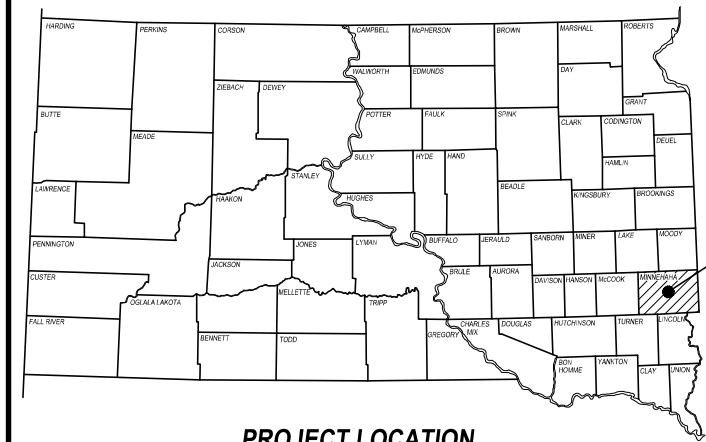




PROJECT LOCATION

STATE OF SOUTH DAKOTA
DEPARTMENT OF TRANSPORTATION
PLANS FOR PROPOSED

SALT BRINE TANK FOUNDATION

SIoux FALLS AREA DOT
WIP #410B380
PCN i7YH

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	410B380	1	9

INDEX OF SHEETS

Sheet No. 1	Title Sheet
Sheet No. 2 - 4	Estimate of Quantities and General Notes
Sheet No. 5	Grading Plan
Sheet No. 6	Drainage Plan
Sheet No. 7	General Drawing
Sheet No. 8	Foundation Details (A)
Sheet No. 9	Foundation Details (B)

STORM WATER PERMIT
None Required

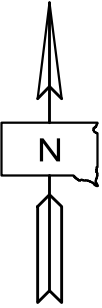
T 102 N



T 102 N

R 50 W

LOCATION MAP



Know what's below.
Call before you dig.



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ESTIMATE OF QUANTITIES

BID ITEM NUMBER	ITEM	QUANTITY	UNIT
009E0010	Mobilization	Lump Sum	LS
110E1010	Remove Asphalt Concrete Pavement	696.0	SqYd
120E0010	Unclassified Excavation	681	CuYd
120E7500	Aggregate Column	200.1	CuYd
250E0010	Incidental Work	Lump Sum	LS
260E1010	Base Course	888.8	Ton
320E1200	Asphalt Concrete Composite	196.4	Ton
451E0516	6" PVC Pipe	253	Ft
451E7016	Connect to Existing Sewer Main	1	Each
460E0100	Class A45 Concrete, Miscellaneous	150.9	CuYd
480E0200	Epoxy Coated Reinforcing Steel	27,700	Lb
651E0040	4" Concrete Sidewalk	140.0	SqFt
Special	10" Area Drain with Grate Assembly	8	Each

ENVIRONMENTAL COMMITMENTS

The SDDOT is committed to protecting the environment and uses Environmental Commitments as a communication tool for the Engineer and Contractor to ensure that attention is given to avoid, minimize, and/or mitigate an environmental impact. Environmental Commitments to various agencies and the public have been made to secure approval of this project. An agency with permitting authority can delay a project if identified environmental impacts have not been adequately addressed. Unless otherwise designated, the Contractor’s primary contact regarding matters associated with these commitments will be the Project Engineer. During construction, the Project Engineer will verify that the Contractor has met Environmental Commitment requirements. These environmental commitments are not subject to change without prior written approval from the SDDOT Environmental Office.

Additional guidance on SDDOT’s Environmental Commitments can be accessed through the Environmental Procedures Manual found at: <<https://dot.sd.gov/doing-business/environmental/about-environmental/>>

For questions regarding change orders in the field that may have an effect on an Environmental Commitment, the Project Engineer will contact the Environmental Engineer at 605-773-3180 or 605-773-4336 to determine whether an environmental analysis and/or resource agency coordination is necessary.

Once construction is complete, the Project Engineer will review all environmental commitments for the project and document their completion.

COMMITMENT E: STORM WATER

Construction activities constitute less than 1 acre of disturbance.

Action Taken/Required:

At a minimum and regardless of project size, appropriate erosion and sediment control measures must be installed to control the discharge of pollutants from the construction site.

COMMITMENT H: WASTE DISPOSAL SITE

The Contractor will furnish a site(s) for the disposal of construction and/or demolition debris generated by this project.

Action Taken/Required:

Construction and/or demolition debris may not be disposed of within the Public ROW.

The waste disposal site(s) will be managed and reclaimed in accordance with the following from the General Permit for Construction/Demolition Debris Disposal Under the South Dakota Waste Management Program issued by the Department of Agriculture and Natural Resources.

The waste disposal site(s) will not be located in a wetland, within 200 feet of surface water, or in an area that adversely affects wildlife, recreation, aesthetic value of an area, or any threatened or endangered species, as approved by the Environmental Office and the Project Engineer.

If the waste disposal site(s) is located such that it is within view of any ROW, the following additional requirements will apply:

1. Construction and/or demolition debris consisting of concrete, asphalt concrete, or other similar materials will be buried in a trench separate from wood debris. The final cover over the construction and/or demolition debris will consist of a minimum of 1 foot of soil capable of supporting vegetation. Waste disposal sites provided outside of the Public ROW will be seeded in accordance with Natural Resources Conservation Service recommendations. The seeding recommendations may be obtained through the appropriate County NRCS Office. The Contractor will control the access to waste disposal sites not within the Public ROW with fences, gates, and placement of a sign or signs at the entrance to the site stating, “No Dumping Allowed”.
2. Concrete and asphalt concrete debris may be stockpiled within view of the ROW for a period not to exceed the duration of the project. Prior to project completion, the waste will be removed from view of the ROW or buried, and the waste disposal site reclaimed as noted above.

