



SOUTH DAKOTA DEPARTMENT OF GAME, FISH AND PARKS

523 EAST CAPITOL AVENUE | PIERRE, SD 57501

ADDENDUM NO. 01 08/20/2026

Project Title **New Welcome Center**
Location **Lake Vermillion Recreation Area**
Project No. Verm250a

Bid Opening Date: **August 26, 2026 3:30 PM CT**
VIA: Electronic Opening

Owner: State of South Dakota
Department of Game, Fish and Parks

Scope of this Addendum:

The following becomes a part of the original plans and specifications, taking precedence over the items that may conflict. The bidder shall note receipt and make acknowledgment of the addendum on his bid form, incorporating its provisions in his bid.

ADDENDUM CONTENTS

- | | |
|------------------|---|
| ARTICLE 1 | REVISIONS TO PLAN DRAWINGS |
| ARTICLE 2 | UPDATED SPECIFICATIONS |
| ARTICLE 3 | REVISIONS TO THE ESTIMATE OF QUANTITIES / BID SCHEDULE |
| ARTICLE 4 | BIDDER QUESTIONS AND RESPONSES |
| ARTICLE 5 | GEOTECHNICAL REPORT |



SOUTH DAKOTA DEPARTMENT OF GAME, FISH AND PARKS

523 EAST CAPITOL AVENUE | PIERRE, SD 57501

ARTICLE 1 – REVISIONS TO THE PLAN DRAWINGS

NEW WELCOME CENTER
LAKE VERMILLION RECREATION AREA
SOUTH DAKOTA DEPARTMENT OF GAME, FISH, AND PARKS
PROJECT NO. Verm250a
MCCOOK COUNTY, SOUTH DAKOTA



VICINITY MAP



INDEX OF SHEETS	
SHEET NO. 01	TITLE SHEET
SHEET NO. 02	ESTIMATE OF QUANTITIES
SHEET NO. 03-06	PLAN NOTES
SHEET NO. 07-14	PLAN SHEETS
SHEET NO. 15	ELEVATIONS
SHEET NO. 16-19	DETAILS

ONE CALL INFO

LAT: 43.594769
LONG: -97.18517

NW ¼ SECTION 34
T102N, R053W
MCCOOK COUNTY, SD

LAKE VERMILLION RECREATION AREA
26140 451ST AVE
CANISTOTA, SD 57012

LOCAL CONTACT INFORMATION

REED PETERSON, PARK MANAGER 605-376-9066

BIDDING INFORMATION

PLAN REQUESTS: DANA ERTZ, 605-773-6082

TECHNICAL QUESTIONS: SEAN CAMPBELL, 605-295-4165

BID TABS, PLAN HOLDERS LISTS:
[HTTPS://GFP.SD.GOV/BIDS-CONTRACTS/](https://gfp.sd.gov/bids-contracts/)



LOCATION MAP

ESTIMATE OF QUANTITIES

ITEM NO.	ITEM	UNITS	QTY
1	Mobilization	LS	1
2	Topsoil Strip, Salvage, & Place	CY	80
3	Remove Asphalt/Concrete Pavement	SY	1200
4	Unclassified Excavation	CY	400
5	Concrete Foundation & Footings	LS	1
6	6" Concrete Slab (24'x30')	CY	14
7	6" Compacted Base Course under slab	TON	15
8	4" Concrete Sidewalk	CY	10
9	Concrete Curb and Gutter	CY	5
10	Steel Pipe Bollard, 6-Inch, Concrete Filled, Complete in Place	EA	2
11	Welcome Center, framed/trussed/sheathed (24'x30')	LS	1
12	Ordinary Roadway Shaping	SY	2400
13	Water Service; Tie to existing supply line, include new F&I Curb Stop, and rough in.	LS	1
14	Electrical; Raceway from transformer to panel location rough in	LS	1
15	Waste Water System Complete; Roughed in	LS	1
16	Telecom / Fiber; Conduit - Roughed in	LS	1
17	Traffic Control	LS	1
18	Asphalt Base Bid Welcome Center ~14,000 SF @ 9"BC	TON	875
19	Asphalt Base Bid Welcome Center ~14,000 SF @ 3"AC	TON	280

ALTERNATES

ITEM NO.	ITEM	UNITS	QTY
ALT 1	Park Entrance Asphalt Repair ~ 3,500 SF @ 3"AC, 9"BC	LS	1
ALT 2	Comfort Station Asphalt Repair ~1,000 SF @ 3"AC, 9"BC	LS	1

SCOPE OF WORK

Work covered under this Contract includes, but is not limited to:

- Concrete 4' frost footing foundation and slab.
- Timber framed structure. Framing, trusses, sheathing, and openings only.
- Construct asphalt road additions/repairs and construct parking lot.
- Furnish and Install septic tank and drain field.
- Sanitary sewer stub in to foundation.
- Electrical service brought in from transformer.
- Water service tie-in to existing waterline on site, include curb stop.

GENERAL NOTES

Due to work area constraints, some hand work and miscellaneous small equipment may be necessary to accomplish the work. The Contractor shall take this into consideration when bidding the Project.

The Contractor is advised to visit the site prior to bid preparation to ascertain the amount of work involved.

UTILITIES

The Contractor shall notify South Dakota One Call, 1-800-781-7474, to locate any utility that may be located within the Project Limits. South Dakota One Call may not be able to locate secondary, private utilities and these will also be the responsibility of the Contractor to locate. The Contractor is responsible for any damage to utilities and the subsequent repair expense.

HAUL ROUTE

The Contractor will be responsible for determining any haul routes from the material source(s) to the Project Site including any agreements necessary with respective governmental agencies for maintenance and restoration of the routes.

It shall be the responsibility of the Contractor to prepare the haul route, maintain the haul route in a good condition satisfactory to the governing agency, and upon completion of its use, restore the haul route to a condition at least equal to that which existed at the time hauling operations began.

The fact that other general and normal traffic has used the haul route or a portion of it concurrently shall not relieve the Contractor of the obligation to maintain and restore the haul route as required.

WASTE DISPOSAL SITE

The Contractor shall furnish an off-site disposal facility suitable for and recognized as such for the disposal of excess excavation spoils and construction debris generated by this Project.

NOTIFICATION TO PROJECT ENGINEER

1. The Project Engineer shall be notified 10 business days prior to the date construction is to begin.
2. The Project Engineer shall be notified prior to any over runs of Plan's Quantities.

OWNER RESPONSIBILITIES

1. Have site ready for Contractor by construction start date.
2. Mark Existing Utilities.

CONSTRUCTION STAKING

The Owner will provide the initial construction staking. Construction staking for the Project shall include offset batter boards and finish floor elevation pins. Batter board offset distance and number of finish floor elevation pins to be requested by the Contractor. No subsequent staking is anticipated for the Project. The Contractor is responsible for maintaining stakes thereafter. No separate payment will be made to maintain construction staking provided.

SEQUENCE OF OPERATIONS

All work schedules shall be coordinated with the Project Engineer and the Project Manager in the field. The Contractor shall submit a construction sequence and schedule for approval. It is recognized and acknowledged that multiple operations can and will coincide simultaneously.

COMPLETION DATE

All work shall be substantially complete by November 20, 2026.

Liquidated Damages for work not substantially complete by **November 20, 2026**, shall be assessed at **\$350 per calendar day** until all remaining work is substantially complete.

Final completion for the project is set to be **Dec 30, 2026**.

ALLOWABLE WORK HOURS

Work can not commence until September 7th, 2026.

Working hours for this Project shall be **Monday-Thursday, 8 AM - 8 PM, Friday 8 AM - 6 PM.**

Working hours may be adjusted with the approval of the Project Manager in the field.

CERTIFICATION AND TESTING

The Contractor shall provide certification documentation for all materials delivered to the Project Site.

PROJECT CONTACTS

Sean Campbell, Project Engineer
South Dakota Game, Fish, and Parks-Engineering
(605) 295-4165

Luke Dreckman, District Supervisor
South Dakota Game, Fish, and Parks-Division of Parks and Recreation
(712) 229-2569

Reed Peterson, Park Manager
South Dakota Game, Fish, and Parks-Division of Parks and Recreation
(605) 376-9066

MOBILIZATION

Lump Sum payment for expenses incurred by the Contractor before actual Project construction begins; including but not limited to, bringing personnel, equipment, supplies, and incidentals to the site; establishing temporary offices and other facilities; constructing security fences; obtaining temporary utilities; and paying premiums on bonds and insurance policies.

Progress payments, when applicable, will be made as follows:

1. When 5% of the total original contract amount has been earned from other items on the bid schedule, 50% of the amount bid for mobilization will be paid, exclusive of any amount already paid by the Contractor for bond premiums.
2. When 10% of the total original contract amount has been earned, the balance of the amount bid for mobilization will be paid.

TOPSOIL STRIP, SALVAGE AND PLACE

Topsoil shall be stripped, salvaged and stockpiled prior to excavation/trenching operations. Topsoil shall be stripped in the area of the comfort station addition footprint. Following completion of the project, topsoil shall be spread evenly over the disturbed areas. Payment for Topsoil Strip, Salvage and Place shall be by the cubic yard and shall include all costs necessary to complete the work as specified.

ROCK EXCAVATION

Rock excavation shall be defined as masses which, in the opinion of the Project Engineer, cannot be excavated without blasting, drilling, or the use of rippers or other specialized equipment; and all detached rocks or boulders measuring more than 2' in their largest exposed face which are fastened in the trench due to their size. **No rock excavation is anticipated; however, if encountered, a price will be negotiated and agreed upon prior to beginning any rock excavation operations in the field.**

BASE COURSE

The Contractor shall furnish and install base course as per the Plan Drawing's details and/or in accordance with manufacturer's specifications provided. Base Course shall be placed and compacted in such manner that the specified section thicknesses are met throughout.

Base Course furnished shall conform to the specified gradation set forth in the SDDOT *Standard Specifications for Roads and Bridges*, 2025 Edition, Section 882, Table 1. The base course provided shall meet the requirements set forth in Table 1 for aggregate base course, limestone ledge rock base course, or limestone ledge rock gravel cushion.

Payment shall be inclusive to respective bid line items, furnished and installed, and shall be included in those respective bid line items accordingly.

CAST IN PLACE CLASS M CONCRETE

The Contractor shall furnish and install Class M concrete in accordance with the Plan Drawing's details and/or in accordance with the manufacturer's specifications provided in accordance with the specifications set forth in Section 462, Concrete for Incidental Construction-Class M, of the *Standard Specifications for Roads and Bridges*, South Dakota Department of Transportation, 2025 Edition, as they pertain to the Project.

Payment shall be inclusive to respective bid line items, furnished and installed, and shall be included in those respective bid line items accordingly.

The Contractor is advised that other items specified by the manufacturer, not specifically mentioned here, shall be inclusive to the respective bid line item, furnished and installed, and shall be included in those respective bid line items accordingly.

ELECTRICAL SERVICE TIE IN

The Contractor shall furnish and install the materials necessary for electrical service line installation from the existing transformer, to the welcome center building. The furnished USE conductor wire shall conduct single phase,120/240V electrical service. The furnished USE conductor wire shall be three-wire conductor and shall be installed as per the National Electric Code (NEC).

Payment shall be a lump sum payment and shall include necessary excavation and all materials required to tie electrical service line into the existing electrical panel as per the National Electric Code (NEC).

WATER SUPPLY LINE TIE IN

The Contractor shall furnish and install all pipe and fittings necessary to connect to the existing water supply line. The Contractor shall submit a shop drawing and/or verify the connection with the Project Manager in the field prior to installation.

WATER SERVICE LINE - 1" AND/OR 1 1/4" Ø

The Contractor shall furnish and install 1" and/or 1 1/4" nominal diameter water service line in accordance with the Plan Drawings and details within, and/or as directed in the field. The specified water service line shall be HDPE (200psig) of specified diameter.

Payment for 1" and/or 1 1/4" Ø Water Service Line Furnished and Installed shall be lump sum for each respective bid line item and shall include pipe costs and all necessary fittings; equipment, materials, and labor costs for installation; detection tape; locating wire; utility marker posts; pressure testing; line disinfection/flushing; and any incidental costs necessary to complete the work as specified.

PRESSURE TESTING

The Contractor shall perform a hydrostatic test on the water system. Hydrostatic testing shall be completed in accordance with AWWA Standard C600-93, Section 4. The leakage rate shall be equal to or less than 10 gallons per inch diameter of pipe per mile for 24 hours or the Project will not be accepted without correction. No visible leaks will be allowed. Costs associated with the equipment, materials, and labor necessary for pressure testing shall be inclusive to the Water Service Line Furnished and Installed unit price per lineal foot and shall be included as such.

LINE DISINFECTION / FLUSHING

The Contractor shall disinfect the water system in accordance with AWWA Standard C651. Water flushed from the water system shall not be discharged into a stream, river, or lake. Upon completion of disinfecting operations, the Contractor shall collect a bacteriological water sample and submit the sample to the State Health Department for analysis. The Contractor shall disinfect the water system until negative results are obtained by the State Health Department analysis and the Project will not be accepted until such time.

Costs associated with the equipment, material, and labor necessary for line disinfection/flushing shall be inclusive to the Water Service Line Furnished and Installed unit price per lineal foot and shall be included as such.

STOP AND WASTE VALVES (DRAIN BACK) - 1" AND/OR 1 1/4" Ø

The contractor shall furnish and install stop and waste valves (drain back) in accordance with the Plan Drawings and the details within and/or as delineated in the field and as per the manufacturer's specifications. The specified curb valve box, stop and waste shall be Minneapolis pattern as manufactured by Mueller Co. or an approved equal.

The Contractor shall provide the Owner with a wrench of the adequate length to actuate the valve.

Concrete setting blocks shall be furnished and installed by the Contractor as per installation details. The costs associated with furnishing and installing concrete setting blocks shall be inclusive to the unit price bid line item per each Stop and Waste Valve Furnished and Installed and shall be included as such.

The Contractor shall encase each stop and waste valve in a 2'x2'x4" concrete pad. Minor grading and shaping of the existing grade to accommodate installation of a 3" bedding layer of compacted base course and concrete placement slightly above (4"±) surrounding existing grade will be required. Upon completion of the concrete pad installation, the minor grading spoils generated and/or available topsoil from the Project Site shall be shaped around the edges to drain away from the pad and the corresponding area seeded and fertilized.

The costs associated to encase the stop and waste valves in concrete pads shall be inclusive to the unit price bid line item per each Stop and Waste Valve Furnished and Installed and shall be included as such.

Payment for Stop and Waste Valve Furnished and Installed shall be per each, including the curb valve box, stop and waste, a wrench of adequate length, concrete setting blocks, concrete encasement pads and associated incidental work; and all costs necessary to complete the work as specified.

4" Ø SCHEDULE 40 PVC SEWER PIPE

The Contractor shall furnish and install 4"Ø Schedule 40 PVC sewer pipe as per the Plan Drawings and the details within; in accordance with the manufacturer's specifications/recommendations; and in compliance with all SDDANR Chapter 74:53:01 regulations in regards to Individual and Small On-Site Wastewater Systems.

An estimated **40** lineal feet of Schedule 40 PVC sewer pipe is required for this Project. The estimate includes all pipe to and between the septic tank series.

Installation shall include the cost of the pipe; all couplings, elbows, wyes, tees, and fittings necessary; excavation, backfilling, detection tape, locate wire; and any and all incidentals necessary. Low-strength concrete thrust blocks shall be installed at fitting locations when changing direction of the pipe alignment.

Payment for 4"Ø Schedule 40 PVC Sewer Pipe Furnished and Installed shall be lump sum and shall include all costs necessary to complete the work as specified.

WASTE WATER DRAINFIELD

The Contractor shall furnish and install 4"Ø Schedule 40 PVC sewer pipe as per the Plan Drawings and the details within; in accordance with the manufacturer's specifications/recommendations; and in compliance with all SDDANR Chapter 74:53:01 regulations in regards to Individual and Small On-Site Wastewater Systems.

TRAFFIC CONTROL

The Contractor's Traffic Control shall conform with applicable MUTCD Standards, 2009 Edition, with revisions, and Section 4.5 of the SDDOT Standard Specifications for Roads and Bridges, 2015 Edition.

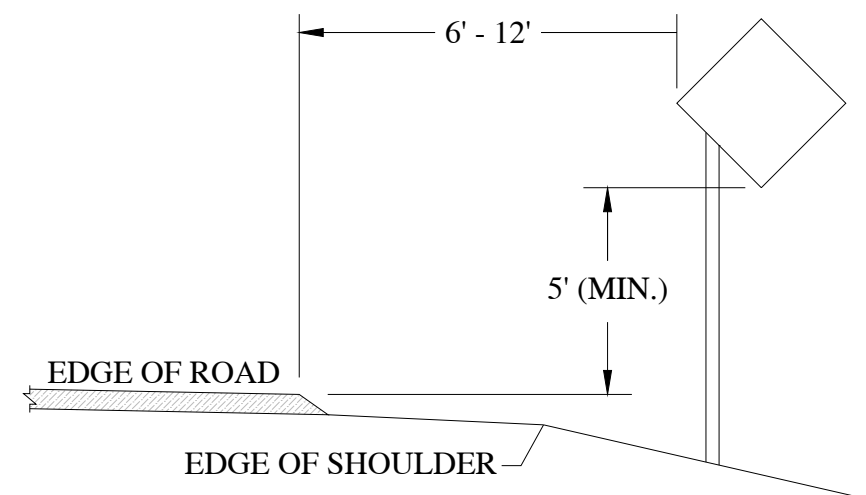
The Contractor has the responsibility to assure that all traffic signs are kept in the proper position, clean, and legible at all times. Crash-worthy sign supports shall be used for all construction related signing. Damaged signs shall be replaced without undue delay.

The immediate Project Site shall be closed off to the public; however, traffic shall be maintained along the adjacent campground access road.

Construction activities, equipment staging, and material stockpiles shall be confined to the immediate Project Site vicinity.

The Lump Sum bid item Traffic Control will be full compensation for all equipment, work, materials, signage, maintenance, and removal thereof, for the duration of the Project.

ITEMIZED LIST FOR TRAFFIC CONTROL					
		CONVENTIONAL ROAD			
SIGN CODE	DESCRIPTION	NUMBER	SIGN SIZE	UNITS PER SIGN	UNITS
W8-6	TRUCK CROSSING	2	48" x 48"	34	68
W20-1	ROAD WORK AHEAD	2	48" x 48"	34	68
-----	TYPE III BARRICADE (SINGLE SIDED) - 8'	2	-----	40	80
			TOTAL UNITS		216



TYPICAL POST MOUNTING DETAIL

The Contractor shall protect and restrict all pedestrians from work areas.

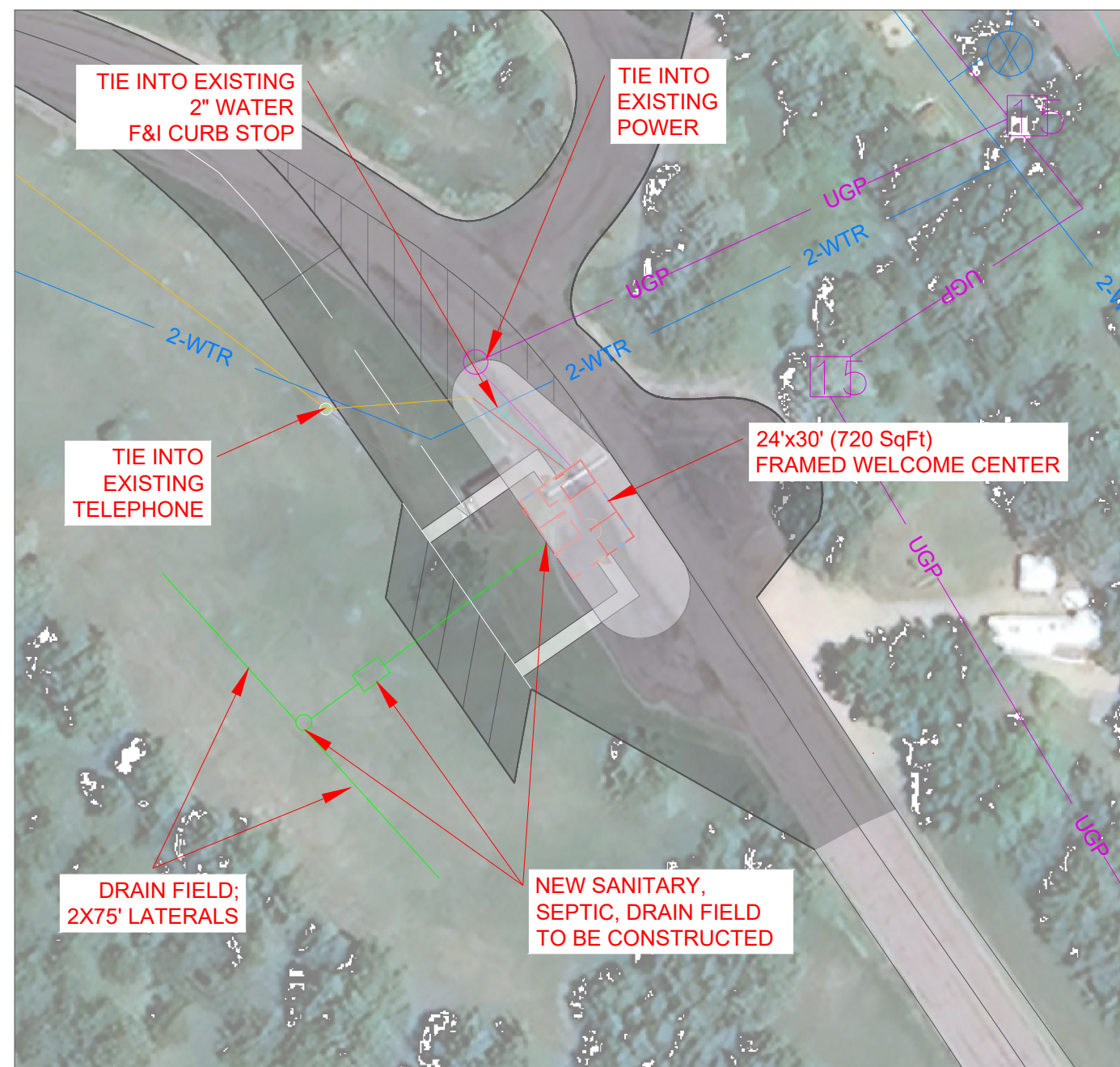
All signs mounted on fixed supports which are wider than 36" or larger than 10 square feet in area shall be mounted on two posts.

The location of all Traffic Control Devices shall be determined by the Contractor.



