

WESTSIDE PARK

MCVAY FAMILY REFLECTION GARDEN YANKTON, SOUTH DAKOTA

CLIENT:



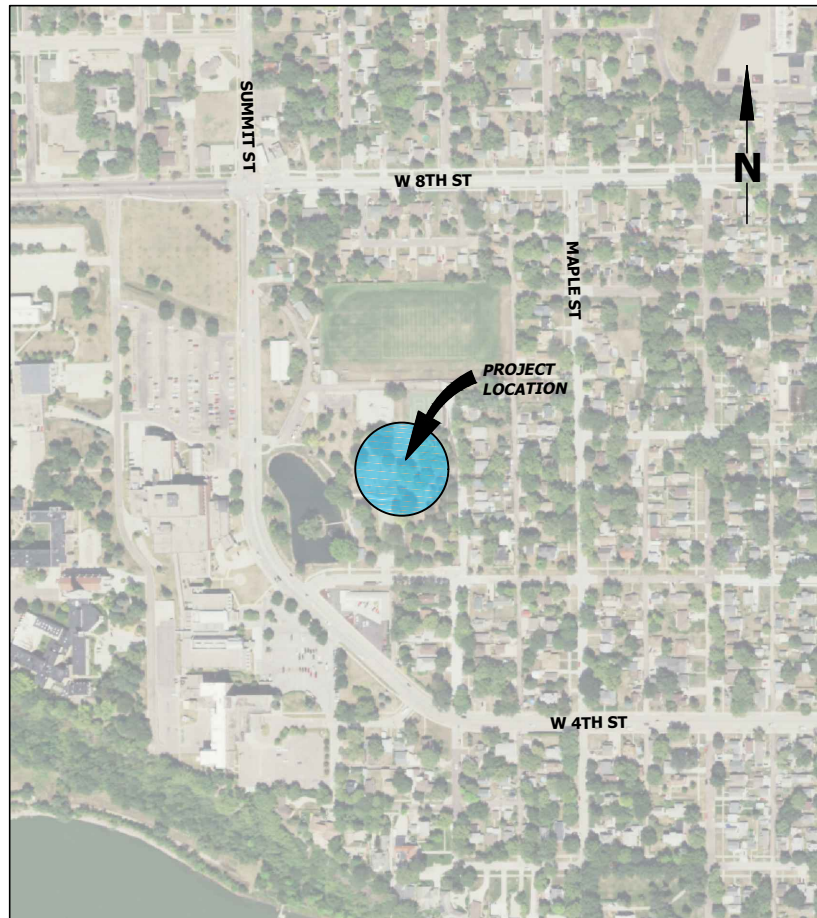
CITY OF YANKTON
416 WALNUT ST
P.O. BOX 176
YANKTON, SOUTH DAKOTA 57078
PH: 605.668.5221
FAX: 605.668.5265

MAYOR:
STEPHANIE MOSER

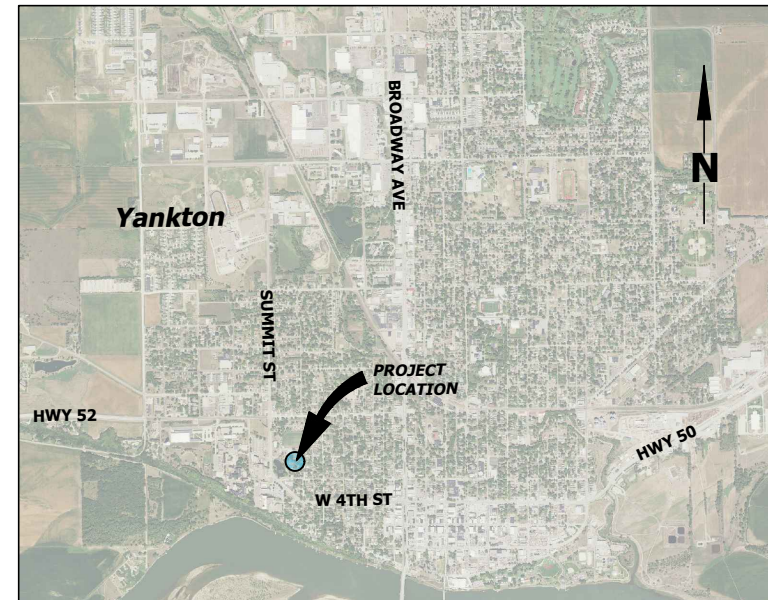
CITY STAFF:
AMY LEON, CITY MANAGER
AL VIERECK, CITY FINANCE OFFICER
TODD LARSON, PARKS & RECREATION DIRECTOR
ADAM HABERMAN, PUBLIC WORKS DIRECTOR

STOCKWELL NO. 22199

LOCATION MAP:



VICINITY MAP (LOCAL):



LEGEND OF LINE TYPES:

	- CENTERLINE
	- PROPERTY LINE
	- SECTION LINE
	- QUARTER LINE
	- MAJOR CONTOUR
	- MINOR CONTOUR
	- WATER MAIN
	- STORM SEWER
	- SANITARY SEWER
	- SANITARY SEWER FORCE MAIN
	- COMBINED SEWER
	- GAS MAIN
	- UNDERGROUND POWER
	- OVERHEAD POWER
	- FIBER OPTIC
	- CONC. CURB & GUTTER
	- APPROACH
	- WOOD FENCE
	- CHAIN LINK FENCE
	- BARBED WIRE FENCE

LEGEND OF SYMBOLS:

	- DECIDUOUS TREE		- UTILITY CLOSURE
	- CONIFEROUS TREE		- WELL
	- TREE STUMP		- WATERMAIN SHUTOFF
	- SHRUB		- FIRE HYDRANT
	- SIGN		- WATERMAIN VALVE & BOX
	- PARKING METER POST		- WATERMAIN CAP
	- MAIL BOX		- UTILITY CLEANOUT
	- FLAGPOLE		- UTILITY RISER
	- SPRINKLER HEAD		- UTILITY METER
	- GAS VALVE		- STORM SEWER MANHOLE
	- TRAFFIC SIGNAL LIGHT		- SANITARY MANHOLE
	- POWER POLE		- WATER MANHOLE
	- GUY WIRE		- ELECTRIC MANHOLE
	- STREET LIGHT		- TELEPHONE MANHOLE
	- FLOOD LIGHT		- FIBER OPTIC MANHOLE
	- HISTORICAL STREET LIGHT		

UTILITY PROVIDER LIST:

WATER:
CITY OF YANKTON
KYLE GOODMANSON
315 WEST RIVERSIDE DRIVE
YANKTON, SD 57078
(605) 668-5272

WASTEWATER:
CITY OF YANKTON
KYLE GOODMANSON
315 WEST RIVERSIDE DRIVE
YANKTON, SD 57078
(605) 668-5272

STORM WATER:
CITY OF YANKTON
BRAD BIES
416 WALNUT STREET
YANKTON, SD 57078
(605) 668-5251

GAS:
MIDAMERICAN ENERGY COMPANY
NICOLLE RASMUSSEN
1200 SOUTH BLAUVELT AVENUE
SIOUX FALLS, SD 57105
(605) 373-6081

TELECOMMUNICATIONS:
MIDCO
GREG BUTHE
3507 S. DULUTH AVENUE
SIOUX FALLS, SD 57105
(605) 231-0400

VAST BROADBAND
JAY MORRISON
(605) 306-5099

CENTURYLINK
TREVOR JANSSEN
(605) 977-2848

ENERGY:
NORTHWESTERN ENERGY
NOAH KILONZO
313 CEDAR STREET
YANKTON, SD 57350
(605) 668-4604

Drawings indicate general utility locations only. Neither the correctness or completeness of locations are guaranteed.

Prior to excavation contact:
SOUTH DAKOTA ONE CALL
(1-800-781-7474)

PLANS ISSUED BY:

CIVIL ENGINEER /
LANDSCAPE ARCHITECT /
SURVEYOR

ELECTRICAL ENGINEER



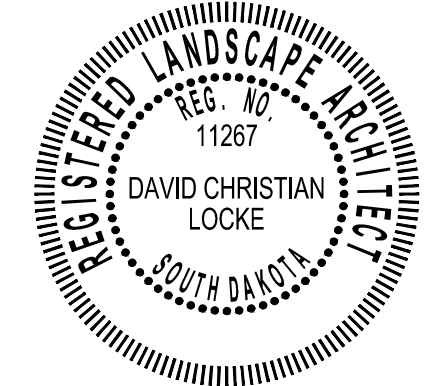
STOCKWELL ENGINEERS, INC.
801 N. PHILLIPS AVENUE, SUITE 100
SIOUX FALLS, SD 57104
PH: 605.338.6668
FAX: 605.338.8750



ASSOCIATED CONSULTING ENGINEERING, INC.
340 S. PHILLIPS AVENUE
SIOUX FALLS, SD 57104
605.335.3720

SHEET INDEX:

SHEET #	SHEET NAME
G-001	COVER SHEET
G-002	ORIENTATION & DATA CONTROL
C-001	GENERAL NOTES
C-100	TRAFFIC CONTROL PLAN
C-200	EROSION CONTROL PLAN
C-210	EROSION CONTROL DETAILS
C-300	EXISTING CONDITIONS & REMOVALS PLAN
C-400 THRU C-402	SITE PLAN
C-500	GRADING & UTILITY PLAN
C-600 THRU C-606	DETAILS
L-100	LANDSCAPING PLAN
L-200 THRU L-201	LANDSCAPING DETAILS
E1.01 THRU E3.04	ELECTRICAL NOTES & PLANS



I, David C. Locke, hereby certify that these plans, except where otherwise indicated, were prepared by me, or under my direct supervision and that I am a duly registered engineer under the laws of the State of South Dakota.

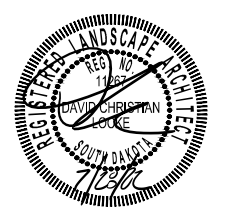
David C. Locke 1/28/22
David C. Locke LA S.D. No. 11267 Date



STOCKWELL
 STOCKWELL ENGINEERS, INC.
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WESTSIDE PARK
 MCVAY FAMILY REFLECTION GARDEN
 YANKTON, SOUTH DAKOTA
 SEE PROJECT #: 22199



PLOT DATE 7/25/2022 10:27 AM

BID SET

ORIENTATION & DATA CONTROL

G-002

CONTROL DATA			
POINT NUMBER	NORTHING	EASTING	ELEVATION
CP-1	10,909.540	52,985.900	1,250.050

GENERAL REQUIREMENTS

1.1 PROJECT INFORMATION

1.1.1 The Owner of the project is the City of Yankton. The City of Yankton has retained Stockwell Engineers to act as the Owner's representative. Contact information for each is provided below

City of Yankton
416 Walnut Street
Yankton, SD 57078
(605)668-5221

Stockwell Engineers
801 North Phillips Ave, Suite 100
Sioux Falls, SD 57104
(605)338-6668

1.2 DESCRIPTION OF WORK

1.2.1 This project consists of the addition of the McVay Family Reflection Garden at Westside Park in Yankton. Improvements include concrete sidewalks, landscaping, labyrinth, arbor, bench, retaining wall, pavers, and a sundial, as well as other work as identified in the technical drawings.

1.3 SPECIFICATION AND DRAWING CONVENTIONS

1.3.1 The specifications use certain conventions for the style of language and the intended meaning of certain terms, words, and phrases when used in particular situations. These conventions are as follows:

1.3.2 Imperative mood and streamlined language are generally used in the Specifications. The words "shall," "shall be," or "shall comply with," depending on the context, are implied where a colon (:) is used within a sentence or phrase.

1.3.3 Specification requirements are to be performed by Contractor unless specifically stated otherwise.

1.3.4 The General Notes of this section apply to the Work of all Sections in the Specifications.

1.4 SPECIFICATIONS TO BE USED

1.4.1 The Project Manual, together with the most current edition of the South Dakota Department of Transportation Standard Specifications for Roads and Bridges with Supplemental Specifications and Errata and required provisions, are hereby made a part of these specifications in its entirety unless otherwise revised, deleted, or supplemented herein.

1.4.2 The South Dakota Department of Transportation Standard Specifications for Roads and Bridges with Supplemental Specifications and Errata can be downloaded from the SDDOT's website at <http://www.sddot.com/>.

1.5 ORDER OF PRECEDENCE

1.5.1 If conflicts arise, the order of precedence of the contract documents shall be as follows: Drawings over Technical Specifications over Special Provisions over Supplemental Specifications over General Conditions over South Dakota Department of Transportation Supplemental Specifications and Errata over South Dakota Department of Transportation Standard Specifications for Roads and Bridges.

1.6 LOCAL ORDINANCES

1.6.1 The Contractor shall abide by all local, state, and federal ordinances or policies.

1.7 TIME PROVISIONS

1.7.1 Time provisions shall be as specified under Article 4 of the Agreement between Owner and Contractor.

1.8 SEQUENCE OF OPERATIONS

1.8.1 The following Sequence of Operation shall be followed unless an alternate Sequence of Operations is submitted in writing and approved by the Engineer. Work shall commence under this contract after all start date requirements are fulfilled and shall be completed within the time provisions specified. Notify the Engineer as start date requirements are approaching. After the Contractor has, in the opinion of the Engineer, satisfactorily completed all start date requirements in accordance with the contract documents, approval to commence work shall be given.

1.8.2 Construction may begin after the notice to proceed is issued and a preconstruction meeting is held, and in accordance with Article 4 of the Agreement between the Owner and the Contractor.

1.8.3 Special Conditions: Maintain temporary access to properties adjacent to the project whenever feasible. Always maintain temporary access to commercial businesses.

1.9 ACCESS TO SITE

1.9.1 The Project Site shall be within the property lines and easement areas as illustrated in the plans. Contractor shall have limited use of Project Site for construction operations as indicated in the construction documents. Driveways and entrances serving premises shall be kept clear and available to Owner, Owner's employees, and emergency vehicles at all times. Material storage and vehicle and equipment traffic shall be limited to the construction limits. Schedule deliveries to minimize space and time requirements for storage of material and equipment on-site.

1.9.2 All paved streets adjacent to the project are to be cleaned at the end of each working day.

1.9.3 It shall be the responsibility of the Contractor to coordinate with the property owners relating to access to their property and any subsequent damages.

1.10 WORK RESTRICTIONS

1.10.1 Contractor shall comply with limitations on use of public streets and with other requirements of authorities having jurisdiction. Onsite work hours shall be limited to the following:

1. Weekday Hours: dawn to dusk
2. Saturday Hours: dawn to dusk
3. Sunday Hours: prohibited unless approved by the Engineer
4. Holidays: Prohibited unless approved by the Engineer
5. Utility Shutdown Hours: 8:00 am to 5:00 pm

1.10.2 Utility Interruptions: Do not interrupt utilities unless the Work necessitates. Notify Engineer in writing two days in advance of proposed utility interruptions. Obtain Engineer's written permission before proceeding.

1.10.3 Disruptive Operations: Coordinate operations that may result in elevated levels of noise, vibration, odors, or other disruption with Engineer. Notify Engineer in writing two days in advance of proposed disruptive operations. Obtain Engineer's written permission before proceeding.

1.11 SUBSTITUTIONS

1.11.1 Refer to the General Conditions for substitution procedures.

1.12 CONTRACT MODIFICATION AND PAYMENT

1.12.1 Refer to the General Conditions for contract modification and payment procedures.

1.13 SCHEDULE OF VALUES

1.13.1 Prior to the preconstruction meeting, the Contractor shall submit to the Engineer a schedule of values as required in the General Conditions. The schedule of values shall be prepared in coordination with the Contractor's progress schedule. Where work is separated into phases requiring separately phased payments, provide sub schedules showing values coordinated with each phase of payment. The schedule of values shall be updated when requested by the Engineer.

1.14 LIST OF SUBCONTRACTOR AND SUPPLIERS

1.14.1 Prior to the preconstruction meeting, submit to the Engineer a summary identifying individuals or firms proposed for each portion of the Work, including those who are to furnish products or equipment to be fabricated. The list shall include the following information:

1. Name, address, telephone number, and email address of entity performing subcontract or supplying products
2. Description of related Work covered by subcontract
3. Drawing number and detail references, as appropriate, covered by subcontract
4. Names of key personnel who will be involved with the Work.

1.15 LIST OF CONTACTS

1.15.1 Prior to the pre-construction meeting, submit to the Engineer a list of key personnel. The list shall include superintendent and other personnel in attendance at Project Site. Identify individuals along with their duties and responsibilities. Include addresses, cellular telephone numbers and e-mail addresses.

1.16 PROGRESS SCHEDULE

1.16.1 In accordance with the General Conditions and prior to scheduling the pre-construction meeting, submit a preliminary progress schedule to the Engineer for approval. Prepare the schedule using current version of a computer program that was developed specifically to manage progress schedules. Approved programs include Microsoft Project, Primavera, Meridian Prolog or another equivalent program.

1.16.2 General Format: Develop schedule in bar and network format. Span schedule from date established for the Notice to Proceed to date of Readiness for Final Payment. Illustrate first workday of each week with a continuous vertical line. Block out and clearly label holidays. Illustrate each significant construction activity separately and indicate each activity's estimated start date, completion date, time duration, sequence requirements, and relationship to other activities. Indicate float or the amount of time an activity can be delayed without adversely affecting the early start of the successor activity.

1.16.3 Significant Milestones: Include milestones indicated in the Contract Documents in schedule, including, but not limited to, Notice to Proceed, Commencement Deadlines, Interim Completion dates, Substantial Completion, and Readiness for Final Payment.

1.16.4 Include a narrative that lists the Contractor's anticipated work hours. Describe the days of the week when operations are expected to occur and the associated hours for each day. List holidays and other anticipated days when work will not occur. Provide the estimated number of adverse weather days for each month.

1.16.5 After the Progress Schedule is approved, a preconstruction meeting can be scheduled. At monthly intervals, update schedule to reflect actual construction progress and activities. Issue revised schedule one week before each regularly scheduled coordination meeting. Include a report with updated schedule that indicates every change, including, but not limited to, changes in logic, durations, actual starts and finishes, and activity durations. As the Work progresses, indicate final completion percentage for each activity. Failure to submit schedules will result in the Owner withholding payment until the updated schedule is submitted.

1.16.6 When periodic update indicates the Work is behind the current approved schedule, submit a report indicating means by which Contractor intends to regain compliance with the schedule. Indicate changes to working hours, working days, crew sizes, equipment required to achieve compliance, and date by which the schedule will be regained.

1.17 SCHEDULE OF SUBMITTALS

1.17.1 Prior to the pre-construction meeting, deliver to the Engineer a Submittal Schedule as required in the General Conditions. The Schedule of Submittals shall be prepared in coordination with the Contractor's Progress Schedule and Schedule of Values. Include time required for review, ordering, manufacturing, fabrication, and delivery when establishing dates. Include additional time required for making corrections or revisions to submittals noted by Engineer and additional time for handling and reviewing submittals required by those corrections.

1.18 GENERAL COORDINATION PROCEDURES

1.18.1 Coordination: Coordinate operations included in different Sections of the Specifications to ensure efficient and orderly installation of each part of the Work, including those that depend on each other for proper installation, connection, and operation. Make adequate provisions to accommodate items scheduled for later installation.

1.18.2 Administrative Procedures: Coordinate scheduling and timing of required administrative procedures with other construction activities to avoid conflicts and to ensure orderly progress of the Work. Such administrative activities include, but are not limited to the following:

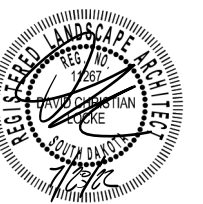
1. Preparation of Contractor's Progress Schedule.
2. Preparation of the Schedule of Values.
3. Installation and removal of temporary facilities and controls.
4. Delivery and processing of submittals.
5. Progress meetings.
6. Preinstallation conferences.
7. Project closeout activities.
8. Startup and adjustment of systems.



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801 N. PHILLIPS AVE., SUITE 100
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WESTSIDE PARK
MCVAY FAMILY REFLECTION GARDEN
YANKTON, SOUTH DAKOTA
SEI Project #: 22199



Plot Time: 7/25/2022 1:37 PM

BID SET

GENERAL
NOTES

C-001

1.19 REQUEST FOR INFORMATION (RFI):

1.19.1 General: Immediately on discovery of the need for additional information, clarification, or interpretation of the Contract Documents, Contractor shall prepare and submit an RFI in the form specified. Coordinate and submit RFIs in a prompt manner so as to avoid delays in Contractor's work or work of subcontractors. Include a detailed, legible description of item needing information or interpretation and the following:

1. Project name.
2. Project number.
3. Date.
4. Name of Contractor.
5. Name of Engineer.
6. RFI number, numbered sequentially.
7. RFI subject.
8. Specification Section number and title and related paragraphs, as appropriate.
9. Drawing number and detail references, as appropriate.
10. Field dimensions and conditions, as appropriate.
11. Contractor's suggested resolution. If Contractor's suggested resolution impacts the Contract Time or the Contract Sum, Contractor shall state impact in the RFI.
12. Contractor's signature.
13. Attachments: Include sketches, descriptions, measurements, photos, Product Data, Shop Drawings, coordination drawings, and other information necessary to fully describe items needing interpretation.

1.19.2 Engineer will review each RFI, determine action required, and respond. Allow seven working days for Engineer's response for each RFI. The following Contractor generated RFIs will be returned without action:

1. Requests for approval of submittals.
2. Requests for approval of substitutions.
3. Requests for approval of Contractor's means and methods.
4. Requests for coordination information already indicated in the Contract Documents.
5. Requests for adjustments in the Contract Time or the Contract Sum.
6. Requests for interpretation of Architect's actions on submittals.
7. Incomplete RFIs or inaccurately prepared RFIs.

1.19.3 Engineer's action may include a request for additional information, in which case Engineer's time for response will date from time of receipt by Engineer of additional information. Engineer's action of RFIs that may result in a change to the Contract Time, or the Contract Price may require a Change Order as specified in the General Conditions of the Contract.

1.20 DIGITAL DATA FILES

1.20.1 Digital data files of Engineer's CAD drawings will be provided by Engineer for Contractor's use during construction. Contractor may use digital data files in preparing coordination drawings, Shop Drawings, and Project record Drawings. Engineer makes no representations as to the accuracy or completeness of digital data files as they relate to Contract Drawings. Contractor and those subcontractors granted access by Contractor, shall execute a data licensing agreement in form acceptable to Engineer.

1.21 PROJECT MEETINGS

1.21.1 General: The Contractor shall schedule and conduct meetings and conferences at Project site unless otherwise indicated. Inform participants and others involved, and individuals whose presence is required, of date and time of each meeting. Notify Engineer of scheduled meeting dates and times a minimum of 10 working days prior to meeting.

1.21.2 Preconstruction Meeting: Schedule and conduct a preconstruction conference in accordance with the General Conditions.

1. Attendees: Authorized representatives of Owner, Engineer and their consultants, Contractor and its superintendent, major contractors, suppliers, and other concerned parties shall attend the conference. Participants at the conference shall be familiar with Project and authorized to conclude matters relating to the Work.

2. Agenda: Discuss procedures and items of significance that could affect progress, including responsibilities and personnel assignments, tentative construction schedule, phasing, critical work sequencing and long lead items, designation of key personnel and their duties, lines of communications, use of web-based Project software, procedures for processing field decisions and change orders, procedures for RFIs, Procedures for testing and inspecting, procedures for processing Applications for Payment, distribution of the Contract Documents, submittal procedures, use of the premises, work restrictions, working hours, Owner's occupancy requirements, responsibility for temporary facilities and controls, procedures for disruptions and shutdowns, parking availability, staging areas, equipment deliveries and priorities, safety, security, and progress cleaning.

1.21.3 Coordination Meetings: Contractor shall conduct Project coordination meetings at biweekly intervals. Project coordination meetings are in addition to specific meetings held for other purposes. Coordination meetings shall be held at a time and location approved by the Engineer.

1. Attendees: In addition to representatives of Owner, and Engineer, each contractor, subcontractor, supplier, and other entity concerned with current progress or involved in planning, coordination, or performance of future activities shall be represented at these meetings. All participants at the meetings shall be familiar with Project and authorized to conclude matters relating to the Work. Private utility owners, the general public, and those interested in the current progress or performance of future activities shall be invited to attend. The Contractor will provide a summary of the project schedule and will answer questions. The public will then be dismissed, and the remaining attendees will discuss construction coordination and other items as needed.

2. Agenda: Review and correct or approve minutes of the previous coordination meeting. Review other items of significance that could affect progress. Include topics for discussion as appropriate to status of Project. Review progress since the last coordination meeting. Determine whether each contract is on time, ahead of schedule, or behind schedule, in relation to combined Contractor's construction schedule. Determine how construction behind schedule will be expedited; secure commitments from parties involved to do so. Discuss whether schedule revisions are required to ensure that current and subsequent activities will be completed within the Contract Time. Revise combined Contractor's construction schedule after each coordination meeting where revisions to the schedule have been made or recognized. Issue revised schedule concurrently with report of each meeting. Review present and future needs of each contractor present, including interface requirements, sequence of operations, status of submittals, deliveries, off-site fabrication, access, site use, temporary facilities and controls, work hours, hazards and risks, progress cleaning, quality and work standards, status of RFIs, proposal requests, change orders or pending changes. Record meeting results and distribute copies to everyone in attendance and to others affected by decisions or actions resulting from each meeting.

1.22 SUBMITTALS

1.22.1 Submittal procedures are specified in the General Conditions. Deliver submittals in form acceptable to Engineer. Include a transmittal or cover letter listing the following:

1. Name of the Project
2. Date transmitted
3. Name of the Engineer
4. Name of the Contractor
5. Name of firm or entity that prepared the submittal
6. Submittal purpose and description
7. References to specification section with paragraph number and generic name sited.
8. Drawing number and detail references, as appropriate
9. Location(s) where product is to be installed, as appropriate
10. Other necessary identification
11. Remarks
12. Identify options requiring selection by Engineer
13. Signature of transmitter

1.22.2 On each submittal, clearly indicate deviations from requirements in the Contract Documents, including minor variations and limitations; include relevant additional information and revisions, other than those requested by Engineer on previous submittals. Indicate by highlighting on each submittal or noting on attached separate sheet. Site references to specification section, drawing number or detail with paragraph number and generic name.

1.22.3 Prepare and deliver submittals required by individual specification sections. A non-comprehensive list is provided below.

1. Progress Schedule
2. Schedule of Values
3. Schedule of Submittals
4. List of Subcontractors and Suppliers
5. Contact List
6. Asphalt/Concrete job mix formula
7. Materials Certifications
8. Shop Drawings
9. DANR Contractor Authorization Form

1.22.4 Shop Drawings: Prepare Project-specific information, drawn accurately to scale. Do not base Shop Drawings on reproductions of the Contract Documents or standard printed data. Fully illustrate requirements in the Contract Documents. Include identification of products, schedules, compliance with specified standards, notation of coordination requirements, notation of dimensions established by field measurement, relationship, and attachment to adjoining construction clearly indicated, seal and signature of professional engineer if specified.

1.22.5 Incomplete submittals will be rejected and returned for resubmittal without review. Engineer will discard submittals received from sources other than Contractor.

1.23 ACCEPTANCE TESTING

1.23.1 Refer to the General Conditions for acceptance testing procedures.

1.23.2 Owner will furnish Contractor with names, addresses, and telephone numbers of testing agencies engaged and a description of types of testing and inspection they are engaged to perform. Costs for retesting and reinspecting construction that replaces or is necessitated by work that failed to comply with the Contract Documents will be charged to Contractor, and a Change Order will adjust the Contract Sum.

1.23.3 Notify testing agencies at least 24 hours in advance of time when Work that requires testing or inspection will be performed. Testing and inspection requested by Contractor and not required by the Contract Documents are Contractor's responsibility.

1.24 CONFLICTING REQUIREMENTS

1.24.1 Conflicting Standards and Other Requirements: If compliance with two or more standards or requirements are specified and the standards or requirements establish different or conflicting requirements for minimum quantities or quality levels, comply with the most stringent requirement. Refer conflicting requirements that are different, but apparently equal, to Engineer for direction before proceeding.

1.24.2 Minimum Quantity or Quality Levels: The quantity or quality level shown or specified shall be the minimum provided or performed. The actual installation may comply exactly with the minimum quantity or quality specified, or it may exceed the minimum within reasonable limits. To comply with these requirements, indicated numeric values are minimum or maximum, as appropriate, for the context of requirements. Refer uncertainties to Engineer for a decision before proceeding.

1.25 REFERENCES

1.25.1 Industry Standards: Unless the Contract Documents include more stringent requirements, applicable construction industry standards have the same force and effect as if bound or copied directly into the Contract Documents to the extent referenced. Such standards are made a part of the Contract Documents by reference. Each entity engaged in construction on Project should be familiar with industry standards applicable to its construction activity. Copies of applicable standards are not bound with the Contract Documents. Where copies of standards are needed to perform a required construction activity, obtain copies directly from publication source.

1.25.2 Where abbreviations and acronyms are used in Specifications or other Contract Documents, they shall mean the recognized name of the entities indicated in Gale's "Encyclopedia of Associations: National Organizations of the U.S." or in Columbia Books' "National Trade & Professional Associations of the United States."



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Plot Time: 7/25/2022 1:37 PM

BID SET

GENERAL
NOTES

C-002

1.26 TEMPORARY FACILITIES

1.26.1 Coordinate construction and use of temporary facilities with consideration given to conservation of energy, water, and materials. Coordinate use of temporary utilities to minimize waste. Salvage materials and equipment involved in performance of, but not actually incorporated into, the Work. See other Sections for disposition of salvaged materials that are designated as Owner's property. Locate facilities where they will serve Project adequately and result in minimum interference with performance of the Work. Relocate, modify, and repair facilities as required by progress of the Work. Locate facilities to limit site disturbance.

1.26.2 Temporary Roads and Paved Areas: Construct and maintain temporary roads and paved areas adequate for construction operations. Locate temporary roads and paved areas within construction limits indicated on Drawings. Provide dust-control treatment that is nonpolluting and nontracking. Reapply treatment as required to minimize dust.

1.26.3 Traffic Controls: Comply with requirements of authorities having jurisdiction. Protect existing site improvements to remain including curbs, pavement, and utilities. Maintain access for fire-fighting equipment and access to fire hydrants.

1.26.4 Parking: Provide temporary or use designated areas of Owner's existing parking areas for construction personnel.

1.26.5 Dewatering Facilities and Drains: Comply with requirements of authorities having jurisdiction. Review existing storm water runoff patterns and facilities. Maintain Project site, excavations, and construction free of water. Dispose of rainwater in a lawful manner that will not result in flooding Project or adjoining properties or endanger permanent Work or temporary facilities. Remove snow and ice as required to minimize accumulations.

1.26.6 Waste Disposal Facilities: Provide waste-collection containers in sizes adequate to handle waste from construction operations. Comply with requirements of authorities having jurisdiction

1.27 SECURITY AND PROTECTION OF FACILITIES

1.27.1 Protection of Existing Facilities: Protect existing vegetation, equipment, structures, utilities, and other improvements at Project site and on adjacent properties, except those indicated to be removed or altered. Repair damage to existing facilities. Where access to adjacent properties is required in order to affect protection of existing facilities, obtain written permission from adjacent property owner to access property for that purpose.

1.27.2 Environmental Protection: Provide protection, operate temporary facilities, and conduct construction as required to comply with environmental regulations and that minimize possible air, waterway, and subsoil contamination or pollution or other undesirable effects.

1.27.3 Temporary Erosion and Sediment Control: Comply with requirements of EPA Construction General Permit or authorities having jurisdiction, whichever is more stringent, and requirements specified in the plans.

1.27.4 Storm Water Control: Comply with requirements of authorities having jurisdiction. Review existing storm water runoff patterns and facilities. Provide barriers in and around excavations and subgrade construction to prevent flooding by runoff of stormwater from heavy rains. Install manhole construction plate markers to protect sanitary sewer facilities from inflow. Repair damage caused by improper temporary drainage facilities at Contractor's expense.

1.28 PRODUCT DELIVERY, STORAGE, AND HANDLING

1.28.1 Deliver, store, and handle products using means and methods that will prevent damage, deterioration, and loss, including theft and vandalism. Comply with manufacturer's written instructions.

1.28.2 Delivery and Handling: Schedule delivery to minimize long-term storage at Project site and to prevent overcrowding of construction spaces. Coordinate delivery with installation time to ensure minimum holding time for items that are flammable, hazardous, easily damaged, or sensitive to deterioration, theft, and other losses. Deliver products to Project site in an undamaged condition in manufacturer's original sealed container or other packaging system, complete with labels and instructions for handling, storing, unpacking, protecting, and installing. Inspect products on delivery to determine compliance with the Contract Documents and to determine that products are undamaged and properly protected.

1.28.3 Storage: Store products to allow for inspection and measurement of quantity or counting of units. Store materials in a manner that will not endanger Project structure. Store products that are subject to damage by the elements, under cover in a weathertight enclosure above ground, with ventilation adequate to prevent condensation. Protect foam plastic from exposure to sunlight, except to extent necessary for period of installation and concealment. Comply with product manufacturer's written instructions for temperature, humidity, ventilation, and weather-protection requirements for storage. Protect stored products from damage and liquids from freezing.

1.29 PRODUCT WARRANTIES

1.29.1 Warranties specified in other Sections shall be in addition to, and run concurrent with, other warranties required by the Contract Documents. Manufacturer's disclaimers and limitations on product warranties do not relieve Contractor of obligations under requirements of the Contract Documents.

1.30 EXAMINATION, PREPARATION, AND CONSTRUCTION LAYOUT

1.30.1 Existing Conditions: The existence and location of underground and other utilities and construction indicated as existing are not guaranteed. Before beginning sitework, investigate and verify the existence and location of underground utilities, mechanical and electrical systems, and other construction affecting the Work. Before construction, verify the location and invert elevation at points of connection of sanitary sewer, storm sewer, and water-service piping; underground electrical services; and other utilities. Furnish location data for work related to Project that must be performed by public utilities serving Project site.

1.30.2 Examination and Acceptance of Conditions: Before proceeding with each component of the Work, examine substrates, areas, and conditions, with Installer or Applicator present where indicated, for compliance with requirements for installation tolerances and other conditions affecting performance. Record observations. Proceed with installation only after unsatisfactory conditions have been corrected. Proceeding with the Work indicates acceptance of surfaces and conditions.

1.30.3 Existing Utility Information: Furnish information to local utility owner that is necessary to adjust, move, or relocate existing utility structures, utility poles, lines, services, or other utility appurtenances located in or affected by construction. Coordinate with authorities having jurisdiction.

1.30.4 Field Measurements: Take field measurements as required to fit the Work properly. Recheck measurements before installing each product. Where portions of the Work are indicated to fit to other construction, verify dimensions of other construction by field measurements before fabrication. Coordinate fabrication schedule with construction progress to avoid delaying the Work.

1.30.5 Space Requirements: Verify space requirements and dimensions of items shown diagrammatically on Drawings.

1.30.6 Verification: Before proceeding to lay out the Work, verify layout information shown on Drawings, in relation to the property survey and existing benchmarks. If discrepancies are discovered, notify Engineer promptly.

1.30.7 Construction Layout: Notify the Engineer to lay out the Work using accepted surveying practices. Engineer's Surveyor shall establish benchmarks and control points for Contractor to set lines and levels. Preserve and protect benchmarks and control points during construction operations. Do not change or relocate benchmarks or control points without prior written approval of Engineer. Report lost or destroyed benchmarks or control points promptly. Contractor shall verify the accuracy of benchmarks set by the Engineer's Surveyor and notify the Engineer immediately if errors are discovered. Proceed to lay out the Site only after errors are corrected. Proceeding with the Work indicates Contractor's acceptance of Surveyor's benchmark.

1.30.8 Lines and Levels: Contractor shall lay out and establish control lines and levels for site improvements. Transfer survey markings and elevations from benchmarks, as necessary. Always level from two or more locations.

1.31 INSTALLATION

1.31.1 General: Locate the Work and components of the Work accurately, in correct alignment and elevation, as indicated. Make vertical Work plumb and make horizontal Work level. Where space is limited, install components to maximize space available for maintenance and ease of removal for replacement. Comply with manufacturer's written instructions and recommendations for installing products in applications indicated. Install products at the time and under conditions that will ensure the best possible results. Maintain conditions required for product performance until Substantial Completion. Conduct construction operations so no part of the Work is subjected to damaging operations or loading in excess of that expected during normal conditions of occupancy. Sequence the Work and allow adequate clearances to accommodate movement of construction items on site and placement in permanent locations.

1.31.2 Tools and Equipment: Where possible, select tools or equipment that minimize production of excessive noise levels.

1.32 CUTTING AND PATCHING

1.32.1 General: Employ skilled workers to perform cutting and patching. Proceed with cutting and patching at the earliest feasible time, and complete without delay. Cut in-place construction to provide for installation of other components or performance of other construction, and subsequently patch as required to restore surfaces to their original condition.

1.32.2 Existing Warranties: Remove, replace, patch, and repair materials and surfaces cut or damaged during installation or cutting and patching operations, by methods and with materials so as not to void existing warranties.

1.32.3 Temporary Support: Provide temporary support of work to be cut.

1.32.4 Protection: Protect in-place construction during cutting and patching to prevent damage. Provide protection from adverse weather conditions for portions of Project that might be exposed during cutting and patching operations.

1.32.5 Existing Utility Services and Mechanical/Electrical Systems: Where existing services/systems are required to be removed, relocated, or abandoned, bypass such services/systems before cutting to minimize interruption to occupied areas.

1.32.6 Cutting: Cut in-place construction by sawing, drilling, breaking, chipping, grinding, and similar operations, including excavation, using methods least likely to damage elements retained or adjoining construction. If possible, review proposed procedures with original Installer; comply with original Installer's written recommendations. In general, use hand or small power tools designed for sawing and grinding, not hammering and chopping. Cut holes and slots neatly to minimum size required, and with minimum disturbance of adjacent surfaces. Temporarily cover openings when not in use. Cut or drill from the exposed or finished side into concealed surfaces. For concrete and masonry, cut using a cutting machine, such as an abrasive saw or a diamond-core drill. For excavating and backfilling, comply with requirements in applicable Sections where required by cutting and patching operations. Proceed with patching after construction operations requiring cutting are complete.

1.32.7 Patching: Patch construction by filling, repairing, refinishing, closing up, and similar operations following performance of other work. Patch with durable seams that are as invisible as practicable. Provide materials and comply with installation requirements specified in other Sections, where applicable. Where feasible, test and inspect patched areas after completion to demonstrate physical integrity of installation. Restore exposed finishes of patched areas and extend finish restoration into retained adjoining construction in a manner that will minimize evidence of patching and refinishing. Clean piping, conduit, and similar features before applying paint or other finishing materials. Restore damaged pipe covering to its original condition.

1.32.8 Cleaning: Clean areas and spaces where cutting and patching are performed. Remove paint, mortar, oils, putty, and similar materials from adjacent finished surfaces.

1.33 PROGRESS CLEANING

1.33.1 General: Clean Project site and work areas daily. Enforce requirements strictly. Dispose of materials lawfully. Comply with requirements in NFPA 241 for removal of combustible waste materials and debris. Do not hold waste materials more than seven days during normal weather or three days if the temperature is expected to rise above 80 deg F. Containerize hazardous and unsanitary waste materials separately from other waste. Mark containers appropriately and dispose of legally, according to regulations. Use containers intended for holding waste materials of type to be stored. Coordinate progress cleaning for joint-use areas where Contractor and other contractors are working concurrently.



WESTSIDE PARK
MCVAY FAMILY REFLECTION GARDEN
YANKTON, SOUTH DAKOTA
SEI Project #: 22199



Plot Time: 7/25/2022 1:37 PM

BID SET

GENERAL
NOTES

C-003

1.33.2 Site: Maintain Project site free of waste materials and debris. Clean areas where work is in progress to the level of cleanliness necessary for proper execution of the Work.

1.33.3 Installed Work: Keep installed work clean. Clean installed surfaces according to written instructions of manufacturer or fabricator of product installed, using only cleaning materials specifically recommended. If specific cleaning materials are not recommended, use cleaning materials that are not hazardous to health or property and that will not damage exposed surfaces.

1.33.4 Concealed Spaces: Remove debris from concealed spaces before enclosing the space.

1.33.5 Exposed Surfaces in Finished Areas: Clean exposed surfaces and protect as necessary to ensure freedom from damage and deterioration at time of Substantial Completion.

1.33.6 Waste Disposal: Do not bury or burn waste materials on-site. Do not wash waste materials down sewers or into waterways. Comply with waste disposal requirements as specified.

1.33.7 During handling and installation, clean and protect construction in progress and adjoining materials already in place. Apply protective covering where required to ensure protection from damage or deterioration at Substantial Completion.

1.33.8 Clean and provide maintenance on completed construction as frequently as necessary through the remainder of the construction period. Adjust and lubricate operable components to ensure operability without damaging effects.

1.33.9 Limiting Exposures: Supervise construction operations to ensure that no part of the construction, completed or in progress, is subject to harmful, dangerous, damaging, or otherwise deleterious exposure during the construction period.

1.34 PROTECTION OF INSTALLED CONSTRUCTION

1.34.1 Provide final protection and maintain conditions that ensure installed Work is without damage or deterioration at time of Substantial Completion.

