PROJECT:

TORNADO SAFE ROOM
CITY OF ALEXANDRIA
SPORTS FIELD COMPLEX
ALEXANDRIA, SD

OWNER:

CITY OF ALEXANDRIA
421 MAIN ST. BOX 157
ALEXANDRIA, SD 57311

ARCHITECT:

L.L. JIRSA ARCHITECT
P.O. BOX 925
MITCHELL, SD 57301
605-770-6424
email: lljirsaarchitecte gmail.com

CIVIL ENGINEER:

SPN & ASSOCIATES
P.O. BOX 398
MITCHELL, SD 57301
605-996-7761

MECHANICAL ENGINEER:

RQE CE
P.O. BOX 368
MITCHELL, SD 57301
605-996-7543

STRUCTURAL ENGINEER:

ALBERTSON ENGINEERING INC.
3202 W. MAIN, SUITE C
RAPID CITY, SD 57702
605 343-9606

ELECTRICAL ENGINEER:

EFRAIMSON ELECTRIC, INC.
2821 8TH AVE. NE
ABERDEEN, SD 57401
605-216-8330

DRAWING INDEX

GENERAL NOTES:

1. IBC OCCUPANCY CLASSIFICATION - A3
2. TYPE OF SAFE ROOM - COMMUNITY GENERAL PUBLIC
3. DESIGN CONFORMS TO FEMA P-361 & ICC500 FOR TORNADO SAFE ROOMS WITH A 2 HOUR MINIMUM HAZARD MITIGATION TIME FOR OCCUPANCY.
4. DESIGN OCCUPANT CAPACITY - 122 PERSONS TOTAL WITH 660 NET SQ.FT.. 120 OCCUPANTS @ 5 SQ.FT./OCCUPANT + 2 HANDICAP OCCUPANTS @ 15 SQ.FT. EACH. SEE OCCUPANT LOAD PLAN.
5. SAFE ROOM PERIOD OF OCCUPANCY: MAY 1 - OCT 1 DURING ATHLETIC CONTESTS.
6. DESIGN WIND SPEED 200 MPH (3 SECOND GUST)
7. ALL EMERGENCY SUPPLIES TO BE PROVIDED BY OWNER INCLUDING THE FOLLOWING:
   - FLASHLIGHTS, LARGE LIGHT STICKS
   - FIRST AID KITS
   - BOTTLED WATER
   - NOAA WEATHER RADIO WITH SIGNAL AMPLIFIER WITH CONTINUOUSLY CHARGING BATTERIES OR BATTERY SUPPLY
   - RADIO RECEIVING COMMERCIAL RADIO BROADCASTS.
   - A SOUNDING DEVICE, i.e., AIRHORN WHICH OPERATES WITHOUT A POWER SOURCE.
   - TOOLS TO PRY OPEN AN INOPERABLE DOOR WHICH HAS BEEN BLOCKED BY DEBRIS.
   - SIGNAL AMPLIFIER FOR CELL PHONES TO RECEIVE AND SEND CELLULAR SIGNALS FROM WITHIN THE SAFE ROOM
   - EMERGENCY RADIO FOR CONTACTING POLICE, FIRE OR OTHER EMERGENCY SERVICES.
8. EXPOSED STEEL PLATES, DOWELS, ANCHORS FOR PRECAST CONCRETE ROOF PANEL CONNECTIONS TO BE PRIMED AND PAINTED TO PREVENT RUST.
9. ALL EXPOSED CONCRETE FLOOR SLAB, PRECAST CONCRETE ROOF PANELS AND EXPOSED CMU SURFACES TO BE SEALED TO PREVENT MOISTURE PENETRATION.
10. ALL CONSTRUCTION TO COMPLY WITH LOCAL CODES AND ORDINANCES.
11. CONTRACTOR SHALL OBTAIN ALL REQUIRED STATE AND LOCAL BUILDING PERMITS AND INSPECTIONS TO LEGALLY COMPLETE THE WORK IN ACCORDANCE TO THE PLANS AND SPECIFICATIONS

CODE REFERENCE

2021 - IBC - INTERNATIONAL BUILDING CODE
2021 - FEMA P-361
2020 - ICC 500
2024 - UNIFORM PLUMBING CODE
2023 - NATIONAL ELECTRICAL CODE
2010 - ADA STANDARDS FOR ACCESSIBLE DESIGN

BUILDING DATA

864 GROSS SQ. FT.
SINGLE STORY
TYPE OF CONSTRUCTION - IB
OCCUPANCY CLASSIFICATION - A3

L.L. JIRSA ARCHITECT
P.O. BOX 925
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605-770-6424

REGISTERED ARCHITECT
REG. NO. 4999
LARRY L. JIRSA
SOUTH DAKOTA
12-31-25

PROJECT NAME
CITY OF ALEXANDRIA
TORNADO SAFE ROOM
SPORTS FIELD COMPLEX
ALEXANDRIA, SD

REVISIONS

NO	DATE	DESCRIPTION

PROJECT NO.
51-2025

DATE
DEC. 31, 2025

SHEET TITLE
COVER SHEET

SHEET NO.
CS-1

Ex. 4" PVC Drain Tile
Inv = 1348.01

Ex. 12" CMP Culvert
N Inv = 1346.60
S Inv = 1346.36

Gravel Surfacing

Asphalt Surfacing

Existing Drain Field Approx. Location Size Unknown

Existing Concrete

Buried Sewer Access

Gravel Surfacing

Asphalt Surfacing

Moveable Equipment Shed (Moved By Others)

Concession Stand

Concrete Surfacing

Water Meter Pit

French Drain Inlet

Power

Location Unknown
Not Field Located

Bleachers

Dugout

Gravel Surfacing

Stairs

Grandstands

Stairs

Water Spigot

Note: Underground power was not located at the time of the Survey.

G:\Files\CAD\Land Project R2 (Job #'s 16000+)\16722-Jirsa Alexandria Tornado Safe Room\16722-Jirsa Alexandria Tornado Safe Room.dwg, Topo, 12/23/2025 3:10:39 PM, jasonk

SPN & Associates

Engineers - Planners - Surveyors

2100 North Sanborn Boulevard - P.O. Box 398
Mitchell, South Dakota 57301-0398
Phone: (605) 996-7761 - Fax: (605) 996-0015

Certificate

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of South Dakota.

PROFESSIONAL ENGINEER
REG. NO. 8471
JEFFREY P. MCCORMICK
SOUTH DAKOTA
12-31-25

Revisions

11/07/25	Changes Per Peer Review Dated 10/17/25. Revisions By NAP.

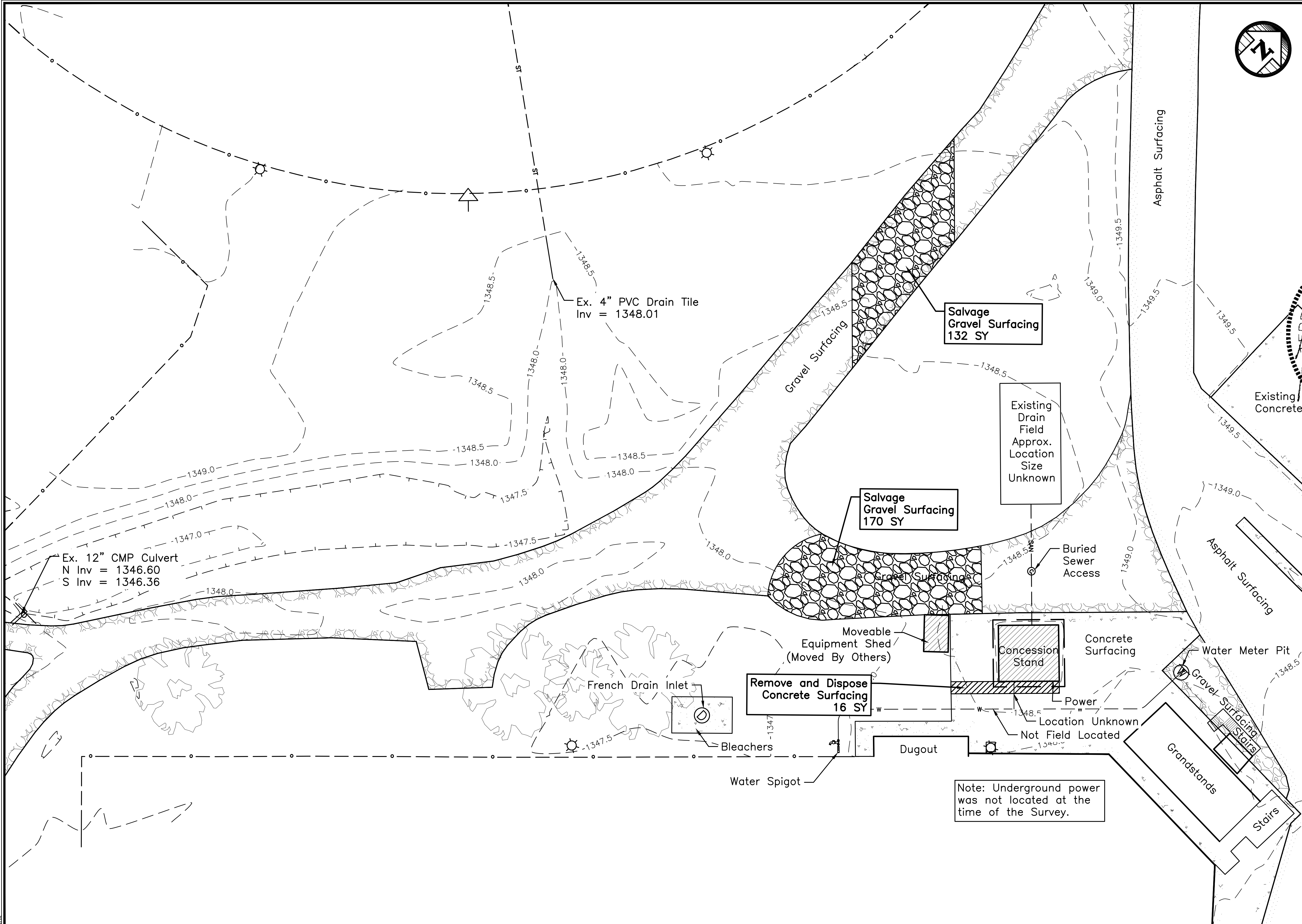
Plan Horiz. Scale:	1" = 30'
Drawn By:	NAP
Checked By:	JPM
Date:	12/31/2025
Project No.:	16722
File Name:	16722-...Tornado Safe Room

Project Name:
City of Alexandria Tornado Safe Room

Located in:
Alexandria, South Dakota

Sheet Name:
Existing Topographic Survey

Sheet Number:
C-1



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Registered Professional Engineer — Reg. No. 8471 — Jeffrey P. McCormick — South Dakota — 12-31-25

Revisions

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Plan Horiz. Scale:	1" = 30'
Drawn By:	NAP
Checked By:	JPM
Date:	12/31/2025
Project No.:	16722
File Name:	16722-...Tornado Safe Room

Project Name:
City of Alexandria Tornado Safe Room

Located in:
Alexandria, South Dakota

Sheet Name:
Removal Plan

Sheet Number:
C-2

G:\Files\CAD\Land Project R2 (Job #'s 16000+)\16722-Jirsa Alexandria Tornado Safe Room\16722-Jirsa Alexandria Tornado Safe Room.dwg, Removal, 12/23/2025 3:10:57 PM, jasonk

Place and Reshape Gravel Surfacing 132 SY (Match Existing Depth, or 4" Minimum Depth)

Ex. 4" PVC Drain Tile Inv = 1348.01

Gravel Surfacing

S A N I T A R Y S E W E R

Asphalt Surfacing

Existing Concrete

Existing Drain Field Approx. Location Size Unknown

Place and Reshape Gravel Surfacing 115 SY (Match Existing Depth, or 4" Minimum Depth)

Buried Sewer Access

4" Concrete Sidewalk with 2" Granular Cushion 475 SF

5.00'

43.33'

33.33'

Proposed Building Tornado Safe Room FFE: 1348.88

26.00'

31.00'

10.0'

12.94'

Concrete Surfacing

Concession Stand

Water Meter Pit

Gravel Surfacing

Asphalt Surfacing

Power

Location Unknown Not Field Located

French Drain Inlet

Bleachers

Dugout

Water Spigot

Grandstands

Stairs

Asphalt Parking Lot

G:\Files\CAD\Land Project R2 (Job #'s 16000+)\16722-Jirsa Alexandria Tornado Safe Room\16722-Jirsa Alexandria Tornado Safe Room.dwg, Site Plan, 12/23/2025 3:11:21 PM, jasonk

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JEFFREY P. MCCORMICK
SOUTH DAKOTA
12-31-25

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Plan Horiz. Scale:	1" = 30'
Drawn By:	NAP
Checked By:	JPM
Date:	12/31/2025
Project No.:	16722
File Name:	16722-...Tornado Safe Room

Project Name:
City of Alexandria Tornado Safe Room

Located in:
Alexandria, South Dakota

Sheet Name:
Site Plan

Sheet Number:
C-3

Septic Tank Notes:
–The septic tank shall be water tight.
–Cement powder shall be type II.
–Joints between the tank, lid, cones, and casting shall be sealed with butyl rubber joint sealant.
–1' depth of 1" crushed rock shall be placed below the tank prior to installation.
–The tank shall be 1,200 gallon capacity as manufactured by J&D Precast Inc. or approved equal.
–The septic tank shall be installed by a state–certified installer meeting the SD Administrative Rules, Chapter 74.53 as well as Hanson County Planning and Zoning Requirements.
–The septic tank shall be constructed and installed as per the requirements in SD Administrative Rule, Chapter 74.53

Ex. 4" PVC Drain Tile
Inv = 1348.01

(3) 4" Inspection Cleanout w/ Neenah Casting

(3) 100 LF 4" Perforated PVC @ 0.0% Slope

100.00'

9.00' 9.00'

(2) 9 LF 4" Perforated PVC @ 0.0% Slope

20 LF 4" PVC @ 2% Minimum Slope

1,200 Gallon Septic Tank
Rim Elev: 1348.30
SE Inv: Field Verify
NW Inv: Field Verify

20 LF 4" PVC @ 2% Minimum Slope

Cleanout

Proposed Building
Tornado Safe Room
FFE: 1348.88

Gravel Surfacing

Existing Drain Field Approx. Location Size Unknown

Asphalt Surfacing

Buried Sewer Access

Concession Stand

Concrete Surfacing

Existing Concrete

Water Meter Pit

Gravel Surfacing

Stairs

Asphalt Surfacing

Power
Location Unknown

Not Field Located

French Drain Inlet

Bleachers

Water Spigot

Dugout

Grandstand

SAN

UE

W

G:\Files\CAD\Land Project R2 (Job #'s 16000+)\16722-Jirsa Alexandria Tornado Safe Room\16722-Jirsa Alexandria Tornado Safe Room.dwg, Utility Plan, 12/23/2025 3:10:44 PM, jasonk

SPN & Associates
Engineers - Planners - Surveyors
2100 North Sanborn Boulevard - P.O. Box 398
Mitchell, South Dakota 57301-0398
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JEFFREY P. MCCORMICK
SOUTH DAKOTA
12-31-25

Revisions

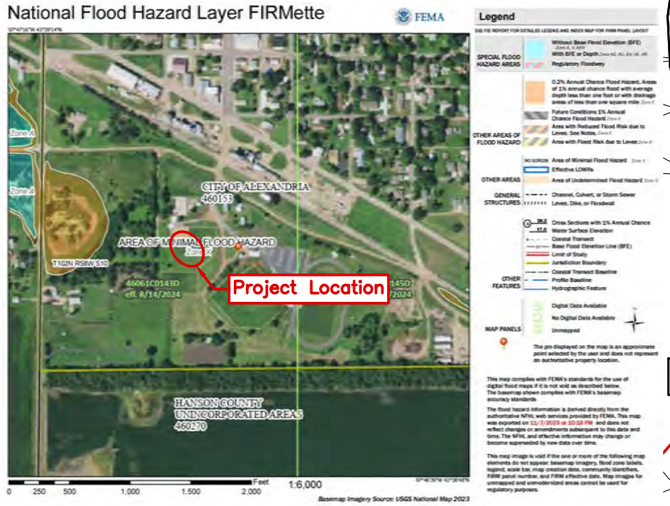
11/07/25	Changes Per Peer Review Dated 10/17/25. Revisions By NAP.

Plan Horiz. Scale:	1" = 20'
Drawn By:	NAP
Checked By:	JPM
Date:	12/31/2025
Project No.:	16722
File Name:	16722–...Tornado Safe Room

Project Name:
City of Alexandria Tornado Safe Room
Located in:
Alexandria, South Dakota

Sheet Name:
Utility Plan

Sheet Number:
C-4



Flood Elevation

100–Year Flood Elevation Approximately = 1343.00

Limits of Construction

Existing Drain Field Approx. Location Size Unknown

Buried Sewer Access

MATCH EXISTING GRV: 1348.10

MATCH EXISTING GRV: 1348.07

MATCH EXISTING GRV: 1348.19

MATCH EXISTING GRV: 1348.50

MATCH EXISTING GRV: 1348.78

MATCH EXISTING GRV: 1347.73

MATCH EXISTING GRV: 1347.36

MATCH EXISTING GRV: 1347.46

GR: 1348.36

GR: 1347.50

1348.5

1348.0

1347.5

TW: 1348.78

TW: 1348.87

TW: 1348.74

TW: 1348.70

TW: 1348.58

TW: 1348.49

TW: 1348.43

TW: 1348.31

TW: 1348.24

MATCH EXISTING TW: 1348.70

MATCH EXISTING TW: 1348.07

Proposed Building
Tornado Safe Room
FFE: 1348.88

Concession Stand

Accessible Route

Power Location Unknown

Not Field Located

French Drain Inlet

Bleachers

Water Spigot

Dugout

SAN

UE

W

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JEFFREY P. MCCORMICK
SOUTH DAKOTA
12-31-25

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Plan Horiz. Scale:	1" = 10'
Drawn By:	NAP
Checked By:	JPM
Date:	12/31/2025
Project No.:	16722
File Name:	16722–...Tornado Safe Room

Project Name:
City of Alexandria Tornado Safe Room

Located in:
Alexandria, South Dakota

Sheet Name:
Grading Plan

Sheet Number:
C-5

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Seed, Fertilize and Mulch
177 SY

Ex. 4" PVC Drain Tile
Inv = 1348.01

Gravel Surfacing

Asphalt Surfacing

Existing
Concrete

Existing
Drain
Field
Approx.
Location
Size
Unknown

Seed, Fertilize and Mulch
463 SY

Buried
Sewer
Access

Proposed Building
Tornado Safe Room
FFE: 1348.88

Concession
Stand

Concrete
Surfacing

Water Meter Pit

Silt Fence
50 LF

French Drain Inlet

Power

Location Unknown
Not Field Located

Bleachers

Dugout

Type 3 Erosion Control Blanket
Seed, Fertilize and Mulch
160 SY

Water Spigot

Grandstands

Stairs

Asphalt Parking
Lot

SPN & Associates
Engineers - Planners - Surveyors
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JEFFREY P. MCCORMICK
SOUTH DAKOTA
12-31-25

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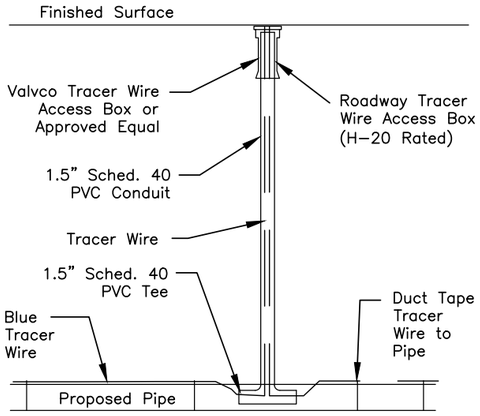
Plan Horiz. Scale:	1" = 30'
Drawn By:	NAP
Checked By:	JPM
Date:	12/31/2025
Project No.:	16722
File Name:	16722-...Tornado Safe Room

Project Name:
City of Alexandria Tornado Safe Room
Located in:
Alexandria, South Dakota

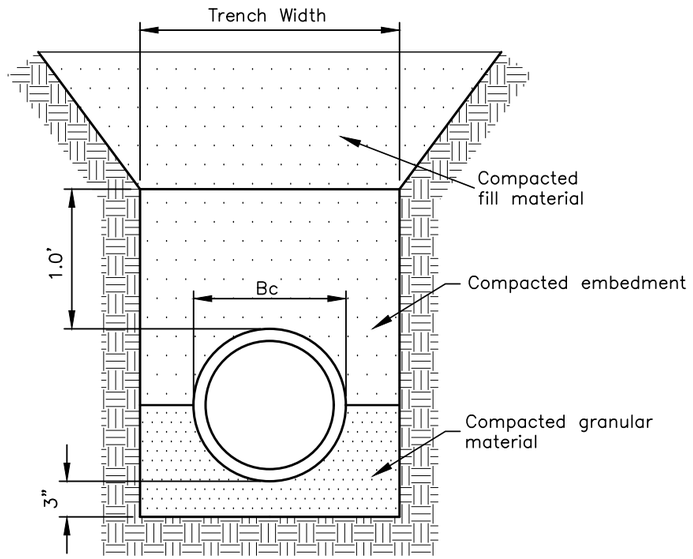
Sheet Name:
Erosion Control Plan

Sheet Number:
C-6



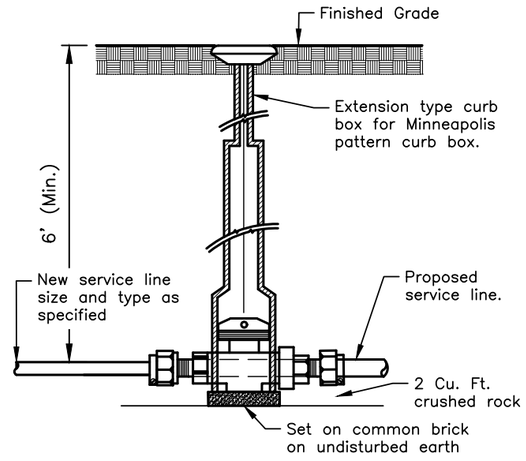
TRACER WIRE CONDUIT AND ACCESS BOX INSTALLATION

SCALE: NONE



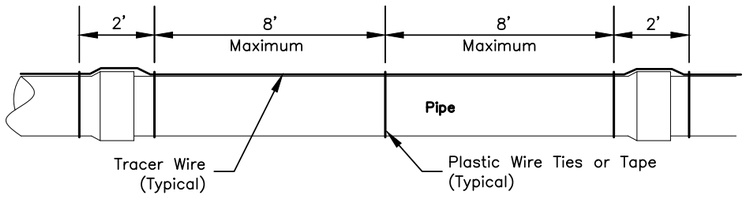
BEDDING DETAIL (PVC PIPE)

SCALE: NONE



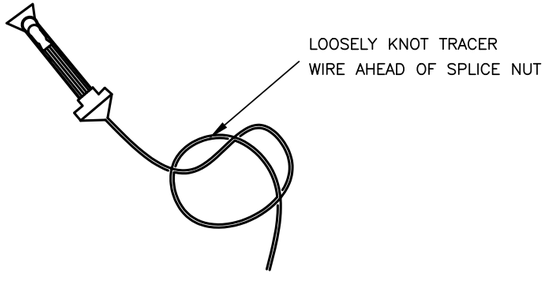
CURB STOP DETAIL

SCALE: NONE



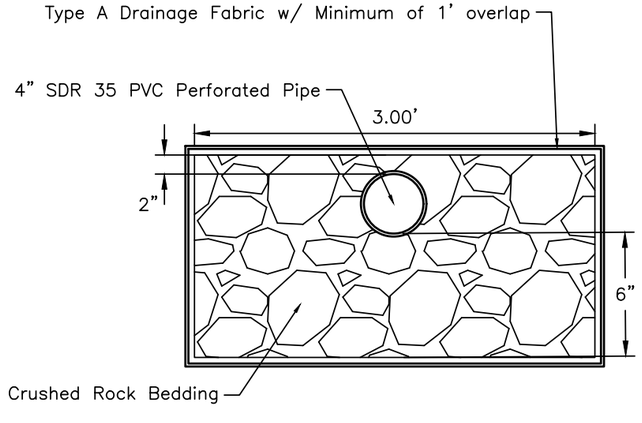
TRACER WIRE INSTALLATION

SCALE: NONE



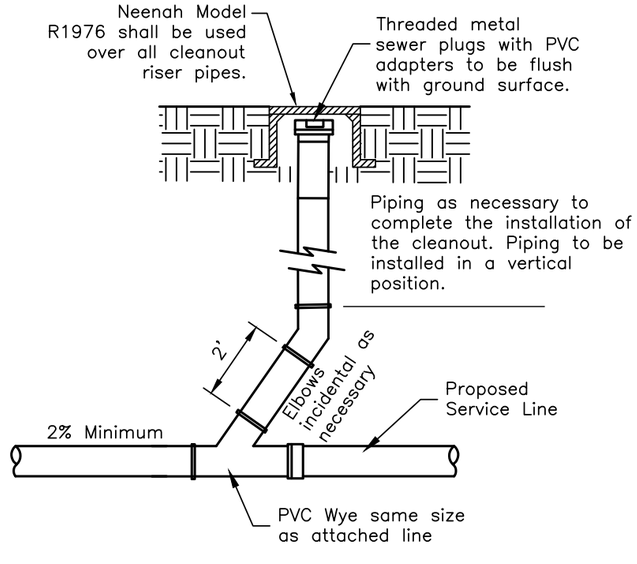
TRACER WIRE SPLICE DETAIL

SCALE: NONE



ABSORPTION TRENCH

SCALE: NONE



TYPICAL CLEANOUT DETAIL

SCALE: NONE

SPN & Associates

Engineers - Planners - Surveyors

2100 North Sanborn Boulevard - P.O. Box 398
Mitchell, South Dakota 57301-0398
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JEFFREY P. MCCORMICK
SOUTH DAKOTA
12-31-25

Revisions

11/07/25	Changes Per Peer Review Dated 10/17/25. Revisions By NAP.