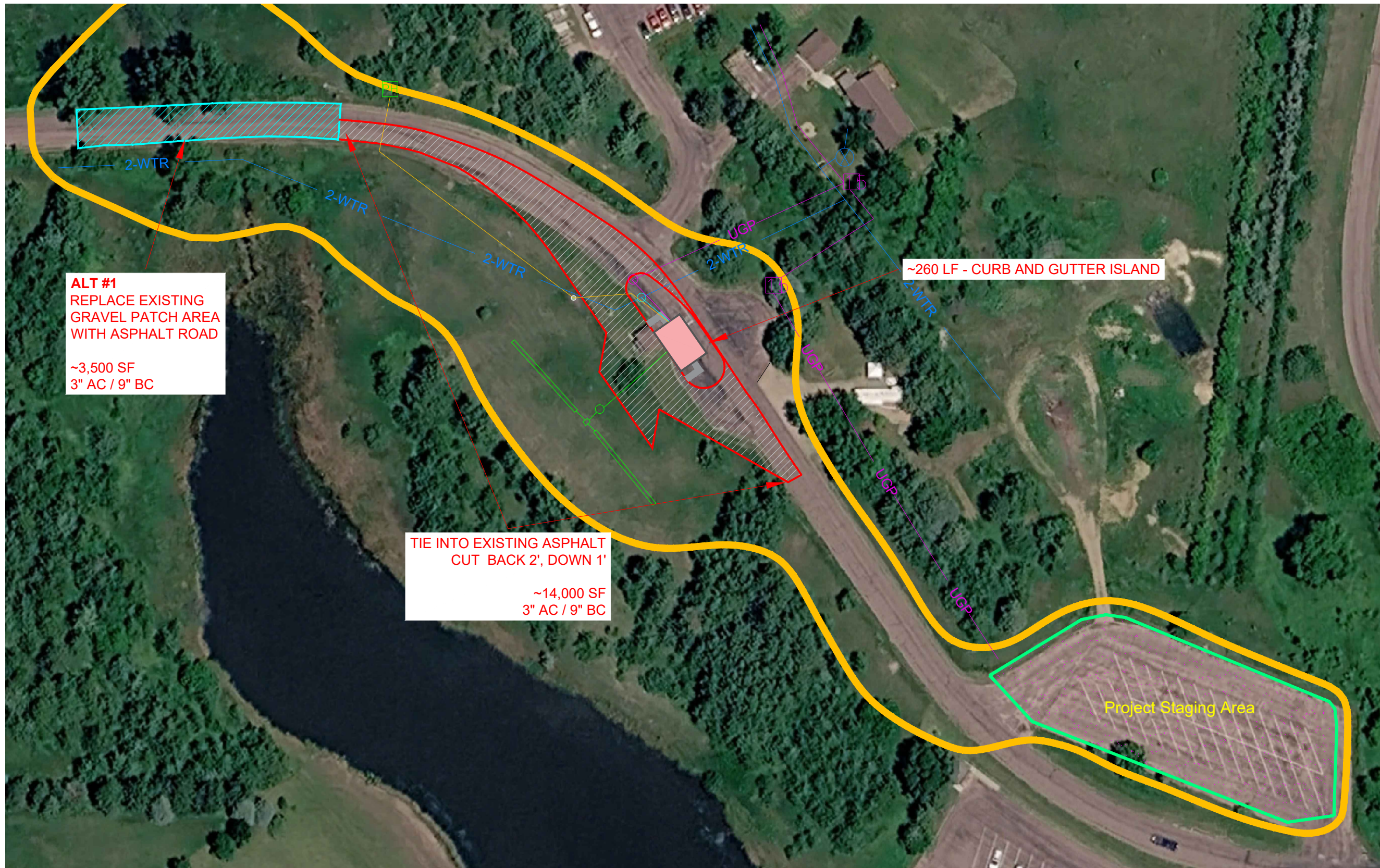
EXISTING ENTRANCE BOOTH

SCALE: NTS

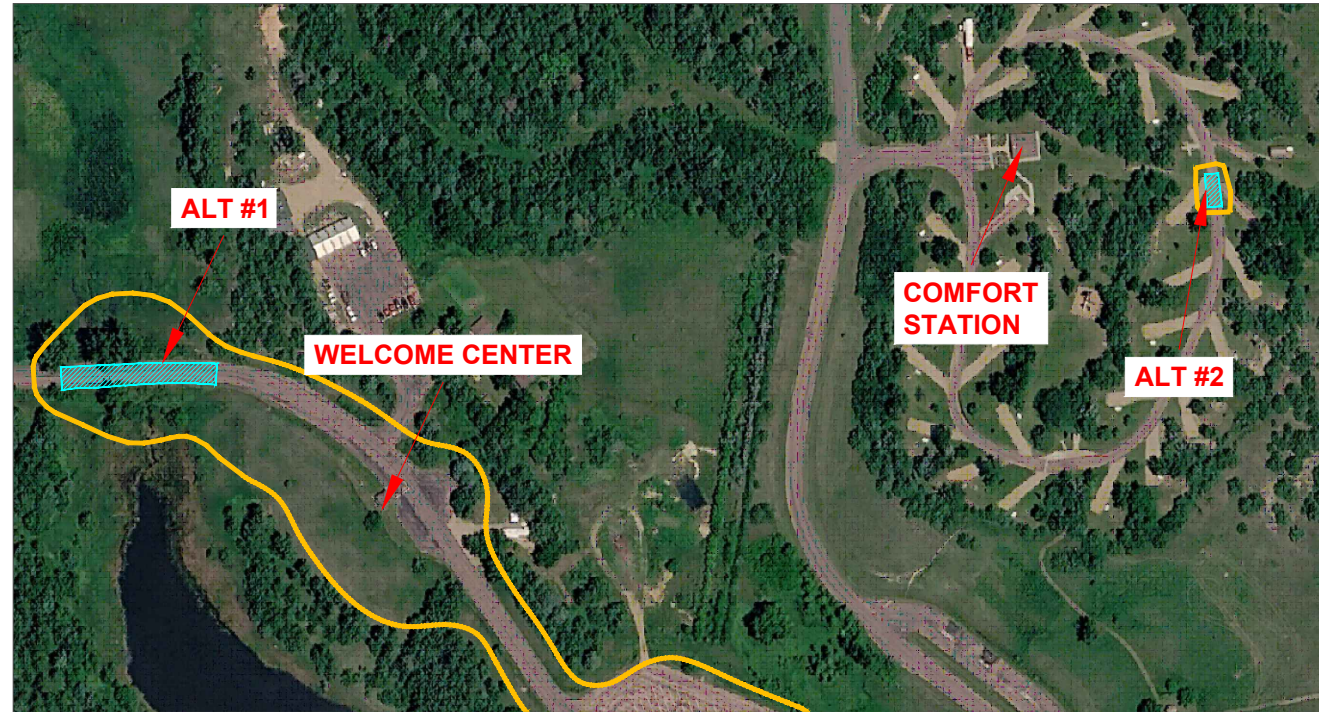


PLANNED NEW WELCOME CENTER

SCALE: NTS

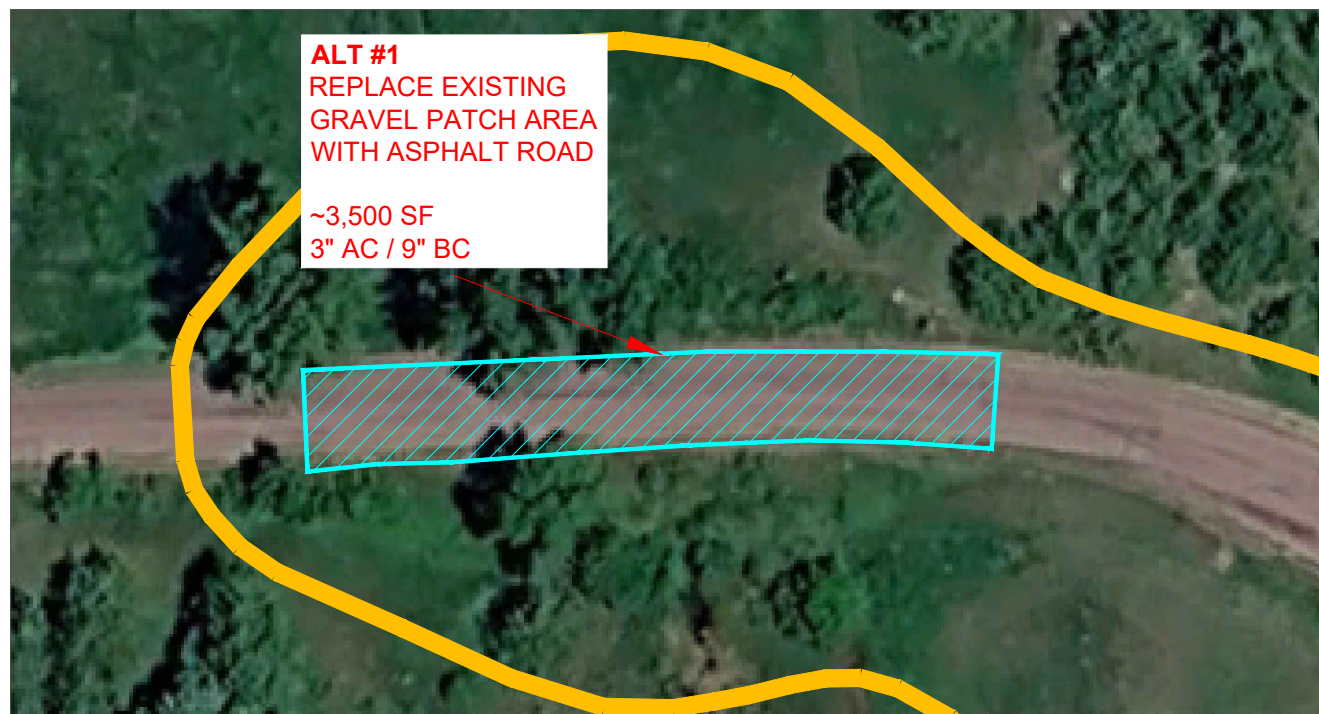


EXISTING ENTRANCE BOOTH
SCALE: NTS



OVERVIEW - ALT #1 & ALT #2

SCALE: NTS



ALT #1
SCALE: NTS



ALT #2
SCALE: NTS

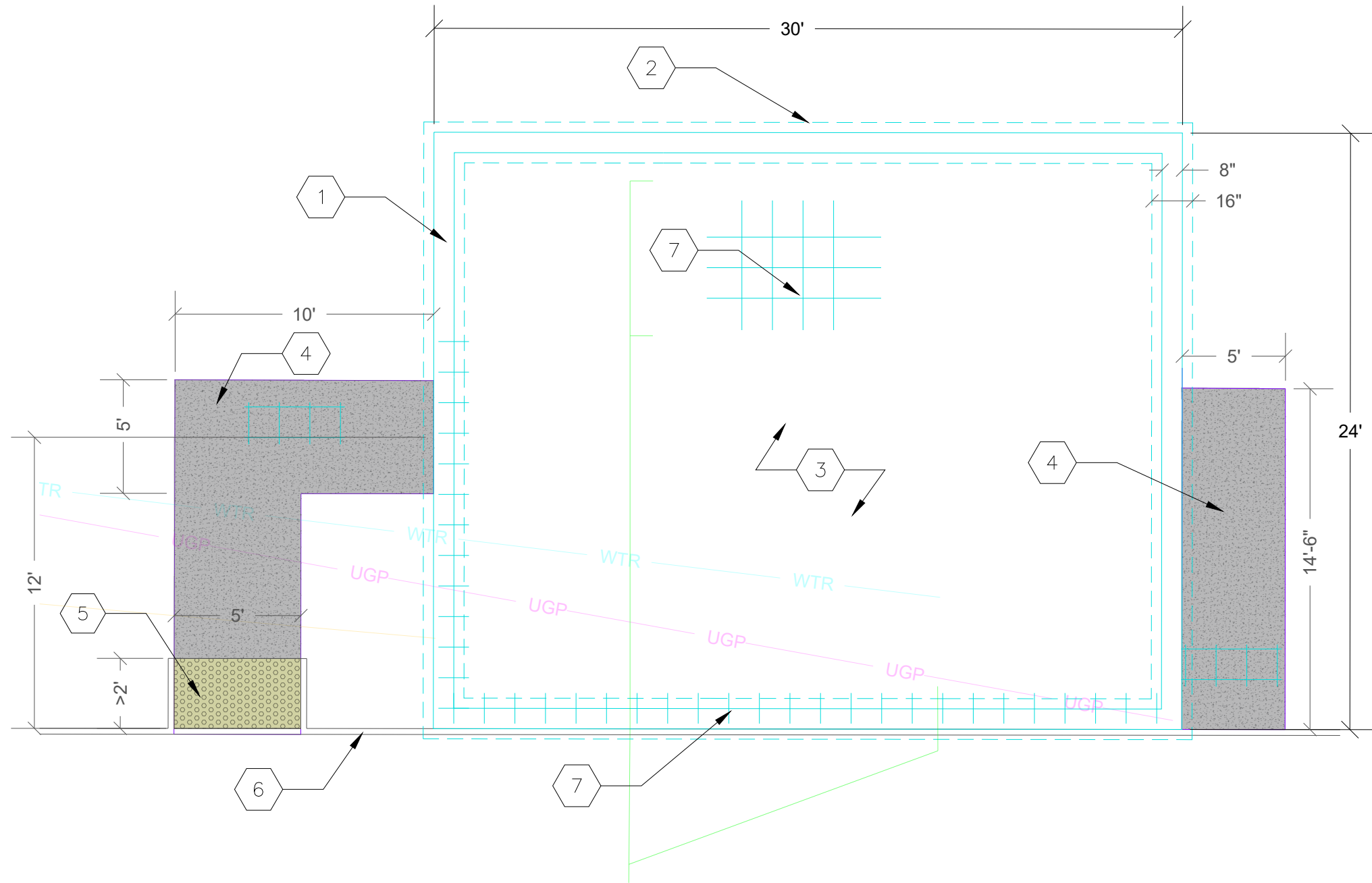


South Dakota
Department of Game, Fish & Parks

Division of Administration
Foss Building
525 E. Capitol Ave.
Pierre, South Dakota 57501-3182
Phone: (605) 773 - 6082

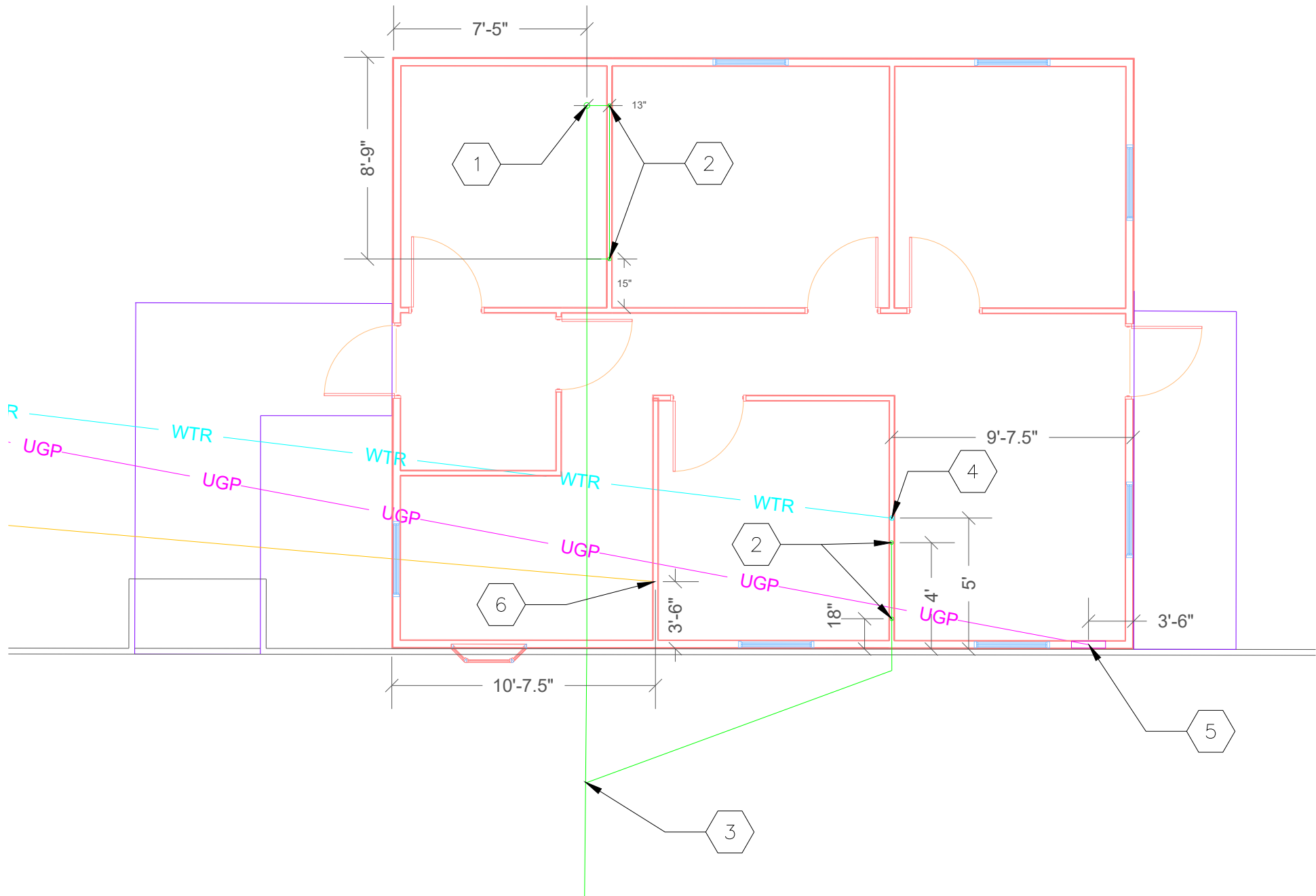
PROJECT NUMBER Verm250a	DATE 8/20/2026	REVISION 50C	APPENDIX #1
DRAWN BY	REVISION	50C	APPENDIX #1
CHECKED BY	REVISION	50C	APPENDIX #1

NEW WELCOME CENTER
LAKE VERMILLION RECREATION AREA
MCCOOK COUNTY, SOUTH DAKOTA



KEYNOTE SCHEDULE	
1	FOUNDATION WALL; 8" THICK
2	FOUNDATION FOOTINGS; 16" WIDE BY 8" THICK
3	FOUNDATION SLAB ON GRADE; 6" THICK
4	4" CONCRETE SIDEWALKS; 1:12 RUNNING SLOPE, 2% CROSS SLOPE
5	CONCRETE ADA SIDEWALK RAMP w/ DETECTION PLATE; 1:12 SLOPE
6	CONCRETE CURB AND GUTTER
7	REBAR; #4 @ 2' O.C.

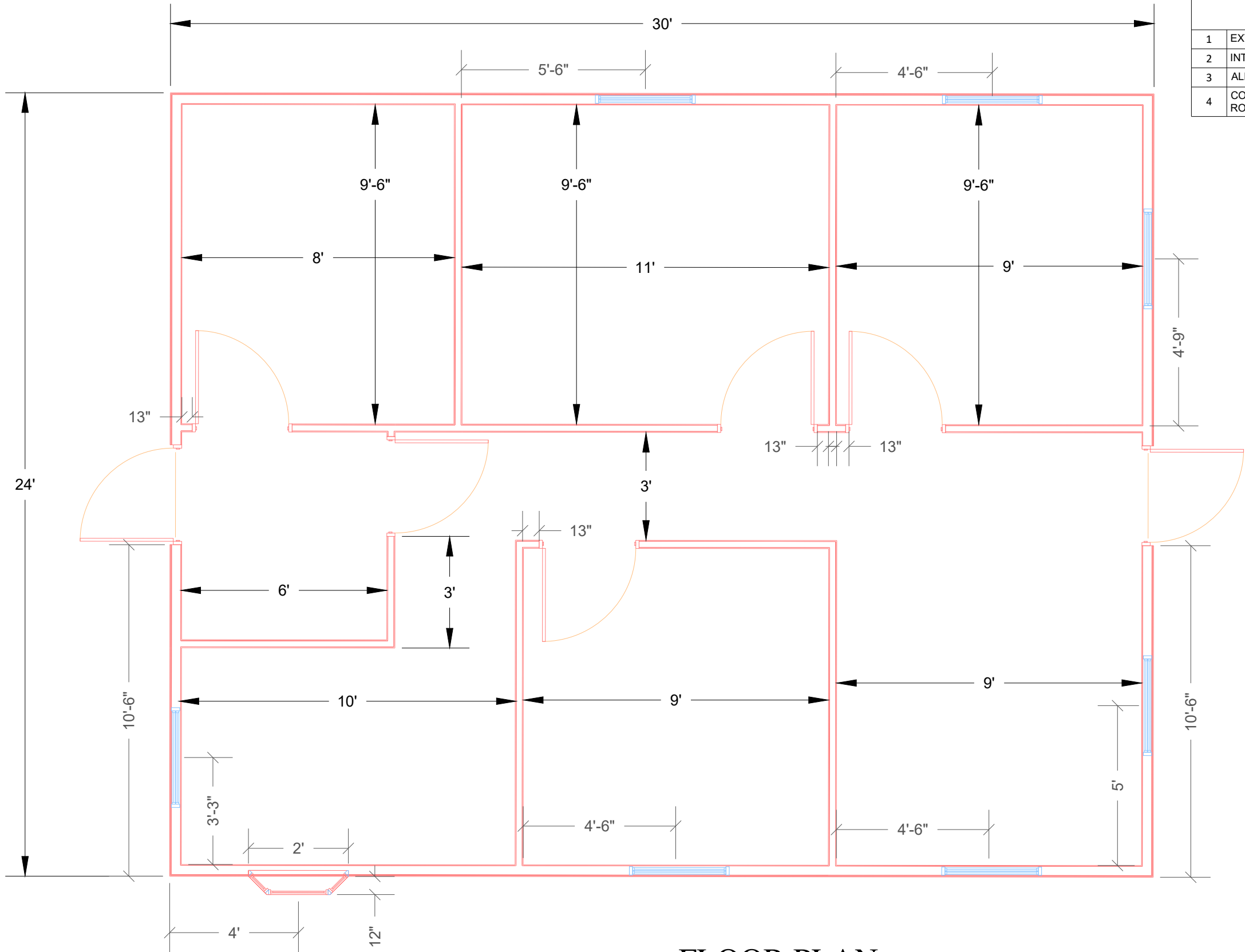
FOUNDATION PLAN
SCALE: NTS



UTILITY ROUGH IN PLAN
SCALE: NTS

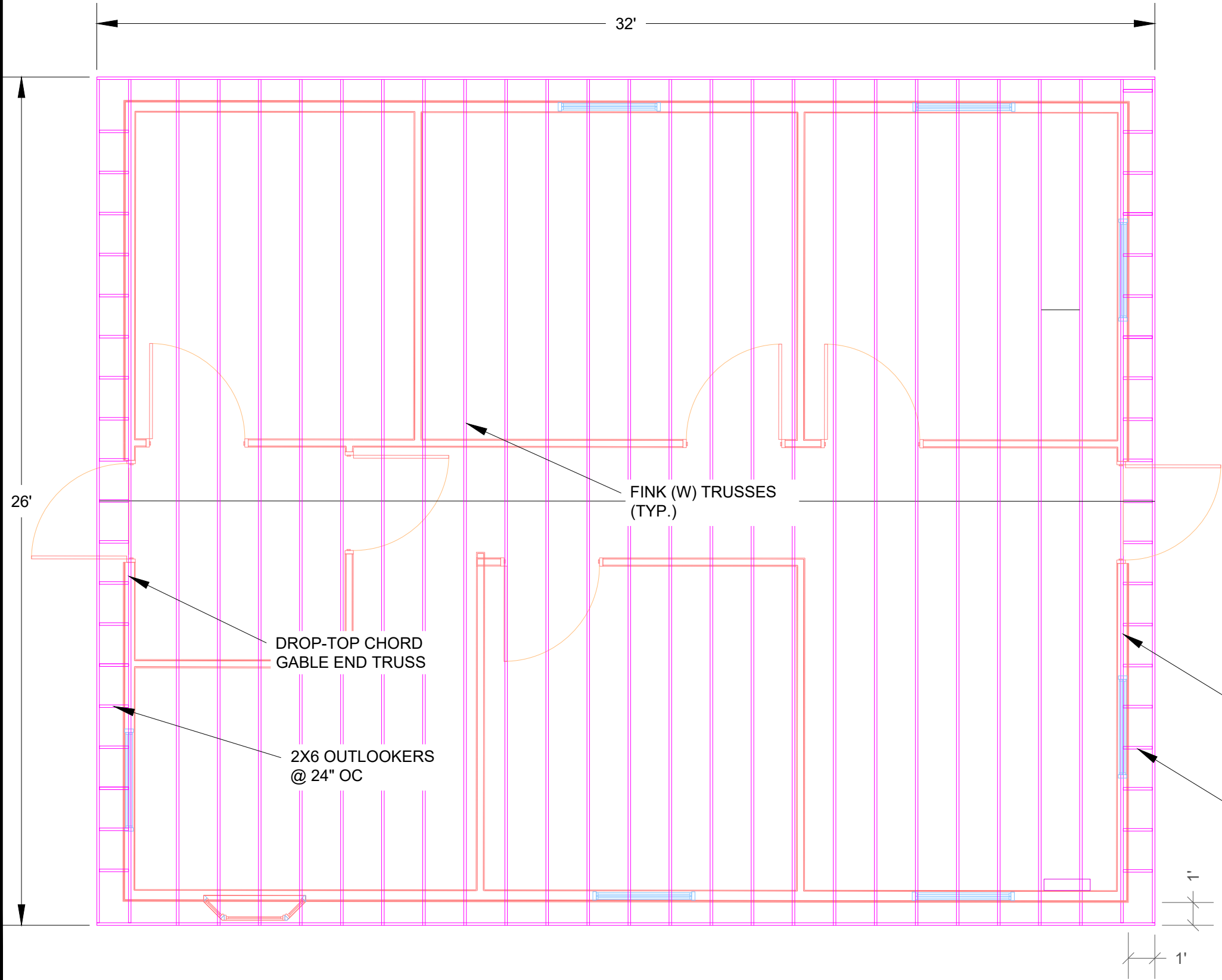
GENERAL NOTES	
1	EXT WALLS 2X6 SPF #2 @16" O.C.
2	INT WALLS 2X4 @16" O.C.
3	ALL UTILITY LINES TO BE SLEEVED AT FOUNDATION PENETRATION

KEYNOTE SCHEDULE	
1	SANITARY 3" STUB UP 6" AFF
2	2" SANITARY WASTE AND VENT; 18" AFF
3	3", 2", 4" SANITARY Y-FITTING
4	2" WATER SERVICE STUB UP & ISOLATION VALVE; 18" AFF
5	4" RACEWAY STUBUP; 4' AFF
6	4" COMMUNICATIONS CONDUIT; 18" AFF



GENERAL NOTES	
1	EXT WALLS 2X6 SPF #2 @16" O.C.
2	INT WALLS 2X4 @16" O.C.
3	ALL UTILITY LINES TO BE SLEEVED AT FOUNDATION PENETRATION
4	CONTRACTOR SCOPE TO FRAME AND SHEATH ONLY, WINDOW AND DOOR ROUGH OPENINGS CUT IN.

FLOOR PLAN
SCALE: NTS



ROOF FRAMING PLAN
SCALE: NTS

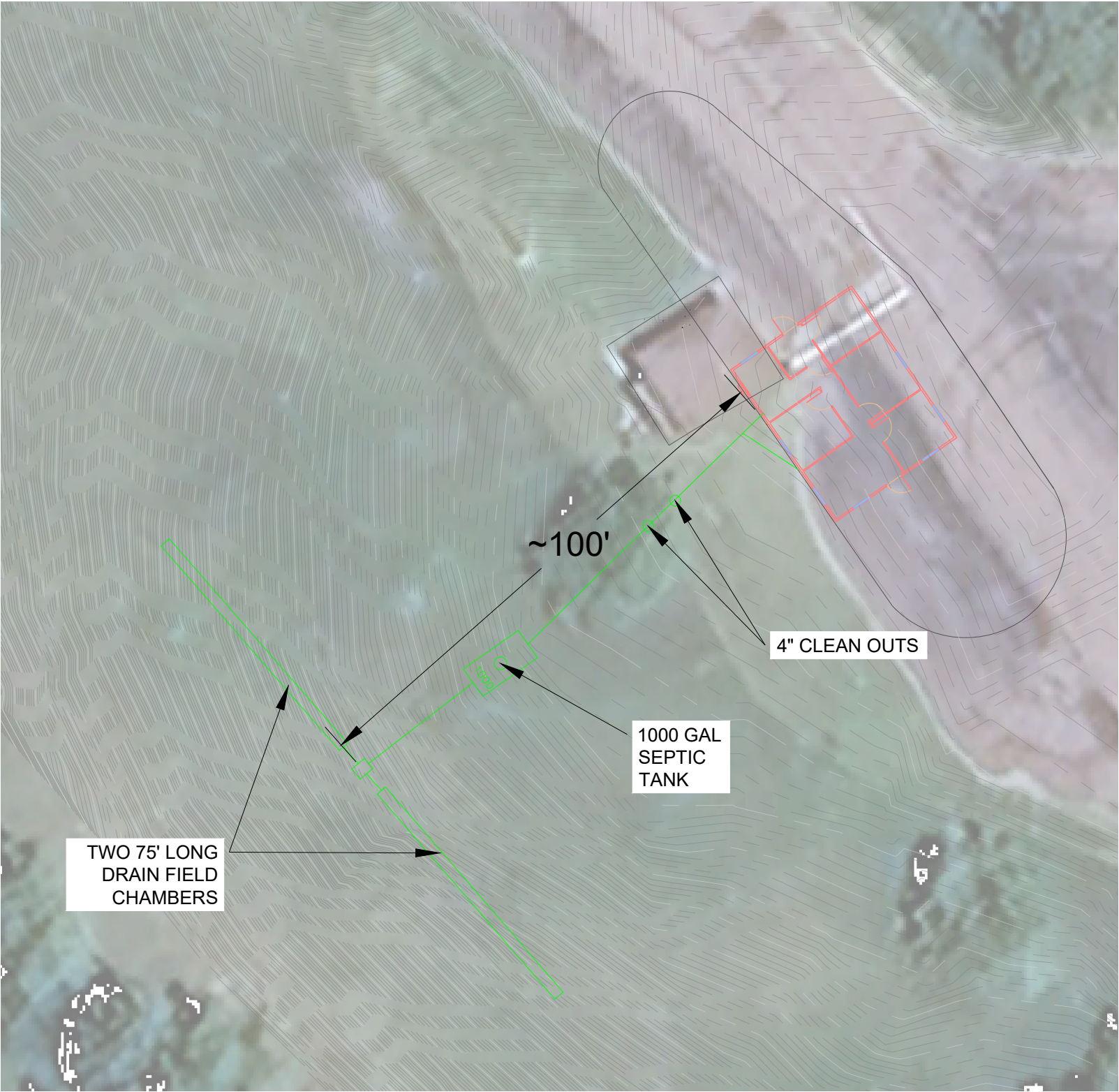
GENERAL NOTES	
1	5:12 SLOPE
2	WOOD TRUSSES @ 24" O.C.