The above requirements will not apply to waste disposal sites that are covered by an individual solid waste permit as specified in SDCL 34A-6-58, SDCL 34A-6-1.13, and ARSD 74:27:10:06. Failure to comply with the requirements stated above may result in civil penalties in accordance with South Dakota Solid Waste Law, SDCL 34A-6-1.31.

All costs associated with furnishing waste disposal site(s), disposing of waste, maintaining control of access (fence, gates, and signs), and reclamation of the waste disposal site(s) will be incidental to the various contract items.

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	410B380	2	9

COMMITMENT I: HISTORIC PRESERVATION OFFICE CLEARANCES

State Historic Preservation Office (SHPO or THPO) concurrence has not been obtained for this project.

Action Taken/Required:

All earth disturbing activities require a cultural resource review prior to scheduling the pre-construction meeting. This work includes but is not limited to: Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas.

The Contractor will arrange and pay for a record search and when necessary, a cultural resource survey. The Contractor has the option to contact the state Archaeological Research Center (ARC) at 605-394-1936 or another qualified archaeologist, to obtain either a records search or a cultural resources survey. A record search might be sufficient for review if the site was previously surveyed; however, a cultural resources survey may need to be conducted by a qualified archaeologist.

The Contractor will provide ARC with the following: a topographical map or aerial view in which the site is clearly outlined, site dimensions, project number, and PCN. If applicable, provide evidence that the site has been previously disturbed by farming, mining, or construction activities with a landowner statement that artifacts have not been found on the site.

The Contractor will submit the cultural resources survey report to SDDOT Environmental Office, 700 East Broadway Avenue, Pierre, SD 57501-2586. SDDOT will submit the information to the appropriate SHPO/THPO. Allow **30 Days** from the date this information is submitted to the Environmental Engineer for SHPO/THPO review.

In the event of an inadvertent discovery of human remains, funerary objects, or if evidence of cultural resources is identified during project construction activities, then such activities within 150 feet of the inadvertent discovery will immediately cease and the Project Engineer will be immediately notified. The Project Engineer will contact the SDDOT Environmental Office, who will contact the appropriate SHPO/THPO within 48 hours of the discovery to determine an appropriate course of action.

The Contractor is responsible for obtaining any additional permits and clearances for Contractor furnished material sources, material processing sites, stockpile sites, storage areas, plant sites, and waste areas that affect wetlands, threatened and endangered species, or waterways. The Contractor will not utilize a site known or suspected of having contaminated soil or water. The Contractor will provide the required permits and clearances to the Project Engineer at the preconstruction meeting.



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UTILITIES

The Contractor will contact the involved utility companies through South Dakota One Call (1-800-781-7474) prior to starting work. It will be the responsibility of the Contractor to coordinate work with the utility owners to avoid damage to existing facilities.

The Contractor will also coordinate with the SDDOT to locate private utilities on site prior to starting the work.

The Contractor will be aware that the existing utilities shown in the plans were surveyed prior to the design of this project and might have been relocated or replaced by a new utility facility prior to construction of this project, might be relocated or replaced by a new utility facility during the construction of this project, or might not require adjustment and may remain in its current location. The Contractor will contact each utility owner and confirm the status of all existing and new utility facilities.

PROJECT SCOPE

This project consists of installing a new salt brine tank foundation and containment area for the South Dakota Department of Transportation area office in Sioux Falls.

SEQUENCE OF OPERATIONS

The Contractor will submit a sequence of operations for approval two weeks prior to the preconstruction meeting. If changes to the sequence of operations are proposed during the project, these must be submitted for review a minimum of one week prior to potential implementation. Approval for changes to the sequence of operations will only be allowed when the proposed changes meet with the Department’s intent for traffic control and sequencing of the work.

WORK ZONE PROTECTION

The Contractor will delineate all excavation limits from the adjacent SDDOT material storage yard by means of cones, snow fence, or other approved delineation methods acceptable to the Engineer. Delineation will be maintained in a neat and continuous manner throughout the duration of the work to clearly separate the excavation area from adjacent storage yard activity. Payment for work zone delineation will be incidental to other contract items.

EXISTING SITE CONDITIONS

A field investigation for the proposed foundation location was conducted in July 2026. Boring 1 was completed to a depth of 41 ft below the existing ground surface and Boring 2 was completed to a depth of 31 feet below existing ground surface. The test borings determined that the proposed site is underlain by lean clay. The test borings logs and subsequent laboratory tests are included in the Proposal.

SHRINKAGE FACTOR

Embankment +20%

EARTHWORK BALANCE

Excavation	4	CuYd	Embankment	52	CuYd
Foundation Undercut	483	CuYd	20% Shrinkage	10	CuYd
Excavation for Base Course	194	CuYd	Waste	819	CuYd
Other Excavation	200	CuYd			
Total	881	CuYd	Total	881	CuYd

Excavation is the quantity of Unclassified Excavation less the quantity of Foundation Undercut and Excavation for Base Course.

Other Excavation includes the sum of the quantities for the following:
Excavation for Aggregate Columns (200 CuYd)

These quantities are for information purposes only, compensation for these are accounted for within various bid items.

It is assumed (for the purposes of earthwork balance) that the Contractor will be able to use 70% of the material from Excavation, Foundation Undercut, Excavation for Base Course, and Other Excavation, and will have to waste the remaining material at (a) site(s) provided by the Contractor and approved by the Engineer. All costs for labor, materials, and equipment necessary to waste material as well as restoration of the waste site(s) will be incidental to the contract unit price per cubic yard for “Unclassified Excavation”.

