

STEPHEN J.

Albertson Engineering Inc. 3202 W. MAIN, SUITE C

605.343.9606

CONSULTANT

PROJECT IDEN:

ROSS HEADFRAME SLAB REPLACEMENT

SANFORD UNDERGROUND RESEARCH FACILITY LEAD, SOUTH DAKOTA

ISSUE BLOCK: ISSUE TYPE

100% CD's

MANAGEMENT: PROJECT NO: 2024-253.1

CHECKED BY: SJK

DRAWN BY: SJK

SHEET TITLE:

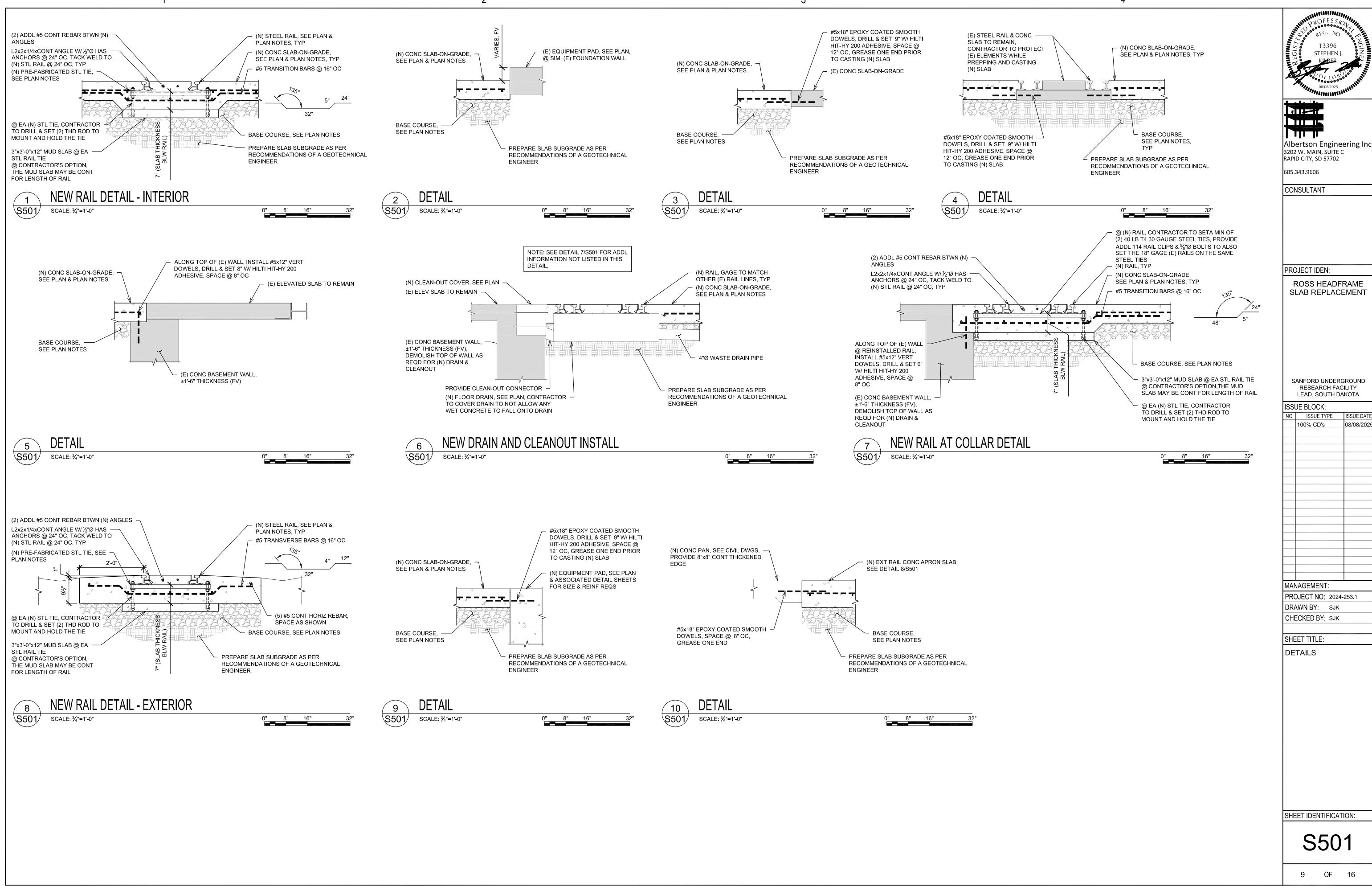
OVERALL SLAB-ON-GRADE PLAN WITH EXTERIOR RAIL EXTENSION

SHEET IDENTIFICATION:

6 OF 16

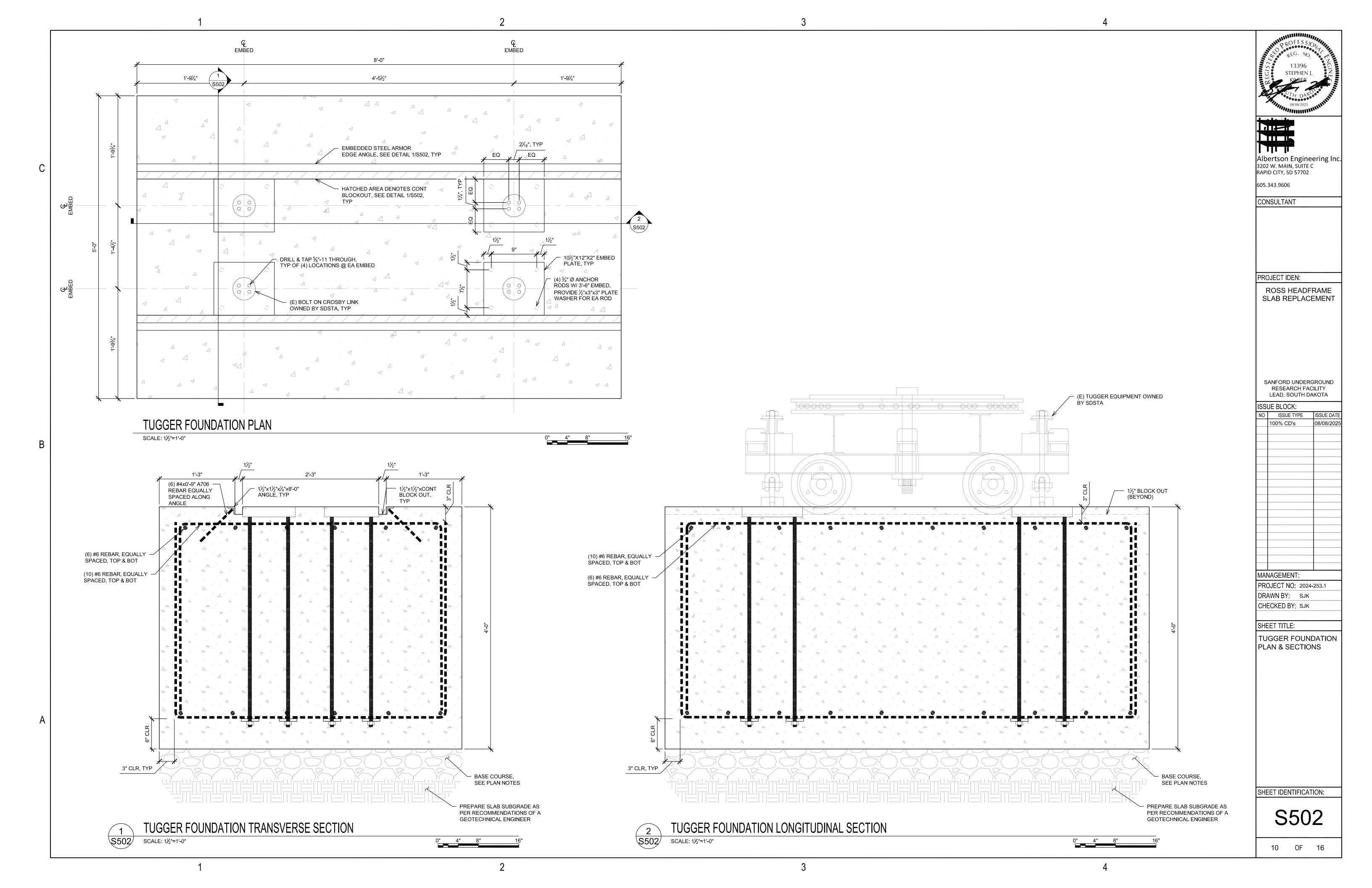
S103

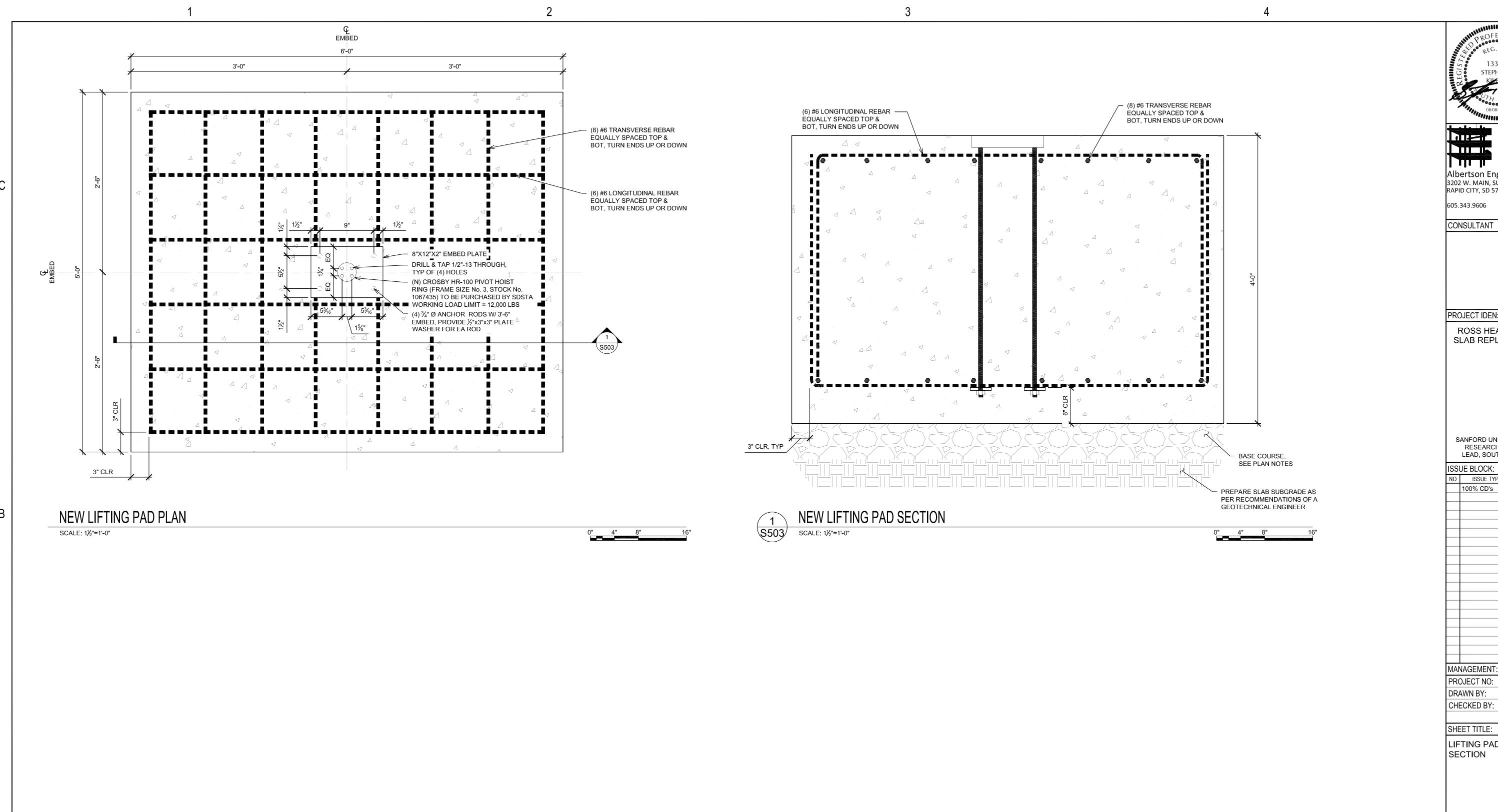
3



2

ISSUE DAT 08/08/202





Albertson Engineering Inc. 3202 W. MAIN, SUITE C RAPID CITY, SD 57702

605.343.9606

CONSULTANT

PROJECT IDEN:

ROSS HEADFRAME SLAB REPLACEMENT

SANFORD UNDERGROUND RESEARCH FACILITY LEAD, SOUTH DAKOTA

ISSUE BLOCK:

NO ISSUE TYPE 100% CD's 08/08/202

MANAGEMENT: PROJECT NO: 2024-253.1

DRAWN BY: SJK CHECKED BY: SJK

LIFTING PAD PLAN & SECTION

SHEET IDENTIFICATION:

S503

10 OF 16

2

3

GENERAL NOTES:

- STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH CIVIL DRAWINGS AND JOB SPECIFICATIONS. CONSULT THESE DOCUMENTS FOR OTHER INFORMATION NOT SHOWN ON STRUCTURAL DRAWINGS.
- ALL DIMENSIONS AND CONDITIONS MUST BE VERIFIED IN THE FIELD. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER BEFORE PROCEEDING WITH THE AFFECTED PART OF THE
- THE STRUCTURE IS DESIGNED TO BE SELF SUPPORTING AND STABLE AFTER THE BUILDING IS COMPLETE. IT IS THE CONTRACTOR'S SOLE RESPONSIBILITY TO DETERMINE ERECTION PROCEDURES AND SEQUENCE TO ENSURE SAFETY OF THE BUILDING AND ITS COMPONENTS DURING ERECTION. THIS INCLUDES THE ADDITION OF NECESSARY SHORING, SHEETING, TEMPORARY BRACING (AND ACCOMPANYING FOOTINGS), GUYS OR TIEDOWNS.
- ADDITIONAL OBSERVATIONS AS A RESULT OF REJECTION OF WORK COMPLETED AND/OR ADDITIONAL OBSERVATIONS DUE TO THE DEFICIENCIES IN WORK OBSERVED WILL BE AT THE EXPENSE OF THE CONTRACTOR.
- ALL STRUCTURAL SHOP DRAWINGS TO BE REVIEWED BY JOB SUPERINTENDENT IN ADDITION TO ALL PERSONNEL DEEMED NECESSARY BY CONTRACTOR PRIOR TO SUBMITTAL TO ENGINEER FOR APPROVAL.
- ALL SHOP DRAWINGS TO BE REVIEWED BY ALBERTSON ENGINEERING INC. SHALL HAVE ELECTRONIC COPIES PROVIDED TO ALBERTSON ENGINEERING INC. FOR REVIEW. AN ELECTRONIC MARKED SET OF THOSE DRAWINGS WILL BE RETURNED TO THE CONTRACTOR. NO ADDITIONAL HARD COPIES OF THE SHOP DRAWINGS NEED TO BE PROVIDED TO ALBERTSON ENGINEERING INC., ALTHOUGH OTHER PARTIES MAY REQUIRE HARD COPIES OF THE MARKED UP DRAWINGS. THESE REQUIREMENTS ARE IN ADDITION TO THE TYPICAL PROJECT SHOP DRAWING SUBMITTAL REQUIREMENTS STATED IN THE PROJECT SPECIFICATIONS.
- THE DESIGN OF THE STRUCTURE SHOWN IN THESE CONSTRUCTION DOCUMENTS IS FOR THE ONE-TIME USE AT THE SPECIFIC SITE REFERENCED IN THE TITLE BLOCK.

DESIGN CODES:

- 2021 INTERNATIONAL BUILDING CODE.
- ACI 318-14 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE AND COMMENTARY.
- AISC 360-16 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS.
- ASCE 7-16 MINIMUM DESIGN LOADS AND ASSOCIATED CRITERIA FOR BUILDINGS AND OTHER STRUCTURES.

DESIGN LOADS:

FLOOR SLAB:

THE STRUCTURAL SYSTEM FOR THIS BUILDING HAS BEEN DESIGNED WITH THE FOLLOWING SUPERIMPOSED LOADINGS BASED ON RISK CATEGORY II:

100 PSF

12 KIPS

CONCENTRATED EQUIPMENT LOAD CAT 996 FRONT END LOADER MOVING AROUND ~18 KIP LOAD MAX TIRE LOAD

AREA LIVE LOAD

30 KIPS/TIRE MAX TIRE PRESSURE TUGGER FOUNDATION TUGGER MAX PULL CAPACITY

TUGGER ASSUMED WEIGHT 1,500 LBS LIFTING PAD

SIZE NO. 3 WORKING LOAD LIMIT

HR-100 CROSBY PIVOT HOIST RING FRAME

TIMBERLAND WINCH PAD TIMBERLAND WINCH MAX LIFT CAPACITY

BASED ON ¾" ROPE

12,400 LBS FLEET ANGLE (NEW POSITION) EMPTY HOIST BODY WEIGHT 6,880 LBS

FOUNDATIONS:

- CONCRETE SLAB-ON-GRADES ARE DESIGNED FOR AN ALLOWABLE SOIL BEARING PRESSURE OF 4,000 PSF ON EXISTING SOILS AND AN ASSUMED SUBGRADE MODULUS OF 400 PCI.
- 2. FOR BASE BID, CONTRACTOR TO PROVIDE PRICING FOR: 2.1. REMOVAL OF EXISTING SOILS DOWN TO 18" BELOW THE NEW SLAB.
- 2.2. 12" DEPTH SCARIFICATION AND COMPACTION OF THE EXISTING SOILS AT THE BASE OF THE EXCAVATION. THE FULL COMPACTION REQUIREMENTS (MOISTURE CONTENT AND PROCTOR DENSITY) ARE NOT PROVIDED HERE.
- 2.3. INSTALLATION OF 18" OF CLEAN ROCK BELOW THE NEW SLAB. 2.4. THESE SUBGRADE PREPARATION REQUIREMENTS ARE TO BE REVIEWED AND ADJUSTED AS REQUIRED BY A LICENSED

GEOTECHNICAL ENGINEER. SEE BULLET 3 BELOW.

BEFORE CONSTRUCTION COMMENCES, SOIL BEARING CAPACITY, SUBGRADE MODULUS, AND SLAB PREPARATION REQUIREMENTS ARE TO BE VERIFIED BY LICENSED COMPETENT GEOTECHNICAL ENGINEER. AT THE SOLE DISCRETION OF THE GEOTECHNICAL ENGINEER, A SUBSURFACE EXPLORATION MAY BE REQUIRED. THE GEOTECHNICAL FIRM SHALL DEVELOP A REPORT WHICH WILL INCLUDE ANALYSIS AND RECOMMENDATIONS FOR SITE PREPARATION IN ORDER TO BEAR THE FOUNDATION LOADS. THIS DEVELOPED REPORT SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW BEFORE FOUNDATION

CHEMICAL ANCHORS:

CONSTRUCTION BEGINS.

SHALL BE A POLYMER INJECTION SYSTEM SUCH AS HILTI HY-200 OR APPROVED EQUAL, INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S INSTRUCTIONS. INSTALLERS SHALL BE TRAINED BY THE MANUFACTURER'S REPRESENTATIVE.

ANCHOR RODS:

SHALL BE ASTM F1554 GRADE 36 THREADED ROD.

CONCRETE TESTING:

- 1. CONCRETE TESTING SHALL BE PAID FOR BY THE CONTRACTOR. TESTING LABORATORY SHALL PERFORM THE FOLLOWING TESTS ON CAST-IN-PLACE CONCRETE:
- 1.1. ASTM C143 "STANDARD TEST METHOD FOR SLUMP OF PORTLAND CEMENT CONCRETE."
- ASTM C39 "STANDARD TEST METHOD FOR COMPRESSIVE STRENGTH OF CYLINDRICAL CONCRETE SPECIMENS." A SEPARATE TEST SHALL BE CONDUCTED FOR EACH CLASS, FOR EVERY 50 CUBIC YARDS (OR FRACTION THEREOF), PLACED PER DAY. REQUIRED CYLINDER(S) QUANTITIES AND TEST AGE AS FOLLOWS: 1 AT 7 DAYS
- 1.3. PROVIDE ONE ADDITIONAL RESERVE CYLINDER TO BE TESTED UNDER THE DIRECTION OF THE ENGINEER, IF REQUIRED. IF 28 DAY STRENGTH IS ACHIEVED, THE ADDITIONAL CYLINDER(S) MAY BE DISCARDED.

2 AT 28 DAYS

- TESTING SHALL BE BASED UPON CONCRETE TAKEN AT POINT OF
- 1.5. IN ADDITION TO TYPICAL TESTING REQUIREMENTS, SLUMP AND AIR CONTENT SAMPLES SHALL BE TAKEN AT BEGINNING OF FIRST TRUCK PRIOR TO ANY PLACEMENT AND REPEATED AT THE MIDDLE OF FIRST TRUCK. CONCRETE PLACEMENT SHALL NOT START IF INITIAL TEST(S) FAIL AND SHALL NOT CONTINUE OF TEST TAKEN AT MIDDLE OF FIRST LOAD FAILS.
- 1.6. IF ANY SLUMP OR AIR CONTENT FAILS DURING PLACEMENT, TESTS SHALL BE IMMEDIATELY REPORTED AND RETAKEN. IF RETAKEN TESTS FAIL THEN ALL SUBSEQUENT LOADS MUST BE TESTED AT ARRIVAL AND TEST MUST SHOW COMPLIANCE PRIOR TO THE CONCRETE IN THAT TRUCK BEING ALLOWED FOR USE ON PROJECT. ALL COSTS FOR ADDITIONAL TESTING SHALL BE AT THE OWNER'S EXPENSE.