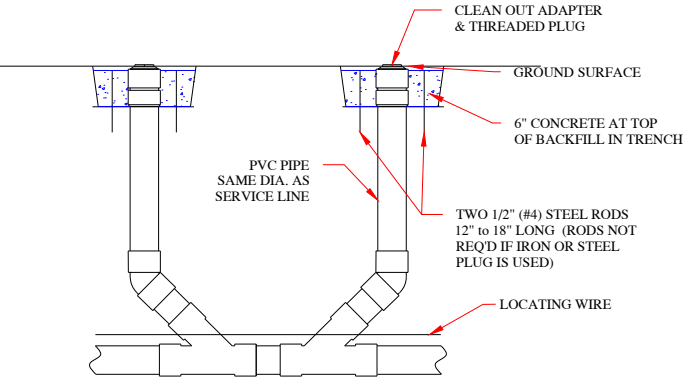
Division of Administration
Foss Building
525 E. Capitol Ave.
Pierre, South Dakota 57501-3182
Phone: (605) 773 - 6082

PROJECT NUMBER Verm250a	DATE 8/20/2026	APPENDIX #1
DRAWN BY JORDAN	REVISION JORDAN	
CHECKED BY JORDAN	50C	

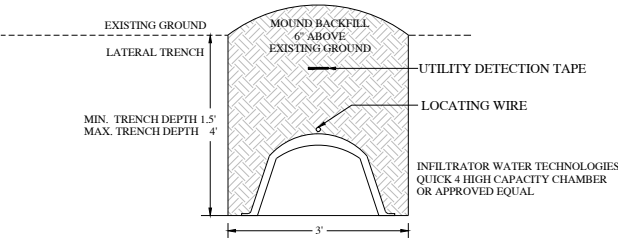
NEW WELCOME CENTER
LAKE VERMILLION RECREATION AREA
MCCOOK COUNTY, SOUTH DAKOTA



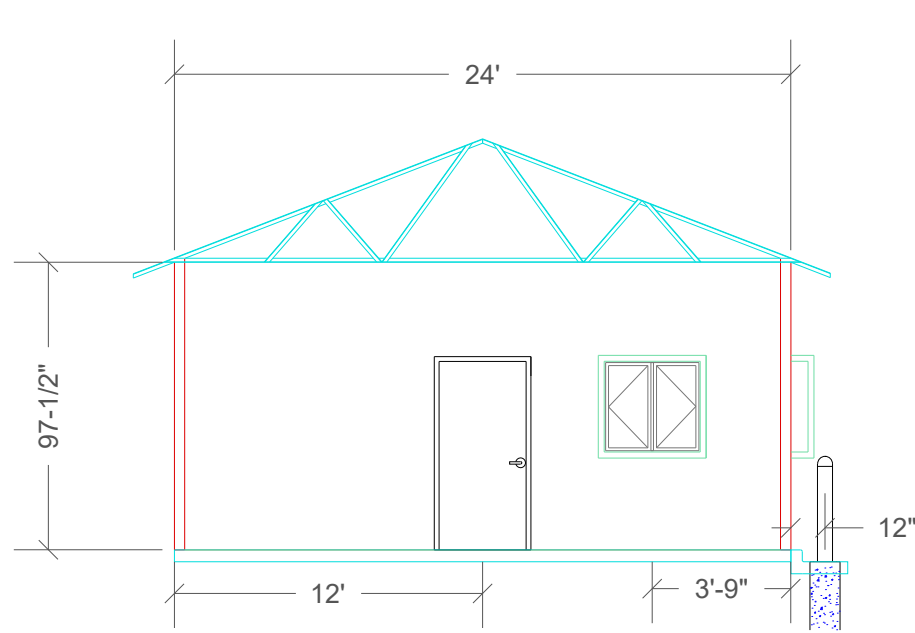
DRAIN FIELD PLAN
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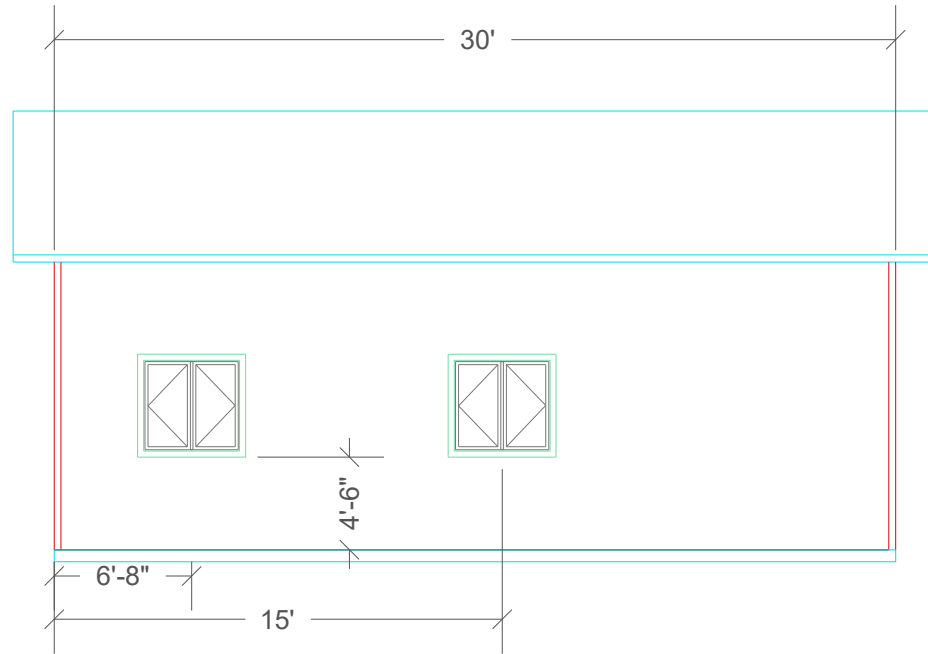
CLEANOUT
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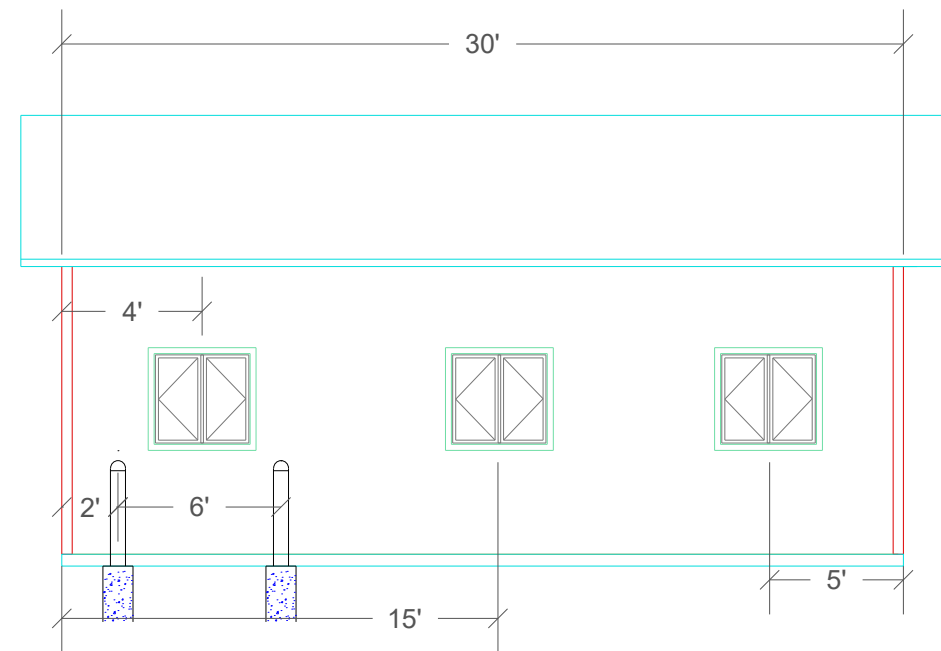
DRAIN FIELD LATERAL
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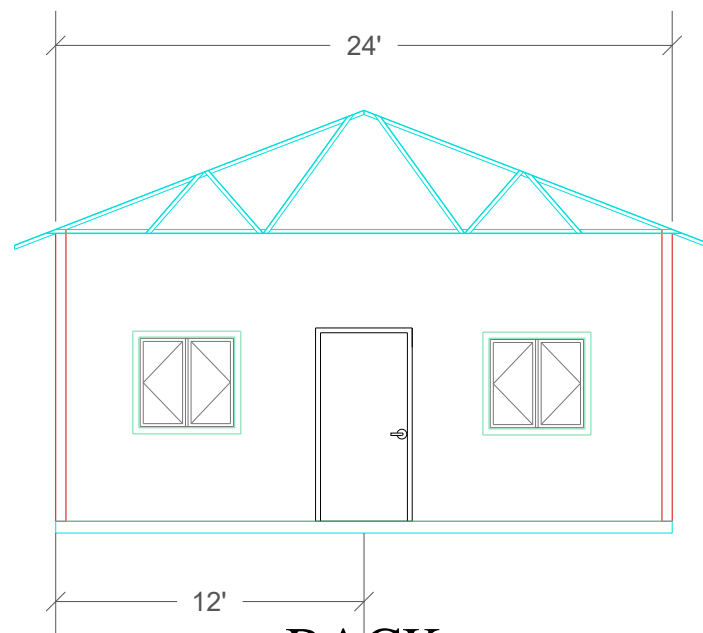
FRONT
SCALE: NTS



RR SIDE
SCALE: NTS

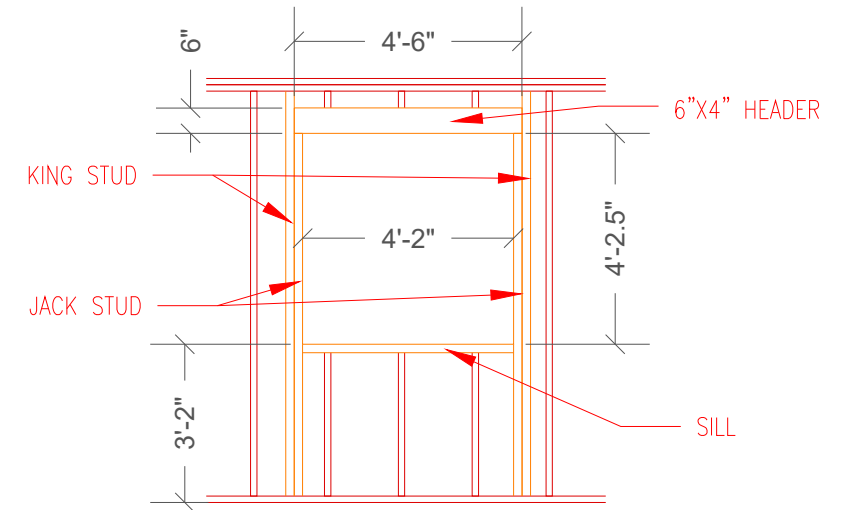


NON RR SIDE
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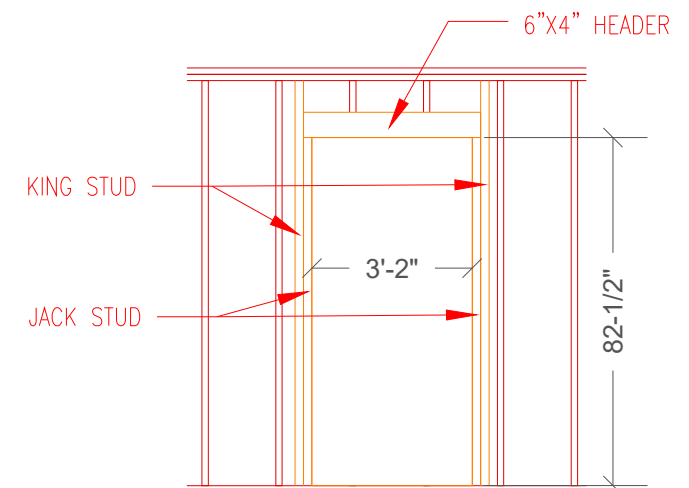


BACK
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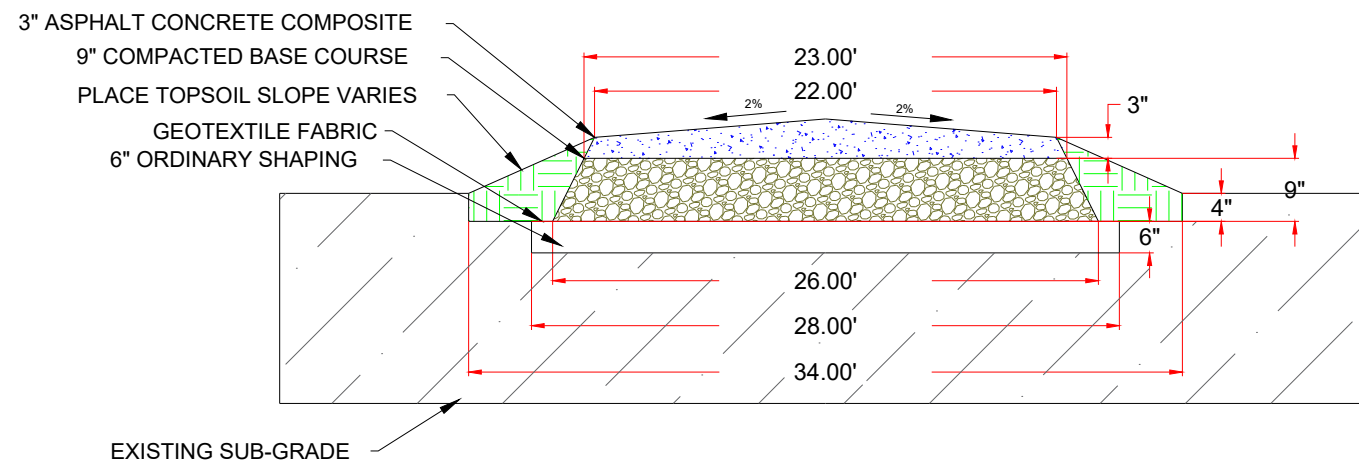
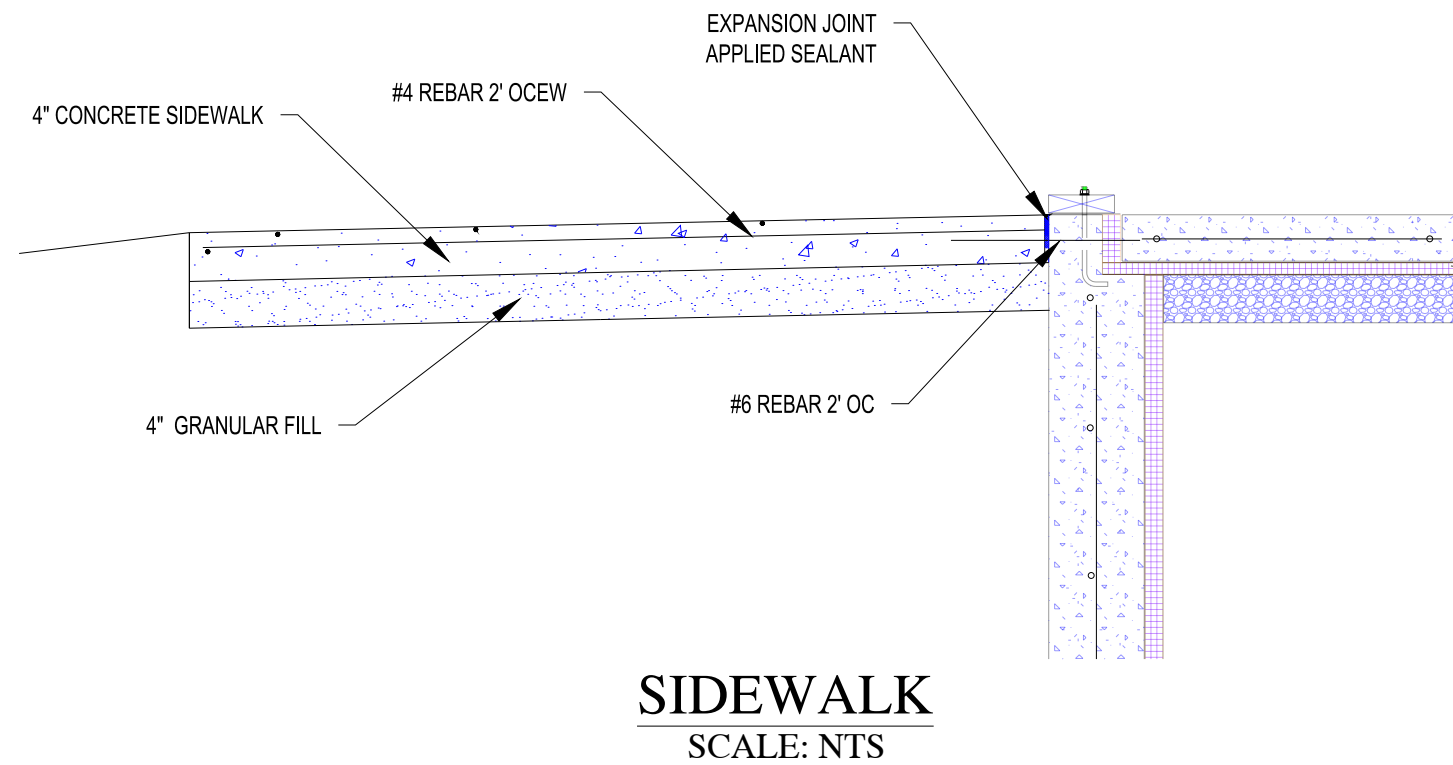
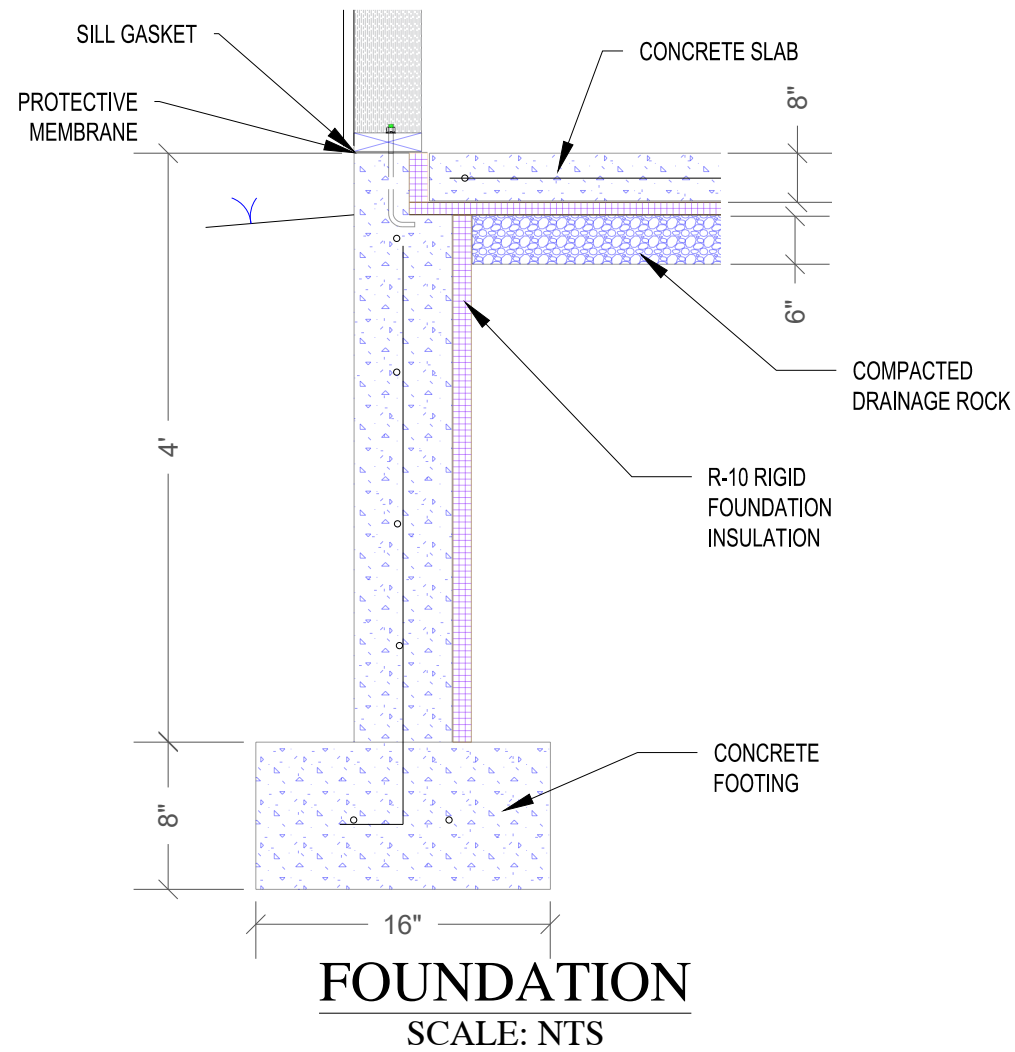
GENERAL NOTES	
1	WINDOW(S) RO TO BE 4'-2"X4'-2.5"
2	DOOR(S) RO TO BE 3'-4"W x 7'8"H
3	HEADERS TO BE 2x 6"X2" w/1/2" PLY BETWEEN, SPANNING JACK TO JACK
4	WALL FRAMING TO BE 8'H



WINDOW FRAMING DETAIL
SCALE: NTS

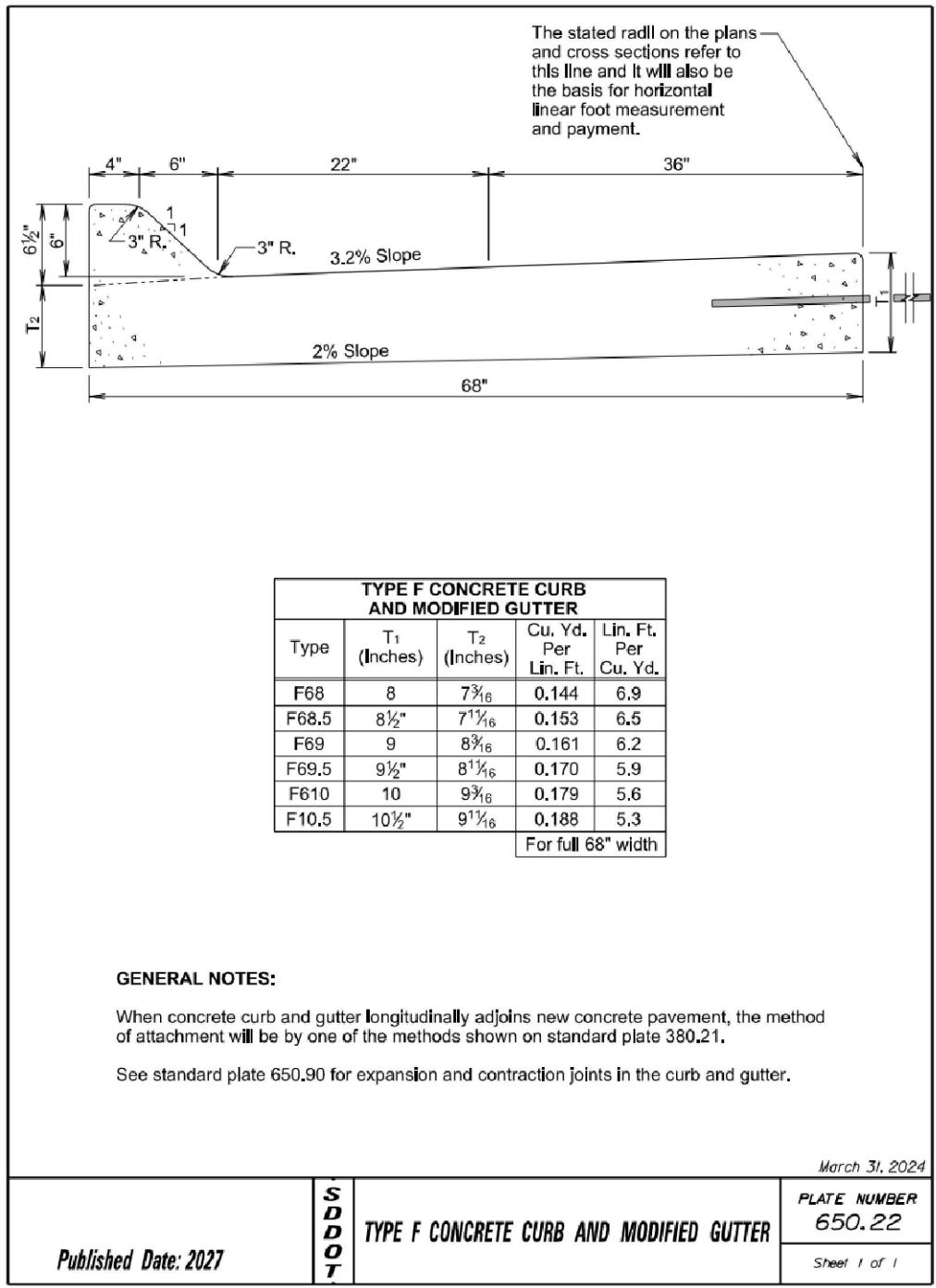
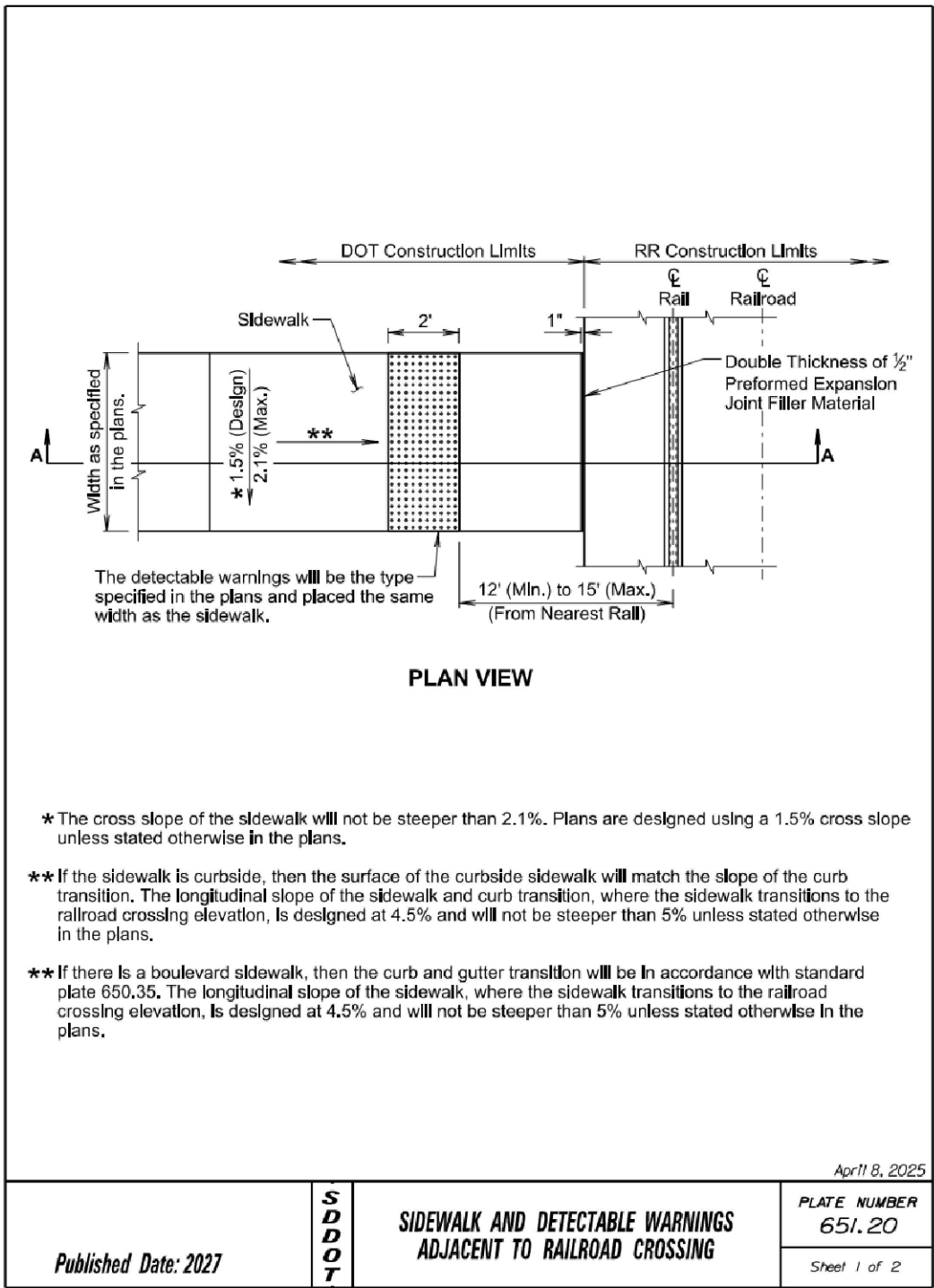