UNCLASSIFIED EXCAVATION

To expedite final payment, the computed quantity of Unclassified Excavation will be the basis of payment for this item. No field measurements will be made for payments except when changes from the plan shown construction limits are ordered by the Engineer.

The existing asphalt surfacing throughout the project site is approximately 5 inches thick. The quantity of asphalt surfacing to be removed has not been included in the quantity for Unclassified Excavation and will be paid at the contract unit price per square yard for “Remove Asphalt Concrete Pavement”. Saw cutting the edges of the existing asphalt for removal will be incidental to the price of asphalt concrete pavement removal.

The excess soil resulting from earthwork activities, if any, will become the property of the Contractor who will be responsible for its removal from the site.

TABLE OF UNCLASSIFIED EXCAVATION

Excavation	4 CuYd
Foundation Undercut	483 CuYd
Excavation for Base Course	194 CuYd
Total	681 CuYd

AGGREGATE COLUMNS BELOW SALT BRINE TANK FOUNDATION

See the Special Provision for Aggregate Column Reinforcement.

The aggregate column designer will use the soil parameters provided in the plans unless prior communication and approval has been provided through the SDDOT Geotechnical Engineering Activity.

Quantities for granular material for the aggregate columns provided in the plans are an estimate based on the dimensions of the treatment areas, a projected column diameter of 24 inches, initial column spacing of 5.5’ feet below the tanks and 8’ outside of the tanks, and initial projected depths of 20 feet. The initial quantity of 200.1 cubic yards of material is only an estimate based on these values.

The aggregate column designer will determine actual quantities, spacing, depth, and all other design aspects of the aggregate column foundation improvements. Calculations, including the actual volume of granular material expected, will be included with the shop plans and submitted to the Department for review.

For informational purposes, the foundation above the aggregate columns has been designed as a 28’ x 88’ monolithic rectangular reinforced concrete foundation based on the following assumptions:

- The foundation will support three tanks of the size and spacing denoted in the plans.
- The tanks will be maintained at a minimum of 10% of their capacity at all times. Additional anchor rods will be required if tank capacity is less than 10%.
- The subgrade will be properly prepared and compacted.
- Settlement is confirmed not to govern.
- The tanks are supported continuously over their flat bottoms.
- The foundation is analyzed as a plate on elastic soil springs, rather than assuming uniform soil pressure beneath the entire foundation.
- Design wind speed: V = 115 mph
- Allowable Soil Bearing Capacity: Qu = 3 ksf

Caving soils and groundwater may be encountered. The Contractor will have proper equipment and materials on site and available for use, including, but not limited to, temporary casing, dewatering equipment, etc.

Prior to beginning installation of aggregate columns, undercut the entire foundation improvement area 2 feet below the proposed bottom of the foundation. The 2 foot undercut below the bottom of the foundation, within the aggregate column foundation improvement area, is accounted for in the Unclassified Excavation quantity. Limits of this excavation will extend 5 feet from the edge of the foundation in all directions.

Backfill the foundation improvement area with 1 foot of granular material to establish a working pad. Measurements of the foundation improvement excavation area are based on the existing groundline. Establishing required elevations will be the responsibility of the Contractor. Proceed with aggregate column installation. Once all the columns within the limits of the foundation improvement area have been placed, backfill the area with a minimum of 1 foot of granular material to the bottom of the proposed foundation. Granular material will conform to the requirements of Aggregate Base Course in Section 882 of the Standard Specifications. The 2 foot of granular material will be paid for at the contract price per ton for Base Course.

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FOUNDATION DRAINAGE

1.

The Contractor will install area drains in the salt brine tank foundation as detailed on the drainage plan. The Contractor may be required to modify the drainage plan to avoid aggregate column locations. Once aggregate column locations have been determined, shop drawings of the proposed drainage system will be submitted to the Engineer for review prior to fabrication. All materials used for the drainage system will be resistant to corrosion from the salt brine tank solution.
2.

PVC surface drainage inlets will be of the inline drain type. The grates for each of these fittings will be furnished by the same Manufacturer. The surface drainage inlets will be manufactured by Nyloplast, a division of Advanced Drainage Systems, Inc., or prior approved equal.
3.

The inline drain required for this contract will be manufactured from PVC pipe stock, utilizing a thermo-molding process to reform the pipe stock to the furnished configuration. The drainage pipe connection stubs will be manufactured from PVC pipe stock and formed to provide a watertight connection with the specified pipe system This joint tightness will conform to ASTM D3212 for joints for drain and sewer plastic pipe using flexible elastomeric seals. The flexible elastomeric seals will conform to ASTM F477. The pipe bell spigot will be joined to the inline drain body by use of a swage mechanical joint. The raw material used to manufacture the pipe stock that is used to manufacture the inline drain body and pipe stubs of the surface drainage inlets will conform to ASTM D1784 cell class 12454.
4.

Bedding material below the PVC pipe will be pea rock or a clean, dry sand meeting the following gradation of minus 1-inch with not more than 10 percent passing the No. 200 sieve. Bedding material will be placed in a trench that extends a minimum of 1’ laterally on both sides of the PVC pipe as well as 6” below and above the PVC pipe. The cost of the bedding material will be incidental to the PVC pipe.
5.

The existing storm sewer that the proposed PVC pipe will tie into is a 24” reinforced concrete pipe. The Contractor will be required to core into the existing pipe to connect the new PVC pipe to the existing drainage system. All cost for materials and labor required to connect the pipes including, coring, grouting, and all other materials necessary to make the connection with be incidental to the contract unit price per each for ‘Connect to Existing Sewer Main’.