PENETRATIONS:

1. NO PENETRATIONS SHALL BE MADE IN ANY STRUCTURAL MEMBERS OTHER THAN THOSE LOCATED ON THESE DRAWINGS WITHOUT PREVIOUS APPROVAL OF THE ENGINEER.

CONCRETE MIX DESIGN

1. CONCRETE MIX SHALL BE DESIGNED BY A RECOGNIZED TESTING LABORATORY TO ACHIEVE A STRENGTH AT 28 DAYS AS SHOWN IN THE BELOW CONCRETE CURING STRENGTH SCHEDULE WITH A PLASTIC AND WORKABLE MIX:

CONCRETE PROPERTIES

LOCATION	28 DAY COMPRESSIVE STRENGTH	ENTRAINED AIR	SLUMP	MAX W/C RATIO
EXTERIOR SLABS	5,000 PSI	5.0% - 7.0%	3"±1"	0.40

- 2. SUBMIT PROPOSED MIX DESIGN WITH RECENT FIELD CYLINDER OR LAB TESTS FOR REVIEW PRIOR TO USE. MIX SHALL BE UNIQUELY IDENTIFIED BY MIX NUMBER OR OTHER POSITIVE IDENTIFICATION. CONCRETE SHALL COMPLY WITH ALL THE REQUIREMENTS OF ASTM STANDARD C94 FOR MEASURING, MIXING, TRANSPORTING, ETC. CONCRETE TICKETS SHALL BE TIME STAMPED WHEN CONCRETE IS BATCHED. THE MAXIMUM TIME ALLOWED FROM THE TIME THE MIXING WATER IS ADDED UNTIL IT IS DEPOSITED IN ITS FINAL POSITION SHALL NOT EXCEED ONE AND ONE HALF (1-1/2) HOURS. IF FOR ANY REASON THERE IS A LONGER DELAY THAN STATED ABOVE, THE CONCRETE SHALL BE DISCARDED. IT SHALL BE THE RESPONSIBILITY OF THE TESTING LAB TO NOTIFY THE OWNER'S REPRESENTATIVE AND THE CONTRACTOR OF ANY NONCOMPLIANCE WITH THE ABOVE. ALL SLABS SHALL BE CURED USING CURING COMPOUND MEETING ASTM STANDARD C309 TYPE 1 AND SHALL HAVE A FUGITIVE DYE. THE COMPOUND SHALL BE PLACED AS SOON AS THE FINISHING IS COMPLETED OR AS SOON AS THE WATER HAS LEFT THE UNFINISHED CONCRETE. ALL SCUFFED OR BROKEN AREAS IN THE CURING MEMBRANE SHALL BE RECOATED DAILY. CALCIUM CHLORIDES SHALL NOT BE UTILIZED; OTHER ADMIXTURES MAY BE USED ONLY WITH THE APPROVAL OF THE ENGINEER.
- 3. CONCRETE SHALL UTILIZE TYPE IL CEMENT. (AND CONCRETE USED FOR SLABS SHALL HAVE A 20% MINIMUM CLASS F FLY-ASH CONTENT BY
- 4. COARSE AND FINE AGGREGATES SHALL COMPLY WITH ASTM C33 AND ACI 302.1, CURRENT VERSIONS.
- 5. THE CONCRETE STRENGTHS SHOWN IN THE SECTION ABOVE AND IN THE SPECIFICATIONS ARE MINIMUM COMPRESSIVE STRENGTHS. THE ENGINEER SHALL DETERMINE IF THE CONCRETE IS ACCEPTABLE, OR TO BE REMOVED, OR TO RECEIVE SPECIAL CURING IF THE COMPRESSIVE STRENGTHS ARE LESS THAN SPECIFIED.
- WATER REDUCING AGENTS MAY BE USED IN THE CONCRETE MIX. PLASTICIZERS AND SUPER-PLASTICIZERS MAY BE USED ONLY WHEN WRITTEN PERMISSION OF THE ENGINEER IS GIVEN.
- 7. NO SALTS OF ANY KIND MAY BE USED IN CONCRETE BEFORE OBTAINING THE ENGINEER'S WRITTEN PERMISSION FOR THEIR USE.

