTURED BY CHEVRON) OR AASHTO M294, TYPE S (E.G. HANCOR BLUE SEAL AS MANUFACTURED BY HANCOR CORPORATION).
8. CORRUGATED STEEL CULVERT PIPE (CSCP) SHALL BE INDUSTRY STANDARD GALVANIZED CORRUGATED STEEL CULVERT PIPE. CORRUGATIONS SHALL BE 2 2/3 INCHES BY 1/2-INCH. STEEL THICKNESS SHALL BE 0.052-INCH FOR 8-INCH DIAMETER PIPE AND 0.064-INCH FOR DIAMETERS FROM 10 TO 48 INCHES. JOINTS SHALL BE INDUSTRY STANDARD CONNECTING BANDS SUBJECT TO THE APPROVAL OF THE ESD.

JOINT ASSEMBLY OF POLYETHYLENE AND POLYVINYL CHLORIDE PIPING
LUBRICATED SPIGOT END SHALL BE INSERTED INTO RECEIVING PIPE BELL UNTIL MARKED LINE IS EVEN WITH EDGE OF BELL. ASSEMBLY RESULTING IN OVER-INSERTION, ROLLED GASKETS, SPLIT BELLS, FAILURE TO PASS ACCEPTANCE TESTING OR DAMAGE TO PREVIOUSLY ASSEMBLED JOINTS WILL BE CONSIDERED SUFFICIENT CAUSE FOR REJECTION OF THE WORK.

ALIGNMENT
ALL PIPES SHALL BE LAID UNIFORMLY TO LINE AND GRADE SO THAT THE FINISHED SEWER WILL PRESENT A UNIFORM BORE. NOTICEABLE VARIATIONS FROM TRUE ALIGNMENT AND GRADE WILL BE CONSIDERED SUFFICIENT CAUSE FOR REJECTION OF THE WORK.

PHASING & CONSTRUCTION SCHEDULE
A PHASING & CONSTRUCTION SCHEDULE SHALL BE SUBMITTED TO THE ESD UPON REQUEST. THE PHASING & CONSTRUCTION SCHEDULE SHALL INDICATE THE CONTRACTOR'S PLAN FOR PROGRESSION OF THE WORK.

REJECTION OF PIPE MATERIALS
PIPE SHALL BE SUBJECT TO REJECTION FOR FAILURE TO CONFORM TO ANY REQUIREMENT OF THE SPECIFICATIONS OR FOR ANY OF THE FOLLOWING REASONS:
1. FRACTURES OR CRACKS PASSING THROUGH THE PIPE WALL OR SOCKET, EXCEPT THAT A SINGLE CRACK NOT EXCEEDING 2 INCHES IN LENGTH AT EITHER END OF THE PIPE OR A SINGLE FRACTURE IN THE SOCKET NOT EXCEEDING 3 INCHES IN WIDTH NOR 2 INCHES IN LENGTH SHALL NOT BE CONSIDERED CAUSE FOR REJECTION UNLESS THESE DEFECTS EXIST IN MORE THAN 5% OF THE ENTIRE SHIPMENT OR LOT.
2. CHIPS OR FRACTURES ON THE INTERIOR OF THE PIPE EXCEEDING 2 INCHES IN LENGTH, 1 INCH IN WIDTH, OR A DEPTH MORE THAN 1/4 THE BARREL THICKNESS.
3. CRACKS SUFFICIENT TO IMPAIR THE STRENGTH, DURABILITY, OR SERVICEABILITY OF THE PIPE.
4. DEFECTS THAT INDICATE IMPERFECT PROPORTIONING, MIXING, AND MOLDING.
5. VARIATIONS OF MORE THAN 1/8 INCH PER LINEAR FOOT IN ALIGNMENT OF A PIPE INTENDED TO BE STRAIGHT.
6. INSECURE ATTACHMENT OF SPURS.
7. DAMAGED ENDS, WHERE SUCH DAMAGE WOULD PREVENT MAKING A SATISFACTORY JOINT.
8. CRACKS, SPLITS, OR DAMAGE OF ANY KIND WHICH MAY IMPAIR THE WATERTIGHT INTEGRITY OF PLASTIC PIPE.

COUPLINGS
WHERE PIPE COUPLINGS ARE REQUIRED TO JOIN PIPES OF DISSIMILAR MATERIAL, THEY SHALL BE FULLY STAINLESS STEEL SHIELDED RUBBER COUPLINGS INTENDED FOR UNDERGROUND USE. COUPLINGS SHALL BE RUBBER UNDERGROUND SEWER COUPLING WITH RUBBER CONFORMING TO ASTM C 425, ASTM C 1173 AND 316 SERIES STAINLESS STEEL CLAMPS WITH NUT AND BOLT OR WORM DRIVE TAKE-UP.

BEDDING MATERIAL
BEDDING MATERIAL SHALL CONSIST OF DURABLE PARTICLES RANGING IN SIZE FROM FINE TO COURSE IN SUBSTANTIALLY UNIFORM COMBINATION. WISDOT 3/4 INCH DENSE GRADED BASE COURSE SUBSECTION 305.2.2.1 IS GENERALLY ACCEPTABLE UNDER THIS SPECIFICATION. SAND DOES NOT MEET THE GRADATION REQUIREMENTS UNDER THIS SPECIFICATION.

SIEVE	PERCENT PASSING
1-INCH	100
3/4-INCH	95-100
3/8-INCH	50-90
NO. 4	35-70
NO. 10	15-55
NO. 40	10-35
NO. 200	5-15

LIFT THICKNESS FOR BEDDING MATERIALS SHALL NOT EXCEED 12 INCHES. BEDDING SHALL BE COMPACTED BY HAND, OR MECHANICALLY COMPACTED BY EQUALLY CAREFUL MEANS, TO A MINIMUM OF 90% OF STANDARD PROCTOR DENSITY. PIPE BEDDING SHALL BE AS FOLLOWS:
1. PLASTIC PIPE PLASTIC PIPE, INCLUDING BUT NOT LIMITED TO PVC AND PE, SHALL BE LAID WITH BEDDING MATERIAL OF ⅜" DENSE GRADED BASE PLACED BELOW AND AROUND THE PIPE UP TO THE SPRING LINE IN SUCH A MANNER AS TO PROVIDE ADEQUATE SIDE SUPPORT AND TO PREVENT LATERAL MOVEMENT OF THE PIPE. A LAYER OF ⅜" DENSE GRADED BASE SHALL BE SPREAD OVER THE BOTTOM OF THE TRENCH, SO THAT AFTER THE PIPE HAS BEEN PLACED THEREON, EMBEDDED TO GRADE, AND ALIGNED, THERE REMAINS A 4 INCH MINIMUM DEPTH OF ⅜" DENSE GRADED BASE BELOW THE PIPE BARREL AND A MINIMUM OF 3 INCHES BELOW THE BELL FOR PIPE 36 INCHES IN DIAMETER OR SMALLER AND A MINIMUM OF 6 INCHES BELOW THE PIPE FOR DIAMETERS 36 INCHES OR LARGER. IF EXCAVATION HAS BEEN CARRIED DEEPER THAN 6 INCHES BELOW THE PIPE BARREL, THE EXCESS DEPTH SHALL BE FILLED WITH AGGREGATE. CARE SHALL BE TAKEN TO INSURE THAT THE PIPE DOES NOT REST DIRECTLY ON THE BELL BUT IS UNIFORMLY SUPPORTED THROUGH ITS ENTIRE LENGTH. WOOD FOOT BLOCKS OF 2-INCH MINIMUM THICKNESS MAY BE USED AT JOINTS OF PIPE 36 INCHES IN DIAMETER AND LARGER PROVIDED THAT THE BEDDING MATERIAL IS MECHANICALLY COMPACTED UNDER THE LOWER 90 DEGREE QUADRANT OF THE PIPE. SUPPORTING BLOCKS ARE NOT PERMITTED UNDER PIPE LESS THAN 36 INCHES IN DIAMETER.
2. RCP RCP PIPE SHALL BE BEDDED ACCORDING TO THE SPECIFICATIONS FOR PLASTIC PIPE.
3. DI DI SEWER PIPE SHALL BE BEDDED ACCORDING TO THE SPECIFICATIONS FOR PLASTIC PIPE, EXCEPT THAT BEDDING MATERIAL MAY BE ⅜" DENSE GRADED BASE OR COVER MATERIAL.
4. CSCP CSCP SHALL BE BEDDED ACCORDING TO THE SPECIFICATIONS FOR PLASTIC PIPE.

COVER MATERIAL
COVER MATERIAL SHALL CONSIST OF DURABLE PARTICLES RANGING IN SIZE FROM FINE TO COURSE IN SUBSTANTIALLY UNIFORM COMBINATION. WISDOT 3/4 INCH DENSE GRADED BASE COURSE SUBSECTION 305.2.2.1 IS GENERALLY ACCEPTABLE UNDER THIS SPECIFICATION. SAND DOES NOT MEET THE GRADATION REQUIREMENTS UNDER THIS SPECIFICATION.

SIEVE	PERCENT PASSING
1-INCH	100
3/4-INCH	95-100
3/8-INCH	50-90
NO. 4	35-70
NO. 10	15-55
NO. 40	10-35
NO. 200	5-15

LIFT THICKNESS FOR PIPE COVER SHALL NOT EXCEED 12 INCHES. COVER SHALL BE MECHANICALLY TAMPED TO A MINIMUM OF 90% OF STANDARD PROCTOR DENSITY.
1. PLASTIC PIPE PLASTIC PIPE, INCLUDING BUT NOT LIMITED TO PVC AND PE, SHALL BE LAID WITH COVER MATERIAL OF ⅜" DENSE GRADED BASE PLACED IN NOT LESS THAN TWO STAGES, ONE TO THE TOP OF THE PIPE AND THE OTHER TO A LEVEL AT LEAST 6 INCHES ABOVE THE PIPE FOR SIZES 36 INCHES IN DIAMETER OR SMALLER AND TO A LEVEL AT LEAST 12 INCHES ABOVE THE PIPE WHERE THE PIPE IS LARGER THAN 36 INCHES IN DIAMETER. MATERIAL SHALL BE PLACED BY HAND OR EQUALLY CAREFUL MEANS IN ORDER TO PROVIDE LATERAL SUPPORT FOR THE PIPE, EACH STAGE OF COVER SHALL BE COMPACTED BY HAND OR MECHANICAL TAMPING TO A MINIMUM OF 90% STANDARD PROCTOR DENSITY. IF THE REMAINING BACKFILL MATERIAL CONTAINS LARGE ROCKS OR BOULDERS, THE SECOND STAGE OF COVER SHALL BE INCREASED TO A LEVEL 12 INCHES ABOVE THE PIPE.
2. RCP RCP SHALL BE COVERED ACCORDING TO THE SPECIFICATIONS FOR PLASTIC PIPE, EXCEPT WHERE PIPE 36 INCHES IN DIAMETER OR LARGER IS INSTALLED, GRANULAR BACKFILL MAY BE USED AS COVER.
3. DI DI SEWER PIPE SHALL BE COVERED ACCORDING TO THE SPECIFICATIONS FOR PLASTIC PIPE, EXCEPT THAT THE COVER MATERIAL SHALL THE SAME MATERIAL USED FOR BEDDING MATERIAL.
4. CSCP CSCP SHALL BE COVERED ACCORDING TO THE SPECIFICATIONS FOR PLASTIC PIPE.

PREPARATION OF SUBGRADE
ALL UNDESIRABLE MATERIAL SUCH AS ORGANIC SOILS, ETC., WHICH CANNOT ADEQUATELY SUPPORT THE MANHOLE SHALL BE REMOVED BELOW THE NORMAL MANHOLE BOTTOM AND REPLACED WITH CRUSHED STONE.WHERE DISTANCE TO STABLE GROUND IS EXCESSIVE, THE ESD RESERVES THE RIGHT TO ORDER OTHER TYPES OF FOUNDATION SUCH AS ADDITIONAL POURED BASE AS DEEMED NECESSARY.

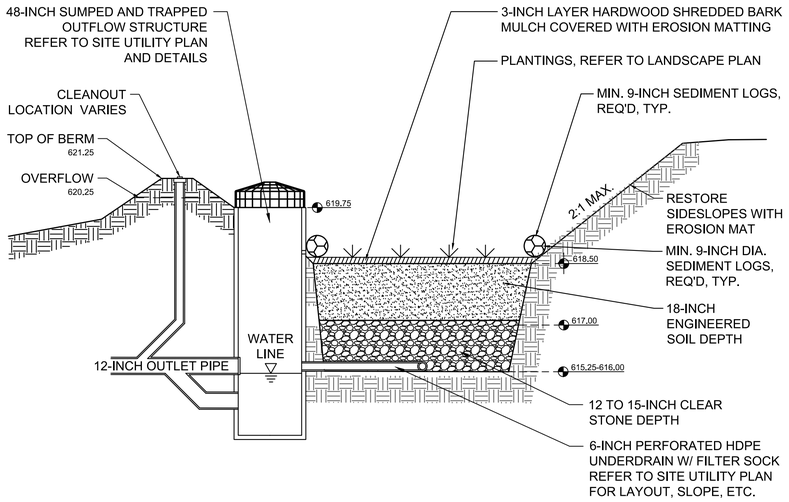
MANHOLE BASES
CONCRETE MANHOLE BASES SHALL BE AS FOLLOWS:
1. PRECAST MANHOLE WITH INTEGRAL BASE THE EXCAVATION SHALL BE MADE DEEP ENOUGH SO THAT AFTER THE BOTTOM MANHOLE BARREL SECTION WITH THE INTEGRAL BASE HAS BEEN PLACED THEREON, SET TO GRADE, AND PLUMBED, THERE REMAINS A MINIMUM DEPTH OF BEDDING MATERIAL BELOW THE BOTTOM OF THE BASE EQUAL TO THE DEPTH OF BEDDING MATERIAL OF THE ADJACENT SEWERS. THE ANNULAR SPACE BETWEEN THE MANHOLE EXCAVATION AND THE OUTSIDE MANHOLE WALL SHALL BE BACKFILLED WITH BEDDING MATERIAL UP TO THE SPRING LINE OF THE INCOMING PIPE.
2. FIELD POURED BASE FOR PRECAST MANHOLE THE PRECAST MANHOLE BOTTOM BARREL SHALL BE SET ON CONCRETE BRICK OR BLOCK SO THAT THE BOTTOM OF THIS SECTION IS BELOW THE SPRING LINE OF THE OUTLET PIPE, SET FOR PROPER LOCATION AND PLUMBED. THE CONCRETE BASE OF CLASS D CONCRETE SHALL HAVE A MINIMUM THICKNESS OF 12 INCHES BELOW THE INVERT OF THE OUTLET SEWER. THE MANHOLE BASE SHALL SUBSTANTIALLY CONFORM TO THE REQUIRED SHAPE AND DIMENSIONS. THE EXCAVATION SHALL BE BACK-FORMED, IF NECESSARY, TO ACHIEVE THIS END. IF EXCAVATION IN STABLE SOIL HAS BEEN CARRIED BELOW THE REQUIRED DEPTH, SUCH EXCESS DEPTH SHALL BE FILLED WITH CONCRETE. EXCESS CONCRETE SHALL NOT BE DEPOSITED AROUND THE MANHOLE IN SUCH A MANNER THAT WILL INTERFERE WITH POSSIBLE FUTURE CONNECTIONS. THE PIPE SHALL BE SUPPORTED ON BRICK OR SOLID CONCRETE BLOCKS FOR THE POURING OF THE CONCRETE BASE. THE CONCRETE SUPPORT FOR RIGID PIPE SHALL END IN A VERTICAL PLANE FLUSH WITH THE FACE OF THE PIPE BELL.
3. SEPARATE CONCRETE BASE SLAB SEPARATE CONCRETE BASE SLABS SHALL NOT GENERALLY BE ACCEPTABLE UNDER THESE SPECIFICATIONS.