ASPHALT CONCRETE COMPOSITE

Asphalt for tack SS-1h or CSS-1h will be applied between each lift of Asphalt Concrete Composite. Asphalt for tack will be applied at a rate resulting in undiluted residual asphalt of 0.09 gallons per square yard on existing pavement or milled asphalt concrete surfaces and at a rate resulting in undiluted residual asphalt of 0.06 gallons per square yard on primed base course or new asphalt concrete pavement. The asphalt for tack will be applied for the full width of the bottom layer of Asphalt Concrete Composite.

The flush seal and prime requirements for Asphalt Concrete Composite will be waived for this project.

SPECIFICATIONS

1.

Structural Design Specifications:

a.

ASCE/SEI 7-16 – Minimum Design Loads and Associated Criteria for Buildings and Other Structures (ASCE/SEI 7-16)

b.

ACI 318-19 – Building Code Requirements for Structural Concrete (ACI 318-19) and Commentary
2.

Construction Specifications: South Dakota Standard Specifications for Roads and Bridges, 10-7-26 Version, Required Provisions, and Special Provisions as included in the Proposal. The Standard Specifications for Roads and Bridges are available for download and viewing at: <https://dot.sd.gov/doing-business/contractors/standard-specifications>

GENERAL STRUCTURE NOTES

1.

All concrete will be Class A45 Concrete, Miscellaneous conforming to Section 460 of the Construction Specifications, with the following modifications: the type of cement will be either a Type V of Type II with 20% to 25% Class F Modified Fly Ash substituted for cement in accordance with Section 605 of the Construction Specifications.
2.

All reinforcing steel will conform to ASTM A615 Grade 60.
3.

All lap splices shown are contact lap splices unless noted otherwise.
4.

All exposed concrete corners and edges will be chamfered 3/4-inch unless noted otherwise in the plans.
5.

Use 2-inch clear cover on all reinforcing steel EXCEPT as shown.

INCIDENTAL WORK

1.

The Contractor will be required to install the three empty salt brine tanks on the new tank foundation. For informational purposes, each tank weighs 7,300 pounds. The tanks are approximately 30’-0” tall.
2.

The tanks will not be installed on the foundation until the compressive strength of the concrete has reached 4,500 psi.
3.

Each tank will be anchored to the foundation with four 1” diameter anchor rods.
4.

The anchor rods will be supplied by the Contractor and will conform to ASTM F1554 Grade 36 steel and will be galvanized in accordance with ASTM A123. Nuts will be heavy hex nuts conforming to ASTM A563. The Contractor will submit shop drawings for review prior to fabrication.
5.

Holes drilled in the existing concrete will be true and normal or as shown in the plans. Drilling holes using a core drill will not be allowed. Care will be taken not to damage the existing reinforcing steel. Prior to the start of drilling any holes in the concrete, an effort will be made by Department forces to mark on the concrete surface where practical any locations of the in-place reinforcing steel. In spite of this precaution, the Contractor can still expect to encounter and have to drill through reinforcing steel.
6.

The epoxy resin mixture will be of a type for bonding steel to hardened concrete and will conform to AASHTO M235 Type IV (Equivalent to ASTM C881, Type IV). Grade 1, 2, or 3 may be used for vertical dowels.

7.

The diameter of the drilled holes will not be less than 1/8-inch greater, nor more than 3/8-inch greater than the diameter of the dowels or as per the Manufacturer’s recommendations. The drilled holes will be blown out with compressed air using a device that will reach the back of the hole to ensure that all debris or loose material has been removed prior to epoxy injection.
8.

Mix epoxy resin as recommended by the Manufacturer and apply by an injection method as approved by the Engineer. Beginning at the back of the drilled holes, fill the holes 1/3 to 1/2 full of epoxy, or as recommended by the Manufacturer, prior to insertion of the steel bar. Rotate the steel bar during installation to eliminate voids and ensure complete bonding of the bar. Insertion of the bars by the dipping or painting method will not be allowed.
9.

No loads will be applied to the epoxy grouted dowel bars until the epoxy resin has had sufficient time to cure as specified by the epoxy resin manufacturer.
10.

The Engineer will verify the orientation of the tanks prior to installation of the anchors.
11.

The cost of suppling the anchor rods and placing the tanks, epoxy resin, anchor rods, and other incidental items will be incidental to the contract lump sum price for “Incidental Work”.

COORDINATION

The SDDOT has plans to install a salt brine shed adjacent to the north side of the project limits for the salt brine tank foundation. The Contractor may be required to coordinate construction operations with the SDDOT and their contractors, if construction operations are conducted in conjunction with the salt brine tank foundation. Construction of the adjacent building to the north may also impact the final grading limits for the project.