CONCRETE AND REINFORCING PLACEMENT:

SHALL NOT EXCEED 1/4".

- 1. ALL CONCRETE SHALL BE PLACED IN ACCORDANCE WITH ACI 301 AND ACI 117 EXCEPT AS MODIFIED BELOW:
- 1.1. ACI 117 ITEM 4.3.1.1 ELEVATIONS OF SLABS-ON-GRADE TOP OF SLAB ELEVATION SHALL BE WITHIN A 3/8" ENVELOPE EITHER SIDE OF THE THEORETICAL DESIGN SURFACE.
- 1.2. ACI 117 ITEM 4.5.7 FLOOR FINISH TOLERANCES AS MEASURED BY PLACING A FREE STANDING (UNLEVELED) 10 FT. STRAIGHT EDGE ANYWHERE ON THE SLAB AND ALLOWING IT TO REST UPON TWO HIGH SPOTS WITHIN 28 DAYS AFTER SLAB CONCRETE PLACEMENT. THE GAP AT ANY POINT BETWEEN THE STRAIGHT EDGE AND THE FLOOR
- 2. ALL REINFORCING STEEL TO BE ASTM A615, GRADE 60 (#4 AND LARGER), EXCEPT WHERE NOTED OTHERWISE. REINFORCING SHALL NOT BE WELDED.

LEAD-BASED PAINT AND ASBESTOS ABATEMENT

3. ALL REINFORCING STEEL BARS TO BE DETAILED AND PLACED IN

4. LAP ALL REINFORCING SPLICES IN CONCRETE A MINIMUM OF 48 BAR

DIAMETERS OR 24 INCHES, WHICHEVER IS GREATER, UNLESS NOTED

WELDMENTS, OR CONCRETE INSERTS FOR FASTENING AND SECURING

OTHER COMPONENTS. CONCRETE INSERTS SHALL BE FURNISHED BY

CONTRACTOR CASTING THE CONCRETE AROUND THEM. CLIP ANGLES

PROVIDE TWO (2) #5'S, ONE AT EACH FACE, UNLESS NOTED OTHERWISE,

DIRECTIONS. CONTACT ENGINEER FOR ALL OPENINGS GREATER THAN

AROUND ALL OPENINGS GREATER THAN 12"x12" IN CAST-IN-PLACE

CONCRETE. EXTEND REINFORCING 2'-0" BEYOND OPENING IN BOTH

8 COLD WEATHER AND HOT WEATHER PROVISIONS OF ACI 306 AND 305

CONTRACTOR TO FURNISH AND INSTALL 500 LINEAL FT. EACH OF

ADDITIONAL #4 & #5 REINFORCING STEEL TO BE USED AT ENGINEER'S

MISCELLANEOUS SHAPES AND PLATES. STEEL RAIL SHALL CONFORM

TO ASTM A36 (Fy=36 KSI). STEEL TUBING SHALL CONFORM TO ASTM

NEW WEST WALL DOOR STEEL TO RECEIVE ONE SHOP COAT AND ONE

4.1. CONTRACTOR TO COORDINATE FINAL PAINT COLOR WITH OWNER.

5. ALL BOLTED CONNECTIONS SHALL CONSIST OF ¾"Ø F3125 GRADE A325

7. ANCHOR BOLT HOLES IN STRUCTURAL STEEL SHALL BE OVERSIZED NO

STRUCTURAL STEEL WITHIN AISC'S CODE OF STANDARD PRACTICE FOR

CONTRACTOR SHALL MAINTAIN ERECTION TOLERANCES OF

(CURRENT EDITIONS), RESPECTIVELY, SHALL BE MAINTAINED.

STEEL SHALL CONFORM ASTM A36 (Fy=36 KSI) FOR ALL OTHER

STEEL SHALL CONFORM TO THE LATEST EDITION OF AISC SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS.

3. ALL WELD CONNECTIONS TO BE MADE WITH E70XX ELECTRODES.

A500 EITHER GRADE B OR C (Fy=46 KSI).

FIELD TOUCH UP COAT OF APPROVED PAINT.

TYPE F1852 BOLTS, UNLESS NOTED OTHERWISE.

MORE THAN 1/8" MAX, UNLESS NOTED OTHERWISE.

STEEL BUILDINGS AND BRIDGES.