1.34.2 Protection of Existing Items: Provide protection and ensure that existing items to remain undisturbed by construction are maintained in condition that existed at commencement of the Work.

1.34.3 Comply with manufacturer's written instructions for temperature and relative humidity.

1.35 WASTE MANAGEMENT AND DISPOSAL

1.35.1 Implement approved waste management plan. Provide handling, containers, storage, signage, transportation, and other items as required to implement waste management plan during the entire duration of the Contract. Train workers, subcontractors, and suppliers on proper waste management procedures, as appropriate for the Work.

1.35.2 Site Access and Temporary Controls: Conduct waste management operations to ensure minimum interference with roads, streets, walks, walkways, and other adjacent occupied and used facilities. Designate and label specific areas on Project site necessary for separating materials that are to be salvaged and recycled. Comply with requirements for Temporary Facilities and Controls for controlling dust and dirt, environmental protection, and noise control.

1.35.3 Disposal of Waste: Except for items or materials to be salvaged or recycled, remove waste materials from Project site and legally dispose of them in a landfill or incinerator acceptable to authorities having jurisdiction. Except as otherwise specified, do not allow waste materials that are to be disposed of accumulate on-site. Remove and transport debris in a manner that will prevent spillage on adjacent surfaces and areas. Burning waste materials on Site is not permitted.

1.36 CLOSEOUT PROCEDURES

1.36.1 Procedures for Substantial Completion are specified in the General Conditions and further described in the paragraphs that follow.

1.36.2 Final Cleaning: Perform final cleaning. Conduct cleaning and waste-removal operations to comply with local laws and ordinances and Federal and local environmental and antipollution regulations. Employ experienced workers or professional cleaners for final cleaning. Clean each surface or unit to condition expected in an average maintenance program. Comply with manufacturer's written instructions.

1.36.3 Complete the following cleaning operations before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

1. Clean Project site, yard, and grounds, in areas disturbed by construction activities, including landscape development areas, of rubbish, waste material, litter, and other foreign substances.
2. Sweep paved areas broom clean. Remove petrochemical spills, stains, and other foreign deposits.
3. Rake grounds that are not planted, mulched, or paved to a smooth, even-textured surface.
4. Trim tree limbs damaged during construction.
5. Remove tools, construction equipment, machinery, and surplus material from Project site.
6. Clean exposed exterior and interior hard-surfaced finishes to a dirt-free condition, free of stains, films, and similar foreign substances. Avoid disturbing natural weathering of exterior surfaces. Restore reflective surfaces to their original condition.
7. Remove labels that are not permanent.
8. Clean light fixtures, lamps, globes, and reflectors to function with full efficiency.
9. Leave Project clean and ready for occupancy.

1.36.4 Submit and complete the following items before requesting inspection for certification of Substantial Completion for entire Project or for a designated portion of Project:

1. Submit a list of items to be completed and corrected (Contractor's punch list), indicating the value of each item on the list and reasons why the Work is incomplete.
2. Obtain and submit releases from authorities having jurisdiction permitting Owner unrestricted use of the Work and access to services and utilities. Include occupancy permits, operating certificates, and similar releases.
3. Submit closeout submittals specified in other Sections, including project record documents, operation and maintenance manuals, damage or settlement surveys, property surveys, special warranties, and similar final record information.
4. Submit changeover information related to Owner's occupancy, use, operation, and maintenance.
5. Advise Owner of pending insurance changeover requirements.
6. Advise Owner of changeover in utility services.
7. Terminate and remove temporary facilities from Project site, along with mockups, construction tools, and similar elements.
8. Complete final cleaning requirements.

1.36.5 Inspection: Submit a written request for inspection to determine Substantial Completion in conformance with the General Conditions.

1.36.6 Complete repair and restoration operations identified in Engineer's Punch List. Repair, or remove and replace, defective construction. Repairing includes replacing defective parts, refinishing damaged surfaces, touching up with matching materials, and properly adjusting operating equipment. Where damaged or worn items cannot be repaired or restored, provide replacements. Remove and replace operating components that cannot be repaired. Restore damaged construction and permanent facilities used during construction to specified condition.

1.36.7 Submit certified copy of Engineer's Substantial Completion inspection list of items to be completed or corrected (punch list), endorsed and dated by Engineer. Certified copy of the list shall state that each item has been completed or otherwise resolved for acceptance.

CONCRETE

2.1 CAST IN PLACE CONCRETE

2.1.1 Reference: SDDOT Standard Specifications for Roads and Bridges.

2.1.2 Submittals: Submit design mixture for each job mix proposed for the Work. Submit alternate design mixtures when characteristics of materials, Project conditions, weather, test results, or other circumstances warrant adjustments. Indicate amounts of mixing water to be withheld for later addition at Project site.

2.1.3 Products: Products to be as follows unless otherwise specified. Reference SDDOT Standard Specifications for Roads and Bridges for additional specifications.

1. Concrete: M6 mix design.
2. Form Facing Materials: Provide form-facing panels that provide continuous, true, and smooth concrete surfaces. Furnish in largest practicable sizes to minimize number of joints. Plywood, metal, or other approved panel materials.
3. Reinforcing Bars: ASTM A 615, Grade 60, deformed
4. Epoxy Coated Reinforcing Bars: ASTM A 615, Grade 60, deformed bars, ASTM A 775, epoxy coated, with less than 2 percent damaged coating in each 12-inch bar length.
5. Epoxy Repair Coating: Liquid, two-part, epoxy repair coating; compatible with epoxy coating on reinforcement and complying with ASTM A 775.
6. Curing Compound: SDDOT Standard Specifications for Roads and Bridges – Section B21.

2.1.4 Schedule inspections with Owner's inspectors and testing agencies. Inspections and testing include:

1. Form work and steel reinforcement placement inspections
2. Concrete placement inspections
3. Concrete sampling

2.1.5 Delivery, Storage and Handling: Deliver, store and handle steel reinforcement to prevent bending and damage. Avoid damaging coatings on steel reinforcement.

2.1.6 Cold-Weather Placement: Comply with ACI 306.1 and as follows. Protect concrete work from physical damage or reduced strength that could be caused by frost, freezing actions, or low temperatures. When average high and low temperature is expected to fall below 40 deg F for three successive days, maintain delivered concrete mixture temperature within the temperature range required by ACI 301. Do not use frozen materials or materials containing ice or snow. Do not place concrete on frozen subgrade or on subgrade containing frozen materials. Do not use calcium chloride, salt, or other materials containing antifreeze agents or chemical accelerators unless otherwise specified and approved in mixture designs.

2.1.7 Hot-Weather Placement: Comply with ACI 301 and as follows. Maintain concrete temperature below 90 deg F at time of placement. Chilled mixing water or chopped ice may be used to control temperature, provided water equivalent of ice is calculated to total amount of mixing water. Using liquid nitrogen to cool concrete is Contractor's option. Fog-spray forms, steel reinforcement, and subgrade just before placing concrete. Keep subgrade uniformly moist without standing water, soft spots, or dry areas.

2.1.8 Formwork Installation: Design, erect, shore, brace, and maintain formwork to support vertical, lateral, static, and dynamic loads, and construction loads that might be applied, until structure can support such loads. Construct formwork so concrete members and structures are of size, shape, alignment, elevation, and position indicated, within tolerance limits. Limit concrete surface irregularities. Construct forms tight enough to prevent loss of concrete mortar. Construct forms for easy removal without hammering or prying against concrete surfaces. Clean forms and adjacent surfaces to receive concrete. Remove chips, wood, sawdust, dirt, and other debris just before placing concrete. Retighten forms and bracing before placing concrete, as required, to prevent mortar leaks and maintain proper alignment. Coat contact surfaces of forms with form-release agent, according to manufacturer's written instructions, before placing reinforcement.

2.1.9 Embedded Item Installation: Place and secure anchorage devices and other embedded items required for adjoining work that is attached to or supported by cast-in-place concrete. Use setting drawings, templates, diagrams, instructions, and directions furnished with items to be embedded.

2.1.10 Steel Reinforcement Installation: Clean reinforcement of loose rust and mill scale, earth, ice, and other foreign materials that reduce bond to concrete. Accurately position, support, and secure reinforcement against displacement. Locate and support reinforcement with bar supports to maintain minimum concrete cover. Repair cut and damaged epoxy coatings with epoxy repair coating according to ASTM D 3963/D 3963M.

2.1.11 Joints, General: Construct joints true to line with faces perpendicular to surface plane of concrete. Install so strength and appearance of concrete are not impaired, at locations indicated or as approved by Engineer. Form keyed joints where indicated. Use a bonding agent at locations where fresh concrete is placed against hardened or partially hardened concrete surfaces.



WESTSIDE PARK
MCVAY FAMILY REFLECTION GARDEN
YANKTON, SOUTH DAKOTA
SEI Project #: 22199



Plot Time: 7/25/2022 1:37 PM

BID SET

GENERAL
NOTES

C-004

2.1.12 Slab Joints: Form weakened-plane contraction joints, sectioning concrete into areas as indicated. Construct contraction joints for a depth equal to at least one-fourth of concrete thickness. For tooled joints, form contraction joints after initial floating by grooving and finishing each edge of joint to a radius of 1/8 inch. Repeat grooving of contraction joints after applying surface finishes. Eliminate groover tool marks on concrete surfaces. For sawed joints, Form contraction joints with power saws equipped with shatterproof abrasive or diamond-rimmed blades. Cut 1/8-inch-wide joints into concrete when cutting action does not tear, abrade, or otherwise damage surface and before concrete develops random contraction cracks.

2.1.13 Placement: Before placing concrete, verify that installation of formwork, reinforcement, and embedded items is complete and that required inspections are completed. Do not add water to concrete during delivery, at Project site, or during placement unless approved by Engineer. Deposit concrete continuously in one layer or in horizontal layers of such thickness that no new concrete is placed on concrete that has hardened enough to cause seams or planes of weakness. If a section cannot be placed continuously, provide construction joints as indicated. Deposit concrete to avoid segregation. Consolidate concrete during placement operations, so concrete is thoroughly worked around reinforcement and other embedded items and into corners. Maintain reinforcement in position on chairs during concrete placement. Work mortar against forms to produce a smooth finish relatively free of water, air pockets and honeycombing. Screed slab surfaces with a straightedge and strike off to correct elevations. Slope surfaces uniformly to drains where required. Begin initial floating using bull floats or darbies to force coarse aggregate from the surface and form a uniform and open-textured surface plane, before excess bleed water appears on the surface. Do not further disturb slab surfaces before starting finishing operations.

2.1.14 Finished Formed Surfaces: At tops of walls, horizontal offsets, and similar unformed surfaces adjacent to formed surfaces, strike off smooth and finish with a texture matching adjacent formed surfaces. Continue final surface treatment of formed surfaces uniformly across adjacent unformed surfaces unless otherwise indicated.

2.1.15 Finishing Slabs: Consolidate surface by hand floating. Restraighten, cut down high spots, and fill low spots. Repeat float passes and reststraightening until surface is left with a uniform, smooth, granular texture. After applying float finish, apply first troweling and consolidate concrete by hand or power-driven trowel. Continue troweling passes and reststraighten until surface is free of trowel marks and uniform in texture and appearance. While concrete is still plastic, slightly scarify surface with a fine broom.

2.1.16 Curbs: Provide monolithic finish to interior curbs by stripping forms while concrete is still green and by steel-troweling surfaces to a hard, dense finish with corners, intersections, and terminations slightly rounded.

2.1.17 Concrete Protecting and Curing: Protect freshly placed concrete from premature drying and excessive cold or hot temperatures. Comply with ACI 306.1 for cold-weather protection and ACI 301 for hot-weather protection during curing. Apply curing compound uniformly in continuous operation by power spray or roller according to manufacturer's written instructions. Recoat areas subjected to heavy rainfall within three hours after initial application. Maintain continuity of coating and repair damage during curing period.

2.1.18 Concrete Surface Repairs: Repair and patch defective areas. Repair honeycombs, rock pockets or other defects along formed surfaces. Remove and replace concrete that cannot be repaired and patched to Engineer's approval.

EARTHWORK

3.1 SITE CLEARING

3.1.1 Documentation: Document existing trees and plantings, adjoining construction, and site improvements that establishes preconstruction conditions that might be misconstrued as damage caused by site clearing. Use sufficiently detailed photographs or video recordings. Include plans and notations to indicate specific wounds and damage conditions of each tree or other plant designated to remain.

3.1.2 Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during site-clearing operations. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed trafficways if required by Owner or authorities having jurisdiction.

3.1.3 Notify South Dakota One Call 1-800-781-7474 for area where Project is located before site clearing. Do not commence site clearing operations until temporary erosion and sedimentation control measures are in place. Carefully remove items indicated to be salvaged and store on Owner's premises.

3.1.4 Protect and maintain benchmarks and survey control points from disturbance during construction. Verify that trees, shrubs, and other vegetation to remain or to be relocated have been flagged and that protection zones have been identified and enclosed. Protect existing site improvements to remain from damage during construction. Restore damaged improvements to their original condition, as acceptable to Owner.

3.1.5 Existing Utilities: Locate, identify, disconnect, and seal or cap utilities indicated to be removed or abandoned in place. Arrange with private utility companies to shut off indicated utilities. Owner will arrange to shut off indicated utilities when requested by Contractor. Do not interrupt utilities serving facilities occupied by Owner or others, unless permitted by Engineer and only after arranging to provide temporary utility services.

3.2 CLEARING & GRUBBING

3.2.1 Remove obstructions, trees, shrubs, and other vegetation to permit installation of new construction. Do not remove trees, shrubs, and other vegetation indicated to remain or to be relocated. Grind down stumps and remove roots larger than 2 inches in diameter, obstructions, and debris to a depth of 18 inches below exposed subgrade. Use only hand methods or air spade for grubbing within protection zones. Chip removed tree branches and dispose of off-site. Fill depressions caused by clearing and grubbing operations with satisfactory soil material unless further excavation or earthwork is indicated.

3.2.2 Salvage landscaping within the construction limits for reset where indicated in the Drawings. Replenish landscape rock or mulch where deficient.

3.3 TOPSOIL STRIPPING

3.3.1 Strip topsoil to depth of 6 inches minimum in a manner to prevent intermingling with underlying subsoil or other waste materials. Remove subsoil and non-soil materials from topsoil, including clay lumps, gravel, and other objects larger than 2 inches in diameter; trash, debris, weeds, roots, and other waste materials. Stockpile topsoil where indicated in the drawings. Stockpile topsoil away from edge of excavations without intermixing with subsoil or other materials. Grade and shape stockpiles to drain surface water. Cover to prevent windblown dust and erosion by water. Do not stockpile topsoil within protection zones. Dispose of surplus topsoil.

3.4 SITE IMPROVEMENTS

3.4.1 Remove existing above and below grade improvements as necessary to facilitate new construction. Remove slabs, paving, curbs, gutters, and aggregate base as indicated in the drawings. Unless existing full-depth joints coincide with line of demolition, neatly saw-cut along line of existing pavement to remain before removing adjacent existing pavement. Saw-cut faces vertically.

3.4.2 Remove surplus soil material, unsuitable topsoil, obstructions, demolished materials, and waste materials including trash and debris, and legally dispose of them off Owner's property.

3.5 EARTH MOVING

3.5.1 Reference: SDDOT Standard Specifications for Roads and Bridges

3.5.2 Preinstallation: Review methods and procedures related to earthmoving, including, but not limited to personnel and equipment needed to make progress and avoid delays, coordination of Work with utility locator service, coordination of Work and equipment movement with the locations of tree- and plant-protection zones, extent of trenching by hand or with air spade and field quality control.

3.5.3 Traffic: Minimize interference with adjoining roads, streets, walks, and other adjacent occupied or used facilities during earth-moving operations. Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction.

3.5.4 Utility Locator Service: Notify South Dakota One Call for area where Project is located before beginning earth-moving operations.

3.5.5 Erosion Control: Do not commence earth-moving operations until temporary site fencing and erosion- and sedimentation-control measures specified are in place.

3.5.6 Products: Reference SDDOT Standard Specifications for Roads and Bridges for additional specifications.

1. Earthen Material: Provide borrow soil materials when sufficient satisfactory soil materials are not available from excavations.
2. Base Course: Base course to be SDDOT Standard Specifications for Roads and Bridges Aggregate Base Course unless otherwise specified.

3.5.7 Schedule inspections with Owner's inspectors and testing agencies. Inspections and testing include:

1. Subgrade observation of bridge abutments.
2. Subgrade observation of retaining walls.

3.5.8 Preparation: Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by earth-moving operations. Protect and maintain erosion and sedimentation controls during earth-moving operations. Protect subgrades and foundation soils from freezing temperatures and frost. Remove temporary protection before placing subsequent materials.

3.5.9 Dewatering: Prevent surface water and ground water from entering excavations, from ponding on prepared subgrades, and from flooding Project site and surrounding area. Protect subgrades from softening, undermining, washout, and damage by rain or water accumulation. Reroute surface water runoff away from excavated areas. Do not allow water to accumulate in excavations. Do not use excavated trenches as temporary drainage ditches.

3.5.10 Unclassified Earth Excavation: Excavate to subgrade elevations regardless of the character of surface and subsurface conditions encountered. Unclassified excavated earthen materials may include soil materials or boulders. No changes in the Contract Sum or the Contract Time will be authorized for removal of boulders. If excavated materials intended for fill and backfill include unsatisfactory soil materials and rock, replace with satisfactory soil materials. Earth excavation includes excavating pavements and obstructions visible on surface; underground structures, utilities, and other items indicated to be removed; and soil, boulders, and other materials not classified as bedrock or unauthorized excavation. If bedrock is encountered, do not excavate until it has been classified and cross sectioned by Engineer. Bedrock shall be measured and paid separately.

3.5.11 Excavating for Structures: Excavate to indicated elevations and dimensions within a tolerance of plus or minus 1 inch. If applicable, extend excavations a sufficient distance from structures for placing and removing concrete formwork, for installing services and other construction, and for inspections. Do not disturb bottom of excavation. Trim bottoms to required lines and grades to leave solid base to receive other work.

3.5.12 Excavate surfaces under walks and pavements to indicated lines, cross sections, elevations, and subgrades.

3.5.13 Subgrade Inspection: Notify Engineer when excavations have reached required subgrade. If Engineer determines that unsatisfactory soil is present, continue excavation and replace with compacted backfill or fill material as directed. Proof-roll subgrade below pavements with a pneumatic-tired and loaded 10-wheel, tandem-axle dump truck weighing not less than 15 tons to identify soft pockets and areas of excess yielding. Do not proof-roll wet or saturated subgrades. Completely proof-roll subgrade in one direction, repeating proof-rolling in direction perpendicular to first direction. Limit vehicle speed to 3 mph. Excavate soft spots, unsatisfactory soils, and areas of excessive pumping or rutting, as determined by Engineer, and replace with compacted backfill or fill as directed. Reconstruct subgrades damaged by freezing temperatures, frost, rain, accumulated water, or construction activities, as directed by Engineer, without additional compensation.

3.5.14 Unauthorized Excavation: Fill unauthorized excavation under foundations or wall footings by extending bottom elevation of concrete foundation or footing to excavation bottom, without altering top elevation. Lean concrete fill, with 28-day compressive strength of 2500 psi, may be used when approved by Engineer. Fill unauthorized excavations under other construction, pipe, or conduit as directed by Engineer.

3.5.15 Storage of Soil Materials: Stockpile borrow soil materials and excavated satisfactory soil materials without intermixing. Place, grade, and shape stockpiles to drain surface water. Cover to prevent windblown dust. Stockpile soil materials away from edge of excavations. Do not store within drip line of remaining trees.

3.5.16 Backfill: Place backfill on subgrades free of mud, frost, snow, or ice. Place and compact backfill in excavations promptly, but not before completing the following:

1. Construction below finish grade including, where applicable, subdrainage, damp proofing, waterproofing, and perimeter insulation.
2. Surveying locations of underground utilities for Record Documents.
3. Testing and inspecting underground utilities.
4. Removing concrete formwork.
5. Removing trash and debris.
6. Removing temporary shoring, bracing, and sheeting.
7. Installing permanent or temporary horizontal bracing on horizontally supported walls.

3.5.17 Soil Fill: Plow, scarify, bench, or break up sloped surfaces steeper than 1 vertical to 4 horizontal so fill material will bond with existing material. Place and compact fill material in layers to required elevations. Place soil fill on subgrades free of mud, frost, snow, or ice.

3.5.18 Soil Moisture Control: Uniformly moisten or aerate subgrade and each subsequent fill or backfill soil layer before compaction to within 2 percent of optimum moisture content. Remove and replace, or scarify and air dry, otherwise satisfactory soil material that exceeds optimum moisture content by 2 percent and is too wet to compact to specified dry density.

3.5.19 Compaction of Soil Backfill and Fills: Place backfill and fill soil materials in layers not more than 8 inches in loose depth for material compacted by heavy compaction equipment and not more than 4 inches in loose depth for material compacted by hand-operated tampers. Place backfill and fill soil materials evenly on all sides of structures to required elevations and uniformly along the full length of each structure.

3.5.20 Compact soil materials to not less than the following percentages of maximum dry density according to ASTM D 698 ASTM D 1557:

1. Under structures, building slabs, steps, and pavements, scarify and recompact top 12 inches of existing subgrade and each layer of backfill or fill soil material at 95 percent.
2. Under walkways, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 92 percent.
3. Under turf or unpaved areas, scarify and recompact top 6 inches below subgrade and compact each layer of backfill or fill soil material at 85 percent.

3.5.21 Grading: General: Uniformly grade areas to a smooth surface, free of irregular surface changes. Comply with compaction requirements and grade to cross sections, lines, and elevations indicated. Provide a smooth transition between adjacent existing grades and new grades. Cut out soft spots, fill low spots, and trim high spots to comply with required surface tolerances.

3.5.22 Site Rough Grading: Slope grades to direct water away from buildings and to prevent ponding. Finish subgrades to elevations required to achieve indicated finish elevations, within the following subgrade tolerances:

1. Turf or Unpaved Areas: Plus or minus 1 inch
2. Walks: Plus or minus 1 inch
3. Pavements: Plus or minus 1/2 inch

3.5.23 Base Course Under Pavements and Walks: Place base course on subgrades free of mud, frost, snow, or ice. Place base course material over subbase course under pavement. Shape base course to required crown elevations and cross-slope grades. Place base course in compacted thickness in layers of equal thickness, with no compacted layer more than 6 inches thick or less than 3 inches thick. Compact base course at optimum moisture content to required grades, lines, cross sections, and thickness to not less than 95 percent of maximum dry density according to ASTM D 698 ASTM D 1557.

3.5.24 Testing Agency: Owner will engage a qualified geotechnical engineering testing agency to perform tests and inspections. Allow testing agency to inspect and test subgrades and each fill or backfill layer. Proceed with subsequent earth moving only after test results for previously completed work comply with requirements. When testing agency reports that subgrades, fills, or backfills have not achieved degree of compaction specified, scarify and moisten or aerate, or remove and replace soil materials to depth required; recompact and retest until specified compaction is obtained.

3.5.25 Protection: Protect newly graded areas from traffic, freezing, and erosion. Keep free of trash and debris. Repair and reestablish grades to specified tolerances where completed or partially completed surfaces become eroded, rutted, settled, or where they lose compaction due to subsequent construction operations or weather conditions. Scarify or remove and replace soil material to depth as directed by Engineer; reshape and recompact. Where settling occurs before Project correction period elapses, remove finished surfacing, backfill with additional soil material, compact, and reconstruct surfacing. Restore appearance, quality, and condition of finished surfacing to match adjacent work, and eliminate evidence of restoration to greatest extent possible.

3.5.26 Disposal of Surplus and Waste Materials: Remove surplus satisfactory soil and waste materials, including unsatisfactory soil, trash, and debris, and legally dispose of them off Owner's property.

3.6 DEWATERING

3.6.1 Dewatering Performance: Furnish, install, test, operate, monitor, and maintain dewatering system of sufficient scope, size, and capacity to control hydrostatic pressures and to lower, control, remove, and dispose of pond and ground water and permit excavation and construction to proceed on dry, stable subgrades.

1. Continuously monitor and maintain dewatering operations to ensure erosion control, stability of excavations and constructed slopes, prevention of flooding in excavation, and prevention of damage to subgrades and permanent structures.
2. Prevent surface water from entering excavations by grading, dikes, or other means.
3. Accomplish dewatering without damaging existing buildings, structures, and site improvements adjacent to excavation.
4. Remove dewatering system when no longer required for construction.

3.6.2 Regulatory Requirements: Comply with governing EPA notification regulations before beginning dewatering. Comply with water- and debris-disposal regulations of authorities having jurisdiction.

3.6.3 Protect structures, utilities, sidewalks, pavements, and other facilities from damage caused by settlement, lateral movement, undermining, washout, and other hazards created by dewatering operations.

1. Prevent surface water and subsurface or ground water from entering excavations, from ponding on prepared subgrades, and from flooding site or surrounding area.
2. Protect subgrades and foundation soils from softening and damage by rain or water accumulation.

3.6.4 Install dewatering system to ensure minimum interference with roads, streets, walks, and other adjacent occupied and used facilities.

3.6.5 Do not close or obstruct streets, walks, or other adjacent occupied or used facilities without permission from Owner and authorities having jurisdiction. Provide alternate routes around closed or obstructed traffic ways if required by authorities having jurisdiction.

3.6.6 Provide temporary grading to facilitate dewatering and control of surface water.

3.6.7 Install dewatering system utilizing wells, well points, or similar methods complete with pump equipment, standby power and pumps, filter material gradation, valves, appurtenances, water disposal, and surface-water controls.

1. Space well points or wells at intervals required to provide sufficient dewatering.
2. Use filters or other means to prevent pumping of fine sands or silts from the subsurface.

3.6.8 Place dewatering system into operation to lower water to required levels before excavating below ground-water level.

3.6.9 Provide sumps, sedimentation tanks, and other flow-control devices as required by authorities having jurisdiction.

3.6.10 Provide standby equipment on-site, installed and available for immediate operation, to maintain dewatering on continuous basis if any part of system becomes inadequate or fails.

3.6.11 Operate system continuously until drains, sewers, and structures have been constructed and fill materials have been placed or until dewatering is no longer required.

3.6.12 Operate system to lower and control ground water to permit excavation, construction of structures, and placement of fill materials on dry subgrades. Drain water-bearing strata above and below bottom of foundations, drains, sewers, and other excavations.

1. Do not permit open-sump pumping that leads to loss of fines, soil piping, subgrade softening, and slope instability.
2. Reduce hydrostatic head in water-bearing strata below subgrade elevations of foundations, drains, sewers, and other excavations.
3. Maintain piezometric water level a minimum of 24 inches (600 mm) below bottom of excavation.

3.6.13 Dispose of water removed by dewatering in a manner that avoids endangering public health, property, and portions of work under construction or completed. Dispose of water and sediment in a manner that avoids inconvenience to others.

3.6.14 Remove dewatering system from Project site on completion of dewatering. Plug or fill well holes with sand or cut off and cap wells a minimum of 36 inches (900 mm) below overlying construction.

3.6.15 Provide continual observation to ensure that subsurface soils are not being removed by the dewatering operation.

3.6.16 Protect and maintain dewatering system during dewatering operations. Promptly repair damages to adjacent facilities caused by dewatering.

EXTERIOR IMPROVEMENTS

4.1 SOIL PREPARATION:

4.1.1 Reference: SDDOT Standard Specifications for Roads and Bridges

4.1.2 Preconstruction Testing: Owner will engage a qualified testing agency to perform preconstruction soil analyses on imported soil. Notify Engineer seven days in advance of the dates and times when soil will be imported.

4.1.3 Delivery, Storage and Handling: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and compliance with state and Federal laws if applicable. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants. Provide erosion-control measures to prevent erosion or displacement of bulk materials, discharge of soil-bearing water runoff, and airborne dust reaching adjacent properties, water conveyance systems, or walkways. Do not move or handle materials when they are wet or frozen. Accompany each delivery of bulk fertilizers and soil amendments with appropriate certificates.

4.1.4 Products: Products to be as follows unless otherwise specified. Reference SDDOT Standard Specifications for Roads and Bridges for additional specifications.

1. Contractor Furnished Topsoil: Imported, naturally formed soil from off-site and modified as necessary to produce viable planting soil. If necessary, amend imported soil with materials to become planting soil meeting testing requirements of AASHTO T88, ASTM D 5268-07 and the following:

Compositional Category	Percentage by Mass
Total Sample:	
Deleterious materials (rock, gravel, slag, cinder, roots, sod)	5 max
Material passing the No. 10 sieve:	
Organic Material	2 to 20
Sand content	20 to 60
Silt and clay content	35 to 70
pH (ASTM D 5268)	5 to 7

- i. Source: Take imported, unamended soil from sources that are naturally well-drained sites where topsoil occurs at least 4 inches deep, not from bogs, or marshes; and that do not contain undesirable organisms; disease-causing plant pathogens; or obnoxious weeds and invasive plants.
- ii. Unacceptable Materials: Concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth.
- iii. Fertilizers: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in composition amounts recommended in soil reports from qualified testing agency.

4.1.5 Preinstallation: Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in planting soil. Proceed with placement only after unsatisfactory conditions have been corrected.



WESTSIDE PARK
MCVAY FAMILY REFLECTION GARDEN
YANKTON, SOUTH DAKOTA
 SEI Project #: 22199



Plot Time: 7/25/2022 1:37 PM

BID SET

GENERAL NOTES

C-006

4.1.6 Preparation of Soil: Excavate soil from designated area(s) to depths required and stockpile until amended. Clean soil of concrete slurry, concrete layers or chunks, cement, plaster, building debris, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, acid, and other extraneous materials that are harmful to plant growth. Clean soil to contain specified combined maximum of percent by dry weight of stones, roots, plants, sod, clay lumps, and pockets of coarse sand. If necessary, mix unamended soil with amendments to produce required planting soil.

4.1.7 Subgrade Preparation: Do not till if existing soil or subgrade is frozen, muddy, or excessively wet. Till subgrade to a minimum depth of 4 inches. Remove stones larger than 1 inch in any dimension and sticks, roots, rubbish, and other extraneous matter and legally dispose of them off Owner's property.

4.1.8 Placing Soil: Do not apply soil if existing soil or subgrade is frozen, muddy, or excessively wet. Apply soil and mix approximately half the thickness of soil over prepared, loosened subgrade. Mix thoroughly into top 2 inches of subgrade. Spread remainder of planting soil.

4.1.9 Compaction: Compact each blended lift of planting soil to 75 to 82 percent of maximum Standard Proctor density according to ASTM D 698 except where a different compaction value is indicated on Drawings.

4.1.10 Finish Grading: Grade planting soil to a smooth, uniform surface plane with loose, uniformly fine texture. Roll and rake, remove ridges, and fill depressions to meet finish grades.

4.1.11 Protection: Protect areas of in-place soil from additional compaction, disturbance, and contamination. Prohibit the following practices within these areas except as required to perform planting operations:

1. Storage of construction materials, debris, or excavated material.
2. Parking vehicles or equipment.
3. Vehicle traffic.
4. Foot traffic.
5. Erection of sheds or structures.
6. Impoundment of water.
7. Excavation or other digging unless otherwise indicated.

4.1.12 If planting soil or subgrade is over compacted, disturbed, or contaminated by foreign or deleterious materials or liquids, remove the planting soil and contamination; restore the subgrade as directed by Engineer and replace contaminated planting soil with new planting soil.

4.1.13 Weed Control: Perform weed control and protect in-place soil from noxious weed germination.

4.1.14 Cleaning: Protect areas adjacent to planting-soil preparation and placement areas from contamination. Keep adjacent paving and construction clean and work area in an orderly condition. Remove surplus soil and waste material including excess subsoil, unsuitable materials, trash, and debris and legally dispose of them off Owner's property unless otherwise indicated. Dispose of excess subsoil and unsuitable materials on-site where directed by Owner.

4.2 TURF AND GRASSES

4.2.1 Reference: SDDOT Standard Specifications for Roads and Bridges

4.2.2 Submittals: Provide the following submittals

1. Certificate of Grass Seed: From seed vendor for each grass-seed monostand or mixture, stating the botanical and common name, percentage by weight of each species and variety, and percentage of purity, germination, and weed seed. Include the year of production and date of packaging.
2. Product certificates for fertilizers from manufacturer.

4.2.3 Delivery, Storage and Handling: Deliver packaged materials in original, unopened containers showing weight, certified analysis, name and address of manufacturer, and indication of compliance with state and Federal laws, as applicable. Do not dump or store bulk materials near structures, utilities, walkways and pavements, or on existing turf areas or plants. Provide erosion-control measures to prevent erosion or displacement of bulk materials; discharge of soil-bearing water runoff; and airborne dust reaching adjacent properties, water conveyance systems, or walkways. Accompany each delivery of bulk materials with appropriate certificates.

4.2.4 Planting Restrictions: Plant during one of the following periods. Coordinate planting periods with initial maintenance periods to provide required maintenance from date of planting completion.

1. Spring Planting: April 15 to May 15
2. Fall Planting: August 15 to September 15

4.2.5 B. Weather Limitations: Proceed with planting only when existing and forecasted weather conditions permit planting to be performed when beneficial and optimum results may be obtained. Apply products during favorable weather conditions according to manufacturer's written instructions.

4.2.6 Products: Products to be as follows unless otherwise specified. Reference SDDOT Standard Specifications for Roads and Bridges for additional specifications.

1. Grass Seed: Fresh, clean, dry, new-crop seed complying with AOSA's "Rules for Testing Seeds" for purity and germination tolerances. Seed of grass species as listed below for solar exposure, with not less than 85% germination, not less than 97% pure seed, and not more than 0.10% weed seed:

i. Turf Mix 1:

Grass Species	LBS/1 ACRE
Improved Kentucky Bluegrass (minimum 3 varieties)	240
Fine-Leaf Perennial Ryegrass (minimum 2 varieties)	60
TOTALS	300

2. Fertilizers: Commercial-grade complete fertilizer of neutral character, consisting of fast- and slow-release nitrogen, 50 percent derived from natural organic sources of urea formaldehyde, phosphorous, and potassium in the following composition:

i. Composition: 1 lb/1000 sq. ft. of actual nitrogen, 4% phosphorous, and 2% potassium, by weight.

3. Fiber Mulch: Biodegradable, dyed-wood, cellulose-fiber mulch; nontoxic and free of plant-growth or germination inhibitors; with a maximum moisture content of 15 percent and a pH range of 4.5 to 6.5.

4. Non-asphaltic Tackifier: Colloidal tackifier recommended by fiber-mulch manufacturer for slurry application; nontoxic and free of plant-growth or germination inhibitors.

5. Erosion Control Blanket: Biodegradable wood excelsior, straw, or coconut-fiber mat enclosed in a photodegradable plastic mesh. Include manufacturer's recommended steel wire staples, 6 inches (150 mm) long.

i. Products: Subject to compliance with requirements, provide products on the SDDOT approved products list.

4.2.7 Schedule inspections with Owner's inspectors and testing agencies. Inspections and testing include:

1. Inspection of planting areas prior to seeding.

4.2.8 Examination: Examine areas to be planted for compliance with requirements and other conditions affecting installation and performance of the Work. Verify that no foreign or deleterious material or liquid such as paint, paint washout, concrete slurry, concrete layers or chunks, cement, gravel, plaster, oils, gasoline, diesel fuel, paint thinner, turpentine, tar, roofing compound, or acid has been deposited in soil within a planting area. Suspend planting operations during periods of excessive soil moisture until the moisture content reaches acceptable levels to attain the required results. Uniformly moisten excessively dry soil that is not workable, or which is dusty. Proceed with installation only after unsatisfactory conditions have been corrected. If contamination by foreign or deleterious material or liquid is present in soil within a planting area, remove the soil and contamination as directed by Engineer and replace with new planting soil.

4.2.9 Initial Weed Control: Inspect areas to be planted for vegetative growth that has already germinated. Where found, apply an appropriate post-emergent herbicide with low soil residual as recommended by the manufacturer. Suspend seeding operations until soil residual dissipates.

4.2.10 Preparation: Protect structures; utilities; sidewalks; pavements; and other facilities, trees, shrubs, and plantings from damage caused by planting operations. Protect adjacent and adjoining areas from hydroseeding and hydromulching overspray. Protect grade stakes set by others until directed to remove them. Install erosion-control measures to prevent erosion or displacement of soils and discharge of soil-bearing water runoff or airborne dust to adjacent properties and walkways. Prepare planting area for soil placement and mix planting soil according to "Soil Preparation" Section. Moisten prepared area before planting if soil is dry. Water thoroughly and allow surface to dry before planting. Do not create muddy soil. Pulverize soil to less than 1-inch particles and rake to a uniformly smooth, fine textured surface within 0.5 inches of finished elevation. Remove stones larger than 1 inch. Before planting, obtain Engineer's acceptance of finish grading; restore planting areas if eroded or otherwise disturbed after finish grading.

4.2.11 Seeding: Sow seed with drill or slit seeder wherever feasible. Do not hydroseed, broadcast or drop seed unless necessary. Evenly distribute seed by sowing equal quantities in two directions at right angles to each other. Do not use wet seed or seed that is moldy or otherwise damaged. Do not seed against existing trees. Limit extent of seed to outside edge of planting saucer. Sow seed at rates specified under "Products" Section. Rake seed lightly into top 1/8 inch of soil, roll lightly, and water with fine spray. Protect seeded areas with slopes exceeding 1:4 with erosion-control blankets installed and stapled according to manufacturer's written instructions.

4.2.12 Fertilizing: Apply initial fertilizer following seeding operations at the rate of 300 lbs per acre.

4.2.13 Hydromulching: Review weather forecast and apply hydromulching 18 hours prior to rainfall or other watering. Mix specified fiber mulch in water, using equipment specifically designed for hydromulching application. Continue mixing until uniformly blended into homogeneous slurry suitable for hydraulic application. Mix slurry with fiber-mulch manufacturer's recommended tackifier. Spray-apply slurry uniformly to all areas seeded in a one-step process. Apply slurry at a rate so that mulch component is deposited at not less than 3000-lb/acre dry weight.

4.2.14 Hydroseeding: Hydroseed where slopes are steeper than 3:1. Increase the specified seed ratio amount 50% and mix with fiber mulch slurry. Spray apply slurry uniformly to all areas to be seeded in a two-step process. Apply first slurry coat at a rate so that mulch component is deposited at not less than 500-lb/acre dry weight, and seed component is deposited at not less than the specified seed-sowing rate. Apply slurry cover coat of fiber mulch (hydromulching) at a rate of 3000 lb/acre.

4.2.15 Turf Renovation: Renovate existing turf where indicated. Renovate turf damaged by Contractor's operations, such as storage of materials or equipment and movement of vehicles. Reestablish turf where settlement or washouts occur or where minor regrading is required. Install new planting soil as required. Remove sod and vegetation from diseased or unsatisfactory turf areas; do not bury in soil. Remove topsoil containing foreign materials, such as oil drippings, fuel spills, stones, gravel, and other construction materials resulting from Contractor's operations, and replace with new planting soil. Mow, dethatch, core aerate, and rake existing turf. Remove weeds before seeding. Where weeds are extensive, apply selective herbicides as required. Do not use pre-emergence herbicides. Remove waste and foreign materials, including weeds, soil cores, grass, vegetation, and turf, and legally dispose of them off Owner's property. Till stripped, bare, and compacted areas thoroughly to a soil depth of 6 inches. Apply initial fertilizer required for establishing new turf and mix thoroughly into top 4 inches of existing soil. Install new planting soil to fill low spots and meet finish grades. Apply seed and protect with mulch as required for new turf. Water newly planted areas and keep moist until new turf is established.

4.2.16 Turf Maintenance: Maintain and establish turf for 45 days by watering, fertilizing, weeding, mowing, trimming, replating and performing other operations as required to establish healthy, viable turf. Roll, regrade and replant bare or eroded areas and remulch to produce a uniformly smooth turf. Provide materials and installation the same as those used in the original installation. Fill in as necessary soil subsidence that may occur because of settling or other processes. Replace materials and turf damaged or lost in areas of subsidence. In areas where mulch has been disturbed by wind or maintenance operations, add new mulch and anchor as required to prevent displacement. Hand pull or inoculate legumes and noxious weeds.

4.2.17 Turf Acceptance: Turf installations shall appear healthy and uniform with a close stand of grass, free of weeds and surface irregularities, with coverage exceeding 90% over any 10 sq. ft. and bare spots not exceeding 5 by 5 inches. Use specified materials to reestablish turf that does not comply with requirements and continue maintenance until turf is satisfactory to Engineer.



WESTSIDE PARK
MCVAY FAMILY REFLECTION GARDEN
YANKTON, SOUTH DAKOTA
 SEI Project #: 22199



Plot Time: 7/25/2022 1:37 PM

BID SET

GENERAL NOTES

C-007

4.2.18 Cleanup and Protection: Promptly remove soil and debris created by turf work from paved areas. Clean wheels of vehicles before leaving site to avoid tracking soil onto roads, walks, or other paved areas. Remove surplus soil and waste material, including excess subsoil, unsuitable soil, trash, and debris, and legally dispose of them off Owner's property. Erect temporary fencing or barricades and warning signs as required to protect newly planted areas from traffic. Maintain fencing and barricades throughout initial maintenance period and remove after plantings are established. Remove nondegradable erosion-control measures after grass establishment period.