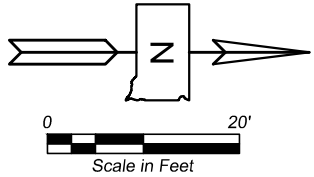
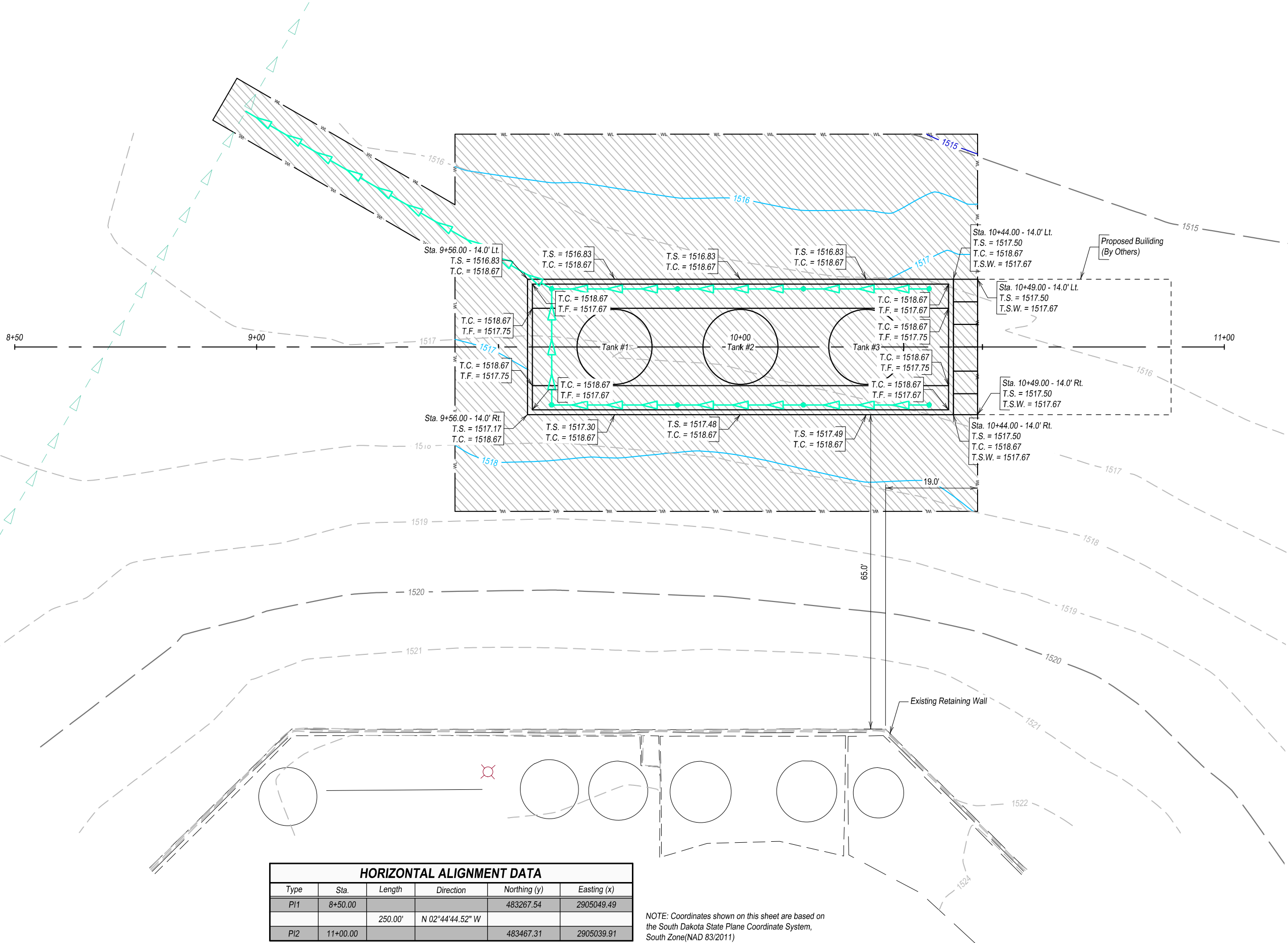