Plan Horiz. Scale:	NONE
Drawn By:	NAP
Checked By:	JPM
Date:	12/31/2025
Project No.:	16722
File Name:	16722–...Tornado Safe Room

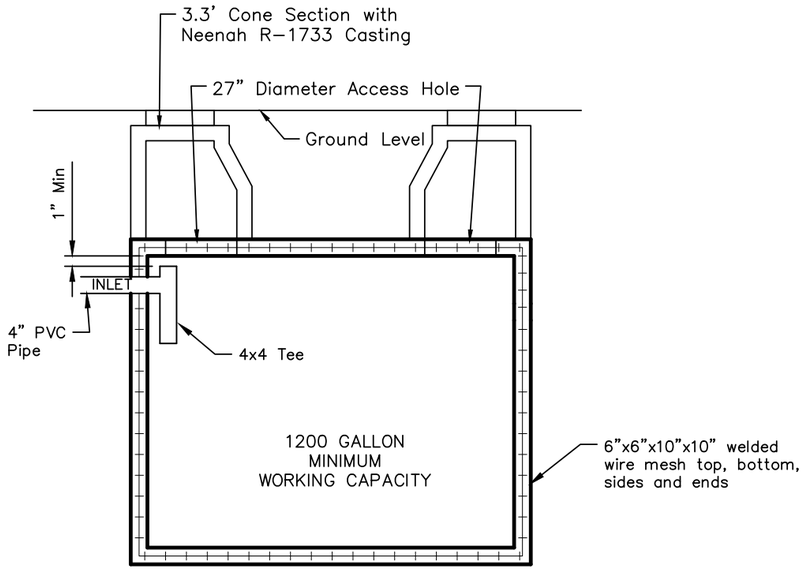
Project Name:
City of Alexandria Tornado Safe Room

Located in:
Alexandria, South Dakota

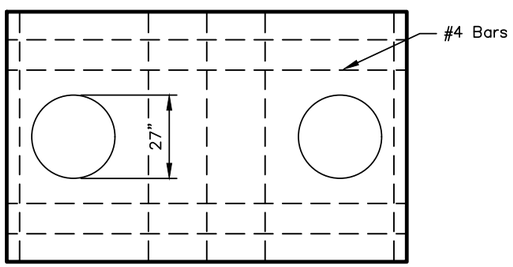
Sheet Name:
Details

Sheet Number:
C-7

G:\Files\CAD\Land Project R2 (Job #'s 16000+)\16722-Jirsa Alexandria Tornado Safe Room\16722-Jirsa Alexandria Tornado Safe Room.dwg, Details, 12/23/2025 3:11:35 PM, Jasonk

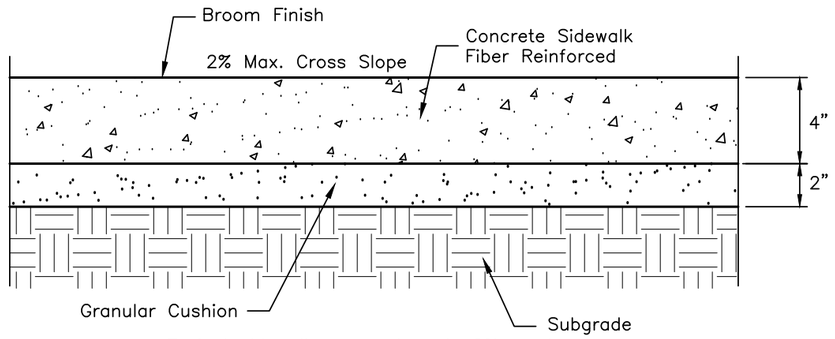


- The septic tank shall be water tight.
- Cement powder shall be type II.
- The tank wall thickness shall be 6".
- Joints between the tank, lid, cones, and casting shall be sealed with butyl rubber joint sealant.
- 1' depth of 1" crushed rock shall be placed below the tank prior to installation.
- The septic tank shall be installed a minimum of 10' from the building.



SEPTIC TANK

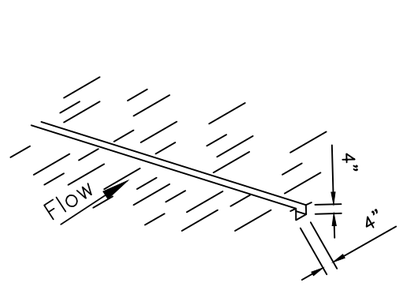
SCALE: NONE



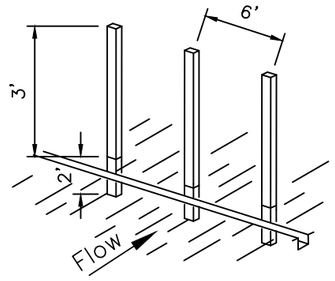
Typical sidewalk cross slope is 2% maximum. Joint patterns shall match existing patterns as nearly as possible.

TYPICAL SIDEWALK SECTION

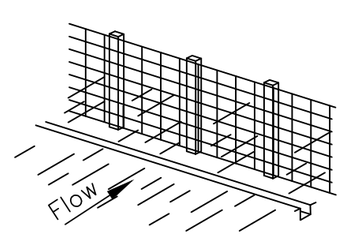
SCALE: NONE



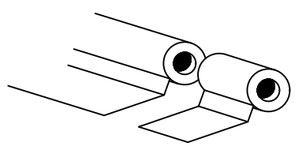
① EXCAVATE TRENCH



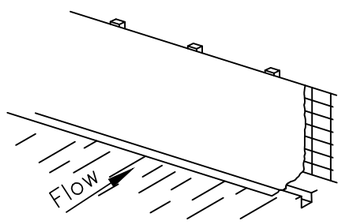
② DRIVE WOOD OR METAL POSTS



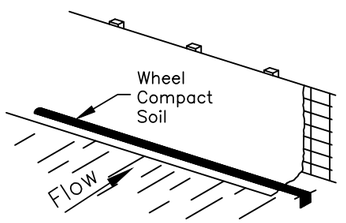
③ ATTACH WOVEN WIRE OR OTHER DURABLE MATERIAL



④ CUT LENGTH OF SILT FENCE FABRIC



⑤ ATTACH FABRIC



⑥ BACKFILL TRENCH

NOTE:
Fabric shall be attached with a total of 4 plastic or wire ties per post. Three ties shall be used at the top and one shall be appropriately placed at midpoint of the post.

SILT FENCE CONSTRUCTION

SCALE: NONE

SPN & Associates

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Revisions

11/07/25	Changes Per Peer Review Dated 10/17/25. Revisions By NAP.

Plan Horiz. Scale:	NONE
Drawn By:	NAP
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Date:	12/31/2025
Project No.:	16722
File Name:	16722-...Tornado Safe Room

Project Name:
City of Alexandria Tornado Safe Room

Located in:
Alexandria, South Dakota

Sheet Name:
Details

Sheet Number:
C-8

GENERAL NOTES AND SPECIFICATIONS

1. UNLESS SPECIFIED OTHERWISE, ALL IMPROVEMENTS SHALL CONFORM TO THE CURRENT ADDITION OF THE SDDOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES.

2. UNDERGROUND UTILITIES WERE NOT ALL LOCATED. UTILITY LOCATIONS SHOULD BE VERIFIED IN THE FIELD BEFORE CONSTRUCTION. IT IS THE CONTRACTOR'S RESPONSIBILITY TO CONTACT SOUTH DAKOTA ONE CALL AND ALL UTILITY COMPANIES PRIOR TO BEGINNING ANY WORK.

3. THE SITE SHALL BE CLEARED AS MAY BE NOTED ON THE PLANS OF ALL OBSTRUCTIONS AND DELETERIOUS MATERIAL SUCH AS FOUNDATIONS, LOGS, SHRUBS, BRUSH, WEEDS, STUMPS, OTHER VEGETATION AND ACCUMULATION OF RUBBISH OF WHATEVER NATURE. THIS MATERIAL SHALL BE SATISFACTORILY DISPOSED OF OFF-SITE.

4. CONTRACTOR SHALL PROVIDE AND INSTALL EROSION CONTROL DEVICES (SILT FENCE OR OTHER METHODS) AT LIMITS OF CONSTRUCTION AND LOCATIONS THAT RUNOFF LEAVES THE SITE PRIOR TO CONSTRUCTION, AND SHALL MAINTAIN SAID EROSION CONTROL DEVICES DURING CONSTRUCTION, ALL IN CONFORMANCE WITH CURRENT LOCAL, COUNTY AND STATE CRITERIA.

5. THE CONTRACTOR SHALL PROVIDE FOR AND MAINTAIN ALL EXISTING DRAINAGE WAYS, STORM WATERS AWAY FROM EXISTING BUILDINGS AND EXPOSED SURFACES OR PROVIDE IMMEDIATE PUMPING OF PONDED AREAS ON THE WORK SITE. NO COMPENSATION WILL BE MADE FOR DAMAGE RESULTING FROM IMPROPER DRAINAGE DURING CONSTRUCTION.

6. THE CONTRACTOR WILL BE RESPONSIBLE FOR FURNISHING ANY TRAFFIC CONTROL DEVICES TO SAFELY CONTROL TRAFFIC THROUGH OR AROUND THE PROJECT SITE. THE CONTRACTOR SHALL FURNISH AND INSTALL TRAFFIC CONTROL DEVICES IN ACCORDANCE WITH THE MANUAL ON UNIFORM TRAFFIC CONTROL DEVICES (MUTCD).

7. NO CONCRETE WASHOUT OR WASHOFF SHALL BE ALLOWED ON SITE, UNLESS A WRITTEN PLAN AND PROCEDURE HAS BEEN PROVIDED FOR THE CAPTURE AND TREATMENT OF THE WASH WATER.

8. ANY AND ALL AREAS THAT WILL REMAIN IDLE FOR MORE THAN 14 DAYS SHALL BE TEMPORARILY STABILIZED.

9. AS SOON AS FINAL GRADING IS COMPLETED THE SITE SHALL BE STABILIZED AND FINAL SEEDING COMPLETED.

10. MATERIALS AND DEBRIS SHALL BE REMOVED FROM THE PROJECT SITE AND DISPOSED OF AT LOCATIONS OUTSIDE THE PROJECT LIMITS. THE CONTRACTOR SHALL BE REQUIRED TO LOCATE A DISPOSAL SITE AT HIS OWN EXPENSE.

11. ALL CONCRETE USED FOR THIS PROJECT SHALL BE CLASS M6 AND SHALL CONFORM TO THE CONSTRUCTION REQUIREMENTS OF THE 2025 EDITION OF THE SD DOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES. ALL EXTERIOR CONCRETE SURFACES SHALL HAVE A LIGHT BROOM FINISH UNLESS OTHERWISE DIRECTED. THE 28-DAY COMPRESSIVE STRENGTH SHALL NOT BE LESS THAN 4,000 PSI.

12. PREFORMED EXPANSION JOINT FILLER SHALL CONFORM TO THE REQUIREMENTS OF AASHTO M213. ALL EXPANSION JOINTS SHALL BE SEALED WITH LOW MODULUS SILICONE SEALANT CONFORMING TO THE REQUIREMENTS OF THE 2025 EDITION OF THE SD DOT STANDARD SPECIFICATIONS FOR ROADS AND BRIDGES. JOINT SEALANT SHALL BE INSTALLED IN SUCH A MANNER AS TO FILL THE ENTIRE VOID WHERE IT IS BEING APPLIED. JOINT SEALANT SHALL BE FINISHED OFF TO HAVE A SMOOTH SLIGHTLY CONCAVE SURFACE. JOINT SEALANT THAT DOES NOT PROPERLY ADHERE TO THE SURROUNDING SURFACES SHALL BE REMOVED AND REPLACED AT NO ADDITIONAL COST TO THE OWNER.

13. GRAVEL BASE COURSE AND CUSHION

THE AGGREGATE FOR GRANULAR BASES SHALL CONFORM TO THE FOLLOWING GRADATIONS:

	Gravel Cushion	Base Course
Processing Required	Crushed	Crushed
	PASSING PERCENT BY WEIGHT	
2" Sieve	-----	----
1" Sieve	-----	100
¾" Sieve	100	80-100
½" Sieve	------	68-91
No. 4 Sieve	50-75	46-70
No. 8 Sieve	38-64	34-58
No. 40 Sieve	15-35	13-35
No. 200 Sieve	3-12	3-12
Liquid Limit Max	25	25
Plasticity Index	0-6	0-6
L.A. Abrasion Test Loss Maximum	40	40

THE AMOUNT OF CRUSHED PARTICLES IN THE CRUSHED ROCK SHALL CONSIST OF NOT LESS THAN 25% OF THE TOTAL WEIGHT. A CRUSHED PARTICLE SHALL BE DEFINED TO BE A FRAGMENT OF STONE SHOWING AT LEAST ONE FRESHLY FRACTURED FACE. THE CRUSHED ROCK PRODUCED FOR USE IN MAKING THE MINERAL AGGREGATE SHALL CONTAIN AT LEAST 30% BUT NOT MORE THAN 50% BY WEIGHT OF AIR-DRIED MATERIAL RETAINED ON A ¼-INCH SQUARE OPENING SIEVE.

SPN & Associates
Engineers - Planners - Surveyors
2100 North Sanborn Boulevard - P.O. Box 398
Mitchell, South Dakota 57301-0398
Phone: (605) 996-7761 - Fax: (605) 996-0015

Certificate

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REGISTERED PROFESSIONAL ENGINEER
REG. NO. 8471
JEFFREY P. MCCORMICK
SOUTH DAKOTA
12-31-25

Revisions

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GENERAL NOTES AND SPECIFICATIONS

THE SAMPLING AND TESTING OF THE MATERIALS SHALL BE DONE IN ACCORDANCE WITH THE FOLLOWING METHODS AND PROCEDURES:

	Test Procedure
Sampling	SD 201
Gradation	SD 202
Liquid Limit and Plasticity Index	SD 207
L.A. Abrasion Test	ASSHTO T96
Crushed Particle Test	SD 211

COMPACTION AND WATERING SHALL BE CONTINUED ON ALL AREAS OF THE BASE COURSE AND GRAVEL SURFACING MATERIAL UNTIL IT HAS BEEN COMPACTED TO 97% OF MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM D698 (STANDARD PROCTOR) AT A MOISTURE CONTENT BETWEEN OPTIMUM AND 3% OVER OPTIMUM.

GRADING

1. UPON COMPLETION OF CLEARING AND GRUBBING, THE CONTRACTOR MAY BEGIN EXCAVATION. TOPSOIL SHALL BE SALVAGED BY THE CONTRACTOR TO BE RE-USED FOR ALL AREAS TO BE RESEEDED. ALL AREAS REQUIRING TOPSOIL SHALL BE OVER-EXCAVATED OR UNDER-FILLED TO ALLOW FOR PLACEMENT OF A MINIMUM OF 4" OF TOPSOIL.

2. THE CONTRACTOR SHALL INFORM AND SATISFY HIMSELF AS TO THE CHARACTER, QUANTITY AND DISTRIBUTION OF ALL MATERIAL TO BE EXCAVATED. EXCAVATION OPERATIONS SHALL BE CONDUCTED SO THAT MATERIALS OUTSIDE THE LIMITS OF CONSTRUCTION WILL NOT BE DISTURBED.

3. UPON COMPLETION OF THE EXCAVATION TO THE SUBGRADE, THE CONTRACTOR SHALL SCARIFY THE SUBGRADE TO A MINIMUM DEPTH OF 8" AND RE-COMPACT THE SUBGRADE.

4. COMPACTION AND WATERING SHALL BE CONTINUED ON ALL AREAS OF THE SUBGRADE UNTIL IT HAS BEEN COMPACTED TO 95% OF MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM D698 (STANDARD PROCTOR). THE MOISTURE CONTENT OF THE COMPACTED SOIL SHALL BE BETWEEN 2% BELOW OPTIMUM AND 2% OVER OPTIMUM.

5. FINAL PLACEMENT OF TOPSOIL SHALL INCLUDE FILLING LOW AREAS, CUTTING DOWN HIGH SPOTS AND FINISH GRADING TO CREATE SMOOTH UNIFORM GRADES ACCEPTABLE TO THE OWNER AND PROJECT MANAGER. TOPSOIL SHALL BE LIGHTLY COMPACTED. ALL ROCKS, STICKS AND OTHER DEBRIS GREATER THAN ONE INCH IN ANY DIMENSION SHALL BE REMOVED FROM THE TOPSOIL PRIOR TO SEEDING.

SIDEWALK

1. SIDEWALKS SHALL BE ADA COMPLIANT AND INSTALLED AT THE LOCATIONS AND AT THE ELEVATIONS SHOWN ON THE PLANS. CONTRACTION JOINT SHALL BE CONSTRUCTED SUCH THAT WHEN COMPLETED, THE PANELS FORMED BY THE JOINTING WILL BE SQUARE IN SHAPE UNLESS OTHERWISE DIRECTED BY THE PROJECT MANAGER. EXPANSIONS SHALL BE INSTALLED AROUND THE STRUCTURE AND AT INTERVALS NOT GREATER THAN 150'. THE SIDEWALK SHALL BE PLACED ON A MINIMUM OF TWO (2) INCHES OF GRAVEL CUSHION.

EROSION CONTROL

1. THE CONTRACTOR WILL BE RESPONSIBLE TO COMPLETE THE MONITORING, REPORTING, AND MAINTENANCE OF THE STORM WATER POLLUTION PREVENTION PLAN AS REQUIRED BY THE STORM WATER DISCHARGE PERMIT.

2. ADDITIONAL EROSION AND SEDIMENT CONTROL DEVICES SHALL BE INSTALLED AS NECESSARY TO PREVENT SEDIMENT AND POLLUTANTS FROM LEAVING THE SITE.

3. SEEDING LIMITS SHALL BE ADJUSTED TO AREA DISTRUBED BY CONTRACTOR AS NECESSARY TO COMPLETE THE WORK.

4. EROSION CONTROL BLANKETS SHALL BE INSTALLED AT LOCATIONS PROVIDED IN THE PLANS OR AS DIRECTED BY THE PROJECT MANAGER. THE APPROVED PRODUCT LIST FOR EROSION CONTROL BLANKET IS PROVIDED BELOW.

Type 3 Erosion Control Blanket	AEC Premier Straw/Coconut	American Excelsior Company Arlington TX (800) 777-7645 www.curlex.com
Type 3 Erosion Control Blanket	Curlex III	American Excelsior Company Arlington TX (800) 777-7645 www.curlex.com
Type 3 Erosion Control Blanket	Landlok CS2	Propex Geosynthetics Chattanooga, TN (800) 621-1273 www.geotextile.com
Type 3 Erosion Control Blanket	SC150	North American Green Evansville IN (800) 772-2040 www.nagreen.com
Type 3 Erosion Control Blanket	SC3000	Enviroscape ECM, Ltd. Oakwood OH (888) 550-1999 www.strawblanket.com
Type 3 Erosion Control Blanket	SC32	erosioncontrolblanket.com St Andrews MB (866) 280-7327 http://www.erosioncontrolblanket.com
Type 3 Erosion Control Blanket	SC400	Nedia Enterprises, Inc. Ashburn VA (571) 223-0200 http://www.nedia.com
Type 3 Erosion Control Blanket	WintersChoice	Winters Excelsior Company Birmingham AL (205) 908-7170 www.WinterExcelsior.com

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GENERAL NOTES AND SPECIFICATIONS

SEEDING

1. THE CONTRACTOR SHALL PROVIDE FRESH, CLEAN, NEW CROP SEED, COMPLYING WITH THE TOLERANCES FOR PURITY AND GERMINATION ESTABLISHED BY THE OFFICIAL SEED ANALYSIS OF NORTH AMERICA AND THE SOUTH DAKTOA SEED LAW. SEED SHALL NOT EXCEED 1% WEED CONTENT. PROVIDE SEED OF THE GRASS SPECIES AND PROPORTIONS AS FOLLOWS, OR APPROVED EQUAL:

GRASS VARIETY	% OF MIX (BY WEIGTH/PURE LIVE SEED)
CREEPING RED FESCUE	33.3
PERENNIAL RYE GRASS	33.3
SD COMMON KENTUCKY BLUEGRASS	33.3

2. FERTILIZER SHALL BE PLACED AS RECOMMENDED BY THE SEEDER.

TRACER WIRE

1. TRACER WIRE SHALL BE A DIRECT BURY WIRE, 12 AWG SOLID STRAND SOFT DRAWN COPPER PER ASTM B-3 OR B-8. THE BREAKING POUNDS OF THE WIRE SHALL BE A MINIMUM OF 380. ALL WIRE SHALL BE SPARK TESTED AT 7500 VAC.

2. INSULATION: CONDUCTOR SHALL BE INSULATED WITH LOW DENSITY HIGH MOLECULAR WEIGHT POLYETHYLENE INSULATION SUITABLE FOR DIRECT BURY APPLICATIONS PER ASTM D-1248. THE MINIMUM INSULATION THICKNESS SHALL BE 0.03.

   a. FOR SANITARY SEWER THE COLOR OF INSULATION SHALL BE GREEN WITH A PRINT LINE SAYING "SEWER".

   b. FOR WATER MAIN THE COLOR OF INSULATION SHALL BE BLUE WITH A PRINT LINE SAYING "WATER".

3. SPLICES AND CONNECTORS SHOULD BE CAPABLE OF HANDLING FROM 2 TO 4 WIRES PER CONNECTOR AND DESIGNATED AS "WATER-PROOF". PVC ADHESIVES OR SEALING COMPOUNDS ARE NOT ACCEPTABLE.

4. TRACER WIRES SHALL BE TERMINATED USING SMALL TERMINAL BOXES SUITABLE FOR FLUSH BURY WITH A 2½-INCH CAST IRON TOP, INTEGRAL STAINLESS TERMINALS AND A MINIMUM 12-INCH LONG ABS BOTTOM SECTION. THE TERMINAL BOXES SHALL BE RATED FOR AN H-20 LOAD.

SANITARY SEWER SERVICE

1. POLYVINYL CHLORIDE PIPE AND FITTINGS SHALL BE SDR 35 CONFORMING TO THE REQUIREMENTS OF ASTM SPECIFCATION D 3034 FOR RIGID POLY (VINYL CHLORIDE) SEWER PIPE. GASKETED TYPE JOINTS SHALL BE RUBBER GASKETS CONFORMING TO THE REQUIREMENTS OF ASTM F-477.

2. BEDDING AND INITIAL BACKFILL OVER SANITARY SEWER SERVICES SHALL BE 3/4" ROCK WITH 95% PASSING THE 3/4" SIEVE AND <5% PASSING THE NO. 4 SIEVE.

3. COMPACTION AND WATERING SHALL BE CONTINUED ON ALL AREAS OF THE TRENCH UNTIL IT HAS BEEN COMPACTED TO 95% OF MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM D698 (STANDARD PROCTOR). THE MOISTURE CONTENT OF THE COMPACTED SOIL SHALL BE BETWEEN 2% BELOW OPTIMUM AND 2% OVER OPTIMUM.

4. SANITARY SEWER SERVICES SHALL MEET SD DANR RECOMMENDED DESIGN CRITERIA FOR MINIMUM SLOPE.

WATER SERVICE

1. WATER SERVICE PIPE TO BE INSTALLED SHALL BE HDPE WATER SERVICE PIPE PRESSURE CLASS 200, SDR 7 PE-3408 CONFORMING TO ASTM D2239 TUBING OR CROSSLINKED POLYETHYLENE (PEXa) CONFORMING TO AWWA C904, ASTM F876, CSA B137.5, NSF 14, NSF 61 AND PPI TR-4 WITH A PRESSURE RATING OF 200 PSI.

2. COUPLINGS FOR WATER SERVICE PIPE AND TUBING SHALL BE BRASS BODY WITH PACK-JOINT CONNECTIONS ON BOTH ENDS. PACK-JOINT CONNECTIONS SHALL BE APPROPRIATE FOR THE SERVICE LINE MATERIALS SIZE AND TYPE TO BE CONNECTED.

3. BEDDING AND INITIAL BACKFILL OVER WATER SERVICES SHALL BE SAND WITH NO ROCK LARGER THAN ONE (1") INCH IN DIAMETER.

4. COMPACTION AND WATERING SHALL BE CONTINUED ON ALL AREAS OF THE TRENCH UNTIL IT HAS BEEN COMPACTED TO 95% OF MAXIMUM DRY DENSITY IN ACCORDANCE WITH ASTM D698 (STANDARD PROCTOR). THE MOISTURE CONTENT OF THE COMPACTED SOIL SHALL BE BETWEEN 2% BELOW OPTIMUM AND 2% OVER OPTIMUM.

5. WATER PIPE SHALL BE BURIED A MINIMUM OF SIX (6') FEET TO THE TOP OF THE PIPE.

SEPTIC SYSTEM

1. THE SEPTIC TANK SHALL BE INSTALLED ON A MINIMUM 12" DEPTH OF COMPACTED ONE (1") INCH NOMINAL CRUSHED ROCK.

PERFORATED PVC SEWER PIPE

1. POLYVINYL CHLORIDE (PVC) GRAVITY SEWER PIPE SHALL BE SDR 35 CONFORMING TO THE REQUIREMENTS OF ASTM SPECIFICATION D 3034 FOR RIGID POLY (VINYL CHLORIDE) SEWER PIPE.

2. SOLVENT CEMENT FOR PVC PIPE JOINTS SHALL CONFORM TO ASTM SPECIFICATION ASTM D 2564 AND SHALL BE APPLIED IN CONFORMANCE WITH ASTM D 2855.

3. GASKETED TYPE JOINTS SHALL BE MADE WITH RUBBER GASKETS CONFORMING TO THE REQUIREMENTS OF ASTM F-477.

4. THE PIPE SHALL BE CAPABLE OF WITHSTANDING TRENCH LOADS IMPOSED ON IT.

5. PERFORATIONS IN PVC PIPE SHALL BE CIRCULAR WITH A DIAMETER OF NOT LESS THAN 3/16 INCHES NOR MORE THAN 3/8 INCHES IN DIAMETER. PERFORATIONS SHALL BE ARRANGED APPROXIMATELY 3 INCHES APART, CENTER TO CENTER, ALONG ROWS PARALLEL TO THE LONGITUDINAL AXIS OF THE PIPE. THE ROWS SHALL BE APPROXIMATELY 1-1/2 INCHES APART AND ARRANGED IN A STAGGERED PATTERN SUCH THAT ALL PERFORATIONS LIE AT THE MID-POINT BETWEEN PERFORATIONS IN ADJACENT ROWS. THE ROWS SHALL BE SPACED OVER NOT MORE THAN 90 DEGREES OF THE CIRCUMFERENCE. THE SPIGOT OR TONGUE END OF THE PIPE SHALL NOT BE PERFORATED FOR A LENGTH EQUAL TO THE DEPTH OF THE SOCKET. PERFORATIONS SHALL CONTINUE AT UNIFORM SPACINGS OVER THE ENTIRE LENGTH OF THE PIPE.