UTILITIES

5.1 REFERENCE:

5.1.1 Reference the City of Yankton standard specifications for storm sewer and warranty except as modified herein.

5.2 COMMON WORK RESULTS FOR UTILITIES

5.2.1 Delivery, Storage and Handling: Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture. Store plastic pipes protected from direct sunlight. Support to prevent sagging and bending.

5.2.2 Piping Installation: Install piping according to the following requirements and utilities Sections specifying piping systems. Drawing plans, schematics, and diagrams indicate general location and arrangement of piping systems. Indicated locations and arrangements were used to size pipe and calculate friction loss, expansion, pump sizing, and other design considerations. Install piping as indicated unless deviations to layout are approved on the Coordination Drawings. Install piping indicated to be exposed and piping in equipment rooms and service areas at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise. Install piping to permit valve servicing. Install piping at indicated slopes. Install piping free of sags and bends. Install fittings for changes in direction and branch connections. Select system components with pressure rating equal to or greater than system operating pressure. Install sleeves for pipes passing through concrete and masonry walls and concrete floor and roof slabs.

5.2.3 Piping Joint Construction: Join pipe and fittings according to the following requirements and utilities Sections specifying piping systems. Ream ends of pipes and tubes and remove burrs. Bevel plain ends of steel pipe. Remove scale, slag, dirt, and debris from inside and outside of pipe and fittings before assembly. For threaded joints, thread pipe with tapered pipe threads according to ASME B1.20.1. Cut threads full and clean using sharp dies. Ream threaded pipe ends to remove burrs and restore full ID. Apply appropriate tape or thread compound to external pipe threads unless dry seal threading is specified. Do not use pipe or pipe fittings with threads that are corroded or damaged. Do not use pipe sections that have cracked or open welds. Join plastic pressure piping gasketed joints according to ASTM D 3139. Join plastic non-pressure piping gasketed joints according to ASTM D 3212.

5.3 STORM DRAINAGE PIPING

5.3.1 Reference: City of Yankton Technical Specifications for Storm Sewer and SDDOT Standard Specifications for Roads and Bridges.

5.4 PROTECTION OF EXISTING FACILITIES

5.4.1 Existing sanitary sewer lines and manholes within the construction limits shall be protected at all times during construction. The upstream ends of existing sanitary sewer lines downstream from new sanitary sewer construction shall be plugged at locations to be approved by the Engineer. Water, stone, dirt, gravel, asphalt, concrete, or any other debris shall not be allowed to enter the City's sanitary sewer system during flushing operations or at any other time. Construction taking place in the vicinity of any existing City sanitary sewer lines or manholes shall not cause any inflow of surface water, ground water, water from damaged water lines, or debris to enter the City's sanitary sewer system. The Contractor shall be responsible for any damages incurred to the City's sanitary sewer system and/or private property and any actions imposed by DANR due to spills or overflows.

5.4.2 Manhole construction plate markers shall be constructed in accordance with standard plates. The plate markers shall be installed on existing manholes immediately after construction surfacing removals have been completed and on new manholes immediately after installation. The Contractor shall ensure that all manholes are secured, protected and watertight at the end of each workday. Under no circumstances shall an uncompleted or completed manhole be left uncovered, unprotected or not watertight overnight.

TRAFFIC CONTROL NOTES

6.1 GENERAL MAINTENANCE OF TRAFFIC

6.1.1 Install traffic control to conform to the most current Edition of the Manual on Uniform Traffic Control Devices (MUTCD) unless otherwise modified in the plans.

6.1.2 Notifications: Notify the Engineer 7 days prior to start of construction and before any substantial traffic control change. Notify the Engineer 48 hours in advance of all other traffic control changes. Install variable message boards 7 days prior to the closure.

6.1.3 Install traffic control devices after 8:30 am.

6.1.4 Removing, relocating, salvaging, and resetting of existing traffic control devices, including delineation, shall be the responsibility of the Contractor. Any delineators and signs damaged or lost shall be replaced by the Contractor at no cost to the City.

6.1.5 Storage of vehicles and equipment shall be outside the clear zone and as near as possible to the right-of-way line. Contractor's employees should mobilize at a location off the right-of-way and arrive at the work sites in a minimum number of vehicles necessary to perform the work.

6.1.6 Indiscriminate driving and parking of vehicles within the right-of-way and park will not be permitted. Any damage to the vegetation, surfacing, embankment, delineators, and existing signs resulting from such indiscriminate use shall be repaired and/or restored by the Contractor, at no expense to the City, and to the satisfaction of the Engineer.

6.1.7 All breakaway sign supports shall comply with FHWA NCHRP 350 crash-worthy requirements. The Contractor shall provide post installation details at the preconstruction meeting for all steel post breakaway sign support assemblies.

6.1.8 Installation, maintenance, relocation, and removal of Type I and II barricades, cones, vertical panels, drums, barricade warning lights, watchmen, tubular markers, and flags shall be incidental.

6.1.9 The Contractor or designated traffic control subcontractor shall ensure the adequacy, legibility, and reflectivity of each sign and device. Sign washing shall be considered incidental to Traffic Control and required as directed by the Engineer.

6.1.10 The Contractor shall provide temporary access routes for residences and businesses located in the construction area unless otherwise noted in the plans. Temporary routes and drives shall be considered incidental.

6.1.11 Flagger warning signs shall be installed when using flaggers to direct traffic. Flaggers shall wear appropriate safety clothing and shall use a Stop/Slow paddle.

6.2 TEMPORARY CONSTRUCTION SIGNS

6.2.1 Installation of temporary traffic control shall conform to the Manual on Uniform Traffic Control Devices (MUTCD) 2009 Edition, Section 6F.03 Sign Placement, unless otherwise modified in the plans. Signs mounted on portable sign supports shall meet requirements provided in Paragraphs 4 through 6 of Section 6F.03 Sign Placement if used for duration greater than 30 days.

6.2.2 The R9-8 through R9-11a series, R11 series, W1-6 through W1-8 series, M4-10, E5-1, or other similar type signs may be used on portable sign supports that do not meet the minimum mounting heights provided in Paragraphs 4 through 6 up to 30 days. All other signs must meet the minimum height requirements if used longer than 3 days.

6.2.3 Signs mounted on Type 3 Barricades should not cover more than 50 percent of the top two rails or 33 percent of the total area of the three rails.

6.3 VEHICULAR ACCESS

6.3.1 In general, the project limits are specified to be closed to thru vehicular traffic. Temporary access to local traffic shall be maintained whenever feasible. The Contractor shall notify the Engineer 7 days in advance of closures that will affect vehicular access. The Contractor shall reference the signage plans for illustrations of temporary signing to be maintained throughout the duration of the project. Construction shall be completed in a timely fashion to minimize the impact to vehicular traffic.

6.3.2 Temporary Gravel Crossings shall be used and placed at locations as shown in the Traffic Control Plans and/or as determined by the Engineer during construction. Base course shall be salvaged from the temporary crossings and be reused for roadbed placement.

6.4 TRUCK ROUTES

6.4.1 The Contractor shall only haul materials in and out of the construction site on the streets designated by the City as truck routes.

6.5 PEDESTRIAN TRAFFIC

6.5.1 The Contractor shall protect and restrict all pedestrians from work areas. Safety fence shall be installed around all work areas adjacent to pedestrian walkways and at other locations as illustrated in the plans or deemed necessary by the Engineer. Safety fence shall be installed in a respectable manner spacing posts as needed to keep the fence taut.

6.5.2 Temporary boardwalks shall be constructed at locations to provide access to those who are disabled and in need of temporary access. Locations shall be determined in the field by the Engineer. Boardwalks shall be ADA accessible.

6.6 CHANNELIZING DEVICES

6.6.1 In transition and taper sections, channelizing devices shall be reflectorized drums. In tangent sections, 42" tall grabber cones may be used instead of reflectorized drums.

6.7 STANDARD SPACING FOR SIGNS, TAPERS, AND CHANNELIZING DEVICES

Posted Speed Prior to Work (M.P.H.)	Spacing of Advance Warning Signs (Feet)				Taper Length (Feet) (L)	Spacing of Channelizing Devices (Feet) (G)
	(A)	(B)	(C)	(D)		
0 - 30	200				180	25
35 - 40	350				320	25
45 - 50	500				600	50
55	500				660	50
	(A)	(B)	(C)	(D)		
60 - 65	500	1000	1300	1600	780	50
75	500	1000	1300	1600	1125	50

EROSION CONTROL NOTES

7.1 GENERAL EROSION CONTROL

7.1.1 Prevent erosion and contain all construction related debris, sediments, or containments on site. Protective measures are illustrated in the Drawings but are not meant to be all inclusive. Monitor the site and notify Engineer of any failures to contain construction related pollutants. Inspect, maintain, and repair erosion and sedimentation control measures during construction until permanent vegetation is established and until a Notice of Termination is filed with the DANR.

7.2 SOIL STABILIZER

7.2.1 The soil stabilizer shall be applied on disturbed areas when final stabilization is delayed due to seasonal limitations.

7.2.2 The Contractor shall apply soil stabilizer according to the manufacturer's recommendations and at the rate specified.

7.2.3 Wood fiber mulch that contains a green dye shall be mixed with the soil stabilizer to be used as a tracer when the soil stabilizer is applied hydraulically. Wood fiber mulch shall be added at a rate of 300 pounds per acre to all of the approved soil stabilizers listed in the table except for the Pam-12 Plus product. The wood fiber mulch shall be a 100% wood fiber product and does not need to contain a tackifier.



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WESTSIDE PARK
MCVAY FAMILY REFLECTION GARDEN
YANKTON, SOUTH DAKOTA
SEI Project #: 22199



Plot Time: 7/25/2022 1:37 PM

BID SET

GENERAL
NOTES

C-008

7.2.4 The soil stabilizer shall be from the list below or an approved equal:

<u>Product</u>	<u>Manufacturer</u>
StarTak 600 Applied at a rate of 150 Lb/Acre	Chemstar Products Company Minneapolis, MN Phone: 1-800-328-5037 www.chemstar.com
Pam-12 Plus	ENCAP, LLC Green Bay, WI Phone: 1-877-405-5050 http://professional.encap.net/
NOTE: Pam-12 Plus will only be allowed on a case-by-case basis with written approval from City Environmental and the Engineer.	
Applied at a rate of:	
<u>Slope</u>	
None to 4:1	1000 Lb/Acre
Steeper than 4:1	- not recommended
M-Binder Applied at a rate of 150 Lb/Acre	Ecology Controls Carpinteria, CA Phone: 1-805-684-0436 www.ssseeds.com
FiberRX Applied at a rate of:	Hydrostraw, LLC Manteno, IL Phone: 1-800-545-1755 http://hydrostraw.com/
<u>Slope</u>	
None to 4:1	50 Lb/Acre
3:1	60 Lb/Acre
2:1	70 Lb/Acre
1:1 or steeper	80 Lb/Acre
Enviropam Applied at a rate of 9 Lb/Acre	Innovative Turf Solutions, LLC Cincinnati, OH Phone: 1-513-317-8311 www.innovativeturfsolutions.com
HydraTack, Tack Plus, Tack-P, or Tack-P Plus Applied at a rate of 30 Lb/Acre	Innovative Turf Solutions, LLC Cincinnati, OH Phone: 1-513-317-8311 www.innovativeturfsolutions.com
FI-1045 Hydrobond or FI-1046 Hydrobond Applied at a rate of 15 Lb/Acre	JRM Chemical, Inc. Cleveland, OH Phone: 1-216-475-8488 www.soilmoist.com
HF5000 Tack Applied at a rate of 60 Lb/Acre	Rantec Corporation Ranchester, WY Phone: 1-307-655-9565 www.ranteccorp.com
R-Tack Applied at a rate of 150 Lb/Acre	Rantec Corporation Ranchester, WY Phone: 1-307-655-9565 www.ranteccorp.com

SpecTack Applied at a rate of:	Rantec Corporation Ranchester, WY Phone: 1-307-655-9565 www.ranteccorp.com
<u>Slope</u>	
None	30 to 80 Lb/Acre
4:1	50 to 100 Lb/Acre
3:1	80 to 120 Lb/Acre
2:1	100 to 170 Lb/Acre
Super Tack Applied at a rate of 60 Lb/Acre	Rantec Corporation Ranchester, WY Phone: 1-307-655-9565 www.ranteccorp.com
EarthGuard SFM Applied at a rate of 60 LB/Acre (approx. 6 Gallons/Acre)	Terra Novo Inc. Bakersfield, CA Phone: 1-661-747-5956 www.terranovo.com

EXISTING CONDITIONS & REMOVAL NOTES

8.1 FACILITIES AND UTILITY WORK BY OTHERS

- 8.1.1 Reference examination and preparation paragraphs of General Requirements.
- 8.1.2 Notify South Dakota One Call 1-800-781-7474 to have utilities field located.
- 8.1.3 Prior to beginning Work, locate, excavate, expose, and record elevations of all underground facilities whether indicated or not. Notify engineer and utility owner where conflicts are discovered. Coordinate schedules with utility owners and provide ample time for them to access site and relocate facilities.
- 8.1.4 The following utility companies are known to have facilities on the project:

City of Yankton

Kyle Goodmanson – Water/Wastewater
phone: (605) 668-5272
Brad Bies – Storm Water
phone: (605)668-5251

Northwestern Energy

Noah Kilonzo
phone: (605)668-4604

Midco Communications

Greg Buthe
phone: (605) 231-0400

Vast Broadband

Jay Morrison
phone: (605)306-5099

MidAmerican Energy

Nicolle Rasmusson
phone: (605)373-6081

Lumen

Trevor Janssen
phone: (605)977-2848

8.1.5 Safeguard utility owner's facilities and coordinate efforts to coincide and minimize inconvenience to the public and utility companies. Where pipe utility installation crosses existing utilities, support the utilities in a manner that is acceptable to the owner of the utility. Repair damage caused to facilities to the satisfaction of utility owner.

8.1.6 Remove and dispose of abandoned utilities encountered while performing work. Costs shall be incidental to project.

8.2 INCIDENTAL WORK

8.2.1 Incidental Work Items include but are not limited to the following:

1. Repairing damaged utilities
2. Removal and disposal of abandoned private utilities
3. Salvage, reset or replenish disturbed landscaping
4. Removal and reinstalling concrete sidewalk for electrical connections.

GRADING, PAVING AND RESTORATION NOTES

9.1 EARTHWORK

9.1.1 Reference General Notes. Move earthen materials and establish elevations as indicated in the drawings. Strip organic material within embankment areas prior to filling.

9.1.2 The contractor shall anticipate excavated material to compact to a higher density than its native state and apply his/her own assumptions of shrinkage as they see fit and include them in their unit price.

9.2 STRIP AND STOCKPILE TOPSOIL

9.2.1 Strip and stockpile topsoil of disturbed areas with a depth of 6". Prior to construction operations starting, topsoil shall be removed from the construction limits and stockpiled in an acceptable location. Stripped topsoil shall be free of clay, rock, debris, tree roots and etc. The stockpile shall provide positive drainage and erosion control silt fence may need to be utilized for containment. Upon completion of surfacing operations, contractor shall place salvaged topsoil at a depth of 6" over all disturbed areas.

9.3 SIDEWALKS

9.3.1 Sidewalks shall be constructed in accordance with the American with Disabilities Act (ADA). The Contractor shall verify elevations as necessary and coordinate with the Engineer to determine the locations of landing areas and slope tolerances in the field.

PLANTING

10.1 PLANT BED PREPARATION

10.1.1 Remove stones larger than 1" in any dimension, sticks, roots, trash and other extraneous matter. Grade the planting areas to a smooth, uniform surface that is loose and uniformly fine textured. Grade to within +/- 0.5" of the finish elevation. Roll and rake, remove ridges, pulverize soil clods to less than 1" and fill depressions to meet finish grades. The Contractor will need prior authorization from the Engineer to commence planting. Plant bed preparation shall be incidental to the appropriate bid items.

10.2 WARRANTY

10.2.1 Installer agrees to repair or replace plantings and accessories that fail in materials, workmanship or growth within the specified warranty period.

10.2.2 Failures include, but are not limited to: death and unsatisfactory growth, and damage from falling or blowing over. The Contractor will be responsible to replace all plants and trees that fail during the project or warranty period at no additional cost to the City.

10.2.3 The Engineer will monitor plants planted by the contractor as part of the construction contract. Trees that die prior to completion of the project will be reported to the contractor and must be removed immediately. Replacement trees will be planted as directed at no additional cost to the City.

10.2.4 The Parks Department will monitor the trees during the warranty period. If a tree meets the criteria below, the Park Supervisor will advise the Engineer of the need to meet on site to confirm that the tree is dead. A picture of the dead tree will then be taken, and the tree will be removed by the Forestry Crew. The Engineer will follow up with the contractor to have the tree replaced at no additional cost to the City.

1. Criteria for identifying a dead tree:

- i. Leaves are brown during the summer.
- ii. Tree loses its leaves during the summer.
- iii. Buds are dry and brittle.
- iv. Brittle branches that break when bent.
- v. The surface beneath the bark of the tree is brown. To check, take a pocket knife and scrape the surface just below the bark. If the surface beneath the bark is green, then the tree is not dead.

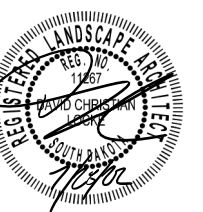
10.2.5 Staking of trees will be at the discretion of the Engineer and will be incidental to the cost of the tree. No hose and wire will be used for staking.



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YANKTON, SOUTH DAKOTA
SEI Project #: 22199



Plot Time: 7/25/2022 1:37 PM

BID SET

GENERAL
NOTES

C-009

10.2.6 All plants, trees and shrubs will be warranted for 12 months from date of project substantial completion. At the end of the warranty period the engineer shall make an inspection of the project and note dead, unhealthy or otherwise unacceptable plants, trees and shrubs that shall be replaced by the Contractor at no additional cost to the project. Warranty costs shall be incidental to the project.

10.3 GENERAL NOTES

10.3.1 All plants, trees and shrubs shall conform to or exceed minimum quality standards as defined by the American Nursery and Landscaping Association, current edition of ANSI Z60.1, and shall be purchased from a Landscape Nursery. Plants, trees and shrubs furnished shall be of the same genus, species, cultivar and size as specified in the plans. Species and variety may be substituted only by the approval of the Engineer. Each plant, tree and shrub shall have an identification label, removed after the Substantial Completion inspection.

10.3.2 Planting locations for each individual species shall be identified prior to planting. Location shall be approved by the Engineer prior to installation.

10.3.3 Hand dig tree planting pits when in close proximity to existing utilities.

10.3.4 All plants, trees and shrubs shall be planted in accordance with all the drawings and specifications included in the plans.

10.3.5 Trees may not be stored on site for more than 24 hours prior to planting without prior approval and installation of a moisture retaining cover or bedding around all root balls.

10.3.6 Within 2 hours after being planted, plants, trees and shrubs shall be watered to thoroughly saturated backfill soil as this provides settlement and filling of voids in the backfill.

10.4 PLANT AND PLANT AREA MAINTENANCE

10.4.1 The Contractor is responsible for maintaining all plants and plant beds until the entire project is complete and accepted by the Owner, per the following:

1. The Contractor is responsible for controlling weeds and mowing all newly seeded, sodded and landscaping areas until a uniform perennial vegetative cover with a density of 90% of the native cover for unpaved areas and areas not covered by permanent structures has been established. The Contractor shall also spray and remove any weeds that are present prior to seeding, sodding and installing the landscaping areas. If areas are seeded in late fall, this requirement shall remain in effect the following spring.
2. Maintain plantings by pruning, cultivating, watering, weeding, fertilizing, mulching, resetting to proper grades or vertical position and performing other operations as required to establish healthy, viable plantings. Spray or treat as required to keep trees and plants free of insects and disease.
3. Fill settled areas with planting soil as necessary. Remove and replace landscape and mulch materials damaged or lost in areas.
4. Protect plants from damage due to landscape operations and operations of other Contractors and trades. Maintain protection during installation and maintenance periods. Treat, repair or replace damaged planting.

10.5 MULCH RINGS AND TREGATORS

10.5.1 A 20 gallon Tregator Slow Release Watering Bag shall be provided and installed with each tree. www.tregator.com. Each tree bag shall be refilled at least once per week.

10.6 WEED BARRIER FABRIC

10.6.1 Weed barrier fabric shall be placed at the areas specified in the plans.

10.6.2 Weed barrier fabric shall be anchored to the ground with 6" U shaped staples. The staples shall be placed at a 4' spacing along all edges, overlaps, and throughout the area of weed barrier fabric. The weed barrier fabric shall be overlapped 4" between rolls.

10.6.3 The weed barrier fabric shall be provided from the list below or an approved alternate:

1. SRW Pro Plus V
SRW Products
1-800-752-9326
www.srwproducts.com
2. Pro 5
DeWitt Company Inc.
1-800-888-9669
www.dewittcompany.com

10.7 MULCH

10.7.1 Western Red Cedar Mulch shall be placed at a thickness of 4 inches in areas shown on the plans.

10.8 LANDSCAPE EDGING

10.8.1 Landscape Edging shall be 3/16" x 5.5" aluminum edging in standard lengths with tapered steel angle stakes. Basis of Design: Sure-Loc, Aluminum Landscape edging black anodized, or equal as approved by addendum 10 days prior to bid date. Accessories include the manufacturer's standard alignment clips or stakes.

PRECAST MODULAR BLOCK GRAVITY RETAINING WALL

11.1 SUMMARY

11.1.1 This Section includes furnishing all materials and labor required for the design and construction of a precast concrete modular block (PMB) gravity retaining wall without geosynthetic reinforcement. Precast modular block retaining wall blocks under this section shall be cast utilizing a wet-cast concrete mixture, exhibit a final handling weight in excess of 1,000 pounds (450 kg) per unit, and may utilize concrete reinforcing steel.

11.1.2 Scope of Work: The work shall consist of furnishing materials, labor, equipment, and supervision for the construction of a precast modular block (PMB) retaining wall structure in accordance with the requirements of this section and in acceptable conformity with the lines, grades, design, and dimensions shown in the project site plans.

11.1.3 Drawings and General Provisions of the Contract, including General and Supplementary Conditions and General Notes also apply to this Section.

11.2 PRICE AND PAYMENT PROCEDURES

11.2.1 Unit Prices: In addition to a lump sum price pursuant to completion of the scope of work in the plans, the General Contractor shall provide a unit price per square foot of vertical wall face that shall be the basis of compensation for up to a ten (10) percent increase or reduction in the overall scope of the retaining wall work.

11.3 REFERENCES

11.3.1 Where the specification and reference documents conflict, the Owner's designated representative will make the final determination of the applicable document.

11.3.2 Definitions:

1. Precast Modular Block (PMB) Unit – machine placed, "wet cast" concrete modular block retaining wall facing unit.
2. Geotextile – a geosynthetic fabric manufactured for use as a separation and filtration medium between dissimilar soil materials.
3. Drainage Aggregate – clean, crushed stone placed within and immediately behind the precast modular block units to facilitate drainage and reduce compaction requirements immediately adjacent to and behind the precast modular block units.
4. Unit Core Fill – clean, crushed stone placed within the hollow vertical core of a precast modular block unit. Typically, the same material used for drainage aggregate as defined above.
5. Foundation Zone – soil zone immediately beneath the leveling pad.
6. Retained Zone – soil zone immediately behind the drainage aggregate and wall infill for wall sections designed as modular gravity structures.
7. Leveling Pad – hard, flat surface upon which the bottom course of precast modular blocks are placed. The leveling pad shall be constructed with crushed stone. A leveling pad is not a structural footing.

8. Wall Infill – the fill material placed and compacted between the drainage aggregate and the excavated soil face in retaining wall sections designed as modular gravity structures.
9. RWDE – retaining wall design engineer.

11.3.3 Reference Standards

1. Design
 - i. AASHTO LRFD Bridge Design Specifications, 8th and 9th Edition.
 - ii. Minimum Design Loads for Buildings and Other Structures – ASCE/SEI 7-16.
 - iii. International Building Code, 2018 Edition.
 - iv. Design Manual for Segmental Retaining Walls, National Concrete Masonry Association, 3rd Edition, 2010.
2. Precast Modular Block Units
 - i. ACI 201 – Guide to Durable Concrete
 - ii. ACI 318 – Building Code Requirements for Structural Concrete
 - iii. ASTM C33 – Standard Specification for Concrete Aggregates
 - iv. ASTM C39 – Standard Test Method for Compressive Strength of Cylindrical Concrete Specimens
 - v. ASTM C94 – Standard Specification for Ready-Mixed Concrete.
 - vi. ASTM C136 – Standard Test Method for Sieve Analysis of Fine and Coarse Aggregates.
 - vii. ASTM C143 – Standard Test Method for Slump of Hydraulic-Cement Concrete.
 - viii. ASTM C150 – Standard Specification for Portland Cement
 - ix. ASTM C231 - Standard Test Method for Air Content of Freshly Mixed Concrete by the Pressure Method.
 - x. ASTM C260 – Standard Specification for Air-Entraining Admixtures for Concrete.
 - xi. ASTM C494 – Standard Specification for Chemical Admixtures for Concrete.
 - xii. ASTM C595 - Standard Specification for Blended Hydraulic Cements.
 - xiii. ASTM C618 - Standard Specification for Coal Fly Ash and Raw or Calcined Natural Pozzolan for Use in Concrete.
 - xiv. ASTM C666 – Standard Test Method for Concrete Resistance to Rapid Freezing and Thawing.
 - xv. ASTM C845 - Standard Specification for Expansive Hydraulic Cement.
 - xvi. ASTM C920 – Standard Specification for Elastomeric Joint Sealants.
 - xvii. ASTM C989 - Standard Specification for Slag Cement for Use in Concrete and Mortars.
 - xviii. ASTM C1116 – Standard Specification for Fiber-Reinforced Concrete.
 - xix. ASTM C1157 - Standard Performance Specification for Hydraulic Cement.
 - xx. ASTM C1218 - Standard Test Method for Water-Soluble Chloride in Mortar and Concrete.
 - xxi. ASTM C1240 - Standard Specification for Silica Fume Used in Cementitious Mixtures.
 - xxii. ASTM C1611 – Standard Test Method for Slump Flow of Self-Consolidating Concrete.
 - xxiii. ASTM C1776 – Standard Specification for Wet-Cast Precast Modular Retaining Wall Units.



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YANKTON, SOUTH DAKOTA
SEI Project #: 22199



Plot Time: 7/25/2022 1:37 PM

BID SET

GENERAL NOTES

C-010

xxiv. ASTM D6638 – Standard Test Method for Determining Connection Strength Between Geosynthetic Reinforcement and Segmental Concrete Units (Modular Concrete Blocks).

xxv. ASTM D6916 – Standard Test Method for Determining Shear Strength Between Segmental Concrete Units (Modular Concrete Blocks).

3. Geosynthetics

- i. AASHTO M 288 – Geotextile Specification for Highway Applications.
- ii. ASTM D3786 – Standard Test Method for Bursting Strength of Textile Fabrics Diaphragm Bursting Strength Tester Method.
- iii. ASTM D4354 – Standard Practice for Sampling of Geosynthetics for Testing.
- iv. ASTM D4355 – Standard Test Method for Deterioration of Geotextiles
- v. ASTM D4491 – Standard Test Methods for Water Permeability of Geotextiles by Permittivity.
- vi. ASTM D4533 – Standard Test Method for Trapezoid Tearing Strength of Geotextiles.
- vii. ASTM D4595 – Standard Test Method for Tensile Properties of Geotextiles by the Wide-Width Strip Method.
- viii. ASTM D4632 – Standard Test Method for Grab Breaking Load and Elongation of Geotextiles.
- ix. ASTM D4751 – Standard Test Method for Determining Apparent Opening Size of a Geotextile.
- x. ASTM D4759 – Standard Practice for Determining Specification Conformance of Geosynthetics.
- xi. ASTM D4833 – Standard Test Method for Index Puncture Resistance of Geomembranes and Related Products.
- xii. ASTM D4873 – Standard Guide for Identification, Storage, and Handling of Geosynthetic Rolls and Samples.
- xiii. ASTM D6241 – Standard Test Method for the Static Puncture Strength of Geotextiles and Geotextile-Related Products Using a 50-mm Probe.

4. Soils

- i. AASHTO M 145 – AASHTO Soil Classification System.
- ii. AASHTO T 104 – Standard Method of Test for Soundness of Aggregate by Use of Sodium Sulfate or Magnesium Sulfate.
- iii. AASHTO T 267 – Standard Method of Test for Determination of Organic Content in Soils by Loss of Ignition.
- iv. ASTM C33 – Standard Specification for Concrete Aggregates.
- v. ASTM D448 – Standard Classification for Sizes of Aggregates for Road and Bridge Construction.
- vi. ASTM D698 – Standard Test Method for Laboratory Compaction Characteristics of Soil Using Standard Effort. (12,400 ft-lb./ft (2,700 kN-m/m)).
- vii. ASTM D1241 – Standard Specification for Materials for Soil-Aggregate Subbase, Base and Surface Courses.
- viii. ASTM D1556 – Standard Test Method for Density and Unit Weight of Soil in Place by Sand-Cone Method.
- ix. ASTM D1557 – Standard Test Method for Laboratory Compaction Characteristics of Soil Using Modified Effort. (56,000 ft-lb./ft (2,700 kN-m/m)).
- x. ASTM D2487 – Standard Practice for Classification of Soils for Engineering Purposes (Unified Soil Classification System).
- xi. ASTM D2488 – Standard Practice for Description and Identification of Soils (Visual-Manual Procedure).

xii. ASTM D3080 – Standard Test Method for Direct Shear Test of Soils Under Consolidated Drained Conditions.

xiii. ASTM D4254 – Standard Test Method for Minimum Index Density and Unit Weight of Soils and Calculation of Relative Density.

xiv. ASTM D4318 – Standard Test Method for Liquid Limit, Plastic Limit, and Plasticity Index of Soils.

xv. ASTM D4767- Test Method for Consolidated-Undrained Triaxial Compression Test for Cohesive Soils.

xvi. ASTM D4972 – Standard Test Method for pH of Soils.

xvii. ASTM D6913 – Standard Test Methods for Particle-Size Distribution (Gradation) of Soils Using Sieve Analysis.

xviii. ASTM D6938 – Standard Test Method for In-Place Density and Water Content of Soil and Aggregate by Nuclear Methods (Shallow Depth).

xix. ASTM G51 – Standard Test Method for Measuring pH of Soil for Use in Corrosion Testing.

xx. ASTM G57 – Standard Test Method for Field Measurement of Soil Resistivity Using the Wenner Four-Electrode Method.

11.4 ADMINISTRATIVE REQUIREMENTS

11.4.1 Preconstruction Meeting. As directed by the Owner, the General Contractor shall schedule a preconstruction meeting at the project site prior to commencement of retaining wall construction. Participation in the preconstruction meeting shall be required of the General Contractor, the Retaining Wall Installation Contractor (RWIC), the Earthwork/Grading Contractor, and the Qualified Inspection Engineer. The General Contractor shall provide notification to all parties at least 10 calendar days prior to the meeting.

1. Preconstruction Meeting Agenda:

- i. The RWIC shall be provided the opportunity to explain all aspects of the retaining wall construction drawings.
- ii. The RWIC shall explain all excavation needs, site access and material staging area requirements to the General Contractor and Earthwork/Grading Contractor.

11.5 SUBMITTALS

11.5.1 Product Data. At least 14 days prior to construction, the General Contractor shall submit the retaining wall product submittal package to the Owner's Representative for review and approval. The submittal package shall include technical specifications and product data from the manufacturer for the following:

1. Precast Modular Block System brochure
2. Precast Modular Block concrete test results as follows:
 - i. 28-day compressive strength
 - ii. Air content
 - iii. Slump or Slump Flow (as applicable)
3. Geotextile

11.5.2 Installer Qualification Data. At least 14 days prior to construction, the General Contractor shall submit the qualifications of the business entity responsible for installation of the retaining wall, the RWIC.

11.5.3 Retaining Wall Design Calculations and Construction Shop Drawings. Prior to construction, the General Contractor shall furnish construction shop drawings and the supporting structural calculations report to the Owner for review and approval. Unless specifically requested by the Owner, the submittal may be in electronic format. This submittal shall include the following:

1. Signed, sealed (State of South Dakota) and dated drawings and engineering calculations prepared in accordance with these specifications.

11.6 CONSTRUCTION SHOP DRAWING PREPARATION

11.6.1 The RWDE shall coordinate the retaining wall construction shop drawing preparation with the project Civil Engineer, project Geotechnical Engineer and Owner's Representatives. The General Contractor shall furnish the RWDE the following project information required to prepare the construction shop drawings. This information shall include, but is not limited to, the following:

1. Current versions of the site, grading, drainage, utility, erosion control, landscape, and irrigation plans.
2. Electronic CAD file of the civil site plans listed in (1).
3. Report of geotechnical investigation and all addenda and supplemental reports.
4. Recommendations of the project Geotechnical Engineer regarding effective stress shear strength and total stress shear strength (when applicable) parameters for in-situ soils in the vicinity of the proposed retaining wall(s) and for any fill soil that may potentially be used as backfill in retained and/or foundation zones of the retaining wall.
5. Information pertaining to the magnitude, location, and nature of surcharge loadings acting on or near the proposed wall.

11.6.2 The RWDE shall provide the Owner with a certificate of professional liability insurance verifying the minimum coverage limits of \$1 million per claim and \$1 million aggregate.

11.6.3 Design of the precast modular block retaining wall shall satisfy the requirements of this section. Where local design or building code requirements exceed these specifications, the local requirements shall also be satisfied.

11.6.4 The RWDE shall note any exceptions to the requirements of this section by listing them at the bottom right corner of the first page of the construction shop drawings.

11.6.5 Approval or rejection of the exceptions taken by the Retaining Wall Engineer will be made in writing as directed by the Owner.

11.6.6 The RWDE shall determine the appropriate standard(s) to be utilized, and to which the precast modular block design shall be based upon, except as noted herein.

11.6.7 In the event that a conflict is discovered between these specifications and a reasonable interpretation of the design specifications and methods referenced in Paragraph above, these specifications shall prevail.

11.6.8 Soil Shear Parameters. The RWDE shall prepare the construction shop drawings based upon soil shear strength parameters from the available project data and the recommendations of the project Geotechnical Engineer. If insufficient data exists to develop the retaining wall design, the RWDE shall communicate the specific deficiency of the project information or data to the Owner in writing.

11.6.9 Allowable bearing pressure requirements for each retaining wall shall be clearly shown on the construction drawings.

11.7 QUALITY ASSURANCE

11.7.1 RWIC Qualifications. In order to demonstrate basic competence in the construction of precast modular block walls, the RWIC shall document compliance with the following:

1. Experience.
 - i. Construction experience with a minimum of 3,000 square feet of the proposed precast modular block retaining wall system.
 - ii. Construction of at least three (3) precast modular block (large block) retaining wall structures within the past three (3) years.
2. RWIC experience documentation for each qualifying project shall include:
 - i. Project name and location
 - ii. Date (month and year) of construction completion
 - iii. Contact information of Owner or General Contractor
 - iv. Type (trade name) of precast modular block system used
 - v. Maximum height of the wall constructed
 - vi. Face area of the wall constructed



WESTSIDE PARK
MCVAY FAMILY REFLECTION GARDEN
YANKTON, SOUTH DAKOTA
SEI Project #: 22199



Plot Time: 7/25/2022 1:37 PM

BID SET

GENERAL NOTES

C-011

- In lieu of the requirements set forth in items 1 and 2 above, the RWIC must submit documentation demonstrating competency in precast modular block retaining wall construction through a training program that is deemed acceptable by the Owner.

11.7.2 RWDE Qualifications and Statement of Experience. The RWDE shall submit a written statement affirming that he or she has the following minimum qualifications and experience.

- The RWDE shall be licensed to practice in the jurisdiction of the project location.
- The RWDE shall be independently capable of performing all internal and external stability analyses, including those for compound stability, rapid draw-down and deep-seated.
- The RWDE shall affirm in writing that he or she has personally supervised the design of the retaining walls for the project, that the design considers all the requirements listed and that he or she accepts responsibility as the design engineer of record for the retaining walls constructed on the project.
- The RWDE shall affirm in writing that he or she has designed a minimum of approximately 3,000 face square feet of modular block earth retaining walls within the previous five (5) years.
- In lieu of these specific requirements, the engineer may submit alternate documentation demonstrating competency in Precast Modular Block retaining wall design.

11.7.3 The Owner reserves the right to reject the design services of any engineer or engineering firm who, in the sole opinion of the Owner, does not possess the requisite experience or qualifications.

11.8 QUALITY CONTROL

11.8.1 The Owner's Representative shall review all submittals for materials, design, RWDE qualifications and the RWIC qualifications.

11.8.2 The Owner's engagement of the Inspection Engineer does not relieve the RWIC of responsibility to construct the proposed retaining wall in accordance with the approved construction shop drawings and these specifications.

11.8.3 The RWIC shall inspect the on-site grades and excavations prior to construction and notify the RWDE and General Contractor if on-site conditions differ from the elevations, assumptions, grading, and soil and groundwater conditions depicted in the retaining wall construction shop drawings.

11.9 DELIVERY, STORAGE AND HANDLING

11.9.1 The RWIC shall inspect the materials upon delivery to ensure that the proper type, grade and color of materials have been delivered.

11.9.2 The RWIC shall store and handle all materials in accordance with the manufacturer's recommendations as specified herein and in a manner that prevents deterioration or damage due to moisture, temperature changes, contaminants, corrosion, breaking, chipping, UV exposure or other causes. Damaged materials shall not be incorporated into the work.

11.9.3 Geosynthetics

- All geosynthetic materials shall be handled in accordance with ASTM D4873. The materials should be stored off the ground and protected from precipitation, sunlight, dirt and physical damage.

11.9.4 Precast Modular Blocks

- Precast modular blocks shall be stored in an area with positive drainage away from the blocks. Be careful to protect the block from mud and excessive chipping and breakage. Precast modular blocks shall not be stacked more than three (3) units high in the storage area.

11.9.5 Drainage Aggregate and Backfill Stockpiles

- Drainage aggregate or backfill material shall not be piled over unstable slopes or areas of the project site with buried utilities.
- Drainage aggregate material shall not be staged where it may become mixed with or contaminated by poor draining fine-grained soils such as clay or silt.

MATERIALS

11.10 PRECAST MODULAR BLOCK RETAINING WALL UNITS

11.10.1 All units shall be wet-cast precast modular retaining wall units conforming to ASTM C1776.

11.10.2 All units for the project shall be obtained from the same manufacturer. The manufacturer shall be licensed and authorized to produce the retaining wall units by the precast modular block system patent holder/licensor and shall document compliance with the published quality control standards of the proprietary precast modular block system licensor for the previous three (3) years, or the total time the manufacturer has been licensed, whichever is less.

11.10.3 Concrete used in the production of the precast modular block units shall be first-purpose, fresh concrete. It shall not consist of returned, reconstituted, surplus or waste concrete. It shall be an original production mix meeting the requirements of ASTM C94 and exhibit the properties as shown in the following table:

Concrete Mix Properties:

Freeze Thaw Exposure Class	Minimum 28-Day Compressive Strength	Maximum Water Cement Ratio	Nominal Maximum Aggregate Size	Aggregate Class Designation ⁽¹⁾	Air Content
Very Severe	4,500 psi (30.0 MPa)	0.40	1 inch (25 mm)	4S	6.0% +/- 1.5%
Maximum Water-Soluble Chloride Ion (Cl⁻) Content in Concrete, Percent by Weight of Cement					0.15
Maximum Chloride as Cl⁻ Concentration in Mixing Water, Parts Per Million					1000
Maximum Percentage of Total Cementitious Materials By Weight ⁽²⁾ (Very Severe Exposure Class Only):					
Fly Ash or Other Pozzolans Conforming to ASTM C618					25
Slag Conforming to ASTM C989					50
Silica Fume Conforming to ASTM C1240					10
Total of Fly Ash or Other Pozzolans, Slag, and Silica Fume ⁽³⁾					50
Total of Fly Ash or Other Pozzolans and Silica Fume ⁽³⁾					35
Alkali-Aggregate Reactivity Mitigation per ACI 201					
Slump (Conventional Concrete) per ASTM C143⁽¹⁰⁾				5 inches +/- 1 1/2 inches (125 mm +/- 40 mm)	
Slump Flow (Self-Consolidating Concrete) per ASTM C1611				18 inches - 32 inches (450 mm - 800 mm)	

⁽¹⁾Defined in ASTM C33 Table 3 *Limits for Deleterious Substances and Physical Property Requirements of Coarse Aggregates for Concrete.*

⁽²⁾The total cementitious material also includes ASTM C150, C595, C845, C1157 cement. The maximum percentages shall include:

- Fly ash or other pozzolans in type IP, blended cement, ASTM C595, or ASTM C1157.
- Slag used in the manufacture of an IS blended cement, ASTM C595, or ASTM C1157.
- Silica fume, ASTM C1240, present in a blended cement.

⁽³⁾Fly ash or other pozzolans and silica fume shall constitute no more than 25 and 10 percent, respectively, of the total weight of the cementitious materials.

11.10.4 Each concrete block shall be cast in a single continuous pour without cold joints. With the exception of half-block units, corner units and other special application units, the precast modular block units shall conform to the nominal dimensions listed in the table below and be produced to the dimensional tolerances shown.