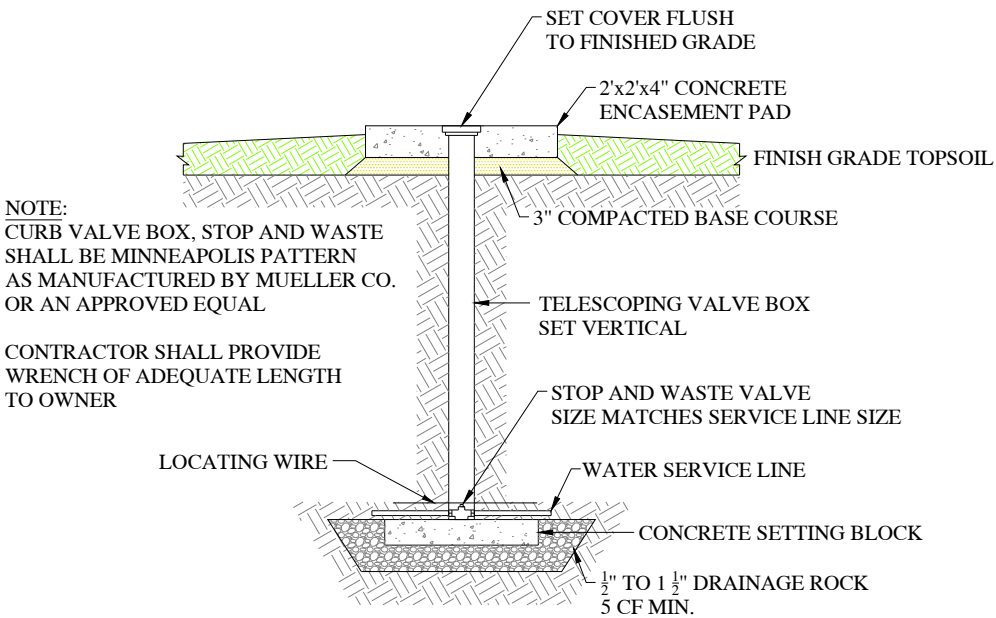
DOOR FRAMING DETAIL
SCALE: NTS



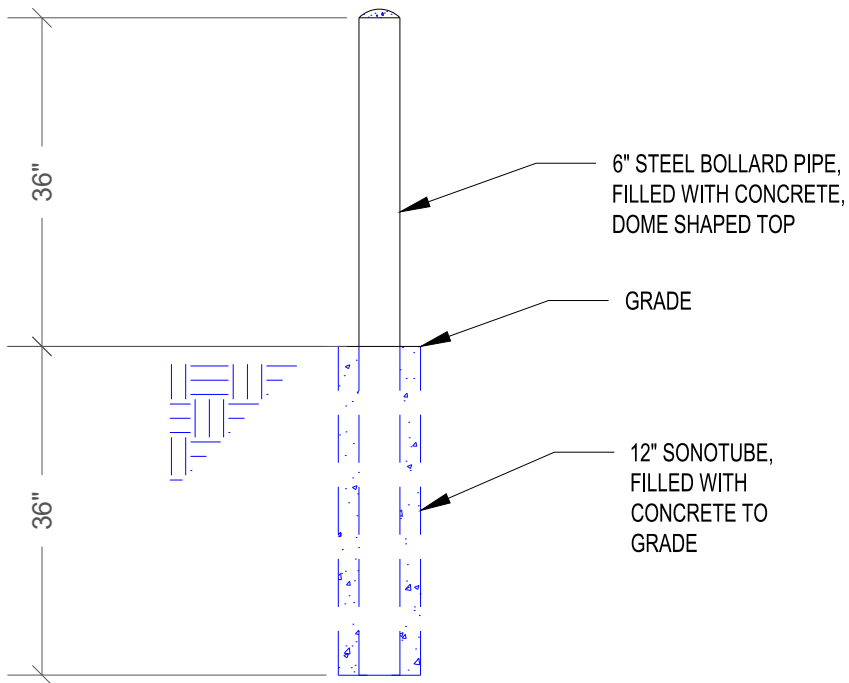
TYPICAL ACC ROAD

SCALE: NTS



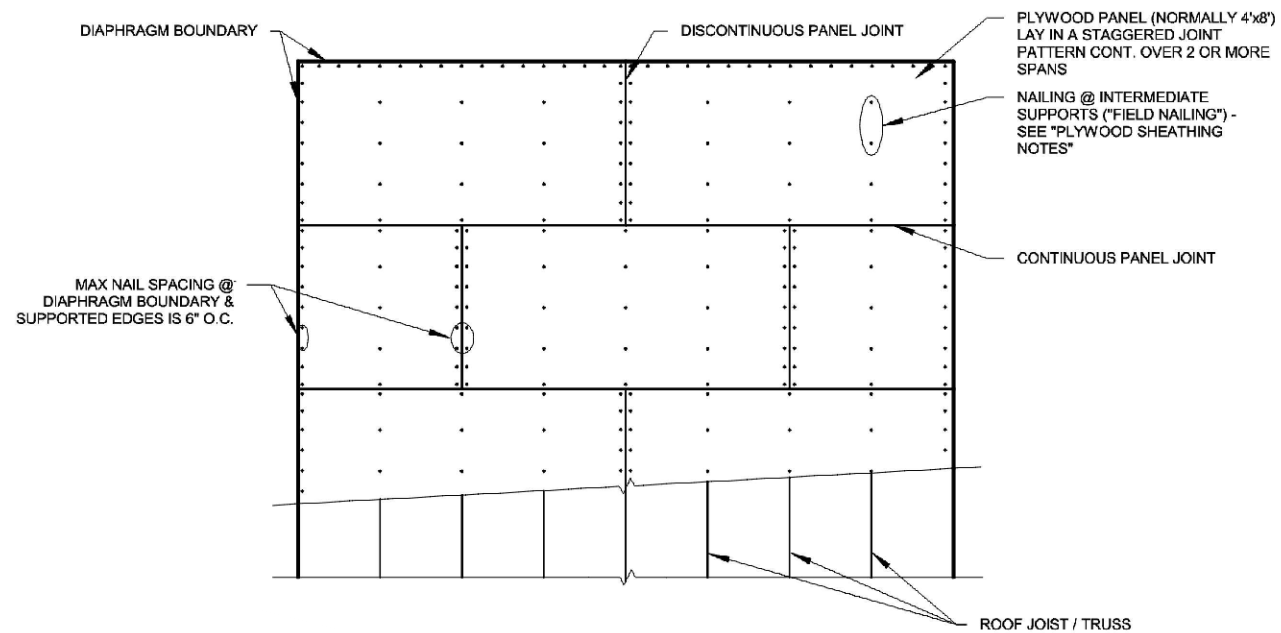


CURB STOP
SCALE: NTS

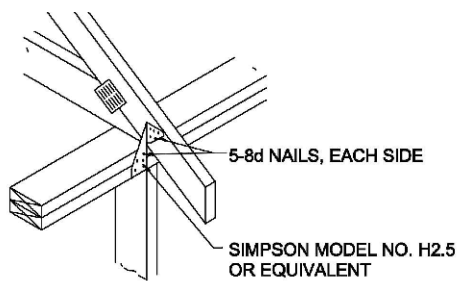


BOLLARD
SCALE: NTS

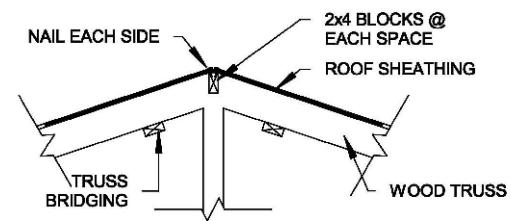
SHEATHING FASTENER SCHEDULE		
ROOF		
$\frac{7}{16}$ " APA rated OSB	10d NAILS	6" SPACING ALONG SUPPORTED EDGES 12" SPACING ALONG INTERMEDIATE FRAMING
EXTERIOR WALLS		
$\frac{7}{16}$ " APA rated OSB (EXTERIOR FACE)	8d NAILS	6" SPACING ALONG PANEL EDGES 12" SPACING ALONG INTERMEDIATE FRAMING



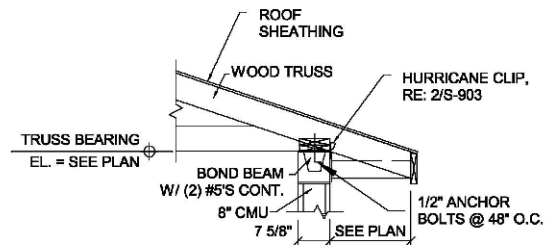
1 TYPICAL ROOF DIAPHRAGM DETAIL
NTS



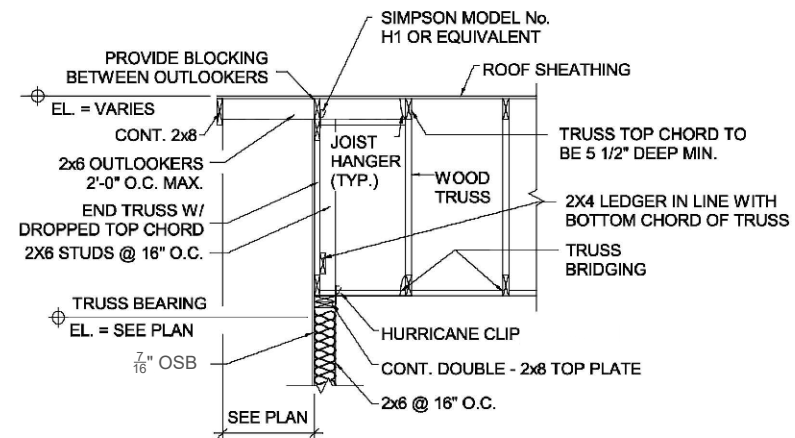
2 ROOF TRUSS TO STUD WALL
CONNECTION
NO SCALE



3 TYP. DETAIL AT RIDGE
NO SCALE



4 ROOF TRUSS BEARING ON STUD WALL
DETAIL
NO SCALE



5 TYPICAL ROOF TRUSS END WALL
DETAIL
NO SCALE



SOUTH DAKOTA DEPARTMENT OF GAME, FISH AND PARKS

523 EAST CAPITOL AVENUE | PIERRE, SD 57501

ARTICLE 2 – UPDATED SPECIFICATIONS

TECHNICAL SPECIFICATIONS - ADDENDA #1

**NEW WELCOME CENTER
LAKE VERMILLION RECREATION AREA
McCOOK COUNTY, SOUTH DAKOTA
PROJECT NO. Verm250a**

SOUTH DAKOTA DEPARTMENT OF GAME, FISH AND PARKS
Division of Parks and Recreation · Engineering

INDEX FOR TECHNICAL SPECIFICATIONS

SECTION	TITLE
---------	-------

DIVISION 01

- | | |
|----------|---------------------------------|
| 01 10 00 | SUMMARY OF WORK |
| 01 55 26 | TRAFFIC CONTROL |
| 01 71 23 | CONSTRUCTION STAKING AND LAYOUT |

DIVISION 02

- | | |
|----------|------------------------------|
| 02 41 00 | DEMOLITION AND SITE CLEARING |
|----------|------------------------------|

DIVISION 03

- | | |
|----------|------------------------|
| 03 30 00 | CAST-IN-PLACE CONCRETE |
|----------|------------------------|

DIVISION 06

- | | |
|-----------------|-------------------------------------|
| 06 10 00 | ROUGH CARPENTRY |
| 06 17 53 | SHOP FABRICATED WOOD TRUSSES |

DIVISION 07

- | | |
|---------------------|--|
| 07 21 00 | THERMAL INSULATION |
| 07 25 00 | WEATHER BARRIERS |
| 07 41 13 | ROOFING |
| 07 62 00 | SHEET METAL FLASHING AND TRIM |
| 07 92 00 | JOINT SEALANTS |

DIVISION 08

- | | |
|-----------------|--|
| 08 11 00 | EXTERIOR DOORS, FRAMES, WINDOWS |
|-----------------|--|

DIVISION 22

- | | |
|----------|---|
| 22 10 00 | PLUMBING ROUGH-IN AND UTILITY STUB-OUTS |
|----------|---|

DIVISION 26

- | | |
|----------|---------------------------------|
| 26 05 33 | RACEWAYS FOR ELECTRICAL SYSTEMS |
|----------|---------------------------------|

DIVISION 27

- | | |
|----------|------------------------|
| 27 05 28 | COMMUNICATIONS CONDUIT |
|----------|------------------------|

DIVISION 31

- | | |
|----------|--------------|
| 31 20 00 | EARTH MOVING |
|----------|--------------|

DIVISION 32

- | | |
|----------|-------------------------|
| 32 11 23 | AGGREGATE BASE COURSE |
| 32 12 16 | ASPHALT CONCRETE PAVING |
| 32 92 19 | SITE RESTORATION |

DIVISION 33

- | | |
|----------|---|
| 33 11 00 | WATER UTILITY SERVICE |
| 33 31 00 | SANITARY SEWER AND SEPTIC TANK |
| 33 36 00 | WASTEWATER DRAINFIELD (ABSORPTION SYSTEM) |

SECTION 01 10 00
SUMMARY OF WORK

PART 1 — GENERAL

1.1 PROJECT DESCRIPTION

- A. The Work of this Contract consists of construction of a new single-story, wood-framed Welcome Center, approximately 24 feet by 30 feet (720 square feet), at Lake Vermillion Recreation Area, McCook County, South Dakota, GF&P Project No. Verm250a, together with associated site work.
- B. The building foundation is a slab-on-grade with cast-in-place perimeter frost-depth foundation walls and footings in accordance with the geotechnical report (GeoTek Engineering & Testing Services, Inc., Report No. 26-0297).
- C. Site work includes earthwork and grading; water and sanitary sewer services; an on-site wastewater treatment system (septic tank and drainfield); aggregate base and asphalt concrete paving for the parking lot and driving lane; concrete sidewalks, entry apron, and curb and gutter; electrical and communications conduits; and site restoration.
- D. The Work also includes asphalt pavement repairs at two locations outside the Welcome Center site: Alt #1 the culvert crossing on the main park road, and Alt #2 the trench crossing from the West Comfort Station drainfield. These repair areas are outside the LWCF grant scope and are bid, measured, and paid as Alternate items per General Conditions.

1.2 WORK BY OWNER

- A. The Contractor's scope of Work under this Contract extends through completion of site work, exterior flatwork, foundation, under-slab utility stub-outs, wall and roof framing, sheathing, and exterior openings.
- B. The Owner (park staff and Owner-retained trade contractors) will complete the remainder of the building following Substantial Completion, including roofing, siding, doors/windows, interior finishes, electrical distribution and devices, plumbing fixtures and distribution beyond stub-outs, and HVAC.
- C. Work by Owner is not part of this Contract. The Contractor shall not disturb, and shall protect, Owner-furnished materials stored on site, if any.

1.3 CONTRACTOR USE OF SITE

- A. The park remains open to the public during construction. The Contractor shall maintain one lane of unimpeded traffic on park roads at all times and shall conduct operations to minimize disruption to park visitors and operations.
- B. Traffic control, including signage and flagging, is the Contractor's responsibility per Section 01 55 26.
- C. A staging and material storage area will be assigned by the Park Manager at the preconstruction conference. Confine construction operations, equipment, and stockpiles to the assigned areas and the limits of disturbance shown on the Drawings.
- D. Protect existing trees, vegetation, structures, pavements, and utilities outside the limits of Work. Damage caused by the Contractor's operations shall be repaired to the Owner's satisfaction at no additional cost.

- E. Do not operate equipment or stockpile materials on the designated drainfield area at any time; see Section 33 36 00.

1.4 RELATED REQUIREMENTS

- A. The General Conditions and Special Conditions apply to all Sections of these Specifications.

PART 2 — PRODUCTS

Not Used.

PART 3 — EXECUTION

Not Used.

END OF SECTION

SECTION 01 55 26
TRAFFIC CONTROL

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers maintenance of traffic and temporary traffic control on park roads during construction.

1.2 REQUIREMENTS

- A. The park remains open during construction. Maintain one lane of unimpeded traffic on park roads at all times.
- B. Furnish, install, maintain, and remove all signage, channelizing devices, and flagging required for the Work, in accordance with the Manual on Uniform Traffic Control Devices (MUTCD), current edition.
- C. Where sight lines allow, temporary stop-sign control of single-lane sections is acceptable; flagging shall be provided where required for safety, including during paving operations at the off-site repair areas on the main park road.
- D. Traffic control is paid as the bid item(s) listed on the Bid Form; all other traffic control is incidental.

PART 2 — PRODUCTS

Not Used.

PART 3 — EXECUTION

Not Used.

END OF SECTION

SECTION 01 71 23
CONSTRUCTION STAKING AND LAYOUT

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers construction survey and layout of the Work.

1.2 REQUIREMENTS

- A. The Owner shall provide all construction staking and layout from control points and benchmarks shown on the Drawings or provided by the Engineer.
- B. Preserve control points and benchmarks; re-establishment of disturbed control is at the Contractor's expense.
- C. Layout includes building corners and gridlines, foundation elevations, utility alignments and invert elevations, pavement grades, and the drainfield layout per the DANR-approved design.

PART 2 — PRODUCTS

Not Used.

PART 3 — EXECUTION

Not Used.

END OF SECTION

SECTION 02 41 00
DEMOLITION AND SITE CLEARING

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers removal of existing pavement at tie-in locations, clearing and grubbing, and stripping and stockpiling of topsoil.
- B. Related Sections: 31 20 00 — Earth Moving; 32 92 19 — Seeding and Site Restoration.

1.2 SALVAGE

- A. All salvaged material is the property of the Owner unless otherwise noted. Materials designated for disposal shall be removed from park property and legally disposed at the Contractor's expense.

PART 2 — PRODUCTS

Not Used.

PART 3 — EXECUTION

3.1 PAVEMENT REMOVAL

- A. Sawcut existing asphalt pavement full depth in neat, straight lines at removal limits shown on the Drawings, including the tie-in areas at the two off-grant repair locations.
- B. Remove existing pavement and base within removal limits without damaging pavement to remain. Damaged pavement outside removal limits shall be removed to the nearest sawcut line and replaced at the Contractor's expense.

3.2 CLEARING AND GRUBBING

- A. Clear vegetation, including root balls, within the limits of disturbance. Grub roots and organic material from areas to receive fill, structures, or pavement.

3.3 TOPSOIL STRIPPING

- A. Strip topsoil to full depth encountered (approximately 6 inches) from all areas of disturbance and stockpile on site at a location approved by the Park Manager, separate from other excavated material.
- B. Protect stockpiles from erosion. Salvaged topsoil will be re-spread under Section 32 92 19.

END OF SECTION

SECTION 03 30 00
CAST-IN-PLACE CONCRETE

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers cast-in-place concrete for perimeter frost-depth foundation walls and footings, interior slab-on-grade, entry apron/stoop, sidewalks, and curb and gutter.
- B. Related Sections: 31 20 00 — Earth Moving (subgrade and fill preparation); 01 45 00 — Quality Control.

1.2 REFERENCES

- A. ACI 301 — Specifications for Concrete Construction; ACI 306.1 — Standard Specification for Cold Weather Concreting; ACI 305.1 — Specification for Hot Weather Concreting; ASTM C94 — Ready-Mixed Concrete; ASTM C309 — Liquid Membrane-Forming Curing Compounds.

1.3 SUBMITTALS

- A. Concrete mix design(s) for each class of concrete, with aggregate gradations and admixture data.
- B. Reinforcing steel shop drawings and bar lists.
- C. Cold-weather concreting and protection plan per Article 3.5, submitted before any concrete placement after October 1.

1.4 GEOTECHNICAL BASIS

- A. Foundation design values per GeoTek Report No. 26-0297: net allowable soil bearing pressure up to 2,000 psf with site preparation per Section 31 20 00; modulus of subgrade reaction $k = 90$ psi/inch for the floor slab.
- B. Bottom of perimeter footings for the heated building shall be a minimum of 4 feet below finished exterior grade for frost protection. Footings for unheated structures, if any, shall bear a minimum of 5 feet below finished exterior grade.

PART 2 — PRODUCTS

2.1 CONCRETE MATERIALS

- A. Ready-mixed concrete per ASTM C94.
- B. Concrete classes:
 - exterior flatwork and foundation walls exposed to freeze-thaw: 4,500 psi at 28 days, air-entrained 5-7%, maximum w/cm per exposure class F3;
 - interior slab-on-grade: 4,000 psi at 28 days, no air entrainment if steel-troweled.
- C. Air entrainment is required for all concrete exposed to freezing and thawing in service.

2.2 REINFORCEMENT

- A. Deformed reinforcing bars: ASTM A615, Grade 60. Welded wire reinforcement, where used: ASTM A1064. Sizes, spacing, and placement per the Drawings.

2.3 ACCESSORY MATERIALS

- A. Under-slab vapor retarder: minimum 10-mil polyethylene sheet meeting ASTM E1745 Class A, with taped seams and penetrations.
- B. Curing compound: ASTM C309; or moisture curing by approved methods.
- C. Joint filler, expansion joint material, and sealants per the Drawings.

PART 3 — EXECUTION

3.1 SUBGRADE AND BASE

- A. Place concrete only on subgrade, fill, and base prepared, compacted, and approved per Section 31 20 00. Do not place concrete on frozen, frost-heaved, or saturated subgrade.
- B. Footing excavation bottoms shall be observed and approved by the Owner's testing agency prior to placing reinforcement or concrete.

3.2 FORMING, PLACEMENT, AND FINISHING

- A. Form, place, consolidate, and finish concrete per ACI 301 and the Drawings.
- B. Slab and flatwork finishes: interior slab — steel trowel; exterior flatwork — light broom, edges tooled.
- C. Jointing: sawcut or tooled control joints at spacing shown on the Drawings; sawcut joints as soon as the concrete will support the saw without raveling.

3.3 CURING

- A. Cure all concrete a minimum of 7 days by curing compound or moisture curing. Protect flatwork from surface damage during curing.

3.4 ANCHOR BOLTS AND EMBEDS

- A. Set anchor bolts, hold-downs, and embedded items per the Drawings and approved shop drawings, secured against displacement, prior to concrete placement. Coordinate under-slab stub-out sleeves and blockouts with Sections 22 10 00, 26 05 33, and 27 05 28 before slab placement.

3.5 COLD-WEATHER CONCRETING

- A. Given the November 20, 2026 Substantial Completion date, cold-weather concreting per ACI 306.1 is anticipated and shall be planned for by the Contractor.
- B. Cold-weather requirements apply when ambient conditions meet the ACI 306.1 definition of cold weather. Provide protection (insulated blankets, enclosures, heat as required) to maintain concrete temperatures per ACI 306.1 for the required protection period. Do not place concrete against frozen subgrade or use frozen aggregates.
- C. Cold-weather protection is incidental.

3.6 FIELD QUALITY CONTROL

- A. Owner-retained testing per Section 01 45 00. The Contractor shall provide concrete for test specimens, safe access, and curing storage on site.

END OF SECTION

SECTION 06 10 00 ROUGH CARPENTRY

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers wood framing of walls and roof, wall and roof sheathing, blocking, nailers, and connection hardware for the building shell.

1.2 SUBMITTALS

- A. If prefabricated roof trusses are used: truss shop drawings and design calculations sealed by a professional engineer licensed in South Dakota, designed per ANSI/TPI 1 for the loads shown on the Drawings.
- B. Product data for sheathing, connectors, and fasteners.

1.3 PREFABRICATED ALTERNATIVES

- A. The building is designed as site-built (stick-framed) construction. Prefabricated or panelized wall/roof assemblies may be proposed as an approved equal provided they meet or exceed the requirements of the Contract Documents and are approved by the Engineer prior to fabrication.

PART 2 — PRODUCTS

2.1 FRAMING LUMBER

- A. Dimension lumber: SPF or Hem-Fir No. 2 or better, grade-stamped, maximum 19 percent moisture content, sizes and spacing per the Drawings.
- B. Sill plates and wood in contact with concrete or masonry: preservative-treated per AWPA U1, Use Category UC2 minimum, with fasteners and connectors hot-dip galvanized or stainless where in contact with treated wood.

2.2 SHEATHING

- A. Wall sheathing: wood structural panels (OSB or plywood), APA rated, thickness and nailing per the Drawings. Roof sheathing: wood structural panels, APA rated, thickness and nailing per the Drawings.

2.3 CONNECTORS AND FASTENERS

- A. Anchor bolts, hold-downs, hangers, and framing connectors: sizes, models, and locations per the Drawings; galvanized steel. Fasteners per the fastening schedule on the Drawings.

PART 3 — EXECUTION

3.1 INSTALLATION

- A. Frame plumb, level, true, and per the Drawings. Set sill plates on sill sealer over anchor bolts cast per Section 03 30 00.
- B. Install sheathing with required edge blocking, gaps, and nailing per the Drawings and APA recommendations.
- C. Protect framing and sheathing from prolonged wetting; install the weather barrier (Section 07 25 00) promptly after sheathing is complete.

END OF SECTION

SECTION 06 17 53

SHOP-FABRICATED WOOD TRUSSES

PART 1 — GENERAL

1.1 SUMMARY

A. This Section covers shop-fabricated, metal-plate-connected wood roof trusses, girder trusses, gable end frames, and the bracing, hangers, and bearing hardware required for a complete and stable roof structure.

B. Related Sections: 06 10 00 — Rough Carpentry (wall framing, sheathing, blocking); 03 30 00 — Cast-in-Place Concrete (anchorage); 07 21 00 — Thermal Insulation;

1.2 REFERENCES

A. ANSI/TPI 1 — National Design Standard for Metal Plate Connected Wood Truss Construction.

B. SBCA/TPI BCSI — Building Component Safety Information: Guide to Good Practice for Handling, Installing, Restraining and Bracing of Metal Plate Connected Wood Trusses.

C. ASTM A653 — Steel Sheet, Zinc-Coated (Galvanized), for connector plates.

D. ASCE 7 and the 2021 International Building Code as adopted by the State of South Dakota. [FLAG: Verify current edition years at time of advertisement.]

1.3 DESIGN CRITERIA

A. Trusses shall be designed for the loads and criteria shown on the structural drawings. The following table shall be completed by the Engineer of Record and shown on the drawings prior to advertisement.

Design Parameter	Value
Ground snow load	35 PSF
Roof snow load	30 PSF
Roof live load	20 PSF minimum
Top chord dead load	8 PSF
Bottom chord dead load	10 PSF minimum

Design Parameter	Value
Ultimate design wind speed	120 MPH
Exposure category	C_E
Risk category	II

1.4 DELEGATED DESIGN

- A. Truss design is delegated to the Contractor. The truss designer shall be a professional engineer licensed in the State of South Dakota, retained by the truss fabricator or the Contractor at no additional cost to the Owner.
- B. The truss designer is responsible for: individual truss member sizing, connector plate design, connection design within the truss, truss-to-truss connections including girder hangers, permanent individual truss member restraint and bracing design, and the calculated bearing and uplift reactions.
- C. The Engineer of Record remains responsible for: the loads and criteria in Article 1.3; the supporting structure below the truss bearing, including headers, walls, and foundations; the overall lateral force resisting system and diaphragm design; and review of truss submittals for general conformance with the design intent only.
- D. Review of truss submittals by the Engineer does not relieve the Contractor or truss designer of responsibility for the delegated design or for dimensional accuracy.