SPN & Associates
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SOUTH DAKOTA
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GENERAL NOTES AND SPECIFICATIONS

ABSORPTION BED MATERIAL

1. ABSORPTION BED MATERIAL USED IN THE SUBSURFACE DISPOSAL AREA SHALL BE WASHED STONE WITH A HARDNESS OF 3 OR GREATER ON THE MOH'S SCALE OF HARDNESS AND RESISTANT TO DISSOLUTION AND SLAKING. CRUSHED LIMESTONE WILL NOT BE ACCEPTED. MATERIAL SHALL BE FREE OF ADHERENT COATINGS, CORROSIVE AGENTS, ORGANIC MATTER OR SOFT, FRIABLE, THIN OR ELONGATED PARTICLES.

2. ABSORPTION BED MATERIAL SHALL CONFORM TO THE FOLLOWING GRADATION LIMITS:

SIEVE OPENING	BEDDING MATERIAL (PERCENT PASSING)
2 1/2"	100
1/2"	<5

3. THE GEOTEXTILE FABRIC SEPARATOR SHALL BE A NON-WOVEN FABRIC. THE GEOTEXTILE FABRIC SHALL BE GEOTEX 401 AS MANUFACTURED BY PROPEX OR APPROVED EQUAL.

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STORM WATER POLLUTION PREVENTION PLAN

*(The numbers right of the title headings are **reference numbers** to the GENERAL PERMIT FOR STORM WATER DISCHARGES ASSOCIATED WITH CONSTRUCTION ACTIVITIES)*

❖ STAFF TRAINING/SWPPP IMPLEMENTATION (5.3 1-2)

To promote stormwater management awareness specific for this project, the Contractor's Erosion Control Supervisor should provide correspondence of how the SWPPP will be implemented. The Contractor's Erosion Control Supervisor is responsible for providing this information at the preconstruction meeting, and subsequently completing an attendance log, which should identify site-specific implementation of the SWPPP and the names of the personnel who attended the preconstruction meeting. Documentation of the preconstruction meeting will be filed with the SWPPP documents.

❖ SITE DESCRIPTION (5.3 4)

- **Project Limits: See Title Sheet**
- **Project Description: See Title Sheet (5.3 3.a)**
- **Site Map(s): See Title Sheet and Plans (5.3 4.(a)-(r))**
- **Major Soil Disturbing Activities** (check all that apply)
  - ☑ Clearing and grubbing
  - ☑ Excavation/borrows
  - ☑ Grading and shaping
  - ☑ Filling
  - ☑ Cutting and filling
  - ☐ Other (describe):
- **Total Project Area: 0.27 Ac (5.3 3.b.)**
- **Total Area To Be Disturbed: 0.27 Ac (5.3 3.b)**
- **Total Area To Be Disturbed At One Time: 0.27 Ac (5.3 3.c)**
- **Existing Vegetation and Percent Vegetation Cover**: Grass, 80% **(5.3 3.d)**
- **Soil Properties:** See Enclosed Soil Information or NA **(5.3 3.e)**
- **Name of Receiving Water Body/Bodies: None (5.3 3.f)**

❖ ORDER OF CONSTRUCTION ACTIVITIES (5.3 3.h)

- **The Contractor will enter the Start Dates.**

Description	Start Date
Install perimeter protection where runoff sheets from site.	
Install channel and ditch bottom protection.	
Clearing and grubbing.	
Remove and store topsoil.	
Stabilize disturbed areas.	
Install utilities, storm sewers, curb and gutter.	
Install inlet/culvert protection after completing utility installation.	
Complete final grading and paving.	
Complete traffic control installation and protection devices.	
Reseed areas disturbed by construction activities.	

❖ EROSION AND SEDIMENT CONTROLS (5.3 5.(a)-(f))

- Perimeter Controls (See Detail Plan Sheets)

(The Contractor will check all that apply and enter Start Dates.)

Description	Start Date
☐ Natural Buffers	
☐ Silt Fence	
☐ Erosion Control Wattles	
☐ Temporary Berm/Windrow	
☐ Floating Silt Curtain	
☐ Stabilized Construction Entrances	
☐ Entrance/Exit Equipment Tire Wash	
☐ Other:	

- **Structural Erosion and Sediment Controls**

(The Contractor will check all that apply and enter Start Dates.)

Description	Start Date
☐ Temporary Sediment Barriers	
☐ Erosion Bales	
☐ Temporary Slope Drain	
☐ Turf Reinforcement Mat	
☐ Riprap	
☐ Gabions/Gabion Mattress	
☐ Check Rock Dams	
☐ Sediment Traps/Basins	
☐ Culvert Inlet Protection	
☐ Transition Mats	
☐ Area Drain Inlet Protection	
☐ Curb Inlet Protection	
☐ Interceptor Ditch	
☐ Concrete Washout Facility	
☐ Work Platform	
☐ Temporary Water Barrier	
☐ Temporary Water Crossing	
☐ Permanent Stormwater Ponds	
☐ Permanent Open Vegetated Swales	
☐ Natural Depressions to allow for Infiltration	
☐ Sequential Systems (Combined Practices)	
☐ Other:	

- **Dust Controls** (The Contractor will check all that apply and enter Start Dates.)

Description	Start Date
☐ Tarps & Wind impervious fabrics	
☐ Watering	
☐ Stockpile location/orientation	
☐ Dust Control Chlorides	
☐ Other:	

- **Dewatering BMPs** (The Contractor will check all that apply and enter Start Dates.)

Description	Start Date
☐ Sediment Basins	
☐ Dewatering Bags	
☐ Weir Tanks	
☐ Temporary Diversion Channel	
☐ Other:	

- **Wetland Avoidance**

  Will construction and/or erosion and sediment controls impinge on regulated wetlands? Yes No ✓ If yes, the structural and erosion and sediment controls have been included in the total project wetland impacts and have been included in the 404 permit process with USACE.

- **Storm Water Management (5.4 7.(a)-(c))**

  Storm water management will be handled by temporary controls outlined above, and permanent controls needed to meet permanent storm water management needs in the post construction period. Permanent controls will be shown on the plans and noted as permanent.

- **Stabilization Practices (See Detail Plan Sheets)**

(Stabilization measures shall be initiated as soon as possible, but in no case later than 14 days after the construction activity in that portion of the site has temporarily or permanently ceased. Initiation of final or temporary stabilization may exceed the 14-day limit if earth disturbing activities will be resumed within 21 days.**)**

(The Contractor will check all that apply and enter Start Dates.)

Description	Start Date
☑ Temporary or Permanent Seeding	
☐ Sodding	
☐ Planting	
☐ Mulching (Straw or Cellulose Fiber)	
☐ Erosion Control Blankets or Mats	
☐ Vegetation Buffer Strips	
☐ Roughened Surface (e.g. tracking)	
☐ Hydro Mulch	
☐ Soil Stabilizer	
☐ Bonded Fiber Matrix	
☐ Other:	

- **Other Storm Water Controls (5.3 8.b)**
  - **Waste Disposal**

    All liquid waste materials will be collected and stored in sealed metal containers approved by the project engineer. All trash and construction debris from the site will be deposited in the approved containers. Containers will be serviced as necessary, and the trash will be hauled to an approved disposal site or licensed landfill. All onsite personnel will be instructed in the proper procedures for waste disposal, and notices stating proper practices will be posted in the field office. The general contractor's representative responsible for the conduct of work on the site will be responsible for seeing waste disposal procedures are followed.
  - **Hazardous Waste**

    All hazardous waste materials will be disposed of in a manner specified by local or state regulations or by the manufacturer. Site personnel will be instructed in these practices, and the individual designated as the contractor's on-site representative will be responsible for seeing that these practices are followed.
  - **Sanitary Waste**

    Portable sanitary facilities will be provided on all construction sites. Sanitary waste will be collected from the portable units in a timely manner by a licensed waste management contractor or as required by any local regulations.

❖ Maintenance and Inspection (4.0)

- **Maintenance and Inspection Practices**
  - Inspections will be conducted at least once every 7 calendar days or every 14 calendar days and within 24 hours of precipitation that exceeds 0.25 inches or snowmelt that generates runoff. You must keep a properly maintained rain gauge on your site.
  - All controls will be maintained in good working order. Necessary repairs will be initiated within 24 hours of the site inspection report.
    - Silt fence will be inspected for depth of sediment and for tears in order to ensure the fabric is securely attached to the posts and that the posts are well anchored. Sediment buildup will be removed from the silt fence when it reaches 1/3 of the height of the silt fence.
    - Sediment basins and traps will be checked. Sediment will be removed when the depth reaches approximately 50 percent of the structure's capacity, and at the conclusion of the construction.
    - All seeded areas will be checked for bare spots, washouts, and vigorous growth free of significant weed infestations.
    - Inspection and maintenance reports will be prepared for each site inspection, this form will also be used to document changes to the SWPPP. A copy of the completed inspection form will be filed with the SWPPP documents.
    - The contractor's site superintendent is responsible for inspections. Maintenance, repair activities are the responsibility of the contractor. The Contractor will complete the inspection and maintenance reports and distribute copies to the owner and engineer.

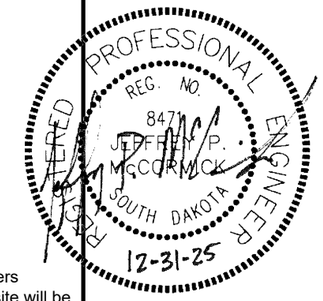
SPN & Associates

Engineers - Planners - Surveyors

2100 North Sanborn Boulevard - P.O. Box 398
Mitchell, South Dakota 57301-0398
Phone: (605) 996-7761 - Fax: (605) 996-0015

Certificate

I hereby certify that this plan, specification, or report was prepared by me or under my direct supervision and that I am a duly Registered Professional Engineer under the laws of the State of South Dakota.



Revisions

12/23/25	Changes Per Peer Review. Revisions By JAK.

Plan Horiz. Scale:	None
Drawn By:	JAK
Checked By:	JPM
Date:	12/31/2025
Project No.:	16722
File Name:	16722-...Tornado Safe Room

Project Name:
City of Alexandria Tornado Safe Room

Located in:
Alexandria, South Dakota

Sheet Name:
SWPPP Sheet 1

Sheet Number:
C-13

❖Non-Storm Water Discharges (5.3 10)

The following non-storm water discharges are anticipated during the course of this project (The Contractor will check all that apply).

- ☐ Discharges from water line flushing.
- ☐ Pavement wash-water, where no spills or leaks of toxic or hazardous materials have occurred.
- ☐ Uncontaminated ground water associated with dewatering activities.

❖Spill Prevention (5.3 8)

➢ Material Management

Housekeeping

- Only needed products will be stored on-site by the contractor.
- Except for bulk materials the contractor will store all materials under cover and in appropriate containers.
- Products shall be kept in their original containers with the original manufacture's label.
- Material mixing will be conducted in accordance with the manufacturer's recommendations.
- Whenever possible, all products will be completely used before properly disposing of the container off site.
- The manufacturer's directions for disposal of materials and containers will be followed.
- The contractor's site superintendent will inspect materials storage areas regularly to ensure proper use and disposal.
- Dust generated will be controlled in an environmentally safe manner.
- Vegetation areas not essential to the construction project will be preserved and maintained as noted on the erosion control plans.

▪ Hazardous Materials

- Products will be kept in original containers unless the container is not resealable.
- Original labels and material safety data sheets will be retained in a safe place to relay important product information.
- If surplus product must be disposed of, manufacturer's label directions for disposal will be followed.
- Maintenance and repair of all equipment and vehicles involving oil changes, hydraulic system drain down, de-greasing operations, fuel tank drain down and removal, and other activities which may result in the accidental release of contaminants will be conducted on an impervious surface and under cover during wet weather to prevent the release of contaminants onto the ground.
- Wheel wash water will be collected and allowed to settle out suspended solids prior to discharge. Wheel wash water will not be discharged directly into any storm water system or storm water treatment system.
- Potential pH-modifying materials such as: bulk cement, cement kiln dust, fly ash, new concrete washings, concrete pumping, and mixer washout waters will be collected on site and managed to prevent contamination of storm water runoff.

❖Materials Inventory (5.3 9.(a)-(c))

The following materials or substances are expected to be present on the site during the construction period. These materials will be handled as noted under the headings "EROSION AND SEDIMENT CONTROLS" and "SPILL PREVENTION"
(The Contractor will check all that apply).

- ☐ Concrete and Portland Cement
- ☐ Detergents
- ☐ Paints
- ☐ Metals
- ☐ Bituminous Materials
- ☐ Petroleum Based Products
- ☐ Cleaning Solvents
- ☐ Wood
- ☐ Cure
- ☐ Texture
- ☐ Chemical Fertilizers
- ☐ Herbicides
- ☐ Diesel Exhaust Fluid
- ☐ Other:

➢ Product Specific Practices (5.3 9)

▪ Petroleum Products

All on-site vehicles will be monitored for leaks and receive regular preventive maintenance to reduce the chance of leakage. Petroleum products will be stored in tightly sealed containers which are clearly labeled.

▪ Fertilizers

Fertilizers will be applied only in the amounts recommended by the supplier. Once applied, fertilizers will be worked into the soil to limit the exposure to storm water. Fertilizers will be stored in an enclosed area. The contents of partially used fertilizer bags will be transferred to sealable containers to avoid spills.

▪ Paints

All containers will be tightly sealed and stored when not required for use. The excess will be disposed of according to the manufacturer's instructions and any applicable state and local regulations.

▪ Concrete Trucks

Contractors will provide designated truck washout areas on the site. These areas must be self contained and not connected to any storm water outlet of the site. Upon completion of construction washout areas will be properly stabilized.

➢ Spill Control Practices (5.3 8)

In addition to the previous housekeeping and management practices, the following practices will be followed for spill prevention and cleanup if needed.

- For all hazardous materials stored on site, the manufacturer's recommended methods for spill clean up will be clearly posted. Site personnel will be made aware of the procedures and the locations of the information and cleanup supplies.
- Appropriate cleanup materials and equipment will be maintained by the contractor in the materials storage area on-site. As appropriate, equipment and materials may include items such as booms, dust pans, mops, rags, gloves, goggles, kitty litter, sand, sawdust, and plastic and metal trash containers specifically for clean up purposes.
- All spills will be cleaned immediately after discovery and the materials disposed of properly.
- The spill area will be kept well ventilated and personnel will wear appropriate protective clothing to prevent injury from contact with a hazardous substance.
- After a spill a report will be prepared describing the spill, what caused it, and the cleanup measures taken. The spill prevention plan will be adjusted to include measures to prevent this type of spill from reoccurring, as well as clean up instructions in the event of reoccurrences.
- The contractor's site superintendent, responsible for day-to-day operations, will be the spill prevention and cleanup coordinator. The contractor is responsible for ensuring that the site superintendent has had appropriate training for hazardous materials handling, spill management, and cleanup.

➢ Spill Response (5.3 8)

The primary objective in responding to a spill is to quickly contain the material(s) and prevent or minimize migration into storm water runoff and conveyance systems. If the release has impacted on-site storm water, it is critical to contain the released materials on-site and prevent their release into receiving waters. If a spill of pollutants threatens storm water or surface water at the site, the spill response procedures outlined below must be implemented in a timely manner to prevent the release of pollutants.

- The contractor's site superintendent will be notified immediately when a spill or the threat of a spill is observed. The superintendent will assess the situation and determine the appropriate response.
- If spills represent an imminent threat of escaping erosion and sediment controls and entering receiving waters, personnel will be directed to respond immediately to contain the release and notify the superintendent after the situation has been stabilized.
- Spill kits containing appropriate materials and equipment for spill response and cleanup will be maintained by the contractor at the site.
- If oil sheen is observed on surface water (e.g. settling ponds, detention ponds, swales), action will be taken immediately to remove the material causing the sheen. The contractor will use appropriate materials to contain and absorb the spill. The source of the oil sheen will also be identified and removed or repaired as necessary to prevent further releases.
- If a spill occurs the superintendent or the superintendent's designee will be responsible for completing the spill reporting form and for reporting the spill to SD DANR.
- Personnel with primary responsibility for spill response and clean up will receive training by the contractor's site superintendent or designee. The training must include identifying the location of the spill kits and other spill response equipment and the use of spill response materials.
- Spill response equipment will be inspected and maintained as necessary to replace any materials used in spill response activities.

❖Spill Notification (7.1 1.(a)-(i))

In the event of a spill, the contractor's site superintendent will make the appropriate notification(s), consistent with the following procedures:

- A reportable spill is a quantity of 25 gallons or more or any spill of oil which: 1) violates water quality standards, 2) produces a "sheen" on a surface water, or 3) causes a sludge or emulsion must be reported immediately to the National Response Center .
- Any spill of oil or hazardous substance to waters of the state must be reported immediately by telephone to the SD DANR.

❖Post Construction Stormwater Management (5.3 7.(a)-(c))

Storm management will be handled by temporary controls outlined in "Description and maintenance of control measures" and any permanent controls needed to meet permanent stormwater management needs in the post construction period will be shown in the plans and noted as permanent.

❖Infeasibility Document (5.3 11)

If it is determined to be infeasible to comply with any of the requirements of the Stormwater Permit, the infeasibility determination must be thoroughly documented in the SWPPP.

❖Required SWPPP Modifications (5.5)

➢ Conditions Requiring SWPPP Modifications (5.5 1)

The SWPPP must be modified, including the site map(s) in response to any of the following conditions.

- When a new operator responsible for implementation of any part of the SWPPP begins work on the site.
- When changes to the construction plans, sediment and erosion control measures, or any best management practices on site that are no longer accurately reflected in the SWPPP. This includes changes made in response to corrective actions triggered by inspections.
- To reflect areas on the site map where operational control has been transferred (including the date of the transfer) or has been covered under a new permit since initiating coverage under this general permit.
- If inspections by site staff, local officials, SDDANR, or U.S. EPA determine that SWPPP modifications are necessary for compliance with the Stormwater Permit.
- To reflect any revisions to applicable federal, state, or local requirements that affect the control measures implemented at the site.
- If approved to reflect any changes in chemical water treatment systems or controls, including the use of a different water treatment chemical, age rates, different areas, or methods of application.

➢ Deadlines for SWPPP Modification (5.5 2)

Any required revisions to the SWPPP must be completed within 7 calendar days following any of the items listed above.

➢ Documentation of Modifications to the Plan (5.5 3)

All SWPPP modification records are required to be maintained showing the dates of when the modification occurred. The records must include the name of the person authorizing each change and a brief summary of all changes.

➢ Certification Requirements (5.5 4)

All modifications made to the SWPPP must be signed and certified as required in Section 7.4.

➢ Required Notice to Other Operators (5.5 5)

If there are multiple operators at the site, the Contractor's Erosion Control Supervisor must notify each operator that may be impacted by the change to the SWPPP within 24 hours.

When changes are made to the construction project that will require alterations in the temporary erosion controls of the site, the Storm Water Pollution Prevention Plan (SWPPP) will be amended to provide appropriate protection to disturbed areas, all storm water structures, and adjacent waters. The Contractor will modify the SWPPP plan and drawings to reflect the needed changes. Copies of forms and the SWPPP will be retained in a designated place for review over the course of the project.

SPN & Associates
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Certificate

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Revisions

12/23/25	Changes Per Peer Review. Revisions By JAK.

Plan Horiz. Scale:	None
Drawn By:	JAK
Checked By:	JPM
Date:	12/31/2025
Project No.:	16722
File Name:	16722-...Tornado Safe Room

Project Name:
City of Alexandria Tornado Safe Room
Located in:
Alexandria, South Dakota

Sheet Name:
SWPPP Sheet 2

Sheet Number:
C-14

❖ CERTIFICATIONS

Certification of Compliance with Federal, State, and Local Regulations

The Storm Water Pollution Prevention Plan (SWPPP) for this project reflects the requirements of all local municipal jurisdictions for storm water management and sediment and erosion control as established by ordinance, as well as other state and federal requirements for sediment and erosion control plans, permits, notices or documentation as appropriate.

➢ **City of Alexandria**

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____

Authorized Signature. (See the General Permit, Section 7.4 1)

➢ **Prime Contractor**

This section is to be executed by the General Contractor after the award of the contract and at least 15 days prior to the beginning of construction. This section may be executed any time there is a change in the Prime Contractor of the project.

I certify under penalty of law that this document and all attachments were prepared under my direction or supervision in accordance with a system designed to assure that qualified personnel properly gather and evaluate the information submitted. Based on my inquiry of the person or persons who manage the system, or those persons directly responsible for gathering the information, the information submitted is, to the best of my knowledge and belief, true, accurate, and complete. I am aware that there are significant penalties for submitting false information, including the possibility of fine and imprisonment for knowing violations.

_____

Authorized Signature. (See the General Permit, Section 7.4 1)

❖ CONTACT INFORMATION

➢ **Contractor Information**:
- Prime Contractor Name:
- Contractor Contact Name:
- Address:
- Address:
- City:
- State:
- Zip:
- Office Phone:
- Field:
- Cell:
- Fax:

➢ **Project Engineer**
- Name: Jeff McCormick
- Business Address: 2100 N. Sanborn Blvd.
- Job Office Location 2100 N. Sanborn Blvd.
- City: Mitchell State: SD Zip: 57301
- Office Phone: 605-996-7761 Fax:605-996-0015

➢ **SD DANR Contact Spill Reporting**
- Business Hours Monday-Friday (605) 773-3296
- Nights and Weekends (605) 773-3231

➢ **SD DANR Contact for Hazardous Materials.**
- (605) 773-3153

➢ **National Response Center Hotline**
- (800) 424-8802.

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Revisions

12/23/25	Changes Per Peer Review. Revisions By JAK.

Plan Horiz. Scale:	None
Drawn By:	JAK
Checked By:	JPM
Date:	12/31/2025
Project No.:	16722
File Name:	16722-...Tornado Safe Room

Project Name:

City of Alexandria Tornado Safe Room

Located in:

Alexandria, South Dakota

Sheet Name:

SWPPP Sheet 3

Sheet Number:

C-15

PRECAST CONCRETE JAMBS AND HEAD @ EXTERIOR DOOR. SEE SHEET A-6 FOR DETAILS

NEW CONCRETE WALK

EXISTING CONC. SLAB

SAFE ROOM SIGNS

VENTILATION LOUVER 12"H x 24"W

ELECTRICAL METER

ELECTRIC PANEL

ELECTRIC UPS PANEL

BENCH SEATING

TYPICAL VENTILATION LOUVER 12"H x 24"W W/ MOTORIZED DAMPER BELOW BENCH SEAT

UTILITY RM.

ELEC. HAND DRYER

SIDEWALL EXHAUST VENT 9'-0" A.F.F. SEE 2/A-6

MEN

ROOM SIGNS

MIRROR

SOAP DISP.

TOILET PAPER DISPENSER

GRAB BARS

BENCH SEATING

LAV

WC

MIRROR

LAV

WC

TOILET PAPER DISPENSER

SIDEWALL EXHAUST VENT 9'-0" A.F.F. SEE 2/A-6

WOMEN

ELECTRIC HAND DRYER

SAFE ROOM SIGNS

7'-4" H. HEADER

SAFE ROOM

120 PERSON CAPACITY
+ 2 HANDICAP SPACES
TOTAL CAPACITY 122 PERSONS

F.E. CABINET

8" CMU EXT. WALL TYP.