Block Type	Dimension	Nominal Value	Tolerance
28" (710 mm) Block	Height	18" (457 mm)	+/- 3/16" (5 mm)
	Length	46-1/8" (1172 mm)	+/- 1/2" (13 mm)
	Width*	28" (710 mm)	+/- 1/2" (13 mm)
41" (1030 mm) Block	Height	18" (457 mm)	+/- 3/16" (5 mm)
	Length	46-1/8" (1172 mm)	+/- 1/2" (13 mm)
	Width*	40-1/2" (1030 mm)	+/- 1/2" (13 mm)
60" (1520 mm) Block	Height	18" (457 mm)	+/- 3/16" (5 mm)
	Length	46-1/8" (1172 mm)	+/- 1/2" (13 mm)
	Width*	60" (1520 mm)	+/- 1/2" (13 mm)
52" (1320 mm) XL Block	Height	36" (914 mm)	+/- 3/16" (5 mm)
	Length	46-1/8" (1172 mm)	+/- 1/2" (13 mm)
	Width*	52" (1320 mm)	+/- 1/2" (13 mm)
72" (1830 mm) XL Block	Height	36" (914 mm)	+/- 3/16" (5 mm)
	Length	46-1/8" (1172 mm)	+/- 1/2" (13 mm)
	Width*	72" (1830 mm)	+/- 1/2" (13 mm)
96" (2440 mm) XL Block	Height	36" (914 mm)	+/- 3/16" (5 mm)
	Length	46-1/8" (1172 mm)	+/- 1/2" (13 mm)
	Width*	96" (2440 mm)	+/- 1/2" (13 mm)

* Block tolerance measurements shall exclude variable face texture

11.10.5 Individual block units shall have a nominal height of 12-24 inches.

11.10.6 With the exception of half-block units, corner units and other special application units, the precast modular block units shall have

- Two (2), circular dome shear knobs that are 10 inches (254 mm), 7.5 inches (190 mm), or 6.75 inches (171 mm) in diameter and 4 inches (102 mm) or 2 inches (51 mm) in height. The shear knobs shall fully index into a continuous semi-cylindrical shear channel in the bottom of the block course above.
- The peak interface shear between any two (2) vertically stacked precast modular block units, with 10 inch (254 mm) diameter shear knobs, measured in accordance with ASTM D6916 shall exceed 6,500 lb/ft (95 kN/m) at a minimum normal load of 500 lb/ft (7kN/m), as well as an ultimate peak interface shear capacity in excess of 11,000 lb/ft (160 kN/m).
- The peak interlock shear between any two (2) vertically stacked precast modular block units, with 7.5 inch (190 mm) or 6.75 inch (171 mm) diameter shear knobs, measured in accordance with ASTM D6916 shall exceed 1,850 lb/ft (27 kN/m) at a minimum normal load of 500 lb/ft (7kN/m) as well as an ultimate peak interface shear capacity in excess of 10,000 lb/ft (146 kN/m).
- Test specimen blocks tested under ASTM D6916 shall be actual, full-scale production blocks of known compressive strength. The interface shear capacity reported shall be corrected for a 4,000 psi (27.6 MPa) concrete compressive strength. Regardless of precast modular block configuration, interface shear testing shall be completed without the inclusion of unit core infill aggregate.

11.10.7 In certain configurations and/or combinations of blocks, some minor on-site trimming/partial removal of some of the shear knobs may be necessary to allow for proper alignment.

11.10.8 Without field cutting or special modification, the precast modular block units shall be capable of achieving a minimum radius of 14 ft 6 in (4.42 m).

11.10.9 The precast modular block units shall be manufactured with integrally cast shear knobs that establish a standard horizontal set-back for subsequent block courses. The precast modular block system shall be available in the four (4) standard horizontal set-back facing batter options listed below:

18-inch High Blocks:

Horizontal Set-Back/Blk. Course	Max. Facing Batter
3/8" (10 mm)	1.2°
1-5/8" (41 mm)	5.2°
9-3/8" (238 mm)	27.5°
16-5/8" (422 mm)	42.7°

- The precast modular block units shall be furnished with the required shear knobs that provide the facing batter required in the construction shop drawings.
- Basis of Design: 1-5/8" setback per block course.



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SEI Project #: 22199



Plot Time: 7/25/2022 1:37 PM

BID SET

GENERAL NOTES

C-012

11.10.10 The precast modular block unit face texture shall be selected by the Owner from the available range of textures available from the precast modular block manufacturer. Each textured block facing unit shall be a minimum of 5.76 square feet (0.54 square meters) with a unique texture pattern that repeats with a maximum frequency of once in any 15 square feet (1.4 square meters) of wall face.

1. Basis of Design: Limestone.

11.10.11 The block color shall be selected by the Owner from the available range of colors available from the precast modular block manufacturer.

1. Basis of Design: Natural Color.

11.10.12 All precast modular block units shall be sound and free of cracks or other defects that would interfere with the proper installation of the unit, impair the strength or performance of the constructed wall. PMB units to be used in exposed wall construction shall not exhibit chips or cracks in the exposed face or faces of the unit that are not otherwise permitted. Chips smaller than 1.5" (38 mm) in its largest dimension and cracks not wider than 0.012" (0.3 mm) and not longer than 25% of the nominal height of the PMB unit shall be permitted. PMB units with bug holes in the exposed architectural face smaller than 0.50" in its largest dimension shall be permitted. Bug holes, water marks, and color variation on non-architectural faces are acceptable. PMB units that exhibit cracks that are continuous through any solid element of the PMB unit shall not be incorporated in the work regardless of the width or length of the crack.

11.10.13 Pre-approved Manufacturers.

1. Manufacturers of Redi-Rock Retaining Wall Systems as licensed by Redi-Rock International, LLC, 2940 Parkview Drive, Petoskey, MI 49770 USA; telephone (866) 222-8400; website: www.redi-rock.com.
2. Manufacturers of Monster Block Retaining Wall System as licensed by Monster Block, 1405 East Highway 50, Vermillion, SD 57069; telephone (605) 638-0812; website: www.monsterblock.com.

11.10.14 Substitutions. Technical information demonstrating conformance with the requirements of this specification for an alternative precast modular block retaining wall system must be submitted for preapproval at least 14 calendar days prior to the bid date. Acceptable alternative PMB retaining wall systems, otherwise found to be in conformance with this specification, shall be approved in writing by the Owner 7 days prior to the bid date. The Owner's Representative reserves the right to provide no response to submissions made outside of the time requirements of this section or to submissions of block retaining wall systems that are determined to be unacceptable to the Owner.

11.11 GEOTEXTILE

11.11.1 Nonwoven geotextile fabric shall be placed as indicated on the retaining wall construction shop drawings. Additionally, the nonwoven geotextile fabric shall be placed in the v-shaped joint between adjacent block units on the same course. The nonwoven geotextile fabric shall meet the requirements Class 3 construction survivability in accordance with AASHTO M 288.

11.11.2 Pre-approved Nonwoven Geotextile Products.

1. Mirafi 140N
2. Propex Geotex 451
3. Skaps GT-142
4. Thrace-Linq 140EX
5. Carthage Mills FX-40HS
6. Stratatex ST 142

11.12 DRAINAGE AGGREGATE AND WALL INFILL

11.12.1 Drainage aggregate (and wall infill for retaining walls designed as modular gravity structures) shall be a durable crushed stone conforming to No. 57 size per ASTM C33 with the following particle-size distribution requirements per ASTM D6913:

U.S. Standard Sieve Size	% Passing
1-1/2" (38 mm)	100
1" (25 mm)	95-100
1/2" (13 mm)	25-60
No. 4 (4.76 mm)	0-10
No. 8 (2.38 mm)	0-5

11.13 LEVELING PAD

11.13.1 The precast modular block units shall be placed on a leveling pad constructed from crushed stone. The leveling pad shall be constructed to the dimensions and limits shown on the retaining wall design drawings prepared by the RWDE.

11.13.2 Crushed stone used for construction of a granular leveling pad shall meet the requirements of the drainage aggregate and wall infill or a preapproved alternate material.

EXECUTION

11.14 GENERAL

11.14.1 All work shall be performed in accordance with OSHA, State, and local safety standards, state and local building codes and manufacturer's requirements.

11.14.2 The General Contractor is responsible for the location and protection of all existing underground utilities. Any new utilities proposed for installation in the vicinity of the retaining wall, shall be installed concurrent with retaining wall construction. The General Contractor shall coordinate the work of subcontractors affected by this requirement.

11.14.3 New utilities installed below the retaining wall shall be backfilled and compacted to a minimum of 98% maximum dry density per ASTM D698 standard proctor.

11.14.4 The General Contractor is responsible to ensure that safe excavations and embankments are maintained throughout the course of the project.

11.15 EXAMINATION

11.15.1 Prior to construction, the General Contractor, Grading Contractor, RWIC and Inspection Engineer shall examine the areas in which the retaining wall will be constructed to evaluate compliance with the requirements for installation tolerances, worker safety and any site conditions affecting performance of the completed structure. Installation shall proceed only after unsatisfactory conditions have been corrected.

11.16 PREPARATION

11.16.1 Excavation.

1. The Grading Contractor shall excavate to the lines and grades required for construction of the precast modular block retaining wall as shown on the construction drawings. The Grading Contractor shall minimize over-excavation.
2. Over-excavated soil shall be replaced with compacted fill in conformance with the specifications of the RWDE and General Notes of this project.
3. Embankment excavations shall be bench cut as directed by the project Geotechnical Engineer and inspected by the Inspection Engineer for compliance.

11.16.2 Foundation Preparation.

1. Prior to construction of the precast modular block retaining wall, the leveling pad area and undercut zone (if applicable) shall be cleared and grubbed. All topsoil, brush, frozen soil and organic material shall be removed. Additional foundation soils found to be unsatisfactory beyond the specified undercut limits shall be undercut and replaced with approved fill as directed by the project Geotechnical Engineer.

11.16.3 Leveling Pad.

1. The leveling pad shall be constructed to provide a level, hard surface on which to place the first course of precast modular block units. The leveling pad shall be placed in the dimensions shown on the retaining wall construction drawings and extend to the limits indicated.
2. Crushed Stone Leveling Pad. Crushed stone shall be placed in uniform maximum lifts of 6" (150 mm). The crushed stone shall be compacted by a minimum of 3 passes of a vibratory compactor capable of exerting 2,000 lb (8.9 kN) of centrifugal force and to the satisfaction of the Inspection Engineer.

11.17 PRECAST MODULAR BLOCK WALL SYSTEM INSTALLATION

11.17.1 The precast modular block structure shall be constructed in accordance with the construction drawings, these specifications and the recommendations of the retaining wall system component manufacturers. Where conflicts exist between the manufacturer's recommendations and these specifications, these specifications shall prevail.

11.17.2 Geotextile and drainage aggregate shall be installed as shown on the construction shop drawings.

11.17.3 Precast Modular Block Installation

1. The first course of block units shall be placed with the front face edges tightly abutted together on adjacent blocks, on the prepared leveling pad at the locations and elevations shown on the construction drawings. The RWIC shall take special care to ensure that the bottom course of block units are in full contact with the leveling pad, are set level and true and are properly aligned according to the locations shown on the construction drawings.
2. Backfill shall be placed in front of the bottom course of blocks prior to placement of subsequent block courses. Nonwoven geotextile fabric shall be placed in the V-shaped joints between adjacent blocks. Drainage aggregate shall be placed in the V-shaped joints between adjacent blocks, and extend to a minimum distance of 12" (300 mm) behind the block unit.
3. Drainage aggregate shall be placed in 9 inch to 12 inch maximum lifts (as specified by the Engineer) and compacted by a minimum of three (3) passes of a vibratory plate compactor capable exerting a minimum of 2,000 lb (8.9 kN) of centrifugal force, or by other suitable compaction methods.
4. Nonwoven geotextile fabric shall be placed between the drainage aggregate and the retained soil.
5. Subsequent courses of block units shall be installed with a running bond (approximate half block horizontal course-to-course offset). With the exception of 90 degree corner units, the shear channel of the upper block shall be fully engaged with the shear knobs of the block course below. The upper block course shall be pushed forward to fully engage the interface shear key between the blocks and to ensure consistent face batter and wall alignment. Drainage aggregate, unit core fill, geotextile and properly compacted backfill shall be complete and in-place for each course of block units before the next course of blocks is stacked.
6. The elevation of retained soil fill shall not be less than 1 block course (18") below the elevation of the retained backfill throughout the construction of the retaining wall.
7. If included as part of the precast modular block wall design, cap units shall be secured with an appropriate construction adhesive in accordance with the Manufacturer's recommendation.

11.17.4 Construction Tolerance. Allowable construction tolerance of the retaining wall shall be as follows:

1. Deviation from the design batter and horizontal alignment, when measured along a 10' (3 m) straight wall section, shall not exceed 3/4".
2. Deviation from the overall design batter shall not exceed 1/2" per 10' of wall height.
3. The maximum allowable offset (horizontal bulge) of the face in any precast modular block joint shall be 1/2".
4. The base of the precast modular block wall excavation shall be within 2" of the staked elevations, unless otherwise approved by the Inspection Engineer.
5. Differential vertical settlement of the face shall not exceed 1' along any 200' of wall length.
6. The maximum allowable vertical displacement of the face in any precast modular block joint shall be 1/2".
7. The wall face shall be placed within 2" of the horizontal location staked.

11.18 WALL INFILL AND BACKFILL PLACEMENT

11.18.1 Backfill material placed immediately behind the drainage aggregate shall be compacted as follows:

1. 98% of maximum dry density at ± 2% optimum moisture content per ASTM D698 standard proctor or 85% relative density per ASTM D4254.

11.18.2 Compactive effort within 3' of the back of the precast modular blocks should be accomplished with walk-behind compactors. Compaction in this zone shall be within 95% of maximum dry density as measured in accordance with ASTM D1557 modified proctor or 80% relative density per ASTM D 4254. Heavy equipment should not be operated within 3' of the back of the precast modular blocks.

11.18.3 Backfill material shall be installed in lifts that do not exceed a thickness of 9 to 12 inches, as specified by Engineer.

11.18.4 At the end of each work day, the RWIC shall grade the surface of the last lift of the granular wall infill to a 3% ± 1% slope away from the precast modular block wall face and compact it.



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 YANKTON, SOUTH DAKOTA
 SEI Project #: 22199



Plot Time: 7/25/2022 1:37 PM

BID SET

GENERAL NOTES

C-013

11.18.5 The Contractor shall always protect the precast modular block wall structure against surface water runoff through the use of berms, diversion ditches, silt fence, temporary drains and/or any other necessary measures to prevent soil staining of the wall face, scour of the retaining wall foundation or erosion of the reinforced backfill or wall infill.

11.19 OBSTRUCTIONS IN THE INFILL ZONE

11.19.1 The RWIC shall make all required allowances for obstructions behind and through the wall face in accordance with the approved construction shop drawings.

11.19.2 Should unplanned obstructions become apparent for which the approved construction shop drawings do not account, the affected portion of the wall shall not be constructed until the RWDE can appropriately address the required procedures for construction of the wall section in question.

11.20 COMPLETION

11.20.1 For walls supporting unpaved areas, a minimum of 12" (300 mm) of compacted, low-permeability fill shall be placed over the granular wall infill zone of the precast modular block retaining wall structure. The adjacent retained soil shall be graded to prevent ponding of water behind the completed retaining wall.

11.20.2 For retaining walls with crest slopes of 5H:1V or steeper, appropriate soil erosion/sedimentation control measures shall be installed along the wall crest immediately following construction and grading of the crest slope. The crest slope above the wall shall be immediately seeded and protected to establish vegetation.

11.20.3 The Contractor shall confirm that the as-built precast modular block wall geometries conform to the requirements of this section. The Contractor shall notify the Owner representative of any deviations.

METAL FABRICATIONS

12.1 SUBMITTALS

12.1.1 Provide shop drawing submittals for all fabricated steel components. Include details of cuts, connections, splices, camber, holes, embedment, and other pertinent information. Indicated welds by standard AWS symbols, distinguishing between shop and field welds, showing size, length, and type of weld. Indicate type, size and length of bolts, distinguishing between shop and field bolts. Include embedment drawings.

12.2 QUALITY ASSURANCE

12.2.1 Shop-painting applications shall be qualified according to AISC's sophisticated paint endorsement P1 or SSPC-QP 3, "Standard Procedure for Evaluating Qualifications of Shop Painting Applicators."

12.2.2 Welding procedures and personnel shall be qualified according to AWS D1.1, "Structural Welding Code – Steel."

12.3 PRODUCTS

12.3.1 Structural Steel Materials

1. All steel used for fabrication of arbor structure shall be type 304-Stainless Steel unless noted otherwise on drawings.

12.3.2 Bolts, Connectors and Anchors

1. In general, provide stainless steel bolts, washers, flats, nuts and pipe sleeves. Select fasteners for type, grade, and class required.
2. All anchor bolts shall be hot dipped galvanized.
3. Cast-in-place anchors in concrete shall be threaded or wedge type; galvanized ferrous castings, either ASTM A 47/A 47M malleable iron or ASTM A 27/A 27M cast steel. Provide bolts, washers, and shims as needed, hot-dip galvanized per ASTM A 153/A 153M.

12.4 EXTERIOR FINISHES

12.4.1 Surface Preparation: All exterior steel to be blasted, primed and painted as follows:

1. SSPC-1 Solvent: Clean (entire surface)

2. Prepare substrate surfaces by cleaning with solvent (AXALTA 3939s). Remove all surface contaminants from substrate surface (oil, grease, grime). If a biodegradable cleaner is required, Simple Green or Purple Power may be used in accordance to the product data sheets (PDS).
3. SSPC-SP2 or SSPC-SP3: Required to remove all weld slag and spatter
4. SSPC-SP2 Hand Tool Cleaning: Hand tool cleaning is a method of preparing the substrate surfaces by the use of non-powered hand tools. Use 3M red scuff pad (07447) or a non metallic brush to remove weld burn / slag.
5. SSPC-SP3 Power Tool Clean: Power tool clean all weld seams to remove weld burn / slag. A low RPM grinder using a 3M Clean & Strip Disc (07460) can be used to remove weld burn / slag.
6. Blast Surface: Media blast with a non-metallic media such as Aluminum Oxide, Garnett or Black Beauty to achieve a surface profile with a minimum of 1 ml and a maximum of 2 ml. Do not blast with Silica or Steel Shot.
7. Primer Coat: AZALTA Corlar 2.1 PR-P (High Solids Productive Epoxy Primer) with FG-040 Activator, mix ratio 2:1 with no induction time. Apply per mix/application instructions found on product data sheet. Thinner additions per product data sheet.
8. Finish Coat: AZALTA Imron 3.5 HG-D (Polyurethane Enamel) with 9T00-A Activator mix ratio 4:1 with no induction time. Apply per mix/application instructions found on product data sheet. May need to reduce paint with AXALTA Y-32401 reducer. Color: black semi-gloss.

- i. Apply high-performance coatings according to manufacturer's written instructions and recommendations in "MPI Architectural Painting Specifications Manual." Apply coatings to produce surface films without cloudiness, spotting, holidays, laps, brush marks, runs, sags, ropiness, or other surface imperfections. Pinholes, stipple, or eggshell appearance will not be accepted and will need to be sanded and recoated. Use paint manufacturer recommended flow additives to insure a smooth appearance. The contractor shall be responsible for protection of paint until substantial completion. Painting of signage, temporary barricades and other methods as required shall be incidental to the painting cots.

12.5 FABRICATION

12.5.1 Fabricated and assemble structural steel in shop to greatest extent possible. Mark and match-mark materials for field assembly. Complete structural-steel assemblies, including welding of units, before starting shop-prime operations.

12.5.2 Provide steel framing and supports as needed to complete the Work. Fabricate units from steel shapes, plates and bars of welded construction. Perform cutting, drilling, and fitting required for installing metal fabrications. Set metal fabrications accurately in location, with edges and surfaces level, plumb and true. Fit exposed connections accurately together. Weld connections that are not to be left as exposed joints but cannot be shop welded. Do not weld, cut, or abrade surfaces of exterior units that have been hot-dip galvanized after fabrication. Provide anchorage devices and fasteners where metal fabrications are required to be fastened to in-place construction.

12.5.3 Remove sharp or rough areas on exposed surfaces. Weld corners and seams continuously. Use materials and methods that minimize distortion and develop strength and corrosion resistance of base materials. Obtain fusion without undercut or overlap. Remove welding flux immediately. Finish exposed welds smooth and blended. Form exposed connections with hairline joints, flush and smooth, using concealed fasteners where possible. Locate joints where least conspicuous. Fabricate seams and other connections that will be exposed to weather in a manner to exclude water. Provide weep holes where water may accumulate.

12.5.4 Perform thermal cutting by machine to greatest extent possible. Plane thermally cut edges to be welded to comply with requirements in AWS D1.1.

12.5.5 Cut, drill, or punch standard bolt holes perpendicular to metal surfaces.

12.5.6 Accurately finish ends of columns and other members transmitting bearing loads.

12.6 SHOP AND FIELD CONNECTIONS

12.6.1 Weld connection shall comply with AWS D1.1 for welding procedure specifications, tolerances, appearance, and quality of welds and for methods used in correcting welding work. Remove backing bars or runoff tabs, back gouge and grind steel smooth. Verify that weld sizes, fabrication sequence, and equipment used for architecturally exposed structural steel will limit distortions to allowable tolerances. Prevent weld show-through on exposed steel surfaces.

12.7 QUALITY CONTROL

12.7.1 Correct deficiencies in work that inspections indicate do not comply with the contract documents.

12.7.2 Field welds will be visually inspected according to AWS D1.1. Correct deficiencies in work that inspections indicate does not comply with the contract documents.

12.8 REPAIRS AND PROTECTION

12.8.1 Touch-up chipped or otherwise damaged paint as directed by engineer.

12.9 FINAL CLEANING

12.9.1 Clean exposed painted steel of all dirt and debris.

GENERAL STRUCTURAL NOTES

13.1 POST-INSTALLED ANCHORS

13.1.1 Except where indicated on the drawings, post-installed anchors shall consist of the following anchor types as provided by HILTI, Inc. or approved equal.

1. Anchorage to concrete

i. Adhesive anchors for cracked and uncracked concrete use:

- (a) HILTI HIT-HY 200 Safe Set System with HILTI Hollow Drill Bit (TE-CD or TE-YD) and VC 20/40 Vacuum (VC 20-U or VC 40-U) System with HAS-E Threaded Rod per ICC ESR-3187
- (b) HILTI HIT-RE 500 V3 Safe Set System with HILTI Hollow Drill Bit (TE-CD or TE-YD) and VC 20/40 Vacuum (VC 20-U or VC 40-U) with HAS-E Threaded Rod per ICC ESR-3814
- (c) HILTI HIT-RE 500 V3 Safe Set System with HILTI Roughening Tool (TE-YRT) with HAS-E Threaded Rod per ICC ESR-3814 for diamond cored holes

ii. Medium duty mechanical anchors for cracked and uncracked concrete use:

- (a) HILTI KWIK BOLT-TZ Expansion Anchors per ICC ESR-1917
- (b) HILTI KWIK BOLT 3 Expansion Anchors (uncracked concrete only) per ICC ESR-2302

2. Rebar doweling into concrete

i. Adhesive anchors for cracked and uncracked concrete use:

- (a) HILTI HIT-HY 200 Safe Set System with HILTI Hollow Drill Bit (TE-CD or TE-YD) and VC 20/40 Vacuum (VC 20-U or VC 40-U) System with continuously deformed rebar per ICC ESR-3187
- (b) HILTI HIT-HY 500 V3 Safe Set System with HILTI Hollow Drill Bit (TE-CD or TE-YD) and VE 20/40 Vacuum (VC 20-U or VC 40-U) System with continuously deformed rebar per ICC ESR-3814
- (c) HILTI HIT-RE 500 V3 Safe Set System with HILTI Roughening Tool (TE-YRT) with continuously deformed rebar per ICC ESR-3814 in diamond cored holes

13.1.2 Substitution requests for alternate products must be approved in writing by the Engineer of Record prior to use. Contractors shall provide calculations demonstrating that the substituted product is capable of achieving the performance values of the specified product. Substitutions will be evaluated by their having an ICC ESR showing compliance with the relevant building code for seismic uses, load resistance, installation category, and availability of comprehensive installation instructions. Adhesive anchor evaluation will also consider creep, in-service temperature and installation temperature.

13.1.3 Install anchors per the manufacturer instructions, as included in the anchor packaging.

13.1.4 Overhead adhesive anchors must be installed using the HILTI PROFI System.

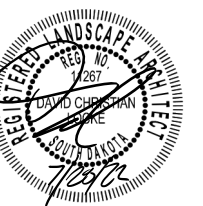
13.1.5 The contractor shall arrange an anchor manufacturer's representative to provide onsite installation training for all of the anchoring products specified. The Engineer of Record must receive documented confirmation that all of the contractor's personnel who install anchors are trained prior to the commencement of installing anchors.



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YANKTON, SOUTH DAKOTA
SEI Project #: 22199



Plot Time: 7/25/2022 1:37 PM

BID SET

GENERAL NOTES

C-014

13.1.6 Anchor capacity is dependent upon spacing between adjacent anchors and proximity of anchors to edge of concrete. Install anchors in accordance with spacing and edge of clearances indicated on drawings.

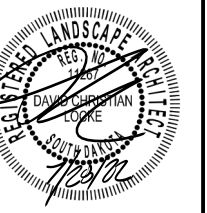
13.1.7 Existing reinforcing bars in the concrete structure may conflict with specific anchor locations. Unless noted on the drawings that the bars can be cut, the contractor shall review the existing drawings and shall undertake to locate the position of the reinforcing bars at the locations of the concrete anchors, by HILTI FERROSCAN, GPR, X-ray, chipping or other means.



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YANKTON, SOUTH DAKOTA
SEI Project #: 22199

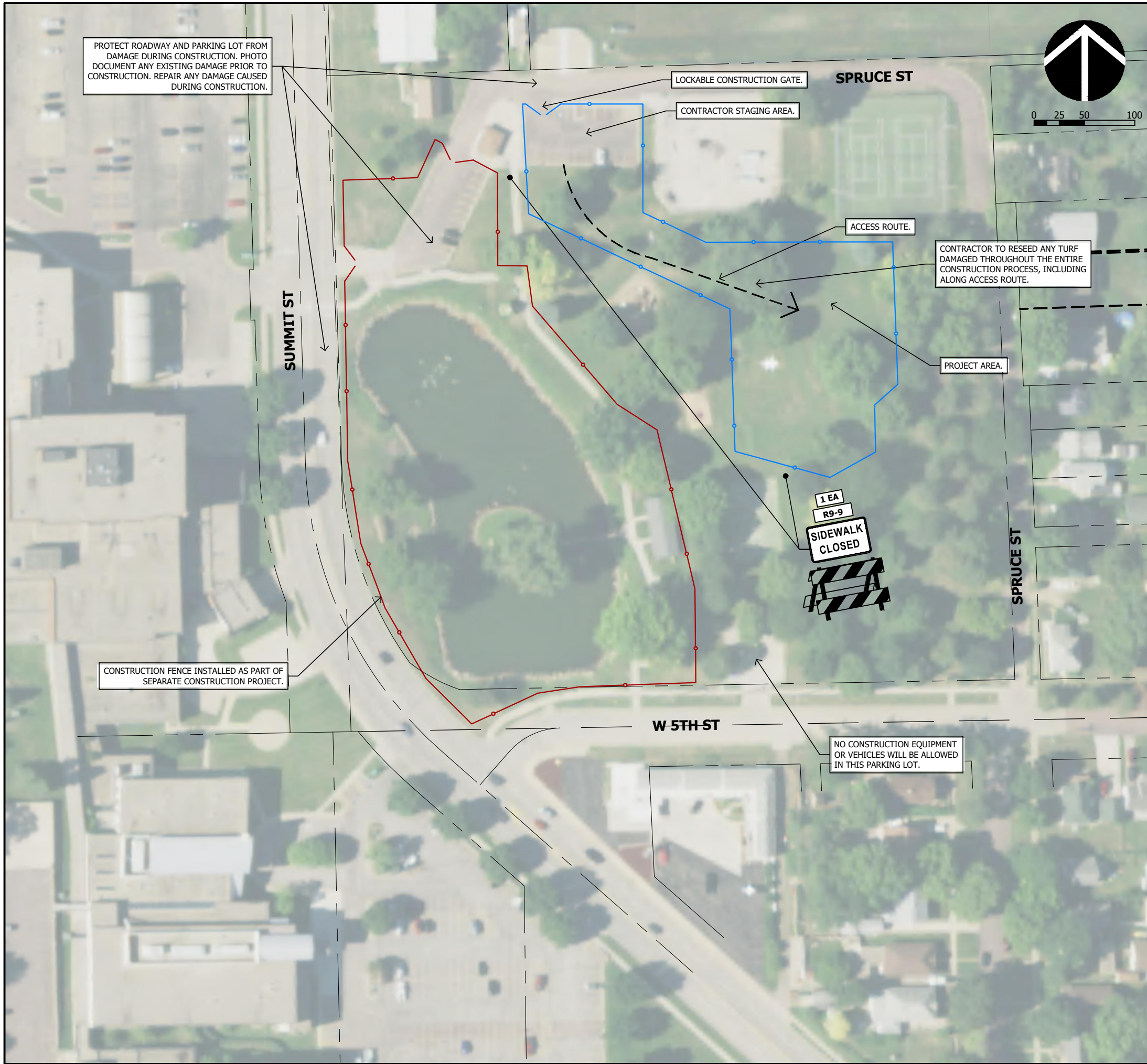


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GENERAL NOTES

C-015



PROTECT ROADWAY AND PARKING LOT FROM DAMAGE DURING CONSTRUCTION. PHOTO DOCUMENT ANY EXISTING DAMAGE PRIOR TO CONSTRUCTION. REPAIR ANY DAMAGE CAUSED DURING CONSTRUCTION.

LOCKABLE CONSTRUCTION GATE.

CONTRACTOR STAGING AREA.

SPRUCE ST

ACCESS ROUTE.

CONTRACTOR TO RESEED ANY TURF DAMAGED THROUGHOUT THE ENTIRE CONSTRUCTION PROCESS, INCLUDING ALONG ACCESS ROUTE.

PROJECT AREA.





SPRUCE ST

W 5TH ST

NO CONSTRUCTION EQUIPMENT OR VEHICLES WILL BE ALLOWED IN THIS PARKING LOT.

CONSTRUCTION FENCE INSTALLED AS PART OF SEPARATE CONSTRUCTION PROJECT.

LEGEND

-  4' CONSTRUCTION FENCE AROUND ENTIRE CONSTRUCTION LIMITS
-  TEMPORARY CONSTRUCTION SIGN
-  8-FT DOUBLE SIDED TYPE III BARRICADE
-  6' CHAIN LINK CONSTRUCTION FENCE INSTALLED AS PART OF SEPARATE CONSTRUCTION PROJECT.

GENERAL NOTES

INSTALLATION OF TRAFFIC CONTROL SHALL CONFORM TO THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD), MOST CURRENT EDITION, UNLESS MODIFIED ON THE PLANS.

THE CONTRACTOR SHALL NOTIFY THE ENGINEER 7 DAYS PRIOR TO START OF CONSTRUCTION AND BEFORE ANY SUBSTANTIAL TRAFFIC CONTROL CHANGE. NOTIFY THE ENGINEER 48 HOURS IN ADVANCE OF ANY SIDEWALK CLOSURES SO A PRESS RELEASE CAN BE ISSUED.

REMOVING, RELOCATING, SALVAGING, AND RESETTING OF TRAFFIC CONTROL DEVICES SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. ANY DELINEATORS OR SIGNS DAMAGED OR LOST SHALL BE REPLACED BY THE CONTRACTOR AT NO COST TO THE CITY.

ALL TRAFFIC CONTROL, INCLUDING INSTALLATION, MAINTENANCE, RELOCATION, AND REMOVAL OF BARRICADES, CONES, VERTICAL PANELS, DRUMS, BARRICADE WARNING LIGHTS, WATCHMEN, TUBULAR MARKERS, AND FLAGS SHALL BE INCLUDED IN THE LUMP SUM BID.

THE CONTRACTOR, OR DESIGNATED TRAFFIC CONTROL SUBCONTRACTOR, SHALL ENSURE THE ADEQUACY, LEGIBILITY, AND REFLECTIVITY OF EACH SIGN AND DEVICE. SIGN WASHING SHALL BE CONSIDERED INCIDENTAL TO THE LUMP SUM BID AND REQUIRED AS DIRECTED.

WHENEVER IT IS NECESSARY FOR A CONSTRUCTION VEHICLE OR PIECE OF EQUIPMENT TO BLOCK A LANE, FLAGGERS MUST BE PRESENT TO DIRECT TRAFFIC.

FLAGGER WARNING SIGNS SHALL BE INSTALLED WHEN USING FLAGGERS TO DIRECT TRAFFIC INTO AND OUT OF THE WORK AREA. FLAGGERS SHALL WEAR APPROPRIATE SAFETY CLOTHING AND SHALL USE A STOP/SLOW PADDLE. FLAGGING SHALL BE CONSIDERED INCIDENTAL TO THE LUMP SUM BID.

MAINTAIN ACCESS WHERE INDICATED. COORDINATE INTERRUPTIONS TO ACCESS WITH PROPERTY OWNERS AND TENANTS.



STOCKWELL
 STOCKWELL ENGINEERS, INC.
 801 N. PHILLIPS AVE. SUITE 100
 SIOUX FALLS, SD 57104
 PH: 605.338.6668
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City of **Yankton**
 SIOUX SAKA
 Making Your Vision a Reality

WESTSIDE PARK
MCVAY FAMILY REFLECTION GARDEN
 YANKTON, SOUTH DAKOTA
 SET PROJECT #: 22199



REGISTERED LANDSCAPE ARCHITECT
 REG. NO. 1126
 DAVID KRISTA LOCK
 SOUTH DAKOTA
 7/25/2022 10:29 AM

BID SET

TRAFFIC CONTROL PLAN

C-100

22179 - C-200 - Erosion Control Plan.dwg


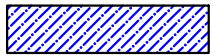

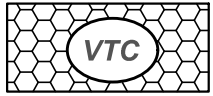




CONTRACTOR TO RESEED ANY TURF DAMAGED THROUGHOUT THE ENTIRE CONSTRUCTION PROCESS, INCLUDING ALONG ACCESS ROUTE.

GENERAL NOTES

1. AT NO TIME SHALL ANY WATERS FROM THIS PROJECT ENTER THE STORM SEWER OR LEAVE THE PROJECT LIMITS WITHOUT EXPOSURE TO A SEDIMENT FILTRATION DEVICE. ALL DROP INLETS, MANHOLES, AND JUNCTION BOXES (EXISTING OR NEW) SHALL HAVE SEDIMENT CONTROL DEVICES PLACED AROUND THEIR PERIMETER DURING ALL STAGES OF CONSTRUCTION EXCEPT DURING THE PLACEMENT OF THE FINAL SURFACING. THIS MAY NECESSITATE MULTIPLE INSTALLATIONS OF THE SEDIMENT CONTROL DEVICES AT THE SAME LOCATION.
2. ALL PAVED STREETS/PARKING AREAS ADJACENT TO THE SITE SHALL BE SWEEPED CLEAN AT THE END OF EACH DAY.
3. ANY DISCHARGE OF GROUNDWATER FROM THIS SITE TO THE CITY'S STORM SEWER SYSTEM IS NOT AUTHORIZED WITHOUT:
 - SUBMITTAL OF MONITORING DATA TO SD DANR TO DETERMINE WHAT TYPE OF SURFACE WATER DISCHARGE PERMIT WOULD BE NECESSARY.
 - APPROPRIATE SD DANR PERMIT MUST BE OBTAINED PRIOR TO ANY DISCHARGE.
5. ANY DISCHARGE OF GROUNDWATER FROM THIS SITE TO THE CITY'S SANITARY SEWER SYSTEM IS NOT AUTHORIZED WITHOUT:
 - SUBMITTAL OF A WASTEWATER DISCHARGE PERMIT APPLICATION TO PUBLIC WORKS AND RECEIVE CONDITIONAL APPROVAL OR PERMIT PRIOR TO DISCHARGE (CONTACT KYLE GOODMANSON, 668-5272).
6. IF GROUNDWATER IS DISCOVERED, A PROFESSIONAL GROUNDWATER AND ENVIRONMENTAL CONSULTANT SHALL REVIEW THE PLAN FOR GROUNDWATER HAZARDS, BOTH DURING CONSTRUCTION AND POST CONSTRUCTION, AND SUBMIT FINDINGS, SUGGESTIONS, AND/OR MITIGATION TO THE CITY FOR REVIEW OR CERTIFY THAT PROPOSED WORK IN AND AROUND CONSTRUCTION SITE IS CLASSIFIED AS NON-HAZARDOUS.
7. ALL DISTURBED AREAS DUE TO CONSTRUCTION ACTIVITY SHALL BE SEEDED WITH SPECIAL SEED MIX #1.
8. GRADING OPERATIONS THAT ARE LEFT OPEN OVER THE WINTER OR FOR LONGER THAN 14 DAYS SHALL RECEIVE TEMPORARY EROSION CONTROL IN THE FORM OF A COVER CROP OR BONDED FIBER MATRIX (SDDOT APPROVED PRODUCT) INSTALLATION PER MANUFACTURERS AND ENGINEERS RECOMMENDATION.

LEGEND

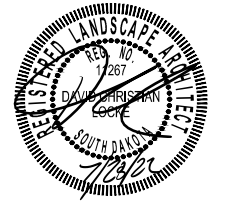
-  SPECIAL SEED MIX #1 AND EROSION CONTROL BLANKET
-  LANDSCAPE AREA (SEE LANDSCAPE PLAN)
-  SITE DISTURBANCE LIMITS
-  VEHICLE TRACKING CONTROL
-  CONCRETE WASHOUT FACILITY
-  SILT FENCE



STOCKWELL ENGINEERS, INC.
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SIOUX FALLS, SD 57104
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WESTSIDE PARK
MCVAY FAMILY REFLECTION GARDEN
 YANKTON, SOUTH DAKOTA
 SEE PROJECT #: 22179

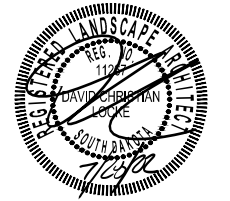
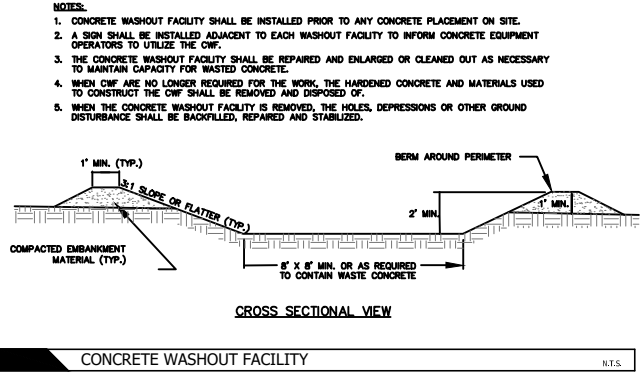
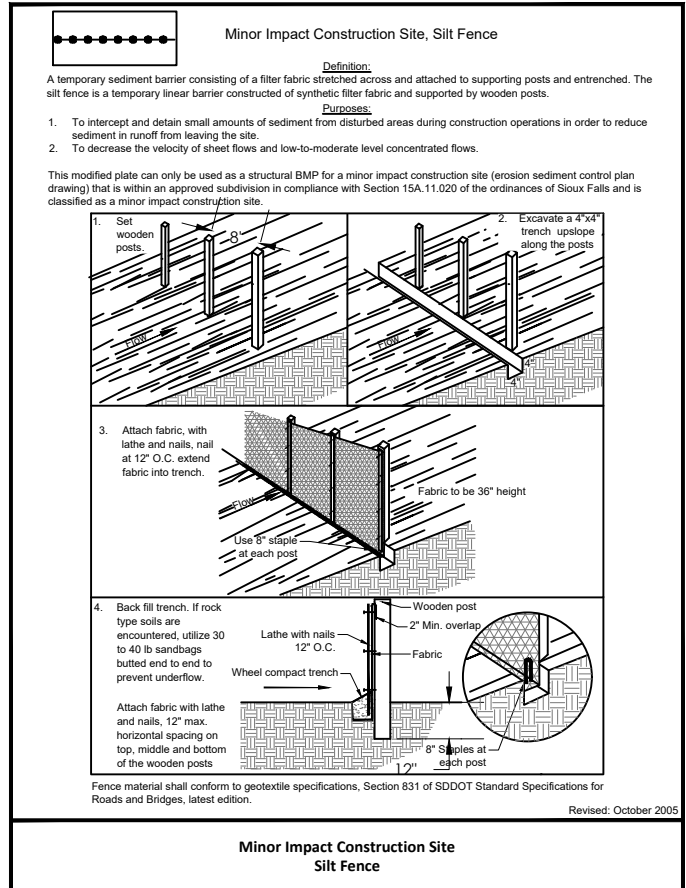
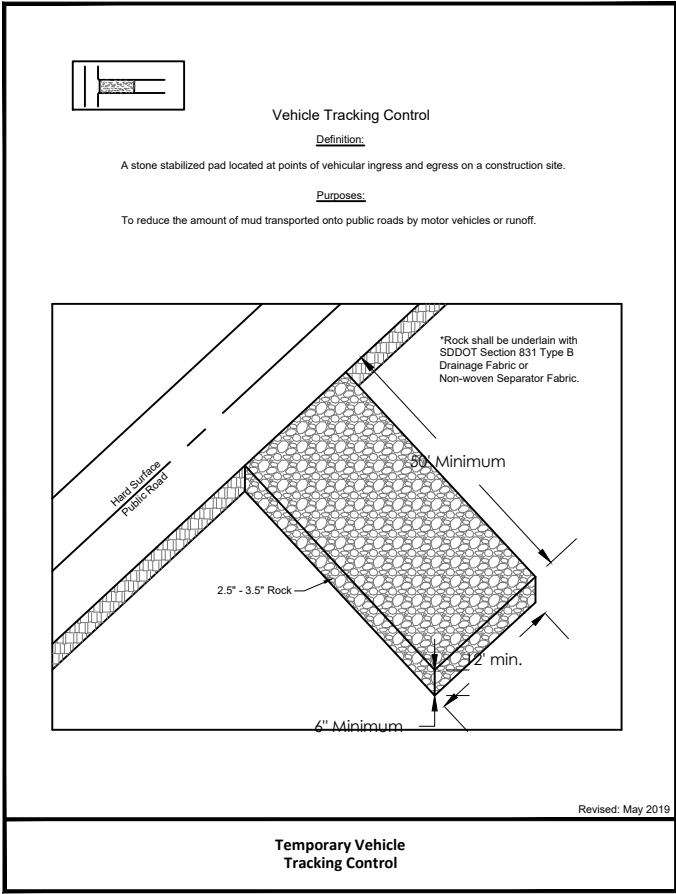


PLOT DATE 7/25/2022 10:30 AM

BID SET

EROSION CONTROL PLAN

C-200

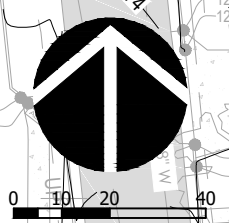


PLOT DATE 7/25/2022 10:31 AM

BID SET

EROSION
CONTROL
DETAILS

C-210



GENERAL NOTES

PRIOR TO ANY EXCAVATION AT THE SITE, CONTRACTOR SHALL EXAMINE ANY APPLICABLE DRAWINGS AVAILABLE FROM THE OWNER AND/OR THE LANDSCAPE ARCHITECT, AND CONSULT WITH THE OWNER'S PERSONNEL AND UTILITY COMPANIES REPRESENTATIVES TO DETERMINE POSSIBLE UTILITY LOCATIONS AND DEPTHS. NO COMPENSATION WILL BE ALLOWED FOR DAMAGE RESULTING FROM FAILURE TO COMPLY WITH THIS REQUIREMENT. REPORT TO OWNER'S REPRESENTATIVE ANY DAMAGE TO EXISTING UTILITIES PRIOR TO REPAIR. CALL SOUTH DAKOTA ONE CALL: 811 (IN-STATE) OR (800)781-7474 (OUTSIDE OF SOUTH DAKOTA).