FLOW CHANNEL
THE FLOW CHANNEL THROUGH MANHOLES SHALL BE MADE TO CONFORM TO THE SHAPE OF THE CONNECTING SEWERS AND SHALL EXTEND VERTICALLY FROM THE SPRINGLINE TO THE CROWN OF THE DISCHARGE PIPE. A MINIMUM UNIFORM DROP OF 0.10 FEET SHALL BE PROVIDED IN THE FLOW CHANNEL BETWEEN THE ENTERING SEWER AND THE DISCHARGE SEWER. THE THROUGH MANHOLE FLOW CHANNEL SHALL BE THE SAME DIAMETER AS THE LARGER OF THE ADJOINING SEWERS.

DROP PIPE
AN OUTSIDE DROP PIPE SHALL BE PROVIDED FOR A SEWER ENTERING A MANHOLE WHERE THE INVERT ELEVATION OF THE ENTERING SEWER IS 2 FEET OR MORE ABOVE THE SPRINGLINE OF THE OUTGOING SEWER. THE ENTIRE DROP PIPE CONNECTION SHALL BE ENCASED IN CONCRETE. THE DROP PIPE SHALL BE THE SAME DIAMETER AS THE INCOMING SEWER UNLESS OTHERWISE SPECIFIED. AN INSIDE DROP PIPE SHALL NOT BE USED WITHOUT THE APPROVAL OF THE ESD.

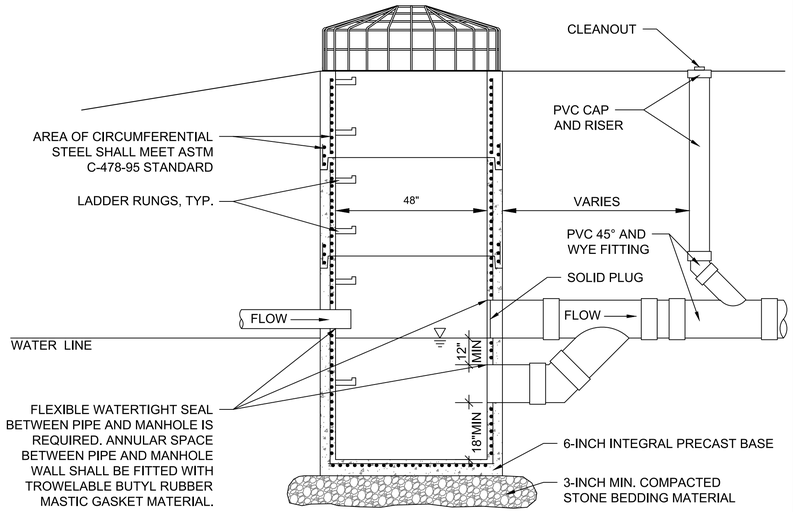
PIPE TO MANHOLE CONNECTION
CONNECTION SHALL BE WATER TIGHT IN ALL MANHOLES. PENETRATIONS IN MANHOLES SHALL BE CORED OR PREFORMED.

THE MANHOLE CONNECTION OF PIPE SEWERS SHALL BE ACCOMPLISHED BY ONE OF THE FOLLOWING:
1. NONFLEXIBLE CONNECTIONS OF RIGID PIPE WHEN RIGID PIPE IS CONNECTED TO A CONCRETE BRICK, BLOCK, OR PRECAST MANHOLE WITHIN THE MANHOLE BASE, IT SHALL BE SUPPORTED ON BRICK OR SOLID CONCRETE BLOCKS FOR THE POURING OF THE CONCRETE BASE. THE CONCRETE OF THE BASE SHALL BE EXTENDED UNDER THE PIPE AND END IN A VERTICAL PLANE FLUSH WITH THE FACE OF THE PIPE BELL. WHERE PIPE ENTERS THE MANHOLE ABOVE THE MANHOLE BASE, IT SHALL BE SUPPORTED FROM THE WALL OF THE MANHOLE TO THE FACE OF THE FIRST PIPE JOINT BELL WITH A WALL OF BACKFILL, CONCRETE, BRICK, OR SOLID CONCRETE BLOCK COLUMNS. CONNECTIONS SHALL BE AS FOLLOWS:
   a. SANITARY WHEN CONNECTING RIGID PIPE TO A PRECAST MANHOLE THE CONNECTION SHALL BE BY MEANS OF AN APPROVED FLEXIBLE WATERTIGHT PIPE TO MANHOLE SEAL. FOR PIPE DIAMETERS UP TO 24 INCHES IN 48-INCH MANHOLES. THIS SEAL SHALL MEET THE PHYSICAL REQUIREMENTS OF ASTM C923. LARGER DIAMETER PIPE CONNECTIONS SHALL BE AS SHOWN ON THE CONTRACT DRAWINGS.
   CONNECTIONS OF CLAY PIPE TO BRICK OR BLOCK MANHOLES SHALL BE BY MEANS OF BRICK AND MORTAR. A MINIMUM OF WATER SHALL BE ADDED TO THE MORTAR TO PRODUCE A LUMPY TEXTURE. MORTAR SHALL BE PACKED IN AND TROWELED OFF.
   b. STORM WHEN CONNECTING RIGID PIPE TO STORM MANHOLES, THE CONNECTION SHALL BE BY MEANS OF BRICK AND MORTAR.
2. FLEXIBLE CONNECTION OF PIPE ALL PLASTIC PIPE SHALL BE CONNECTED TO PRECAST MANHOLES BY MEANS OF AN APPROVED FLEXIBLE WATERTIGHT PIPE TO MANHOLE SEAL. THIS SEAL SHALL MEET THE PHYSICAL REQUIREMENTS OF ASTM C-443 AND THE PERFORMANCE REQUIREMENTS OF ASTM C-425 AND C-433. PIPE ENTERING A MANHOLE THROUGH THIS SEAL SHALL BE LAID IN ACCORDANCE WITH THE BEDDING SECTION REQUIREMENTS AND SHALL NOT BE RIGIDLY SUPPORTED AS REQUIRED FOR NONFLEXIBLE CONNECTIONS. TO MAINTAIN THE SEAL FLEXIBILITY THAT PORTION OF THE ANNULAR SPACE BETWEEN THE PIPE AND THE MANHOLE WALL BELOW THE SPRINGLINE O



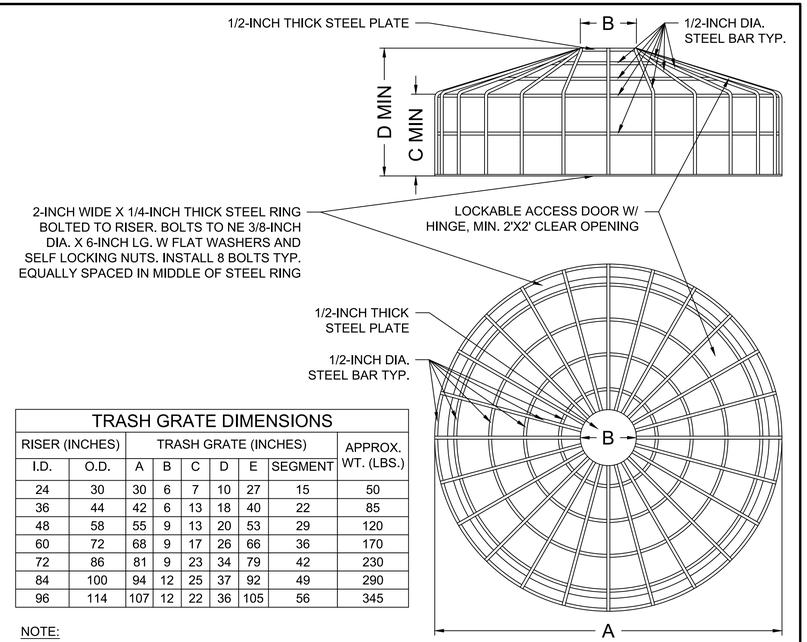
NOTES:
1. CONSTRUCT PER BIORETENTION BASIN CONSTRUCTION REQUIREMENTS NOTES REFER TO LANDSCAPE PLANS AND SPECIFICATIONS FOR PLANTING INFORMATION.
2. DIMENSIONS, ELEVATIONS, AND INVERTS VARY, REFER TO DETAILS, SPECIFICATIONS, SITE PLAN, SITE GRADING PLAN, AND SITE UTILITY PLAN.

1 C906 BIORETENTION BASIN DETAIL (CROSS SECTION)
NTS



NOTES:
1. REFER TO STANDARD SPECIFICATIONS FOR SEWER AND WATER CONSTRUCTION IN WISCONSIN FOR ADDITIONAL INFORMATION
2. CONCRETE AND STEEL REINFORCEMENT SHALL CONFORM TO C-478 REQUIREMENTS OF ASTM SPECIFICATIONS.
3. JOINTS SHALL BE WATERTIGHT AND MADE USING RUBBER GASKETS OR BUTYL RUBBER MASTIC MATERIAL.
4. TRAP CONFIGURATION FOR USE WITH 12" OR LARGER OUTFLOW PIPING.
5. 3" MIN. COMPACTED STONE BEDDING MATERIAL REQUIRED UNDER MANHOLE BASE.
6. BACKFILL STRUCTURE WITH GRANULAR BACKFILL MATERIAL.

2 C906 SUMPED AND TRAPPED OUTFLOW STRUCTURE, 48-INCH
NTS



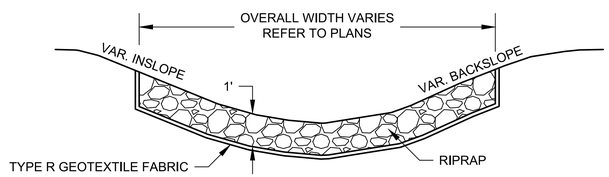
TRASH GRATE DIMENSIONS								
RISER (INCHES)		TRASH GRATE (INCHES)						APPROX. WT. (LBS.)
I.D.	O.D.	A	B	C	D	E	SEGMENT	
24	30	30	6	7	10	27	15	50
36	44	42	6	13	18	40	22	85
48	58	55	9	13	20	53	29	120
60	72	68	9	17	26	66	36	170
72	86	81	9	23	34	79	42	230
84	100	94	12	25	37	92	49	290
96	114	107	12	22	36	105	56	345

NOTE:
1. ALL METAL TRASH RACKS 36-INCH OR LARGER IN DIAMETER, OR WITH A TOTAL WEIGHT GREATER THAT 75 LBS, SHALL HAVE A HINGED, LOCKABLE ACCESS DOOR WITH A MINIMUM 2-FOOT X 2-FOOT CLEAR OPENING.