VENTILATION LOUVER 12"x24"

BENCH SEATING VENTILATION LOUVER 12"H x 24"W

CORNER STORAGE AREA

PRECAST CONCRETE JAMBS AND HEAD @ ENTRY WAY SEE SHEET A-6 FOR DETAILS

5'-0"
5'-0"
26'-0"
7⅝"
5⅝"
6'-6"
7⅝"
5⅝"
4'-6"
7⅝"
6'-9"
7⅝"
6'-9"
26'-0"
7⅝"
1'-10⅞"
4'-6"
5'-0⅞"
7⅝"
1'-8"
5'-0"
16'-8"
33'-4"
16'-8"

N

1/A-1 FLOOR PLAN

1/4" = 1'-0"

L.L. JIRSA ARCHITECT
P.O. BOX 905
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605-770-0424

REGISTERED ARCHITECT
REG. NO. 4996
LARRY L. JIRSA
SOUTH DAKOTA
12-31-25

PROJECT NAME:
CITY OF ALEXANDRIA
TORNADO SAFE ROOM
SPORTS FIELD COMPLEX
ALEXANDRIA, SD

REVISION 2

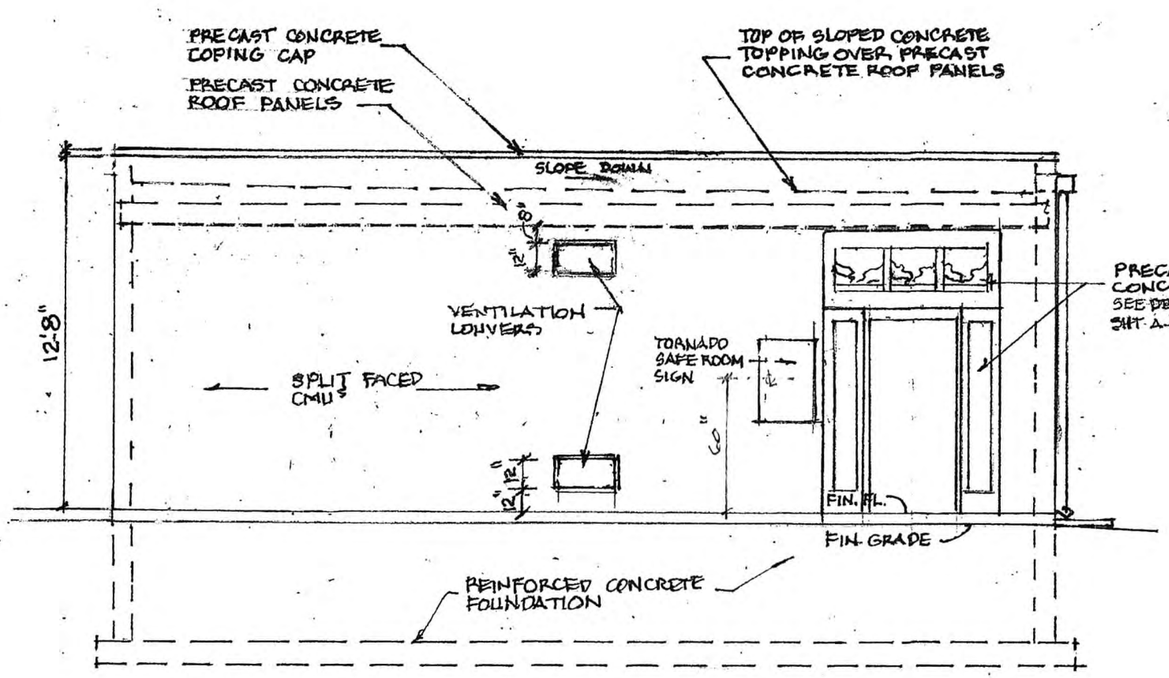
NO	DATE	DESCRIPTION

PROJECT NO.
51-2025

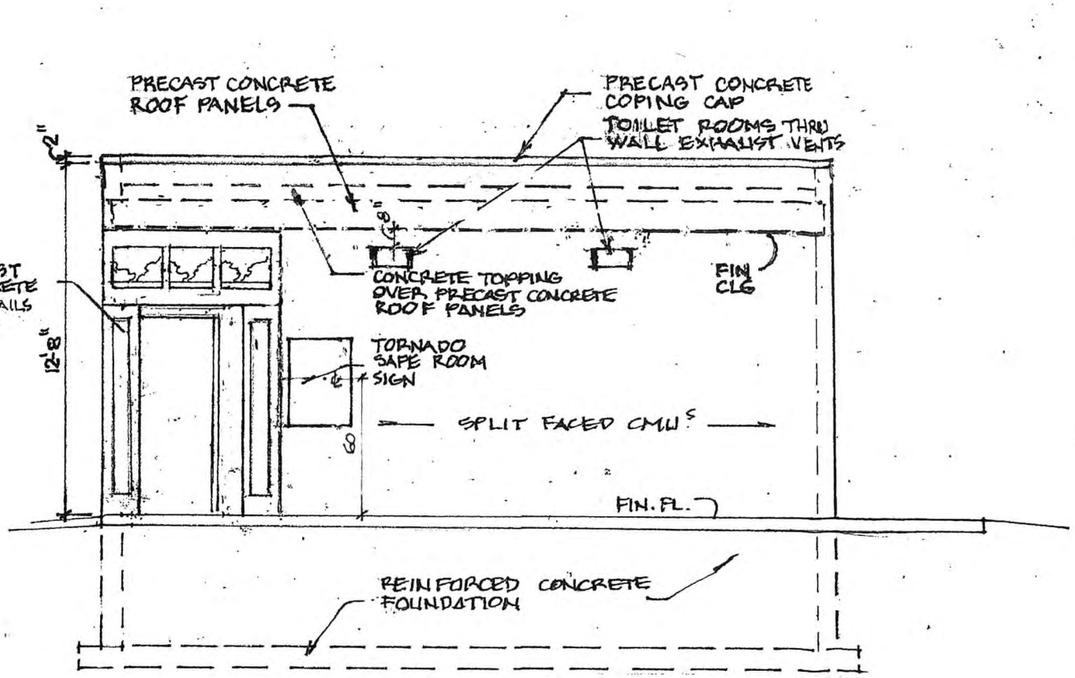
DATE
DEC, 31, 2025

SHEET TITLE
FLOOR PLAN

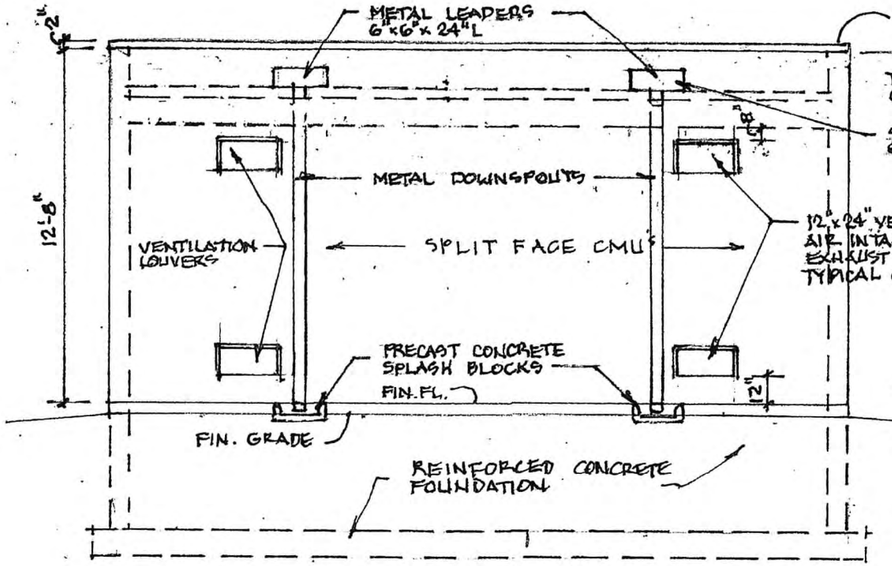
SHEET NO.
A-1



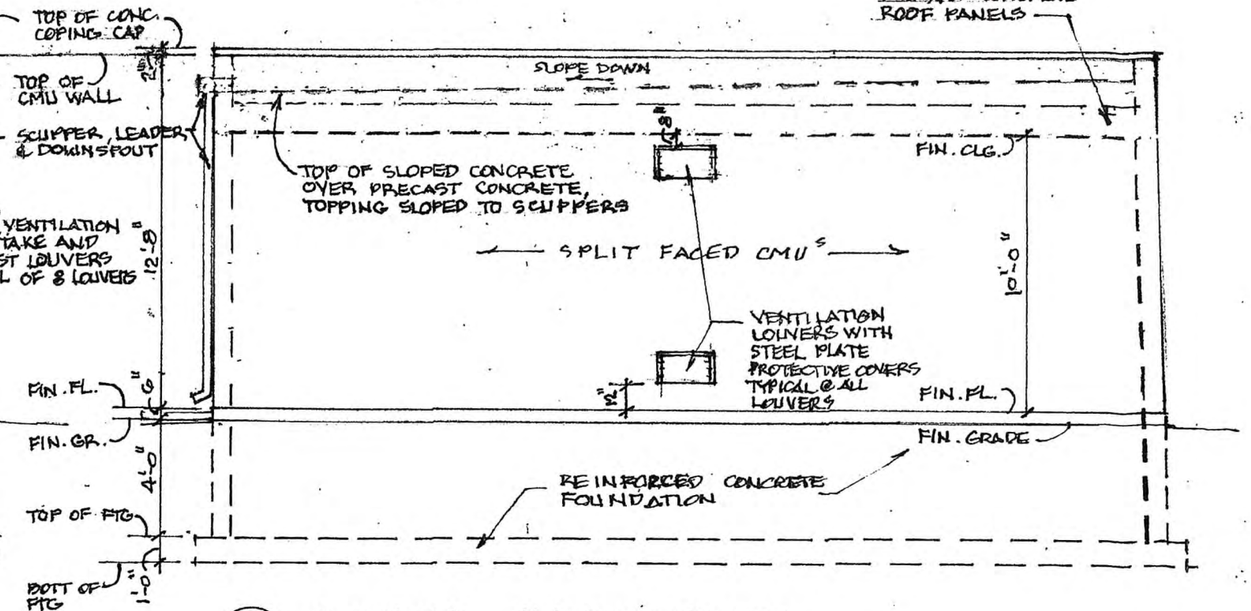
1 / A-2 NORTH ELEVATION
3/16" = 1'-0"



2 / A-2 EAST ELEVATION
3/16" = 1'-0"



3 / A-2 WEST ELEVATION
3/16" = 1'-0"



4 / A-2 SOUTH ELEVATION
3/16" = 1'-0"

NOTE: MAXIMUM WIDTH OF EXERIOR CAULK JOINTS: 3/8" IN ACCORDANCE WITH ASTM C920

L.L. JIRSA ARCHITECT
P.O. BOX 995
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605-770-6484

REGISTERED ARCHITECT
REG. NO. 4996
LARRY L. JIRSA
SOUTH DAKOTA
12-31-25

PROJECT NAME
CITY OF ALEXANDRIA
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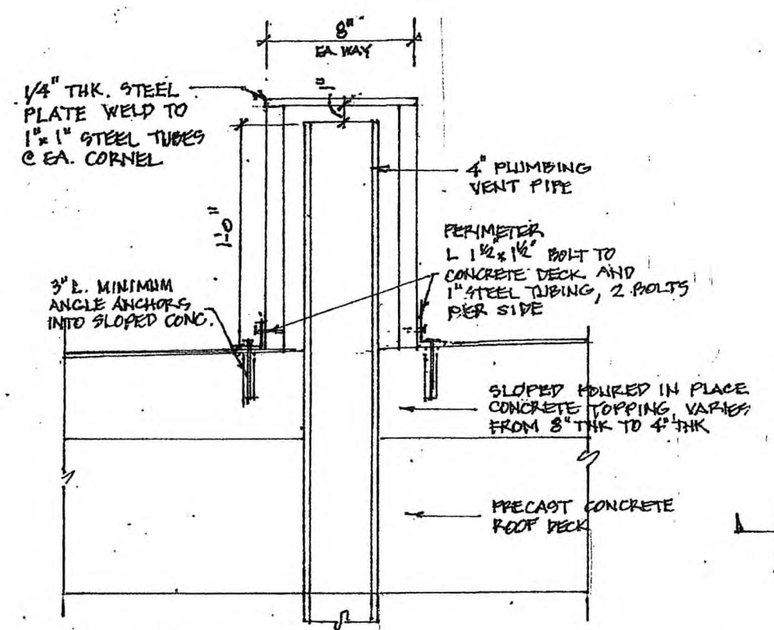
SPORTS FIELD COMPLEX
ALEXANDRIA, SD

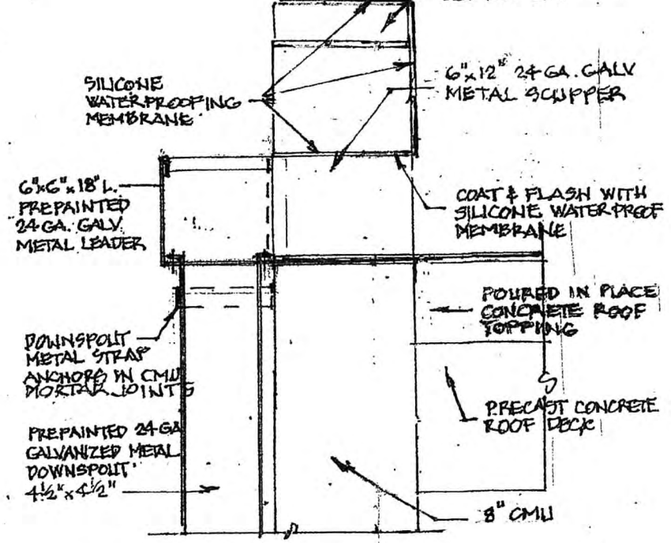
REVISIONS

NO	DATE	DESCRIPTION

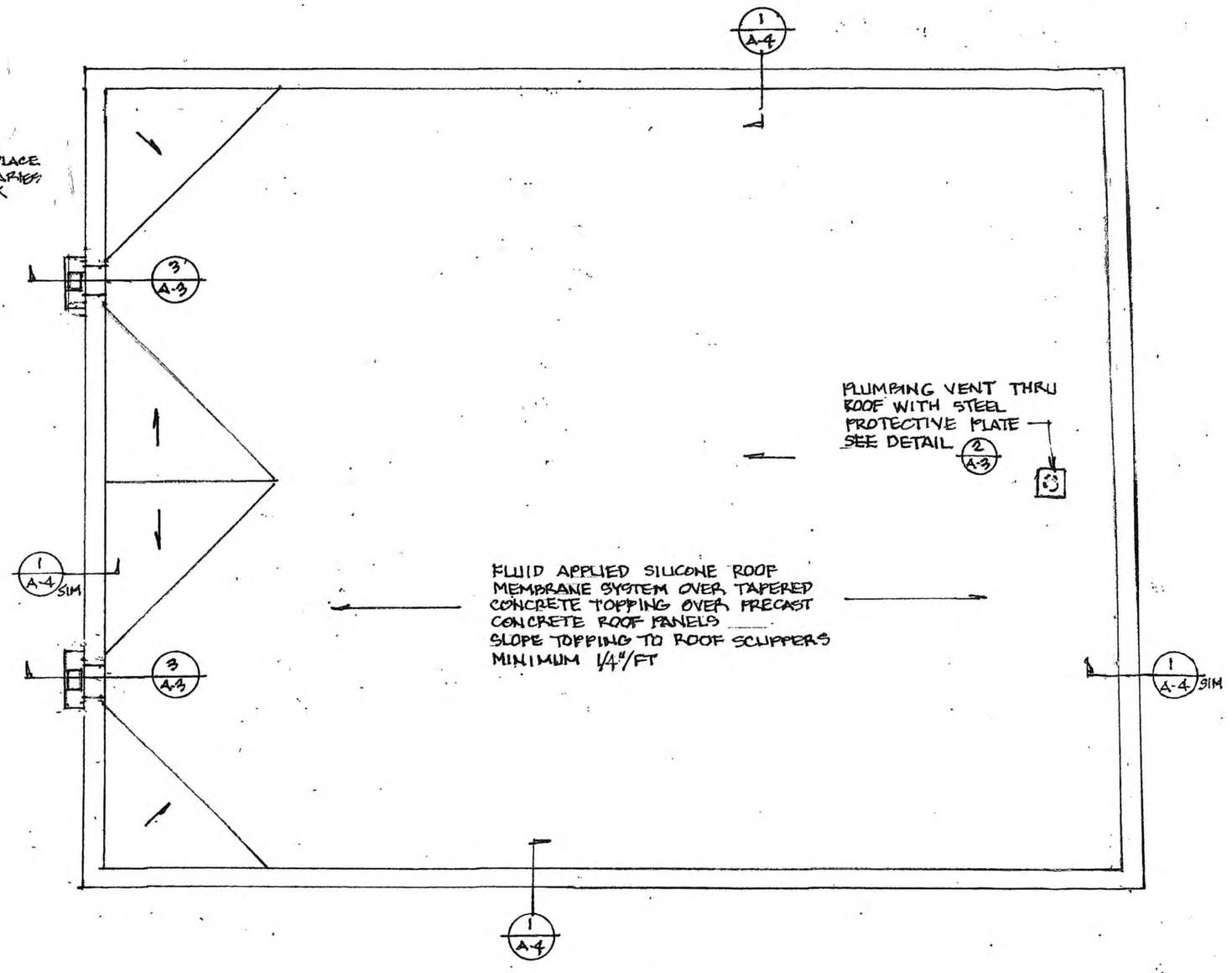
PROJECT NO. 51-2025
DATE DEC. 31, 2025
SHEET TITLE EXTERIOR ELEVATIONS
SHEET NO. A-2



2 / A-3 SECTION
1½" = 1'-0"



3 / A-3 SECTION
1½" = 1'-0"



1 / A-3 ROOF PLAN
1/4" = 1'-0"

N

L.L. JIRSA ARCHITECT
P.O. BOX 905
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605-770-6424

REGISTERED ARCHITECT
REG. NO. 4995
LARRY L. JIRSA
SOUTH DAKOTA
12-31-25

PROJECT NAME
CITY OF ALEXANDRIA
TORNADO SAFE ROOM
SPORTS FIELD COMPLEX
ALEXANDRIA, SD

REVISIONS

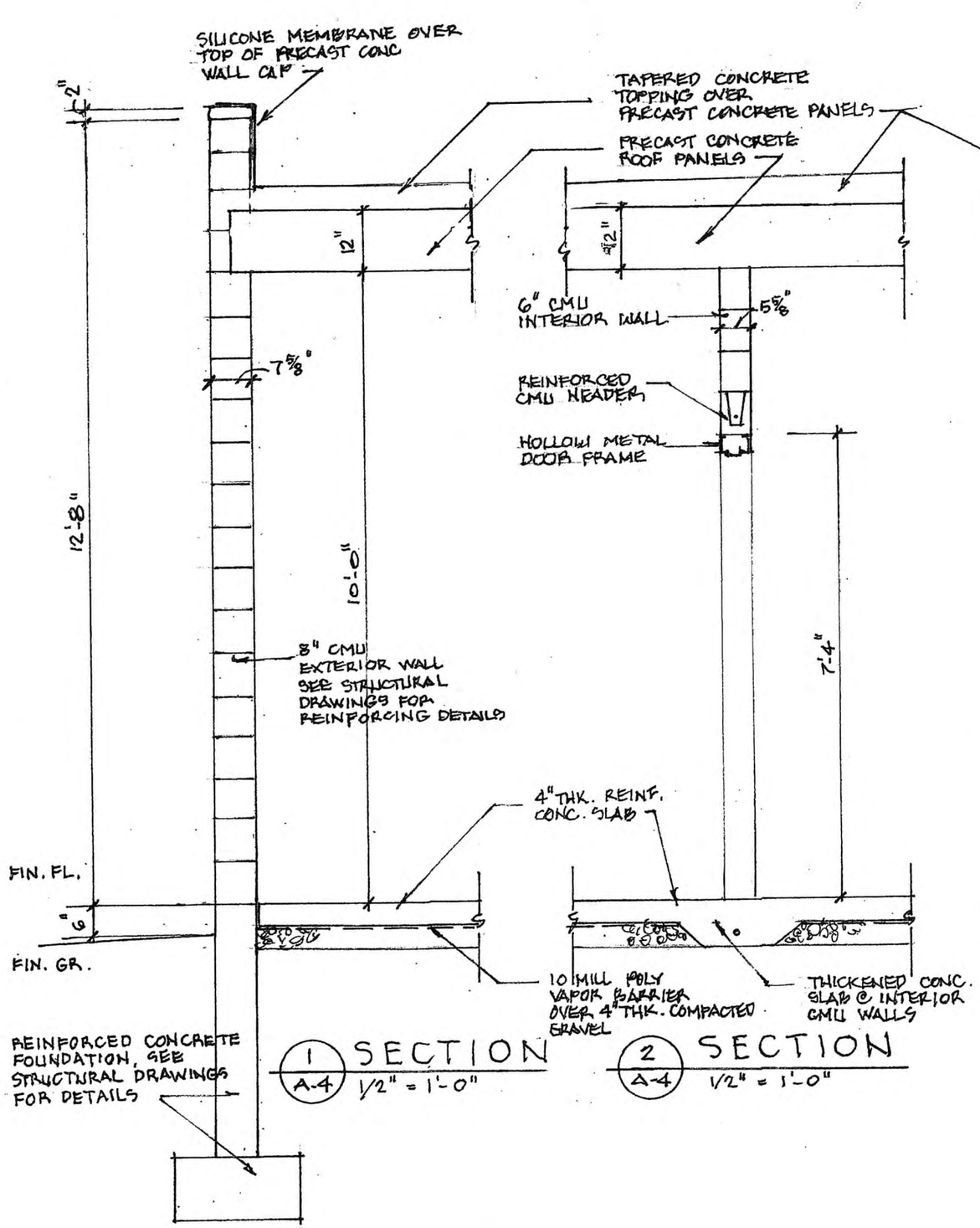
NO.	DATE	DESCRIPTION

PROJECT NO.
51-2025

DATE
DEC. 31, 2025

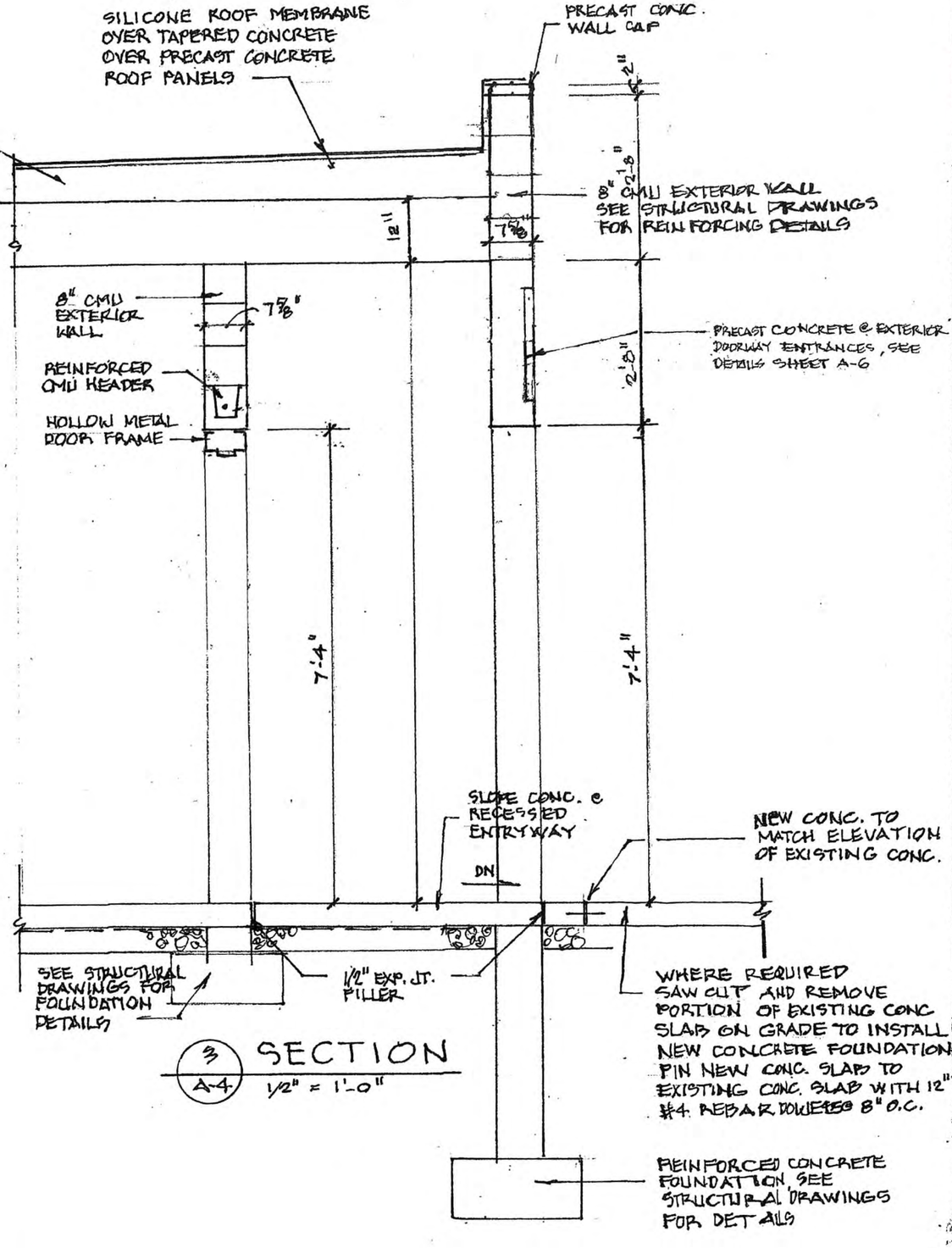
SHEET TITLE
ROOF PLAN

SHEET NO.
A-3



1 A-4 SECTION 1/2" = 1'-0"

2 A-4 SECTION 1/2" = 1'-0"



3 A-4 SECTION 1/2" = 1'-0"

L.L. JIRSA ARCHITECT
P.O. BOX 925
MITCHELL, SD 57301
(605) 770-0464

REGISTERED ARCHITECT
REG. NO. 4996
LARRY L. JIRSA
SOUTH DAKOTA
12-31-25

PROJECT NAME
CITY OF ALEXANDRIA
TORNADO SAFE ROOM
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ALEXANDRIA, SD

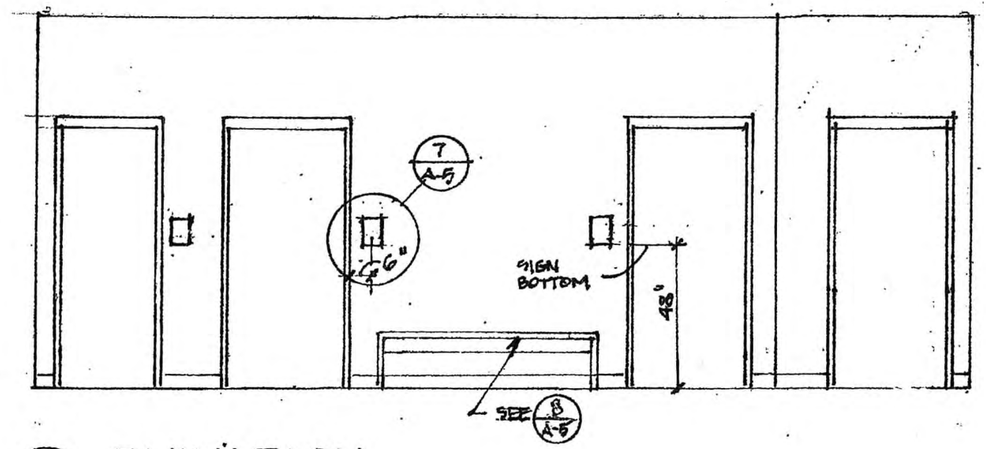
REVISIONS		
NO	DATE	DESCRIPTION

PROJECT NO. 51-2025

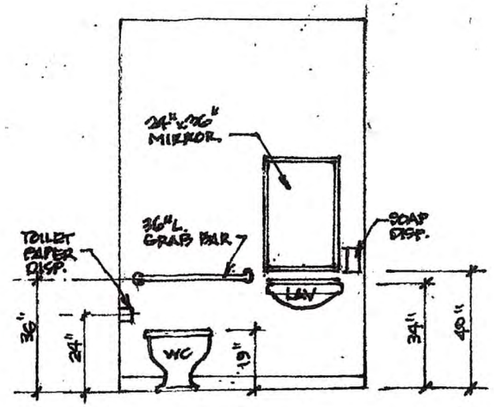
DATE DEC. 31, 2025

SHEET TITLE WALL SECTIONS

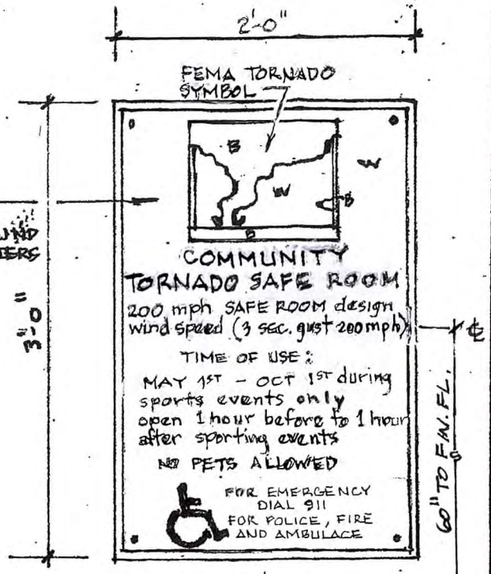
SHEET NO. A-4



1 / A-5 ELEVATION
1/4"=1'-0"