1.5 SUBMITTALS

- A. Truss placement (layout) plan showing the mark, spacing, and location of every truss, girder, and gable end frame.
- B. Individual truss design drawings for each truss type, each sealed by the truss designer, showing span, slope, spacing, bearing locations and required bearing lengths, applied loads, plate sizes and locations, lumber species and grades, deflection, and required permanent bracing.
- C. A tabulated summary of maximum bearing reactions, including uplift and horizontal reactions, for every bearing point. Submit this summary to the Engineer of Record separately and in advance of fabrication so the supporting headers, walls, and anchorage can be verified.
- D. Product data for hangers, hurricane ties, and bearing hardware.
- E. Permanent bracing plan, where required by the truss design drawings.

F. No trusses shall be fabricated until the placement plan and truss design drawings have been returned reviewed. Fabrication prior to return of reviewed submittals is at the Contractor's risk per Section 01 33 00.

1.6 QUALITY ASSURANCE

A. Trusses shall be fabricated by a plant with an established in-plant quality control program conforming to ANSI/TPI 1 Chapter 3, subject to periodic third-party inspection.

B. Lumber shall be grade-marked by an agency accredited by the American Lumber Standard Committee.

1.7 DELIVERY, STORAGE, AND HANDLING

A. Handle, store, and erect trusses in accordance with SBCA/TPI BCSI. Do not lift trusses at points other than those indicated in BCSI-B1 or by the truss designer.

B. Store trusses off the ground on level blocking, in a vertical position where practical, and protected from weather. Trusses that are warped, twisted, water-damaged, or that have loose, missing, or displaced connector plates shall be rejected.

PART 2 — PRODUCTS

2.1 MATERIALS

A. Lumber: visually graded or machine stress-rated dimension lumber, grade-stamped, kiln dried to a maximum moisture content of 19 percent at time of fabrication. Species and grades as required by the truss design.

B. Connector plates: ASTM A653 galvanized steel, minimum G60 coating, of the gauge and tooth pattern required by the truss design and the plate manufacturer's evaluation report.

C. Hangers, hurricane ties, and bearing hardware: hot-dip galvanized steel of the manufacturer and model required by the truss design drawings. Provide the fasteners specified by the hardware manufacturer — substitution of fastener type, length, or quantity is not permitted.

2.2 FABRICATION

A. Fabricate trusses in accordance with ANSI/TPI 1 and the reviewed truss design drawings. Cut members accurately to length and angle so that joints bear tightly.

B. Fabricate girder trusses at the bump-out, at any hip condition, and wherever concentrated loads are carried, with the ply count, ply fastening pattern, and hanger schedule shown on the truss design drawings.

C. Provide gable end frames with vertical studs at the spacing required for the sheathing and cladding shown, designed for the full wind pressure on the end wall.

D. Provide camber where indicated by the truss designer.

PART 3 — EXECUTION

3.1 ERECTION

- A. Erect trusses in accordance with SBCA/TPI BCSI, the reviewed placement plan, and the truss design drawings. Set trusses plumb within 1/50 of the truss depth and within 1/4 inch of the plan location.
- B. Provide full and uniform bearing at each bearing point, with bearing length not less than that required by the truss design drawings. Shimming to achieve bearing is not permitted unless detailed by the truss designer.
- C. Install the specified uplift connector at every truss-to-bearing connection, and install girder hangers per the hardware manufacturer's instructions with all fastener holes filled.

3.2 FIELD ALTERATIONS — PROHIBITED

- A. Do not cut, drill, notch, or otherwise alter any truss chord or web member. This prohibition includes cutting for mechanical, plumbing, electrical, or communications routing, and applies to Owner-performed interior work following Substantial Completion.
- B. Damaged or altered trusses shall be repaired only in accordance with a written repair detail prepared and sealed by the truss designer and submitted to the Engineer. Repair costs, including engineering, are the responsibility of the party causing the damage.
- C. [FLAG: Owner scope coordination. Because the Owner completes interior systems after handoff, add a plan note and a line in Section 01 10 00 stating that chases, drops, or routing openings required by the Owner's interior work must be accommodated within the truss configuration or below the bottom chord. Identify any required openings before truss fabrication.]

3.3 BRACING

- A. Temporary installation restraint and bracing during erection is the sole responsibility of the Contractor, in accordance with BCSI-B2. Do not release lifting equipment until temporary bracing is in place.
- B. Install permanent continuous lateral restraint, diagonal bracing, and web reinforcement exactly as shown on the truss design drawings, before construction loads are applied to the roof.
- C. Do not apply sheathing, roofing materials, or stored loads to unbraced or partially braced trusses. Distribute sheathing bundles and materials over multiple trusses; do not stack on a single truss or panel point.

END OF SECTION

**SECTION 07 21 00
THERMAL INSULATION**

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers sub-slab insulation, foundation perimeter and slab-edge insulation, thermal break at the footing and foundation wall junction, exterior wall cavity insulation, continuous exterior insulation where required, and attic or ceiling insulation.
- B. Related Sections: 03 30 00 — Cast-in-Place Concrete; 31 20 00 — Earth Moving; 06 10 00 — Rough Carpentry; 06 17 53 — Shop-Fabricated Wood Trusses (energy heel).

1.2 REFERENCES

- A. 2021 International Energy Conservation Code as adopted by the State of South Dakota — Climate Zone 6.
- B. ASTM C578 — Rigid Cellular Polystyrene Thermal Insulation; ASTM C1289 — Faced Rigid Cellular Polyisocyanurate; ASTM C665 — Mineral-Fiber Blanket Thermal Insulation; ASTM C1320 — Installation of Mineral Fiber Batt Insulation; ASTM C764 — Mineral Fiber Loose-Fill; ASTM E84 — Surface Burning Characteristics.

1.3 PERFORMANCE REQUIREMENTS

- A. Provide the insulation values shown in the following table. Values are the assumed prescriptive basis for Climate Zone 6 and require confirmation before advertisement.

Assembly	Assumed Required Value	Notes
Sub-slab (full area, under heated slab)	R-10 minimum, continuous	Not prescriptively required for all cases; carried here for occupied-comfort and Owner-installed floor finish performance
Slab perimeter / edge	R-15 minimum, 24 in. vertical	IECC C402.2.4, Zone 6, unheated slab-on-grade
Thermal break at footing / foundation wall junction	R-10 minimum	Prevents the frost-depth foundation wall from bridging the slab edge

1.4 SUBMITTALS

- A. Product data for each insulation type, including R-value per inch, compressive strength for below-slab products, water absorption, and ASTM E84 ratings.
- B. Where a COMcheck or other performance compliance path is used, the compliance report.

PART 2 — PRODUCTS

2.1 BELOW-SLAB AND BELOW-GRADE INSULATION

- A. Sub-slab insulation: extruded polystyrene (XPS) board, ASTM C578 Type IV, minimum 25 psi compressive resistance, minimum R-5.0 per inch, maximum 0.3 percent water absorption by volume. Do not use unfaced expanded polystyrene below the slab.
- B. Slab perimeter and foundation wall insulation: XPS board, ASTM C578 Type IV, minimum 25 psi, thickness as required to achieve the value in Article 1.3.
- C. Above-grade protection at exposed slab edge and foundation face: cementitious or fiberglass-reinforced protective coating, or preformed protection board, applied per the insulation manufacturer's instructions. Exposed foam insulation above grade is not acceptable — it is not UV stable, is readily damaged by mowing and trimmer equipment, and is a rodent entry path.

2.2 THERMAL BREAK MATERIALS

- A. Rigid XPS board or preformed thermal break strip at the junction of the slab edge, the footing, and the foundation wall, of the thickness required to achieve the value in Article 1.3 and continuous around the full building perimeter.
- B. Sill sealer: closed-cell polyethylene or polyurethane foam gasket, full width of the sill plate, at all wood sill plate to concrete interfaces.
- C. Attic access hatch insulation dam and insulated hatch cover, where an access hatch is shown.

PART 3 — EXECUTION

3.1 SUB-SLAB INSULATION

- A. Place sub-slab insulation on the prepared, compacted, and approved fill surface per Section 31 20 00. The surface shall be smooth and free of protruding aggregate that would point-load the board.
- B. Lay boards tight with staggered joints. Cut boards neatly around penetrations. Do not leave gaps at the slab edge.
- C. Install the under-slab vapor retarder specified in Section 03 30 00 **directly beneath the slab, above the insulation**. Lap and tape seams and seal penetrations per that Section.
- D. Protect insulation from construction traffic. Do not operate wheeled or tracked equipment directly on the insulation. Replace crushed, displaced, or damaged board before placing the vapor retarder.

3.2 PERIMETER, SLAB-EDGE, AND THERMAL BREAK

- A. Install perimeter insulation vertically against the inside face of the foundation wall, extending from the top of the slab downward the full depth required by Article 1.3, or to the top of the footing, whichever is greater.
- B. Install the thermal break continuously at the slab edge so there is no direct concrete path from the interior slab to the exterior foundation wall. Maintain continuity at corners, at the entry apron and stoop, and at the bump-out.
- C. Install sill sealer at all sill plates before setting framing, coordinated with Section 06 10 00 §3.1.

- D. Where insulation is exposed above finished grade, apply the specified protective coating or board from at least 6 inches below grade to the top of the exposed edge.

3.3 GENERAL INSTALLATION

- A. Do not install insulation over wet, frozen, or frost-covered surfaces, or where it will be permanently wetted. Insulation that becomes wet before enclosure shall be removed and replaced.
- B. Coordinate installation with the air sealing of penetrations, top plates, and the wall-to-roof transition. Insulation is not a substitute for air sealing.

END OF SECTION

**SECTION 07 25 00
WEATHER BARRIERS**

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers the water-resistive barrier (WRB) over wall sheathing, including tapes, fasteners, and integration with flashings and openings, to achieve the weather-tight shell required for Substantial Completion.

1.2 SUBMITTALS

- A. Product data for WRB, seam tape, and flashing accessories.

PART 2 — PRODUCTS

2.1 MATERIALS

- A. Mechanically attached sheet WRB: spun-bonded polyolefin or equivalent building wrap complying with ICC-ES acceptance criteria for water-resistive barriers (e.g., DuPont Tyvek CommercialWrap or approved equal).
- B. Seam tape, cap fasteners, and self-adhered flashing membrane as recommended by the WRB manufacturer.

PART 3 — EXECUTION

3.1 INSTALLATION

- A. Install per manufacturer's instructions: shingle-lap horizontally, lap vertical seams, tape all seams and penetrations, and integrate with window/door flashings (Division 08) and base-of-wall conditions to drain water out.
- B. Cover WRB with cladding or protect within the manufacturer's maximum UV exposure period.

END OF SECTION

SECTION 07 92 00 JOINT SEALANTS

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers sealants, backing materials, and accessories for exterior and exposed joints in the Work, including perimeter joints at exterior doors and windows, joints between dissimilar materials, control and expansion joints in concrete flatwork and foundation walls, and sealing of penetrations through the exterior envelope.
- B. Related Sections: 03 30 00 — Cast-in-Place Concrete (joint layout); 07 25 00 — Weather Barriers; 08 11 00 — Exterior Doors, Frames, and Windows; 22 10 00 and 26 05 33 (penetration sealing).
- C. Sealants that are integral to a manufactured system — roof panel closures, weather barrier tapes, and window manufacturer's glazing sealants — are specified in their respective Sections and are not covered here.

1.2 REFERENCES

- A. ASTM C920 — Elastomeric Joint Sealants; ASTM C1193 — Use of Joint Sealants; ASTM C1330 — Cylindrical Sealant Backing; ASTM C834 — Latex Sealants; ASTM C1521 — Field Adhesion of Sealants.

1.3 SUBMITTALS

- A. Product data for each sealant, including movement capability, ASTM C920 classification, cure type, and service temperature range.
- B. Manufacturer's color chart; Owner will select colors from the full range.
- C. Manufacturer's written confirmation of compatibility with, and adhesion to, each substrate the sealant will contact — specifically including the weather barrier, the window and door frame material, and any exterior insulation facer.
- D. Cold weather application plan, if any sealant work is scheduled after October 15. See Article 1.5.

1.4 WARRANTY

- A. Provide the sealant manufacturer's standard materials warranty, and the Contractor's warranty against adhesive or cohesive failure, leakage, staining, and deterioration for the warranty period established in the General Conditions.

1.5 ENVIRONMENTAL LIMITATIONS

- A. Do not apply sealants when the ambient or substrate temperature is below the manufacturer's stated minimum, when substrates are wet, frost-covered, or frozen, or when precipitation is imminent.

PART 2 — PRODUCTS

2.1 SEALANT MATERIALS

Application	Sealant Type	Classification
Perimeter of exterior doors, frames, and windows; joints between dissimilar exterior materials	Single-component neutral-cure silicone, low-temperature application	ASTM C920, Type S, Grade NS, Class 50, Use NT, M, G, A, O
Exterior wall joints where the sealant must be painted	Single- or multi-component polyurethane	ASTM C920, Type S or M, Grade NS, Class 35, Use NT, M, A, O
Horizontal joints in exterior concrete flatwork, apron, sidewalk, and curb	Self-leveling polyurethane, traffic grade	ASTM C920, Type S or M, Grade P, Class 25, Use T, M, A
Concealed interior joints and gaps at framing penetrations	Non-curing acoustical sealant or low-expansion polyurethane foam	ASTM C834 or manufacturer's standard

2.2 ACCESSORY MATERIALS

- A. Backer rod: ASTM C1330, closed-cell or bi-cellular polyethylene, non-absorbent, sized approximately 25 percent larger than the joint width. Use non-gassing bi-cellular rod where silicone is specified.
- B. Bond breaker tape: polyethylene or other non-adhering tape recommended by the sealant manufacturer, at joints too shallow for backer rod.
- C. Primer: as recommended in writing by the sealant manufacturer for each specific substrate.
- D. Cleaners and solvents: as recommended by the sealant manufacturer and not detrimental to adjacent materials or finishes.

PART 3 — EXECUTION

3.1 PREPARATION

- A. Clean joint substrates of dust, laitance, form release agents, curing compounds, oil, frost, and old sealant. Concrete and masonry surfaces shall be dry and sound; grind or abrade as required to expose sound material.
- B. Mask adjacent surfaces where required to protect finishes. Remove masking immediately after tooling.
- C. Apply primer where recommended by the manufacturer, within the manufacturer's stated open time.

3.2 JOINT CONFIGURATION

- A. Joints shall be a minimum of 1/4 inch wide and 1/4 inch deep. Where the joint width as constructed does not permit proper sealant configuration, notify the Engineer before proceeding.
- B. For joints up to 1/2 inch wide, sealant depth shall equal joint width. For wider joints, sealant depth shall be one-half the joint width, with a maximum depth of 1/2 inch.

- C. Install backer rod to control depth, without twisting, stretching, or puncturing. Where depth does not permit backer rod, install bond breaker tape at the joint bottom.
- D. Sealant shall bond to two opposing joint faces only. Three-sided adhesion is not acceptable and shall be corrected.

3.3 INSTALLATION

- A. Apply sealant in a continuous operation, filling the joint without voids or entrapped air, using a gun with a nozzle sized to the joint.
- B. Tool the sealant immediately to form a smooth, slightly concave surface in full contact with both joint faces. Dry tooling is preferred; tooling agents that leave a residue or impair adhesion are not permitted.
- C. Coordinate window and door perimeter sealant with the flashing installation in Sections 07 25 00 and 08 11 00 so that the head flashing drainage path is not sealed shut. **The head joint above an exterior opening shall be left unsealed where required to drain, per the window manufacturer's installation instructions.** Sealing a head flashing closed converts a drained assembly into a water trap.

3.4 FIELD QUALITY CONTROL

- A. The Engineer may require field adhesion testing per ASTM C1521 hand-pull method, at a rate of one test per 100 linear feet of exterior joint with a minimum of five tests, performed after full cure.
- B. Where a test indicates adhesive failure, remove and replace sealant in the affected area, adjust the surface preparation or primer, and retest. Repair test locations with matching sealant.

3.5 CLEANING AND PROTECTION

- A. Remove excess sealant and smears as the Work progresses, by methods that do not damage adjacent finishes.
- B. Protect sealants from contact, contamination, and damage during cure. Replace sealant that has been disturbed before cure.

END OF SECTION

SECTION 22 10 00
PLUMBING ROUGH-IN AND UTILITY STUB-OUTS

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers under-slab sanitary waste piping and the domestic water service stub within the building footprint, terminated (capped) for connection by the Owner's plumber after Substantial Completion. Plumbing fixtures and above-slab distribution are Owner scope and not in this Contract.
- B. Related Sections: 33 11 00 — Water Utility Service; 33 31 00 — Sanitary Sewer and Septic Tank; 03 30 00 — Cast-in-Place Concrete.

1.2 QUALITY ASSURANCE

- A. Work shall comply with the plumbing code adopted by the State of South Dakota and be performed by a plumber licensed in South Dakota.

1.3 RECORD DOCUMENTATION — MANDATORY BEFORE BACKFILL

- A. Before any under-slab piping is backfilled or the slab is placed, the Contractor shall photograph the installed rough-in and record dimensioned as-built locations (ties from building gridlines/corners) and invert elevations of every stub, cleanout, and sleeve. Submit to the Engineer per Section 01 77 00. Placement of the slab without this documentation is grounds for rejection of the payment application line item.

PART 2 — PRODUCTS

2.1 MATERIALS

- A. Under-slab sanitary waste and vent rough-in piping: PVC DWV, Schedule 40, ASTM D2665, with solvent-cemented joints.
- B. Water service stub within building: material continuous with the site service per Section 33 11 00, sleeved through the slab, capped and marked.
- C. Sleeves for future penetrations per the plans; seal annular spaces.

PART 3 — EXECUTION

3.1 INSTALLATION AND TESTING

- A. Install piping to the layout, slopes, and invert elevations shown on the plumbing rough-in plan; bed and backfill per Section 31 20 00.
- B. Cap and internally test the under-slab sanitary system (water or air test per the adopted plumbing code) and the water stub (pressure test) with the Engineer or testing agency notified 48 hours in advance; tests shall pass before slab placement.
- C. Extend and cap vent and waste risers above slab level as shown; protect stubs from damage and mark locations.

END OF SECTION

SECTION 26 05 33
RACEWAYS FOR ELECTRICAL SYSTEMS

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers underground electrical service raceway(s) from the utility point of connection to the building, and under-slab/stub raceways within the building footprint, for use by the Owner's electrician and the serving utility. Conductors, service equipment, and building electrical distribution are not in this Contract.

1.2 QUALITY ASSURANCE

- A. Comply with the National Electrical Code (NFPA 70), edition adopted by the State of South Dakota, and the serving utility's service requirements.

PART 2 — PRODUCTS

2.1 MATERIALS

- A. Underground raceway: Schedule 40 PVC conduit, with rigid steel or Schedule 80 PVC elbows/risers at transitions above grade, sizes per the Drawings.
- B. Provide polyester pull tape in each raceway, and detectable warning tape 12 inches above each conduit run.

PART 3 — EXECUTION

3.1 INSTALLATION

- A. Trench, bed, and backfill per Section 31 20 00. Bury depths per NEC Table 300.5 and the serving utility's requirements.
- B. Install long-radius sweeps; cap and seal all terminations; record as-built alignment and depths per Section 01 77 00 before backfill.
- C. Coordinate the shared trench alignment with the communications conduit per Section 27 05 28 where shown.

END OF SECTION

SECTION 27 05 28
COMMUNICATIONS CONDUIT

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers empty communications conduit from the vicinity of the existing fiber vault / road sleeve to the telecommunications backboard location inside the building. Fiber-optic cable, service drop, and network equipment are not in this Contract and will be installed by others after construction.
- B. This conduit is required under this Contract regardless of the Owner's final service provider selection (Golden West or BIT state line extension).

1.2 COORDINATION

- A. Coordinate the conduit route, stub location at the vault end, and termination point at the building with the Engineer prior to installation. Protect the existing fiber vault and road sleeve from damage.

PART 2 — PRODUCTS

2.1 MATERIALS

- A. Conduit: 2-inch Schedule 40 PVC.
- B. Polyester pull tape in each conduit; detectable warning tape 12 inches above the conduit; long-radius sweeps only — no field bends tighter than manufacturer's minimum radius for fiber pulls.

PART 3 — EXECUTION

3.1 INSTALLATION

- A. Trench, bed, and backfill per Section 31 20 00; share the electrical service trench where shown, with separation per code and utility requirements.
- B. Cap and seal both ends; mark terminations; record as-built alignment and depth per Section 01 77 00 before backfill.

END OF SECTION

SECTION 31 20 00 EARTH MOVING

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers excavation, classification of excavated materials, fill materials, placement, compaction, subgrade preparation, and disposal of surplus and unsuitable material for the building foundation and slab, pavements, sidewalks, and utility trenches, based on GeoTek Engineering & Testing Services Report No. 26-0297.
- B. Related Sections: 02 41 00 — Demolition and Site Clearing; 03 30 00 — Cast-in-Place Concrete; 32 11 23 — Aggregate Base Course; 32 92 19 — Seeding and Site Restoration.

1.2 EXCAVATION SAFETY

- A. The Contractor is solely responsible for excavation safety, including sloping, benching, shoring, and trench protection, in accordance with OSHA 29 CFR 1926 Subpart P. Nothing in the Contract Documents relieves the Contractor of this responsibility.

1.3 OBSERVATION AND TESTING

- A. The Owner's testing agency will observe footing excavation bottoms, perform compaction testing, and observe proof rolls per Section 01 45 00. Notify the testing agency a minimum of 48 hours before operations requiring observation.

1.4 CLASSIFICATION OF EXCAVATION

- A. **Unclassified excavation.** Except as modified by paragraph C below, all excavation under this Contract is unclassified. The Contractor shall remove all materials encountered, of whatever nature, to the lines, grades, and depths required, and no additional payment will be made on account of the character, classification, or condition of the material excavated.
- B. **Subsurface conditions of record.** Six test borings were advanced at the site on March 5, 2026, to depths of 6.0 to 8.5 feet. All borings encountered topsoil over lean clay with sand of glacial till origin, firm to stiff, with standard penetration resistances of 7 to 13 blows per foot. **No bedrock, cobbles, or boulders were encountered in any boring, and no groundwater was observed at the time of drilling or at the time of the delayed readings.** Bidders are directed to GeoTek Report No. 26-0297 and the boring logs in its Appendix, which are made available for information and are not a warranty of conditions between or beyond the boring locations.
- C. **Rock excavation.** For the purposes of this Contract, rock is defined as: (1) intact ledge or bedrock in place that requires drilling, blasting, wedging, ripping with a single-tooth ripper on a tracked dozer of 300 net horsepower or greater, or continuous use of a hydraulic hammer for its removal; or (2) an individual detached boulder exceeding one cubic yard in volume. Frozen ground, hardpan, dense glacial till, cemented gravel, existing concrete or asphalt, and materials removable by a hydraulic excavator equipped with a rock bucket are **not** rock and are not separately compensable.
- D. **Unsuitable material.** Material within the limits of required excavation that is organic, saturated, frozen, or otherwise unsuitable for its intended use, and that was not identified in the geotechnical report, shall be removed and replaced with approved fill when directed in writing by the Engineer. Removal and replacement so directed will be paid as

extra work or under an established unit price. Material that becomes unsuitable through the Contractor's operations, including exposure to weather without protection or overexcavation beyond the required lines, shall be replaced at the Contractor's expense.

1.5 DISPOSAL OF SURPLUS AND WASTE MATERIAL

A.

Off-site disposal. Surplus excavated material shall be removed from park property and legally disposed of at a site secured by the Contractor at the Contractor's expense. Prior to hauling, submit to the Engineer: the disposal site location; written permission from the property owner; and evidence that the site is not a wetland, floodplain, or water of the United States, and that no permit is required or, if required, that it has been obtained.

1. No excavated material, construction debris, stumps, brush, or demolition waste shall be buried anywhere on park property.
2. No disposal, stockpiling, staging, or equipment storage shall occur outside the limits of disturbance shown on the Drawings without the prior written approval of the Owner. **This project is partially funded by the Land and Water Conservation Fund; disturbance outside the reviewed project area may trigger federal environmental and historic preservation review obligations and shall not occur without Owner approval.**
3. Stockpiles shall be protected from erosion and shall not obstruct drainage. Topsoil stockpiles shall be kept separate from other excavated material per Section 02 41 00.
4. Salvaged material remains the property of the Owner unless otherwise noted.

PART 2 — PRODUCTS

2.1 FILL MATERIALS (PER GEOTEK REPORT NO. 26-0297)

- A. Granular Structural Fill: pit-run or processed sand or gravel, maximum particle size 3 inches, less than 15 percent passing the No. 200 sieve; place in lifts up to 12 inches.
- B. Select Granular Fill: medium- to coarse-grained free-draining sand or rock, maximum particle size 1 inch, less than 5 percent passing the No. 200 sieve; place in lifts up to 12 inches. Required for the final 6 inches below the floor slab where flooring adhesives will be used.
- C. Crushed Drainage Rock: washed, graded per GeoTek Table 2 — 1½-inch sieve: 100% passing; 1-inch: 70–100%; ¾-inch: 25–60%; 3/8-inch: 0–5%.
- D. Subgrade Fill: granular (max 3-inch particle) or non-organic clay with liquid limit less than 45; no debris, topsoil, or oversize material. Clay in lifts up to 6 inches; granular in lifts up to 12 inches. Non-organic portions of on-site soils may be used with moisture conditioning as required.
- E. Exterior Foundation Wall Backfill: clay or granular soils, free of debris, organics, and oversize; lifts up to 12 inches. Where granular backfill is used in unsurfaced areas, cap with 1 to 2 feet of clay soil.
- F. Interior Foundation Wall Backfill: granular structural fill; lifts up to 12 inches.
- G. Trench bedding and pipe zone material: as specified in the applicable utility Section.

2.2 COMPACTION AND MOISTURE REQUIREMENTS

- A. Compact to the following minimum percentages of maximum dry density per standard Proctor (ASTM D698):
 - 1. Footing areas: 95%.
 - 2. Floor slab areas: 95%.
 - 3. Exterior foundation wall backfill (slab-on-grade structure): 95%.
 - 4. Subgrade in pavement areas: 95%.
 - 5. Base course in pavement areas: 97%.
 - 6. Non-structural areas: 90%.
 - 7. Compaction specifications do not apply to crushed drainage rock.
- B. Moisture content of clay backfill at foundations: +1 to -2 percent of optimum. Clay used as pavement subgrade fill or site grading: -1 to -4 percent of optimum. Granular materials: moisture conducive to vibratory compaction.

PART 3 — EXECUTION

3.1 SITE PREPARATION — FOOTING AREAS

- A. Remove vegetation (including root balls), existing structures, pavements, topsoil, and existing fill materials from footing areas (interior and exterior). Excavation bottoms shall be observed and approved before backfill or concrete placement.
- B. Backfill approved overexcavations to design elevation with granular structural fill or crushed drainage rock. Where fill is required below footings, laterally oversize the excavation bottom 1 foot beyond each footing edge per vertical foot of fill (1H:1V).
- C. If groundwater or saturated soils are encountered at an excavation bottom, place a 6- to 12-inch layer of crushed drainage rock before placing structural fill or footings.
- D. Excavate perimeter footings to bear a minimum of 4 feet below finished exterior grade for frost protection, and footings for unheated structures a minimum of 5 feet, per Section 03 30 00 §1.4.B. **Interior bearing footings within the heated building envelope may bear at or slightly below the floor slab elevation** and shall not be overexcavated to frost depth. Depths shall be as shown on the structural drawings.