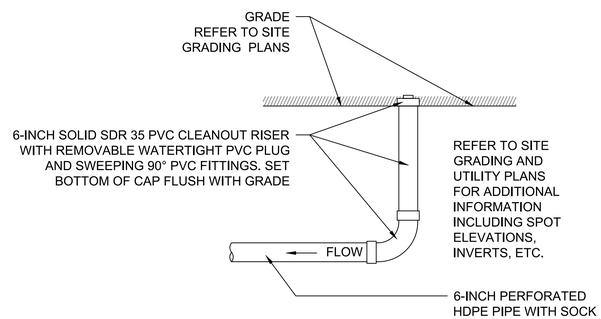
3 C906 TRASH GRATE, 48-INCH
NTS

1. UNLESS OTHERWISE INDICATED IN PROJECT DETAILS AND SPECIFICATIONS, CONSTRUCT BIORETENTION BASIN/CELL PER WISCONSIN DNR TECHNICAL STANDARD 1004, BIO-RETENTION FOR INFILTRATION.
2. THE BIORETENTION BASIN SHALL BE EXCAVATED USING ONLY WIDE-TRACKED CONSTRUCTION EQUIPMENT.
   2.1. TO CONTROL UNNECESSARY SOIL COMPACTION, CONSTRUCTION ACTIVITY USING EQUIPMENT WITHIN THE BASIN SHALL BE MINIMIZED PRIOR TO EXCAVATION AND ELIMINATED AFTER EXCAVATION.
   2.2. AFTER INITIAL EXCAVATION, AND AFTER FINAL GRADING, THE BIORETENTION BASIN SHALL BE SECURED TO PREVENT CONSTRUCTION EQUIPMENT USE IN THE AREA.
3. PRIOR TO DELIVERY AND INSTALLATION OF DRIANTILE, STONE, ENGINEERED SOIL, OR COMPOST:
   3.1. ALL UPSTREAM AREAS SHALL BE RESTORED PER THE LANDSCAPING PLAN, 70% OF THE TURF SEED GERMINATED, AND ALL HARD SURFACE AREAS PAVED.
   3.2. ALL SEDIMENT, INCLUDING ANY NATIVE SOILS SHALL BE REMOVED. IF UNDERCUT IN THE BASINS IS REQUIRED TO REMOVE SEDIMENT AND/OR SOILS, REPLACE WITH CLEAN SAND.
4. AFTER ALL REQUIREMENTS ABOVE ARE SATISFIED, AN 18-INCH LAYER OF WASHED STONE WITH DRAINTILE AND AN 18-INCH LAYER OF ENGINEERED SOIL SHALL BE PLACED.
   4.1. CLEAR STONE SHALL CONSIST OF #1 CLEAR, WASHED STONE.
   4.2. DRAINTILE TO BE 6-INCH PERFORATED HDPE WITH FILTER SOCK.
   4.3. ENGINEERED SOIL SHALL CONSIST OF: 70% PRE-WASHED, COARSE DOLOMITIC SAND AND 30% COMPOST (SHALL MEET DNR SPECIFICATION 100).
   4.4. REFER TO SITE UTILITY PLANS AND DETAILS FOR STORM WATER STRUCTURE, PIPING, AND DRAINTILE INFORMATION
5. AFTER STONE, DRAINTILE, AND ENGINEERED SOIL PLACEMENT, THE BIORETENTION BASIN SHALL BE SECURED TO PREVENT CONSTRUCTION EQUIPMENT USE IN THE AREA.
6. AFTER BASIN CONSTRUCTION ACTIVITY IS COMPLETE, COMMENCE LANDSCAPE CONSTRUCTION:
   6.1. UNLESS OTHERWISE SPECIFIED IN THE LANDSCAPE PLANS, THE SIDE SLOPES OF THE BASIN SHALL BE SEEDED WITH A HIGH QUALITY SEED AND RESTORED WITH WITH CLASS A EROSION MAT.
   6.2. THE BOTTOM BASIN PLANTING AREA SHALL RECEIVE A 2-INCH LAYER OF HARDWOOD SHREDDED BARK MULCH INSTALLED BETWEEN ALL THE PLUGS AND PLANTS. THE HARDWOOD SHREDDED BARK MULCH SHALL BE COVERED WITH JUTE MESH. NO METAL STAPLES OR PLASTIC ALLOWED, USE OF WOOD STAKES PREFERRED.
   6.3. BIORETENTION BASIN PLANTINGS - REFER TO LANDSCAPE PLANS AND DETAILS.
7. CONTRACTOR TO CONTINUE THE FOLLOWING MAINTENANCE ITEMS AS PART OF THE GENERAL CONTRACTORS CONTRACT. THE CONTRACT WILL REMAIN OPEN UNTIL THESE MAINTENANCE ITEMS ARE COMPLETE:
   7.1. CONTRACTOR SHALL WEED THE BIO-INFILTRATION BASIN 30 DAYS AFTER INSTALLATION OF THE ENGINEERED SOIL AND PLANTS AS LONG AS THIS DATE IS IN THE GROWING SEASON (END DATE SEPT. 30). IF THIS DATE IS AFTER SEPT. 30, THE CONTRACTOR SHALL COME BACK IN YEAR TWO AND WEED THE BASIN BETWEEN MAY 15 AND MAY 30. WORK SHALL BE COMPLETED BY A QUALIFIED TECHNICIAN CAPABLE OF DISTINGUISHING UNWANTED WEED SPECIES AND DEAD VEGETATION FROM HEALTHY DESIRED PLANTS.
   7.2. CONTRACTOR SHALL WATER THE BIORETENTION BASINS WEEKLY UNTIL A POINT 30 DAYS AFTER PLANT INSTALLATION. IF THIS DATE OCCURS AFTER SEPT. 30, THEN THE CONTRACTOR SHALL CONTINUE WATERING UNTIL MAY 30 OF YEAR 2 OR UNTIL PLANTS ARE ESTABLISHED. WATERING IS ONLY REQUIRED IF THE EQUIVALENT OF 0.50" OF RAIN DOES NOT FALL AT THE SITE WEEKLY.
   7.3. CONTRACTOR SHALL REPLACE ALL UNHEALTHY AND DEAD PLANTS WITHIN 30 DAYS OF PLANTING, SUBSTANTIAL COMPLETION AT THE SITE, OR MAY 30 OF YEAR 2 OF CONSTRUCTION, WHICHEVER IS LATEST.

4 C906 BIORETENTION BASIN CONSTRUCTION REQUIREMENT NOTES
NTS



5 C906 TYPICAL RIPRAP INSTALLATION DETAIL
NTS



6 C906 BIORETENTION DRAINTILE CLEANOUT
NTS

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	CHECKED BY: KCB	.	.	.	.

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CITY OF SUPERIOR
DOUGLAS COUNTY, WISCONSIN

BIORETENTON POND DETAILS

PROJECT NO. 00628066
SHEET C906

NOTES:

1. ALL PLANT MATERIALS SHALL BE OF MATCHING FORMS AND SIZES WITHIN EACH SPECIES AND SIZE DESIGNATION ON THE DRAWINGS.
2. PLANTS SHALL BE PLACED AS DRAWN. NO SUBSTITUTES SHALL BE MADE WITHOUT PRIOR APPROVAL FROM THE LANDSCAPE ARCHITECT.
3. REMOVE AND DISPOSE OF TURF/SOD AND OTHER EXISTING PLANTS, INCLUDING ESTABLISHED WEEDS PRIOR TO SEEDING.
4. CONTRACTOR SHALL PROTECT ALL EXISTING TREES NOT CALLED OUT FOR REMOVAL. SEE SHEET C201 - SITE EROSION CONTROL AND REMOVALS PLAN.
5. ALL LANDSCAPE PLANTING AREAS ADJOINING TURF TO HAVE METAL EDGING, UNLESS OTHERWISE NOTED.
6. CONTRACTOR RESPONSIBLE FOR EROSION CONTROL IN ALL SEEDED AREAS. ALL DISTURBED AREAS ARE TO BE PROTECTED WITHIN 24 HOURS. DO NOT DISTURB MORE AREA THAN CAN BE COMPLETED AND PROTECTED WITHIN 24 HOURS.
7. PLANTS AND OTHER MATERIALS ARE QUANTIFIED AND SUMMARIZED FOR THE CONVENIENCE OF BIDDING. CONFIRM AND INSTALL SUFFICIENT QUANTITIES TO COMPLETE THE WORK AS DRAWN. NO ADDITIONAL PAYMENTS WILL BE MADE FOR MATERIALS REQUIRED TO COMPLETE THE WORK AS DRAWN.

KEY

- KENTUCKY BLUE GRASS LAWN SEED, (TYP.) WITH 6-INCHES TOPSOIL
- NO MOW FESCUE SEED, (TYP.) WITH 6-INCHES TOPSOIL AND EROSION MATTING
- PLANTING BED WITH METAL EDGING AND HARDWOOD SHREDDED BARK MULCH, 3-INCHES THICK
- 3-INCH PLUGS, 15-INCH O.C. WITH HARDWOOD SHREDDED BARK MULCH 2-INCHES THICK. REFER TO PLANT MIX SCHEDULE
- CONCRETE PAVEMENT, REFER TO SITE PLAN

PROPERTY LINE

DISTURBED AREA LIMITS

TOPSOIL STOCKPILE

PROJECT LIMITS

EX. SHELTER/ RESTROOMS TO REMAIN FFE: 623.57±

CONSTRUCTION ACCESS: CLOUGH AVENUE

CONSTRUCTION STAGING AREA

CONTRACTOR TO REPAIR GRAVEL PARKING AREA AND ACCESS ROAD IN-KIND AFTER CONSTRUCTION AND RESTORE TO PRE-CONSTRUCTION STATE

0 10 20 40

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OVERALL SITE LANSCAPE PLAN

PROJECT NO. 00628066

SHEET L101

PLANT SCHEDULE

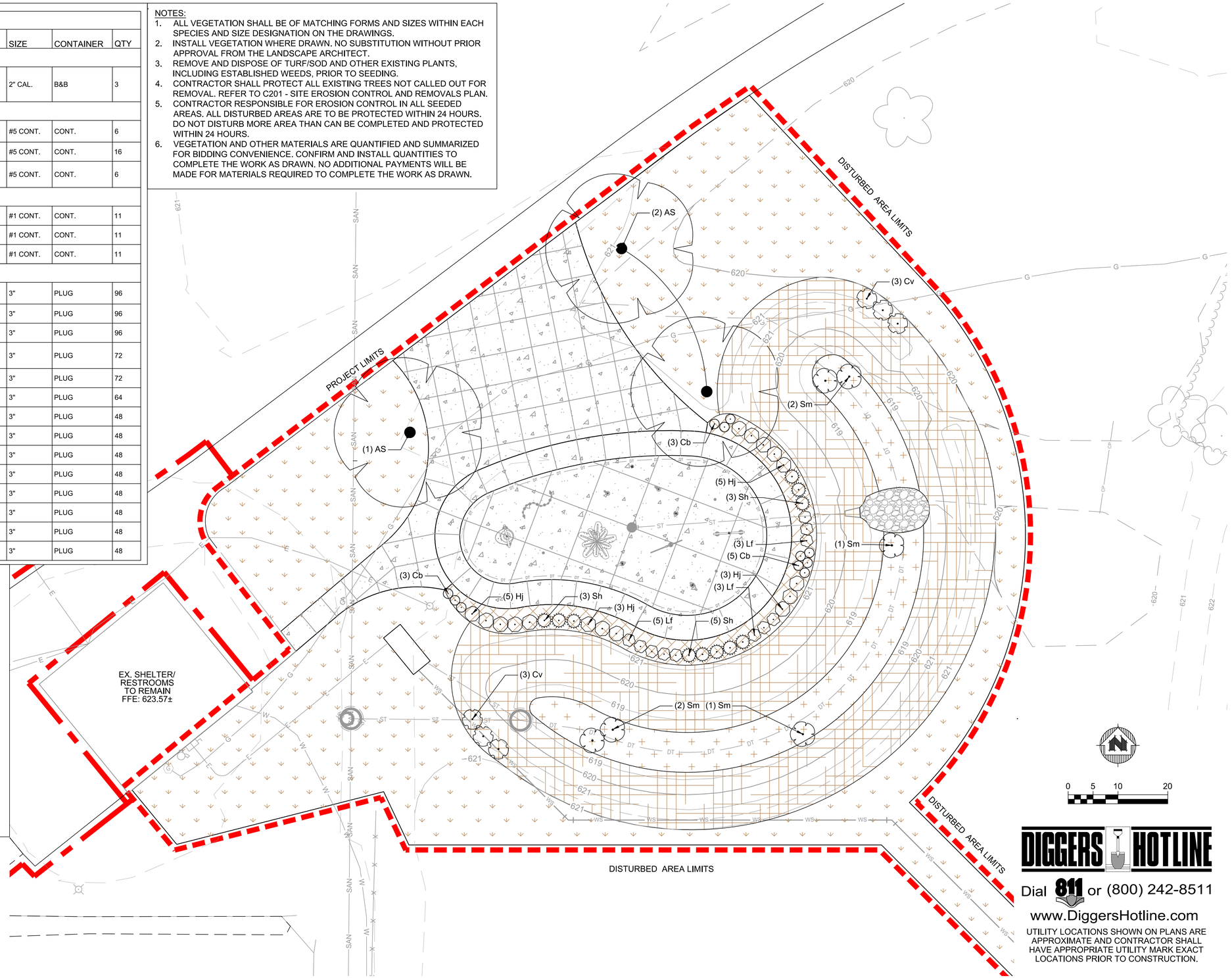
SYMBOL	CODE	BOTANICAL NAME	COMMON NAME	SIZE	CONTAINER	QTY
TREES						
	AS	ACER SACCHARUM	SUGAR MAPLE	2" CAL.	B&B	3
SHRUBS						
	Cv	CORNUS SANGUINEA 'VIRIDISSIMA'	VIRIDISSIMA BLOODTWIG DOGWOOD	#5 CONT.	CONT.	6
	Hj	HYPERICUM KALMIANUM	KALM ST. JOHNSWORT	#5 CONT.	CONT.	16
	Sm	SPIRAEA ALBA	WHITE MEADOWSWEET	#5 CONT.	CONT.	6
GRASSES & PERENNIALS						
	Cb	CAREX BEBBII	BEBB'S SEDGE	#1 CONT.	CONT.	11
	Lf	LYSIMACHIA CILIATA	FRINGED LOOSESTRIFE	#1 CONT.	CONT.	11
	Sh	SPOROBOLUS HETEROLEPIS	PRAIRIE DROPSEED	#1 CONT.	CONT.	11
3-INCH PLUG MIX						
	MIX	BROMUS CILIATUS	FRINGED BROME	3"	PLUG	96
	MIX	CAREX CRINITA	FRINGE SEDGE	3"	PLUG	96
	MIX	CAREX VULPINOIDEA	FOX SEDGE	3"	PLUG	96
	MIX	ASTER NOVAE-ANGLIAE	NEW ENGLAND ASTER	3"	PLUG	72
	MIX	EUPATORIUM MACULATUM	SPOTTED JOE PYE WEED	3"	PLUG	72
	MIX	VERNONIA FASCICULATA	BUNCHED IRONWEED	3"	PLUG	64
	MIX	LIARTRIS SPICATA	SHOWY BLAZING STAR	3"	PLUG	48
	MIX	VERONICASTRUM VIRGINICUM	CULVER'S ROOT	3"	PLUG	48
	MIX	ANEMONE CANADENSIS	CANADA ANEMONE	3"	PLUG	48
	MIX	IRIS VIRGINICA VAR. SHREVEI	SOUTHERN BLUE FLAG	3"	PLUG	48
	MIX	PYCNCNTHEMUM VIRGINIANUM	VIRGINIA MOUNTAIN MINT	3"	PLUG	48
	MIX	VERBENA HASTATA	BLUE VERVAIN	3"	PLUG	48
	MIX	SPIRAEA ALBA	WHITE MEADOWSWEET	3"	PLUG	48
	MIX	ASCLEPIAS INCARNATA	MARSH MILKWEED	3"	PLUG	48

KEY

- KENTUCKY BLUE GRASS LAWN SEED, (TYP.) WITH 6-INCHES TOPSOIL
- NO MOW FESCUE SEED, (TYP.) WITH 6-INCHES TOPSOIL AND EROSION MATTING
- PLANTING BED WITH METAL EDGING AND HARDWOOD SHREDDED BARK MULCH, 3-INCHES THICK
- 3-INCH PLUGS, 15-INCH O.C. WITH HARDWOOD SHREDDED BARK MULCH 2-INCHES THICK. REFER TO PLANT MIX SCHEDULE
- CONCRETE PAVEMENT, REFER TO SITE PLAN