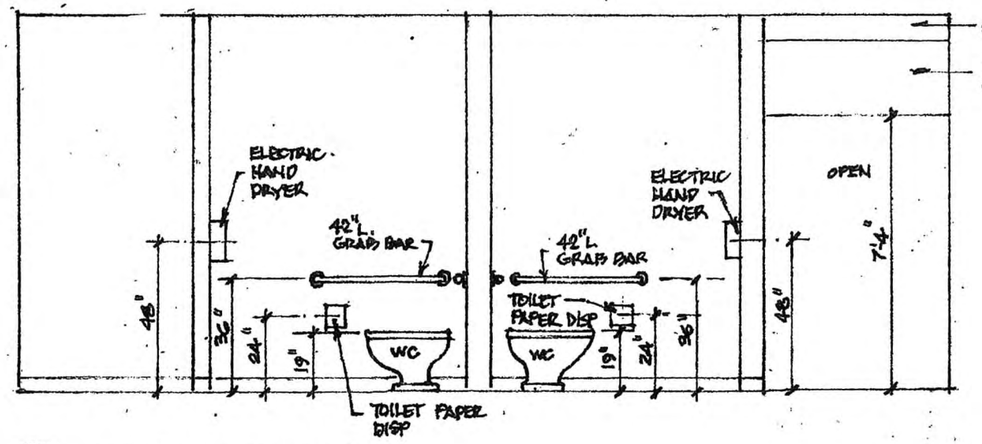


4 / A-5 ELEVATION
1/4"=1'-0"

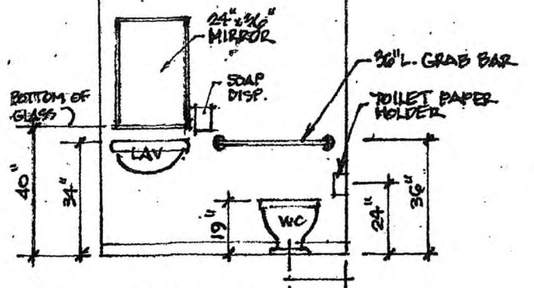


INTERIOR & ENTRANCE SIGNS ELEVATION

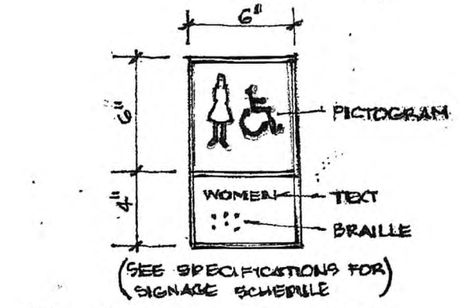
6 / A-5
1"=1'-0"



2 / A-5 ELEVATION
1/4"=1'-0"

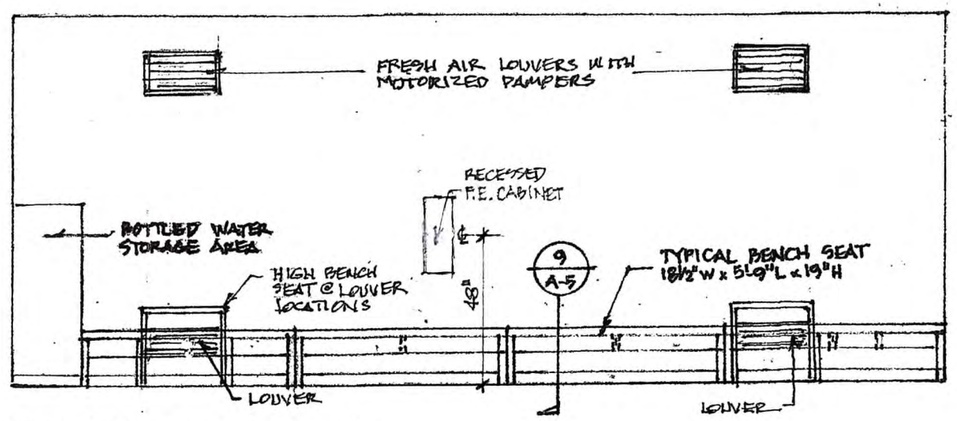


5 / A-5 ELEVATION
1/4"=1'-0"

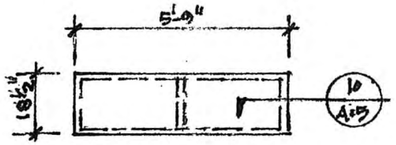


(SEE SPECIFICATIONS FOR SIGNAGE SCHEDULE)

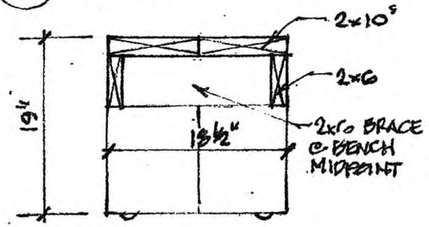
7 / A-5 INTERIOR SIGN
1½" = 1'-0"



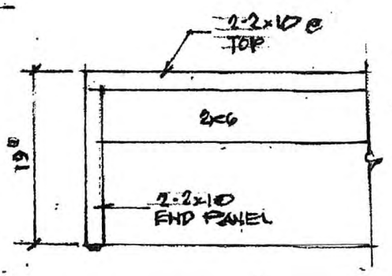
3 / A-5 ELEVATION
1/4"=1'-0"



8 / A-5 TYPICAL BENCH PLAN
1/4"=1'-0"



9 / A-5 SECTION
3/4"=1'-0"



10 / A-5 SECTION
3/4"=1'-0"

L.L. JIRSA ARCHITECT
P.O. BOX 905
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605-770-6424

REGISTERED ARCHITECT
REG/NO. 4956
LARRY L. JIRSA
SOUTH DAKOTA
12-31-25

PROJECT NAME
CITY OF ALEXANDRIA
TORNADO SAFE ROOM
SPORTS FIELD COMPLEX
ALEXANDRIA, SD

REVISIONS

NO	DATE	DESCRIPTION

PROJECT NO. 51-2025
DATE DEC. 31, 2025
SHEET TITLE INTERIOR ELEVATIONS
SHEET NO. A-5

DOOR SCHEDULE

DOOR NO.	DOOR SIZE	DOOR TYPE	FRAME TYPE	HARDWARE SET	NOTES
1	3'-0" x 7'-0"	I	A	1	1
2	3'-0" x 7'-0"	III	B	2	2
3	3'-0" x 7'-0"	III	B	2	2
4	2'-6" x 7'-0"	III	B	2	2
5	3'-0" x 7'-0"	II	A	1	1

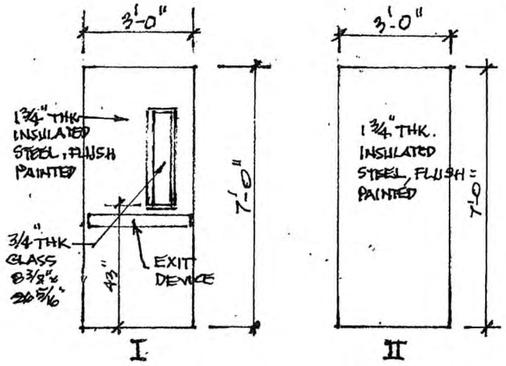
NOTES:
1. DOORS, FRAMES, HARDWARE INSTALLATION TO COMPLY WITH FEMA-361 AND ICC500 DESIGN STANDARDS AND REQUIREMENTS.
2. UNDERCUT INTERIOR DOORS 3/4" TO ALLOW FOR VENTILATION

HARDWARE SETS

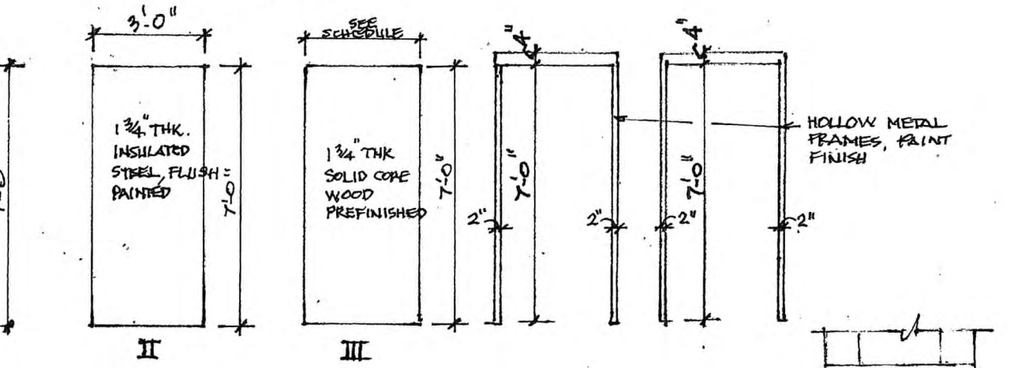
SET NO.1 - ADA ACCESSIBLE
2 PR. - BUTT HINGES
1 - EXIT DEVICE W/CONCEALED RODS W/EXTERIOR LEVER HANDLE
1 - DEAD BOLT
1 - DOOR BOTTOM
1 - ALUMINUM SADDLE 1/4"H x 10"W
1 - CLOSER
1 - DOOR STOP
1 - WEATHER STRIP

SET NO.2 - ADA ACCESSIBLE
1 1/2 PR. - HINGES
1 - PRIVACY LOCKSET W/LEVER HANDLE & VACANT/OCCUPIED SIGN
1 - CLOSER

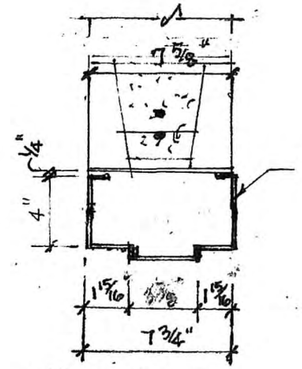
SET NO.3
1 1/2 PR - HINGES
1 - STOREROOM LOCKSET W/LEVER HANDLE



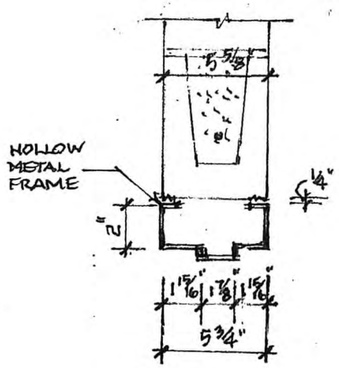
DOOR TYPES
1/4" = 1'-0"



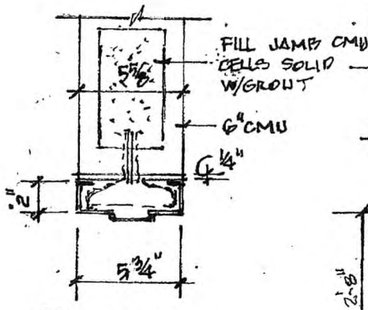
FRAME TYPES
1/4" = 1'-0"



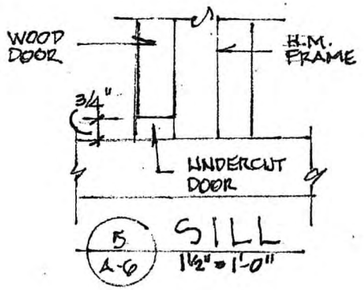
1 A-6 HEAD
1 1/2" = 1'-0"



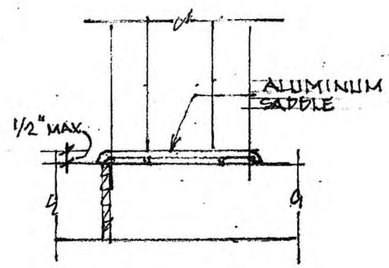
3 A-6 HEAD
1 1/2" = 1'-0"



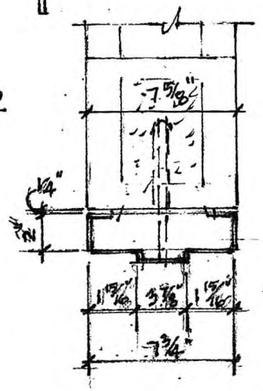
4 A-6 JAMB
1 1/2" = 1'-0"



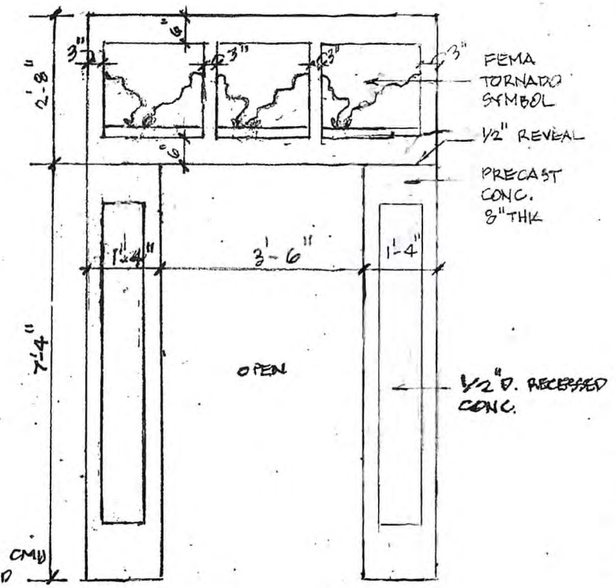
5 A-6 SILL
1 1/2" = 1'-0"



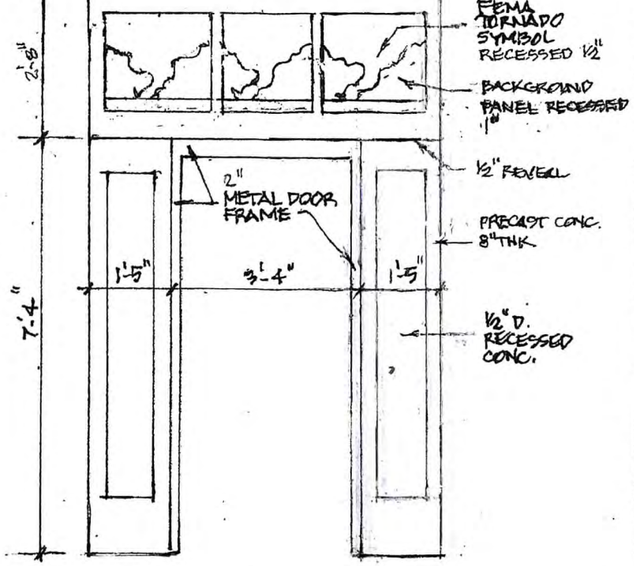
6 A-6 SILL
1 1/2" = 1'-0"



2 A-6 JAMB
1 1/2" = 1'-0"



7 A-6 ELEVATION
3/8" = 1'-0"



8 A-6 ELEVATION
3/8" = 1'-0"

L.L. JIRSA ARCHITECT
P.O. BOX 908
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605-770-6434

REGISTERED ARCHITECT
REG. NO. 4998
LARRY L. JIRSA
SOUTH DAKOTA
12-31-25

PROJECT NAME
CITY OF ALEXANDRIA TORNADO SAFE ROOM SPORTS FIELD COMPLEX ALEXANDRIA, SD

REVISIONS

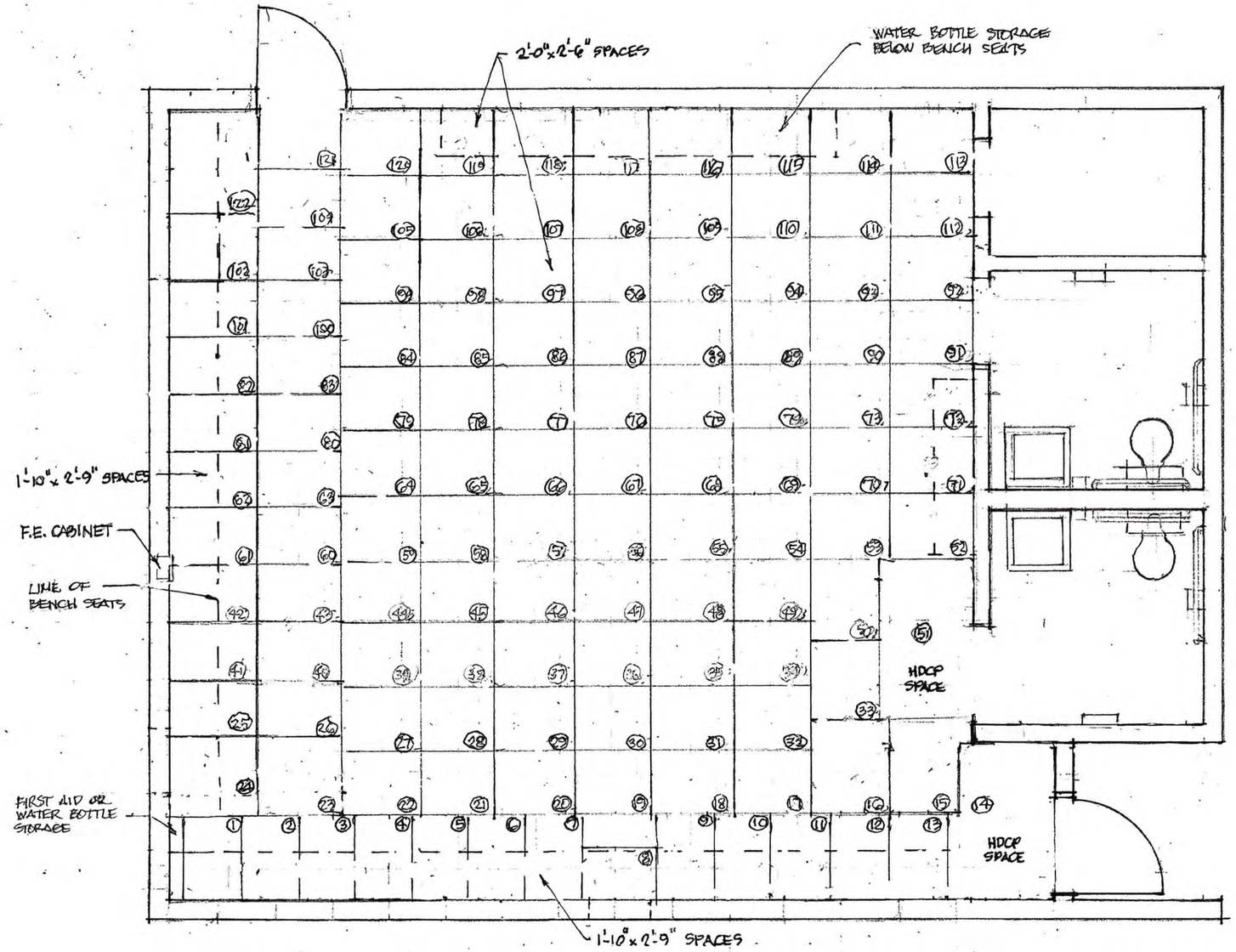
NO.	DATE	DESCRIPTION

PROJECT NO.
51-2025

DATE
DEC. 31, 2025

SHEET TITLE
DOOR SCHEDULE

SHEET NO.
A-6



1 / A-7 OCCUPANT LOAD PLAN

1/4"=1'-0"

122 TOTAL OCCUPANTS

L.L. JIRSA ARCHITECT
P.O. BOX 925
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605-770-6404

REGISTERED ARCHITECT
REG. NO. 6980
LARRY L. JIRSA
SOUTH DAKOTA
12-31-25

PROJECT NAME
CITY OF ALEXANDRIA
TORNADO SAFE ROOM
SPORTS FIELD COMPLEX
ALEXANDRIA, SD

REVISIONS

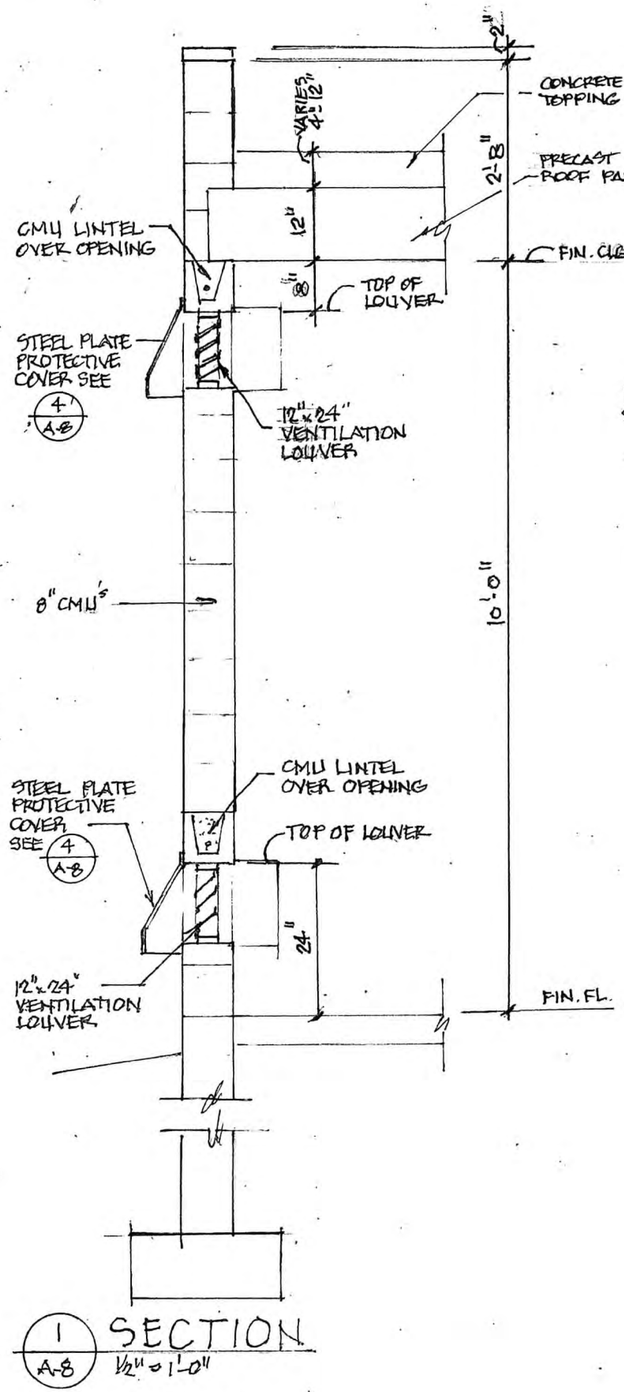
NO	DATE	DESCRIPTION

PROJECT NO.
51-2025

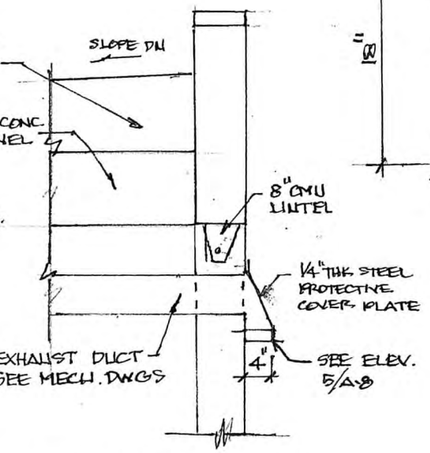
DATE
DEC. 31, 2025

SHEET TITLE
OCCUPANT LOAD PLAN

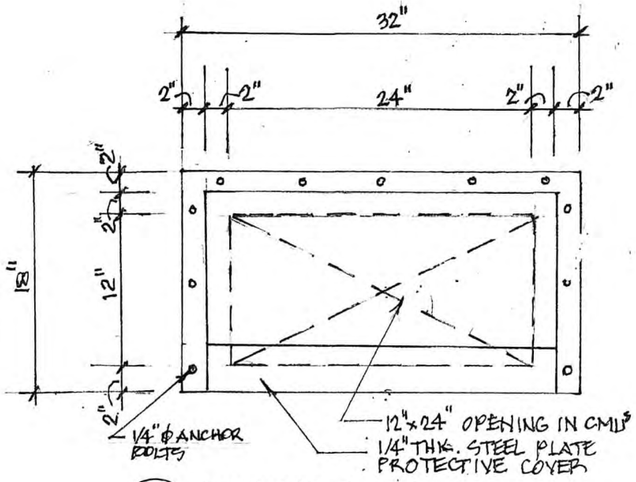
SHEET NO.
A-7



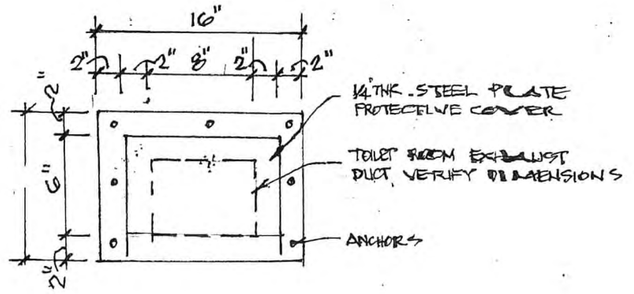
1/A-8 SECTION
1/2"=1'-0"



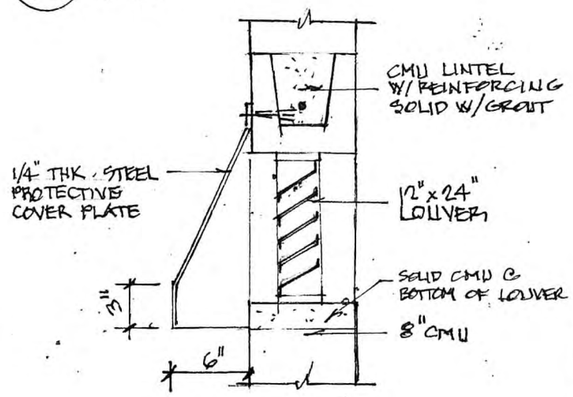
2/A-8 SECTION
1/2"=1'-0"



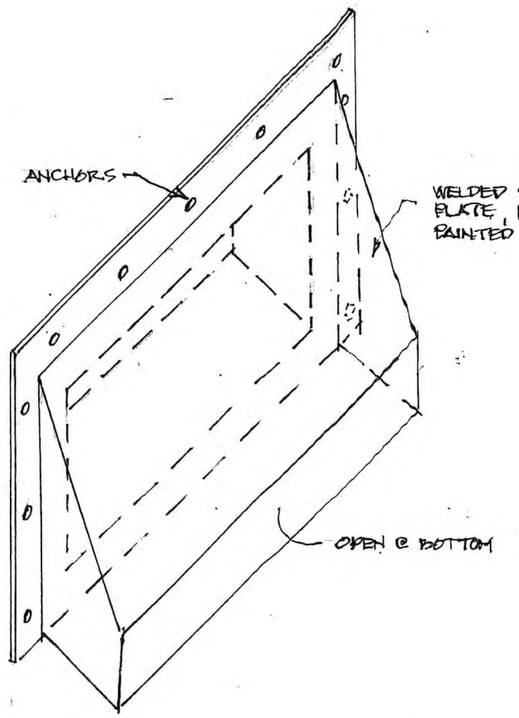
3/A-8 ELEVATION
1"=1'-0"



5/A-8 ELEVATION
1"=1'-0"



4/A-8 SECTION
1"=1'-0"



6/A-8 ISOMETRIC

GENERAL NOTES:

1. ALL PROTECTIVE COVERS TO BE FABRICATED WITH 1/4" THK. MINIMUM STEEL PLATE AND ALL JOINTS WITH CONTINUOUS WELDS.
2. ALL CMU'S TO BE FILLED SOLID WITH GROUT AT ALL ANCHOR BOLT LOCATIONS.
3. ALL OPENINGS IN CMU WALLS TO HAVE REINFORCED CMU LINTEL BLOCKS @ HEADS OF OPENINGS LINTELS TO EXTEND 8" BEYOND JAMBS OF OPENINGS
4. JAMBS OF LOUVER OPENINGS TO BE GROUTED SOLID A MINIMUM OF 8" BEYOND THE TOP AND BOTTOM OF OPENING.
5. ALL STEEL TO BE PRIMED AND PAINTED ON ALL SURFACES.
6. ALL ANCHOR BOLTS TO BE STAINLESS STEEL 1/4"ø x 3" L WITH EXPANSION SLEEVES OR EPOXY SET INTO CMU WALL.
7. GROUT CMU SPLIT FACED SURFACES SMOOTH WHERE PROTECTIVE COVER PLATE IS IN CONTACT WITH CMU'S

L.L. JIRSA ARCHITECT
P.O. BOX 935
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605-770-2444

REGISTERED ARCHITECT
REG. NO. 4935
DARYL L. JIRSA
SOUTH DAKOTA
12-31-25

PROJECT NAME
CITY OF ALEXANDRIA
TORNADO SAFE ROOM
SPORTS FIELD COMPLEX
ALEXANDRIA, SD

REVISIONS

NO	DATE	DESCRIPTION

PROJECT NO
51-2025

DATE
DEC. 31, 2025

SHEET TITLE
PROTECTIVE COVERS DETAILS

SHEET NO.
A-8

SECTION 01 33 00

SUBMITTAL PROCEDURES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included: Make submittals required by the Contract Documents, and revise and resubmit as necessary to establish compliance with the specified requirements. Materials required to comply with FEMA 361 and ICC500 shall be noted within the submittals.