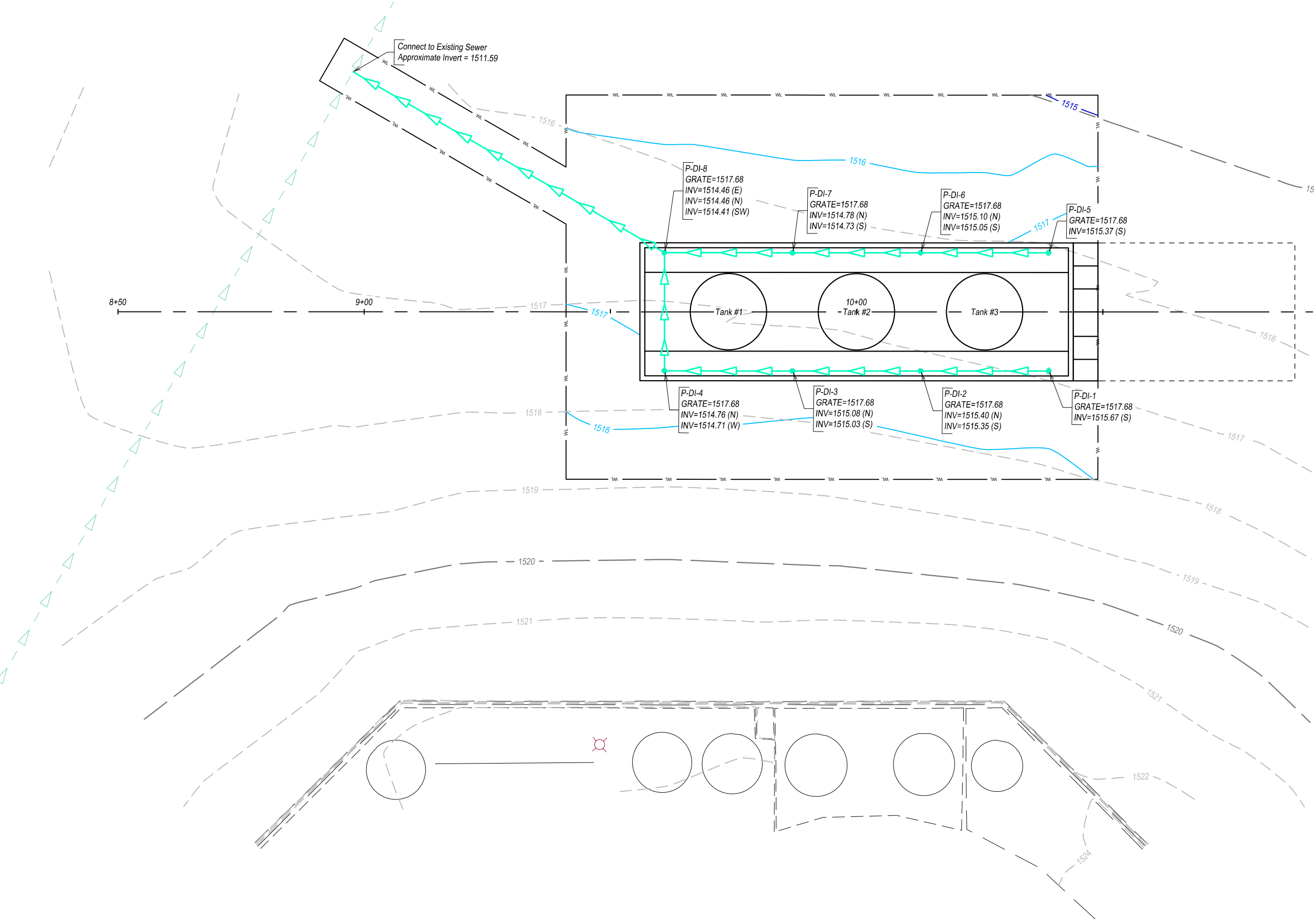
Revised 9/24/2026

The elevations shown in these plans are based on the National Geodetic Survey (NGS) North American Vertical Datum of 1988 (NAVD88).

GRADING PLAN

STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	410B380	5	9





LEGEND

- Existing Storm Sewer
- Proposed 6" PVC Pipe
- Proposed 10" Area Drain with Grate Assembly

ESTIMATED QUANTITIES		
Type	Sta.	Length
6" PVC Pipe	Ft.	253
10" Area Drain with Grate Assembly	Each	8
Connect to Existing Sewer Main	Each	1

TABLE OF AREA DRAINS		
Name	Sta.	Offset
P-DI-1	10+39.00	12.0' Rt.
P-DI-2	10+13.00	12.0' Rt.
P-DI-3	9+87.00	12.0' Rt.
P-DI-4	9+61.00	12.0' Rt.
P-DI-5	10+39.00	12.0' Lt.
P-DI-6	10+13.00	12.0' Lt.
P-DI-7	9+87.00	12.0' Lt.
P-DI-8	9+61.00	12.0' Lt.

North Arrow

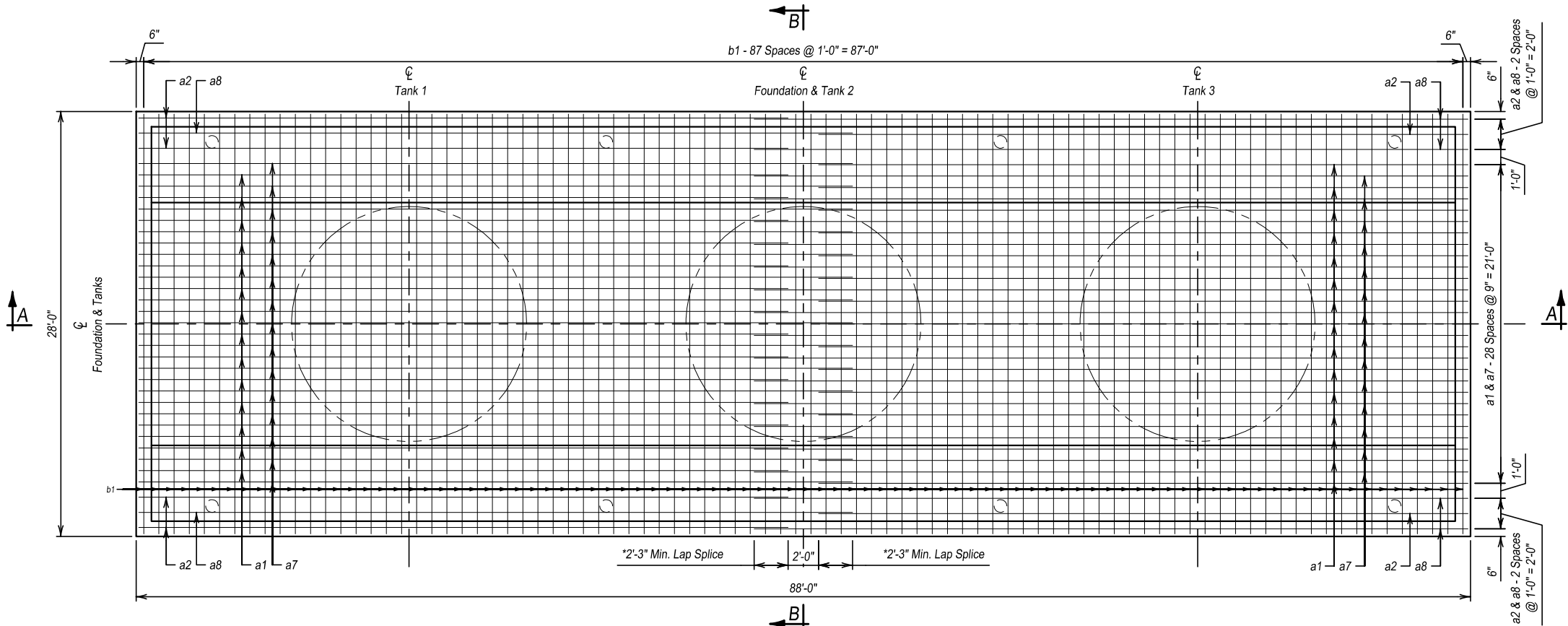
0 20'