NOTES:

1. ALL VEGETATION SHALL BE OF MATCHING FORMS AND SIZES WITHIN EACH SPECIES AND SIZE DESIGNATION ON THE DRAWINGS.
2. INSTALL VEGETATION WHERE DRAWN. NO SUBSTITUTION WITHOUT PRIOR APPROVAL FROM THE LANDSCAPE ARCHITECT.
3. REMOVE AND DISPOSE OF TURF/SOD AND OTHER EXISTING PLANTS, INCLUDING ESTABLISHED WEEDS, PRIOR TO SEEDING.
4. CONTRACTOR SHALL PROTECT ALL EXISTING TREES NOT CALLED OUT FOR REMOVAL. REFER TO C201 - SITE EROSION CONTROL AND REMOVALS PLAN.
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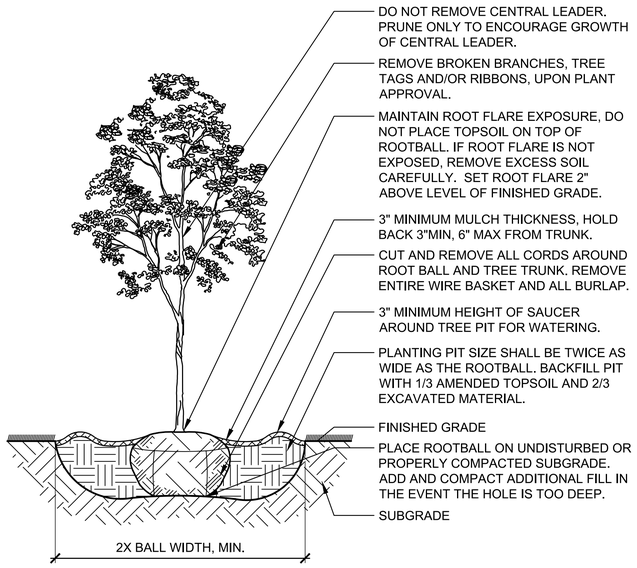
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ENLARGED SITE LANDSCAPE PLAN

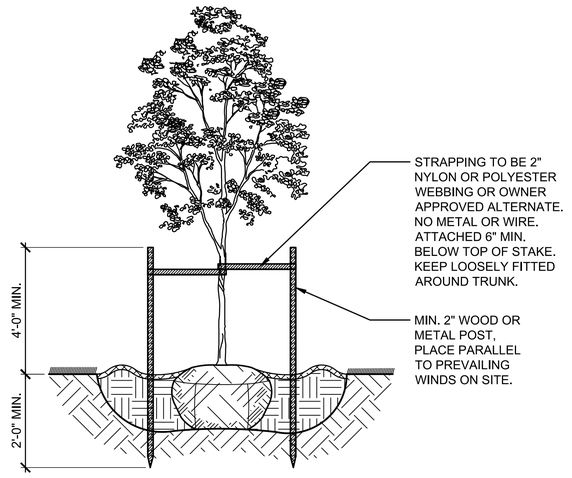
PROJECT NO. 00628066
SHEET L102

NOTE:
1. REMOVE AND PROPERLY DISPOSE OF ANY EXCESS EXCAVATED MATERIAL
2. WRAP TRUNK WITH APPROVED TREE WRAP UP TO FIRST BRANCH. (FALL PLANTING REQUIREMENT).



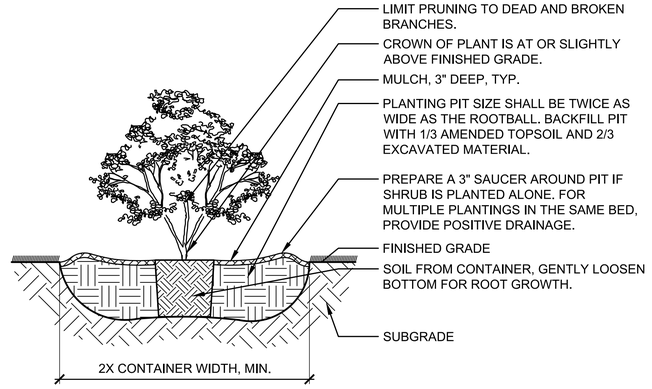
1 L901 DECIDUOUS TREE PLANTING
NTS

NOTE:
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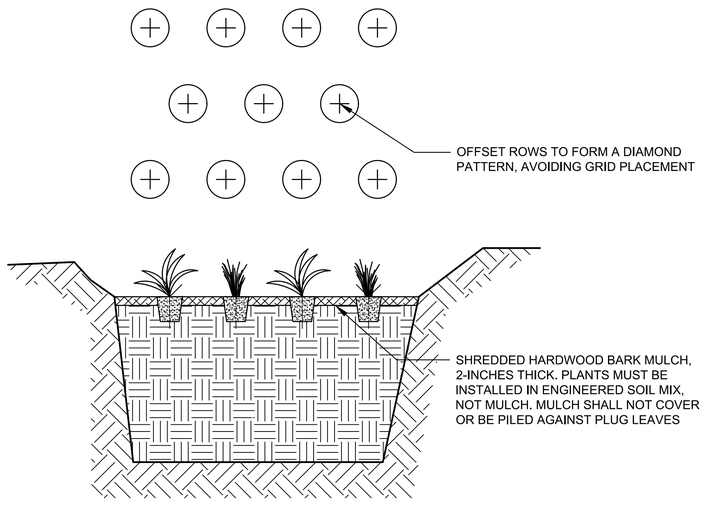
2 L901 DECIDUOUS TREE STAKING
NTS

NOTE:
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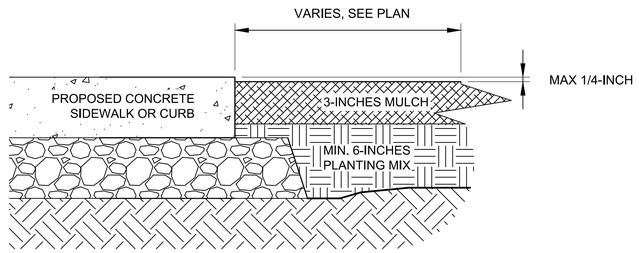


3 L901 SHRUB CONTAINER PLANTING
NTS

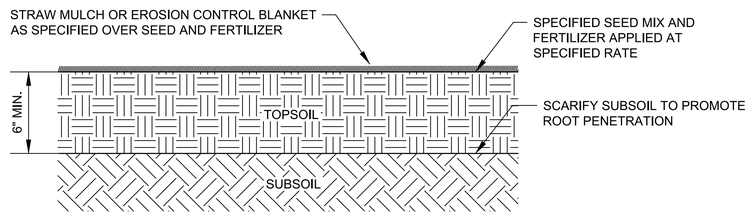
NOTE:
1. PLANTS OF ALL SPECIES SHALL BE INTERMINGLED.
2. PLANTS OF THE SAME SPECIES SHALL NOT BE PLACED IN GROUPS OF 4 OR MORE.



4 L901 BIORETENTION CELL PLUG PLANTING
NTS



5 L901 SHREDDED HARDWOOD BARK MULCH AT SIDEWALK DETAIL
NTS



6 L901 TOPSOIL AND SEEDING
NTS

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LANDSCAPE DETAILS

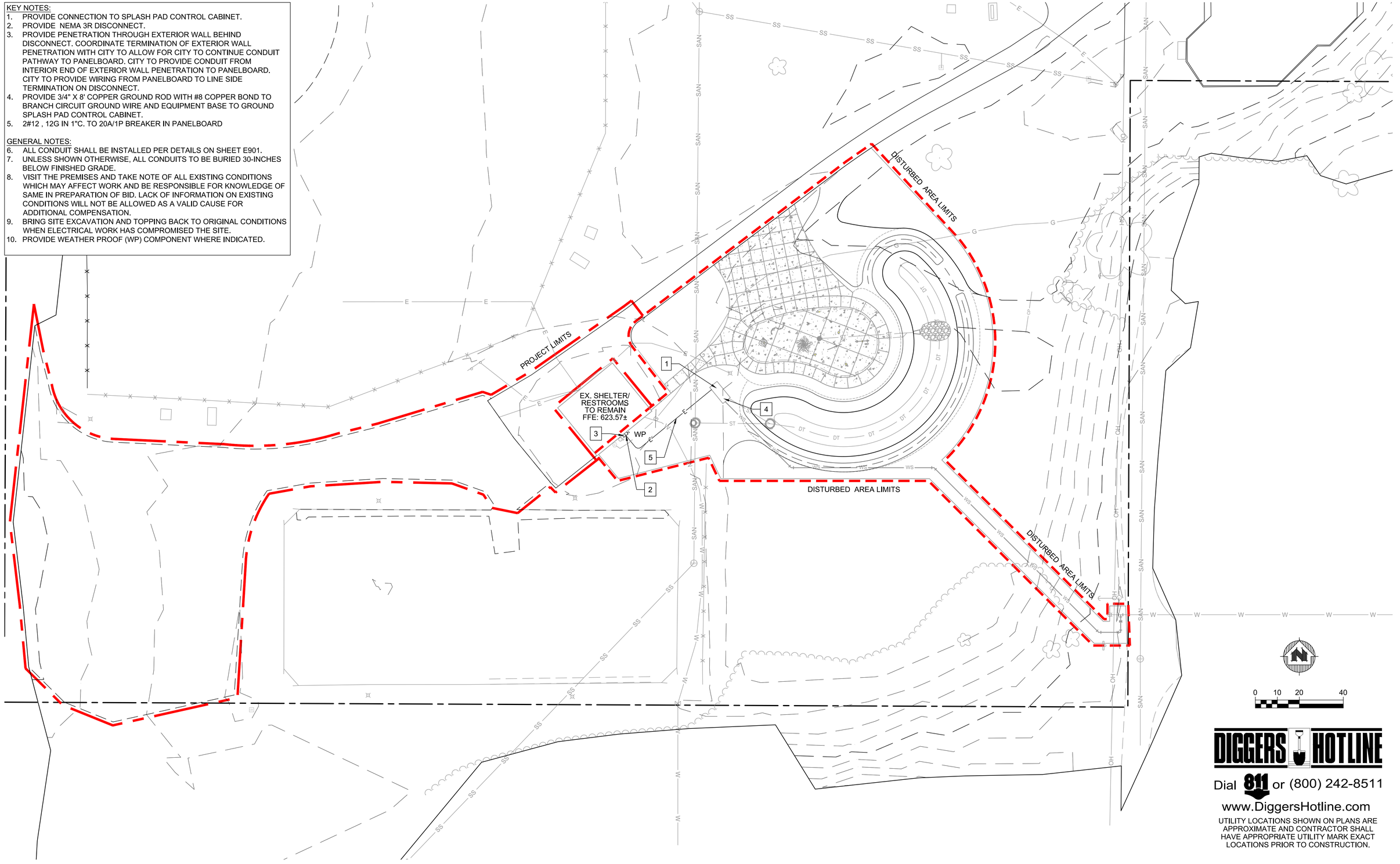
PROJECT NO. 00628066
SHEET L901

KEY NOTES:

1. PROVIDE CONNECTION TO SPLASH PAD CONTROL CABINET.
2. PROVIDE NEMA 3R DISCONNECT.
3. PROVIDE PENETRATION THROUGH EXTERIOR WALL BEHIND DISCONNECT. COORDINATE TERMINATION OF EXTERIOR WALL PENETRATION WITH CITY TO ALLOW FOR CITY TO CONTINUE CONDUIT PATHWAY TO PANELBOARD. CITY TO PROVIDE CONDUIT FROM INTERIOR END OF EXTERIOR WALL PENETRATION TO PANELBOARD. CITY TO PROVIDE WIRING FROM PANELBOARD TO LINE SIDE TERMINATION ON DISCONNECT.
4. PROVIDE 3/4" X 8' COPPER GROUND ROD WITH #8 COPPER BOND TO BRANCH CIRCUIT GROUND WIRE AND EQUIPMENT BASE TO GROUND SPLASH PAD CONTROL CABINET.
5. 2#12 , 12G IN 1"C. TO 20A/1P BREAKER IN PANELBOARD

GENERAL NOTES:

6. ALL CONDUIT SHALL BE INSTALLED PER DETAILS ON SHEET E901.
7. UNLESS SHOWN OTHERWISE, ALL CONDUITS TO BE BURIED 30-INCHES BELOW FINISHED GRADE.
8. VISIT THE PREMISES AND TAKE NOTE OF ALL EXISTING CONDITIONS WHICH MAY AFFECT WORK AND BE RESPONSIBLE FOR KNOWLEDGE OF SAME IN PREPARATION OF BID. LACK OF INFORMATION ON EXISTING CONDITIONS WILL NOT BE ALLOWED AS A VALID CAUSE FOR ADDITIONAL COMPENSATION.
9. BRING SITE EXCAVATION AND TOPPING BACK TO ORIGINAL CONDITIONS WHEN ELECTRICAL WORK HAS COMPROMISED THE SITE.
10. PROVIDE WEATHER PROOF (WP) COMPONENT WHERE INDICATED.