1.02 QUALITY ASSURANCE

A. Coordination of submittals:
1. Prior to each submittal, carefully review and coordinate all aspects of each item being submitted.
2. Verify that each item and the submittal for it conform in all respects with the specified requirements.
3. By affixing the Contractor's signature to each submittal, certify that this coordination has been performed.

B. Substitutions:
1. The Contract is based on the standards of quality established in the Contract Documents. Substitutions will be considered only when listed at time of bidding, on the form provided therefore in the bidding documents, and when substantiated by the Contractor's submittal of required data within 35 calendar days after award of the Contract.
2. The following products do not require further approval except for interface within the Work:
   a. Products specified by reference to standard specifications such as ASTM and similar standards.
   b. Products specified by manufacturer's name and catalog model number.
3. Do not substitute materials, equipment, or methods unless such substitution has been specifically approved in writing for this Work by the Architect.

C. "Or equal":
1. Where the phrase "or equal", or "or equivalent", occurs in the Contract Documents, do not assume that the materials, equipment, or methods will be approved as equal unless the item has been specifically so approved for this Work by the Architect.
2. The decision of the Architect shall be final.

1.03 SUBMITTALS

A. Make submittals of Shop Drawings, Samples, substitution requests, and other items in accordance with the provisions of this Section.

PART 2 - PRODUCTS

2.01 SHOP DRAWINGS

A. Scale and measurements: Make Shop Drawings accurately to a scale sufficiently large to show all pertinent aspects of the item and its method of connection to the Work.

B. Types of prints required:
1. Submit Shop Drawings in the form of Blueline prints or blackline copies, minimum of 4 copies. PDF electronic copies are acceptable of material data and scaled drawings.

C. Review comments of the Architect will be shown on the prints when it is returned to the Contractor. The Contractor shall distribute copies as required for his purposes.

2.02 MANUFACTURERS' LITERATURE

A. Where contents of submitted literature from manufacturers includes data not pertinent to the submittal, clearly show which portions of the contents is being submitted for review.

B. Submit the number of copies which are required to be returned, plus one copy which will be retained by the Architect.

2.03 SAMPLES

A. Provide Sample or Samples identical to the precise article proposed to be provided. Identify as described under "Identification of submittals" below.

B. Number of Samples required:
1. Unless otherwise specified, submit Samples in the quantity which is required to be returned, plus one which will be retained by the Architect.
2. By prearrangement in specific cases, a single Sample may be submitted for review and, when approved, be installed in the Work at a location agreed upon by the Architect.

2.04 COLORS AND PATTERNS

A. Unless the precise color and pattern is specifically called out in the Contract Documents, and whenever a choice of color or pattern is available in the specified products, submit accurate color and pattern charts to the Architect for selection.

PART 3 - EXECUTION

3.01 IDENTIFICATION OF SUBMITTALS

A. Consecutively number all submittals.
1. When material is resubmitted for any reason, transmit under a new letter of transmittal and with a new transmittal number.
2. On resubmittals, cite the original submittal number for reference.

B. Accompany each submittal with a letter of transmittal showing all information required for identification and checking.

C. On at least the first page of each submittal, and elsewhere as required for positive identification, show the submittal number in which the item was included.

D. Maintain an accurate submittal log for the duration of the Work, showing current status of all submittals at all times. Make the submittal log available to the Architect for his review upon request.

3.02 GROUPING OF SUBMITTALS

A. Unless otherwise specified, make submittals in groups containing all associated items to assure that information is available for checking each item when it is received.
1. Partial submittals may be rejected as not complying with the provisions of the Contract.
2. The Contractor may be held liable for delays so occasioned.

3.03 TIMING OF SUBMITTALS

A. Make submittals far enough in advance of scheduled dates for installation to provide time required for reviews, for securing necessary approvals, for possible revisions and resubmittals, and for placing orders and securing delivery.

B. In scheduling, allow at least five working days for review by the Architect following his receipt of the submittal.

3.04 ARCHITECT'S REVIEW

A. Review by the Architect does not relieve the Contractor from responsibility for errors which may exist in the submitted data.

B. Revisions:
1. Make revisions required by the Architect.
2. If the Contractor considers any required revision to be a change, he shall so notify the Architect as provided for in Paragraph 12.3 of the General Conditions.
3. Make only those revisions directed or approved by the Architect.

END OF SECTION 01 33 00

SECTION 03 30 00

CAST-IN-PLACE CONCRETE

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included: Provide cast-in-place concrete foundation and floor slabs where shown on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.02 QUALITY ASSURANCE

A. Use adequate numbers of skilled workmen who are thoroughly trained and experienced in the necessary crafts and who are completely familiar with the specified requirements and the methods needed for proper performance of the work of this Section.

B. Quality control:
1. Do not commence placement of concrete until mix designs have been reviewed and approved by the Architect or Engineer.

Refer to structural drawings for concrete reinforcing details and required testing.

1.03 SUBMITTALS

A. Comply with pertinent provisions of Section 01 33 00.

B. Product data: Within 35 calendar days after the Contractor has received the Owner's Notice to Proceed, submit:
1. Materials list of items proposed to be provided under this Section;
2. Manufacturer's specifications and other data needed to prove compliance with the specified requirements.
3. Reinforcing steel shop drawings indicating reinforcing steel size, placement, clear cover and bending diagrams.

L.L. JIRSA ARCHITECT
P.O. BOX 925
MITCHELL, SD 57301
Email: lljirsaarchitect@gmail.com
605-770-2464

REGISTERED ARCHITECT
REG. NO. 4995
LARRY L. JIRSA
SOUTH DAKOTA
12-31-25

PROJECT NAME:
CITY OF ALEXANDRIA
TORNADO SAFE ROOM
SPORTS FIELD COMPLEX
ALEXANDRIA, SD

REVISIONS

NO.	DATE	DESCRIPTION

PROJECT NO. 51-2025

DATE DEC. 31, 2025

SHEET TITLE SPECIFICATIONS

SHEET NO. SP-1

PART 2 - PRODUCTS

2.01 FORMS

A. Design, erect, support, brace, and maintain formwork so it will safely support vertical lateral loads which might be applied until such loads can be supported safely by the concrete structure.

B. Construct forms to the exact sizes, lines, and dimensions shown, and as required to obtain accurate alignment, location, grades, and level and plumb work in the finished structure.

2.02 VAPOR RETARDER

See structural drawings for vapor retarder requirements and location.

2.03 REINFORCEMENT

A. Comply with the following as minimums:
1. Bars: ASTM A615, grade 60 unless otherwise shown on the Drawings, using deformed bars for number 3 and larger;
2. Bending: ACI 318.

B. Fabricate reinforcement to the required shapes and dimensions, within fabrication tolerances stated in the CRSI "Manual of Standard Practices.

C. Do not use reinforcement having any of the following defects:
1. Bar lengths, depths, or bends exceeding the specified fabricating tolerances;
2. Bends or kinks not indicated on the Drawings or required for this Work;
3. Bars with cross-section reduced due to excessive rust or other causes.

2.04 CONCRETE

A. Comply with the following as minimums:
1. Portland cement: ASTI C595 Type 1L Portland Limestone Cement.
2. Aggregate, general:
   a. ASTI C33-84, uniformly graded and clean;
   b. Do not use aggregate known to cause excessive shrinkage.
3. Aggregate, coarse: Crushed rock or washed gravel No. 57.
4. Aggregate fine: Natural washed sand of hard and durable particles varying from fine to particles passing a 3/8" screen, of which at least 12% shall pass a 50-mesh screen.
5. Water: Clean and potable.

B. Provide concrete with the compressive strengths shown on the Drawings.

C. Surface treatment:
1. Except as otherwise directed by the Architect or shown on the Drawings, on all concrete slabs and walkway surfaces provide "Hunt TLF" curing agent manufactured by Hunt Process Co., Inc. or approved equal.

D. Admixtures: Coarse aggregate shall consist of crushed stone of solid composition, free from dirt and debris, and conforming to ASTI C33.

2.05 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 REINFORCING

A. Comply with the following, as well as the specified standards, for details and methods of reinforcing placement and supports.
1. Clean reinforcement and remove loose dust and mill scale, earth, and other materials which reduce bond or destroy bond with concrete.
2. Position, support, and secure reinforcement against displacement by forms, construction, and the concrete placement operations.
3. Place reinforcement to obtain the required coverages for concrete protection.

3.03 EMBEDDED ITEMS

A. Do not embed piping, other than electrical conduit, in structural concrete.
1. Locate conduit to maintain maximum strength of the structure.
2. Increase the thickness of the concrete if the outside diameter of the conduit exceeds 30% of the thickness of the concrete.

B. Set bolts, inserts, and other required items in the concrete, accurately secured so they will not be displaced, and in the precise locations needed.

3.04 MIXING CONCRETE

A. Transit mix the concrete in accordance with provisions of ASTM C94.
B. Perimeter slab expansion joint shall be W. R. Meadows fiber expansion joint filler or equivalent.

3.06 CONCRETE FINISHING

A. Except as may be show otherwise on the Drawings, provide the following finishes at the indicated locations.
1. Scratch finish:
   a. Apply to monolithic slab surfaces that are to receive concrete floor topping or mortar setting bed.
2. Float finish:
   a. Apply to monolithic slab surfaces that are to receive trowel finish and other finishes specified hereinafter, and to slab surfaces which are to be covered with insulation.
3. Trowel finish:
   a. Apply to monolithic slab surfaces that are to be exposed to view, unless otherwise shown, and to slab surfaces that are to be covered with resilient flooring, carpeting, paint, or other thin-film finish coating system.
4. Non-slip broom finish:
   a. Apply to walks, stairs, drives, ramps, and similar pedestrian and vehicular areas.

3.08 REMEDIAL WORK

A. Repair or replace deficient work as directed by the Architect and at no additional cost to the Owner.

END OF SECTION 03 30 00

SECTION 03 45 00

PRECAST ARCHITECTURAL CONCRETE

PART 1 GENERAL

1.1 SUMMARY

A. This section covers performance criteria, materials, design, production and erection of architectural precast concrete for the exterior wal at entry doorsl and roof panels.

B. Structural performance shall comply with FEMA 361 and ICC 500 design standards for a Tornado Safe Room, refer to structural drawings for design criteria.

1.2 SUBMITTALS

A. Submit the following for Architect and Structural Engineer review.
1. Design mixtures, include results of compressive strength and water absorption tests.

B. Shop (Erection) Drawings
1. Detail fabrication and installation of precast units.
2. Indicate locations, plan views, elevations, dimensions, shapes and cross sections of each unit.
3. Indicate aesthetic intent, including joints, drips, chamfers, reveals and extent and location of each surface finish and color.
4. Indicate details at building corners.
5. Indicate welded connections, using AWS standard symbols. Show size, length and type of each weld.
6. Indicate locations, tolerances and details of anchorage devices to be embedded in or attached to foundation or other precast concrete components.
7. Indicate plan views and elevations showing unit locations and dimensions, erection sequences and bracing plans for special locations.
8. Indicate location of each architectural precast concrete unit by same identification mark placed on unit.
9. Coordinate and indicate openings and inserts required by other trades.
10. Provide shop (erection) drawings.
11. Provide comprehensive engineering design, signed and sealed by licensed professional engineer in South Dakota.Design shall show panel types, connections,concrete cover, reinforcement types.

C. Samples: Provide 12"x12"x2" samples of each different finish, color and texture of all exposed surface.

1.3 QUALITY ASSURANCE

A. Fabricator shall be experienced in producing architectural precast concrete units similar to those indicated for this project and comply with the following:

L.L. JIRSA ARCHITECT
P.O. BOX 905
MITCHELL, SD 57301
email:lljirsaarchitect@gmail.com
605-770-6424

REGISTERED ARCHITECT
REG. NO. 4295
LARRY L. JIRSA
SOUTH DAKOTA
12-31-25

PROJECT NAME
CITY OF ALEXANDRIA
TORNADO SAFE ROOM
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ALEXANDRIA, SD

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NO.	DATE	DESCRIPTION

PROJECT NO.
51-2025

DATE
DEC, 31, 2025

SHEET TITLE
SPECIFICATIONS

SHEET NO.
SP-2

1. Participate in PCI Plant Certification Program at time of bidding and is designated as a PCI certified plant for category AA and BB.
2. Has sufficient production capacity to produce required units without delaying the work.
3. Assumes responsibility for engineering architectural precast concrete units to comply with performance requirements. Responsibility includes preparation of shop erection drawings and comprehensive engineering analysis which complies with the criteria noted by the project structural engineer.

1.3 HANDLING, STORAGE AND DELIVERY

A. Units delivered to the jobsite on a daily basis will be erected each day and not stored on site.

B. Lift and support units only at designated points indicated on shop drawings.

1.4 SEQUENCING

A. Items to be cast into precast concrete wall panels are electrical boxes and conduits. Electrical Contractor shall furnish and deliver electrical components to the precast concrete plant and coordinate placement of electrical components into precast formwork.

PART 2 PRODUCTS

2.1 APPROVED FABRICATORS

A. Gage Brothers- Sioux Falls, SD

2.2 REINFORCING MATERIALS

A. Steel reinforcing bars: ASTM A615/A615M Grade 60 and ASTM A706/A706M for welded reinforcement.

2.3 CONCRETE MATERIALS

A. Portland Cement: ASTM C150, Type I or III

1. For surfaces exposed to view in finished structure use white Portland cement throughout the precast concrete production of wall panels and gray Portland cement for roof panels.

2.4 COLORING ADMIXTURE

A. Coloring admixture ASTMC979, temperature stable and nonfading.

B. Potable water.

C. Air entraining admixture: ASTM C260

2.5 STEEL CONNECTION PLATES

A. Carbon Steel Shapes and Plates: ASTM A36/A36M.

B. Carbon Steel Bolts and Studs: ASTM A307 Grade A.

C. Shop primed finish for exposed steel connections embedded into concrete with rust inhibitive primer.

2.6 STAINLESS STEEL CONNECTION PLATES AT INTERIOR WALL PANELS

A. Stainless Steel Plate: ASTM A666 Type 316or Type 201.

B. Stainless Steel Bolts and Studs: ASTM F593 Alloy 304, 316 or 410.

C. Stainless Steel Headed Studs: ASTM A276 with minimum mechanical properties for studs.

PART 3 FIELDS EXECUTION

3.1 PREPARATION

A. Furnish anchorage devices for precast concrete units to be embedded in or attached to the concrete foundation before start of such work. Provide locations, setting diagrams, templates and instructions for the proper installation of each anchorage device.

3.2 EXAMINATION

A. Examine foundation conditions for compliance with requirements for installation tolerances, bearing surface tolerances and other conditions affecting precast concrete performance.

B. Proceed with precast concrete installation only after unsatisfactory conditions have been corrected.

C. Prior to proceeding with installation, notify precast concrete erector in writing that supporting cast in place concrete foundation has attained minimal allowable design compressive strength ready to receive loads from precast concrete units.

3.3 ERECTION

A. Install loose clips, hangers, bearing pads and other accessories required for connecting architectural precast concrete units to supporting members and backup materials.

B. Precaster or erector shall supply miscellaneous steel preweld connection hardware and install it in the field.

C. Erect architectural precast concrete level, plumb and square within the specified allowable erection tolerances. Provide temporary supports and bracing as required to maintain position, stability and alignment of units until permanent connections are made.

1. Install temporary steel or plastic spacing shims as precast concrete units are erected.
2. Maintain horizontal and vertical joint alignment and uniform joint width as erection progresses.
3. Remove projecting lifting devices and use sand cement grout to fill voids within recessed lifting devices flush with surface of adjacent precast concrete surfaces.
4. Provide uniform joint widths not to exceed 3/8" as required by FEMA for Tornado Safe Rooms.

D. Connect precast concrete units by welding or otherwise indicated on shop (erection) drawings. Remove temporary shims, spacers soon as practical after connecting is complete.

E. Welding: Comply with applicable AWSD.1/DI.IM, AWS D1.4/D1.4M and AWS D1.6/D1.6M requirements for welding, welding electrodes, appearance of welds, quality of welds and methods used in correcting welding work.

1. Protect precast units and bearing pads from damage during field welding or cutting operations and provide noncombustible shields as required.
2. Welded connections should be clearly detailed to show the type, size, length and location of all welds.
3. Visually inspect all welds critical to precast concrete connections. Visually check all welds for completion and remove, reweld or repair all defective welds, if services of AWS certified welding inspector are not furnished by Owner.

3.4 ERECTION TOLERANCES

A. Erect architectural precast concrete units level, plumb, square and in alignment without exceeding tolerances allowed by FEMA 361 and ICC 500.

B. Erect architectural precast concrete units without exceeding the following noncumulative erection tolerances.

1. Plan location from building grid datum + or – ½".
2. Top elevation from nominal top elevation:
   a. Exposed individual panel = or – ¼".
3. Support elevation from nominal support elevation:
   a. Maximum low: ½"
   b. Maximum high: ¼"
4. Maximum plumb variation: ¼"
5. Maximum jog in alignment of matching edges: ¼"
6. Maximum joint width as required by FEMA 361 and ICC 500: 3/8"
7. Maximum jog in alignment of faces: ¼"
8. Differential bowing of camber of adjacent members of the same design: ¼".

END OF SECTION 03 45 00

SECTION 04 22 00

CONCRETE MASONRY UNITS

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work Included: Provide all labor, material and equipment necessary to complete the concrete masonry unit exterior and interior walls as indicated on drawings, specified herein and necessary to complete the work in this Section.

B. Materials included in this Section are related to the concrete masonry wall system and shall include the concrete masonry units, rebar, grout, and related accessories for a complete installation of the wall system.

1.02 QUALITY ASSURANCE

A. Concrete Masonry unit system shall be installed in strict accordance with manufacturers written instructions.

B. Concrete Masonry Unit System shall be designed as reinforced masonry in accordance with the requirements of the International Building Code.

1.03 SUBMITTALS

A. Shop Drawings: Submit minimum four sets of shop drawings showing location of rebar reinforcing, insulation and unit types for coordination with plumbing and electrical work.

B. Product Data: Submit a minimum of four copies of manufactures product data for masonry units, insulation, structure cost and grout, for architect's approval.

1.04 STORAGE, DELIVERY, HANDLING

A. Store all materials in a clean and dry environment as recommended by the manufacturer. Do not allow materials to become damp, wet, freeze or damaged prior to installation.

PART 2 - PRODUCTS

2.01 MATERIALS -INTERIOR WALLS

A. Interior Concrete Masonry Units -Smooth Type 1, lightweight, ASTM C 90, compressive strength per the structural drawings. Blocks shall be 8"x8"x16" and 6" x 8" x 16" standard sizes and shapes as provided by manufacturers.

L.L. JIRSA ARCHITECT
P.O. BOX 925
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605-770-6424

REGISTERED ARCHITECT
REG. NO. 4998
LARRY L. JIRSA
SOUTH DAKOTA
12-31-25

CITY OF ALEXANDRIA
TORNADO SAFE ROOM
SPORTS FIELD COMPLEX
ALEXANDRIA, SD

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B. Reinforcing Steel - Maximum tensile stress is 20,000 psi, ASTM A 615, grade 60.
C. Mortar: Pre-blended factory mix: ASTM C270.
D. Grout – ASTM C476 shall have 28 day compressive strength iof 3,000 psi.

2.02 MATERIALS - EXTERIOR WALLS

A. Exterior Concrete Masonry Units – Split-faced,Type 1, lightweight, ASTM C 90, compressive strength as per the structural drawinngs. Blocks shall be 8"x 8" x16" standard sizes and shapes as provided by manufacturers.
B. Reinforcing Steel - Maximum tensile stress is 20,000 psi, ASTM A 615, grade 60.
C. Mortar: Pre-blended factory mix: ASTM C270.
D. Grout – ASTM C476 shall have 28 day compressive strength of 3,000 psi.

2.02 ACCEPTABLE MANUFACTURERS

A. TCC – Harrisburg, SD 605-330-8481
B. MM Concrete -Eau Claire, WI 715-876-5555

PART 3 - EXECUTION

3.01 INSTALLATION

A. Set.Masonry Units in Running Bond pattern.
B. Masonry Contractor shall coordinate all openings, lintel beams reinforcing, plumbing, electrical, anchoring dowels/bolts and raceways with concrete masonry unit cells.
C. Provide a vertical rebar and grout cell adjacent to each window and door jamb. Extend horizontal rebar at all lintels a minimum of 24" beyond opening. All grouted cells shall be vibrated for consolidation.
D. Ensure all vertical cells to be grouted are aligned and unobstructed openings for grout are provided.
E. All masonry shall be laid true, level, plumb and in accordance with the drawings.

3.02 MORTAR BEDDING AND JOINTING

A. Place mortar in accordance with AC 530.1.
B. Initial bed joint shall not be less than ¼" nor more than ¾".
C. Thickness of bed joints shall not exceed 5/8".
D. Lay hollow units with head and bed joints filled with mortar for the thickness of the face shell.
E. All mortar joints on exposed walls shal be concave and struck to produce a dense, slightly concave surface well bonded to the surface of the masonry unit.
F. Remove and re-lay in fresh mortar any unit that has been disturbed to the extent the initial bond is broken.

3.03 INSTALLATION OF REINFORCING STEEL, WALL TIES AND ANCHORS

A. Install reinforcing steel, wall ties, and anchors in accordance with ACI 530.1.
B. Place reinforcement as detailed on the drawings.
1. Support and fasten reinforcement to prevent displacement beyond specified tolerances during construction and grouting operations.
2. Maintain clear distances between reinforcement and any face of masonry unit or formed surface, but not less than ¼ in. for fine grout, or ½ in. for coarse grout.
3. Completely embed reinforcing bars in grout.
4. Embed joint reinforcement with minimum 5/8 inch cover to faces exposed to weather or earth, and ½ inch elsewhere.
a. Provide minimum 6-in. lap splices and ensure that all ends of longitudinal wires are embedded in mortar at laps.
5. Foundation dowels that interfere with unit webs are permitted to be bent to a maximum of 1 in horizontally for every 6 in. of vertical height.
C. Install wall ties as detailed on the drawings and in accordance with ACI 530.1.
D. Install anchor bolts ties as detailed on the drawings and in accordance with ACI 530.1.
1. Embed headed and bent-bar anchor bolts in grout. Anchor bolts of ¼ in. or less may be placed in mortar bed joints at least ½ in. thickness.
2. Maintain clear distance between anchor bolts and any face of masonry unit or formed surface of at lease ¼ in. when using fine grout, and of at least ½ in. when using coarse grout.
3. Maintain a clear distance between parallel anchor bolts not less the diameter of the anchor bolt, nor less than 1 in.

3.04 GROUTING

A. Comply with grout placement requirements in ACI 530.1.
B. Place grout within 1 ½ hr from introducing water in the mixture and prior to initial set.
1. Discard field-mixed grout that does not meet specified slump without adding water after initial mixing.
2. For transit-mixed grout:
a. Addition of water is permitted at time of initial discharge to adjust consistency to a slump between 8 and 11 in.
b. Discard transit-mixed grout that does not meet specified slump without adding water, other than as allowed in 3.7 B.2.a above.
c. Transit-mixed grout may be used beyond the time limit as long as it meets the specified slump.
C. Grout pour height: Do not exceed max. grout pour height as given in ACI 530.1.
D. Grout lift height:
1. Conventional grout:
a. Place grout in lifts not exceeding 5 ft.
2. Self-consolidating grout:
a. When placed in masonry that has cured for a minimum 4 hours, place in lifts up to the grout pour height.
b. When placed in masonry with less than 4 hours of cure, place in lifts not exceeding 5 ft.
E. Grout consolidation:
1. Conventional grout:
a. Consolidate grout pours 12 in. or less by mechanical vibration or puddling.
b. Consolidate grout pours exceeding 12 in. by mechanical vibration, and reconsolidate after initial water loss and settlement has occurred.
2. Self-consolidating grout: consolidation or reconsolidation is not required.
F. Grout Keys are required between grout pours, or between lifts when the previous

lift is permitted to set prior to placement of subsequent lift.
1. Form grout key by terminating the grout a minimum of 1 ½ in. below a mortar joint.
2. Do not form grout keys within beams.
3. At beams or lintels laid with closed bottom units, terminate the grout pour at the bottom of the beam or lintel without forming a grout key.