3.2 SITE PREPARATION — FLOOR SLAB AREA

- A. Remove vegetation, structures, pavements, and topsoil; excavate to at least 1 foot below bottom-of-slab elevation; compact the exposed subgrade with a large vibratory roller; backfill overexcavation with granular structural fill to design elevation.
- B. Final 6 inches below the slab: select granular fill where flooring adhesives will be used; otherwise aggregate base course or granular structural fill.
- C. Coordinate the final subgrade elevation with the sub-slab insulation thickness specified in Section 07 21 00 so that the finished floor elevation is achieved.

3.3 PAVEMENT SUBGRADE PREPARATION

- A. After removals and cutting/filling to design subgrade elevation, and shortly before paving: scarify the exposed subgrade to a minimum depth of 8 inches using a disc

harrow (not a grader with teeth), moisture-condition to -1 to -4 percent of optimum (ASTM D698), and recompact to 95 percent standard Proctor.

- B. Proof roll the prepared subgrade with a loaded truck of 20 to 30 tons, observed by the testing agency. Areas exhibiting 1 inch or more of rutting or deflection are unstable and shall be corrected (moisture conditioning, overexcavation and replacement, cement stabilization, woven geotextile, thicker base, or granular subbase) as directed by the Engineer.

3.4 TRENCHING AND BACKFILL

- A. Excavate utility trenches to the lines, grades, and depths required; bed pipe and conduit per the utility Sections; backfill and compact per Article 2.2 — 95 percent under pavements and structures, 90 percent in non-structural areas.
- B. **Record as-built alignment, depth, and dimensions from building corners for all buried utilities before backfill**, per Section 01 77 00 and Section 22 10 00. Backfilling a utility before the as-built record is made and accepted is grounds for withholding the associated progress payment.

3.5 COLD WEATHER AND PROTECTION

- A. Do not place fill on frozen ground; do not use frozen material as fill; do not allow foundation or slab subgrades to freeze prior to concrete placement or during the protection period. Remove and replace or recondition frost-damaged subgrade at no additional cost.
- B. Maintain positive drainage away from excavations during construction; remove ponded water promptly.

3.6 DEWATERING

- A. No groundwater was observed in the test borings; however, seasonal fluctuation should be expected. Provide whatever dewatering is required to keep excavations free of water and to permit placement of fill, concrete, and pipe on a firm, dry base. Dewatering is subsidiary to the excavation items unless a separate item appears on the Bid Form.
- B. Discharge dewatering effluent in a manner that does not cause erosion or convey sediment off site or into surface waters.

3.7 PROTECTION OF EXISTING FEATURES

- A. Locate all existing utilities before excavation. Call South Dakota One Call a minimum of 48 hours before excavating.
- B. Protect existing pavement, trees to remain, park signage, and utilities from damage. Restore or replace damaged features at the Contractor's expense to the satisfaction of the Park Manager.

END OF SECTION

SECTION 32 11 23 AGGREGATE BASE COURSE

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers aggregate base course under asphalt pavement, under concrete flatwork where shown, and at the two off-grant asphalt repair areas, together with the separation and stabilization geotextile shown on the pavement detail.
- B. Related Sections: 31 20 00 — Earth Moving (subgrade preparation and proof roll); 32 12 16 — Asphalt Concrete Paving.

1.2 REFERENCES

- A. SDDOT Standard Specifications for Roads and Bridges, edition dated 10-1-2025 — Section 260 (Base Course) and Section 882 (Aggregates for Granular Bases and Surfacing).
- B. ASTM D4595, D4491, D4355, D4751, D6241 — geotextile test methods.
- C. GeoTek Engineering & Testing Services Report No. 26-0297.

1.3 SUBMITTALS

- A. Aggregate source, gradation test results, and quality test results demonstrating compliance with SDDOT Section 882.
- B. Geotextile product data sheet showing compliance with the property values in Article 2.2, including the manufacturer's certification of minimum average roll values.

1.4 MEASUREMENT AND PAYMENT

- A. Aggregate base course will be measured and paid at the Contract unit price, complete in place, at the thicknesses shown on the Drawings.
- B. **Geotextile shown on the pavement section detail is subsidiary to aggregate base course. No separate measurement or payment will be made** for furnishing, storing, placing, lapping, or replacing geotextile within the plan limits, or for the aggregate required to cover it. This resolves the prior open question of whether geotextile would be a base bid item, a separate bid item, or a contingency.
- C. Geotextile installed **outside** the limits shown, when directed in writing by the Engineer for stabilization of an unstable subgrade area identified during proof rolling under Section 31 20 00 §3.3.B, will be paid as extra work or under an established unit price. This is the correct home for the stabilization contingency GeoTek describes as optional; it is a subgrade remediation, not a base course component.

PART 2 — PRODUCTS

2.1 AGGREGATE

- A. Aggregate base course meeting the material, gradation, and quality requirements of SDDOT Sections 260 and 882, consistent with GeoTek Report No. 26-0297.
- B. Recycled asphalt or concrete may be blended only to the extent permitted by SDDOT Section 882 and only with the written approval of the Engineer.

2.2 GEOTEXTILE

- A. Woven geotextile meeting the following minimum average roll values, per GeoTek Report No. 26-0297:
 - 1. Wide-width tensile strength (ASTM D4595): 3,600 lb/ft minimum.
 - 2. Tensile strength at 5 percent strain (ASTM D4595): 1,350 lb/ft minimum.
 - 3. Permittivity (ASTM D4491): 0.25 sec^{-1} minimum.
 - 4. Ultraviolet resistance (ASTM D4355): 70 percent strength retained at 500 hours.
- B. Acceptable products include those listed in GeoTek Report No. 26-0297: Mirafi HP370, Lumite GTF465, Winfab 3x3HF, Winfab 370HP, Carthage Mills FX-300MF, Carthage Mills FX-370MF, SRW 370HP, Skaps M330, Skaps W5050F, ADS 370HP, Foundation Geotextiles FG33, and Foundation Geotextiles FG57, or approved equal meeting the values in paragraph A.

PART 3 — EXECUTION

3.1 GEOTEXTILE PLACEMENT

- A. Place geotextile on the prepared, proof-rolled, and approved subgrade per Section 31 20 00, immediately before placing aggregate. Do not leave geotextile exposed longer than the manufacturer's stated ultraviolet exposure limit.
- B. Unroll the fabric smooth and free of wrinkles, in the direction of construction traffic. Overlap adjacent rolls a minimum of 2 feet, with the upstream or uphill roll on top. Pin or weight edges as needed to prevent displacement.
- C. **Do not operate equipment directly on the geotextile.** Place the first aggregate lift by backdumping and spreading ahead of the equipment, maintaining a minimum of 6 inches of aggregate cover beneath tracked or wheeled equipment at all times.
- D. Repair tears, punctures, and displaced laps by placing a patch of the same material extending a minimum of 3 feet beyond the damaged area in all directions, at no additional cost.

3.2 AGGREGATE PLACEMENT

- A. Place aggregate base course to the compacted thicknesses shown on the Drawings. Per GeoTek Report No. 26-0297: 8 inches in light-duty asphalt areas and 9 inches in heavy-duty asphalt areas.
- B. Place in lifts not exceeding 6 inches compacted thickness, except that the initial lift over geotextile may be placed at the full section thickness where required to protect the fabric.
- C. Compact to 97 percent of maximum dry density per standard Proctor (ASTM D698) at a moisture content conducive to compaction.
- D. Shape and finish to the grade, cross slope, and cross-section shown, within the surface tolerance of SDDOT Section 260. Correct low areas by scarifying and adding material — do not feather thin lifts over a compacted surface.

3.3 PROTECTION

- A. Maintain the completed base course in a smooth, well-drained, compacted condition until paving. Repair rutting, segregation, contamination, and frost damage before placing asphalt, at no additional cost.
- B. Where base course is placed in one season and paved in the next under a deferred paving milestone, reshape, moisture-condition, and recompact the surface immediately before paving, and re-proof-roll if directed by the Engineer.

END OF SECTION

SECTION 32 12 16
ASPHALT CONCRETE PAVING

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers asphalt concrete paving for the parking lot and driving lane, and asphalt pavement repairs at the two off-grant repair areas (main park road culvert crossing; West Comfort Station drainfield trench crossing), which are measured and paid separately per Section 01 20 00.

1.2 REFERENCES

- A. SDDOT Standard Specifications for Roads and Bridges, edition dated 10-1-2025 — Sections 320 and 321, Class G asphalt concrete, per GeoTek Report No. 26-0297.

1.3 SEASONAL LIMITATION

- A. All asphalt paving under this Contract shall be completed within the seasonal paving window and no later than October 15, 2026. This is an interim contract milestone per Section 01 32 00. Paving outside this window will not be permitted except by written approval of the Engineer.

1.4 SUBMITTALS

- A. Asphalt mix design meeting SDDOT requirements for Class G; plant and placement quality control plan.

PART 2 — PRODUCTS

2.1 MATERIALS

- A. Asphalt concrete: SDDOT Sections 320/321, Class G. Tack coat and prime coat per SDDOT where applicable.

PART 3 — EXECUTION

3.1 PLACEMENT

- A. Place on approved, compacted aggregate base per Section 32 11 23, to compacted thicknesses shown on the Drawings (per GeoTek: 4 inches in light-duty areas; 5 inches in heavy-duty areas).
- B. Compact to SDDOT density requirements; provide smooth, uniform surface draining positively; match existing pavement flush at sawcut tie-ins with tacked vertical joints.

3.2 OFF-GRANT REPAIR AREAS

- A. At the two repair areas: sawcut per Section 02 41 00, restore and compact trench backfill and base as required to a stable condition per Section 31 20 00, and pave full lane width to the limits shown. Maintain one-lane traffic with flagging during operations per Section 01 55 26.
- B. Keep quantities, tickets, and measurements for the repair areas fully separate from the Welcome Center site paving.

END OF SECTION

SECTION 32 17 23 PAVEMENT MARKINGS

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers painted pavement markings for the parking lot and drive lane, including parking stall lines, accessible parking stalls and access aisles, International Symbol of Accessibility pavement symbols, directional arrows, stop bars, crosswalks, and any drive-up lane markings at the transaction window bump-out.
- B. Related Sections: 32 12 16 — Asphalt Concrete Paving; 32 39 13 — Bollards; 01 55 26 — Traffic Control.

1.2 REFERENCES

- A. Manual on Uniform Traffic Control Devices (MUTCD), as adopted by the State of South Dakota.
- B. SDDOT Standard Specifications for Roads and Bridges, edition dated 10-1-2025, pavement marking section.
- C. AASHTO M 248 — Ready-Mixed White and Yellow Traffic Paints; AASHTO M 247 — Glass Beads.
- D. ADA Standards for Accessible Design and ICC A117.1.

1.3 SUBMITTALS

- A. Product data and manufacturer's certification for paint and any preformed markings, including VOC content and recommended application temperature and cure time.
- B. A striping layout plan, dimensioned, submitted for the Engineer's review before any marking is applied. The layout shall show stall count, stall and aisle dimensions, accessible stall and access aisle locations, and symbol locations.

1.4 SEQUENCING

- A. Do not apply markings until the asphalt surface has cured for the period recommended by the paint manufacturer, and in no case less than 14 days after paving, unless the manufacturer certifies the product for earlier application.

PART 2 — PRODUCTS

2.1 PAINT

- A. Waterborne traffic marking paint conforming to AASHTO M 248 Type N, or to the SDDOT pavement marking section, low VOC, suitable for application to asphalt concrete pavement.
- B. Colors: white for stall lines, arrows, stop bars, and crosswalks; blue for accessible stall borders and the International Symbol of Accessibility; white for access aisle hatching unless the Owner directs blue.
- C. Glass beads, where required by the SDDOT reference section for roadway applications, conforming to AASHTO M 247 Type I. Beads are not required in parking stall markings unless shown.

2.2 PREFORMED MARKINGS

- A. Preformed thermoplastic or preformed tape markings, conforming to the MUTCD color and retroreflectivity requirements, may be used for International Symbol of Accessibility symbols and directional arrows at the Contractor's option, subject to the Engineer's approval of the product and installation method.

PART 3 — EXECUTION

3.1 LAYOUT

- A. Lay out markings per the reviewed striping plan. Obtain the Engineer's approval of the field layout — snapped lines or spotted control — before applying paint.
- B. Accessible parking stalls, access aisles, and the accessible route shall be laid out first, and shall govern where a dimensional conflict arises with the general stall layout. Accessible stalls shall be located on the shortest accessible route to the accessible entrance.
- C. Minimum dimensions, unless larger dimensions are shown: accessible car stall 96 inches wide; van-accessible stall 132 inches wide, or 96 inches wide with a 96-inch access aisle; access aisle 60 inches wide minimum. Access aisles shall be marked to discourage parking and shall be level with the stall they serve, with a maximum slope of 1:48 in all directions in the stall and aisle.

3.2 APPLICATION

- A. Surfaces shall be clean, dry, and free of dust, dirt, oil, and curing residue. Sweep or blow the surface immediately before application.
- B. Apply only when the pavement surface temperature and the ambient temperature are 50°F and rising, humidity is within the manufacturer's limits, and no precipitation is forecast within the manufacturer's stated drying period.
- C. Stall lines shall be 4 inches wide unless otherwise shown. Apply by mechanical striping equipment with edge guides; freehand application is not acceptable except for symbols and touch-up.
- D. Apply at the manufacturer's recommended wet film thickness, minimum 15 mils, in a uniform, opaque coat. Apply a second coat where the first coat does not achieve uniform opacity over the asphalt.

3.3 TOLERANCES AND CORRECTION

- A. Markings shall not deviate from the specified alignment by more than 1/2 inch in 50 feet, and shall be uniform in width within 1/4 inch.
- B. Markings applied in the wrong location, with the wrong dimensions, or with unacceptable appearance shall be removed by grinding, water blasting, or another method approved by the Engineer, and reapplied. **Painting over an incorrect marking, or blacking it out, is not acceptable.** Repair any pavement surface damage caused by removal.

3.4 PROTECTION

- A. Barricade or cone freshly applied markings until fully dry. Remove and reapply markings damaged by traffic before drying, at no additional cost.

END OF SECTION

SECTION 32 39 13 BOLLARDS

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers fixed, concrete-filled steel pipe bollards for vehicle impact protection at the drive-up transaction window bump-out, at exposed utility equipment and building corners subject to vehicle traffic, and at other locations shown on the Drawings.
- B. Related Sections: 03 30 00 — Cast-in-Place Concrete; 31 20 00 — Earth Moving; 32 12 16 — Asphalt Concrete Paving; 32 17 23 — Pavement Markings.

1.2 REFERENCES

- A. ASTM A53 — Pipe, Steel, Black and Hot-Dipped, Zinc-Coated, Welded and Seamless.
- B. ASTM A123 — Zinc (Hot-Dip Galvanized) Coatings on Iron and Steel Products.
- C. AWS D1.1 — Structural Welding Code, Steel; ACI 301; SSPC surface preparation standards.

1.3 SUBMITTALS

- A. Product data for pipe, protective sleeves or covers, coatings, and reflective banding.
- B. Shop drawings showing bollard height above grade, embedment depth, footing dimensions, cap detail, and the layout dimensioned from building corners and pavement edges.
- C. Concrete mix design, or reference to the mix approved under Section 03 30 00.
- D. Color selection for finish coating or sleeve.

PART 2 — PRODUCTS

2.1 STEEL PIPE

- A. Steel pipe: ASTM A53 Type E or S, Grade B, Schedule 40, 6-inch nominal diameter (6.625 inches outside diameter) unless otherwise shown.
- B. Hot-dip galvanize after fabrication per ASTM A123, or shop prime with a zinc-rich primer and field finish per Article 2.4. Galvanizing is preferred for a park setting because it substantially reduces the repainting maintenance the Park Manager will otherwise carry.
- C. Cap: welded steel cap plate ground smooth, or a domed concrete crown formed at the top of the fill. Flat, uncapped, water-collecting tops are not acceptable.

2.2 CONCRETE

- A. Concrete for footings and pipe fill: 4,000 psi minimum at 28 days, conforming to Section 03 30 00. Concrete exposed at the crown shall be air-entrained per that Section.

2.3 COVERS AND BANDING

- A. Two acceptable finishes: (1) hot-dip galvanized pipe with a high-visibility polyurethane or DTM finish coat; or (2) hot-dip galvanized pipe with a snap-on high-density polyethylene decorative sleeve in a park-standard color.

- B. Reflective banding: a minimum 3-inch-wide band of ASTM D4956 Type III or higher retroreflective sheeting, applied near the top of each bollard located within or adjacent to a drive lane. Reflective banding is required at all bollards at the drive-up bump-out.

2.4 FINISH

- A. Where a painted finish is selected: one coat of zinc-rich primer, if not galvanized, and two finish coats of a high-performance polyurethane or direct-to-metal coating, color as selected by the Owner. Safety yellow shall be used where the bollard's primary function is impact warning in a drive lane.

PART 3 — EXECUTION

3.1 LAYOUT

- A. Stake bollard locations and obtain the Engineer's approval before excavating. Verify that no buried utility, conduit, drainfield lateral, or building footing conflicts with the footing excavation. Call South Dakota One Call before excavating.
- C. Bollard spacing shall not exceed 5 feet on center, and shall be close enough that a vehicle cannot pass between adjacent bollards, unless a wider spacing is shown for a specific access requirement.

3.2 INSTALLATION

- A. Excavate a footing hole of the diameter shown, and in no case less than three times the pipe diameter — 18 inches minimum for a 6-inch bollard.
- B. **Footing depth: extend the bottom of the concrete footing a minimum of 5 feet below finished grade.** Bollards are unheated freestanding elements, and this depth matches the unheated-structure frost depth basis established in Section 03 30 00 §1.4.B. A shallow bollard footing will heave out of plumb in a McCook County winter and will need to be reset.
- C. Set pipe plumb, centered in the excavation, and at the height shown — 42 inches above finished grade unless otherwise indicated. Brace until the concrete has set.
- D. Place footing concrete and pipe fill in a continuous operation. Consolidate concrete around the pipe exterior and within the pipe. Crown the top of the fill to shed water, or install the welded cap plate before setting.
- E. Where bollards are set in paved areas, place footing concrete before paving and provide a neat, sealed joint between the pavement and the bollard footing per Section 07 92 00. Where bollards are set in turf areas, backfill and restore per Section 32 92 19.

3.3 TOLERANCES

- A. Bollards shall be plumb within 1/4 inch over their exposed height, and shall be uniform in exposed height within 1/2 inch within any group. Alignment along a row shall be within 1/2 inch of the staked line.

3.4 FINISHING AND CLEANING

- A. Apply the finish coating or install sleeves after the concrete has cured and the surface is clean and dry. Apply reflective banding at a uniform height within each group.
- B. Touch up damaged galvanizing per ASTM A780 and damaged coatings with the manufacturer's touch-up material. Remove concrete spatter from pipe and pavement.

END OF SECTION

SECTION 32 92 19
SEEDING AND SITE RESTORATION

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers finish grading, topsoil placement, ~~seeding, and mulching~~ of all areas disturbed by the Work, including utility trenches, the drainfield area, staging areas, and the off-site repair areas.

PART 2 — PRODUCTS

2.1 MATERIALS

- A. Topsoil: salvaged site topsoil per Section 02 41 00, supplemented if required with approved imported topsoil free of debris and noxious weeds.
- ~~B. Seed: All seed shall be certified, with dealer's analysis furnished.~~
- ~~C. Mulch: clean grass hay or straw, or hydromulch, anchored.~~

PART 3 — EXECUTION

3.1 EXECUTION

- A. Finish grade to smooth, uniform surfaces draining away from the building; spread salvaged topsoil to a minimum 6-inch depth (loose) on disturbed areas; remove rocks and debris over 2 inches.
- B. Over the drainfield: place topsoil ~~and seed~~ by hand or with light equipment only; do not compact — see Section 33 36 00.
- ~~C. Seed at the specified rate within the seasonal seeding window, or apply dormant seeding as approved by the Engineer given the late season schedule; mulch and anchor.~~

END OF SECTION

SECTION 33 11 00
WATER UTILITY SERVICE

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers the domestic water service line from the point of connection to the building stub per Section 22 10 00.

PART 2 — PRODUCTS

2.1 MATERIALS

- A. Service pipe: HDPE, DR11 200PSI.
- B. Tracer wire on all non-metallic pipe, brought to grade at each end; detectable warning tape 12 inches above pipe.
- C. Fittings, corporation/curb stops, and appurtenances compatible with the service pipe and supplier requirements.

PART 3 — EXECUTION

3.1 INSTALLATION AND TESTING

- A. Install at a 6-foot bury depth providing frost protection per local practice for this area.
- B. Bed, backfill, and compact per Section 31 20 00.
- C. Pressure test the service, and disinfect per AWWA C651 with satisfactory bacteriological sample(s) prior to acceptance.
- D. Record as-built alignment, depth, and curb stop location per Section 01 77 00 before backfill.

END OF SECTION

SECTION 33 31 00
SANITARY SEWER AND SEPTIC TANK

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers the building sewer from the under-slab stub to the septic tank, the septic tank, and effluent piping to the drainfield per Section 33 36 00.
- B. The on-site wastewater system shall be constructed in strict accordance with the DANR-approved design.

1.2 QUALITY ASSURANCE

- A. Comply with ARSD Title 74, Article 74:53 (individual and small on-site wastewater systems) and the conditions of the DANR approval. Installer qualifications per DANR requirements, if any.

PART 2 — PRODUCTS

2.1 MATERIALS

- A. Building sewer and effluent piping: PVC, ASTM D3034 SDR 35 or Schedule 40 per the approved design, with gasketed or solvent-cemented joints as applicable.
- B. Septic tank: precast concrete (or approved material per the DANR design), watertight, with risers to grade at access openings and effluent filter if required by the approved design.

PART 3 — EXECUTION

3.1 INSTALLATION AND TESTING

- A. Excavate, bed, set, and backfill the tank per manufacturer's instructions and Section 31 20 00; set level on a stable, prepared base.
- B. Install building sewer at the slopes and inverts per the approved design; maintain frost cover per the design.
- C. Watertightness test the tank and test the piping per the adopted code / DANR approval conditions; schedule any DANR or Engineer inspection required before backfill.
- D. Record as-built tank location, inverts, and pipe alignments per Section 01 77 00 before backfill.

END OF SECTION

SECTION 33 36 00
WASTEWATER DRAINFIELD (ABSORPTION SYSTEM)

PART 1 — GENERAL

1.1 SUMMARY

- A. This Section covers the soil absorption drainfield serving the Welcome Center, constructed in strict accordance with the design approved by the South Dakota Department of Agriculture and Natural Resources (DANR).
- B. Design basis: absorption area sized per ARSD 74:53:01:30 using site percolation test results. The approved layout is anticipated as two 75-foot chamber laterals located in the tested area.
- C. The drainfield serves the Welcome Center only; no other connections are included in this Contract.

1.2 PROTECTION OF THE DRAINFIELD AREA

- A. The designated drainfield area (and any designated replacement area) shall be staked and protected before any construction activity begins. Do not drive equipment on, stockpile material on, or otherwise compact the drainfield area at any time during the project, except for the equipment performing the drainfield installation itself.

1.3 SUBMITTALS

- A. Product data for chambers, distribution components, and inspection ports; installer's confirmation of the approved layout.

PART 2 — PRODUCTS

2.1 MATERIALS

- A. Leaching chambers: open-bottom plastic chambers per the DANR-approved design.
- B. Distribution piping, fittings, and inspection ports per the approved design.

PART 3 — EXECUTION

3.1 INSTALLATION

- A. Construct trenches to the width, depth, spacing, and grade of the approved design. Do not install in wet or frozen soil conditions; do not smear trench bottoms or sidewalls — scarify smeared surfaces by hand rake before placing chambers.
- B. Install chambers, distribution piping, and inspection ports per the manufacturer and the approved design; maintain level trench bottoms within the design tolerance.
- C. Notify the Engineer (and DANR where required by the approval) a minimum of 48 hours before cover; do not backfill until the open installation has been inspected and approved.
- D. Backfill by hand or with light equipment; do not compact over chambers; crown backfill slightly to allow for settlement; finish and seed per Section 32 92 19.
- E. Record as-built lateral locations, depths, and dimensions from fixed site features per Section 01 77 00 before cover.