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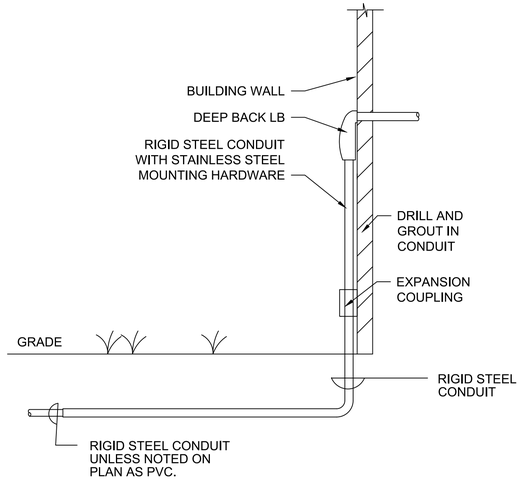
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DOUGLAS COUNTY, WISCONSIN

SITE ELECTRICAL PLAN

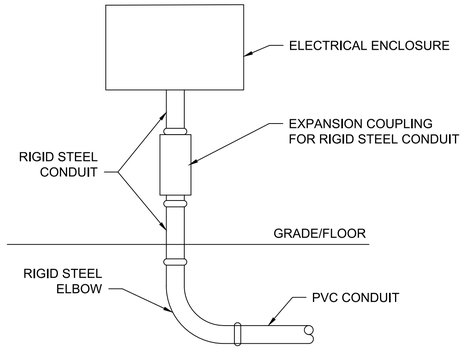
PROJECT NO. 00628066

SHEET E101



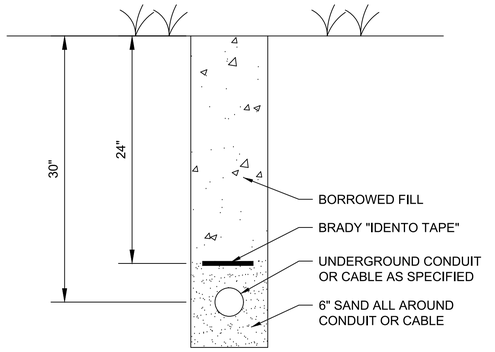
1 E901 EXTERIOR CONDUIT INTO EXISTING SPACE

NTS



2 E901 EXTERIOR CONDUIT INTO EXTERIOR ENCLOSURE

NTS



3 E901 UNDERGROUND CONDUIT/CABLE INSTALLATION

NTS

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ELECTRICAL DETAILS

PROJECT NO. 00628066

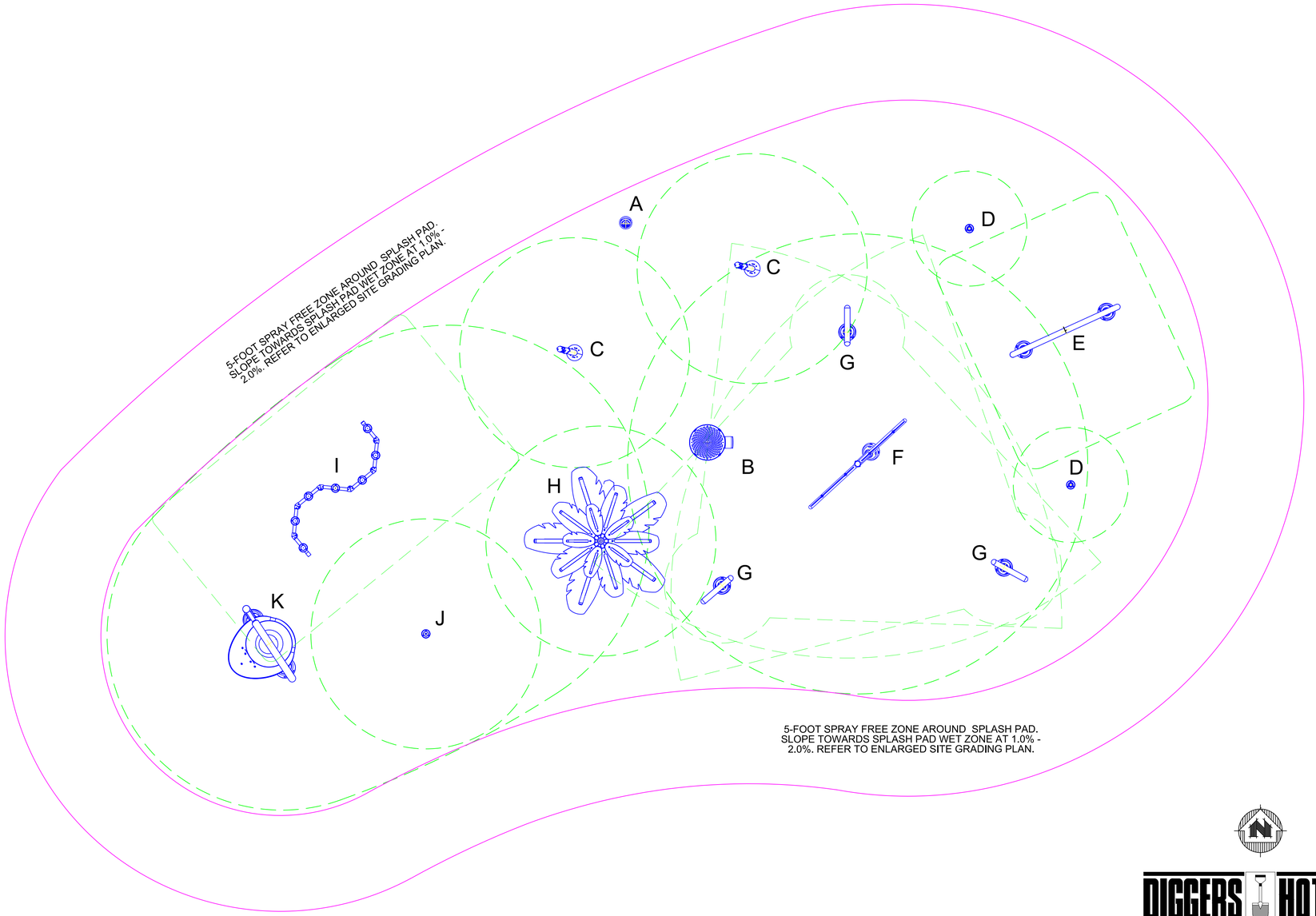
SHEET E901

PRODUCT LEGEND

REF	PRODUCT	QTY	GPM	LPM
A	Activator N°4 VOR 0622	1	0.0	0.0
B	Playsafe Drain N°4 VOR 1004	1	0.0	0.0
C	Glomist VOR 7247	2	0.8	3.0
D	Spraylink™ Funnel VOR 3008	2	14.0	52.9
E	Spray Loop VOR 0519	1	7.5	28.4
F	Helico Nano VOR 7798	1	12.5	47.3
G	Tube N°1 VOR 0220	3	15.0	56.7
H	Pine Tree VOR 8610	1	25.0	94.5
I	Spraylink™ Wave VOR 3057	1	17.0	64.3
J	Spraylink™ Fountain VOR 3007	1	6.0	22.7
K	Twinsplash VOR 7242	1	12.0	45.4
		QTY	GPM	LPM
	TOTAL	15	109.80	415.20

NOTES:

1. SPLASH PAD PLAN IS NOT-TO-SCALE. REFER TO SITE PLAN FOR SCALED DRAWINGS, PAVEMENT LAYOUT, SCORE PATTERN, AND CONTROLLER CABINET LOCATION.
2. COMPONENTS SPECIFIED ARE BASIS OF DESIGN. CONTRACTOR TO PROVIDE SPECIFIED COMPONENTS OR EQUIVALENT.
3. CONTRACTOR TO PROVIDE ABOVE GROUND CONTROLLER CABINET, CABINET FOOTING, AND ALL INTERNAL COMPONENTS REQUIRED TO CONSTRUCT A FULLY FUNCTIONING SPLASH PAD. CABINET TO BE LARGE ENOUGH TO CONTAIN THE FOLLOWING CONTRACTOR PROVIDED COMPONENTS:
   - 3.1. 3-INCH WATER SUPPLY PIPE THROUGH FLOOR REDUCERS
   - 3.2. (1) 2-INCH WATER METER (BY UTILITY COMPANY)
   - 3.3. (1) 3-INCH RPZ BACK FLOW PREVENTER
   - 3.4. 3-INCH TO DUAL 2-INCH WYE-CONNECTOR
   - 3.5. DUAL 2-INCH FEEDS TO DISTRIBUTION MANIFOLD
   - 3.6. DISTRIBUTION MANIFOLD
   - 3.7. TUBING AND VALVES FROM DISTRIBUTION MANIFOLD TO COMPONENTS
   - 3.8. HARD-WIRE SPLASH PAD CONTROLLER
4. CONTRACTOR TO SEQUENCE COMPONENTS TO MAINTAIN GPM FLOW BELOW WDNR REQUIREMENTS FOR FLOW THROUGH SPLASH PADS AND BE ABLE TO SET DAYS/HOURS OF OPERATION.
5. CONTRACTOR TO INSTALL SPLASH PAD DRAIN. REFER TO SITE UTILITY PLAN FOR DISCHARGE PIPE DIRECTION. CONTRACTOR TO INSTALL PIPE FROM DRAIN TO DISCHARGE POINT. DISCHARGE PIPE CONNECTION TO DRAIN ASSUMED 6-INCHES, NOTIFY ENGINEER IF DIFFERENT SIZE REQUIRED. ASSUME 6-INCH INVERT TO BE 16-INCHES BELOW SPLASH PAD DRAIN RIM. NOTIFY ENGINEER IF DIFFERENT DIMENSION REQUIRED. REFER TO ENLARGED SITE GRADING PLAN FOR SURFACE ELEVATIONS.
6. CONTRACTOR SHALL VERIFY ALL GRADES AND SLOPES FOR THE SLABS, PATHS, AND SIDEWALKS. IF DISCREPANCIES ARE DISCOVERED, CONTRACTOR SHALL BRING THEM TO THE ENGINEER'S ATTENTION PRIOR TO START OF CONSTRUCTION. REFER TO ENLARGED SITE GRADING PLAN. ASPHALT PAVEMENT SHOULD SLOPE AT A MINIMUM OF 1.5% AND CONCRETE PAVEMENT/SIDEWALK AT A MINIMUM OF 1.0% IN AT LEAST ONE DIRECTION UNLESS DIRECTED OTHERWISE BY THE ENGINEER. CONTRACTOR SHALL NOTIFY ENGINEER PRIOR TO CONSTRUCTION IF SLOPES LESS THAN THE MINIMUM REQUIREMENTS ARE DISCOVERED.
7. ALL PROPOSED WET AND DRY ZONE SPLASH PAD CONCRETE SHALL BE 6-INCH THICK UNLESS NOTED OTHERWISE ON THE PLAN SHEET.
8. ALL EROSION CONTROL SHALL BE IN PLACE PRIOR TO SITE CONSTRUCTION OR DISTURBANCE.



5-FOOT SPRAY FREE ZONE AROUND SPLASH PAD. SLOPE TOWARDS SPLASH PAD WET ZONE AT 1.0% - 2.0%. REFER TO ENLARGED SITE GRADING PLAN.

DIGGERS HOTLINE

Dial 811 or (800) 242-8511

www.DiggersHotline.com

UTILITY LOCATIONS SHOWN ON PLANS ARE APPROXIMATE AND CONTRACTOR SHALL HAVE APPROPRIATE UTILITY MARK EXACT LOCATIONS PRIOR TO CONSTRUCTION.

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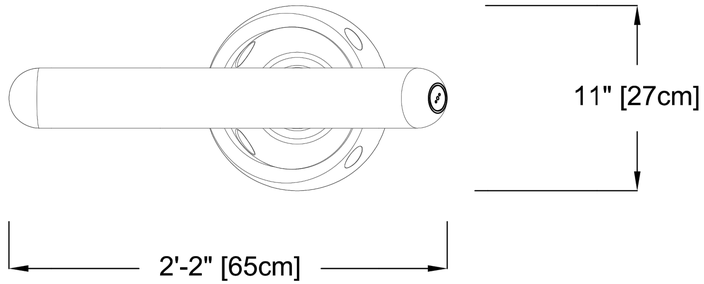
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SPLASH PAD PLAN

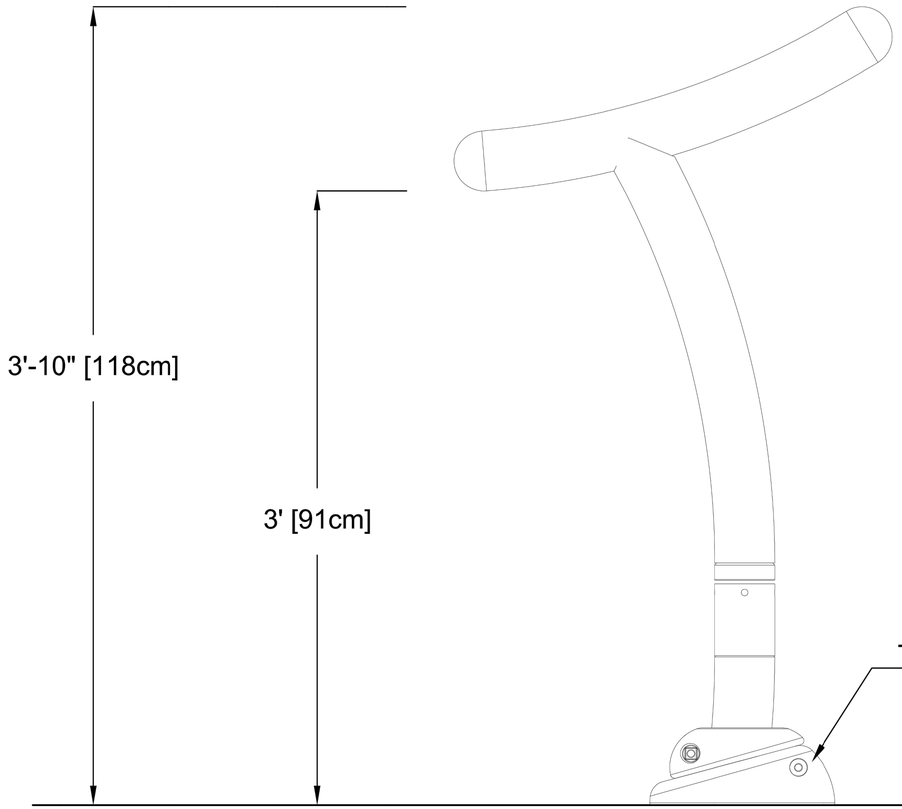
PROJECT NO. 00628066

SHEET F101

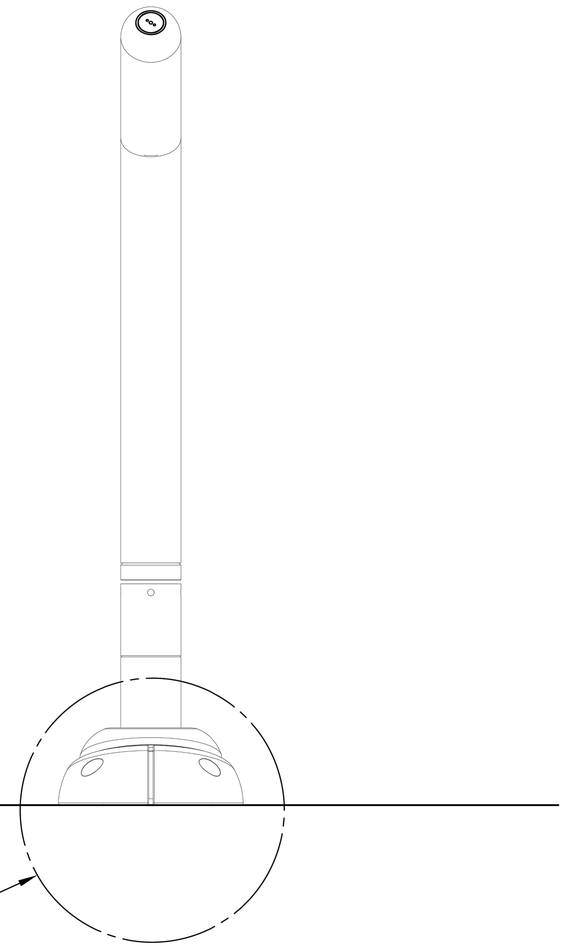
PLAN VIEW



FRONT ELEVATION VIEW



SIDE ELEVATION VIEW



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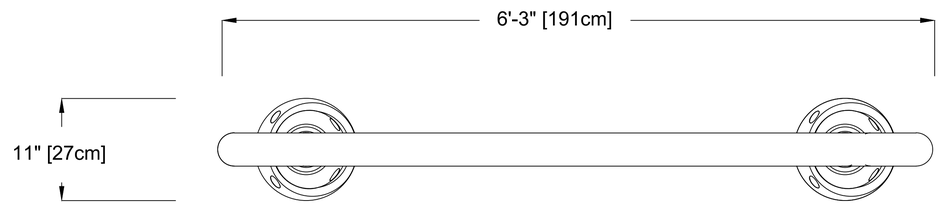
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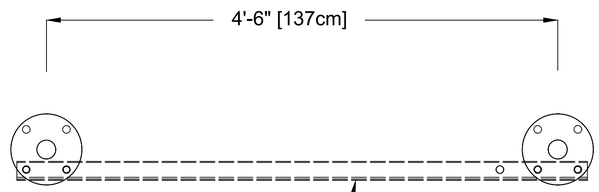
VORTEX VOR-0220 TUBE No1