3.05 POINTING AND CLEANING

A. Point and tool holes in mortar joints to produce a uniform, tight joint
B. During construction, minimize any mortar or grout stains on the wall. Immediately remove any staining or soiling that occurs.
1. For precision or textured units, except as noted below, clean masonry by dry brushing before tooling joints.
2. For burnished, glazed, or pre-finished concrete masonry units, immediately remove any green mortar smears or soiling with a damp sponge.
C. Final Cleaning: After mortar is thoroughly set and cured, clean exposed masonry surfaces of stains, efflorescence, mortar or grout droppings, and debris as follows:
1. Clean exposed cmu walls with a light sandblast. All nonmasonry work near the area to be sandblasted shall be covered or protected before the sandblasting starts. Care shall be taken to avoid contamination to areas that are not to be sandblasted.
a. Burnished, glazed, or pre-finished concrete masonry units shall be protected from sandblast operations.
D. At completion of masonry work, remove all scaffolding and equipment used during construction, and remove all debris, refuse, and surplus masonry material from the site.
1. Comply with Construction Waste Management plan.

END OF SECTION 04 22 00

SECTION 07 01 50

ELASTOMERIC SILICONE COATING ROOF SYSTEM

PART 1 – GENERAL

1.1 SUMMARY

A This specification provides a coating system for application over smooth concrete roofs. Projejct schedule will require the roofing contractor to provide a temporary roof to keep the concrete roof deck dry prior to installation of the applied silicone roof membrane due to improper temperature for silicone membrane to be applied. Temporary roof required shall be at roofing contractors option for a minimum of three months following erection of the building and placement of the poured concrete roof deck.

1.2 ADHESION TESTS

A. Adhesion Tests: On a roof judged by Gaco Western to be acceptable for a coating application, a Gaco Western Field Service Technician must perform adhesion tests. The number of adhesion tests required will be one for every 10,000 square feet with a minimum of two.

B. Adhesion tests will be performed in accordance with ASTM D903 procedures. An area at least 12"x 12" shall be cleaned and primed with GacoFlex E5320 Primer and cured for 24 hours. Apply by brush the GacoFlex S-20 Series Silicone Coating at a rate of 1 gallon per square. While the GacoFlex S-20 Series Silicone Coating is still wet,embed a strip 1" or 2" wide GacoFlex 66-S Polyester Flashing Taqpe across the test patch leaving 4" to 6" dry section of the polyester fabric tape outside the test patch Apply additional GacoFlex Series Silicone Coating to totally encapsulate the polyester fabric tape. Allow the coating to cure for a minimum of 4days then attach an appropriate scale to the end of the dry polyester tape and pull. A minimum of 10 pounds of pull resistance must be achieved. No further work shall be performed until the evaluation test results indicate the adhesion is adequate. The pull test results must be recorded and sent to Gaco Western for final approval.

L.L. JIRSA ARCHITECT
P.O. BOX 925
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605-770-6424

REGISTERED ARCHITECT
REG. NO. 4395
LARRY L. JIRSA
SOUTH DAKOTA
12-31-25

PROJECT NAME
CITY OF ALEXANDRIA
TORNADO SAFE ROOM
SPORTS FIELD COMPLEX
ALEXANDRIA, SD

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1.3 SUBMITTALS

A. Product Data: Submit manufacturer's standard submittal package including specifications, installation instructions and general information for each type of waterproofing material.

B Applicator Qualifications: Submit current "Qualified Applicator" Certificate from the specified waterproofing manufacturer.

C. Warranty for materials and installation shall be provided by the materials manufacturer.

D. Substrate Conditions:

1. Manufacturer's representative shall provide to Owner a completed inspection form verifying substrate condition and any noted defects not specifically related to the new silicone membrane application and warranty.
2. Surface shall be free of foreign materials including but not limited to loose dirt, stones, debris, moisture and shall be in stable condition. All surfaces to receive new silicone coating shall be cleaned prior to installation.
3. Applicator shall complete a substrate inspection prior to start of application of new roofing. New roofing shall be applied directly to the sloped dry concrete roof slab. Applicator shall not install new roof system over existing wet substrate.

1.4 QUALIFICATIONS

A. Primary waterproofing materials shall be the products of a single manufacturer. Secondary materials shall be recommended by the primary manufacturer with prior approval by architect before bidding the work. The manufacturer shall have a minimum of 10 years experience in the manufacture of type of materials specified.

B. Applicators shall have a minimum of 5 years experience in the application of waterproofing materials of the type specified. The applicator shall provide a current "Qualifications Applicator Certificate from the specified waterproofing manufacturer.

1.5 DELIVERY, STORAGE AND HANDLING

A. Deliver all roofing materials in manufacturers original labeled containers.

B. Store materials in accordance with the manufacturer's written instructions.
C. Provide adequate ventilation, protection from hazardous fumes, protection of adjacent surfaces from overspray and adjacent property from drifting spray.

1.6 WARRANTY

A. Gaco Western warrants that all materials supplied will meet or exceed physical properties as published. The contractor guarantees that workmanship will be free of defects in application of coating. The manufacturer shall provide a 50 year warranty on the silicone material and a 20 year warranty on the installation labor.

1.7 PROTECTION OF BUILDING AND OCCUPANTS

A. Coverings: All surfaces not to receive the silicone waterproofing material shall be protected from overspray at adjacent surfaces and vehicles. Protective coverings shall be secured against wind and shall be vented if used in conjunction with applications preventing collection and moisture.

B. Signs: Contractor is to post signs noting potential overspray hazard within 400 feet of the applications. No Smoking signs to be posted as required by the fire marshal.

PART 2 – PRODUCTS

2.1 MANUFACTURERS

A. Acceptable manufacturers: 1. Gaco Western LLC , www. Gaco.com (Basis of Specification)
2. Mule-Hide Products Co. Inc. www.Mulehide.com

2.2 MATERIALS

A. Cleaner: Gaco Flex GacoWash Concentrated Cleaner

B. Primer: GacoFlex E-5320 Epoxy Primer

C. Flashing Tape: GacoWestern GacoFlex 66-S Polyester Flashing Tape, GacoFlex SF-2000 Seam Seal, Gaco Flash Foam

D. Coating: Gaco Western GacoFlex S-20 Series Silicone Coating having the following properties.

PROPERTY	VALUE	TEST METHOD	S-2000 Immersed in water @150 degrees F For 1 year per ASTM D -471
Tensile Strength	550 psi	ASTM D-412	Strength: 463 psi, elongation 125%
Elongation	150 %	ASTM D-412	Permanent set at break: 0%
Tear Resistance	21 pll	ASTM D-624	
Hardness	55 Shore A	ASTM D-676	
Water Vapor	5.3 perms	ASTM E-96	
Volume Solids	95%	Calculated	
Reflectance	0.88	ASTM C- 1549	
Emittance	0.87	ASTM C-1371	
Permeability	Procedure B at 0.5 mm thickness Minimum permeance requirement is 2.5 U.S. perms		

PART 3 – EXECUTION

3.1 PREPARATION
A. All surfaces to receive new spray on silicone coating shall be clean and dry.

E. Drying: Allow surfaces to completely dry to prevent blistering. Examine roof to ensure any residual water has dried before applying GacoFlex S-2 coating.

3.2 INSTALLATION

A. Technical Advice: The installation of this system requires the presence of or with the advice of a Gaco Western technical representative.
B. Primer: On smooth surfaces, apply one coat of GacoFlex E-5320 Primer by spray or roller at the rate of 1 gallon per 250 square feet per pass. Apply 2 coats to prevent possible bleed through. Allow the primer to dry a minimum of 12 hours before the GacoFlex S20 Silicone Coating is applied. Actual cure time varies depending on UV and humidity conditions. Stop the application process 2 hours prior to any rain or dew point is anticipated.

C. Flashing, seams, cracks, penetrations, or terminations shall be one of the following:

1. GacoFlex SF-2000 Liquid Seam Seal at a rate of 64 wet mils, 60 dry mils before top coat or coats are applied.
2. GacoFlex GacoFlashFoam: Apply GacoFlashFoam to the desired thickness, minimum ¾" and maximum 1-1/4."
3. Taping reinforced with a layer of GacoFlex 66-S Spun-laced Polyester Tape embedded in two coats of GacoFlex S-20 Series Silicone Coating.

D. Seams: After the specified top coat has been applied the contractor must walk the roof and ensure all seams are encapsulated. Seams not adequately covered shall require additional silicone coatings.

H. Coating: On smooth surfaces apply 1 coat of GacoFlex S-20 Series Silicone Coating at the average rate of 2 ½ gallons per 100 square feet to obtain 38 dry mils. Coat all surfaces including joint covers and flashings.

3.3 FIELD QUALITY CONTROL

A. No foot traffic is allowed on the new coated surfaces for a minimum period of 3 days. Contractor shall post signs when roof surfaces can be walked on. Should roof coating damage occur during emergency access required during the coating cure period the roofing contractor shall not be responsible for repair unless the emergency requiring access is caused by the roofing contractor.

END OF SECTION 07 01 50

SECTION 07 16 16

CRYSTALLINE WATERPROOFING

PART 1 GENERAL

1,1 System Description
A. System is to be applied to all interior and exterior exposed precast concrete and concrete masonry units for sealing and waterproofing purposes.

1.2 Delivery, Storage and Handling
A. Deliver and store materials in original unopened packages, store off the ground, protect from rain, freezing or excessive temperatures until ready to use.

1.3 Job Conditions
A. Do not apply below 40 degrees For raining or snowing or if such weather conditions are eminent.

1.4 Submittals
A. Submit copies of manufacturers literature, include technical data sheet, safety data sheet and application instructions.

1.9 Warranty
A. Provide written manufacturers warranty against defects in materials and manufacturing for a period of 10 years beginning with the date of substantial completion of the work.

L.L. JIRSA ARCHITECT
P.O. BOX 905
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605-770-6424

REGISTERED ARCHITECT
REG. NO. 4999
LARRY L. JIRSA
SOUTH DAKOTA
12-31-25

PROJECT NAME
CITY OF ALEXANDRIA
TORNADO SAFE ROOM
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ALEXANDRIA, SD

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PART 2 PRODUCTS

2.1 Manufacturer:
A. Kryton International Inc.
Toll Free: 1-800-268-8280
E mail: info@kryton.com

2.2 Product:
A. Crystalline Waterproofing and protective coating: Krystol T1 at all interior exposed precast concrete wall panels, color: White.
B. Concrete Water Repellant and Sealer: Hydropstop at all interior exposed concrete floor slabs and precast concrete ceiling panels and exterior exposed precast concrete wall panels, color: Clear.

PART 3 EXECUTION

3.1 Surface Preparation
A. Concrete surfaces must be clean and free of paint, sealers, form release agents, curing compounds, dirt or any other contaminates.
B. Where steel reinforcing, anchor plates or other steel connectors, mechanically clean the steel to remove any contaminates and rust.

3.2 Installation - Concrete Protection and Waterproofing -Krystol T1
A. Mix to a thick but spreadable consistency approximately 3.5 parts powder to 1 part clean water using a margin trowel or a drill with a grout mixing paddle.
B. Verify surface is Saturated Surface Dry (SSD).
C. Brush or spray Krystol T1 evenly over the concrete to achieve a typical coating thickness of 1-1.5 mils or .04 -.06 inches thick.
1. Brush Application- Apply with a masonry brush using a circular motion to press the coating into low spots. Finish with a lighter pressure to achieve the target coverage and a uniform finish.
2. Spray Application: Spray evenly over the surface at the specified coverage. Low impact spray equipment will require back brushing to ensure adequate contact between the coating and the concrete. Cosult spray equipment manufacturer regarding methods and attachments.
D. Protect all adjacent surfaces and materials from contact with the white sealer application. Some adjacent concrete surfaces Will be sealed with a clear sealer and not a white colored sealer

3.3 Protection and Curing
A. Krystol T1 – Protect freshly applied Krystol coating with tarps or plastic to prevent water loss due to evaporation while it hardens. Leave an air space between freshly applied coating and the protective covering until the coating has set to the touch. Wet curing should begin as soon as the Krystol coating has hardened and will not be damaged by the curing water, usually 6-24 hours depending on temperature. Keep protective coverings in place during the curing period to retain moisture. Apply more curing water if the coating dries out during the curing period. Wet cure for a minimum of 72 hours.

3.4 Installation - Hydrostop Sealer
A. Mix sealer prior to use do not dilute.
B. Surfaces must be dry at the time of application. Do not apply sealer to surfaces that have been washed or rained on in the Previous 24 hours, or if rain is expected in the next 12 hours. Apply sealer uniformly by brush, roller, or low pressure sprayer. Airless spray equipment must be set at a low pressure to prevent atomization of the product during application.
C. Apply only as much sealer as the surface can absorb without material pooling on the surface. A very light fog coat followed immediately by a uniform flood coat will usually provide the most even penetration and prevent over application. For vertical surfaces, apply material using overlapping, horizontal passes and allow a 6-8 inch rundown below the spray line.
D. Do not allow material to pool on the surface. Use a sponge, rag, or roller to immediately remove excess material that does not soak into the surface.
E. Allow the surface to dry naturally. No special curing procedures are required.

3.5 Clean Up
A. Clean area as necessary for a neat, orderly and clean condition.

END OF SECTION 07 16 16

SECTION 07 90 00

JOINT PROTECTION

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. This Section includes caulking, sealant, and related items.

1.02 QUALITY ASSURANCE

A. Compatibility of Materials: Provide only materials which are proven to be compatible with each other and with adjacent joint material.

1.03 DELIVERY, STORAGE AND HANDLING

A. Deliver materials in original manufacturer packaging with seals and labels intact. Handle and store in accordance with manufacturer's instructions.

B. Caulking and sealant materials shall have shelf-life clearly indicated by terminal date on each carton, package, or container.

1.04 PROJECT / SITE CONDITIONS

A. Protection of Adjacent Surfaces:
1. Protect either by applying masking material or manipulating application equipment to confine caulking or sealant material in joint.
2. If masking materials are used, allow no tape to touch cleaned surfaces to receive sealant, and remove tape immediately after finished tooling is accomplished and before surface skin has started to form.
3. Remove misapplied caulking or sealant materials from surfaces immediately.
4. Restore surfaces from which caulking or sealant materials have been removed to their original condition and appearance.

B. Inspect job for conditions which would prevent the execution of this work as specified. Do not proceed until such conditions are corrected.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS

A. Provide caulking and sealant from the following manufacturers: Dow Corning and G.E. for Silicone; W.R. Grace, Pecora Corp., and Sonneborne for polysulfide. Equivalent materials from other manufacturers may be provided, if approved prior to bid by the Architect. Materials shall be from one source, for each type specified.

2.02 CAULKING AND SEALANT MATERIAL

A. Exterior Sealant System: Dow Corning 790 Building Sealant or G.E. Silicone "Silpruf".

B. Backup Materials, Where Required: "Ethafoam" as manufactured by Dow Chemical Company or approved equivalent material. Size of backup material shall be such that a minimum of 25% compression and a maximum of 50% is obtained in all joints. Braided rods are not acceptable.

C. Solvents and cleaning agents as recommended by the manufacturer for use with the particular caulking or sealant being applied.

D. Color: To be selected by Architect from standard manufacturer's colors.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Caulking and Sealant Materials: Install materials in accordance with the manufacturer's printed directions for the material and substrate involved.

3.02 AREAS OF APPLICATION

A. The required typical applications of sealants and caulking include, but are not necessarily limited to the following general locations:
1. Exterior and interior perimeter of metal and fiberglass door frames.
2. Seal at perimeter of wall vents, pipes and conduits.
3. All pipe, conduit and ductwork penetrations through walls, floors, ceilings of interior and exterior surfaces.
4. Concrete slab control joints.
5. Precast concrete wall and ceiling panels. Match color of concrete

3.03 PREPARATORY WORK

A. Inspection: Examine joint surfaces to receive caulking and sealant materials. Commencement of work shall constitute acceptance of joint surface conditions.

B. Cleaning:
1. General: Thoroughly clean joints scheduled to receive caulking and sealant materials. Rake joints to full width and depth. Remove loose particles present.
2. Nonporous Surfaces: Clean surfaces such as metal and glass in accordance with system manufacturer's recommendations. Do not use solvents that leave a residue. Apply and remove solvents with clean white cloths. Do not allow solvents to air dry without wiping.

C. Protection: Prior to sealant application, apply masking tape to adjacent surfaces. Leave masking tape in place until tooling operation is complete.

L.L. JIRSA ARCHITECT
P.O. BOX 925
MITCHELL, SD 57301
email: ljirsaarchitect@gmail.com
605-770-6424

REGISTERED ARCHITECT
REG. NO. 2995
HARRY L. JIRSA
SOUTH DAKOTA
12-31-25

PROJECT NAME
CITY OF ALEXANDRIA
TORNADO SAFE ROOM
SPORTS FIELD COMPLEX
ALEXANDRIA, SD

REVISIONS

NO	DATE	DESCRIPTION

PROJECT NO.
51-2025

DATE
DEC, 31, 2025

SHEET TITLE
SPECIFICATIONS

SHEET NO.
SP-6

3.04 APPLICATION

A. General: Employ only proven installation techniques which will insure that sealants will be deposited in uniform, continuous ribbons without gaps or air pockets, with complete "wetting" of the joint bond surfaces equally on opposite sides. Except as otherwise indicated, fill sealant rabbet to a slightly concave surface, slightly below adjoining surfaces. Where horizontal joints are between a horizontal surface and a vertical surface, fill joint to form a light cove, so that joint will not trap moisture and dirt.

B. Back-up: Install back-up material to proper depth in joints. Use back-up material of suitable size and shape, so that when compressed (25% to 50%), it will fit in joints as required. Carefully roll back-up material into joints to avoid stretching or twisting. Use bond-breaker strip in all joints where sufficient room for back-up material does not exist and where required by manufacturer's recommendations.

C. Tooling: Tool joints to compress the compound into the joint. Except as recommended by the sealing material manufacturer, do not use liquid solutions to moisten tools. Remove masking tape immediately after tooling.

3.05 CLEANING

A. Remove excess sealant materials from adjacent surfaces. Clean surfaces using procedures recommended by the sealing material manufacturer.

END OF SECTION 07 90 00

SECTION 07 61 00

METAL LEADERS AND DOWNSPOUTS

PART 1 - GENERAL

1.01 DESCRIPTION

A. General: Furnish all labor, materials, tools and equipment for metal scuppers, leaders and downspouts shown on drawings.

1.02 SUBMITTALS

A. Samples and shop drawings shall be provided for all metal work and shall indicate dimensions, metal gauges, color and anchoring details.

1.03 JOB CONDITIONS

A. Metal work shall be coordinated with other roofing and masonry work.

PART 2 - PRODUCTS

2.01 MATERIALS

A. Scuppers, leaders and downspouts shall be 24 gauge prefinished galvanized metal shown on drawings Bronze color,

2.02 FABRICATION

A. Fabricate sheet metal straight and true to profiles and sizes indicated.
B. All items shall be shop fabricated.

PART 3 - EXECUTION

3.01 INSTALLATION

A. All metal work to be installed plumb and level. Anchors shall be located within concrete masonry mortar joints. All components shall be securely anchored to comply with FEMA requirements for design wind loads. Downspouts shall be anchored with metal straps into mortar joints.

B. Wipe, clean all metal upon completion of work. Touch-up paint at all scratches. Dented material shall be removed and replaced.

END OF SECTION 07 61 00

SECTION 08 11 00

STEEL DOORS AND FRAMES

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Extent of steel frames and steel doors include two entry doors located at the main entrances to the building and steel frames at three interior doors
B. Door hardware is specified in SECTION 08 71 00.

1.03 QUALITY ASSURANCE

A. Exterior entry doors and frames shall comply with FEMA 361 and ICC 500 requirements for Tornado Safe Rooms and Steel Door Institute "Recommended Specifications.
B. Manufacturer: Provide steel frames and doors by a single firm specializing in production of this type of work.
1. Provide frames by STEELCRAFT, FP14 Series, 14 Gauge galvannealed steel, Double Rabbet for 1 3'4" thick doors.
2. Provide full flush insulated steel doors "PW14 Series" by Steelcraft.

1.04 SUBMITTALS

A. Product Data: Submit manufacturer's specifications for fabrication and installation, including data substantiating that products comply with requirements

PART 2 - PRODUCTS

2.01 MATERIALS, DOORS

A. Cold-Rolled Steel Sheets: 14 gage.
B. Supports and Anchors: Fabricate of not less than 12 gage sheet steel.

2.02 FABRICATION, GENERAL

A. Fabricated steel frame units to be rigid, neat in appearance and free from defects, wrap or buckle. Clearly identify work that cannot be permanently factory-assembled before shipment, to assure proper assembly at project site.
B. Fabricate frames, concealed stiffeners, reinforcement, edge channels, and moldings from cold-rolled, 16 gage stainless steel
C. Exposed Fasteners: Unless otherwise indicated, provide countersunk flat Phillips heads for exposed screws and bolts.

2.04 FINISH HARDWARE PREPARATION

A. Prepare doors and frames to receive mortised and concealed finish hardware LM9300, 3 latch points Comply with applicable requirements of ANSI A 115 series specifications for door and frame preparation for hardware.
B. Reinforce doors and frames to receive surface-applied hardware. Drilling and tapping for surface-applied finish hardware may be done at project site.
C. Locate finish hardware as shown on final shop drawings or, if not shown, in accordance with "Recommended Locations for Builder's Hardware", published by Door and Hardware Institute.

2.05 STANDARD STEEL FRAMES

A. Provide metal frames for doors, of types and styles as shown on drawings and schedules. Conceal fastenings, unless otherwise indicated.
1. Welded frames at all applications.
B. Door Silencers: Except on weather stripped frames, drill stops to receive 2 silencers on strike jambs of single-swing frames and 2 silencers on heads of double-swing frames.

PART 3 - EXECUTION

3.01 INSPECTION

A. Installer must examine substrate and conditions under which steel doors and frames are to be installed and must notify Contractor in writing of any conditions detrimental to proper and timely completion of work. Do not proceed with work until unsatisfactory conditions have been corrected in a manner acceptable to Installer.

3.02 INSTALLATION

A. General: Install standard steel doors, frames, and accessories in accordance with final shop drawings and manufacturer's data, and as herein specified.

3.03 PLACING FRAMES

A. Comply with provisions of SDI-105 "Recommended Erection Instructions for Steel Frames", unless otherwise indicated.
B. In metal stud partitions, install at least 3 wall anchors per jamb at hinge and strike levels. In closed steel and partitions, attach wall anchors to studs with tapping screws. Set frame accurately in position, plumbed, aligned and braced securely until wall construction is complete.

L.L. JIRSA ARCHITECT
P.O. BOX 905
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605-770-6424

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LARRY L. JIRSA
SOUTH DAKOTA
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3.04 DOOR INSTALLATION

A. Fit steel doors accurately in frames, within clearances specified in SDI-100.

3.05 ADJUST AND CLEAN

A. Final Adjustment: Check and read just operating finish hardware items, leaving steel doors and frames undamaged and in complete and proper operating condition.

END OF SECTION 08 11 00

SECTION 08 14 16

INTERIOR WOOD DOORS

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Three interior wood door is shown on drawings and in schedules.

B. Manufacturer: Obtain doors from a single manufacturer to ensure uniformity in quality of appearance and construction, unless otherwise indicated.

1.02 SUBMITTALS

A. Product Data: Submit door manufacturer's product data for each type of wood door, including details of core and edge construction.

1.03 PRODUCT DELIVERY, STORAGE, AND HANDLING

A. Protect wood doors during transit, storage and handling to prevent damage, soiling and deterioration. Comply with manufacturer's written instructions for storage and handling.

PART 2 - PRODUCTS

2.01 WOOD DOORS

A. Flush, solid core wood doors, birch veneer, 1 ¾" thick with painted finish as manufactured by Masonite, Trudoor, Sun Mountain or equivalent. Undercut doors ¾" for ventilation purposes.

PART 3 - EXECUTION

3.01 INSPECTION

A. Require Installer to examine door frames, after their installation, and doors, prior to their hanging, for the following purposes:
1. To verify that frames comply with indicated requirements for type, size, location, and swing characteristics and have been installed with plumb jambs and level heads.
2. To verify that doors are free of defects that could cause their rejection.

B. Obtain Installer's written report listing conditions detrimental to compliance with requirements of this section.
C. Do not allow Installer to proceed with installation until unsatisfactory conditions have been corrected.

3.02 INSTALLATION

A. Condition doors to average prevailing humidity in installation area prior to hanging.

B. Hardware: For installation see Division 8 "Door Hardware" section of these specifications.

D. Job-Fit Doors: Align and fit doors in frames with uniform clearances and bevels as indicated below; do not trim stiles and rails in excess of limits set by manufacturer. Machine doors for hardware. Seal cut surfaces after fitting and machining.

E. Fitting Clearances: For non-rated doors provide clearances of 1/8" at jambs and heads; 1/16" per leaf at meeting stiles for pairs of doors; and 1/8" from bottom of door to top of decorative floor finish or covering.

3.03 ADJUST AND CLEAN

A. Operation: Rehang or replace doors which do not swing or operate freely, as directed by Architect.

B. Finished Doors: Refinish or replace doors damaged during installation, as directed by Architect.

C. Institute protective measures as recommended and accepted by door manufacturer to assure that wood doors will be without damage or deterioration at time of substantial completion.

END OF SECTION 08 14 16

SECTION 10 14 00

SIGNAGE

PART 1 - GENERAL

1.01 DESCRIPTION: Provide interior and exterior signage as per ADA and FEMA standards for handicap accessible restrooms and Tornado Safe Room

A. Work Included: Provide signage as per the following schedule:

1. EXTERIOR SIGNAGE
4 each - Tornado Safe Room (with handicap and tornado symbol), Time of operation during sporting events from May 1st to October 1st – 2 hours before until 2 hours after sporting event.
2. INTERIOR SIGNAGE
1 each – Women with handicap symbol and pictogram
1 each – Men with handicap symbol and pictogram
1 each – Utility

1.02 SUBMITTALS

A. Provide graphic layouts of all signage for approval and standard color selections for lettering and backgrounds for Owner approval.