THE CONTRACTOR SHALL VERIFY THE LOCATION AND PROTECT ALL UTILITIES AND STRUCTURES. DAMAGE TO UTILITIES AND STRUCTURES SHALL BE REPAIRED BY THE CONTRACTOR TO THE SATISFACTION OF THE OWNER OF THE UTILITIES.

FIELD VERIFY EXISTING GRADES AND LOCATIONS OF EXISTING UTILITIES, CONDUIT, LINES, POLES, TREES, PAVING, BUILDING, AND OTHER SITE STRUCTURES PRIOR TO DEMOLITION OR CONSTRUCTION AND IMMEDIATELY INFORM THE LANDSCAPE ARCHITECT OF ANY DISCREPANCIES.

PRIOR TO START, COORDINATE AND SCHEDULE ENGINEER TO MARK REMOVAL LIMITS.

INSTALL EROSION CONTROL DEVICES PRIOR TO START.

CONTACT THE LANDSCAPE ARCHITECT PRIOR TO REMOVING ANY PLANT MATERIAL NOT INDICATED TO BE PROTECTED OR REMOVED.

PROTECT ALL ITEMS WITHIN CONTRACT LIMITS NOT INDICATED TO BE REMOVED. NOTIFY THE LANDSCAPE ARCHITECT OF ANY DISCREPANCIES.

CONTRACTOR SHALL SAW CUT ALL ASPHALT OR CONCRETE TO BE REMOVED TO THE NEAREST CONTROL JOINT WHERE PRACTICAL.

KILL AND REMOVE ALL EXISTING VEGETATION NOTED ON THE PLANS PRIOR TO ALL GRADING ACTIVITIES.

REMOVE AND STOCKPILE ALL TOPSOIL FROM AREAS TO BE PAVED.

PROJECT SITE CONTAINS EXISTING IRRIGATION SYSTEM. REMOVE AND CAP ALL LINES AFFECTED BY PROJECT CONSTRUCTION. CONTRACTOR SHALL PROVIDE WORKING IRRIGATION SYSTEM AT COMPLETION OF PROJECT.

LEGEND

- REMOVE CONCRETE SIDEWALK
- REMOVE CONCRETE CURB & GUTTER
- REMOVE STRUCTURE
- REMOVE & SALVAGE FOR RESET RIPRAP
- CLEAR & GRUB TREE, STUMP, AND/OR BUSH
- TREE PROTECTION FENCING (12' RADIUS AROUND TREE)
- SITE DISTURBANCE LIMITS
- CENTERLINE
- PROPERTY LINE
- CONTOUR LINE
- NATURAL GAS
- UNDERGROUND TELEPHONE
- STEAM LINE
- UNDERGROUND POWER
- OVERHEAD POWER
- UNDERGROUND CABLE TV
- OVERHEAD CABLE TV
- SANITARY SEWER
- STORM SEWER
- WATER MAIN
- CURB AND GUTTER
- POWER POLE
- LIGHT POLE
- GUY WIRE
- WATER VALVE
- GAS VALVE
- MANHOLE
- FIRE HYDRANT
- TRAFFIC SIGNAL
- EXISTING SPOT ELEVATION
- BENCHMARK
- IRON PIN FOUND
- FENCE, BARBED WIRE
- FENCE, CHAIN LINK

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City of **Yankton**
 South Dakota
 Taking Flow Here

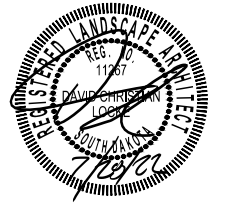
WESTSIDE PARK
MCVAY FAMILY REFLECTION GARDEN
 YANKTON, SOUTH DAKOTA
 SEE PROJECT #: 22199

PLANT DATE 7/26/2022 9:30 PM

BID SET

EXISTING
 CONDITIONS &
 REMOVALS

C-300



PLOT DATE 7/25/2022 10:49 AM

BID SET

SITE PLAN
 (ENLARGED)

C-401

GENERAL NOTES

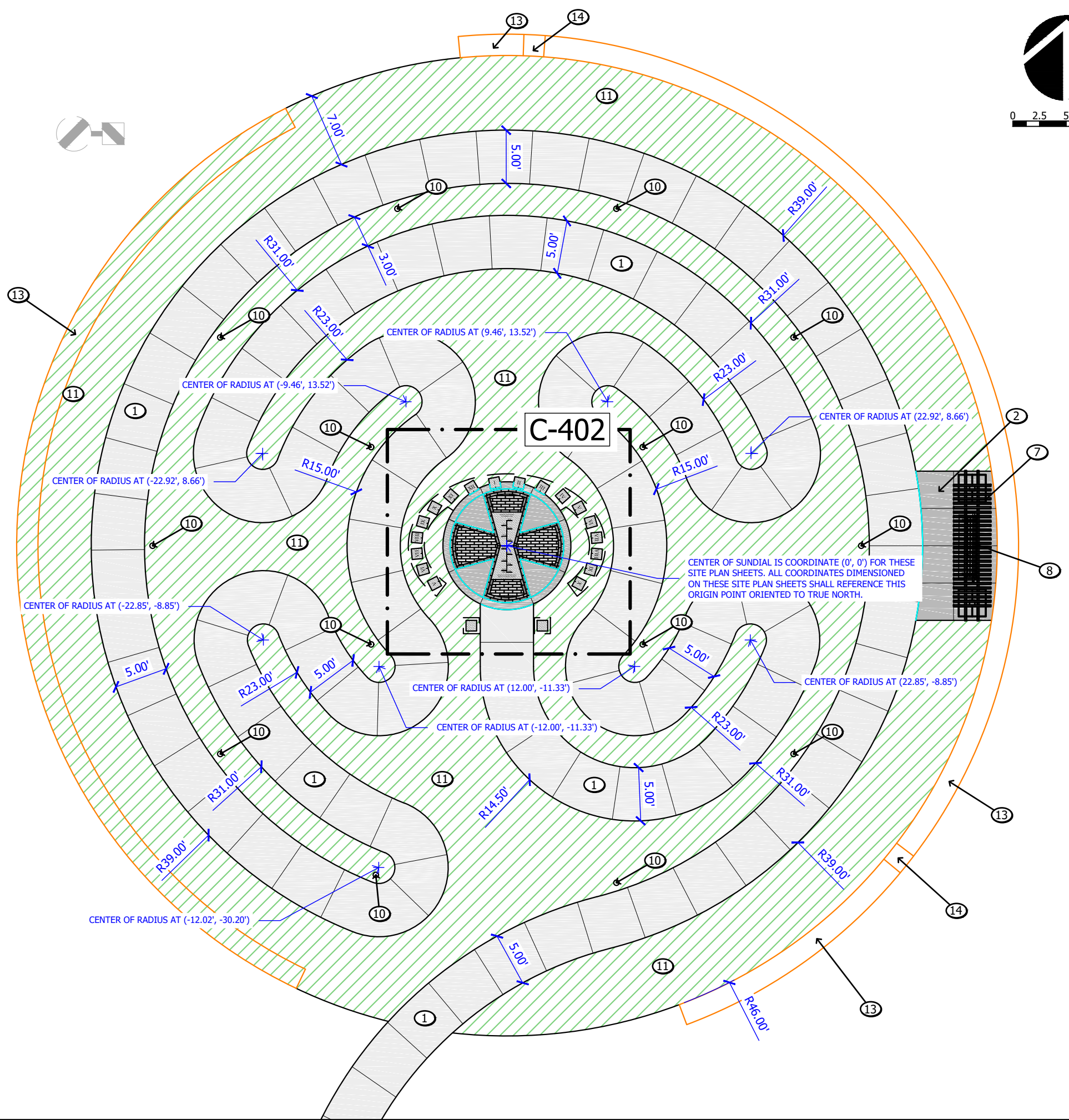
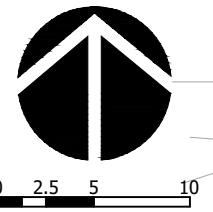
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LEGEND

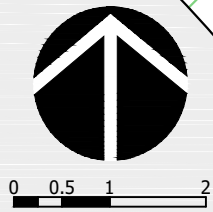
- 4" CONCRETE SIDEWALK W/
4" AGGREGATE BASE COURSE
- 4" COLORED CONCRETE SIDEWALK W/
4" AGGREGATE BASE COURSE
- PAVER #1 ON
CONCRETE BASE, SEE DETAIL
- PAVER #2 ON
CONCRETE BASE, SEE DETAIL
- CAST STONE, SEE DETAILS
- LANDSCAPE AREA
- RETAINING WALL
- EXPANSION JOINT

KEYNOTES

1. INSTALL 4" NON-REINFORCED CONCRETE SIDEWALK OVER 4" AGGREGATE BASE COURSE ON APPROVED SUBGRADE.
2. INSTALL 4" NON-REINFORCED "DARK GREY" COLORED CONCRETE SIDEWALK OVER 4" AGGREGATE BASE COURSE ON APPROVED SUBGRADE.
3. INSTALL UNILOCK COPTHORNE PAVER (COLOR BASALT) PAVER OVER 1" SAND SETTING BED OVER 5" REINFORCED CONCRETE BASE OVER 4" AGGREGATE BASE COURSE ON APPROVED SUBGRADE.
4. INSTALL UNILOCK COPTHORNE PAVER (COLOR BURNT CLAY) OVER 1" SAND SETTING BED OVER 5" REINFORCED CONCRETE BASE OVER 4" AGGREGATE BASE COURSE ON APPROVED SUBGRADE.
5. CAST STONE PAVER. SEE DETAILS.
6. CAST STONE TIME MARKER. SEE DETAILS.
7. ARBOR. SEE DETAILS.
8. METAL BENCH UNDER ARBOR. SEE PLANTING PLAN.
9. CONCRETE PAVER RESTRAINT.
10. ALTERNATE #1: SITE LIGHTING. SEE ELECTRICAL PLANS. ALL COSTS ASSOCIATED WITH ELECTRICAL IMPROVEMENTS SHALL BE INCLUDED IN ALTERNATE #1.
11. LANDSCAPE AREA. SEE LANDSCAPE PLAN.
12. NEW SIDEWALK TO MEET EXISTING SIDEWALK AT 90° ANGLE.
13. MONSTER BLOCK RETAINING WALL. RETAINING WALL SHALL NOT EXCEED 30" ABOVE ADJACENT FINISHED GRADE AT ANY POINT.
14. MONSTER BLOCK ANGLE BLOCK. INSTALL AND LOCATE AS NECESSARY TO TAPER TOP OF WALL TO FINISH GRADE.
15. CONCRETE PAD FOR CAST STONE BLOCK. CONCRETE PAD SHALL PROVIDE BASE FOR ENTIRE CAST STONE BLOCK. EXPANSION JOINT SHALL BE INSTALLED WHERE CONCRETE PAD MEETS CONCRETE SIDEWALK OR PAVER RESTRAINT. SEE DETAIL FOR THICKNESS AND CONNECTIONS.
16. MCVAY DONOR PLAQUE.
17. BENEDICTINE DONOR PLAQUE.



20IN DT



GENERAL NOTES

1. NOT USED.

LEGEND

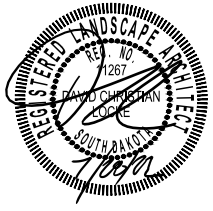
- 4" CONCRETE SIDEWALK W/
4" AGGREGATE BASE COURSE
- 4" COLORED CONCRETE SIDEWALK W/
4" AGGREGATE BASE COURSE
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CONCRETE BASE, SEE DETAIL
- PAVER #2 ON
CONCRETE BASE, SEE DETAIL
- CAST STONE, SEE DETAILS
- LANDSCAPE AREA
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6. CAST STONE TIME MARKER. SEE DETAILS.
7. ARBOR. SEE DETAILS.
8. METAL BENCH UNDER ARBOR. SEE PLANTING PLAN.
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16. MCVAY DONOR PLAQUE.
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WESTSIDE PARK
MCVAY FAMILY REFLECTION GARDEN
 YANKTON, SOUTH DAKOTA
 SEE PROJECT #: 22199

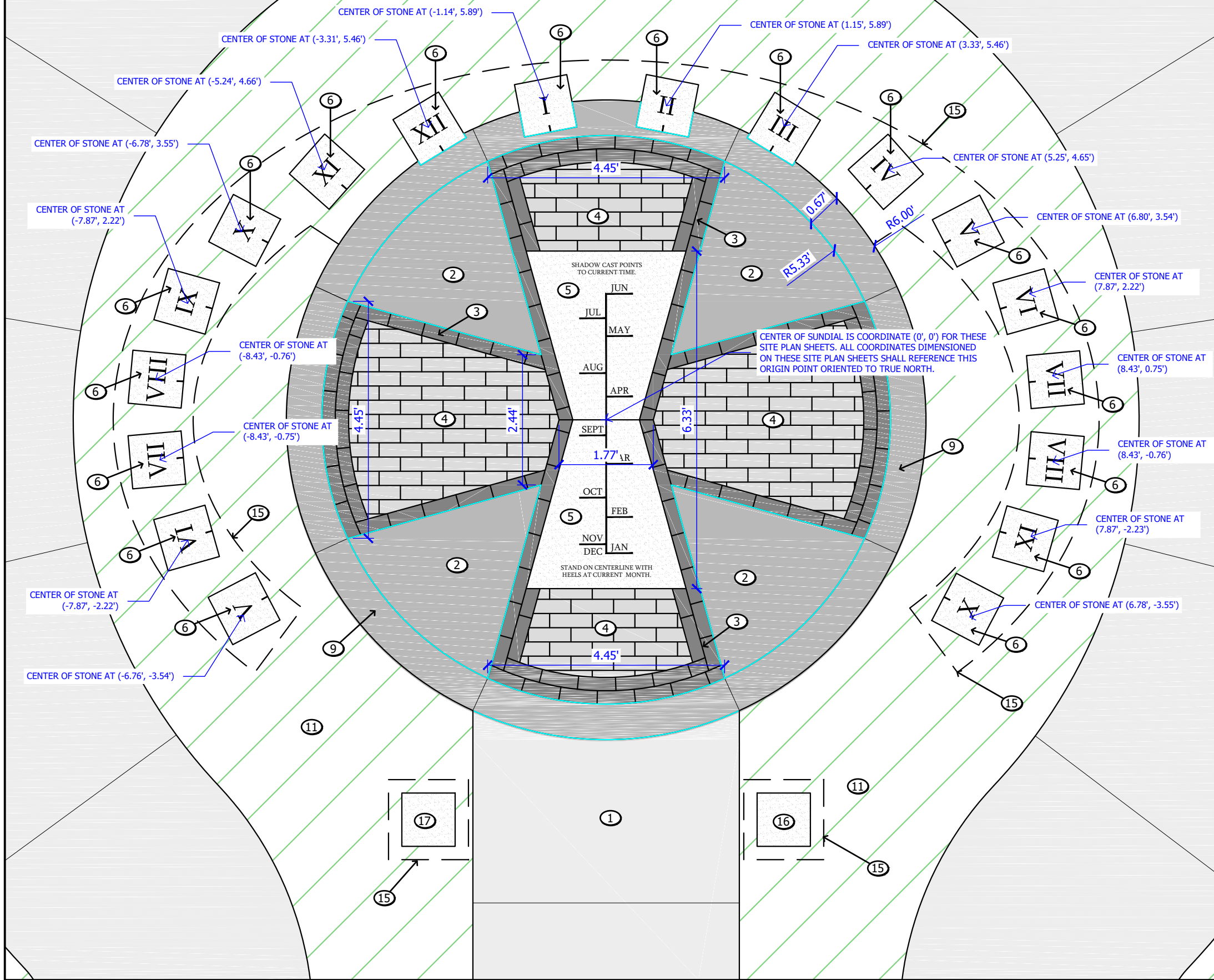


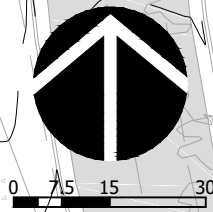
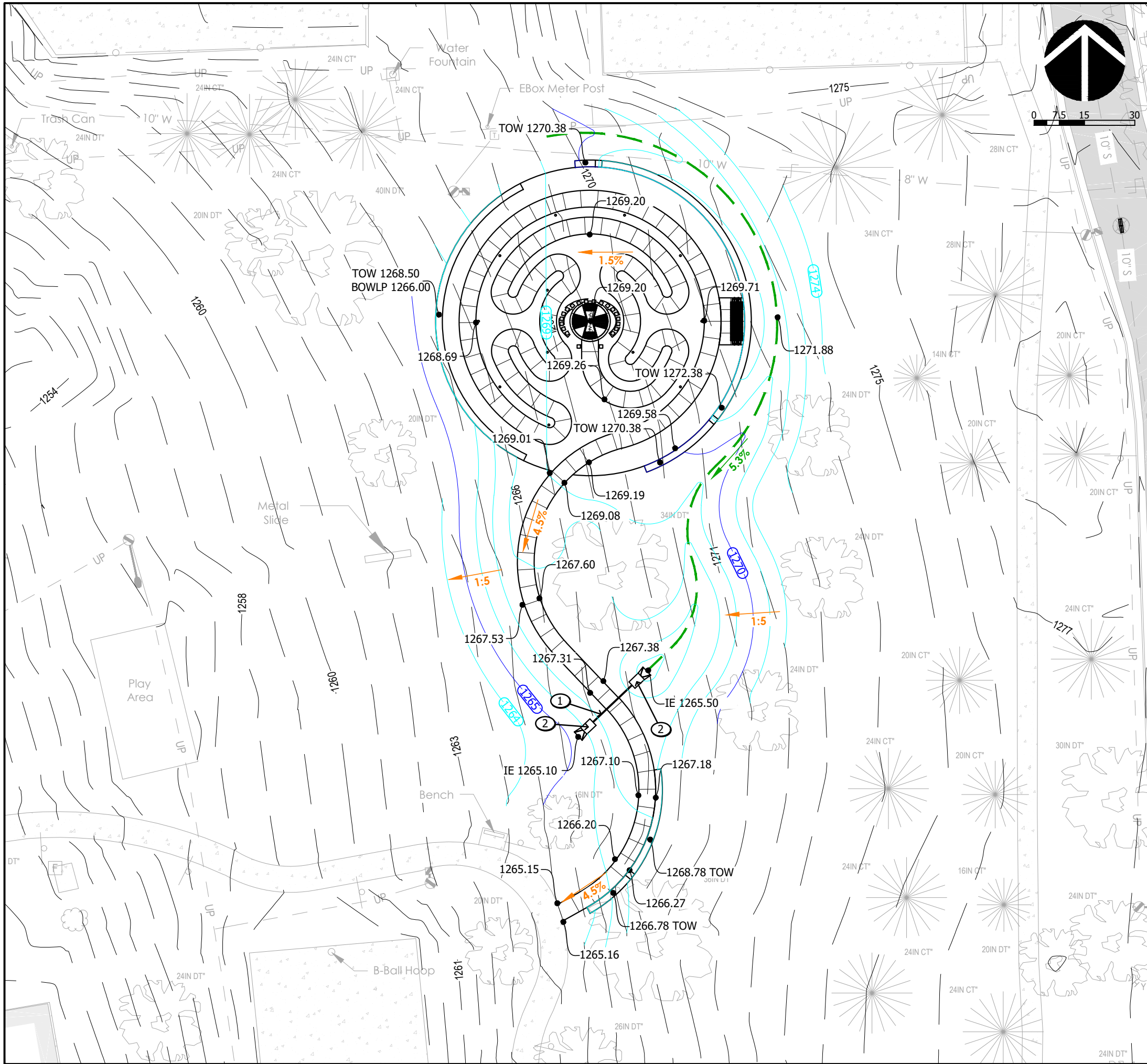
PLOT DATE 7/25/2022 10:50 AM

BID SET

SITE PLAN
(ENLARGED)

C-402





LEGEND

- - - - - EXISTING CONTOUR
- PROPOSED MAJOR CONTOUR
- PROPOSED MINOR CONTOUR
- - - - - GRADING LIMITS
- SLOPE DIRECTION
- ↻ SIDEWALK LANDING AREA AND TURNING MOVEMENT. SLOPES SHALL NOT EXCEED 2.0% IN ANY DIRECTION.
- - - - - SWALE CENTERLINE

ABBREVIATIONS

- TOP - TOP OF PAVEMENT
- TOW - TOP OF WALL
- ME - MATCH EXISTING
- FG - FINISH GRADE
- HP - HIGH POINT
- LP - LOW POINT
- BOW - BOTTOM OF WALL

GENERAL NOTES

THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL PUBLIC AND PRIVATE UTILITIES WHICH LIE WITHIN THE CONSTRUCTION AREA PRIOR TO ANY CONSTRUCTION. NOTIFY THE ENGINEER OF ANY DISCREPANCIES. SOUTH DAKOTA ONE CALL NOTIFICATION CENTER: 811.

THE CONTRACTOR SHALL CONSTRUCT ALL ITEMS WITHIN THIS CONTRACT IN ACCORDANCE WITH ALL STATE AND LOCAL CODES AND REGULATIONS. CONTRACTOR TO COORDINATE ALL WORK WITHIN THE PUBLIC RIGHT OF WAY OR STREETS WITH THE APPROPRIATE JURISDICTIONS.

THE CONTRACTOR SHALL REPORT TO THE OWNER ALL DAMAGE TO OWNERS PROPERTY AND UTILITIES PRIOR TO REPAIR.

CONTRACTOR TO VERIFY ALL SPOT ELEVATIONS FOR POSITIVE DRAINAGE BEFORE INSTALLATIONS.

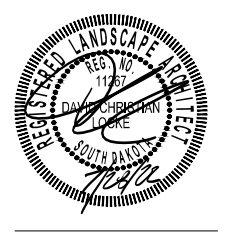
WALK CROSS SLOPE MAY NOT EXCEED 2%.

KEYNOTES

1. 12" RCP DRAINAGE PIPE. SLOPE AT 1.4%
2. 12" RCP FLARED END



WESTSIDE PARK
MCVAY FAMILY REFLECTION GARDEN
 YANKTON, SOUTH DAKOTA
 SEE PROJECT #: 22199

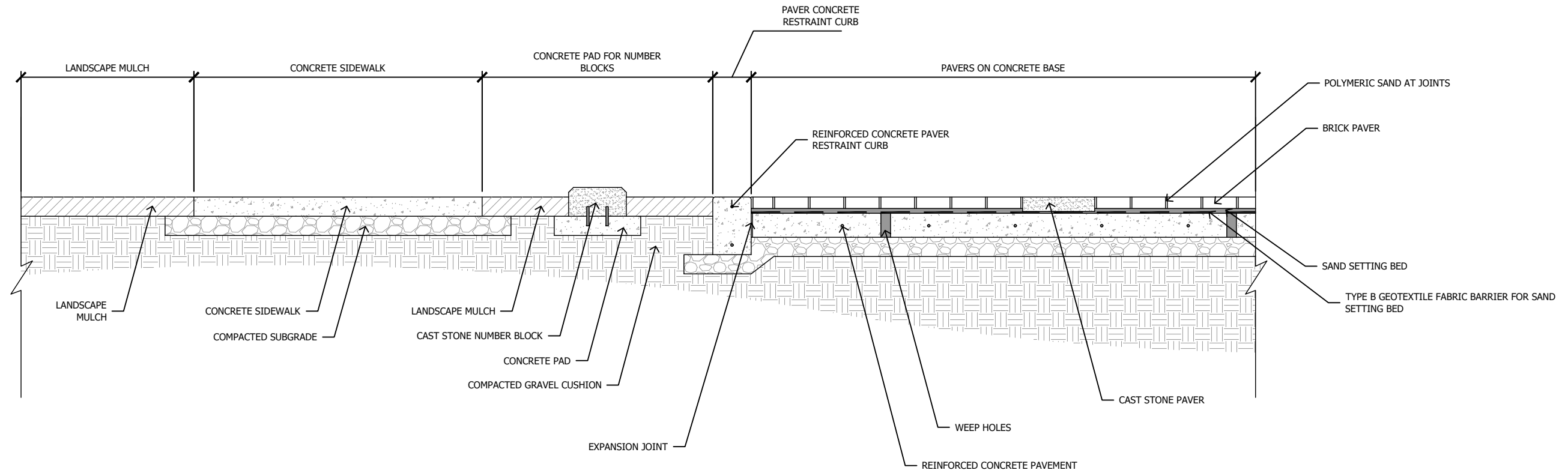


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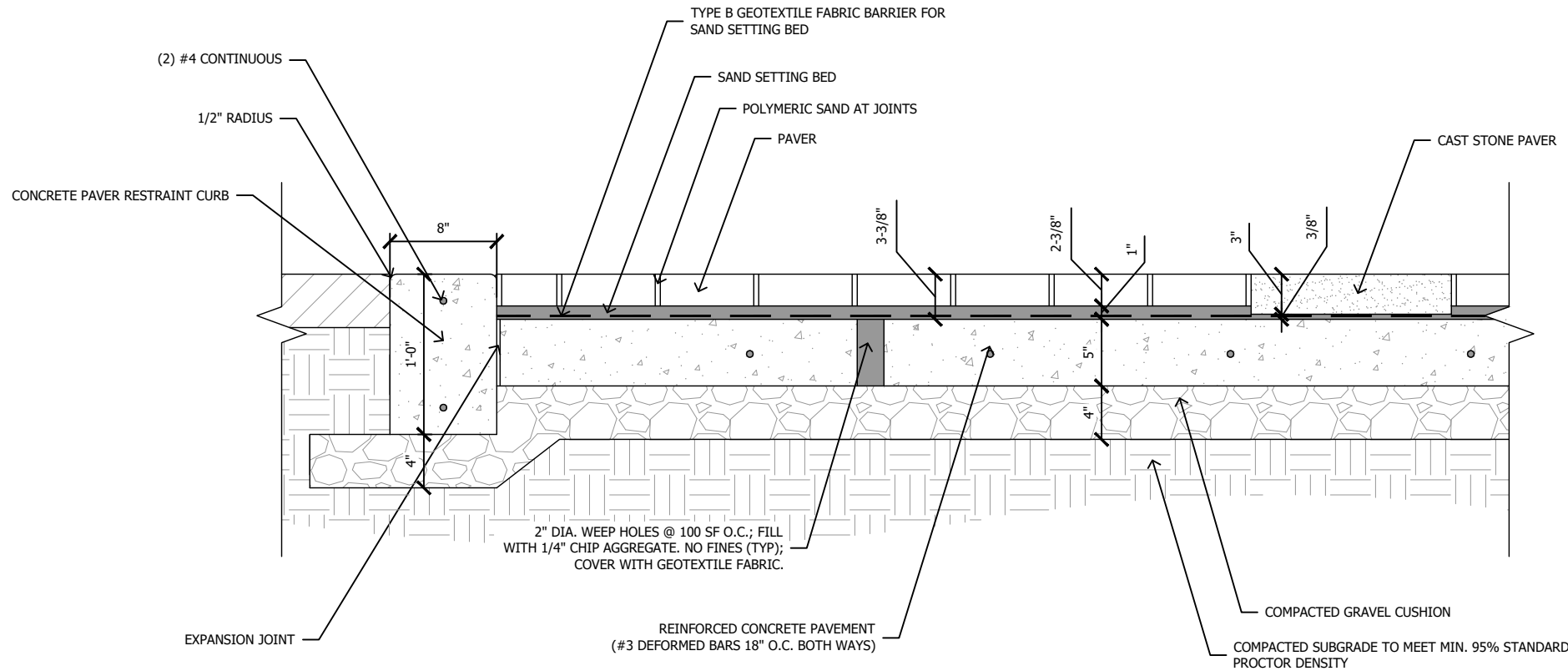
BID SET

GRADING & UTILITY PLAN

C-500



01 SURFACING CROSS SECTION SECTION - N.T.S.



- NOTES:**
- BASE COURSE SHALL BE COMPACTED TO ENSURE A UNIFORM DEPTH OF PAVEMENT.
 - MAXIMUM CROSS SLOPE SHALL BE 2.00%. POSITIVE DRAINAGE SHALL BE MAINTAINED AT ALL TIMES.
 - CONTROL JOINTS SHALL BE SPACED AS SHOWN ON THE PLANS OR 6 FEET O.C. THE MAXIMUM SPACING FOR JOINTS SHALL BE 6 FEET. GENERALLY, CONTROL JOINTS SPACED AT AN EQUAL DISTANCE TO THE WIDTH OF THE WALK WHENEVER FEASIBLE, BUT SHALL BE ADJUSTED AS NECESSARY TO APPEAR UNIFORM.
 - EXPANSION JOINTS SHALL BE INSTALLED AT LOCATIONS SHOWN ON THE PLANS.
 - PROTECT PAVER SURFACE WITH URETHANE SCUFF PAD DURING COMPACTION.

02 PAVERS OVER CONCRETE BASE SECTION - N.T.S.

WESTSIDE PARK
MCVAY FAMILY REFLECTION GARDEN
 YANKTON, SOUTH DAKOTA
 SEE PROJECT #: 22179

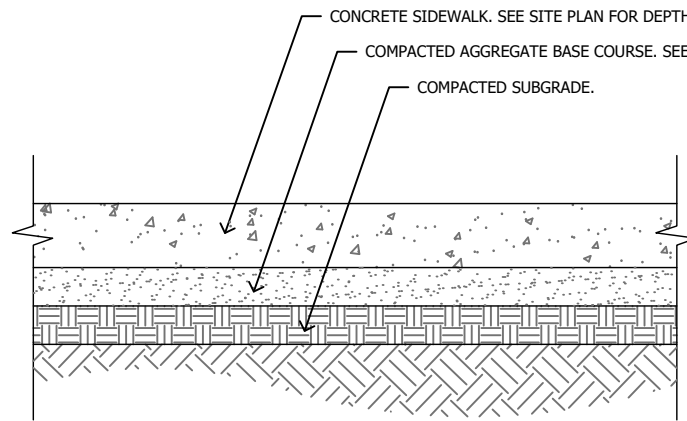


PLOT DATE 7/20/2022 11:44 AM

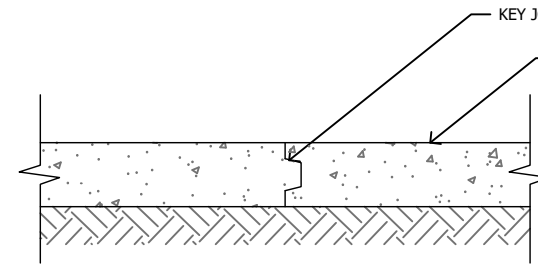
BID SET

DETAILS

C-600



1. SURVEY ELEVATIONS AS REQUIRED. PROCEED TO LAYOUT WORK. REFERENCE DRAWINGS FOR DIMENSIONS.
2. EXCAVATE TO SUBGRADE AND COMPACT. PLACE AND COMPACT BASE COURSE TO ALLOW FOR SPECIFIED THICKNESS OF CONCRETE. SIDEWALKS TO BE A MINIMUM OF 4-IN THICK UNLESS OTHERWISE SPECIFIED.
3. SIDEWALKS TO MEET CURRENT ADA STANDARDS. TARGET SLOPES LESS THAN THE MAXIMUM DURING LAYOUT.
4. INSTALL EXPANSION JOINTS AT SPECIFIED LOCATIONS.
5. FORM SIDEWALKS TO CONFORM WITH DRAWINGS AND OTHER DETAILS. CONTACT ENGINEER FOR INSPECTION PRIOR TO PLACING CONCRETE.
6. FORM CONTRACTION JOINTS AT INTERVALS NECESSARY TO PREVENT RANDOM CRACKS. SPACE JOINTS EQUAL TO THE WIDTH OF SIDEWALK. ADJUST JOINT SPACING FOR UNIFORM APPEARANCE.
7. CONCRETE TO BE M6
8. APPLY BROOM FINISH TO EXTERIOR.



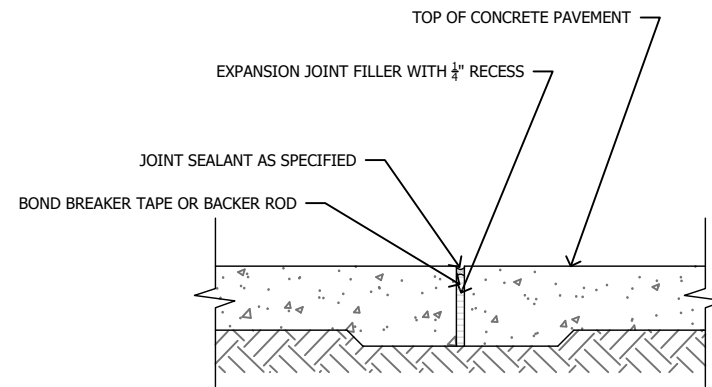
NOTE: CONSTRUCTION JOINTS SHALL BE PLACED BETWEEN INDIVIDUAL POURS OF CONCRETE WHERE EXPANSION JOINTS ARE NOT INDICATED.

01 CONCRETE SIDEWALK

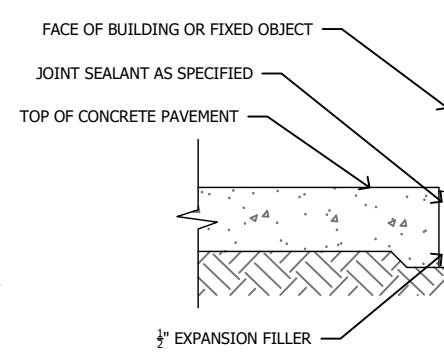
SECTION - N.T.S.

02 CONSTRUCTION JOINT

SECTION - N.T.S.

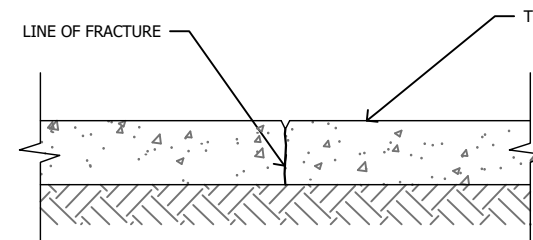


TYPICAL EXPANSION JOINT



EXPANSION JOINT NEAR FIXED OBJECT

NOTE: PLACE EXPANSION JOINTS BETWEEN CONCRETE BUILDING FOUNDATION AND ALL FIXED OBJECTS (I.E. EXISTING SIDEWALK).



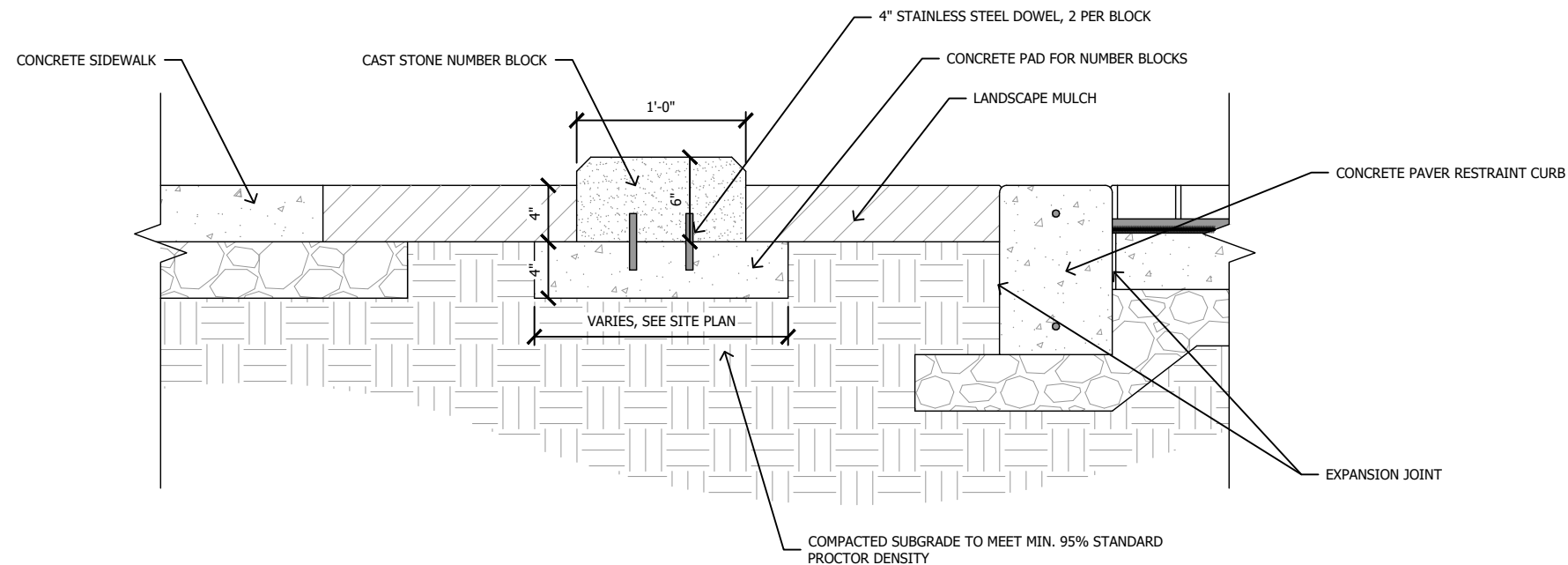
NOTE: SAWN JOINTS SHALL BE CONSTRUCTED AT A MINIMUM DEPTH OF ONE INCH. JOINT DEPTH SHALL BE 1/4TH THE THICKNESS OF THE CONCRETE SLAB.

03 EXPANSION JOINT

SECTION - N.T.S.