PROJECT NO. 00628066
SHEET F901

PLAN VIEW

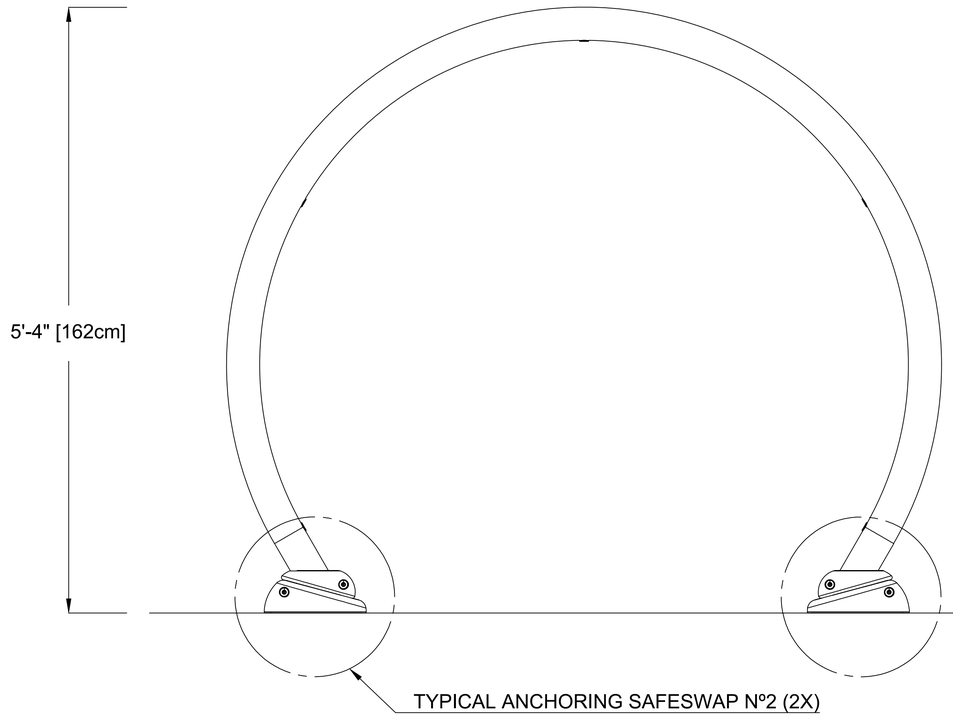


ANCHORING LOCATIONS

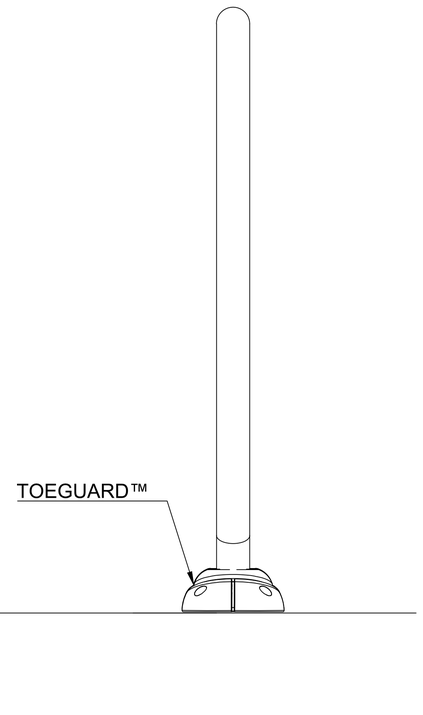


INSTALLATION KIT FOR SPRAY LOOP (1 LOOP) #128 (123637)
REFER TO MAINTENANCE MANUAL FOR INSTRUCTIONS ON
INSTALLATION DETAIL AND KIT #128 MUST BE USED DURING CONCRETE
POURING FOR THE PLACEMENT OF THE SAFESWAP TO ENSURE
CORRECT PLACEMENT FOR FEATURES.

FRONT ELEVATION VIEW



SIDE ELEVATION VIEW



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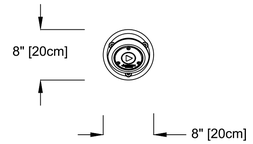
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VORTEX VOR-0519 SPRAY LOOP

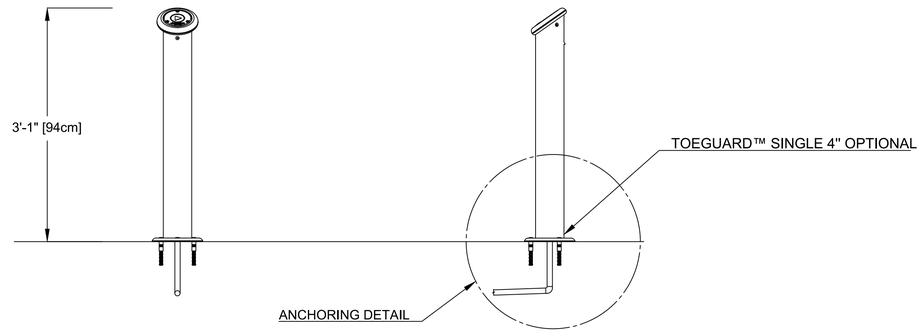
PROJECT NO. 00628066
SHEET F902

PLAN VIEW



FRONT ELEVATION VIEW

SIDE ELEVATION VIEW



NOTES:

1) "BY INSTALLER/BY CONTRACTOR" MAY REFER TO SERVICE PROVIDERS OTHER THAN THE EQUIPMENT MANUFACTURER. PLEASE REFER TO PROJECT SPECIFICATION FOR DETAILS OF RESPONSIBILITY.

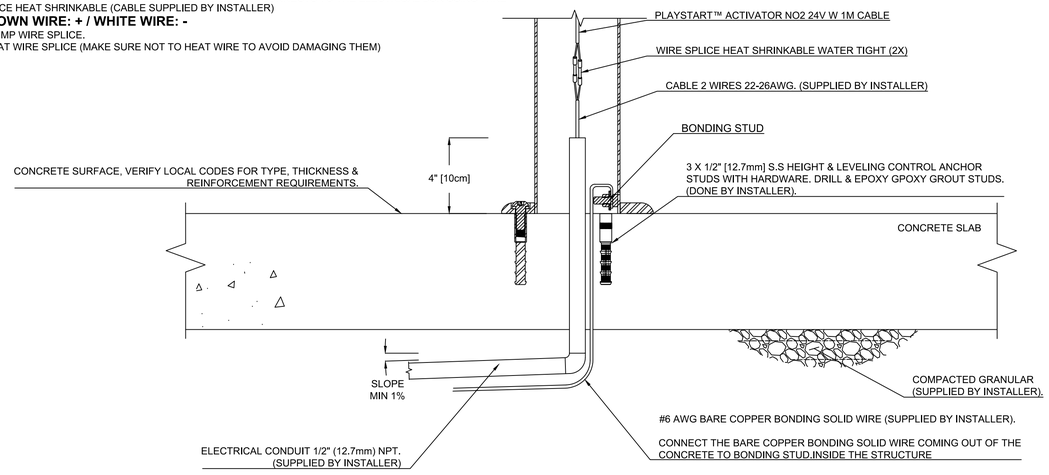
2) ANCHOR FOR CONCRETE INSTALLATION INSTRUCTIONS:

- DRILL 5/8" (15.875mm) HOLE, MIN. HOLE DEPTH 4 1/8" (104.8mm).
- CLEAN THE HOLE.
- FILL EPOXY ADHESIVE INTO HOLE TO APPROXIMATELY 1/3 TO HALF FULL.
- INSERT ANCHOR INTO HOLE.
- ALLOW EPOXY TO CURE PRIOR TO APPLYING MAXIMUM LOAD.

3) CONNECT THE ACTIVATOR CABLE TO THE CABLE THAT CONNECTS TO THE ELECTRICAL BOX USING WIRE SPLICE HEAT SHRINKABLE (CABLE SUPPLIED BY INSTALLER)

BROWN WIRE: + / WHITE WIRE: -

- CRIMP WIRE SPLICE.
- HEAT WIRE SPLICE (MAKE SURE NOT TO HEAT WIRE TO AVOID DAMAGING THEM)



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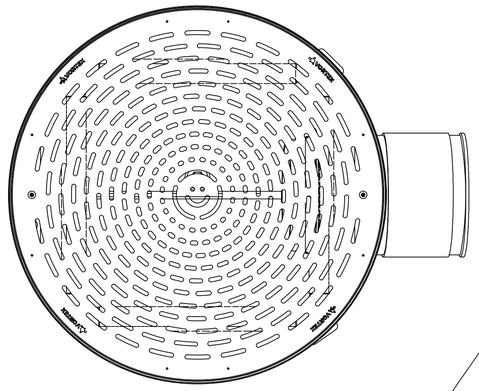
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VORTEX VOR-0622 ACTIVATOR No4

PROJECT NO. 00628066
SHEET F903

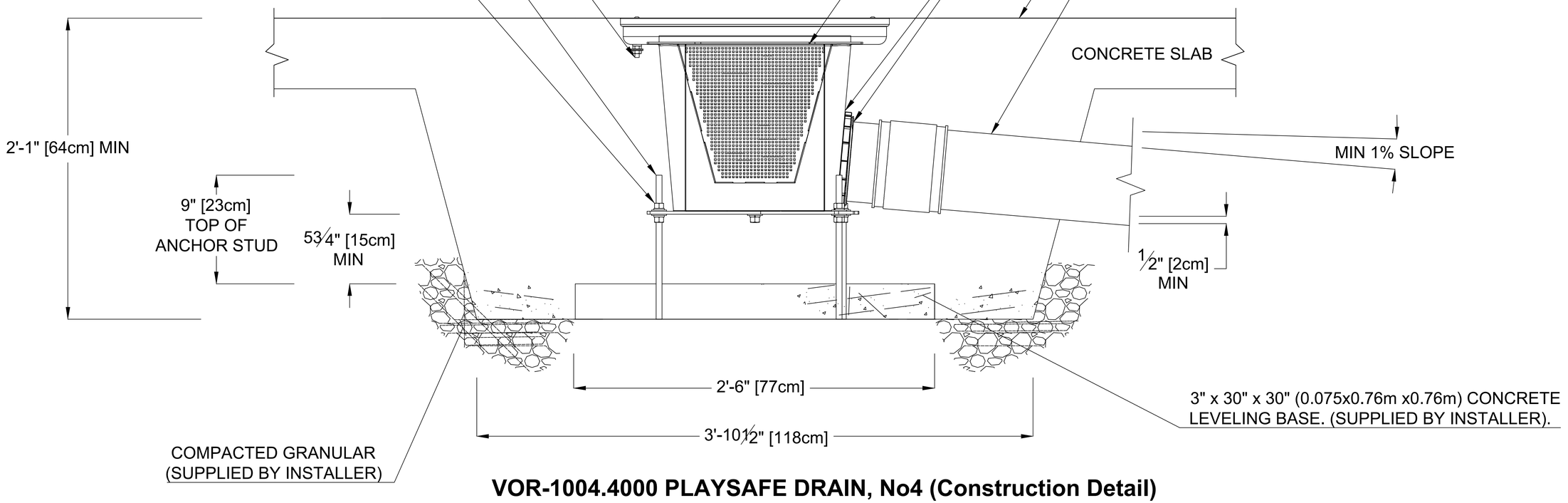
PLAN VIEW

Note:
1- Cover plate must be install during concrete pouring.



STRAINER BASKET
PART #: 33400.2100
STAINLESS STEEL 304 | THICKNESS: 14 GA
SQUARE OPENINGS: 0.15" (3.8mm)
(SOLD SEPARATELY)

FRONT ELEVATION VIEW



VOR-1004.4000 PLAYSAFE DRAIN, No4 (Construction Detail)

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VORTEX VOR-1004 PLAYSAFE DRAIN, No4

PROJECT NO. 00628066
SHEET F904

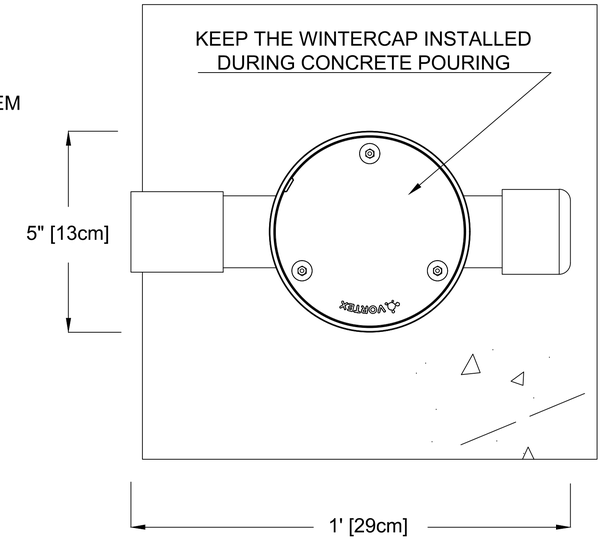
NOTES:

1) “BY INSTALLER/BY CONTRACTOR“ MAY REFER TO
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PLEASE REFER TO PROJECT SPECIFICATION FOR DETAILS OF RESPONSIBILITY.