Scale in Feet



FOUNDATION DETAILS (A)

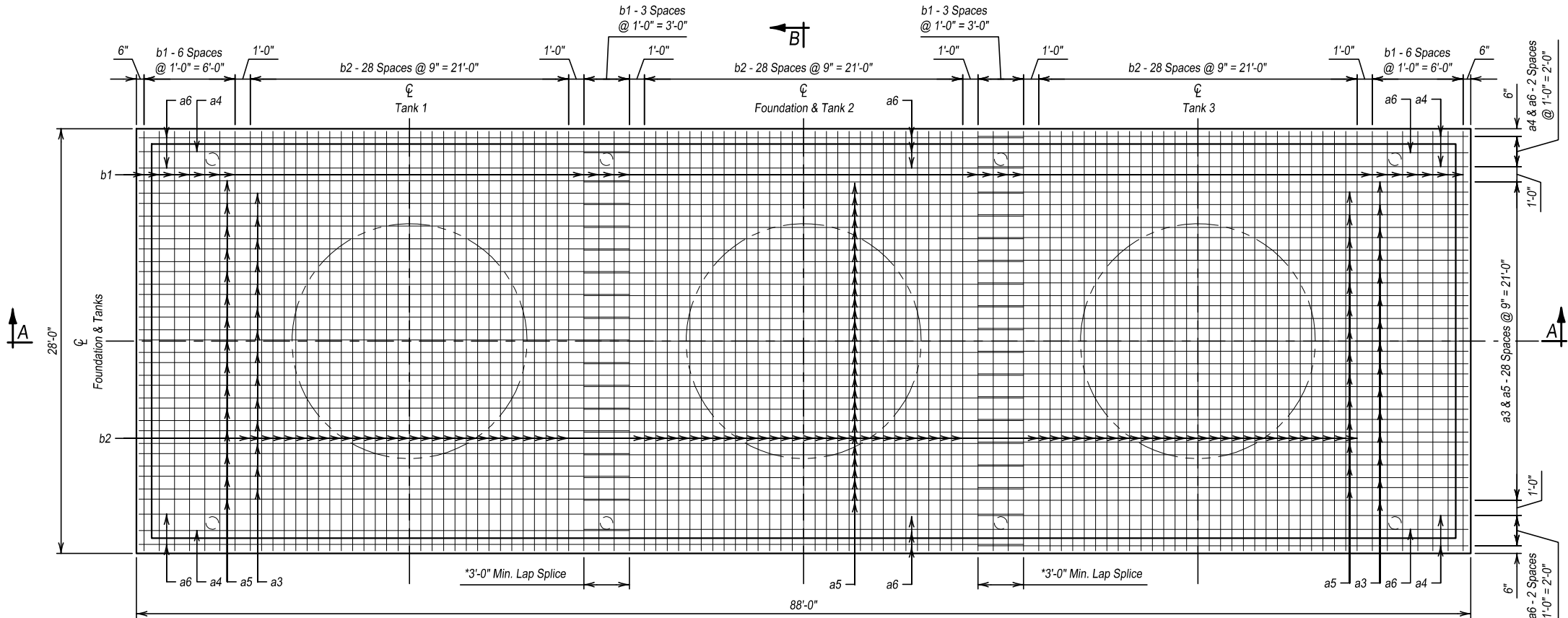
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	410B380	8	9



FOUNDATION PLAN

(Top Reinforcing Steel, Curb Steel Not Shown)