END OF SECTION



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523 EAST CAPITOL AVENUE | PIERRE, SD 57501

ARTICLE 3 – REVISIONS TO THE ESTIMATE OF QUANTITIES / BID SCHEDULE

ESTIMATE OF QUANTITIES

ITEM NO.	ITEM	UNITS	QTY
1	Mobilization	LS	1
2	Topsoil Strip, Salvage, & Place	CY	80
3	Remove Asphalt/Concrete Pavement	SY	1200
4	Unclassified Excavation	CY	400
5	Concrete Foundation & Footings	LS	1
6	6" Concrete Slab (24'x30')	CY	14
7	6" Compacted Base Course under slab	TON	15
8	4" Concrete Sidewalk	CY	10
9	Concrete Curb and Gutter	CY	5
10	Steel Pipe Bollard, 6-Inch, Concrete Filled, Complete in Place	EA	2
11	Welcome Center, framed/trussed/sheathed (24'x30')	LS	1
12	Ordinary Roadway Shaping	SY	2400
13	Water Service; Tie to existing supply line, include new F&I Curb Stop, and rough in.	LS	1
14	Electrical; Raceway from transformer to panel location rough in	LS	1
15	Waste Water System Complete; Roughed in	LS	1
16	Telecom / Fiber; Conduit - Roughed in	LS	1
17	Traffic Control	LS	1
18	Asphalt Base Bid Welcome Center ~14,000 SF @ 9"BC	TON	875
19	Asphalt Base Bid Welcome Center ~14,000 SF @ 3"AC	TON	280

ALTERNATES

ITEM NO.	ITEM	UNITS	QTY
ALT 1	Park Entrance Asphalt Repair ~ 3,500 SF @ 3"AC, 9"BC	LS	1
ALT 2	Comfort Station Asphalt Repair ~1,000 SF @ 3"AC, 9"BC	LS	1



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523 EAST CAPITOL AVENUE | PIERRE, SD 57501

ARTICLE 4 – BIDDER QUESTIONS AND RESPONSES



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PRE-BID QUESTIONS LOG

No.	Question	Addendum #
1	Can you give us a width of the footings & foundations? The height is shown but the drawing is noted as NTS. • Continuous perimeter footing, 16" wide × 8" thick, bottom 4'-0" below finished exterior grade, sized on GeoTek's 2,000 psf net allowable bearing. • Dimensions issued by addendum.	#1
2	There is also a Geotechnical report noted, is that available to us? • Yes, attached to Addenda #1	#1
3	Please provide a section of the ADA ramp & sidewalks. Gravel base & sidewalk depths • 4" concrete walk on 4" compacted aggregate base. • Ramp running slope 1:12 max, cross slope 2% max, 5'×5' level landings top and bottom • Detectable warning at the vehicular crossing. • Broom finish, tooled edges.	#1
4	Do you have a header schedule for the openings? Can you provide the stud size for the exterior (2x6?) & interior walls (2x4?)? Please provide a wall section as to what is to be provided. • Exterior walls 2×6 SPF #2 @ 16" o.c.; • Interior partitions 2×4 @ 16" o.c. • Headers per schedule to be issued, for a building this size, (2) 2×10 with ½" ply spacer at openings ≤6'-0", (2) 2×12 above that, with king/jack counts noted. • Wall section detail by addendum.	#1
5	You note sheathing, will that be ½", and what is the nailing pattern? Do you require insulation, vapor barrier, or interior drywall? Are we providing and installing any siding or exterior trims?	#1



SOUTH DAKOTA DEPARTMENT OF GAME, FISH AND PARKS

523 EAST CAPITOL AVENUE | PIERRE, SD 57501

No.	Question	Addendum #
	• 7/16" APA rated OSB (not 1/2"), 8d common at 6" edge / 12" field, 4" o.c. at braced wall panels and at all panel edges within 4'-0" of corners. • GC scope stops at: sheathing + WRB + flashing. • Owner scope: cavity insulation, vapor retarder, drywall, siding, exterior trim.	
6	It is noted that we are providing roofing and underlayment, are we providing soffits, fascia or gutters? If so can a detail be provided for that? Section 076200 is missing from my project manual. • Contractor roof scope stops at trusses and decking/sheathing installed. • No underlayment, soffits, fascia, or gutters. This work will be completed by GF&P staff.	#1
7	The utility stub up plan is drawn NTS, can you provide measurements and height up walls? • Plan dimensions updated.	#1
8	Can you provide the electrical raceway size? 2", 4" or something different? • Raceway size to be 4".	#1
9	The plans look like asphalt is part of the GCs scope but there isn't a unit price in the bid form associated with it. Please advise. • Asphalt is to be part of the GC scope. Broken into 3 parts. Base bid (Welcome Center), Alternate #1 (Entrance culvert patch), and Alternate #2 (Comfort Station road cut patch)	#1



SOUTH DAKOTA DEPARTMENT OF GAME, FISH AND PARKS

523 EAST CAPITOL AVENUE | PIERRE, SD 57501

No.	Question	Addendum #
	Bid form updated, Base to include UP for AC and BC. Alternates are lump sum.	
10	Substantial Completion Date Conflict The Plans (Sheet 3, Plan Notes) list Substantial Completion as December 18, 2026, with Final Completion on December 30, 2026. The Project Manual (Bid Form, Section 01 10 00, and General Conditions) lists Substantial Completion as November 20, 2026. Please confirm which date governs, as this affects scheduling, cold-weather concrete planning, and liquidated damages exposure. November 20, 2026 Substantial Completion date governs.	#1
11	Off-grant asphalt repair areas Section 32 12 16 references two off-grant asphalt repair areas to be bid, measured, and paid as separate items: (1) the culvert crossing on the main park road, and (2) the trench crossing from the West Comfort Station drainfield. These areas are not shown on the plan sheets we received. Can you provide plans, quantities, or additional detail for these two repair locations? - Plans, quantities, and additional details included in updated plans. - Refer to Addenda #1 Question #9 response.	#1
12	Sheet Metal Flashing and Trim Section 07 62 00 (Sheet Metal Flashing and Trim) is listed in the Division 07 index but the section content does not appear in the Project Manual - it is not included between Section 07 41 13 (Roofing) and Section 22 10 00 (Plumbing). This section would typically cover soffit, fascia, and related trim. Could you provide the missing section content, including material, gauge, finish, and whether soffit is vented or unvented? Please also confirm whether roof drainage (gutters/downspouts) is included in this Contract's scope.	#1



SOUTH DAKOTA DEPARTMENT OF GAME, FISH AND PARKS

523 EAST CAPITOL AVENUE | PIERRE, SD 57501

No.	Question	Addendum #
	These items are to be completed by the GF&P staff. No roofing beyond sheathing/decking will fall within Contractor's scope of work.	
13	What is the actual building size? The specs and estimate of quantities state 38x40 but the floor plan and roof framing plan show a 24x30 building The building is to be 24'x30'.	#1
14	kind of metal roofing do you want? Do you want a 26-gauge screw-down rib panel for the metal roofing? Will we need to provide soffit and fascia trims for this roof? Roofing done by contractor to be decking/sheeting only. GF&P staff will complete the rest of the roof work.	#1
15	Interior footings are shown on the foundation plan, is this correct? Are these footings for shear walls that may require additional framing? Interior footings are not required. Only exterior footings. The interior slab on grade and foundation details added to plan set.	#1
16	Do you have a layout of the exterior sidewalks with dimensions? Dimensioned site plan sheet with walk widths, lengths, and joint layout.	#1
17	Will any demo of the existing building need to be included in our bid? The existing building will need to be salvaged/moved to a nearby location on-site. Directed by the GF&P staff.	#1



SOUTH DAKOTA DEPARTMENT OF GAME, FISH AND PARKS

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ARTICLE 5 – GEOTECHNICAL REPORT



**GEOTEK ENGINEERING
& TESTING SERVICES, INC.**

909 East 50th Street North
Sioux Falls, South Dakota 57104
605-335-5512 Fax 605-335-0773

March 19, 2026

South Dakota Department of Game, Fish & Parks
523 East Capitol Avenue
McCook County, SD

Attn: Sean Campbell

Subj: Geotechnical Exploration
Proposed Welcome Center
Lake Vermillion Recreation Area
McCook County, South Dakota
GeoTek #26-0297

This correspondence presents our written report of the geotechnical exploration program for the referenced project. Our work was performed in accordance with your authorization. We are transmitting an electronic copy of our report for your use.

We thank you for the opportunity of providing our services on this project and look forward to continued participation during the design and construction phases. If you have any questions regarding this report, please contact our office at (605) 335-5512.

Respectfully Submitted,
GeoTek Engineering & Testing Services, Inc.

Shawn P Maassen

Shawn P. Maassen, PE
Project Manager

TABLE OF CONTENTS

INTRODUCTION.....	4
PROJECT INFORMATION	4
SCOPE OF SERVICES	4
FIELD DATA	5
SITE LOCATION & DESCRIPTION	5
GROUND SURFACE ELEVATIONS & TEST BORING LOCATIONS	5
SUBSURFACE CONDITIONS	5
SOIL TYPES	6
<i>Existing Fill Materials</i>	6
<i>Fine Alluvium Soils</i>	6
<i>Coarse Alluvium Soils</i>	6
<i>Glacial Till Soils</i>	6
WATER LEVELS	6
ENGINEERING REVIEW & RECOMMENDATIONS.....	7
PROJECT DESIGN DATA	7
PROPOSED BUILDING (TEST BORINGS 1 & 2)	7
<i>Discussion</i>	7
<i>Site Preparation – Footing Areas</i>	8
<i>Site Preparation – Floor Slab Areas</i>	8
<i>Foundation Loads and Settlement</i>	8
<i>Floor Slab</i>	9
<i>Groundwater or Saturated Soils</i>	9
<i>Frost Protection – Footings</i>	9
<i>Frost Protection – Surface Improvements</i>	9
<i>Drain Tile Recommendations</i>	10
<i>Excavation - Building</i>	10
<i>Seismic Site Classification</i>	10
PARKING LOT & DRIVING LANE (TEST BORINGS 1, 2, & 3)	11
<i>Discussion</i>	11
<i>Subgrade Preparation</i>	11
<i>Pavement Section Thicknesses</i>	12
PROPOSED SEPTIC DRAIN FIELD AREA (BORINGS 4, 5, & 6)	13
MATERIAL TYPES & COMPACTION LEVELS	13
DRAINAGE	15
CONSTRUCTION CONSIDERATIONS	16
GROUNDWATER & SURFACE WATER	16
DISTURBANCE OF SOILS	16
COLD WEATHER PRECAUTIONS	16
EXCAVATION SIDESLOPES	17
OBSERVATIONS & TESTING	17
<i>Excavation</i>	17

Testing.....	17
SUBSURFACE EXPLORATION PROCEDURES	18
TEST BORINGS	18
SOIL CLASSIFICATION	18
WATER LEVEL MEASUREMENTS.....	19
LABORATORY TESTS.....	19
LIMITATIONS.....	19
STANDARD OF CARE	20
APPENDIX	
FIGURE 1 – SITE LOCATION MAP	
FIGURE 2 – TEST BORING LOCATION MAP	
BORING LOGS	
SOIL CLASSIFICATION	
SYMBOLS & DESCRIPTIVE TERMINOLOGY	

**GEOTECHNICAL EXPLORATION
PROPOSED WELCOME CENTER
LAKE VERMILLION RECREATION AREA
MCCOOK COUNTY, SOUTH DAKOTA
GEOTEK #26-0297**

INTRODUCTION

Project Information

This report presents the results of the recent geotechnical exploration program for the proposed welcome center at the Lake Vermillion Recreation Area in McCook County, South Dakota.

Scope of Services

We performed our work in accordance with the authorization of Sean Campbell with the South Dakota Department of Game, Fish & Parks. The authorized scope of services included the following:

1. To perform 6 standard penetration test (SPT) borings to gather data on the subsurface conditions at the project site.
2. To perform laboratory tests that include moisture content, dry density, and Atterberg limits (plastic limit and liquid limit).
3. To prepare an engineering report that includes the results of the field and laboratory tests as well as our earthwork and foundation recommendations for design and construction.

The scope of our work was intended for geotechnical purposes only. This scope of work did not include determining the presence or extent of environmental contamination at the site or to characterize the site relative to wetlands status.

FIELD DATA

Site Location & Description

The project site is located at the Lake Vermillion Recreation Area in McCook County, South Dakota. A site location map (Figure 1) is attached in the Appendix. The site currently consists of an existing building, existing pavements, and vegetation covered areas.

Ground Surface Elevations & Test Boring Locations

The ground surface elevations at the test boring locations were determined by using the top the concrete slab for the existing building, as a benchmark. An arbitrary elevation of 100.0 feet was used for the benchmark. The ground surface elevations at the test boring locations varied from 100.5 feet at test boring 1 to 90.1 feet at test boring 4. A test boring location map (Figure 2) is attached in the Appendix.

Subsurface Conditions

Six (6) test borings were performed at the project site on March 5, 2025. The subsurface conditions encountered at the test boring locations are illustrated by means of the boring logs included in the Appendix.

The subsurface conditions encountered at the test boring locations consisted of up to 5 ½ feet of existing fill materials (at test borings 1 and 2) and topsoil (at test borings 3, 5, and 6) overlying fine alluvium soils (only at test boring 1 and possibly test boring 2), coarse alluvium soils (only at test boring 1), and glacial till soils.

We wish to point out that the subsurface conditions at other times and locations at the site may differ from those found at our test boring locations. If different conditions are encountered during construction, it is important that you contact us so that our recommendations can be reviewed.

Soil Types

Existing Fill Materials

The existing fill materials consisted of sandy lean clay (CL) and lean clay with sand (CL). “N” values of 8 and 11 were measured within the existing fill materials. The moisture condition of the existing fill materials was moist.

Fine Alluvium Soils

Fine alluvium soils consist of primarily silt and clay sized particles (more than 50 percent by weight passing the #200 sieve) that have been deposited by moving water. The fine alluvium soils consisted of lean clay (CL). The “N” value within the fine alluvium soils was 11 (consistency of stiff). The moisture condition of the fine alluvium soils was moist.

Coarse Alluvium Soils

Coarse alluvium soils consist of primarily sand and gravel sized particles (less than 50 percent by weight passing the #200 sieve) that have been deposited by moving water. The coarse alluvium soils consisted of sand with silt (SP-SM). The “N” value within the coarse alluvium was 11 (consistency of medium dense). The moisture condition of the coarse alluvium soils was moist.

Glacial Till Soils

Glacial till soils consist of silt and clay sized particles with sand and gravel intermixed (more than 50 percent by weight passing the #200 sieve) that have been deposited and consolidated by a glacier. The glacial till soils consisted of lean clay with sand (CL). “N” values measured within the glacial till soils ranged from 7 to 14 (consistencies of firm and stiff). The moisture condition of the glacial till soils was moist.

Water Levels

Measurements to record the groundwater levels were made at the test boring locations. The time and level of the groundwater readings are recorded on the boring logs. Groundwater did not enter the boreholes at the time of our measurements.

The water levels indicated on the boring logs may or may not be an accurate indication of the depth or lack of subsurface groundwater. The limited length of observation restricts the accuracy of the measurements. Long term groundwater monitoring was not included in our scope of work.

ENGINEERING REVIEW & RECOMMENDATIONS

Project Design Data

We understand that the project will consist of constructing a new welcome center building. It is our understanding that the proposed building will be a single-story, slab-on-grade structure. We anticipate that the proposed building will be heated during the winter. We anticipate light foundation loads and light floor loads (less than 250 pounds per square foot (psf)) for the proposed building. We assume that foundation support for the building will be provided by perimeter footings resting below frost depth and interior footings resting at or slightly below the floor slab. We have not been provided a finished floor elevation; however, we anticipate that it will be near elevation 101.0 feet. Based on the assumed finished floor elevation, minimal grade change will be needed within the footprint of the building. The project will also include a new parking lot and driving lane as well as a new septic system.

The above information/assumptions are important factors in our review and recommendations. If there are any corrections or additions to the above-mentioned data, it is important that you contact us so that we can review our recommendations with regards to the revised plans.

Proposed Building (Test Borings 1 & 2)

Discussion

It is our opinion that the existing fill materials are not suitable for support of the footings of the proposed building; however, they could be considered for support of a lightly loaded floor slab, if floor slab performance is not critical. The fine alluvium soils, coarse alluvium soils, and glacial till soils are considered to be suitable for the support of the footings and floor slab of the proposed building.

Site Preparation – Footing Areas

The site preparation in the footing areas (both interior and exterior) of the building should consist of removing the vegetation (including root balls), existing structures, existing pavements, topsoil, and existing fill materials. Following the removals, we recommend that the soils exposed at the bottom of the excavations be observed. Once the bottoms of the excavations are approved, overexcavations should be backfilled up to the design elevation with granular structural fill or crushed drainage rock.

Where granular structural fill or crushed drainage rock is needed below the footings, the bottom of the excavation should be laterally oversized 1 foot beyond each edge of the footings for each vertical foot of granular structural fill or crushed drainage rock required below the footings (1 horizontal : 1 vertical).

Site Preparation – Floor Slab Areas

The site preparation in non-critical floor slab areas should consist of removing the vegetation (including root balls), existing structures, existing pavements, and topsoil followed by excavating to a depth at least 1 foot below the bottom-of-slab elevation. The exposed subgrade should then be compacted with a large, vibratory roller packer. However, if the performance of the floor slab is critical, then the existing fill materials should also be removed. Following the removals, we recommend that the soils exposed at the bottom of the excavations be observed and tested. Once the bottoms of the excavations are approved, overexcavated areas should be backfilled with granular structural fill up to the design elevations. See the section entitled ***Floor Slab*** for additional recommendations regarding the final 6 inches of fill below the floor slab.

Foundation Loads and Settlement

If our recommendations are followed during site preparations, then it is our opinion that the footings can be sized for a net allowable soil bearing pressure of up to 2,000 psf. If a higher net allowable soil bearing pressure is desired, then we recommend that we be contacted for additional recommendations

With the net allowable soil bearing pressure, total settlement of the footings should be less than 1 inch and differential settlement should be less than ½ inch within 50 feet. Unknown soil conditions at the site that are different from those depicted at the test boring locations could increase the amount of expected settlement.

Floor Slab

If flooring adhesives will be used on top of the concrete surface, then the final 6 inches of fill beneath the floor slab should be select granular fill. If flooring adhesives will not be used on top of the concrete surface, then an aggregate base course material or granular structural fill material could be used for the final 6 inches below the floor slab. We recommend consulting the floor covering manufacturer for more recommendations if flooring adhesives will be used.

If our recommendations are followed during site preparations, then it is our opinion that the floor slab can be designed using a soil modulus of subgrade reaction (k value) of 90 psi/inch.

Groundwater or Saturated Soils

If groundwater or saturated soils are encountered at the bottom of an excavation, then we recommend placing a layer (6 to 12 inches thick) of crushed drainage rock at the bottom of the excavation prior to placing the granular structural fill or footings.

Frost Protection – Footings

We recommend that all footings be placed at a sufficient depth for frost protection. The perimeter footings for heated buildings should be placed such that the bottom of the footing is a minimum of 4 feet below the finished exterior grade. Interior footings in heated buildings can be placed beneath the floor slab. Footings for unheated structures should be placed such that the bottom of the footing is a minimum of 5 feet below the finished exterior grade.

Frost Protection – Surface Improvements

It is our opinion that the on-site clayey soils have moderate to high frost susceptibility. Surface improvements, such as exterior equipment pads, floor slabs of unheated buildings, pavements, and sidewalks, constructed on these clayey soils are potentially subject to both cosmetic and structural

damage caused by frost heaving. The surface improvements should be designed to accommodate the potential frost movements, or non-frost susceptible drainage fill should be placed beneath the surface improvements. If movement cannot be tolerated, then we recommend placing non-frost susceptible drainage fill beneath the surface improvements. The non-frost susceptible drainage fill should extend to a depth of 4 feet below the finished exterior grade. If it is desired to reduce (but not eliminate) the amount of potential frost heave, we recommend consideration be given to placing 2 feet of non-frost susceptible drainage fill beneath the surface improvements in areas with clayey soils.

Drain Tile Recommendations

It is our opinion that drain tile is not needed along the perimeter of the building in slab-on-grade areas.

Excavation - Building

Precautions will be required during earthwork activities in order to reduce the risk of soil disturbance. All excavations within the footprint of the building should be performed with a track-driven excavator (or backhoe) having a smooth cutting edge. The subgrade should not be exposed to heavy construction traffic from rubber tire vehicles.

Seismic Site Classification

Based on the test borings and the 2021 International Building Code (IBC), it is our opinion that the site, as a whole, corresponds to a Site Class D (stiff soil). Also, the ground acceleration values are as follows: $S_S = 0.104$ g, $S_1 = 0.034$ g, $S_{MS} = 0.166$ g, $S_{M1} = 0.081$ g, $S_{DS} = 0.111$ g, $S_{D1} = 0.054$ g. Therefore, the seismic design category is "A". The ground acceleration values are based on the ASCE 7-16 (referenced standard for 2021 IBC) with Risk Category II. It is our opinion that the risk of liquefaction is low. If needed, we can provide ground acceleration values for a different design code.

Parking Lot & Driving Lane (Test Borings 1, 2, & 3)

Discussion

It is our understanding that a new paved parking lot and driving lane will be constructed as part of the project. We anticipate that the pavement areas will likely require cutting in some areas and filling in other areas to achieve the design subgrade elevations. We expect that the majority of the pavement areas should be in a fair subgrade condition; however poor subgrade conditions may be encountered in some areas. With that said, it is our opinion that normal subgrade preparation (scarification and compaction) could be used for the subgrade preparation after stripping/removals and filling has been performed (assuming a stable subgrade is achieved).

Subgrade Preparation

We recommend removing the existing pavement, vegetation, and topsoil. Following the removals, the subgrade should be prepared by cutting or filling with subgrade fill to the design subgrade elevations.

Once the design subgrade elevations have been achieved and shortly before paving, we recommend scarifying the exposed subgrade soils to a minimum depth of 8 inches and adjusting them to a moisture level that is 1 percent to 4 percent below the optimum moisture content as determined by standard Proctor (ASTM:D698). The scarification should be performed by a disc harrow and not a road grader with teeth. The subgrade soils should then be compacted to a minimum density of 95 percent of standard Proctor (ASTM:D698).

After the subgrade has been scarified and re-compacted, we recommend that a proof roll be performed on the exposed subgrade with a truck weighing 20 tons to 30 tons. During the proof roll, unstable areas in the subgrade should be delineated from stable areas. An unstable area would be considered a location with at least 1 inch of rutting or deflection. Unstable areas will need additional corrections to provide a uniform and stable subgrade condition. Some unstable subgrade conditions may be encountered during construction after the initial scarification and recompaction process, especially during spring thaw, wetter periods of the year, or periods of the year when it is not feasible to dry wet soils (late fall). Additional corrections may include the following: additional moisture conditioning of the subgrade soils (e.g. drying the soils by scarification), an

overexcavation to remove and replace the unstable subgrade soils, cement stabilization of the subgrade soils, the placement of a woven geotextile fabric at the subgrade surface, increasing the thickness of the base course layer, and/or the placement of a granular subbase material below the base course.

Pavement Section Thicknesses

No traffic loads were provided; however, we expect automobile traffic in the light-duty areas and a mixture of automobiles and trucks in the heavy-duty areas. Table 1 shows the recommended pavement section thicknesses based on the subsurface conditions and the assumed traffic loading. We assume that the subgrade soils/fill materials have been prepared per our recommendations and are in a stable condition suitable for pavement support. Concrete pavement is recommended for areas with heavy (or concentrated) long-term loads such as long-term truck or trailer parking and garbage dumpsters.

Table 1. Recommended Pavement Section Thicknesses

Pavement Description	Pavement Surfacing, in	Aggregate Base Course, in
Light-Duty Areas		
Asphalt:	4	8
PC Concrete:	5	6
Heavy-Duty Areas		
Asphalt:	5	9
PC Concrete:	7	6

Notes: A geotextile fabric could be installed beneath the aggregate base course material to extend the life of the pavement.

As stated above, the use of a geotextile fabric below the aggregate base course could be considered to extend the life of the pavement and reduce maintenance over the life of the pavement. A geotextile fabric could also be used to help with stabilization if unstable areas are encountered. If geotextile fabric is used then it should consist of a woven geotextile fabric and meet the requirements listed on the following page:

- Wide Width Tensile Strength (ASTM:D4595): 3,600 lb/ft minimum;
- Wide Width Tensile Strength at 5% Strain (ASTM:D4595): 1,350 lb/ft minimum;
- Permittivity (ASTM:D4491): 0.25 sec-1 minimum;
- UV Resistance at 500 hours (ASTM:D4355): 70% minimum.

Some of the products that meet these requirements include the following: Mirafi HP370, Lumite GTF465, Winfab 3x3HF, Winfab 370HP, Carthage Mills FX-300MF, Carthage Mills FX-370MF, SRW 370HP, Skaps M330, Skaps W5050F, ADS 370HP, Foundation Geotextiles FG33, and Foundation Geotextiles FG57.

The asphalt pavement should meet the requirements of sections 320 and 321 for Class G. We recommend the concrete pavement meet the requirements of Section 380 of the SDDOT Standard Specifications.

It should be noted that routine maintenance such as crack filling, localized patching, and seal coating should be expected with all pavements in our recommendations. The above designs could be reduced if the owner is willing to assume additional maintenance costs or potentially shorter pavement life.

Proposed Septic Drain Field Area (Borings 4, 5, & 6)

Borings 4, 5, and 6 encountered lean clay with sand (glacial till) soils at the anticipated septic drain field depths. The condition of the glacial till soils appeared to be fairly uniform throughout the proposed septic drain field area. We would like to point out that lean clay with sand (glacial till) soils typically have relatively slow percolation rates.

Material Types & Compaction Levels

Granular Structural Fill – The granular structural fill should consist of a pit-run or processed sand or gravel having a maximum particle size of 3 inches with less than 15 percent by weight passing the #200 sieve. The granular structural fill should be placed in lifts of up to 1 foot in thickness.

Crushed Drainage Rock – The crushed drainage rock should be washed and meet the gradation specifications shown in Table 2.

Table 2. Crushed Drainage Rock Gradation Specifications

Sieve Size	Percent Passing
1 ½-inch	100
1-inch	70 – 100
¾-inch	25 – 60
3/8-inch	0 – 5

Select Granular Fill – The select granular fill should consist of a medium to coarse grained, free-draining sand or rock having a maximum particle size of 1 inch with less than 5 percent by weight passing the #200 sieve. The select granular fill should be placed in lifts of up to 1 foot in thickness.

Exterior Foundation Wall Backfill – We recommend either clay or granular soils be used to backfill the exterior side of the foundation walls. Debris, organic material, or over-sized material should not be used as backfill. If granular soils are used in areas that will not have asphalt or concrete surfacing, we recommend capping the granular soils with at least 1 to 2 feet of clay soils to minimize infiltration of surface water. The exterior backfill should be placed in lifts of up to 1 foot in thickness.

Interior Foundation Wall Backfill – Granular structural fill should be used for backfilling the interior side of the foundation walls due to ease of compaction. It should be placed in lifts up to 1 foot in thickness.

Subgrade Fill – The subgrade fill should consist of either a granular or clay material. Debris, highly organic material/topsoil, or over-sized material should not be used as subgrade fill. If a granular material is used, then it should consist of a pit-run or processed sand or gravel having a maximum particle size of 3 inches. The granular material can be placed in lifts of up to 1 foot in thickness. If a clay material is selected, then it should consist of a non-organic clay having a liquid limit less than 45. The non-organic portions of the on-site existing fill materials, fine alluvium soils, coarse alluvium soils, and glacial till soils could be used for subgrade fill; however, portions of the on-site soils will likely require moisture conditioning (wetting or drying) prior to use. Scrutiny on the clay material's moisture content should be made prior to the acceptance and use. The clay fill should be placed in lifts of up to 6 inches in thickness.

Aggregate Base Course Material – We recommend the aggregate base course materials meet the requirements of Sections 260 and 882 of the SDDOT Standard Specifications.

Recommended Compaction Levels – The recommended compaction levels listed in Table 3 are based on a material's maximum dry density value, as determined by a standard Proctor (ASTM: D698) test.

Table 3. Recommended Compaction Levels

Placement Location	Compaction Specifications
Footing Areas	95%
Floor Slab Areas	95%
Exterior Foundation Wall Backfill for Slab-on-Grade Structures	95%
Subgrade in Pavement Areas	95%
Base Course in Pavement Areas	97%
Non-Structural Areas	90%

Notes: Compaction specifications are not applicable with the crushed drainage rock.

Recommended Moisture Levels – The moisture content of the clay backfill materials, when used as backfill around a foundation, should be maintained within a range of plus 1 percent to minus 2 percent of the materials' optimum moisture content. When the clay backfill materials are used as subgrade fill below a pavement area or as site grading, the materials' moisture content should be maintained within a range of minus 1 percent to minus 4 percent of the materials' optimum moisture content. The optimum moisture content should be determined using a standard Proctor (ASTM: D698) test.

The moisture content of the granular backfill materials should be maintained at a level that will be conducive for vibratory compaction.

Drainage

Proper drainage should be maintained during and after construction. The general site grading should direct surface run-off waters away from the excavations. Water which accumulates in the excavations should be removed in a timely manner.

Finished grades around the perimeter of the structure should be sloped such that positive drainage away from the structure is provided. Also, a system to collect and channel roof run-off waters away from the structure is suggested.

CONSTRUCTION CONSIDERATIONS

Groundwater & Surface Water

Water may enter the excavations due to subsurface water, precipitation or surface run off. Any water that accumulates in the bottom of the excavations should be immediately removed and surface drainage away from the excavations should be provided during construction.

Disturbance of Soils

The soils encountered at the test boring locations are highly susceptible to disturbance and can experience strength loss caused by construction traffic and/or additional moisture. Precautions will be required during earthwork activities in order to reduce the risk of soil disturbance.

Cold Weather Precautions

If site preparation and construction is anticipated during cold weather, we recommend all foundations, slabs and other improvements that may be affected by frost movements be insulated from frost penetration during freezing temperatures. If filling is performed during freezing temperatures, all frozen soils, snow and ice should be removed from the areas to be filled prior to placing the new fill. The new fill should not be allowed to freeze during transit, placement and compaction. Concrete should not be placed on frozen subgrades. Frost should not be allowed to penetrate below the footings. If floor slab subgrades freeze, we recommend the frozen soils be removed and replaced, or completely thawed, prior to placement of the floor slab. The subgrade soils will likely require reworking and recompacting due to the loss of density caused by the freeze/thaw process.

Excavation Sideslopes

The excavations must comply with the requirements of OSHA 29 CFR, Part 1926, Subpart P, “Excavations and Trenches”. This document states that the excavation safety is the responsibility of the contractor. Reference to this OSHA requirement should be included in the project specifications.