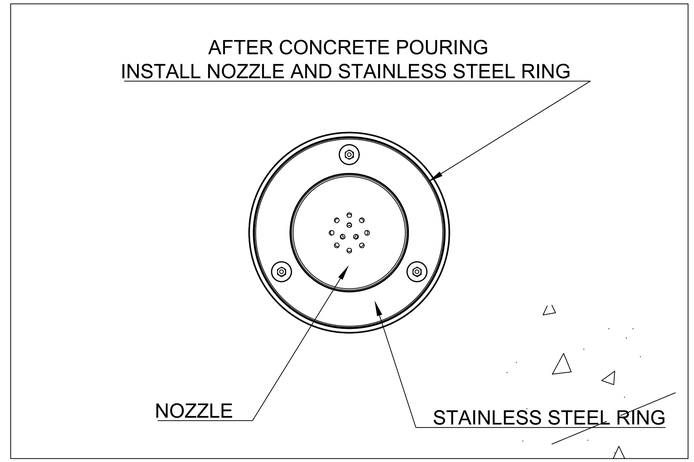
2) POLYMER ENCAPSULATED ASSEMBLY
NO EARTH GROUNDING AND NO BONDING RECOMMENDED FOR SPRAYLINKTM SYSTEM
FOLLOW LOCAL CODE

3) REFER TO INSTALLATION GUIDE FOR MORE DETAILS.

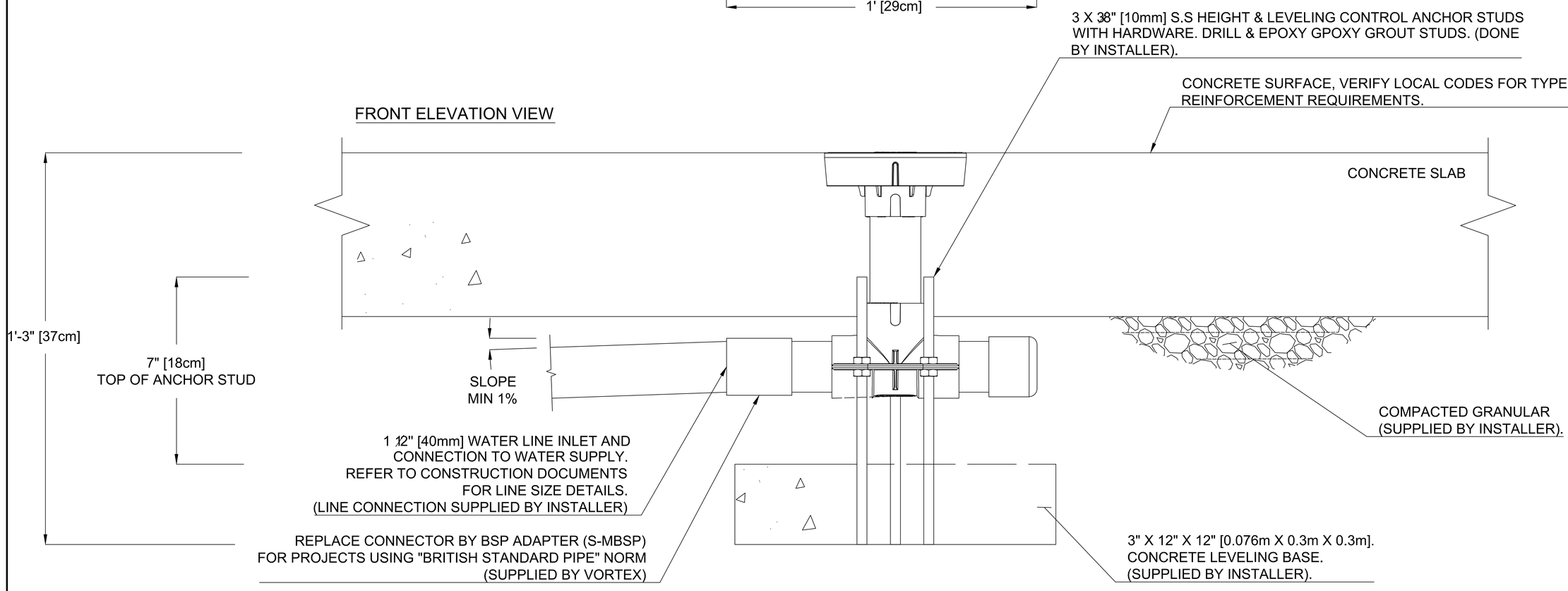
PLAN VIEW



PLAN VIEW



FRONT ELEVATION VIEW



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VORTEX VOR-3007 SPRAYLINK FOUNTAIN

PROJECT NO. 00628066
SHEET F905

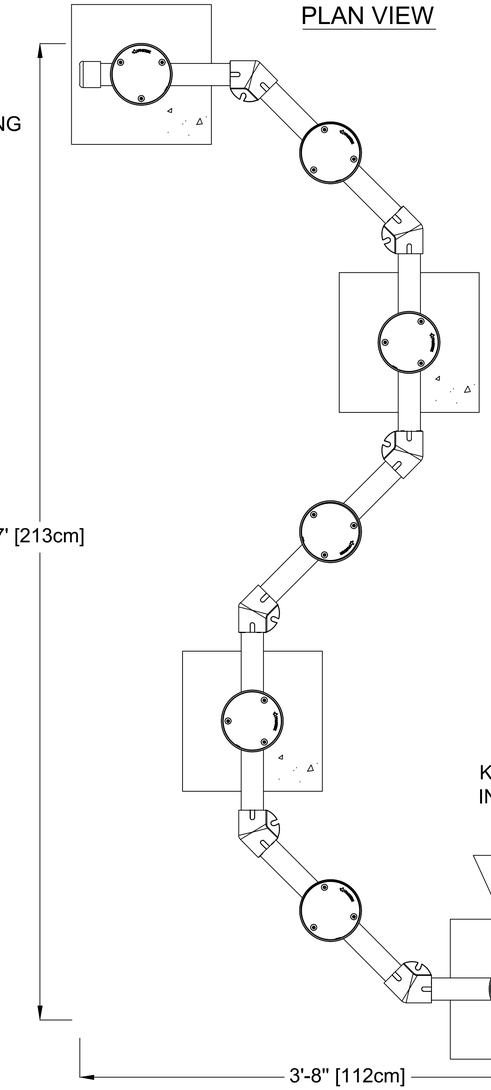
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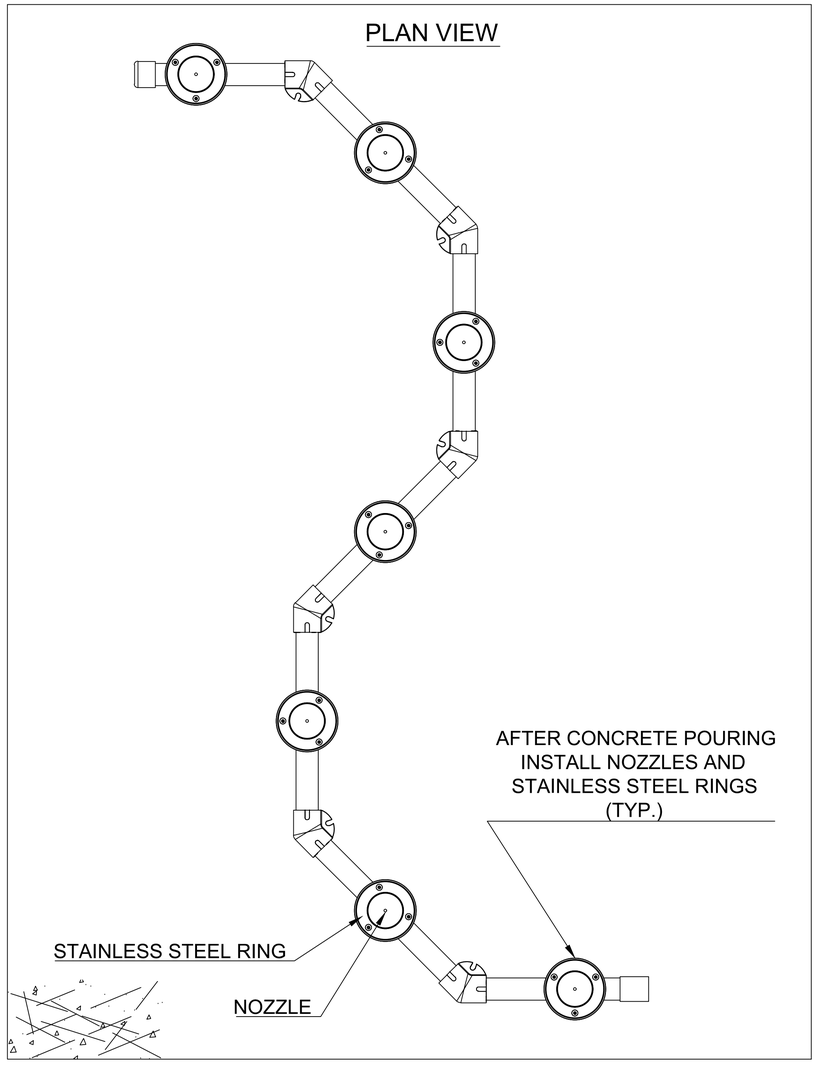
2) POLYMER ENCAPSULATED ASSEMBLY NO EARTH GROUNDING AND NO BONDING RECOMMENDED FOR SPRAYLINKTM SYSTEM. FOLLOW LOCAL CODE

3) REFER TO INSTALLATION GUIDE FOR MORE DETAILS.

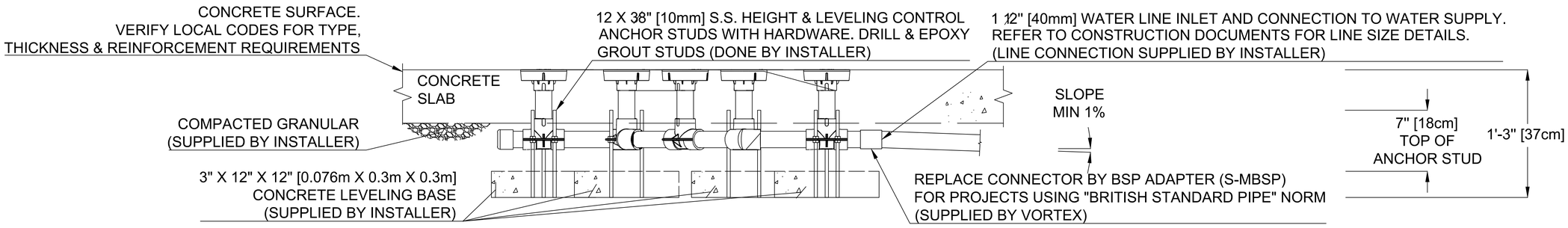
PLAN VIEW



PLAN VIEW



FRONT ELEVATION VIEW



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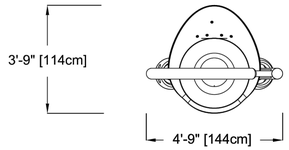
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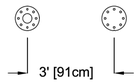
VORTEX VOR-3057 SPRAYLINK WAVE

PROJECT NO. 00628066
SHEET F906

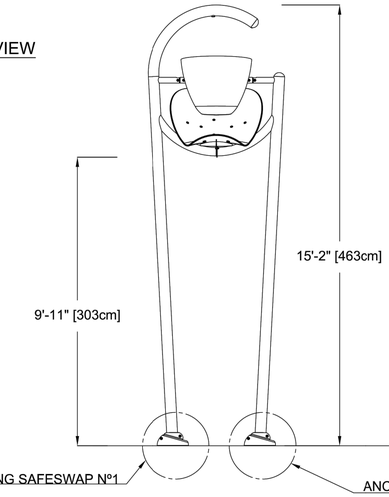
PLAN VIEW



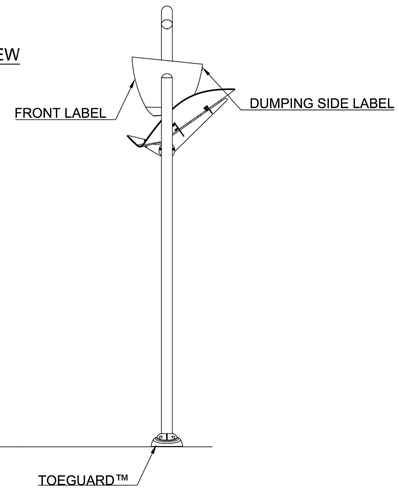
ANCHORING LOCATION

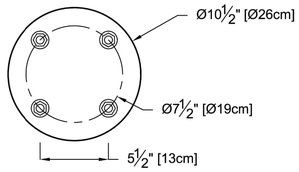


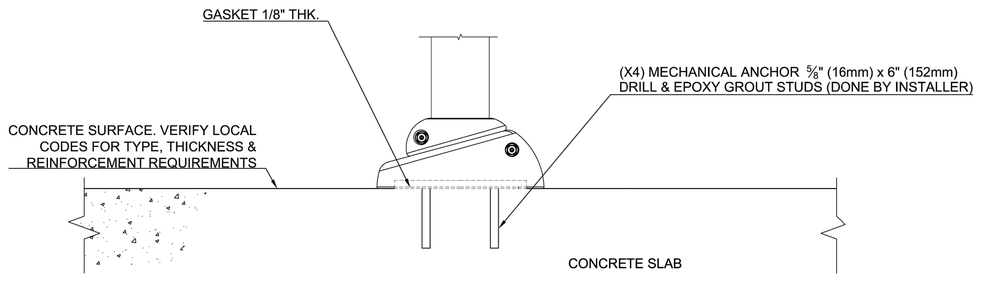
FRONT ELEVATION VIEW



SIDE ELEVATION VIEW







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	DESIGNED BY: KEF	.	.	.	.
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PLOT DATE: 3/20/2025 2:57 PM, G:\00\00628\00628066\CADD\Construction Documents\00628066 Splash Pad Plan.dwg