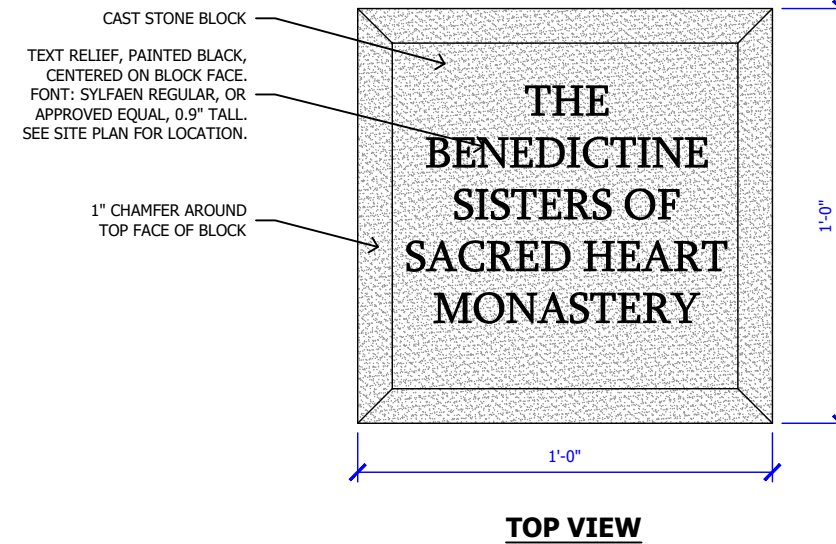
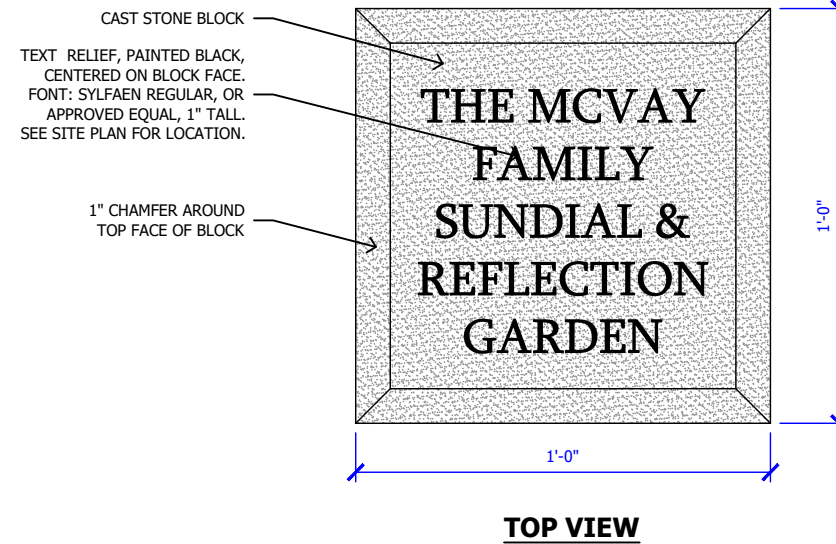
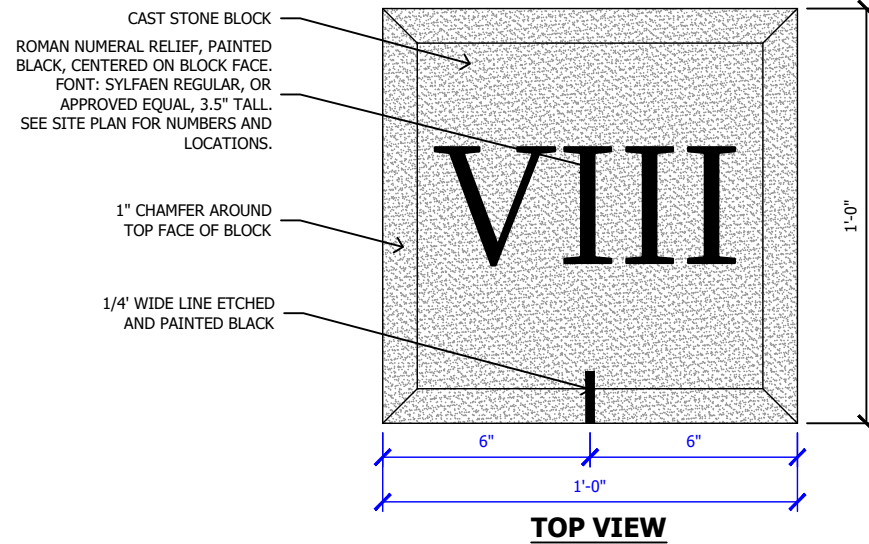
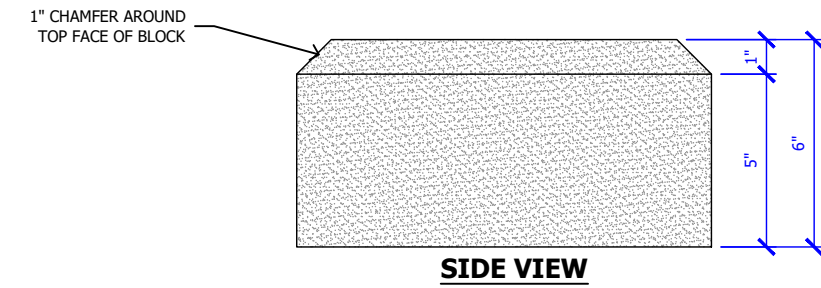
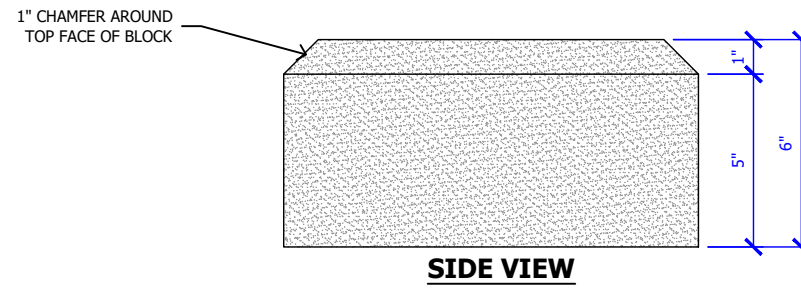
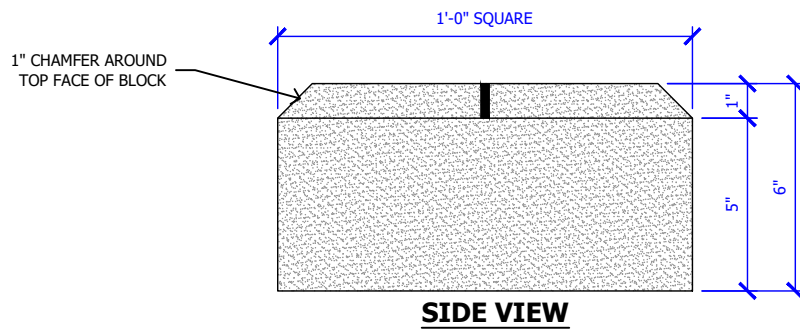
04 CONTROL JOINT

SECTION - N.T.S.



05 CONCRETE PAD FOR NUMBER BLOCKS

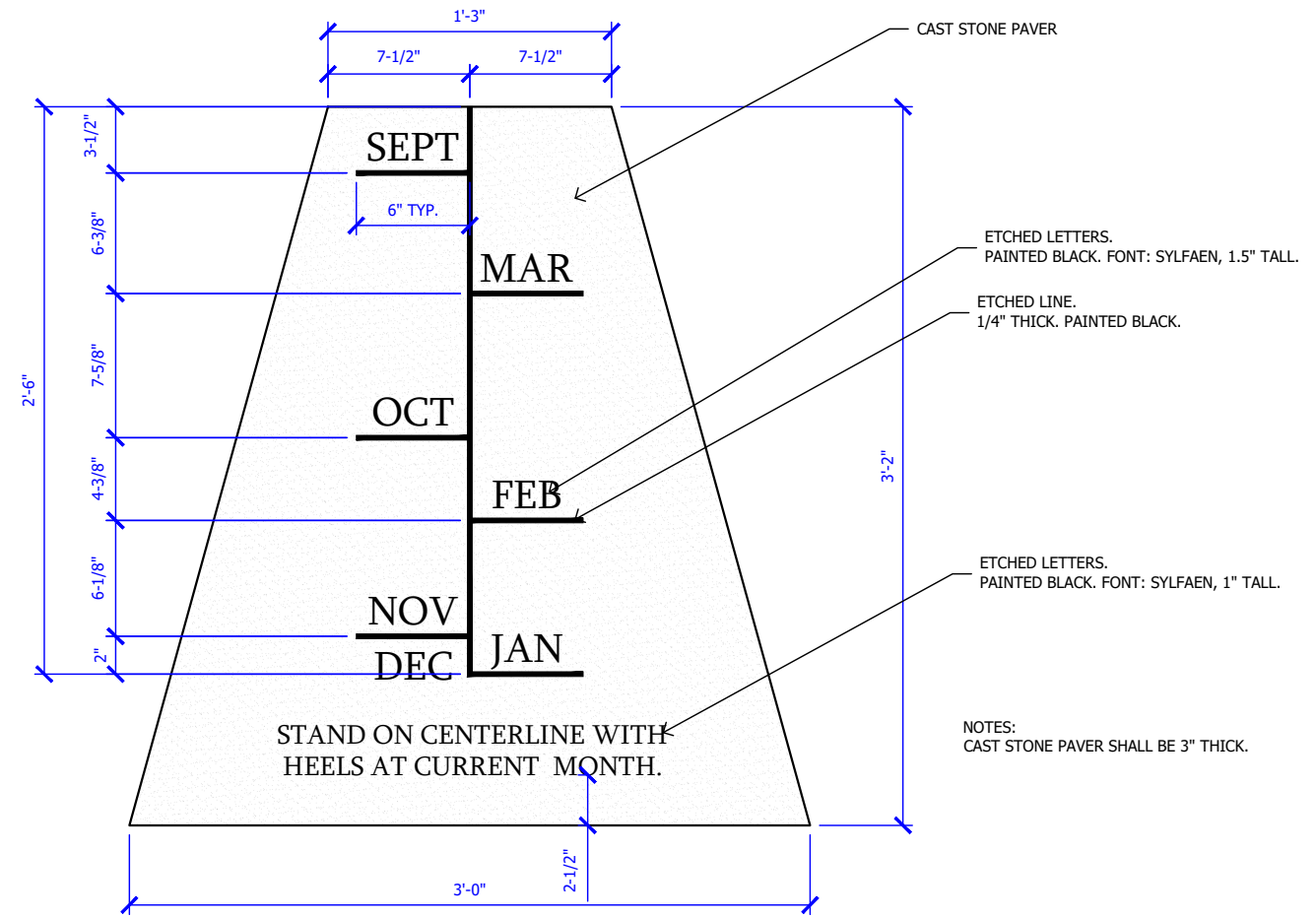
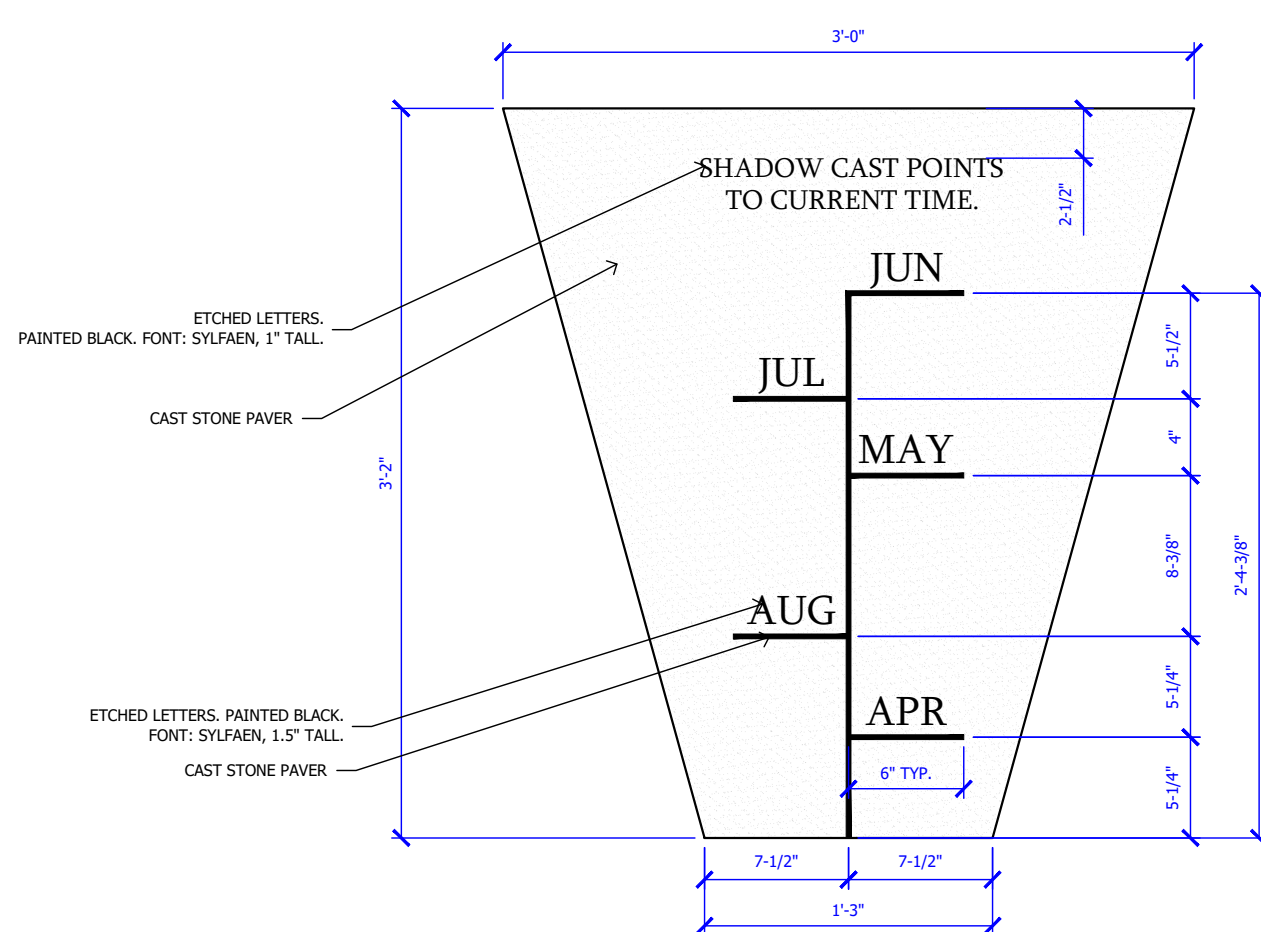
SECTION - N.T.S.



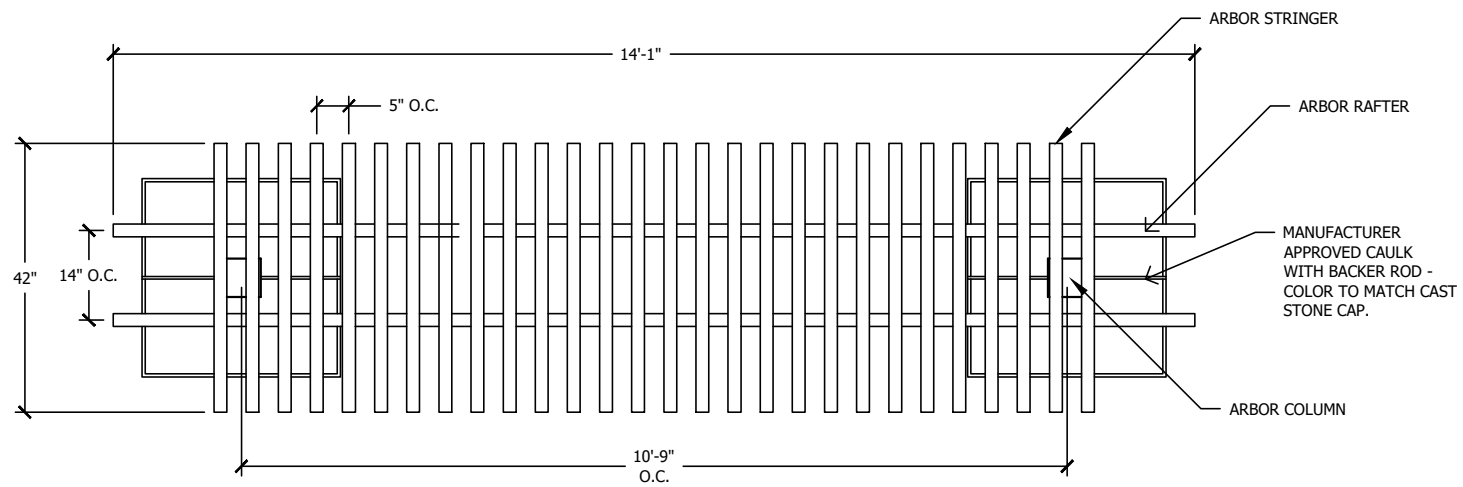
01 CAST STONE NUMBER BLOCKS SECTION - N.T.S.

02 MCVAY DONOR PLAQUE SECTION - N.T.S.

03 BENEDICTINE DONOR PLAQUE SECTION - N.T.S.

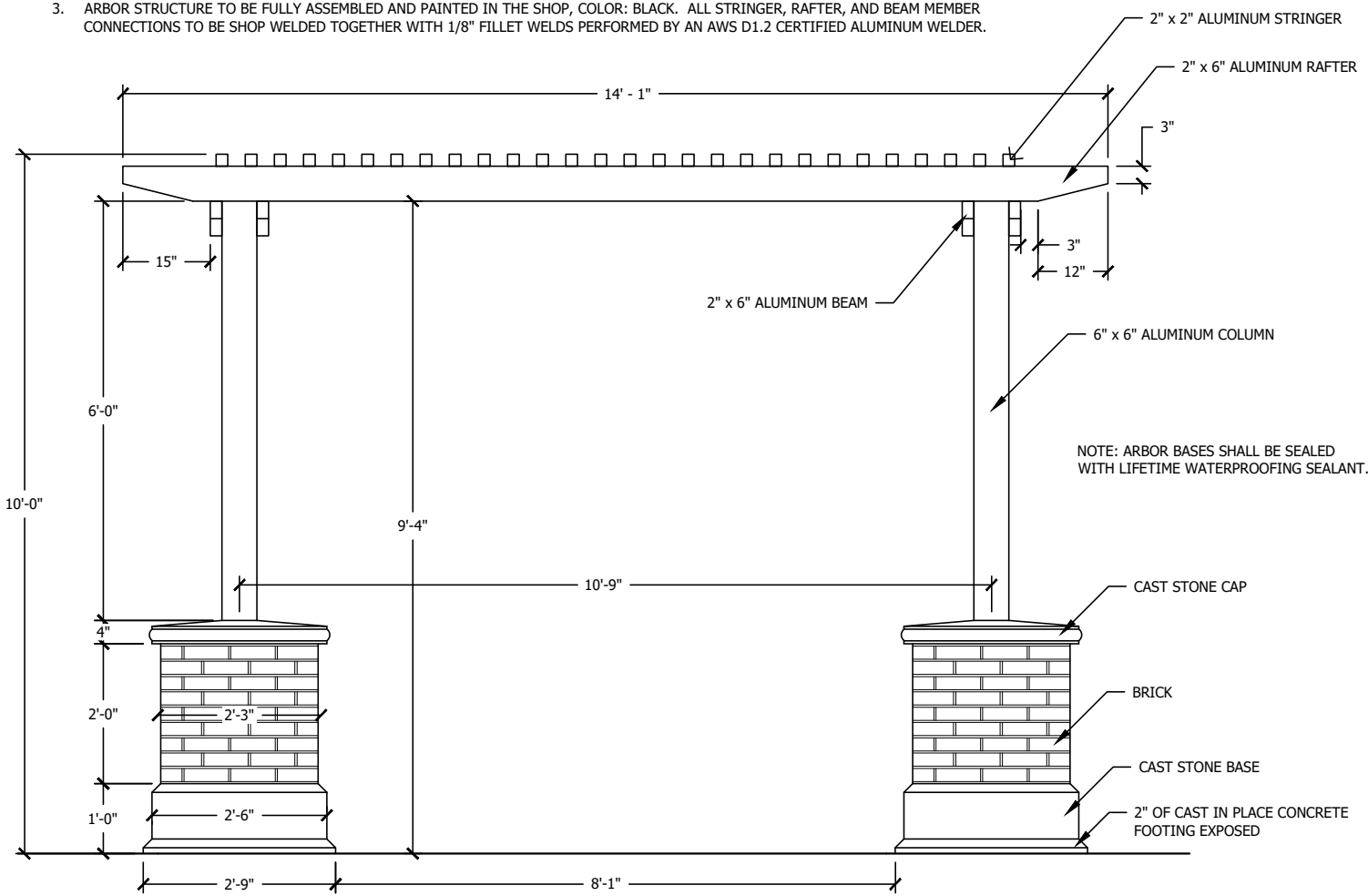


04 CAST STONE PAVERS SECTION - N.T.S.

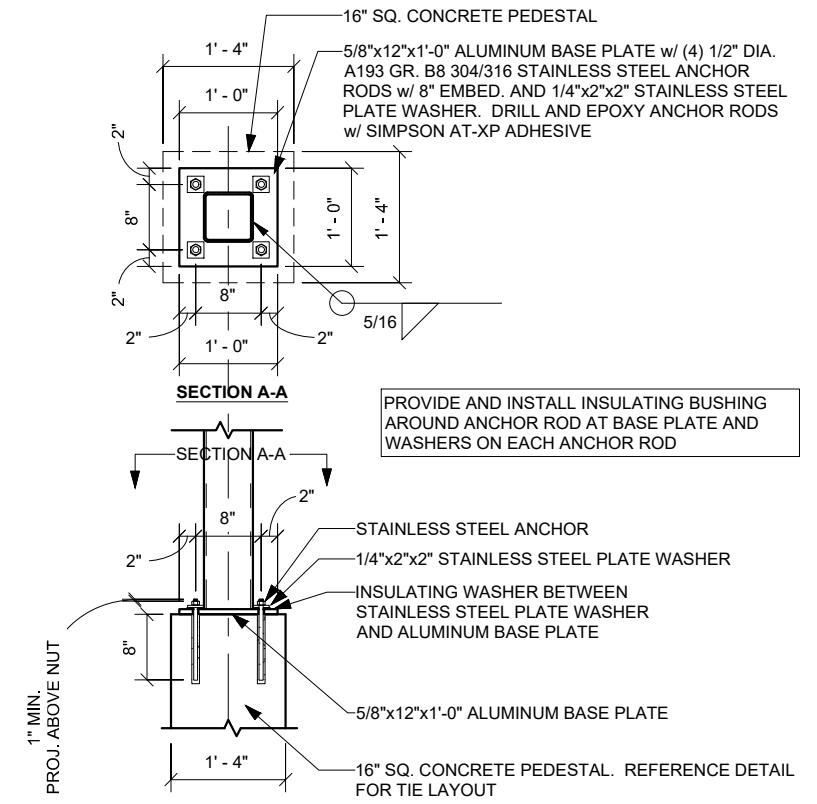


01 ARBOR PLAN SECTION - N.T.S.

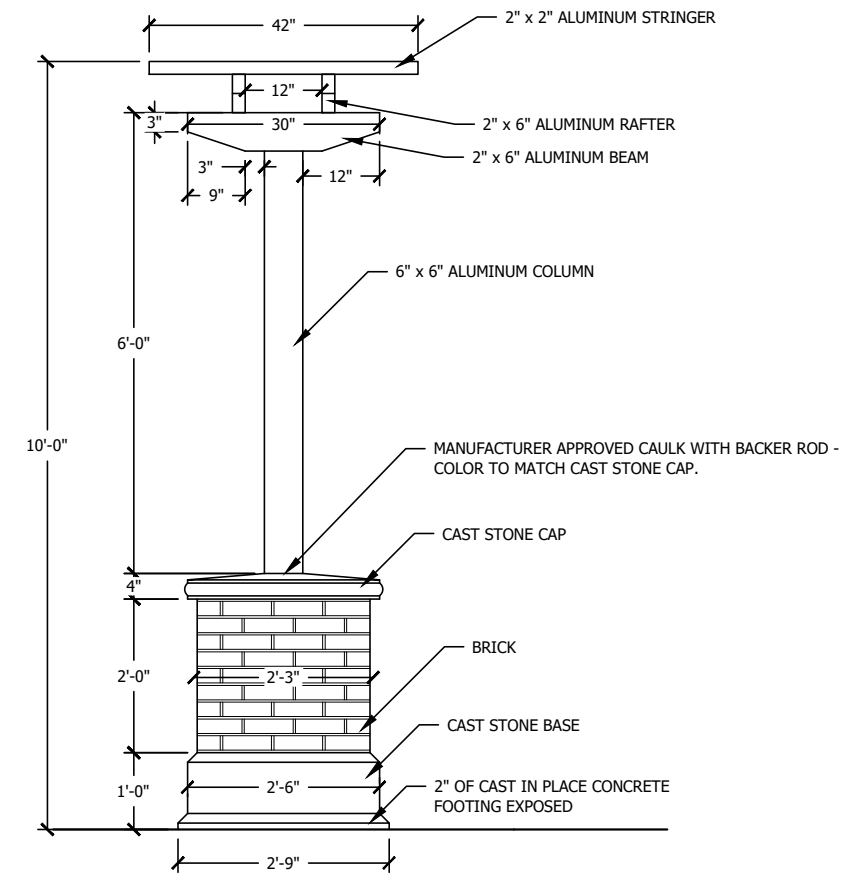
- NOTE:
1. ALL ALUMINUM COLUMNS, BEAMS, RAFTERS AND STRINGERS TO BE CAPPED WITH SAME METAL THICKNESS AS MEMBER. ATTACH ALL COLUMN CAPS AND BEAMS END CAPS WITH FULL SEAL WELDS AND GROUND SMOOTH.
 2. ALL TAPERED BEAMS AND RAFTERS TO BE FABRICATED WITH SAME METAL THICKNESS ON TAPERED PORTION AS MEMBER WITH SEAL WELDS AND GROUND SMOOTH
 3. ARBOR STRUCTURE TO BE FULLY ASSEMBLED AND PAINTED IN THE SHOP, COLOR: BLACK. ALL STRINGER, RAFTER, AND BEAM MEMBER CONNECTIONS TO BE SHOP WELDED TOGETHER WITH 1/8" FILLET WELDS PERFORMED BY AN AWS D1.2 CERTIFIED ALUMINUM WELDER.



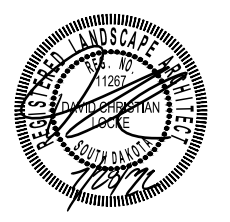
03 ARBOR - FRONT ELEVATION SECTION - N.T.S.



02 TYP HSS COLUMN BASE PLATE SECTION - N.T.S.



04 ARBOR - SIDE ELEVATION SECTION - N.T.S.



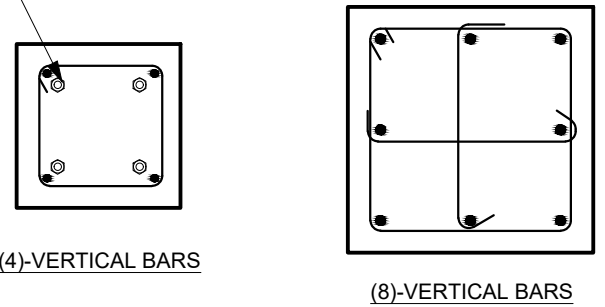
PLOT DATE 7/28/2022 10:01 PM

BID SET

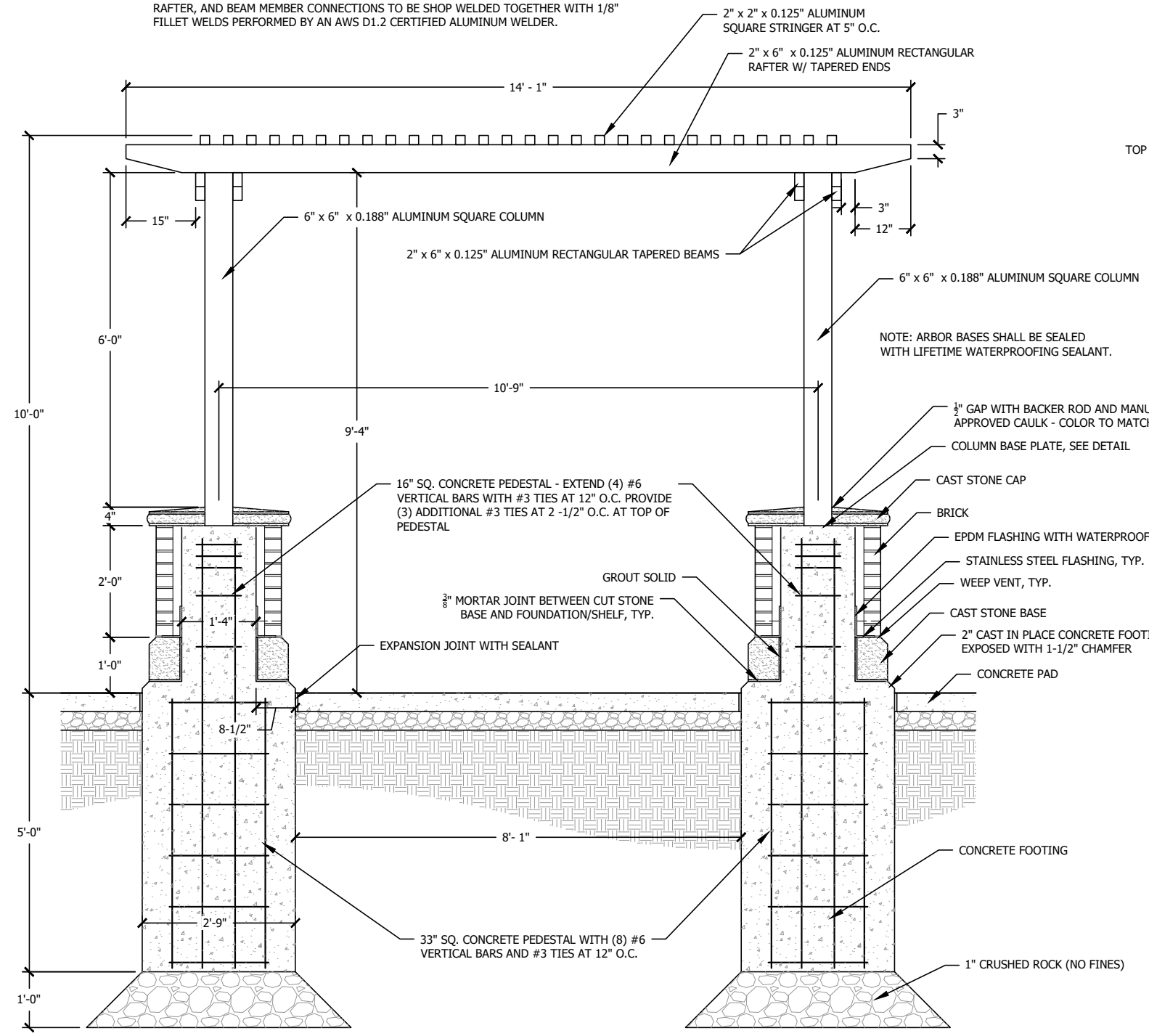
DETAILS

- NOTE:
1. ALL ALUMINUM COLUMNS, BEAMS, RAFTERS AND STRINGERS TO BE CAPPED WITH SAME METAL THICKNESS AS MEMBER. ATTACH ALL COLUMN CAPS AND BEAMS END CAPS WITH FULL SEAL WELDS AND GROUND SMOOTH.
 2. ALL TAPERED BEAMS AND RAFTERS TO BE FABRICATED WITH SAME METAL THICKNESS ON TAPERED PORTION AS MEMBER WITH SEAL WELDS AND GROUND SMOOTH
 3. ARBOR STRUCTURE TO BE FULLY ASSEMBLED AND PAINTED IN THE SHOP. ALL STRINGER, RAFTER, AND BEAM MEMBER CONNECTIONS TO BE SHOP WELDED TOGETHER WITH 1/8" FILLET WELDS PERFORMED BY AN AWS D1.2 CERTIFIED ALUMINUM WELDER.

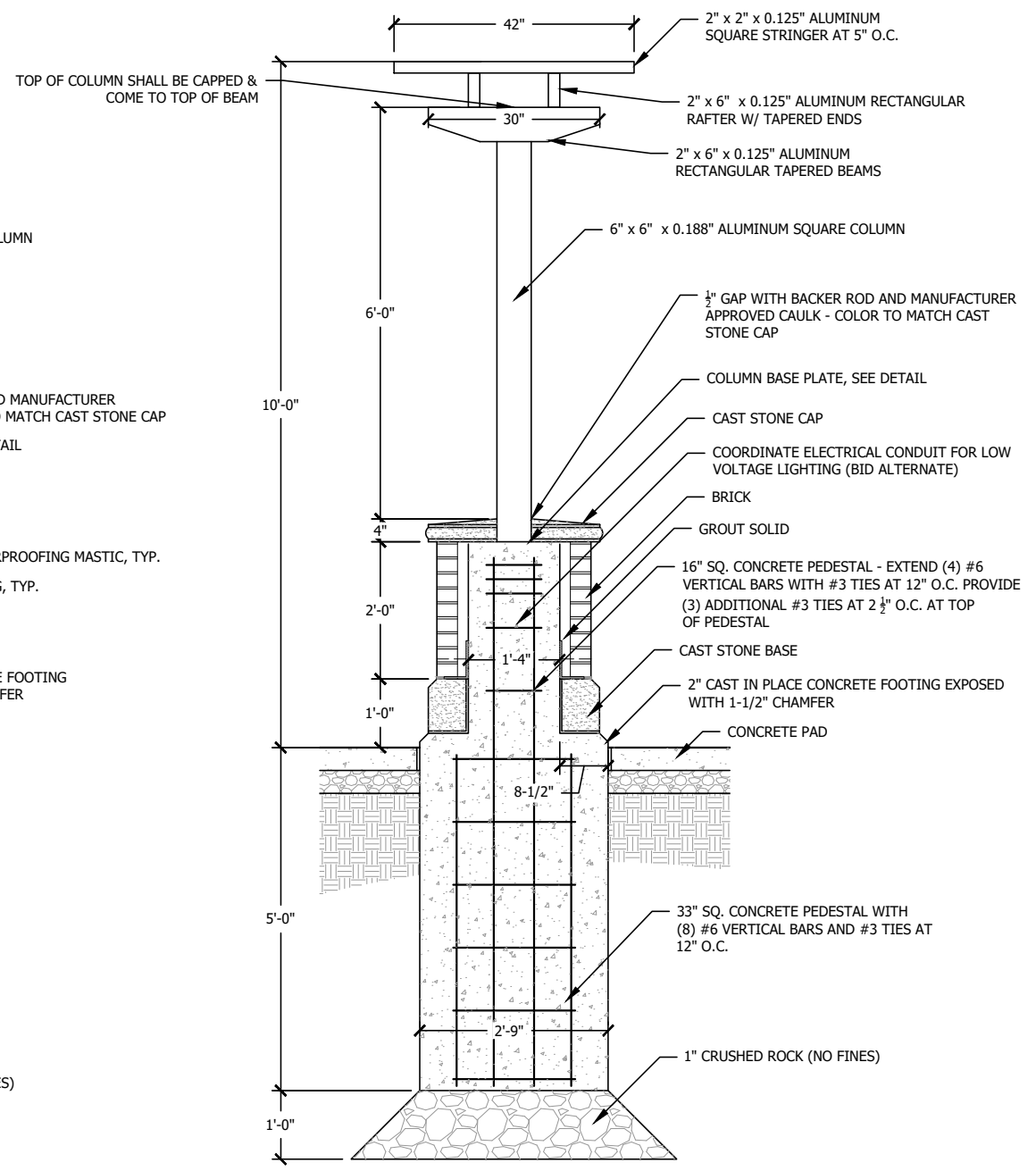
CONTRACTOR TO COORDINATE LOCATION OF POST-INSTALLED ANCHOR RODS w/ PEDESTAL REINFORCING TO AVOID DAMAGING REINFORCING



01 TYPICAL COLUMN TIE LAYOUT SECTION - N.T.S.

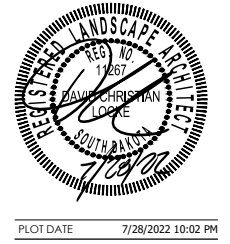


02 ARBOR - FRONT ELEVATION WITH FOOTING SECTION - N.T.S.



03 ARBOR - SIDE ELEVATION WITH FOOTING SECTION - N.T.S.

WESTSIDE PARK
MCVAY FAMILY REFLECTION GARDEN
 YANKTON, SOUTH DAKOTA
 SEE PROJECT #: 22179



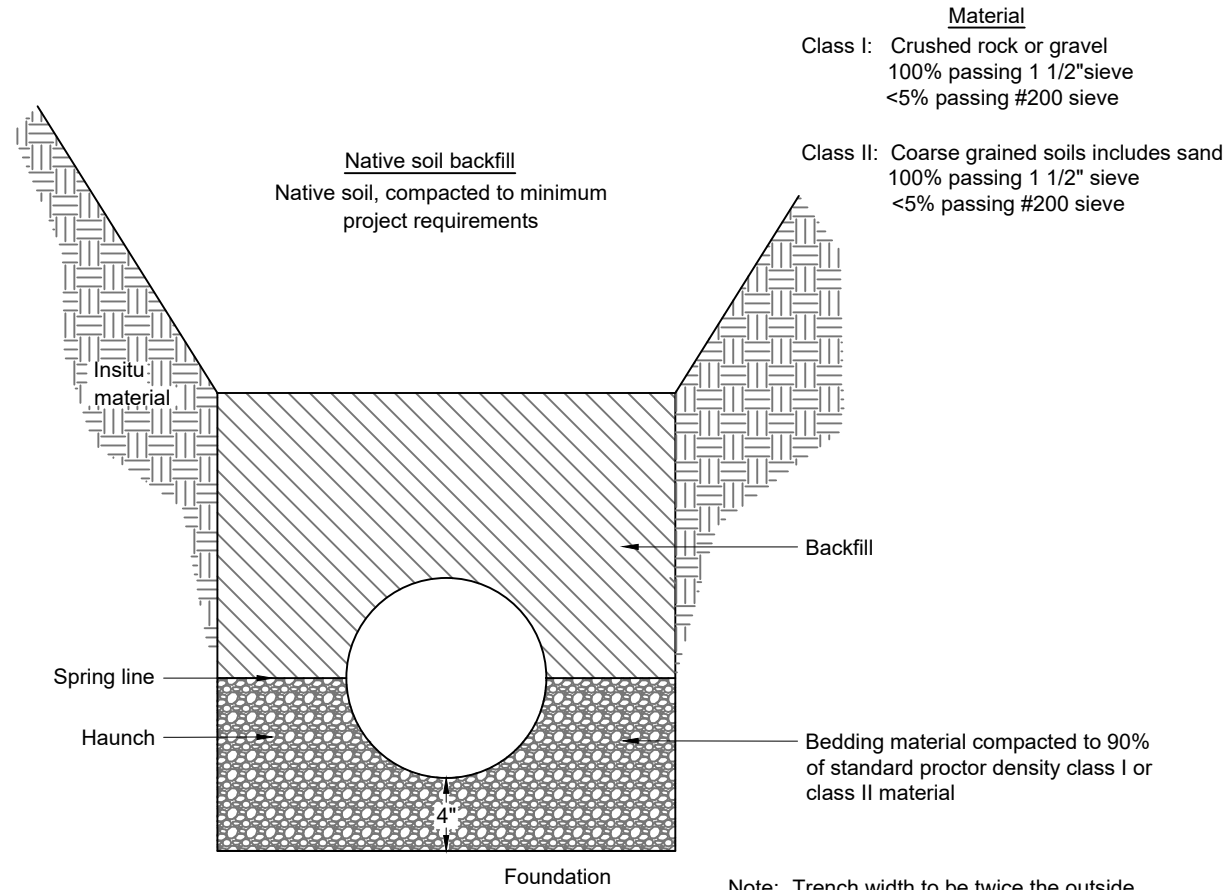
PLOT DATE 7/28/2022 10:02 PM

BID SET

DETAILS

C-604

**For 12" Thru 84" Diameter Pipe
Type B Installation**



- Material**
- Class I: Crushed rock or gravel
100% passing 1 1/2" sieve
<5% passing #200 sieve
 - Class II: Coarse grained soils includes sand
100% passing 1 1/2" sieve
<5% passing #200 sieve

Assume: 140 lbs. per cubic foot pipe strength class shown on plans

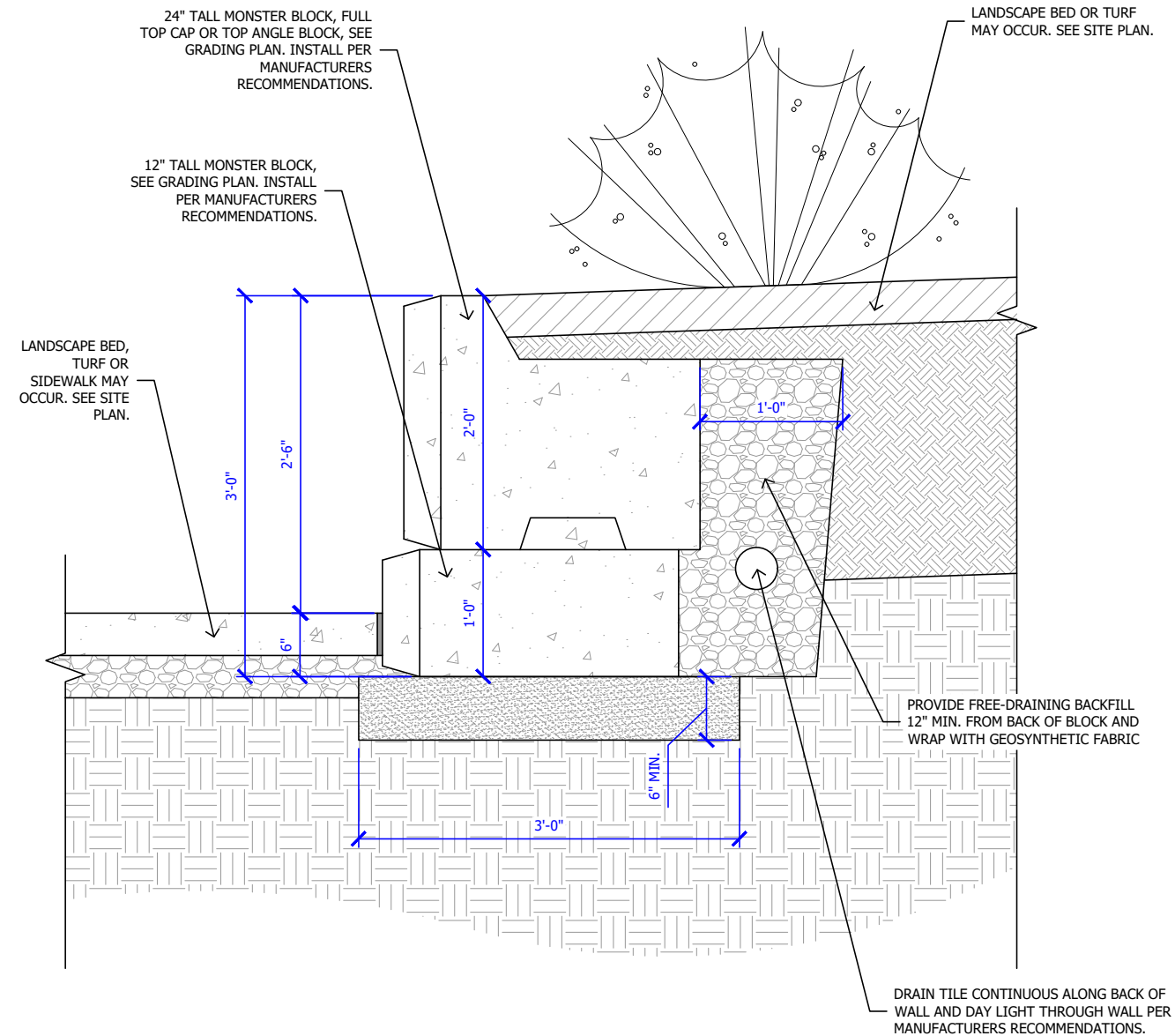
Note: Trench width to be twice the outside diameter, or the outside diameter plus two feet, which ever is less.