Observations & Testing

This report was prepared using a limited amount of information for the project and a number of assumptions were necessary to help us develop our conclusions and recommendations. It is recommended that our firm be retained to review the geotechnical aspects of the final design plans and specifications to check that our recommendations have been properly incorporated into the design documents.

The recommendations submitted in this report have been made based on the subsurface conditions encountered at the test boring locations. It is possible that there are subsurface conditions at the site that are different from those represented by the test borings. As a result, on-site observation during construction is considered integral to the successful implementation of the recommendations. We believe that qualified field personnel need to be on-site at the following times to observe the site conditions and effectiveness of the construction.

Excavation

We recommend that a geotechnical engineer or geotechnical engineering technician working under the direct supervision of a geotechnical engineer observe all excavations for foundations, slabs and pavements. These observations are recommended to determine if the exposed soils are similar to those encountered at the test boring locations, if unsuitable soils have been adequately removed and if the exposed soils are suitable for support of the proposed construction. These observations should be performed prior to placement of fill or foundations.

Testing

After the subgrade is observed by a geotechnical engineer/technician and approved, we recommend a representative number of compaction tests be taken during the placement of the

granular structural fill and backfill placed below foundations, slabs and pavements, beside foundation walls and behind retaining walls. The tests should be performed to determine if the required compaction has been achieved. As a general guideline, we recommend at least 1 test be taken for every 2,000 square feet of granular structural fill placed in building, at least 1 test for every 75 feet to 100 feet in trench fill, and for every 2-foot thickness of fill or backfill placed. The actual number of tests should be left to the discretion of the geotechnical engineer. Samples of proposed fill and backfill materials should be submitted to our laboratory for testing to determine their compliance with our recommendations and project specifications.

SUBSURFACE EXPLORATION PROCEDURES

Test Borings

We performed SPT borings with a track mounted rig equipped with hollow-stem auger. Soil sampling was performed in accordance with the procedures described in ASTM:D1586. Using this procedure, a 2-inch O.D. split barrel sampler is driven into the soil by a 140-pound weight falling 30 inches. After an initial set of 6 inches, the number of blows required to drive the sampler an additional 12 inches is known as the penetration resistance, or “N” value. The “N” value is an index of the relative density of cohesionless soils and the consistency of cohesive soils.

The test borings were backfilled with on-site materials and some settlement of these materials can be expected to occur. Final closure of the holes is the responsibility of the client or property owner.

The soil samples collected from the test boring locations will be retained in our office for a period of 1 month after the date of this report and will then be discarded unless we are notified otherwise.

Soil Classification

As the samples were obtained in the field, they were visually and manually classified by the crew chief according to ASTM:D2488. Representative portions of all samples were then sealed and returned to the laboratory for further examination and for verification of the field classification. In addition, select samples were then submitted to a program of laboratory tests. Where laboratory classification tests (sieve analysis and Atterberg limits) have been performed, classifications according to ASTM:D2487 are possible. Logs of the test borings indicating the depth and

identification of the various strata, the “N” value, the laboratory test data, water level information and pertinent information regarding the method of maintaining and advancing the drill holes are also attached in the Appendix. Charts illustrating the soil classification procedures, the descriptive terminology and the symbols used on the boring logs are also attached in the Appendix.

Water Level Measurements

The water levels indicated on the boring logs may or may not be an accurate indication of the depth or lack of subsurface groundwater. The limited length of observation restricts the accuracy of the measurements. Long term groundwater monitoring was not included in our scope of work.

Subsurface groundwater levels should be expected to fluctuate seasonally and yearly from the groundwater readings recorded at the test borings. Fluctuations occur due to varying seasonal and yearly rainfall amounts and snowmelt, as well as other factors.

Laboratory Tests

We performed laboratory tests on select samples to aid in determining the index properties of the soils. The tests consisted of moisture content, dry density, and Atterberg limits (liquid limit and plastic limit). The laboratory tests were performed in accordance with the appropriate ASTM procedures. The results of the laboratory tests are shown on the boring logs opposite the samples upon which the tests were performed or on the data sheets included in the Appendix.

LIMITATIONS

The recommendations and professional opinions submitted in this report were based upon the data obtained through the sampling and testing program at the test boring locations. We wish to point out that because no exploration program can totally reveal the exact subsurface conditions for the entire site, conditions between test borings and between samples and at other times may differ from those described in our report. Our exploration program identified subsurface conditions only at those points where samples were retrieved or where water was observed. It is not standard engineering practice to continuously retrieve samples for the full depth of the borings. Therefore, strata boundaries and thicknesses must be inferred to some extent. Additionally, some soils layers present in the ground may not be observed between sampling intervals. If the subsurface conditions

encountered at the time of construction differ from those represented by our test borings, it is necessary to contact us so that our recommendations can be reviewed. The variations may result in altering our conclusions or recommendations regarding site preparation or construction procedures, thus, potentially affecting construction costs.

This report is for the exclusive use of the addressee and its representatives for use in design of the proposed project described herein and preparation of construction documents. Without written approval, we assume no responsibility to other parties regarding this report. Our conclusions, opinions and recommendations may not be appropriate for other parties or projects.

STANDARD OF CARE

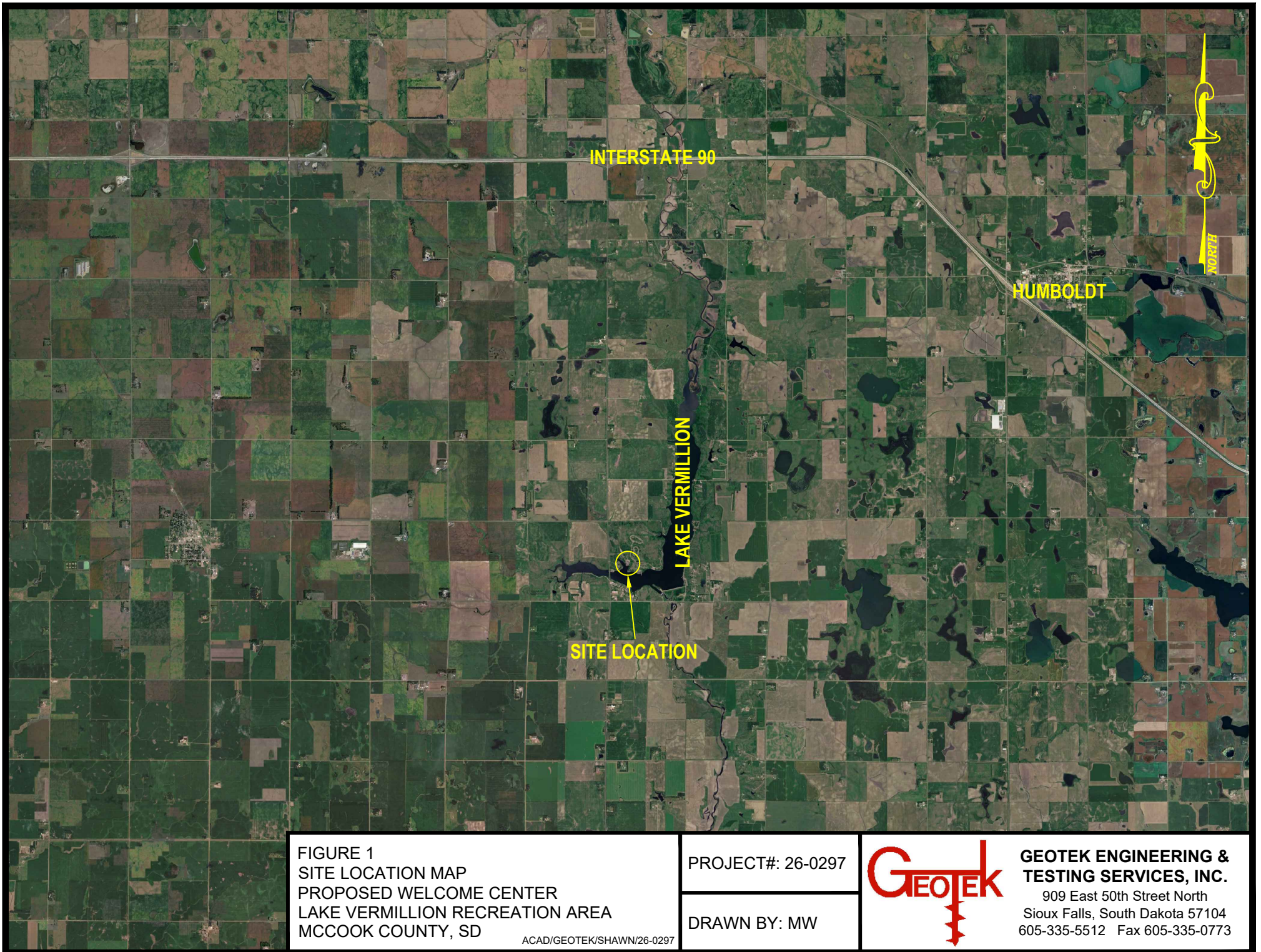
The recommendations submitted in this report represent our professional opinions. Our services for your project were performed in a manner consistent with that level of care and skill ordinarily exercised by members of the engineering profession currently practicing at this time and area.

This report was prepared by:
GeoTek Engineering & Testing Services, Inc.



Shawn P. Maassen, PE
Project Manager





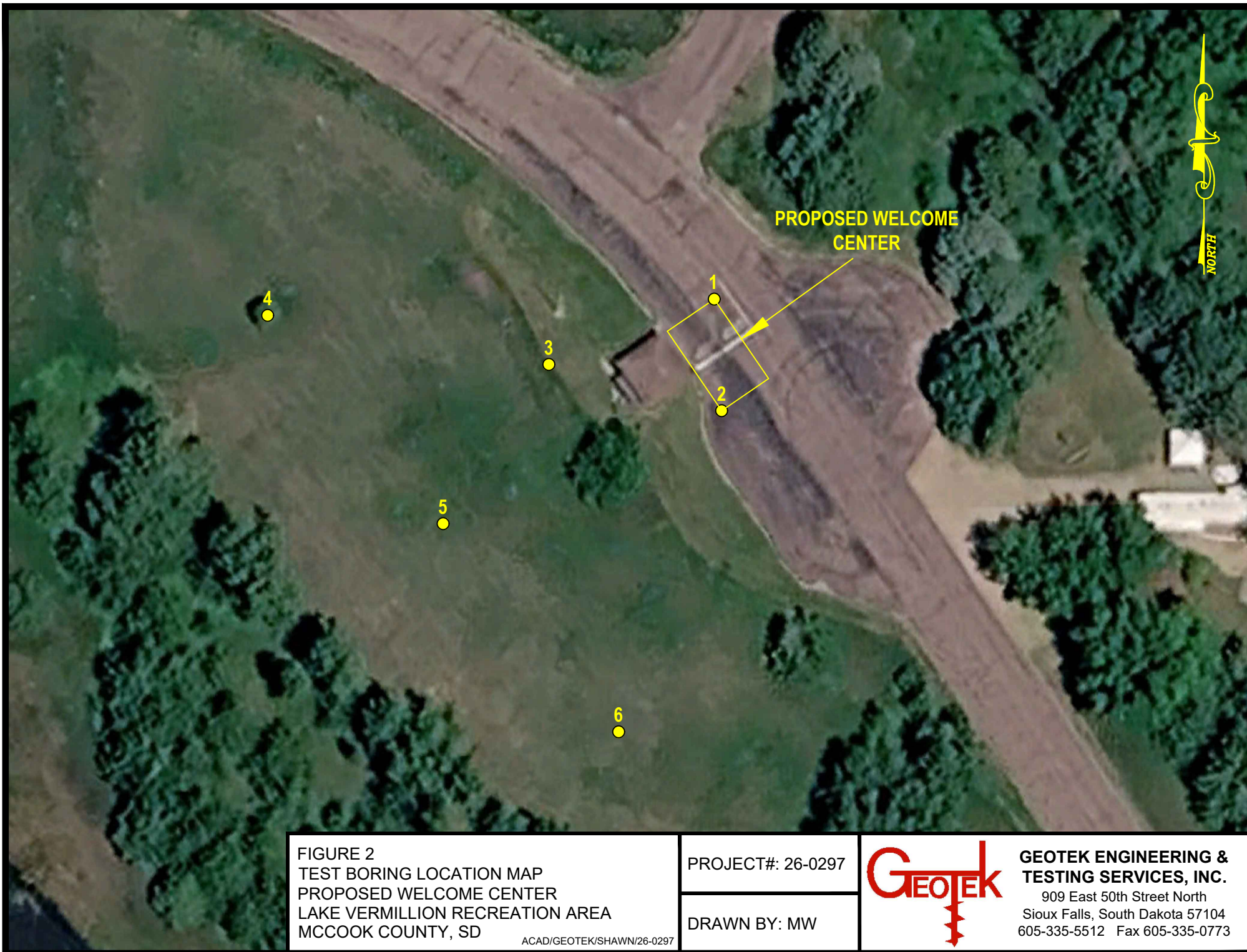


FIGURE 2
TEST BORING LOCATION MAP
PROPOSED WELCOME CENTER
LAKE VERMILLION RECREATION AREA
MCCOOK COUNTY, SD

ACAD/GEOTEK/SHAWN/26-0297

PROJECT#: 26-0297

DRAWN BY: MW



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GEOTECHNICAL TEST BORING LOG

BORING NO. 1

(1 of 1)

GEOTEK # 26-0297											
PROJECT: Proposed Welcome Center, Lake Vermillion Recreation Area, McCook County, SD											
WL	Elevation Depth (feet)	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	N	SAMPLE		LABORATORY TESTS				
					TYPE NO.	MC	D	LL / PL	QU	- #200	
	100.2	ASPHALT, 4" thick									
	0.3	EXISTING GRAVEL BASE, 4" thick									
	100.0	FILL, MOSTLY SANDY LEAN CLAY: a trace of gravel, black and brown, moist	FILL			HSA 1					
	0.5										
	98.5	LEAN CLAY: brown and gray, moist, stiff, (CL)	FINE ALLUVIUM	11		SPT 2	26				
	2.0										
	96.0	SAND WITH SILT: a little gravel, fine to medium grained, brown and gray, moist, medium dense, a few lenses of clay (SP-SM)	COARSE ALLUVIUM	11		SPT 3					
	4.5										
	93.5	LEAN CLAY WITH SAND: a little gravel, brown and gray, moist, stiff, (CL)	GLACIAL TILL	12		SPT 4					
	7.0										
				14		SPT 5	14				
				10		SPT 6					
				11		SPT 7					
	84.5										
	16.0	Bottom of borehole at 16.0 Feet.									
Water Level Measurements											
DATE					Additional Boring Information						
TIME					START: 03-05-2026 COMPLETE: 03-05-2026, 02:41 PM						
SAMPLE DEPTH (ft)					METHOD: 3.25" ID Hollow Stem Auger						
CAVE-IN DEPTH (ft)					LATITUDE: (Latitude / Longitude)						
WATER LEVEL (ft)					LONGITUDE: (Approximate Values)						
03/05/2026					DRILL RIG: B-51 Track Rig						
02:57 PM					CREW CHIEF: Marcus Shields						
16.0											
11.0											
None											



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GEOTECHNICAL TEST BORING LOG

BORING NO. 2

(1 of 1)

GEOTEK #		26-0297									
PROJECT:		Proposed Welcome Center, Lake Vermillion Recreation Area, McCook County, SD									
WL	Elevation	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	N	SAMPLE		LABORATORY TESTS				
	Depth (feet)				TYPE NO.	MC	D	LL / PL	QU	- #200	
	100.2 ft = SURFACE ELEVATION										
	99.9	ASPHALT, 3" thick									
	0.3	EXISTING GRAVEL BASE, 4" thick									
	99.7	FILL, MOSTLY SANDY LEAN CLAY: a trace of gravel, black and brown, moist	FILL			HSA 1					
	0.5										
	98.2	FILL, MOSTLY LEAN CLAY WITH SAND: brown, moist, firm to stiff	FILL (POSSIBLE FINE ALLUVIUM)	11		SPT 2	18		37 / 19		
	2.0										
	94.7	LEAN CLAY WITH SAND: a little gravel, brown and gray, moist, (CL)	GLACIAL TILL	8		SPT 3	18				
	5.5										
				11		SPT 4	18				
				11		SPT 5					
				11		SPT 6					
				11		SPT 7					
	84.2										
	16.0	Bottom of borehole at 16.0 Feet.									
Water Level Measurements											
Additional Boring Information											
DATE	TIME	SAMPLE DEPTH (ft)	CAVE-IN DEPTH (ft)	WATER LEVEL (ft)	START: 03-05-2026 COMPLETE: 03-05-2026, 02:01 PM						
03/05/2026	02:36 PM	16.0	14.0	None	METHOD: 3.25" ID Hollow Stem Auger						
					LATITUDE:		(Latitude / Longitude)				
					LONGITUDE:		(Approximate Values)				
					DRILL RIG: B-51 Track Rig						
					CREW CHIEF: Marcus Shields						



BORING NO. 3 (1 of 1)

PROJECT: Proposed Welcome Center, Lake Vermillion Recreation Area, McCook County, SD

WL	Elevation Depth (feet)	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN		N	SAMPLE		LABORATORY TESTS					
						TYPE NO.	MC	D	LL / PL	QU	- #200		
		98.8 ft = SURFACE ELEVATION											
		TOPSOIL	-- -- --										
	97.8 1.0	LEAN CLAY WITH SAND: a little gravel, brown and gray, moist, stiff, (CL)		GLACIAL TILL	10		SPT 1	15					
					11		SPT 2	17					
					13		SPT 3	18					
	92.8 6.0	Bottom of borehole at 6.0 Feet.											
Water Level Measurements					Additional Boring Information								
DATE	TIME	SAMPLE DEPTH (ft)	CAVE-IN DEPTH (ft)	WATER LEVEL (ft)	START: 03-05-2026 COMPLETE: 03-05-2026, 03:08 PM								
03/05/2026	03:23 PM	6.0	4.0	None	METHOD: 3.25" ID Hollow Stem Auger				(Latitude / Longitude) (Approximate Values)				
					LATITUDE:								
					LONGITUDE:								
					DRILL RIG: B-51 Track Rig								
					CREW CHIEF: Marcus Shields								



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GEOTECHNICAL TEST BORING LOG

BORING NO. 4

(1 of 1)

GEOTEK # 26-0297												
PROJECT: Proposed Welcome Center, Lake Vermillion Recreation Area, McCook County, SD												
WL	Elevation Depth (feet)	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN	N	SAMPLE		LABORATORY TESTS					
					TYPE NO.	MC	D	LL / PL	QU	- #200		
	90.1 ft = SURFACE ELEVATION											
		LEAN CLAY WITH SAND: a little gravel, brown and gray, moist, stiff, (CL)				HSA 1						
					10		SPT 2	16				
					11		SPT 3	18				
					12		SPT 4					
	81.6 8.5	Bottom of borehole at 8.5 Feet.										
Water Level Measurements												
DATE	TIME	SAMPLE DEPTH (ft)	CAVE-IN DEPTH (ft)	WATER LEVEL (ft)	Additional Boring Information							
03/05/2026	03:35 PM	8.5	6.0	None	START: 03-05-2026 COMPLETE: 03-05-2026, 03:24 PM							
					METHOD: 3.25" ID Hollow Stem Auger							
					LATITUDE: _____							
					LONGITUDE: _____							
					(Latitude / Longitude) (Approximate Values)							
					DRILL RIG: B-51 Track Rig							
					CREW CHIEF: Marcus Shields							



BORING NO. 5 (1 of 1)

PROJECT: Proposed Welcome Center, Lake Vermillion Recreation Area, McCook County, SD

WL	Elevation	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN		N	SAMPLE		LABORATORY TESTS				
	Depth (feet)						TYPE NO.	MC	D	LL / PL	QU	- #200
	97.7 ft = SURFACE ELEVATION											
	97.2	TOPSOIL	--									
	0.5	LEAN CLAY WITH SAND: a little gravel, brown and gray, moist, firm to stiff, (CL)		GLACIAL TILL	8		HSA 1	17				
		SPT 2										
		SPT 3										
		SPT 4										
	89.2	Bottom of borehole at 8.5 Feet.										
	8.5											
Water Level Measurements					Additional Boring Information							
DATE	TIME	SAMPLE DEPTH (ft)	CAVE-IN DEPTH (ft)	WATER LEVEL (ft)	START:	03-05-2026 COMPLETE: 03-05-2026, 03:39 PM						
03/05/2026	03:47 PM	8.5	6.5	None	METHOD:	3.25" ID Hollow Stem Auger						
					LATITUDE:	(Latitude / Longitude) (Approximate Values)						
					LONGITUDE:							
					DRILL RIG:	B-51 Track Rig						
					CREW CHIEF:	Marcus Shields						



BORING NO. 6 (1 of 1)

PROJECT: Proposed Welcome Center, Lake Vermillion Recreation Area, McCook County, SD

WL	Elevation	DESCRIPTION OF MATERIAL	GEOLOGIC ORIGIN		N	SAMPLE		LABORATORY TESTS				
	Depth (feet)						TYPE NO.	MC	D	LL / PL	QU	- #200
		98.2 ft = SURFACE ELEVATION										
	97.7	TOPSOIL	--		7							
	0.5	LEAN CLAY WITH SAND: a little gravel, brown and gray, moist, firm to stiff, (CL)		GLACIAL TILL			HSA 1					
							SPT 2	20				
				10		SPT 3	20					
				11		SPT 4						
	89.7	Bottom of borehole at 8.5 Feet.										
	8.5											
Water Level Measurements					Additional Boring Information							
DATE	TIME	SAMPLE DEPTH (ft)	CAVE-IN DEPTH (ft)	WATER LEVEL (ft)	START:	03-05-2026		COMPLETE:	03-05-2026, 03:49 PM			
03/05/2026	03:59 PM	8.5	7.0	None	METHOD:	3.25" ID Hollow Stem Auger						
					LATITUDE:	(Latitude / Longitude) (Approximate Values)						
					LONGITUDE:							
					DRILL RIG:	B-51 Track Rig						
					CREW CHIEF:	Marcus Shields						

SOIL CLASSIFICATION CHART

MAJOR DIVISIONS			SYMBOLS		TYPICAL DESCRIPTIONS
			GRAPH	LETTER	
COARSE GRAINED SOILS MORE THAN 50% OF MATERIAL IS LARGER THAN NO. 200 SIEVE SIZE	GRAVEL AND GRAVELLY SOILS MORE THAN 50% OF COARSE FRACTION RETAINED ON NO. 4 SIEVE	CLEAN GRAVELS (LITTLE OR NO FINES)		GW	WELL-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
				GP	POORLY-GRADED GRAVELS, GRAVEL - SAND MIXTURES, LITTLE OR NO FINES
		GRAVELS WITH FINES (APPRECIABLE AMOUNT OF FINES)		GM	SILTY GRAVELS, GRAVEL - SAND - SILT MIXTURES
				GC	CLAYEY GRAVELS, GRAVEL - SAND - CLAY MIXTURES
	SAND AND SANDY SOILS MORE THAN 50% OF COARSE FRACTION PASSING ON NO. 4 SIEVE	CLEAN SANDS (LITTLE OR NO FINES)		SW	WELL-GRADED SANDS, GRAVELLY SANDS, LITTLE OR NO FINES
				SP	POORLY-GRADED SANDS, GRAVELLY SAND, LITTLE OR NO FINES
		SANDS WITH FINES (APPRECIABLE AMOUNT OF FINES)		SM	SILTY SANDS, SAND - SILT MIXTURES
				SC	CLAYEY SANDS, SAND - CLAY MIXTURES
FINE GRAINED SOILS MORE THAN 50% OF MATERIAL IS SMALLER THAN NO. 200 SIEVE SIZE	SILTS AND CLAYS LIQUID LIMIT LESS THAN 50			ML	INORGANIC SILTS AND VERY FINE SANDS, ROCK FLOUR, SILTY OR CLAYEY FINE SANDS OR CLAYEY SILTS WITH SLIGHT PLASTICITY
				CL	INORGANIC CLAYS OF LOW TO MEDIUM PLASTICITY, GRAVELLY CLAYS, SANDY CLAYS, SILTY CLAYS, LEAN CLAYS
				OL	ORGANIC SILTS AND ORGANIC SILTY CLAYS OF LOW PLASTICITY
	SILTS AND CLAYS LIQUID LIMIT GREATER THAN 50			MH	INORGANIC SILTS, MICACEOUS OR DIATOMACEOUS FINE SAND OR SILTY SOILS
				CH	INORGANIC CLAYS OF HIGH PLASTICITY
				OH	ORGANIC CLAYS OF MEDIUM TO HIGH PLASTICITY, ORGANIC SILTS
HIGHLY ORGANIC SOILS			PT	PEAT, HUMUS, SWAMP SOILS WITH HIGH ORGANIC CONTENTS	

NOTE: DUAL SYMBOLS ARE USED TO INDICATE BORDERLINE SOIL CLASSIFICATIONS

BORING LOG SYMBOLS AND DESCRIPTIVE TERMINOLOGY

SYMBOLS FOR DRILLING AND SAMPLING

<u>Symbol</u>	<u>Definition</u>
Bag	Bag sample
CS	Continuous split-spoon sampling
DM	Drilling mud
FA	Flight auger; number indicates outside diameter in inches
HA	Hand auger; number indicates outside diameter in inches
HSA	Hollow stem auger; number indicates inside diameter in inches
LS	Liner sample; number indicates outside diameter of liner sample
N	Standard penetration resistance (N-value) in blows per foot
NMR	No water level measurement recorded, primarily due to presence of drilling fluid
NSR	No sample retrieved; classification is based on action of drilling equipment and/or material noted in drilling fluid or on sampling bit
SH	Shelby tube sample; 3-inch outside diameter
SPT	Standard penetration test (N-value) using standard split-spoon sampler
SS	Split-spoon sample; 2-inch outside diameter unless otherwise noted
WL	Water level directly measured in boring
▼	Water level symbol

SYMBOLS FOR LABORATORY TESTS

<u>Symbol</u>	<u>Definition</u>
WC	Water content, percent of dry weight; ASTM:D2216
D	Dry density, pounds per cubic foot
LL	Liquid limit; ASTM:D4318
PL	Plastic limit; ASTM:D4318
QU	Unconfined compressive strength, pounds per square foot; ASTM:D2166

DENSITY/CONSISTENCY TERMINOLOGY

<u>Density</u>		<u>Consistency</u>
<u>Term</u>	<u>N-Value</u>	<u>Term</u>
Very Loose	0-4	Soft
Loose	5-8	Firm
Medium Dense	9-15	Stiff
Dense	16-30	Very Stiff
Very Dense	Over 30	Hard

PARTICLE SIZES

<u>Term</u>	<u>Particle Size</u>
Boulder	Over 12"
Cobble	3" – 12"
Gravel	#4 – 3"
Coarse Sand	#10 – #4
Medium Sand	#40 – #10
Fine Sand	#200 – #40
Silt and Clay	passes #200 sieve

DESCRIPTIVE TERMINOLOGY

<u>Term</u>	<u>Definition</u>
Dry	Absence of moisture, powdery
Frozen	Frozen soil
Moist	Damp, below saturation
Waterbearing	Pervious soil below water
Wet	Saturated, above liquid limit
Lamination	Up to ½" thick stratum
Layer	½" to 6" thick stratum
Lens	½" to 6" discontinuous stratum

GRAVEL PERCENTAGES

<u>Term</u>	<u>Range</u>
A trace of gravel	2-4%
A little gravel	5-15%
With gravel	16-50%



SOUTH DAKOTA DEPARTMENT OF GAME, FISH AND PARKS

523 EAST CAPITOL AVENUE | PIERRE, SD 57501

END OF ADDENDUM NO. 01