MINIMUM COVER

1½"

THE CONTRACTOR REQUIRING THEM AND INSTALLED BY THE

SHALL BE FURNISHED BY THE CONTRACTOR REQUIRING THEM.

6. REINFORCING STEEL SHALL RECEIVE CONCRETE COVER AS FOLLOWS:

ACCORDANCE WITH THE LATEST ACI MANUALS.

OTHERWISE ON DRAWINGS (CLASS B SPLICE).

CAST AGAINST AND PERMANENTLY

EXPOSED TO EARTH OR WEATHER

NOT EXPOSED TO EARTH OR WEATHER

OR IN CONTACT WITH THE GROUND, SLABS

EXPOSED TO EARTH

#6 THROUGH #18 BARS

#5 BARS OR SMALLER

#11 BARS OR SMALLER

BEAMS AND COLUMNS

12"x12" FOR DESIGN.

DISCRETION.

<u>STRUCTURAL STEEL:</u>

AND WALLS

#14 AND #18

5. WHERE SHOWN ON THE DRAWINGS, PROVIDE WELD PLATES

- 1. THE EXISTING STRUCTURAL STEEL FRAMING, CLADDING SUPPORTS AND WINDOW FRAMES ARE COVERED IN A LEAD-BASED PAINT. ANY EXISTING PAINTED SURFACE SHALL BE ASSUMED TO HAVE BEEN PAINTED WITH LEAD-BASED PAINT. THE CONTRACTOR SHALL REMOVE THE PAINT AS REQUIRED TO PROPERLY INSTALL THE DETAILED CONNECTIONS. THE CONTRACTOR SHALL HANDLE AND DISPOSE OF THE LEAD-BASED PAINT IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS. THE CONTRACTOR SHALL RETAIN A NECESSARY SPECIALITY SUBCONTRACTOR AS REQUIRED TO PERFORM THE LEAD-BASED PAINT REMEDIATION PRIOR TO THE STRUCTURAL CONNECTION INSTALL. THE CONTRACTOR SHALL REFERENCE THE APPROPRIATE SPECIFICATION SECTIONS FOR FURTHER INFORMATION.
- THE EXTERIOR EXISTING SIDING SHEETS (LACING) ARE COVERED IN AN ASBESTOS COATING. THE CONTRACTOR SHALL REMOVE AND DISPOSE OF THE EXISTING PANELS AS REQUIRED TO PERFORM THE NECESSARY STRUCTURAL MODIFICATIONS. NO CUTTING, GRINDING, OR THERMAL TORCHING OF THE EXISTING LACING PANELS ARE ALLOWED. THE CONTRACTOR WILL HANDLE AND DISPOSE OF THE EXISTING LACING PANELS IN ACCORDANCE WITH ALL LOCAL, STATE, AND FEDERAL REGULATIONS. THE CONTRACTOR SHALL REFERENCE THE APPROPRIATE SPECIFICATION SECTIONS FOR FURTHER INFORMATION.

STRUCTURAL SHEET INDEX

IBC INSPECTION TABLES S002 SLAB-ON-GRADE DEMOLITION PLAN S101

GENERAL STRUCTURAL NOTES

- SLAB-ON-GRADE NEW SLAB PLAN S102
- OVERALL SLAB-ON-GRADE PLAN WITH EXTERIOR RAIL S103 EXTENSION
- ANNOTATED PHOTOGRAPHS S111

ANNOTATED PHOTOGRAPHS

- S-501 DETAILS
- **TUGGER FOUNDATION PLAN & SECTIONS**
- S-504 TIMBERLAND WINCH PAD PLAN & SECTION

LIFTING PAD PLAN & SECTION

- S505 WEST WALL NEW BI-FOLD DOOR ELEVATION & DETAILS
- S-601 STANDARD DETAILS

S-503





Albertson Engineering Inc 3202 W. MAIN, SUITE C RAPID CITY, SD 57702

605.343.9606

CONSULTANT

PROJECT IDEN:

ROSS HEADFRAME SLAB REPLACEMENT

SANFORD UNDERGROUND RESEARCH FACILITY LEAD, SOUTH DAKOTA

ISSUE BLOCK:

ISSUE TYPE ISSUE DAT 08/08/202 100% CD's

MANAGEMENT PROJECT NO: 2024-253.1 DRAWN BY: SJK

SHEET TITLE:

GENERAL

CHECKED BY: SJK

STRUCTURAL NOTES

SHEET IDENTIFICATION:

2 OF 16