Quantity Estimate Table

For Bedding Material

12"	0.14 Ton/L.F.
15"	0.19 Ton/L.F.
18"	0.25 Ton/L.F.
21"	0.29 Ton/L.F.
24"	0.33 Ton/L.F.
27"	0.36 Ton/L.F.
30"	0.40 Ton/L.F.
33"	0.44 Ton/L.F.
36"	0.48 Ton/L.F.
42"	0.57 Ton/L.F.
48"	0.67 Ton/L.F.
54"	0.77 Ton/L.F.
60"	0.88 Ton/L.F.
66"	0.98 Ton/L.F.
72"	1.10 Ton/L.F.
78"	1.24 Ton/L.F.
84"	1.35 Ton/L.F.

**Bedding and Backfill
for RCP Type B Installation**



01 BLOCK RETAINING WALL

SECTION - N.T.S.



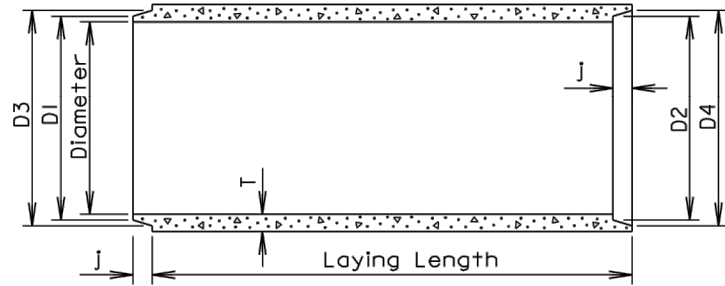
PLOT DATE 7/28/2022 10:02 PM

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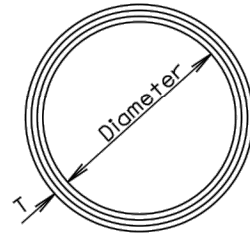
DETAILS

TOLERANCES IN DIMENSIONS

Diameter: $\pm 1.5\%$ for 24" Dia. or less and $\pm 1\%$ or $\frac{3}{8}$ " whichever is more for 27" Dia. or greater.
 Diameters at joints: $\pm \frac{3}{16}$ " for 30" Dia. or less and $\pm \frac{1}{4}$ " for 36" or greater.
 Length of joint (J): $\pm \frac{1}{4}$ ".
 Wall thickness (T): not less than design T by more than 5% or $\frac{3}{16}$ ", whichever is greater.
 Laying length: shall not underrun by more than $\frac{1}{2}$ ".



LONGITUDINAL SECTION



END VIEW

GENERAL NOTES:

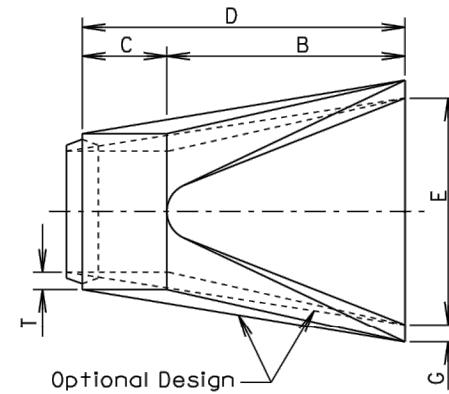
Construction of R.C.P. shall conform to the requirements of Section 990 of the Specifications.

Not more than 2 four-foot sections shall be permitted near the ends of any culvert. Four-foot lengths shall be used only to secure the required length of culvert.

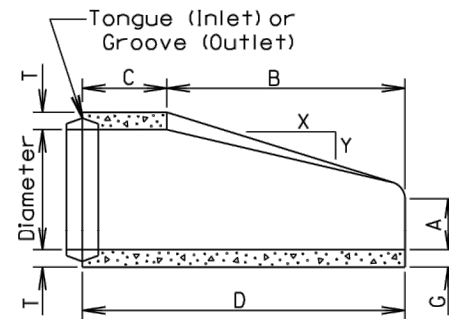
Diam. (in.)	Approx. Wt. /Ft. (lb.)	T (in.)	J (in.)	D1 (in.)	D2 (in.)	D3 (in.)	D4 (in.)
12	92	2	1 3/4	13 1/4	13 5/8	13 7/8	14 1/4
15	127	2 1/4	2	16 1/2	16 5/8	17 1/4	17 5/8
18	168	2 1/2	2 1/4	19 5/8	20	20 3/8	20 3/4
21	214	2 3/4	2 1/2	22 7/8	23 1/4	23 3/4	24 1/8
24	265	3	2 3/4	26	26 3/8	27	27 3/8
27	322	3 1/4	3	29 1/4	29 5/8	30 1/4	30 5/8
30	384	3 1/2	3 1/4	32 3/8	32 3/4	33 1/2	33 7/8
36	524	4	3 3/4	38 3/4	39 1/4	40	40 1/2
42	685	4 1/2	4	45 1/8	45 5/8	46 1/2	47
48	867	5	4 1/2	51 1/2	52	53	53 1/2
54	1070	5 1/2	4 1/2	57 1/8	58 3/8	59 3/8	59 7/8
60	1296	6	5	64 1/4	64 3/4	66	66 1/2
66	1542	6 1/2	5 1/2	70 5/8	71 1/8	72 1/2	73
72	1810	7	6	77	77 1/2	79	79 1/2
78	2098	7 1/2	6 1/2	83 3/8	83 3/8	85 5/8	86 1/8
84	2410	8	7	89 3/4	90 1/4	92 1/8	92 5/8
90	2740	8 1/2	7	95 3/4	96 1/4	98 1/8	98 5/8
96	2950	9	7	102 1/8	102 5/8	104 1/2	105
102	3075	9 1/2	7 1/2	109	109 1/2	111 1/2	112
108	3870	10	7 1/2	115 1/2	116	118	118 1/2

June 26, 2015

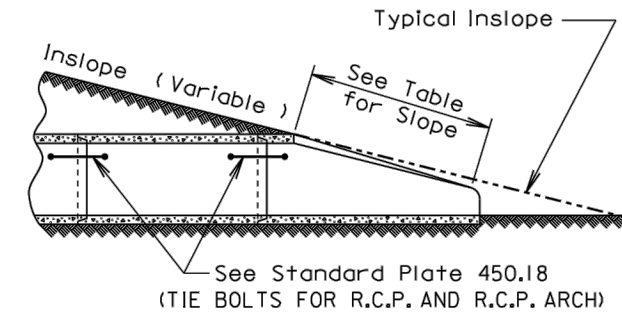
Published Date: 2nd Qtr. 2022	S D D O T	REINFORCED CONCRETE PIPE	PLATE NUMBER 450.01
			Sheet 1 of 1



TOP VIEW



LONGITUDINAL SECTION

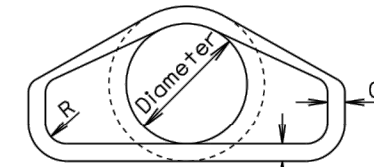


SLOPE DETAIL

GENERAL NOTES:

Lengths of concrete pipe shown on plan sheets are between flared ends only.

Construction of R.C.P. Flared End shall conform to the requirements of Section 990 of the Specifications.



END VIEW

Dia. (in.)	Approx. Wt. of Section (lbs.)	Approx. Slope (X to Y)	T (in.)	A (in.)	B (in.)	C (in.)	D (in.)	E (in.)	G (in.)	R (in.)
12	530	2.4:1	2	4	24	48 7/8	72 7/8	24	2	1 1/2
15	740	2.4:1	2 1/4	6	27	46	73	30	2 1/4	1 1/2
18	990	2.3:1	2 1/2	9	27	46	73	36	2 1/2	1 1/2
21	1280	2.4:1	2 3/4	9	36	37 1/2	73 1/2	42	2 3/4	1 1/2
24	1520	2.5:1	3	9 1/2	43 1/2	30	73 1/2	48	3	1 1/2
27	1930	2.5:1	3 1/4	10 1/2	49 1/2	24	73 1/2	54	3 1/4	1 1/2
30	2190	2.5:1	3 1/2	12	54	19 3/4	73 3/4	60	3 1/2	1 1/2
36	4100	2.5:1	4	15	63	34 3/4	97 3/4	72	4	1 1/2
42	5380	2.5:1	4 1/2	21	63	35	98	78	4 1/2	1 1/2
48	6550	2.5:1	5	24	72	26	98	84	5	1 1/2
54	8240	2:1	5 1/2	27	65	33 1/4	98 1/4	90	5 1/2	1 1/2
60	8730	1.9:1	6	35	60	39	99	96	5	1 1/2
66	10710	1.7:1	6 1/2	30	72	27	99	102	5 1/2	1 1/2
72	12520	1.8:1	7	36	78	21	99	108	6	1 1/2
78	14770	1.8:1	7 1/2	36	90	21	111	114	6 1/2	1 1/2
84	18160	1.6:1	8	36	90 1/2	21	111 1/2	120	6 1/2	1 1/2
90	20900	1.5:1	8 1/2	41	87 1/2	24	111 1/2	132	6 1/2	6

June 26, 2015

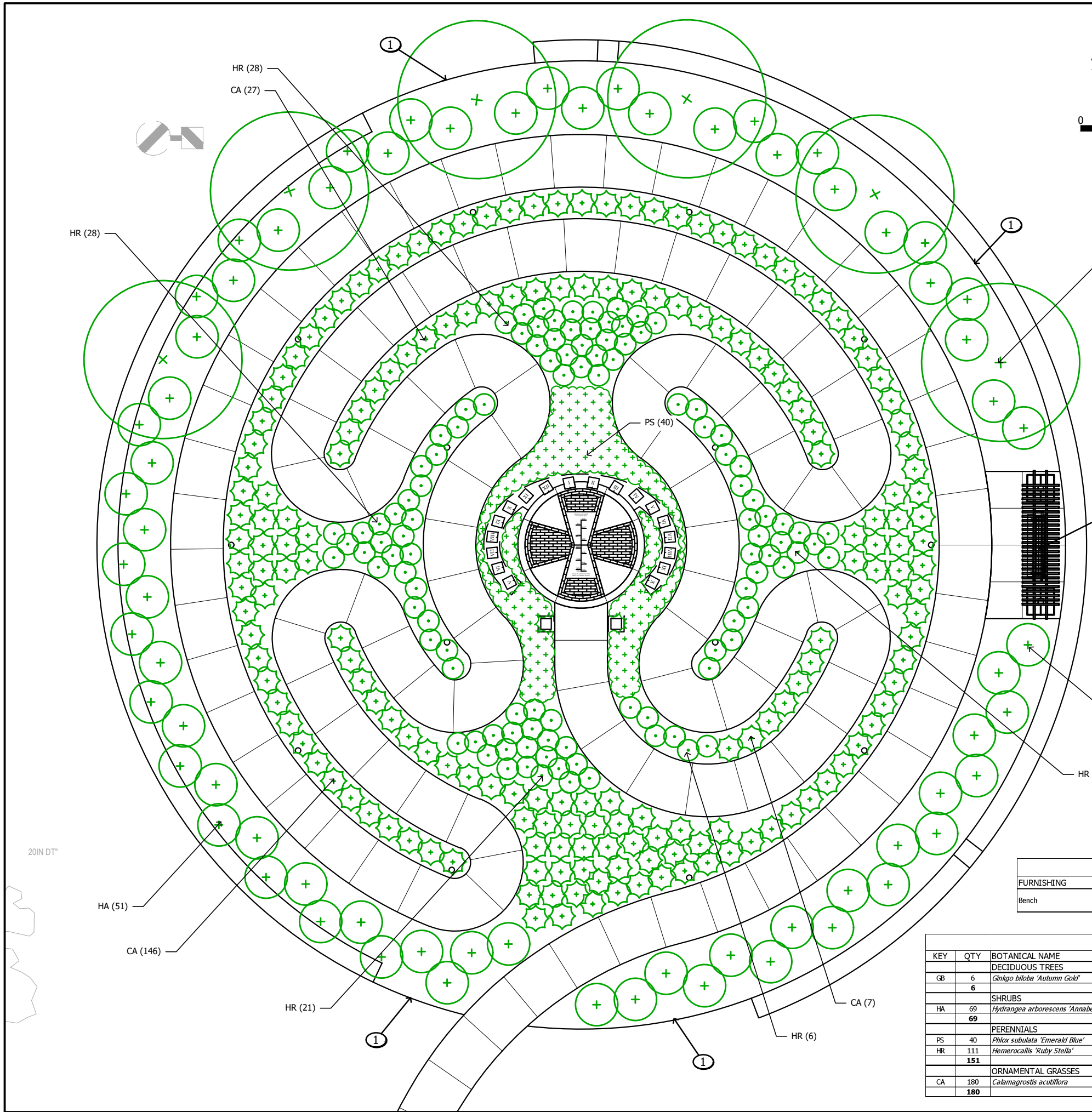
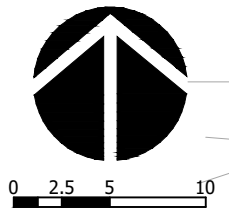
Published Date: 2nd Qtr. 2022	S D D O T	R. C. P. FLARED ENDS	PLATE NUMBER 450.10
			Sheet 1 of 1

GENERAL NOTES

1. PLANT QUANTITIES IN PLANT SCHEDULE ARE FOR CONVENIENCE ONLY AND ARE NOT GUARANTEED. QUANTITIES ON PLAN WILL PREVAIL IF DISCREPANCIES OCCUR.
2. 1.5" SHREDDED CEDAR MULCH AND WEED BARRIER FABRIC IN ALL PLANT BEDS - UNLESS NOTED OTHERWISE.
3. LANDSCAPE CONTRACTOR TO MARK ALL TREE LOCATIONS AND LAY OUT ALL PLANT MATERIAL IN THE FIELD FOR PLANTING. UNLESS APPROVED OTHERWISE, SHRUBS ARE NOT TO BE LOCATED CLOSER THAN 2'-6" TO CURB OR WALKS. PERENNIALS / GRASSES ARE NOT LOCATED CLOSER THAN 1'-6" TO CURB OR WALKS.
4. PROVIDE A MINIMUM OF 48 HOURS NOTICE FOR APPROVAL OF PLANT LAYOUT.
5. APPLY PRE-EMERGENT HERBICIDE TO ALL PLANT BED AREAS.

KEYNOTES

1. ALUMINUM LANDSCAPE EDGING. ALIGN WITH FACE OF RETAINING WALL. SEE DETAILS.
2. METAL BENCH CENTERED UNDER ARBOR.



FURNISHINGS SCHEDULE

FURNISHING	QTY	MANUFACTURER	MODEL	MATERIAL/COLOR	MOUNTING
Bench	1	Victor Stanley	RB-28, 6" Length, no Intermediate Arm Rests, include donor plaque on back rest	Standard Black	Surface Mounted

PLANT SCHEDULE

KEY	QTY	BOTANICAL NAME	COMMON NAME	SIZE	NOTES & SPACING
DECIDUOUS TREES					
GB	6	<i>Ginkgo biloba</i> 'Autumn Gold'	Autumn Gold Ginkgo	2" Cal. / B&B	Well branched straight single leader, matched canopy
SHRUBS					
HA	69	<i>Hydrangea arborescens</i> 'Annabelle'	Annabelle Smooth Hydrangea	#2 Cont.	48" o.c. spacing, or as shown
PERENNIALS					
PS	40	<i>Phlox subulata</i> 'Emerald Blue'	Emerald Blue Creeping Phlox	#1 Cont.	24" o.c. spacing, or as shown
HR	111	<i>Hemerocallis</i> 'Ruby Stella'	Ruby Stella Daylily	#1 Cont.	24" o.c. spacing, or as shown
ORNAMENTAL GRASSES					
CA	180	<i>Calamagrostis acutiflora</i>	Karl Foerster	#1 Cont.	30" o.c. spacing, or as shown

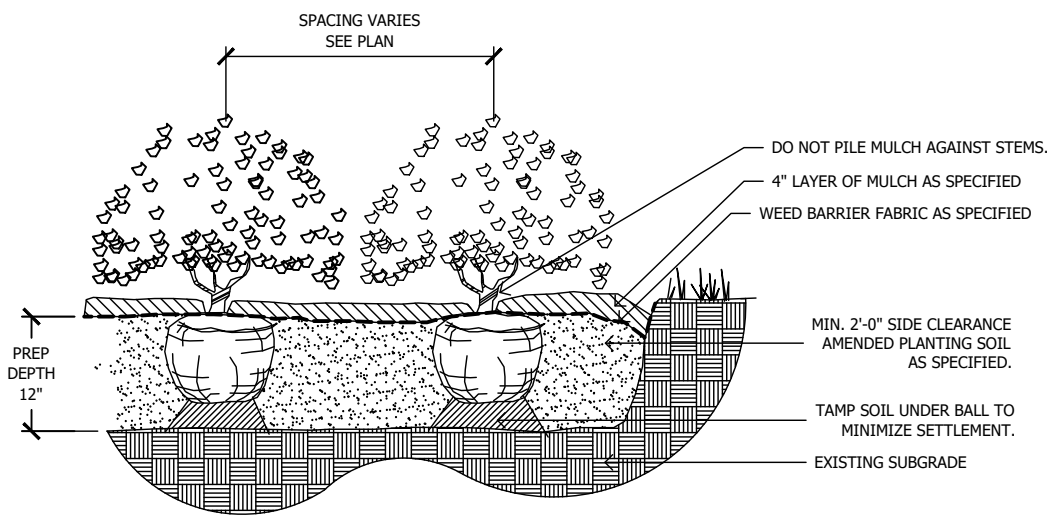
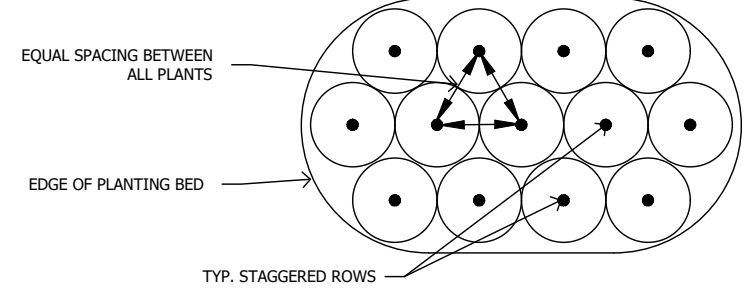
BID SET

LANDSCAPE PLAN

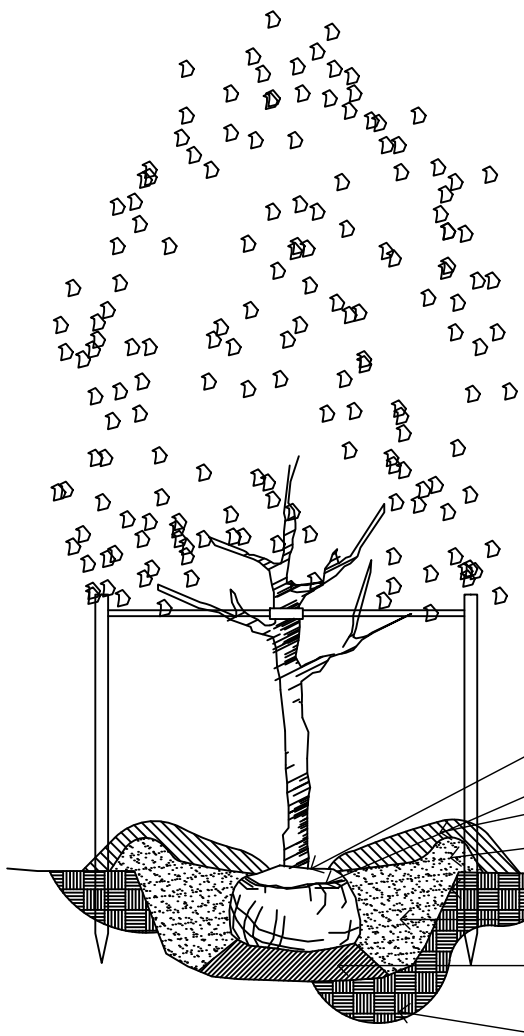
L-100

GENERAL NOTES:

1. INSTALL TOP OF PLANT BALL 2" ABOVE ADJACENT GRADE.
2. TAMP PLANTING MIX FIRMLY AS PIT IS FILLED AROUND EACH PLANT BALL.
3. SOAK EACH PLANT BALL AND PIT IMMEDIATELY AFTER INSTALLATION.
4. PRUNE ONLY DEAD OR DAMAGED BRANCHES.
5. FOR CONTAINER PLANTS, SCARIFY SIDES OF ROOT BALL (1/4"-1/2" DEEP)



01 SHRUB PLANTING PLAN/ SECTION - N.T.S.



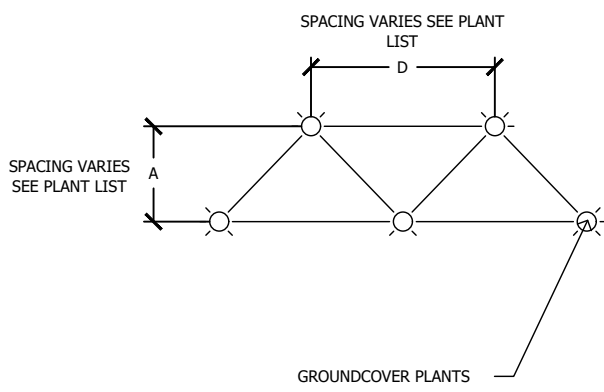
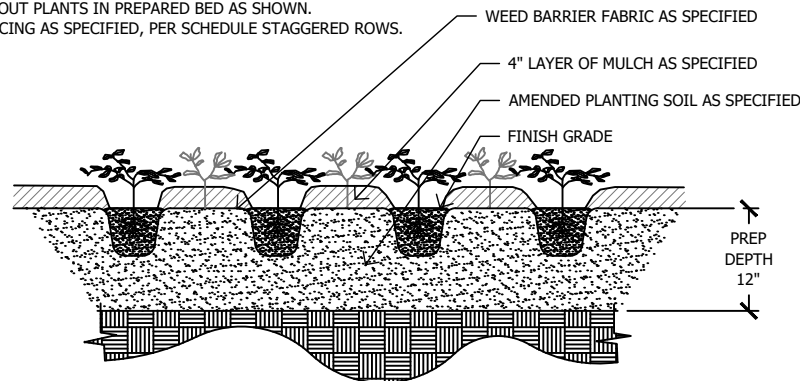
GENERAL NOTES:

1. REMOVE ALL TREATED OR PLASTIC-COATED BURLAP, STRAPPING, WIRE, OR NYLON TWINE FROM ROOT BALL. AFTER SETTING IN HOLE, CUT AWAY TOP AND SIDES OF WIRE BASKET, IF ANY.
2. INSTALL TOP OF ROOTBALL AT OR SLIGHTLY ABOVE FINISHED GRADE LEVEL.
3. EACH TREE MUST BE PLANTED SUCH THAT THE FIRST LATERAL ROOT IS VISIBLE AT THE TOP OF THE ROOTBALL.
3. DO NOT COVER THE TOP OF ROOTBALL WITH SOIL.
4. SET TREE IN VERTICAL POSITION PRIOR TO STAKING.
5. SOAK ROOT BALL AND PIT IMMEDIATELY AFTER INSTALLATION. PLACE 4" OF ORGANIC MULCH AROUND BASE OF TREE, 4' DIAMETER MINIMUM.
6. DO NOT PIERCE ROOT BALL WITH STAKES.
7. DO NOT CUT CENTRAL LEADER OR HEAVILY PRUNE TREE, ONLY PRUNE DEAD OR CROSSOVER BRANCHES.

02 TREE PLANTING PLAN/ SECTION - N.T.S.

GENERAL NOTES:

1. LAYOUT PLANTS IN PREPARED BED AS SHOWN.
2. SPACING AS SPECIFIED, PER SCHEDULE STAGGERED ROWS.



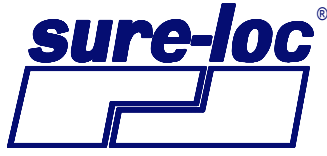
PLANT SPACING (D)	ROW SPACING (A)
6" O.C.	5.20"
8" O.C.	6.93"
10" O.C.	8.66"
12" O.C.	10.4"
15" O.C.	13.0"
18" O.C.	15.6"
24" O.C.	20.8"
30" O.C.	26.0"
36" O.C.	30.0"

03 GROUND COVER PLANTING PLAN/ SECTION - N.T.S.

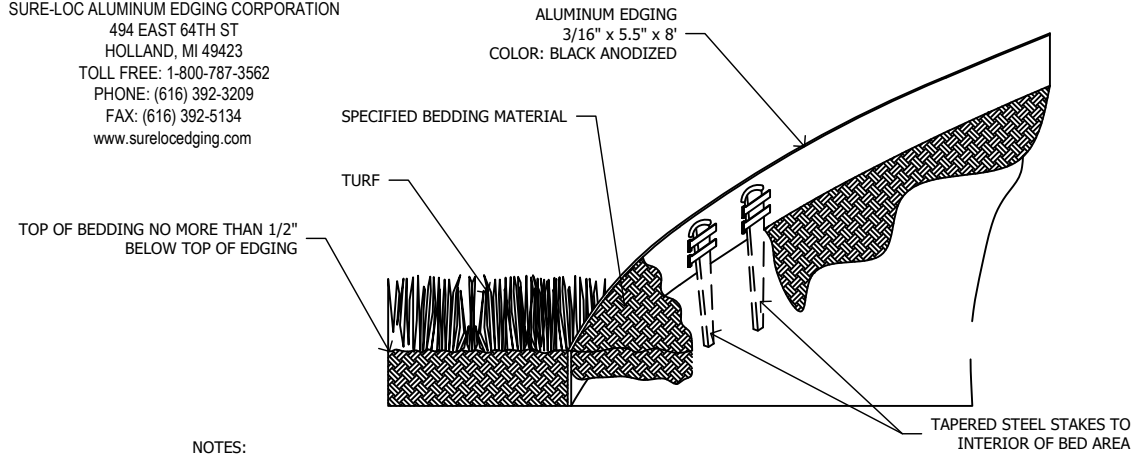
WESTSIDE PARK
MCVAY FAMILY REFLECTION GARDEN
 YANKTON, SOUTH DAKOTA
 SET PROJECT #: 22199



BID SET
 LANDSCAPING
 DETAILS



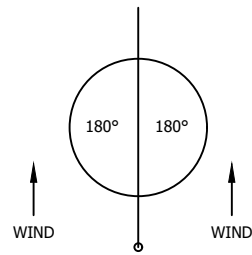
SURE-LOC ALUMINUM EDGING CORPORATION
494 EAST 64TH ST
HOLLAND, MI 49423
TOLL FREE: 1-800-787-3562
PHONE: (616) 392-3209
FAX: (616) 392-5134
www.surelocedging.com



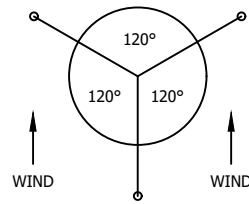
NOTES:
1. INSTALLATION TO BE COMPLETED IN ACCORDANCE WITH MANUFACTURER'S SPECIFICATIONS.

01 ALUMINUM LANDSCAPE EDGING

SECTION - N.T.S.



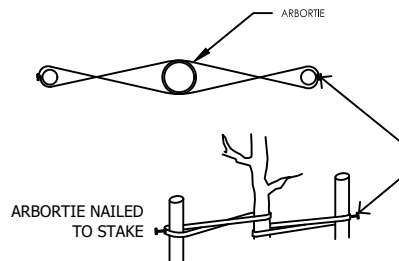
GUYING PATTERN FOR DECIDUOUS TREE PLANTING



GUYING PATTERN FOR EVERGREEN TREE PLANTING

GUY AND STAKE DECIDUOUS TREES 2" AND LARGER CALIPER AND CONIFEROUS TREES OVER 4' HT.

FOR TREES ON 4:1 OR STEEPER SLOPES, PLACE 2 GUYS UPSLOPE, ONE DOWNSLOPE; OTHERWISE PLACE FOR PREVAILING WIND.



FOLD ENDS OF ARBORTIE BACK. SECURE TO STAKE WITH 1" GALVANIZED ROOFING NAIL OR USE A KNOT.

SPECIFIED ARBORTIE GREEN (OR WHITE) STAKING AND GUYING MATERIAL IS TO BE FLAT WOVEN POLYPROPYLENE MATERIAL. 3/4" (19.05MM) WIDE 900 LB. BREAK STRENGTH.

ARBORTIE SHALL BE FASTENED TO STAKES IN A MANNER WHICH PERMITS TREE MOVEMENT AND SUPPORTS THE TREE.

02 TREE GUYING

SECTION - N.T.S.



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WESTSIDE PARK
MCVAY FAMILY REFLECTION GARDEN
YANKTON, SOUTH DAKOTA
SEE PROJECT #: 22199



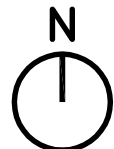
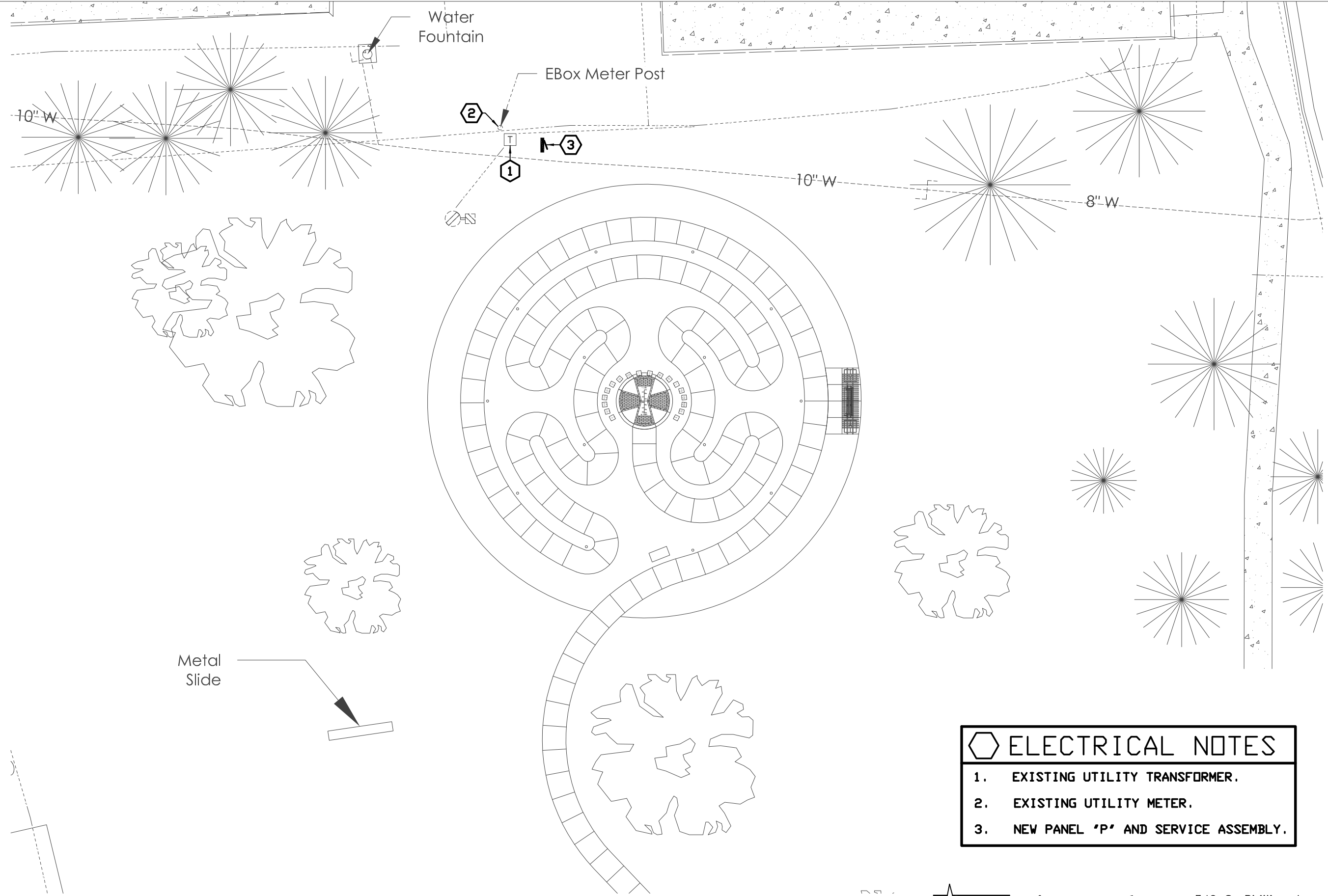
PLOT DATE 7/25/2022 10:35 AM

BID SET

LANDSCAPING
DETAILS

L-201

122052-ELEC.dwg



SITE PLAN - ELECTRICAL

SCALE 0 10 20 30 40

ELECTRICAL NOTES

1. EXISTING UTILITY TRANSFORMER.
2. EXISTING UTILITY METER.
3. NEW PANEL 'P' AND SERVICE ASSEMBLY.



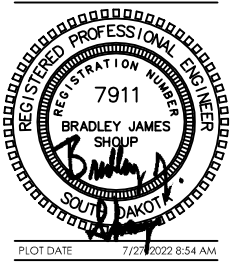
Associated Consulting Engineering, Incorporated

340 S. Phillips Ave.
Sioux Falls, S.D. 57104
(605) 335-3720
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ACEI PROJECT #: 122052

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WEST SIDE PARK
MCVAY FAMILY REFLECTION GARDEN
YANKTON, SOUTH DAKOTA
SEE PROJECT #: 22199



BID SET
SITE PLAN - ELECTRICAL

E1.01

ELECTRICAL NOTES

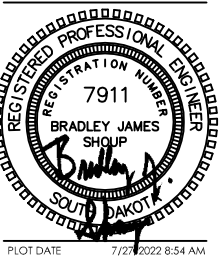
- TO A 20A/1P CIRCUIT BREAKER IN PANEL 'P' VIA PHOTOCELL.



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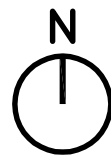
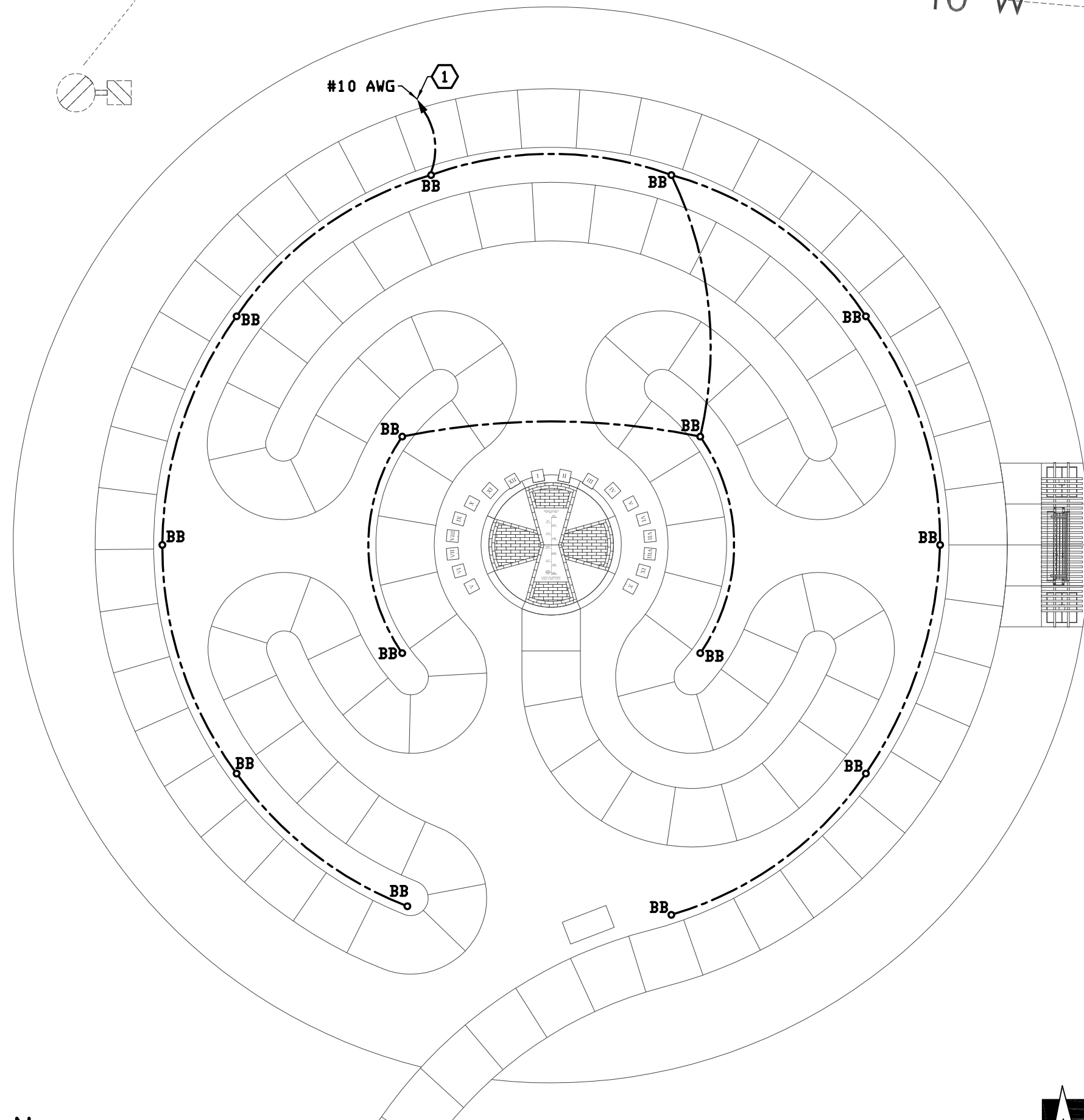
WEST SIDE PARK
MCVAY FAMILY REFLECTION GARDEN
 YANKTON, SOUTH DAKOTA
 SET PROJECT #: 22199



BID SET

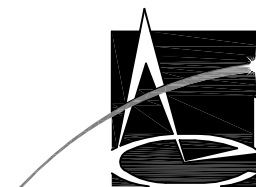
SITE PLAN
 (ENLARGED)
 - ELECTRICAL

E2.01



SITE PLAN (ENLARGED) - ELECTRICAL

SCALE 0 5 10 15 20



Associated Consulting Engineering, Incorporated

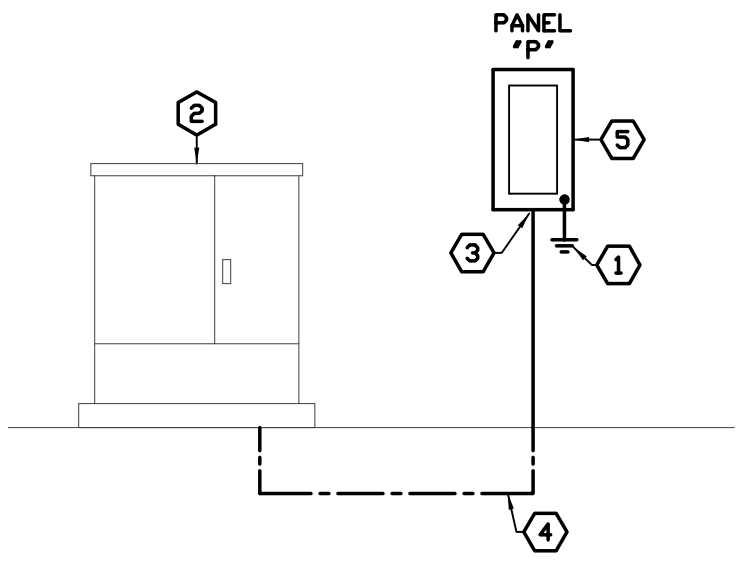
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 E-mail acei@aceinet.com
 ACEI PROJECT #: 122052

LIGHTING FIXTURE SCHEDULE						
Project Name: MCVAY FAMILY GARDEN, YANKTON SD					ACEI Project No: 122052	
TYPE	MFR.	NUMBER	LAMPS	VOLTS	DESCRIPTION	NOTES
BB	LIGMAN	UVR-70311-30W-W40-01-120	LED/4000K	120	LED, LOW PROFILE PILLAR LIGHT, BLACK FINISH, APPROXIMATELY 1600 LUMENS.	1

SPECIFIC NOTES:
 1. INSTALL ON A 12" DIAMETER BY 36" DEEP CONCRETE BASE.