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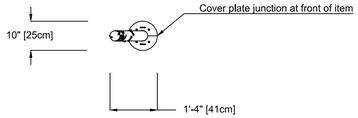
WADE BOWL PARK SPLASH PAD
CITY OF SUPERIOR
DOUGLAS COUNTY, WISCONSIN

VORTEX VOR-7242 TWINSPLASH

PROJECT NO. 00628066

SHEET F907

PLAN VIEW



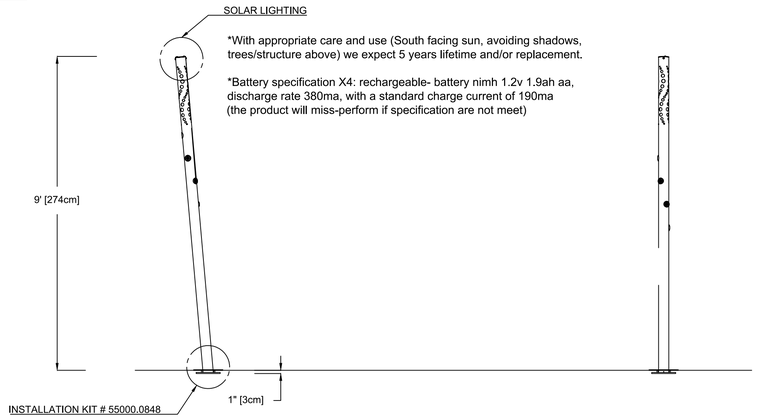
SAFESWAP ORIENTATION VIEW

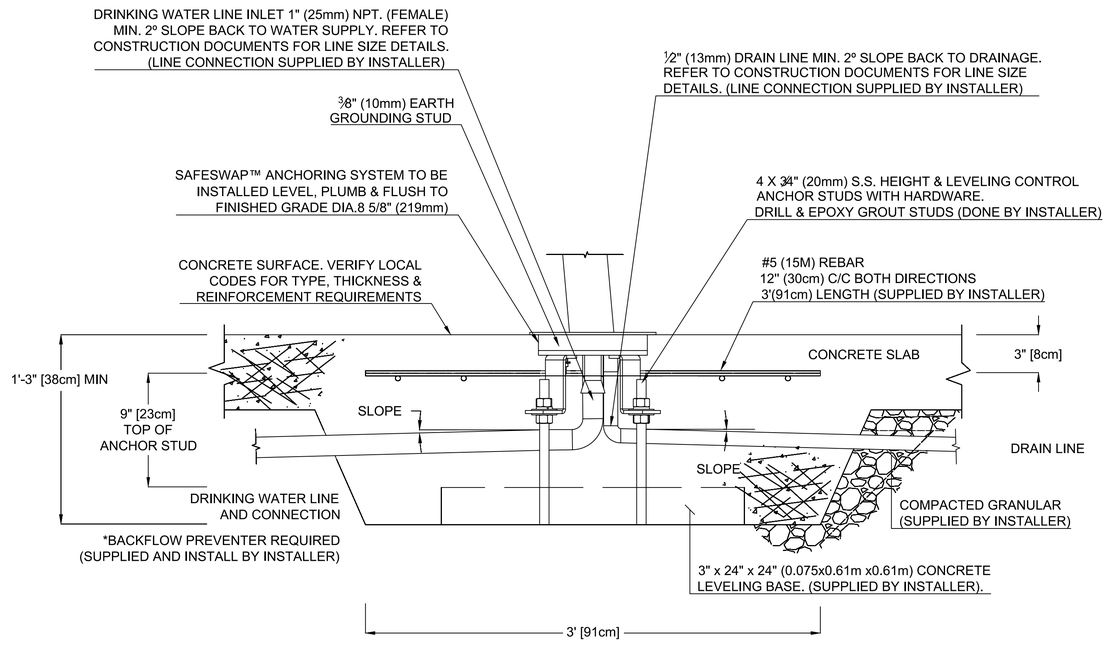


THE PRODUCT SHOULD BE CONNECTED TO DRINKING WATER.

SIDE ELEVATION VIEW

FRONT ELEVATION VIEW





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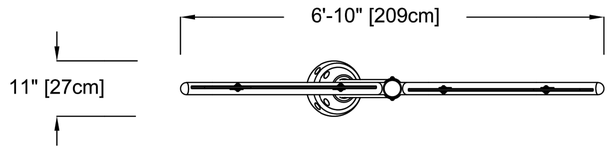
WADE BOWL PARK SPLASH PAD
CITY OF SUPERIOR
DOUGLAS COUNTY, WISCONSIN

VORTEX VOR-7247 GLOMIST

PROJECT NO. 00628066

SHEET F908

PLAN VIEW



FRONT ELEVATION VIEW

SIDE ELEVATION VIEW

ASSEMBLY INSTRUCTIONS:

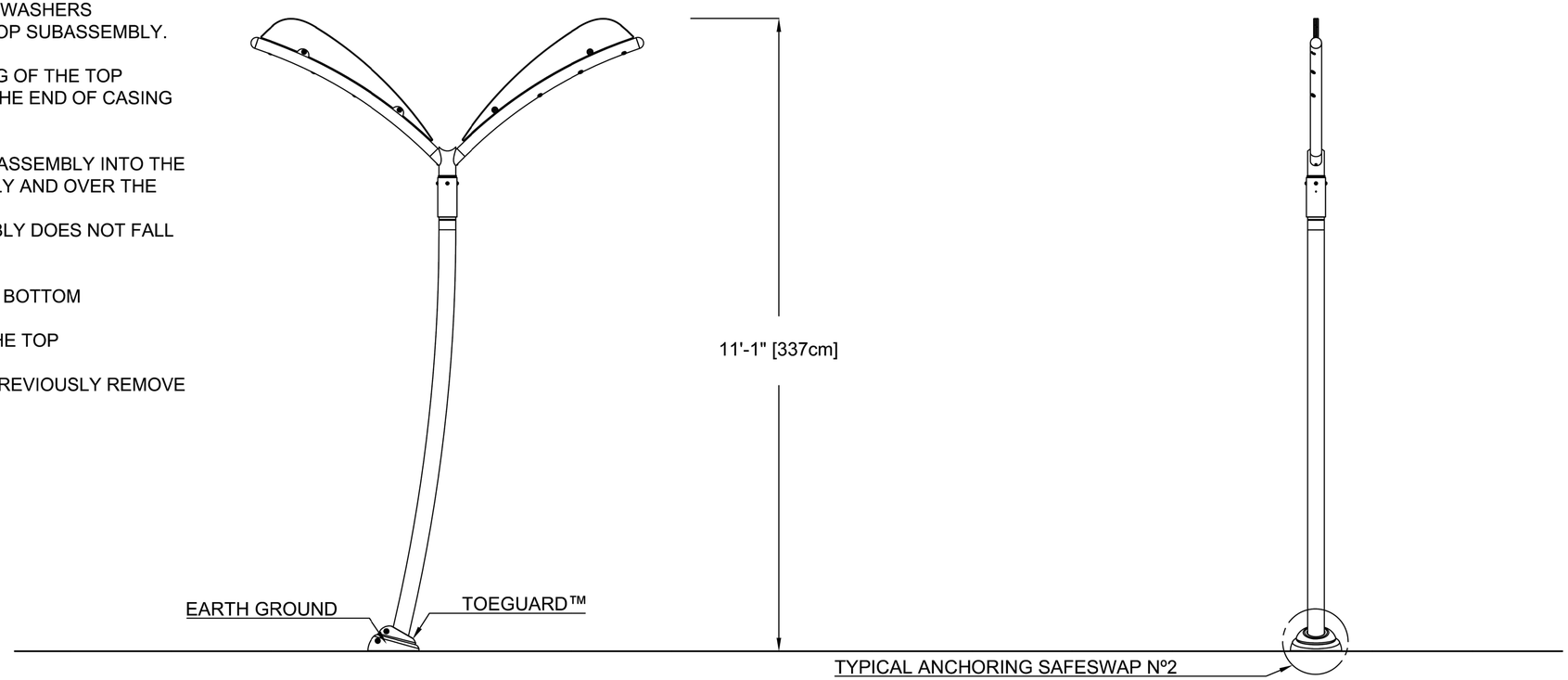
1- WHILE THE PRODUCT IS IN A HORIZONTAL POSITION, REMOVE THE SCREWS AND WASHERS FROM THE BOTTOM CASING OF THE TOP SUBASSEMBLY.

2- REMOVE TAPE OVER END OF CASING OF THE TOP SUBASSEMBLY. ENSURE BEARING IN THE END OF CASING DOES NOT FALL OUT.

3- SLIDE THE CASING OF THE TOP SUBASSEMBLY INTO THE CASING OF THE BOTTOM SUBASSEMBLY AND OVER THE SHAFT
ENSURE BEARING IN TOP SUBASSEMBLY DOES NOT FALL OUT.

4- ALIGN HOLES OF CASING FROM THE BOTTOM SUBASSEMBL
WITH THE HOLES OF THE CASING IN THE TOP SUBASSEMBLY.
RE-INSTALL WASHERS AND SCREWS PREVIOUSLY REMOVE FROM TOP SUBASSEMBLY.

5- INSTALL FEATURE ONTO ANCHOR.



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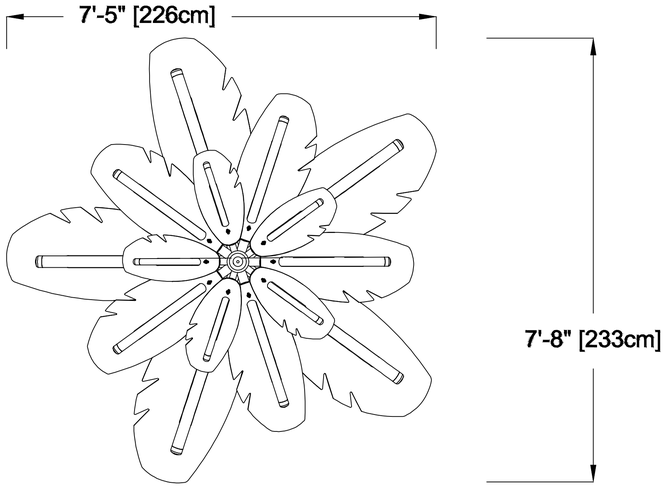
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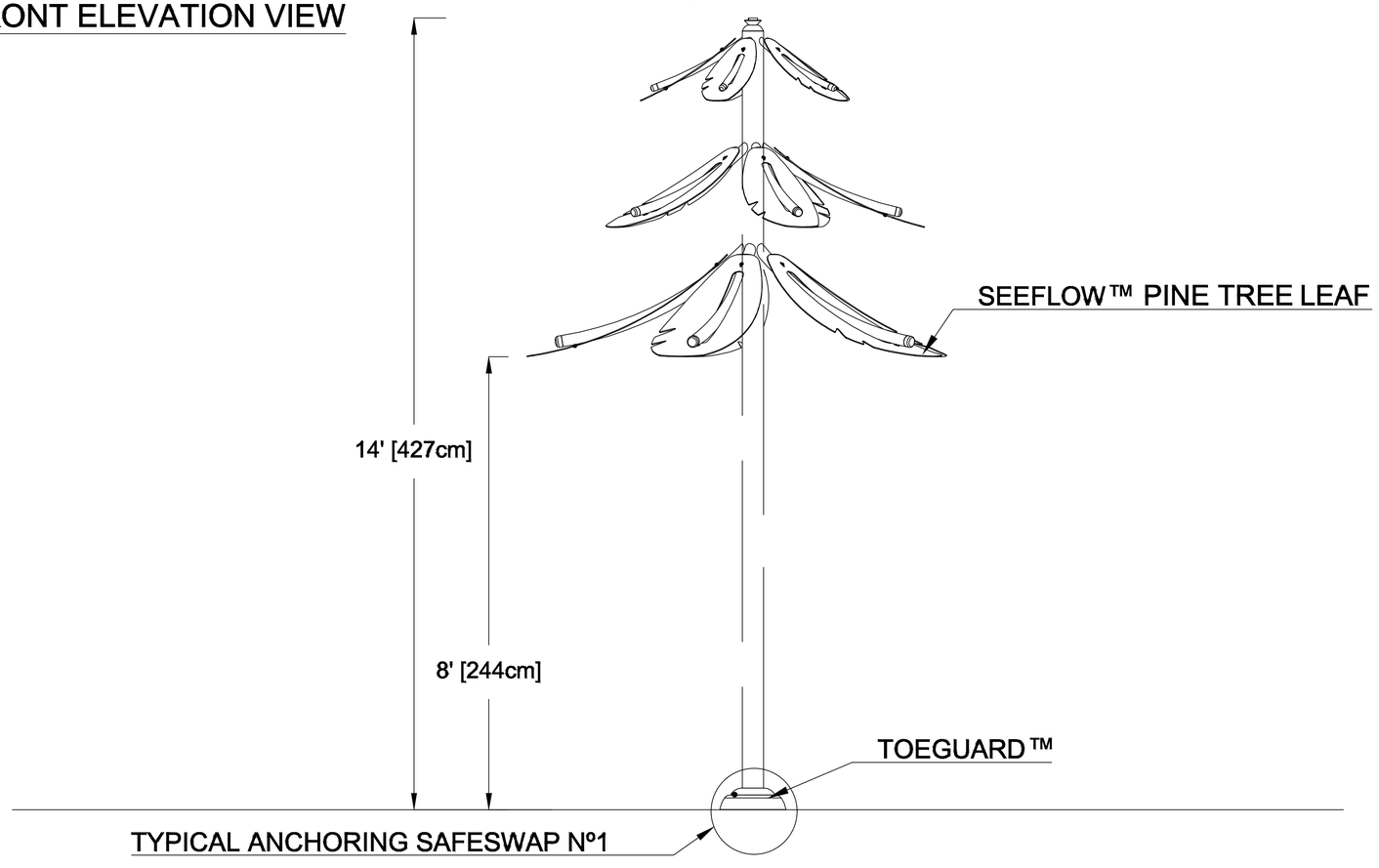
VORTEX VOR-7798 HELICO NANO

PROJECT NO. 00628066
SHEET F909

PLAN VIEW



FRONT ELEVATION VIEW



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VORTEX VOR-8610 PINE TREE

PROJECT NO. 00628066

SHEET F910