*Lap splice location will alternate every other bar



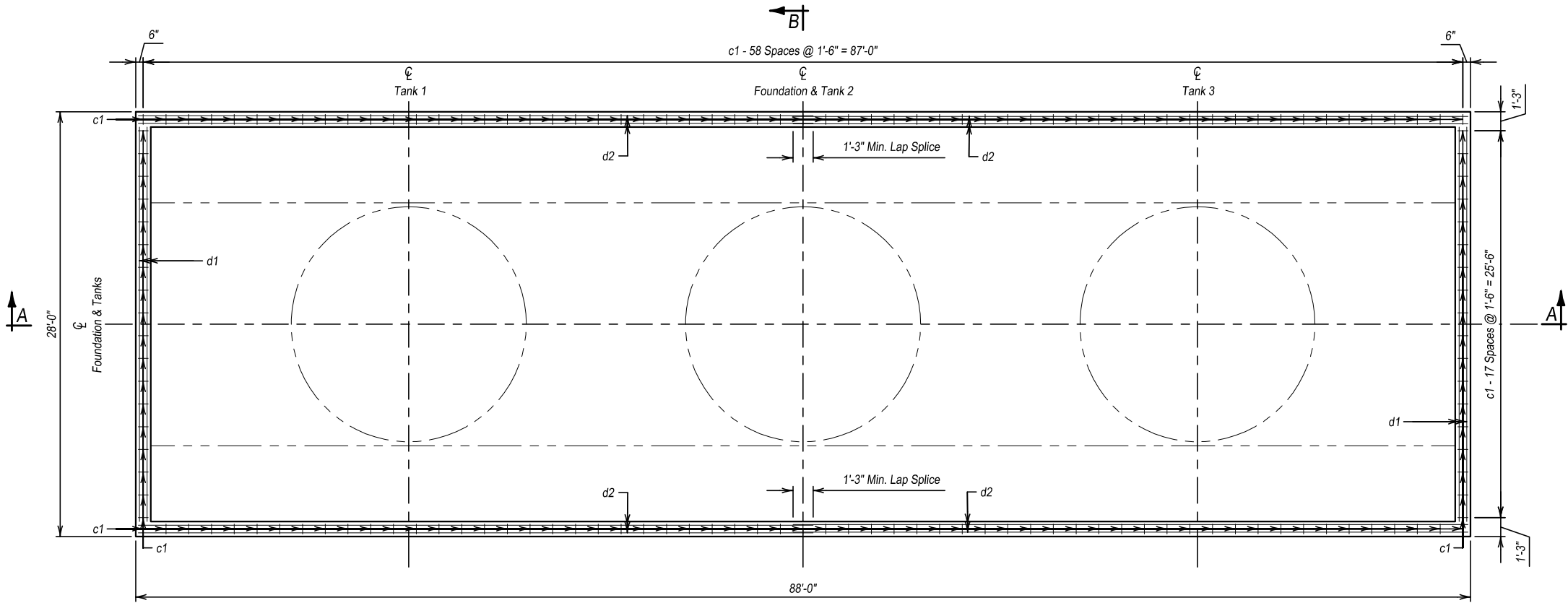
FOUNDATION PLAN

(Bottom Reinforcing Steel)

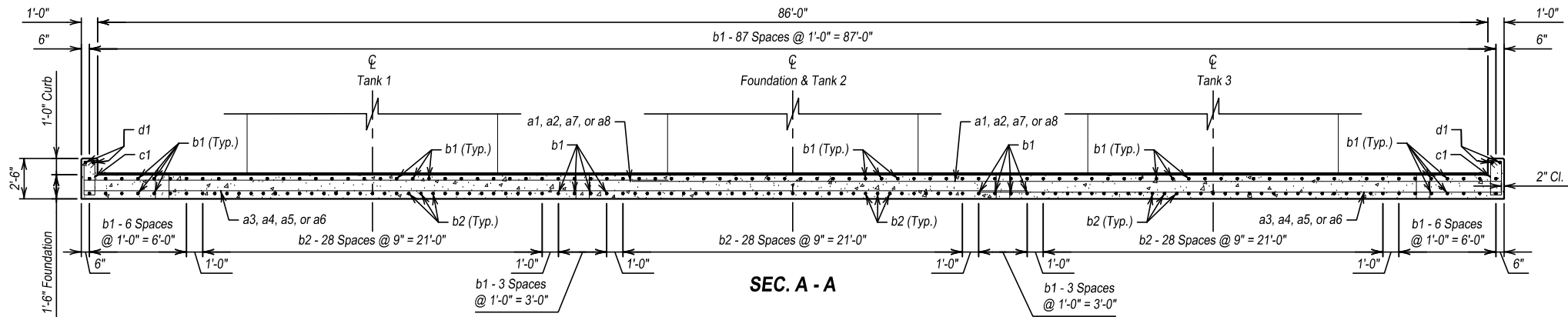


FOUNDATION DETAILS (B)

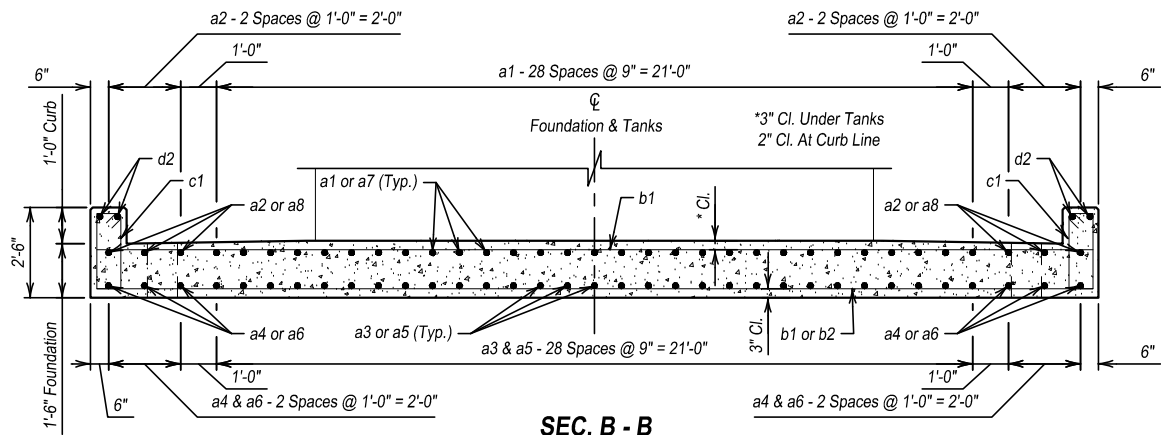
STATE OF SOUTH DAKOTA	PROJECT	SHEET	TOTAL SHEETS
	410B380	9	9



CURB PLAN
(Foundation Steel Not Shown)



SEC. A - A



SEC. B - B

REINFORCING SCHEDULE

Mk.	No.	Size	Length	Type	Bending Details
a1	29	7	42'-10"	Str.	
a2	6	6	42'-10"	Str.	
a3	29	8	58'-4"	Str.	
a4	6	6	32'-4"	Str.	
a5	29	8	32'-4"	Str.	
a6	6	6	58'-4"	Str.	
a7	29	7	47'-1"	Str.	
a8	6	6	47'-1"	Str.	
b1	110	6	27'-8"	Str.	
b2	87	9	27'-8"	Str.	
c1	154	4	6'-5"	T1	
d1	4	4	26'-0"	Str.	
d2	8	4	44'-6"	Str.	

ESTIMATED QUANTITIES

ITEM	UNIT	QUANTITY
Class A45 Concrete, Miscellaneous	Cu. Yd.	150.9
Epoxy Coated Reinforcing Steel	Lb.	27700