POWER RISER NOTES	
1.	GROUND IN ACCORDANCE WITH THE NEC, LOCAL CODE REQUIREMENTS, AND SPECIFICATIONS.
2.	EXISTING UTILITY COMPANY TRANSFORMER.
3.	AVAILABLE FAULT CURRENT OF 9,800A.
4.	3-#6 AWG COPPER THWN-2 IN 1' CONDUIT.
5.	NEMA 3R, 120/240V/1Ø, 60A MCB, 4 EACH 20A/1P BRANCH CIRCUIT BREAKERS.



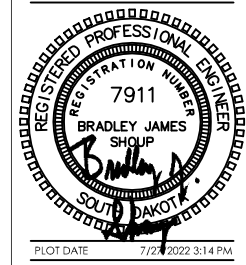
POWER RISER DIAGRAM
 NO SCALE



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WEST SIDE PARK
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BID SET
 POWER RISER DIAGRAM

E3.00

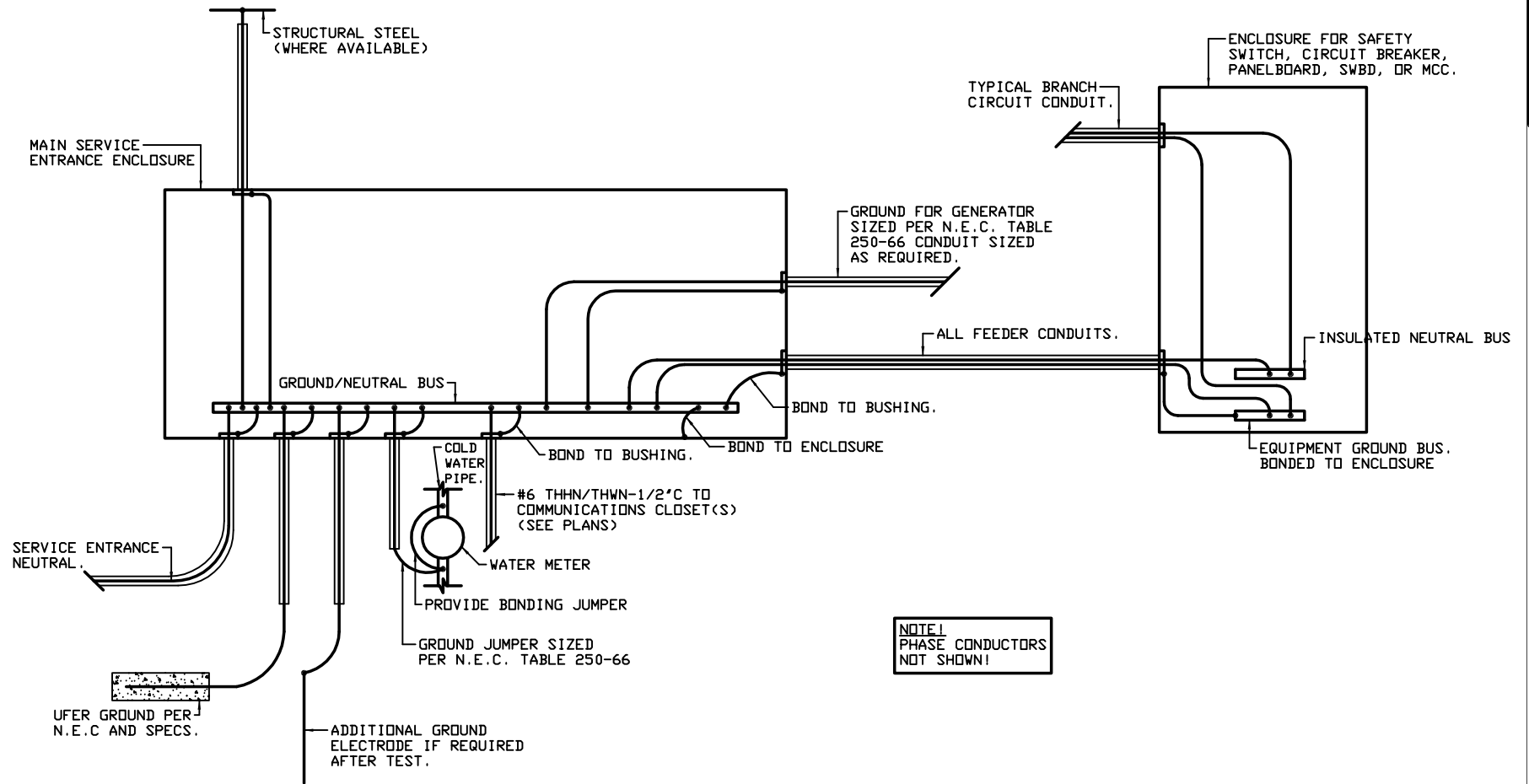
FEEDER SCHEDULE

MARK (AMPS)	4-WIRE FEEDER				3-WIRE FEEDER				"K" RATED 4-WIRE FEEDER				MARK (AMPS)	
	SETS	PH	GND	C	SETS	PH	GND	C	SETS	PH	N	GND		C
15	1	14	14	0.75	1	14	14	0.75	1	14	12	14	0.75	15
20	1	12	12	0.75	1	12	12	0.75	1	12	10	12	0.75	20
25	1	10	10	0.75	1	10	10	0.75	1	10	8	10	0.75	25
30	1	10	10	0.75	1	10	10	0.75	1	10	8	10	0.75	30
35	1	8	10	0.75	1	8	10	0.75	1	8	6	10	0.75	35
40	1	8	10	0.75	1	8	10	0.75	1	8	4	10	1.00	40
45	1	6	10	1.00	1	6	10	0.75	1	6	4	10	1.00	45
50	1	6	10	1.00	1	6	10	0.75	1	6	3	10	1.00	50
60	1	6	10	1.00	1	6	10	0.75	1	6	3	10	1.00	60
70	1	4	8	1.25	1	4	8	1.00	1	4	1/0	8	1.25	70
80	1	4	8	1.25	1	4	8	1.00	1	4	1/0	8	1.25	80
90	1	3	8	1.25	1	3	8	1.25	1	3	2/0	8	1.25	90
100	1	3	8	1.25	1	3	8	1.25	1	3	2/0	8	1.50	100
110	1	2	6	1.25	1	2	6	1.25	1	2	3/0	6	1.50	110
125	1	1	6	1.50	1	1	6	1.25	1	1	4/0	6	2.00	125
150	1	1/0	6	2.00	1	1/0	6	1.50	1	1/0	300	6	2.00	150
175	1	2/0	6	2.00	1	2/0	6	2.00	1	2/0	350	6	2.00	175
200	1	3/0	6	2.00	1	3/0	6	2.00	1	3/0	500	6	2.50	200
225	1	4/0	4	2.50	1	4/0	4	2.00	1	4/0	2-3/0	4	2.50	225
250	1	250	4	2.50	1	250	4	2.50	1	250	2-4/0	4	2.50	250
300	1	350	4	3.00	1	350	4	2.50	1	350	2-300	4	3.00	300
350	1	500	3	3.00	1	500	3	3.00	1	500	2-400	3	3.50	350
400	2	3/0	3	2.00	2	3/0	3	2.00	2	3/0	500	3	2.50	400

MOTOR & APPLIANCE FEEDER SCHEDULE (100 Amps & Less)

MARK (AMPS)	MOTOR LOAD (HP)		4-WIRE FEEDER			3-WIRE FEEDER			MARK (AMPS)
	480V	208V	PH	GND	C	PH	GND	C	
20	7.5 & LESS	3 & LESS	12	12	0.75	12	12	0.75	20
25	10	--	10	10	0.75	10	10	0.75	25
30	15	--	10	10	0.75	10	10	0.75	30
35	--	5	8	10	0.75	8	10	0.75	35
40	15	--	8	10	0.75	8	10	0.75	40
45	--	--	6	10	1.00	6	10	0.75	45
50	--	7.5	6	10	1.00	6	10	0.75	50
60	20	10	6	10	1.00	6	10	0.75	60
70	25	--	4	8	1.25	4	8	1.00	70
80	30	--	4	8	1.25	4	8	1.00	80
90	40	15	3	8	1.25	3	8	1.25	90
100	50	20	3	8	1.25	3	8	1.25	100

- NOTES:
1. FEEDERS SHALL BE 4-WIRE, UNLESS DENOTED WITH:
 - "3W" WHICH SHALL BE 3-WIRE (3W)
 - "IG" WHICH SHALL BE 4-WIRE PLUS INSULATED GROUND AND EQUIPMENT GROUND.
 - "K" WHICH SHALL BE 4-WIRE WITH OVERSIZED NEUTRAL.
 2. SERVICE ENTRANCE CONDUCTORS SHALL NOT BE PROVIDED WITH GROUND CONDUCTOR.
 3. ALL FEEDERS SHALL HAVE EQUIPMENT GROUND CONDUCTOR.
 4. NEUTRAL SHALL BE SAME SIZE AS PHASE CONDUCTOR, UNLESS OTHERWISE NOTED.
 5. CONDUCTOR SIZES FOR FEEDERS OVER 40A ARE BASED ON TERMINATIONS TO EQUIPMENT LISTED FOR 75°C, INCREASE FEEDER SIZES AS REQUIRED FOR TERMINATIONS TO EQUIPMENT NOT LISTED FOR 75°C.
 6. RACEWAY AND CONDUCTOR SIZING IS BASED ON THE USE OF THHN/THWN COPPER CONDUCTORS AND EMT CONDUIT. MODIFY RACEWAY AND CONDUCTOR SIZES AS REQUIRED FOR THE USE OF OTHER RACEWAY AND CONDUCTOR TYPES. SEE SPECIFICATIONS FOR ALLOWABLE CONDUCTOR MATERIAL, INSULATION, AND RACEWAY TYPES.
 7. NOT ALL FEEDER SIZES SHOWN IN THIS SCHEDULE ARE USED IN THIS PROJECT.



BUILDING SERVICE ENTRANCE GROUNDING DETAIL

NO SCALE

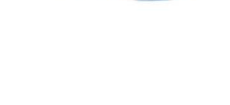
NOTE 1
PHASE CONDUCTORS NOT SHOWN!

ELECTRICAL SYMBOL LEGEND

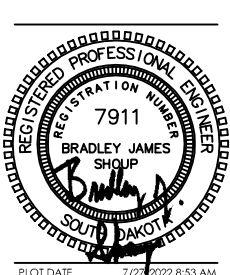
SYMBOL	DESCRIPTION	MNT. HT.	SYMBOL	DESCRIPTION	MNT. HT.
A ○ a	CEILING MOUNTED FIXTURE. CAPITAL LETTER INDICATES FIXTURE TYPE. SMALL LETTER INDICATES SWITCHING. DIAGONAL LINE INDICATES RECESSED.		AC	ABOVE COUNTER - 3" ABOVE BACK SPLASH	
○	WALL MOUNTED FIXTURE		UC	UNDER COUNTER	18"
□ ○	POLE MOUNTED LIGHT FIXTURE		KS	KNEE SPACE	18"
⊙	BOLLARD		I	ISOLATED GROUND	
RB	REMOTE BALLAST		GFI	GROUND FAULT INTERRUPTER	
RH	RELAY		WP	WEATHERPROOF	
TC	TIME CLOCK		E	EMERGENCY POWER	
PC	PHOTO CELL		EP	EXPLOSION PROOF	
CH	CONTACTOR		TR	TAMPER RESISTANT	
CB	CIRCUIT BREAKER		—	STEM ON DEVICE INDICATES WALL MOUNT	
⊕	DUPLEX RECEPTACLE	18"	⊙	TAG INDICATES SPECIFIC ELECTRICAL NOTE	
⊕	FOURPLEX RECEPTACLE	18"	⊙	SPECIAL PURPOSE EQUIPMENT TAG. SEE APPLICABLE SCHEDULE.	
⊕	DUPLEX RECEPTACLE, ISOLATED GROUND	18"	—	HOME RUN TO PANELBOARD. ARROWS INDICATE QUANTITY OF CIRCUITS. NUMBERS INDICATE PANEL AND CIRCUITS. CROSS MARKS INDICATE NUMBER OF WIRES.	
⊕	FOURPLEX RECEPTACLE, ISOLATED GROUND	18"	—	CONDUIT CONCEALED IN WALL OR CEILING, "E" INDICATES EMERGENCY	
⊕	DUPLEX RECEPTACLE, EMERGENCY CIRCUIT	18"	—	CONDUIT UP	
⊕	FOURPLEX RECEPTACLE, EMERGENCY CIRCUIT	18"	—	CONDUIT DN	
⊕	DUPLEX RECEPTACLE, HALF SWITCHED	18"	—	CONDUIT CONCEALED IN FLOOR, "E" INDICATES EMERGENCY	
⊕	CEILING MOUNTED RECEPTACLE OR DROP CORD	18"	—	CONDUIT EXPOSED, "E" INDICATES EMERGENCY	
⊕	FLOOR BOX, SEE SPECIFICATIONS	18"	—	INDICATES ELECTRICAL DEVICES TO BE REMOVED	
⊕	SPECIAL PURPOSE OUTLET AS NOTED OR SPECIFIED.		TR	TRANSFORMER	
MDA	MULTI-OUTLET ASSEMBLY - M.O.A.		□	SPECIAL EQUIPMENT CABINET AS NOTED.	
□	BRANCH CIRCUIT LIGHTING AND APPLIANCE PANELBOARD		□	DISCONNECT	
□	CONTROL CABINET AS NOTED				



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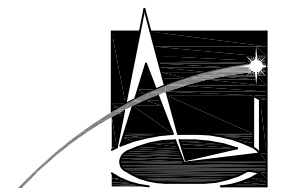


WEST SIDE PARK
MCVAY FAMILY REFLECTION GARDEN
YANKTON, SOUTH DAKOTA
SEE PROJECT #: 22199



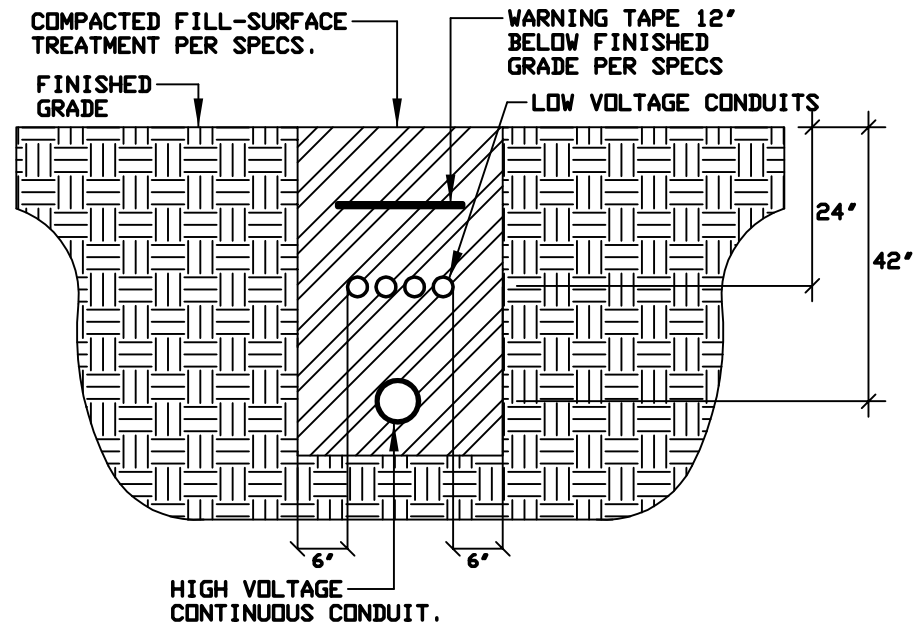
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BID SET
ELECTRICAL DETAILS
E3.01

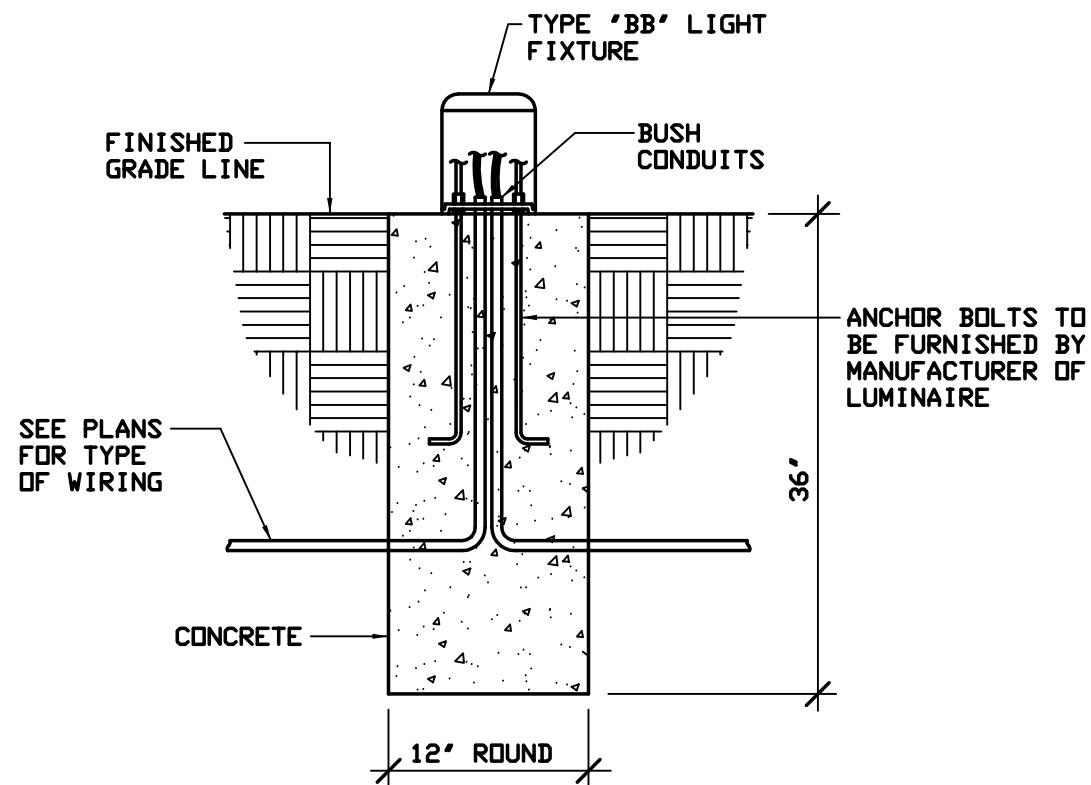


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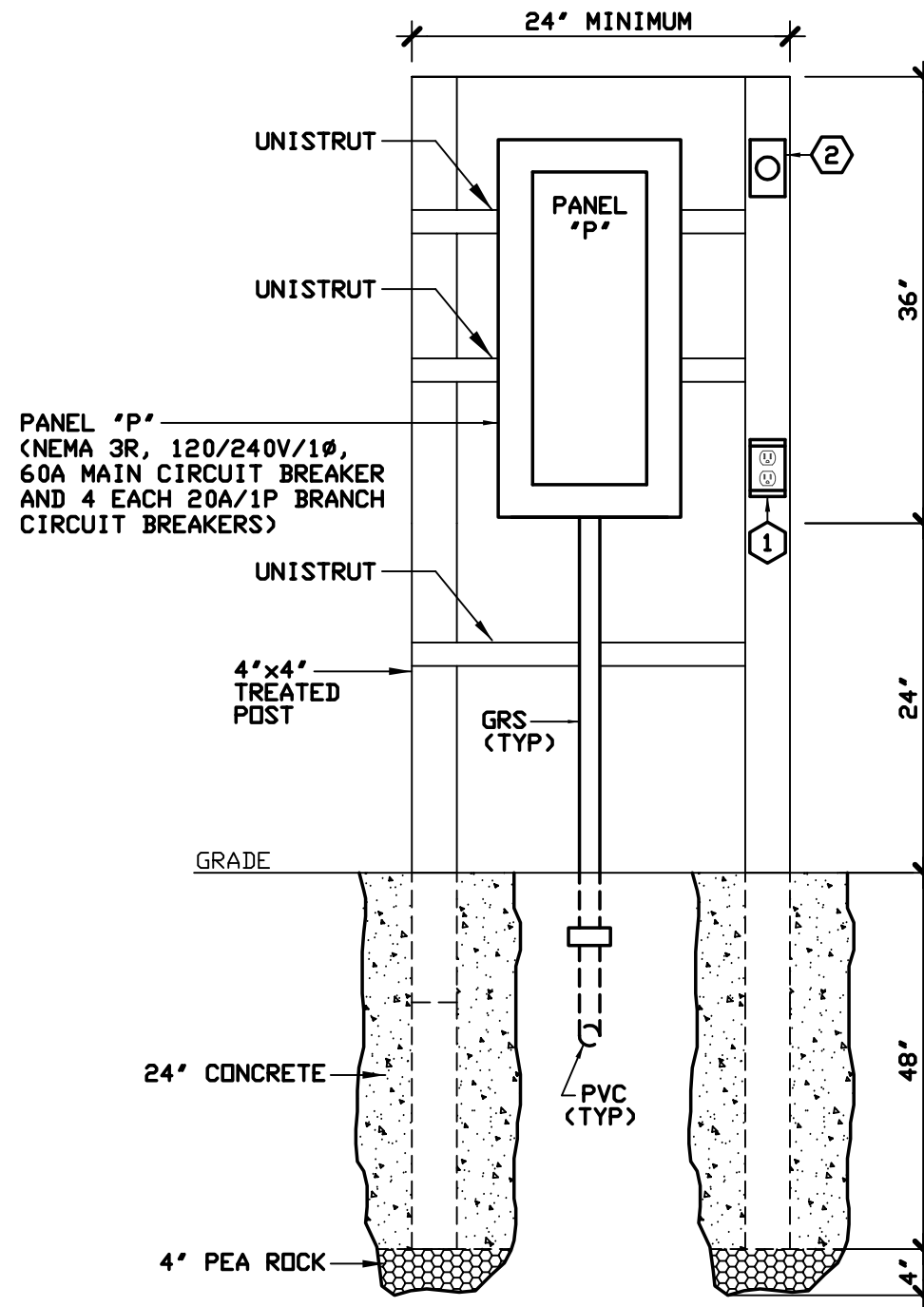
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ACEI PROJECT #: 122052



TYPICAL TRENCH DETAIL
 NO SCALE



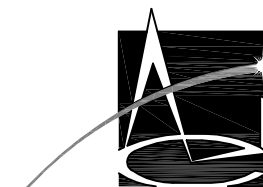
TYPE "BB" BOLLARD MOUNTING DETAIL
 NO SCALE



NOTES:

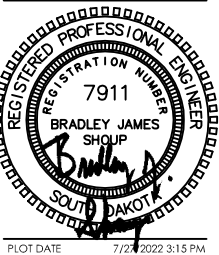
- 120V/20A GFI DUPLEX RECEPTACLE WITH "EXTRA-DUTY" IN-USE COVER. CONNECT TO 20A/1P CIRCUIT BREAKER IN PANEL "P".
- PHOTOCELL (INTERMATIC EK4336S).

MOUNTING ASSEMBLY DETAIL
 NO SCALE



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BID SET

ELECTRICAL
 DETAILS

E3.02

ELECTRICAL SPECIFICATIONS:

The work shall include all electrical work indicated on the Drawings and these specifications that are complementary to the electrical construction portion of this project.

QUALITY ASSURANCE:**Codes and Standards:**

Work, materials and manner of placing material shall conform in every respect with the latest provisions of Local, State and National Codes.

Materials and equipment shall be new and of best quality, of the type best suited for the purpose intended, and be made by nationally recognized and substantially established manufacturers. The type and weight of material used for each purpose shall be as herein specified, and material shall conform with the requirements of the "ASTM" for that particular material.

Electrical materials used in this work shall be listed by the Underwriters Laboratories, Inc. where testing is provided and shall bear their label.

Where the notation of NEMA is indicated, the equipment shall conform to National Electrical Manufacturers Association Standard.

The following list of codes, technical societies, trade organizations and governing agencies shall set the standards by which all work shall be executed:

City Electrical Ordinances
City Electrical Standards and Templates
State Electrical Laws and Statutes
National Electrical Code (NEC) Current Edition
National Board of Fire Underwriters (NBFU)
National Electrical Manufacturers Association (NEMA)
Underwriters Laboratories (UL)
Electrical Testing Laboratory (ETL)

SUBMITTALS:

The Contractor shall submit one (1) electronic copy of all shop drawings to the Engineer. Major components of the system shall be submitted at one time under a protective cover with each section indexed with visible file tabs.

Shop drawings shall indicate catalog number, dimensions, voltage and current characteristics, wire sizes, construction and rough_in data of all materials to be used. Each shop drawing shall be certified as being checked and approved by the Contractor before submittal.

Shop drawings not indicated as being approved by the Contractor will be returned without review.

The Contractor shall maintain two copies of approved shop drawings to be submitted with the Operating and Maintenance Manual.

The Engineer is not an error checker. Shop drawings submitted in error or with errors as compared to Specifications and Drawings will be the responsibility of the Contractor.

Shop drawings must only be those materials as specified or approved in published addendum. Others will be returned without review.

Submittals shall be provided for:

Underground Warning Tape
Wiring Devices.
Lighting Fixtures
Photocell.
Panelboards

Guarantee:

This Contractor shall assume responsibility for any defects which may develop in any part of his work caused by faulty workmanship, material or equipment, and agrees to replace, repair or alter, at his expense, any such faulty workmanship, material or equipment that has been brought to his attention during a period of one year from the date of the final certificate for payment. Acceptance of the work shall not waive this guarantee.

Operating and Maintenance Instructions:

This Contractor shall furnish two (2) copies of complete catalog data, manufacturer's literature and detailed manuals covering the operating, maintenance of equipment and parts list specified under this Division of the Specification.

Test Reports:

Work which is required to be placed within the construction or concealed shall be carefully tested and inspected before being permanently concealed.

The entire system shall be subject to a test at full operating and under normal usage conditions. This shall include voltage and current checks, resistance measurements and equipment operation. Defects in the work or workmanship which appear during these tests shall be properly remedied and a test again applied and continued to a satisfactory conclusion.

Electricity or other energy necessary for use in testing and adjusting and for the operation period will be supplied by the Owner.

Instruments for making tests shall be furnished by this Contractor. After testing the apparatus, the entire system shall be operated for one week under normal conditions. The final test shall be performed as soon as possible after the work is entirely completed.

JOB CONDITIONS:**Fees and Service Charges:**

Permits, licenses, fees and service charges required in connection with the work shall be secured and paid for by this Contractor, and upon completion of the work he shall furnish proof of acceptance from the proper Local or State Department having jurisdiction.

Final Inspection:

Upon completion of the work, the Contractor shall notify the Architect or Engineer and make arrangements for a final observation. After the final observation is made, the Contractor will receive a list of items requiring adjustment, correction, replacement, or completion.

The Contractor shall comply completely with all the listed requirements within a negotiated number of days of receipt of list. Should the Contractor fail to complete items on the list within this time limit, the Owner reserves the right to have the work completed by others and the cost deducted from the contract price, including change orders.

BASIC MATERIALS AND METHODS

The section shall include but not be limited to:

Concrete Bases
Conduit, Fittings and Supports
Outlet Boxes, Pull Boxes and Junction Boxes
Wire and Cable
Location of Outlets and Equipment
Equipment Identification and Cleanup
Grounding
Panelboards
Wiring Devices
Lighting Fixtures

CONCRETE BASES:

3000-psi, 28-day compressive strength as specified in section "Cast-In-Place Concrete".

CONDUIT, FITTINGS AND SUPPORT:

Unless otherwise noted or allowed by following paragraphs, all wiring 120V or greater shall be in conduit. Conduit shall be galvanized rigid steel (GRS), intermediate metallic conduit (IMC), electrical metallic tubing (EMT) or poly-vinyl chloride (PVC).

Conduits shall be sized as required by the NEC for number and size of conductors installed except that 1 inch shall be minimum size for branch circuit home runs and 1/2 inch shall be minimum size for other conduit runs. Maximum size shall be as allowed by the NEC and within the limits of commonly manufactured sizes. Conduit joints shall be cut square, threaded, reamed smooth and drawn up tight. Bends or offsets shall be made with standard conduit ells or field bends made with an approved bender.

Conduit and raceways shall be securely fastened with suitable fastenings.

Concealed conduits shall be run in a direct line with long sweep bends and offsets. Exposed conduits shall be run parallel to and at right angles to building lines and neatly grouped and supported with approved conduit hangers or channel supports. Conduits shall be continuous from outlet to outlet, from outlets to cabinets, pull or junction boxes and shall be secured to all boxes with locknuts and bushings. Conduit ends shall be capped to prevent entrance of foreign materials during construction. Changes in conduit sizes shall occur only at junction boxes. On conduit systems the connector fitting shall be of the insulated throat type. Conduit, elbows and couplings shall be as manufactured by Allied Tube & Conduit, The Republic Steel Company, Triangle, or equal and approved. Conduit fittings shall be of steel as manufactured by The Thomas and Betts Co., Steel City Company, Raco, or equal and approved.

Galvanized Rigid Steel Conduit: Galvanized rigid steel conduit (GRC) shall be used for all exterior exposed conduits above grade. Fittings shall be as specified above.

Intermediate Metal Conduit: Intermediate metal conduit (IMC) may be used in place of GRC, except where prohibited by the NEC. Fittings shall be threaded and installation shall comply with the previous paragraphs as specified herein.

Electrical Metallic Tubing: Electrical metallic tubing (EMT) may be used in equipment enclosures. EMT shall not be used in slab on grade, where exposed to moisture or earth or outside where exposed to weather. Indenter fitting shall not be used. Pressure cast fittings shall not be used. Set screw fittings may be used.

Rigid Non-Metallic Conduit (PVC): Use of PVC is specifically limited to underground or under slab-on-grade applications with all risers transitioned to metal conduit prior to extending above ground or above slab. Rigid non-metallic conduit (PVC) shall be made of virgin polyvinyl chloride resin, extruded, Schedule 40 or 80 PVC rigid conduit, light gray in color, supplied in 20 or 10 foot lengths each with a coupling. It shall be U.L. listed and bear the label for use underground direct burial and concrete encased. It shall be cut square with rough edges removed from ends to protect the wires from abrasion. Connections shall be made by solvent welding. Fittings shall be U.L. listed and installed in accordance with the manufacturer's recommended procedures. Expansion joints shall be provided wherever conduit crosses building expansion joints or where a wide temperature differential exists. Conduit and fittings shall be manufactured by Carlon, CertainTeed, Cantex or Johns_Manville. Rigid non-metallic conduit may be used for underground feeders and branch circuits. Transition to GRS conduit must occur before the conduit is exposed. All 90o ells must be made with galvanized rigid metal conduit. Rigid non-metallic conduit shall not be installed in concrete but may be installed below concrete slab.

Underground Warning Tape: Permanent, bright colored, continuous-printed, vinyl tape. Tape shall be not less than 6 inches wide by 4 mils thick, compounded for permanent direct-burial service, with embedded continuous metallic strip or core, and have a printed legend that indicates type of underground line.

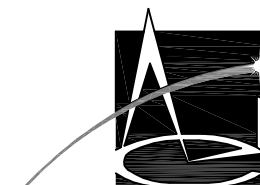
OUTLET BOXES, PULL BOXES AND JUNCTION BOXES:

Outlet boxes shall be galvanized steel standard electrical type with knockout openings as required and shall be manufactured by Appleton, Steel City, National Electric, Raco, or equal and approved. Outlet boxes shall be at least 1_1/2 inches deep, single or gang style type of size to accommodate devices noted. Outlet boxes in masonry walls may be special masonry type. Outlet boxes on exposed conduit runs in unfinished areas and equipment rooms shall be 4 inch square or multi_gang boxes with matching raised covers. Outlet boxes on exposed conduit runs in finished areas or where indicated shall be cast FS type with covers as specified elsewhere. Exterior outlet boxes shall be cast aluminum type with weatherproof in-use cover, similar to . Outlet boxes for receptacle devices shall be provided with grounding lead lug or screw.

Outlet boxes installed in masonry, tile or concrete surfaces shall be provided with square corner type extension rings where special masonry boxes are not used. Outlet boxes shall be protected from entrance of foreign materials during the construction period.

Outlet boxes shall be concealed except where shown or noted otherwise. Outlet boxes, plaster rings or extension rings shall be installed flush with the finished surface. Openings for boxes in masonry, tile, paneling or similar surfaces shall be cut in by trades installing the surface material and shall be exact box size. The Contractor shall verify type and depth of finished surface so that outlet will be flush.

Outlet boxes noted as WP (weatherproof) shall be a flush FS type box with at least 4 machine screw connections for a gasketed device and cover.



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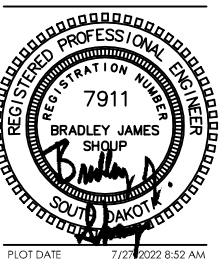
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ACEI PROJECT #: 122052



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**WEST SIDE PARK
MCVAY FAMILY REFLECTION GARDEN
YANKTON, SOUTH DAKOTA**
SEE PROJECT #: 22199



BID SET

SPECIFICATIONS

E3.03

WIRE AND CABLE:**General:**

Wire and cable for feeder and branch circuits shall conform to the requirements of the current edition of the NEC and shall meet all relevant ASTM Specifications. Conductors shall be 600 volt rated, coated soft_drawn copper and unsoft_drawn copper and unless otherwise noted on the Plans and in these Specifications, shall have type THHN/THWN insulation. Wire and cable shall not be older than 12 months.

Aluminum wire shall not be used.

Conductor sizes shall be standard American wire gauge sizes and shall be as noted on the Drawings. Conductors No. 12 and smaller shall be solid; No. 10 and larger, stranded. Minimum size shall be No. 12, unless otherwise noted. Wire size requirements larger than No. 12 shall be as noted on Drawings or as required for the load.

Wire and cable shall be delivered to the job in standard coils or reels without splices and with approved tag noting length, wire size, insulation type, and manufacturer's name; shall be suitably protected from weather and damage during storage and handling.

Branch circuit lighting, receptacle and power wire shall be type THWN/THHN copper wire. Wire for special systems shall be as specified for the system. Service cables and panel feeders shall be type THWN/THHN.

Wire shall not be drawn into conduit until after the conduit system is complete and has been thoroughly swabbed out. Wire shall not be drawn into conduit in such a manner as to injure the insulation. Splices shall be made on building wire with solderless_tapeless, mechanical wire connectors with spring action to maintain constant pressure on the conductors. Connections shall be Scotchlok Brand, Type Y, R and B, or equal and approved.

Wire and cable shall be factory color_coded by integral pigmentation, with a separate color for each phase and neutral conductor. The color code shall be used consistently throughout the electrical installation. Wire and cable shall be as manufactured by General, Hatfield, South Wire, Triangle or equal and approved.

LOCATION OF OUTLETS AND EQUIPMENT:

Outlets shall be installed at the heights and approximate designated positions as shown on Drawings and in the symbol legend, coordinate exact locations with the engineer in the field.

EQUIPMENT IDENTIFICATION AND CLEANUP:

The electrical equipment furnished by this Contractor shall be provided with identification indicating its use or function. Equipment to be identified shall include, but not be limited to, panelboards, special system control panels, special lighting or control switches, special receptacles, junction boxes and empty conduits provided for future use. Normal use lighting switches, receptacles and conduit will not require identification.

Identification shall be with black laminated plastic plates with white engraved letters mounted with drive pins or other approved fasteners. Standard lettering height shall be 1/8 inch. In equipment rooms and unfinished areas, painted stencils or engraved plates shall be used for identification.

Each panelboard shall be provided with a neatly typed directory with plastic protector, of circuits describing loads and areas served.

Hand lettering of identification will not be acceptable. Temporary labels used during construction shall be completely removed and surface repainted if required.

Cleanup: Special care must be taken for protection of panels, switches, light fixtures, etc. Damage from rust, paint, scratches, etc., shall be corrected as directed by the Engineer. Clean switchgear, controls, light fixtures, wiring devices, etc. and take special care to remove dirt, mortar, wire scraps, etc. from junction boxes and switchgear interiors. Clean light fixtures and lamps thoroughly, just prior to final inspection.

GROUNDING:

The conduit system and service neutral conductor shall be grounded together at the service entrance.

Grounding shall be in accordance with the NEC, as shown on the Drawings and as hereinafter specified.

For metallic conduits which terminate without mechanical connection to a housing of electrical equipment by means of locknut and bushings or adapters shall be provided with grounding bushings. Bushings shall be connected with a bare grounding conductor to the equipment ground bus.

Connect metallic conduits, which terminate without mechanical connection to the housing, by grounding bushings and ground wire to the ground bus.

For conduit systems: All conduit systems shall be provided with a separate ground conductor.

For feeders and branch circuits: Install green grounding conductors with all feeders and branch circuits. Bond the grounding wires to each pullbox, junction box, outlet box, cabinets and other enclosures through which the ground wires pass. Provide lugs in each box and enclosure for ground wire termination.

CONNECTIONS TO SPECIAL EQUIPMENT:

Special equipment is hereby defined as equipment that is not specified under this contract but requires connections by this Contractor, as indicated on the Drawings. Such connections shall be performed by this Contractor. This Contractor shall verify the locations of such connections by securing from the equipment suppliers, templates, detail Drawings and roughing_in measurements. Unless otherwise specified the Contractor responsible for furnishing such equipment is also responsible for setting the equipment in place. Equipment included in this Division of the Specifications, requiring connections by other Contractors, shall be provided with proper openings, tappings, flanges, etc., ready for final connections.

ELECTRICAL SERVICE SYSTEM:

This Contractor shall furnish and install as shown or specified herein conduit, wire and electrical service equipment as shown on the drawings. This section shall include, but not limited to:

Electrical Services:

Electric service from the utility company transformer to main panelboard "P".

PANELBOARDS:

All panels shall be constructed of sheet steel of thickness required by code. Enclosures shall be NEMA 3R and shall be equipped with lock.

Panels shall be factory finished with prime coat and flat green baked enamel finish coat. Panels shall provide a minimum of 4' gutter on all sides and be of depth to accommodate number and sizes of conduits entering. A circuit directory and holder with plastic protection shall be provided on the inside of the door. Panels shall be UL listed, suitable for 120/240V, 1PH, 3W applications, with mounting as indicated on the drawings. Panels shall be factory assembled type, of the dead front type and all bussing shall be copper. Neutral bus bars shall be full capacity and shall contain box type lugs for each circuit. Sizes, branches, mounting, etc.. shall be as indicated on the drawings.

Circuit breakers shall be the bolt-on thermal magnetic type with a minimum interrupting rating of 10,000 A.I.C. Panels shall be equal to Square D Type NQOD with QOB breakers. Circuit breakers shall be of the inverse time thermal magnetic type.

WIRING DEVICES:

Wiring devices shall be as specified below and as manufactured by Hubbell, Arrow Hart, Pass and Seymour, Leviton, General Electric or equal and approved.

Duplex receptacles shall be specification grade, 20 AMPS, 125 volt, GFCI, listed weather-resistant type, 3 wire grounding type with grounding terminal and terminals arranged for back or side wiring. Devices shall have gray finish. Provide "While-in-use", heavy duty die cast covers.

LIGHTING FIXTURES, LAMPS AND CONTROLS:

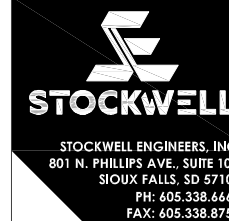
This Contractor shall furnish and install as shown or specified herein conduit, wire, lighting fixtures, lamps and controls. The section shall include but not be limited to:

Lighting Fixtures

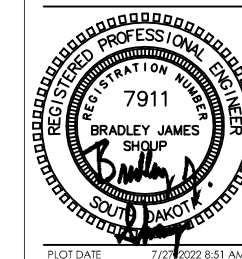
Lighting fixtures shall be as scheduled on the drawings.

QUALITY ASSURANCE:

Lighting fixtures shall conform to latest NEMA Standards.



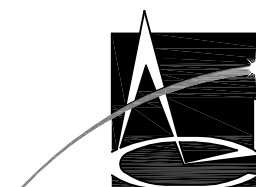
WEST SIDE PARK
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YANKTON, SOUTH DAKOTA
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SPECIFICATIONS

E3.04



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