PART 2 - PRODUCTS

2.01 MATERIALS -INTERIOR SIGNS

A. Interior Signs shall be minimum 9"x 6", 1/8" injection molded plastic.
B. Restrooms signs shall have international symbol of accessibility, man/woman pictogram and braille
C. Mount with stainless steel screws and inserts into concrete masonry units.

2.02 MATERIALS -EXTERIOR SIGNS

A. Exterior signs to be custom painted metal signs by Safetysign.com as per graphic layout as shown on drawings. Signs to be 24" x 36". Sign to be white background with black painted graphics.

PART 3 - EXECUTION

3.01 INSTALLATION

A. Plaque signs shall be mounted on the strike side of doors. Mounting heights shall be 55 inches above finish floor to center of sign and 6 inches from door frame at jamb to center of sign.

B. Signs shall be installed straight and level and mounted with a minimum of four stainless steel screws with wall inserts.

C. Exterior signs to be mounted with a minimum of 4 each stainless steel anchoring bolts and sleeves into concrete masonry wall. Mount exterior signs 55 inches above concrete walk to center of sign.

END OF SECTION 10 14 00

SECTION 10 28 13

TOILET ROOM ACCESSORIES

PART 1 - GENERAL

1.01 DESCRIPTION

A. Work included: Provide toilet room accessories where indicated on the Drawings, as specified herein, and as needed for a complete and proper installation.

1.04 SUBMITTALS

A. Submit product data sheets on all accessories for Architect's final review and approval.

PART 2 - PRODUCTS

2.01 TOILET ROOM ACCESSORIES

A. Toilet Room Accessories as manufactured by Bobrick or equivalent.
1. Grab bars - B5507.99 1 1/4" diameter with 2561 Series anchor plate. See drawings for grab bar locations.
2. Toilet Paper Dispensers – B-2888
3. Soap Dispensers – B-2111
4. Framed mirrors - B-166-2436 Series, provide one mirror at each lavatory.
5. Electric Hand Dryers – B-7128 Surface mounted ADA dryer.

L.L. JIRSA ARCHITECT
P.O. BOX 925
MITCHELL, SD 57301
email:ljirsaarchitect@gmail.com
605-770-6424

REGISTERED ARCHITECT
REG. NO. 4945
LARRY L. JIRSA
SOUTH DAKOTA
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2.02 OTHER MATERIALS

A. Provide other materials, not specifically described but required for a complete and proper installation, as selected by the Contractor subject to the approval of the Architect.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Coordinate as required with other trades to assure proper and adequate provision in the work of those trades for interface with the work of this Section.

B. Install each item in its proper location, firmly anchored into position, as shown on drawings, level and plumb, and in accordance with the manufacturer's recommendations with anchor bolt sleeves and inserts.

END OF SECTION 10 28 13

SECTION 10 51 20

FIRE EXTINGUISHER AND CABINET

PART 1 - GENERAL

1.01 DESCRIPTION OF WORK

A. Provide fire extinguisher and cabinet as shown on drawings and specified herein for complete and proper installation.

PART 2 - PRODUCTS

2.01 CABINET

A. Provide cabinet and extinguisher, location as shown on drawings. Provide Model No. 102-R-1 full glass door with silk screen red letters recessed cabinet, 24" h x 9 1/2" w x 5" d.

B. Acceptable Manufacturer: Modern Metal Products by Muckle, a division of Technico.

2.02 EXTINGUISHER

A. At each fire extinguisher cabinet, provide one fire extinguisher, Type Center 6HK, 4 1/2" diameter cylinder x 19 3/4" high. Class 40ABC, aluminum cylinder.

B. Acceptable Manufacturer: Modern Metal Products.

C. Service, Charge, and tag each fire extinguisher not more than five calendar days prior to the Date of Substantial Completion of the Work.

PART 3 - EXECUTION

3.01 SURFACE CONDITIONS

A. Examine the areas and conditions under which work of this Section will be performed. Correct conditions detrimental to timely and proper completion of the Work. Do not proceed until unsatisfactory conditions are corrected.

3.02 INSTALLATION

A. Install cabinet plumb and level, clean all components from dirt, debris and smudges, mount top of cabinet 54" above finish floor. Recess cabinet in concrete masonry unit wall.

END OF SECTION 10 51 20

PAINTING

PART 1 - GENERAL

1.01 WORK INCLUDED

A. This Section includes paints, primers for metal,door frames.

1.02 ENVIRONMENTAL CONDITIONS

A. Apply no paint when temperature is below 50 degrees F.

PART 2 - PRODUCTS

2.01 ACCEPTABLE MANUFACTURERS:
1. Sherwin Williams, ProMar 200 or equivalent.

2.02 PAINTING MATERIALS

A. Painting materials shall be the type as specified in the Painting Schedule.

PART 3 - EXECUTION

3.01 INSPECTION

A. Before starting painting or finish in a room, space, or area, thoroughly examine surfaces and ensure surfaces are clean, free from dirt, oil, and loose materials..

3.02 PAINTING APPLICATION

A. General: Apply paint materials in accordance with paint materials manufacturer's specifications and this Specification.

B. Apply painting materials by brush in accordance with the manufacturer's recommendation for type surface to receive painting materials.

C.. Make edges of paint adjoining other materials or colors sharp and clean without overlapping.

3.04 PROTECTION DURING APPLICATION

A. Take necessary precautions for the protection from paint spattering on adjacent materials and finishes.

3.05 CLEAN-UP REPAIR

A. Clean-Up: During construction and up to completion of work, clean-up and remove from premises, tools, appliances, empty cans, carton, and rubbish resulting from the work of painting and finishing. Leave areas and spaces clean. Remove paint and oil spattering, drippings, and stains resulting from painting work from painted surfaces and from work of other trades.

B. Repair: Repair paint work which has become damaged or defaced during course of construction and completion of the Project and leave painting and finishing in clean, neat, and perfect condition, acceptable to Owner's representative. Replace damaged material directly attributed to painting work under this Section.

3.06 PROTECTION OF COMPLETED WORK

A. Protect coated surfaces until the Project has been accepted by Owner.

3.07 PAINTING SCHEDULE:

Door Frames/Metal Trim
1st Coat: DTM Acrylic Primer/Finish
2nd & 3rd Coat: S-W ProMar 200 Latex Gloss

L.L. JIRSA ARCHITECT
P.O. BOX 905
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605-770-6424

REGISTERED ARCHITECT
REG. NO. 4965
LARRY L. JIRSA
SOUTH DAKOTA
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STRUCTURAL GENERAL NOTES

GENERAL NOTES:

1. STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH JOB SPECIFICATIONS AND ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND SITE DRAWINGS. CONSULT THESE DRAWINGS FOR SLEEVES, DEPRESSIONS AND OTHER DETAILS NOT SHOWN ON STRUCTURAL DRAWINGS.
2. 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 WORK.
3. 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 TIE-DOWNS.
4. 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.
5. 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.
6. 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.
7. THE DESIGN OF THE STRUCTURE SHOWN IN THESE CONSTRUCTION DOCUMENTS IS FOR THE ONE-TIME USE AT THE SPECIFIC SITE REFERENCED IN THE GEOTECHNICAL REPORT.

DESIGN CODES:

- 2021 INTERNATIONAL BUILDING CODE.
- ACI 318-19 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE AND COMMENTARY.
- AISC 360-16 SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS.
- ASCE 7-16 MINIMUM DESIGN LOADS AND ASSOCIATED CRITERIA FOR BUILDINGS AND OTHER STRUCTURES.
- ICC 500-2023 STANDARD FOR THE DESIGN AND CONSTRUCTION OF STORM SHELTERS.
- FEMA P-361 SAFE ROOF FOR TORDADOS AND HURRICANES, GUIDANCE FOR COMMUNITY AND RESIDENTIAL SAFE ROOMS, FOURTH ADDITION

DESIGN LOADS:

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

ROOF:	
SNOW LOAD	40 PSF
GROUND SNOW LOAD	40 PSF
SNOW EXPOSURE FACTOR	1.0
SNOW THERMAL FACTOR	1.2
SNOW IMPORTANCE FACTOR	1.2
DEAD LOAD	20 PSF
ROOF LIVE LOAD	100 PSF
RAIN INTENSITY	2.99 IN/HR
WIND:	
ULTIMATE WIND SPEED	200 MPH
EXPOSURE CATEGORY	C
INTERNAL PRESSURE COEFFICIENT	±0.55
COMPONENT AND CLADDING PRESSURES	SEE SHEET S-005
TOPOGRAPHICAL FACTOR, K_{ZT}	1.0
DIRECTIONALITY FACTOR, Kd	1.0
SEISMIC:	
SEISMIC DESIGN CATEGORY	A
SITE CLASSIFICATION	D
SEISMIC IMPORTANCE FACTOR	1.5
MAPPED SPECTRAL RESPONSE COEFFICIENTS S_S = 0.130; S_1 = 0.032 S_{DS} = 0.139; S_{D1} = 0.052	
SEISMIC FORCE RESISTING SYSTEM RIGID DIAPHRAGM (PRECAST SOLID SLABS WITH TOPPING) AND ORDINARY REINFORCED MASONRY SHEAR WALLS	
DESIGN BASE SHEAR	0.01W
SEISMIC RESPONSE COEFFICIENT	0.01
RESPONSE MODIFICATION COEFFICIENTS (R)	
ORDINARY REINFORCER MASONRY SHEAR WALLS	2.0
ANALYSIS PROCEDURE EQUIVALENT LATERAL FORCE PROCEDURE	
NO SEISMIC LOADS REQUIRED FOR DESIGN CATEGORY A, USE NOTIONAL LOADS = 0.01 x DEAD LOAD PER ASCE 7-16, SECTION 1.4.	

FOUNDATIONS:

1. SEE THE FOLLOWING REPORT FOR COMPLETE GEOTECHNICAL RECOMMENDATIONS AND INSTALLATION PROCEDURES. SITE PREPARATION AND FOUNDATION SHALL COMPLY WITH THE FOLLOWING:

   PREPARED BY: GEOTEK ENGINEERING & TESTING SERVICES INC.

   TITLE: GEOTECHNICAL EXPLORATION
   PROPOSED STORM SHELTER
   ALEXANDRIA BASEBALL FIELD
   ALEXANDRIA, SOUTH DAKOTA
   GEOTEK #25-1261

   DATE: AUGUST 12, 2025
2. GEOTECHNICAL RECOMMENDATIONS WERE PREPARED WITH SPECIFIC KNOWLEDGE OF THE SPECIFIC BUILDING TYPE, CONSTRUCTION TYPE, AND LIKELY LOADS SHOWN ON THE CONSTRUCTION DOCUMENTS. DETERMINING THE AMOUNT OF SETTLEMENT ACCEPTABLE FOR THE BUILDING TYPE IS THE RESPONSIBILITY OF THE GEOTECHNICAL ENGINEER. ALL STRUCTURAL DESIGNS WERE BASED UPON STAYING WITHIN THE LIMITS GIVEN WITHIN THE GEOTECHNICAL REPORT FOR THE LOADS PRESCRIBED BY THE BUILDING CODE REFERENCED IN THE DESIGN CODES SECTION OF THESE STRUCTURAL NOTES.
3. DESIGNS BASED UPON AN ALLOWABLE BEARING CAPACITY OF 2,000 PSF. SEE GEOTECHNICAL REPORT FOR ALL REQUIREMENTS RELATED TO THE CONSTRUCTION OF THE SLAB AND FOOTINGS ON GRANULAR ENGINEERED FILL MATERIAL.

PLUMBING SLEEVES:

MINIMUM SLEEVE SPACING SHALL BE TWO DIAMETERS CENTER TO CENTER TO THE LARGER SLEEVE OR 6" CLEAR BETWEEN SLEEVES, WHICHEVER IS GREATER. PRIOR TO CONSTRUCTION SLEEVE LOCATIONS AND SIZES SHALL BE APPROVED BY THE STRUCTURAL ENGINEER OF RECORD.

PENETRATIONS:

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 RECOGNIZED TESTING LABORATORY TO ACHIEVE A STRENGTH AT 28 DAYS AS SHOWN IN THE BELOW CONCRETE PROPERTIES SCHEDULE WITH A PLASTIC AND WORKABLE MIX:

CONCRETE PROPERTIES

LOCATION	28 DAY COMPRESSIVE STRENGTH	ENTRAINED AIR	SLUMP	MAX W/C RATIO
FOOTINGS	3,500 PSI	4.0% - 6.0%	5" +/- 1"	0.55
FND WALLS & ALL OTHER CONC	4,500 PSI	5.0% - 7.0%	4"+/- 1"	0.45
INTERIOR SLABS	4,000 PSI	≤ 3.0%	3" +/- 1"	0.5
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. ALL CONCRETE SHALL UTILIZE TYPE IL OR TYPE I/II CEMENT.
4. COARSE AND FINE AGGREGATES WITHIN ALL CONCRETE EXCEPT CONCRETE SHALL COMPLY WITH ASTM C33 AND ACI 302.1, CURRENT VERSIONS. COURSE AND FINE AGGREGATES USED IN INTERIOR SLABS ON GRADE CONCRETE SHALL COMPLY WITH THE REQUIREMENTS OF NOTES a THROUGH e NOTED BELOW.
   a. COMPLIANCE WITH THE NON-REACTIVE REQUIREMENTS OF ACI 302.1 SHALL NOT BE PROVIDED FOR BY THE PROVISION OF ACI 302.1 (SUBSECTION 7.3) THAT EXCLUDES THE AGGREGATES BEING CLASSIFIED AS DELETERIOUSLY REACTIVE WITH ALKALIES IF THE AGGREGATE HAS A SATISFACTORY SERVICE RECORD EVALUATION OR WITH THE ADDITION OF A MATERIAL THAT HAS SHOWN TO PREVENT HARMFUL EXPANSION DUE TO ALKALI-AGGREGATE REACTION.
   b. CONCRETE MIX DESIGN SHALL INCLUDE TEST RECORDS OF THE COMPLIANCE OF THE AGGREGATE MEETING THE REQUIREMENTS OF ASTM C1260, AND THAT THE EXPANSION OF THE MORTAR SAMPLE SHALL NOT EXCEED 0.10% WHEN TESTED IN ACCORDANCE WITH ASTM C1260 AT 14 DAYS. USE OF ADMIXTURES THAT MITIGATE THE EFFECT OF THE REACTIVE AGGREGATE TO BE PROPOSED IN CONCRETE MIX SHOP DRAWING MAY BE AN APPROVED APPROACH BY THE ENGINEER TO ALLOW FOR THE USE OF OTHERWISE REACTIVE AGGREGATES. IF SUCH MITIGATING MEASURES ARE PROPOSED, THEY MUST BE INCLUDED WITHIN MIX DESIGN SUBMITTAL. THE ENGINEER IS GIVEN DISCRETION AS TO WHETHER OR NOT TO ACCEPT MITIGATING MEASURES OR TO MAINTAIN REQUIREMENTS THAT NONREACTIVE AGGREGATES MUST BE USED. AT A MINIMUM, SUCH DOCUMENTATION MUST SHOW THAT REACTIVE AGGREGATES USED IN COMBINATION WITH A GIVEN AMOUNT OF ADMIXTURE RESULTS IN THE EXPANSION OF THE MORTAR SAMPLE BEING LESS THAN 0.10% WHEN TESTED IN ACCORDANCE WITH ASTM C1567 AT 14 DAYS. LIABILITY OF THE PERFORMANCE OF THE CONCRETE MIX REMAINS SOLELY WITH GENERAL CONTRACTOR.
   c. IF CONCRETE MIXES ARE APPROVED BY THE ENGINEER THAT CONTAIN EITHER FINE OR COARSE AGGREGATE, THAT EITHER SEPARATELY OR IN COMBINATION EXCEED THE 0.10% EXPANSION WHEN TESTED ACCORDING TO ASTM C1260, SPECIAL CONSIDERATIONS MUST BE GIVEN TO SLAB CURING (SLABS ON GRADE AND ELEVATED SLABS). IN SUCH INSTANCES SLABS SHALL BE CURED USING EITHER A WET BURLAP OR CONTINUOUS WETTING/FOGGING METHOD FOR SLABS FOR AT LEAST 10 DAYS. USE OF CURING AND/OR SEALING COMPOUNDS IS NOT ACCEPTABLE UNTIL THE SLAB HAS CURED A MINIMUM OF 28 DAYS AND THE CONDITIONS FOR THE APPLICATION OF THE CURING COMPOUND ON THE CONCRETE SLAB SET BY THE MANUFACTURER'S RECOMMENDATIONS HAVE BEEN MET.
   d. ENGINEER HAS SOLE DISCRETION IN DETERMINING ACCEPTABILITY OF A CONCRETE SLAB THAT IS EXHIBITING ALKALI-SILICA REACTION. FOR SLABS SHOWING AN ALKALI SILICA REACTION SOLELY WITHIN THE FINE AGGREGATE: A SLAB SHOWING AN AVERAGE DENSITY OF POPOUTS GREATER THAN 1 PER 8 SQUARE FEET OVER ANY CONTIGUOUS AREA OF 100 SQUARE FEET OR LARGER, OR ANY AREA WITH A DENSITY OF 1 POPOUTS PER 2 -SQUARE FEET WITHIN ANY AREA UP TO 100 SQUARE FEET WOULD BE CONSIDERED AS A BASIS FOR THE REJECTION OF THE SLAB FROM WHICH THOSE SAMPLE AREAS ARE INCLUDED. FOR A ALKALI SILICA REACTION WITHIN THE COARSE AGGREGATE: THE POPOUT DENSITIES CONSIDERED FOR REJECTION OF THE CONCRETE SLAB SHALL BE ½ OF THE DENSITIES GIVEN FOR FINE AGGREGATE. THE EXTENT OF REJECTED SLAB TO BE DETERMINED BY ENGINEER. THE TIME FRAME FOR OBSERVATION OF ALKALI SILICA REACTIONS AND DETERMINATION OF REJECTION OF THE CONCRETE SLAB SHALL BE AT LEAST 56 DAYS FROM THE DATE OF POUR.
   e. CONCRETE MIXES UTILIZING CRUSHED LIMESTONE AS COARSE AGGREGATE AND CONTAINING AT LEAST 25% CLASS F FLY ASH AND HAVING A SATISFACTORY SERVICE RECORD PER ACI 302.1 IS CONSIDERED AN ACCEPTABLE ALTERNATIVE APPROACH TO THE COMPLIANCE REQUIREMENTS OUTLINED IN PROVISIONS 4a THROUGH 4d ABOVE.
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.
6. 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.

HIGH STRENGTH ADHESIVE:

ANCHORING ADHESIVE SHALL BE A TWO-COMPONENT SOLID ADHESIVE BASED SYSTEM SUPPLIED IN MANUFACTURER'S STANDARD SIDE-BY-SIDE CARTRIDGE AND DISPENSED THROUGH A STATIC-MIXING NOZZLE SUPPLIED BY THE MANUFACTURER. ADHESIVE SHALL MEET THE MINIMUM REQUIREMENTS OF ASTM C-881 SPECIFICATION FOR TYPE I, II, IV, AND V, GRADE 3, CLASS B, AC, AND D AND MUST DEVELOP A MINIMUM 12,650 PSI COMPRESSIVE YIELD STRENGTH AFTER 7 DAY CURE. ADHESIVE MUST HAVE A HEAT DEFLECTION TEMPERATURE OF A MINIMUM 136 FA (58 AC). ADHESIVE SHALL BE EPOXY-TIE SET FROM SIMPSON STRONGTIE OR THE HILTI ADHESIVE SYSTEM. ANCHORS SHALL BE INSTALLED PER THE MANUFACTURERS INSTRUCTIONS.

CONCRETE AND REINFORCING PLACEMENT:

1. ALL CONCRETE SHALL BE PLACED IN ACCORDANCE WITH ACI 301 AND ACI 117 EXCEPT AS MODIFIED BELOW:
   A. 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.
   B. ACI 117 ITEM 4.5.7 FLOOR FINISH TOLERANCES AS MEASURED BY PLACING A FREESTANDING (UNLEVELED) 10 FT. STRAIGHTEDGE 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 SHALL NOT EXCEED 1/4".
2. ALL REINFORCING STEEL TO BE ASTM A615, GRADE 60 (#4 AND LARGER), EXCEPT WHERE NOTED OTHERWISE. REINFORCING SHALL NOT BE WELDED
3. SUBMIT SHOP DRAWINGS OF REINFORCING STEEL INCLUDING BAR SCHEDULES, SHAPES OF BENT BARS, SPACING OF BARS, AND LOCATION OF SPLICES.
4. ALL REINFORCING STEEL BARS TO BE DETAILED AND PLACED IN ACCORDANCE WITH THE LATEST ACI MANUALS.
5. LAP ALL REINFORCING SPLICES IN CONCRETE AS NOTED IN THE DRAWINGS.
6. PROVIDE CORNER BARS OF SAME BAR DIAMETER AS SPECIFIED FOR THE WALL, BEAM OR FOOTING. PROVIDE MINIMUM OF 40 BAR DIAMETER LAP FOR ALL CORNER BARS, UNLESS NOTED OTHERWISE.
7. PROVIDE FOUNDATION DOWELS AS SHOWN. MINIMUM SIZE DOWELS TO BE #4, UNLESS OTHERWISE NOTED. ALL VERTICAL REINFORCING STEEL IN COLUMNS AND PIERS, OR VERTICAL REINFORCING IN WALLS, SHALL BE DOWELED INTO THE FOOTINGS WITH SAME SIZE AND QUANTITY DOWEL AS THE VERTICAL REINFORCING.
8. WHERE SHOWN ON THE DRAWINGS, PROVIDE WELD PLATES, WELDMENTS, OR CONCRETE INSERTS FOR FASTENING AND SECURING OTHER COMPONENTS. CONCRETE INSERTS SHALL BE FURNISHED BY THE CONTRACTOR REQUIRING THEM AND INSTALLED BY THE CONTRACTOR CASTING THE CONCRETE AROUND THEM. CLIP ANGLES SHALL BE FURNISHED BY THE CONTRACTOR REQUIRING THEM.
9. REINFORCING STEEL SHALL RECEIVE CONCRETE COVER AS FOLLOWS:

DESCRIPTION	MINIMUM COVER
CAST AGAINST & PERMANENTLY EXPOSED TO EARTH	3"
EXPOSED TO EARTH OR WEATHER	
#6 THROUGH #18 BARS	2"
#5 BARS OR SMALLER	1 1/2"
NOT EXPOSED TO EARTH OR WEATHER OR IN CONTACT WITH THE GROUND, SLABS AND WALLS	
#11 BARS OR SMALLER	3/4"
#14 AND #18	1 1/2"
BEAMS AND COLUMNS	1 1/2"
SHELLS, FOLDED PLATE MEMBERS:	
NO. 6 BAR AND LARGER	3/4"
NO. 5 BAR, W31 OR D31 WIRE AND SMALLER	1/2"

10. PROVIDE TWO (2) #5'S, ONE AT EACH FACE, UNLESS NOTED OTHERWISE, AROUND ALL OPENINGS LESS THAN 12"x12" IN CAST-IN-PLACE CONCRETE. EXTEND REINFORCING 2'-0" BEYOND OPENING IN BOTH DIRECTIONS. CONTACT ENGINEER FOR ALL OPENINGS GREATER THAN 12"x12" FOR DESIGN.
11. COLD WEATHER AND HOT WEATHER PROVISIONS OF ACI 306 AND 305 (CURRENT EDITIONS), RESPECTIVELY, SHALL BE MAINTAINED.
12. UNLESS NOTED OTHERWISE ALL UNDER SLAB VAPOR RETARDERS SHALL CONFORM TO THE REQUIREMENTS OF ASTM E1745 CLASS A AND SHALL BE INSTALLED AS PER MANUFACTURER'S RECOMMENDATIONS.
13. FLOOR FLATNESS AND LEVELNESS TOLERANCES:
    A. MINIMUM F_F & F_L NUMBERS PER ASTM E1155.
    F_F = 35
    F_L = 25
    B. CORRECT SLAB SURFACE IF COMPOSITE OVERALL VALUE IS LESS THAN SPECIFIED OR IF LOCAL VALUE IS LESS THAN 2/3 OF THE SPECIFIED F_F OR F_L NUMBERS.
    C. CORRECT BY REMOVAL AND REPLACEMENT OF DEFECTIVE WORK.
14. OWNER SHALL ENGAGE PARTY TO TEST F_F & F_L NUMBERS WITHIN 72 HOURS OF CASTING. CONTRACTORS MUST PROVIDE 10 DAYS NOTICE PRIOR TO CASTING CONCRETE SLAB-ON-GRADE SECTIONS.
15. CONTRACTOR SHALL PROVIDE CONCRETE FORMS, SHORING, AND BRACING AS REQUIRED TO ACCOMPLISH CAST-IN-PLACE CONCRETE WORK. FORMS SHALL BE TIGHT FITTING PREFORMED STEEL FORMS STIFFENED TO SUPPORT THE WEIGHT OF CONCRETE WITHOUT DEFLECTION DETRIMENTAL TO TOLERANCES AND APPEARANCE OF FINISHED SURFACES. FORM RELEASE AGENT SHALL BE INSTALLED IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS AND SHALL BE APPLIED PRIOR TO PLACEMENT OF REINFORCING STEEL.
16. SLAB ON GRADE SHALL HAVE A HARD TROWEL FINISH.

CONCRETE TESTING:

1. CONCRETE TESTING SHALL BE PAID FOR BY THE OWNER. TESTING LABORATORY SHALL PERFORM THE FOLLOWING TEST ON CAST-IN-PLACE CONCRETE:
   A. ASTM C143 - "STANDARD TEST METHOD FOR SLUMP OF PORTLAND CEMENT CONCRETE."
   B. 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:
      a. (1) AT 7 DAYS
      b. (2) AT 28 DAYS
      c. (1) 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.
   C. TESTING SHALL BE BASED UPON CONCRETE TAKEN AT POINT OF PLACEMENT.
   D. 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 IF TEST TAKEN AT MIDDLE OF FIRST LOAD FAILS.
   E. 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 COMPLETED AT NO EXPENSE TO THE OWNER.

POST INSTALLED ANCHORS AND REBAR:

1. ALL PERSONNEL INSTALLING POST-INSTALLED ANCHORS SHALL HAVE COMPLETED INSTALLATION TRAINING FROM THE MANUFACTURER FOR ALL OF THE ANCHORING PRODUCTS SPECIFIED. TRAINING MUST HAVE BEEN COMPLETED NO MORE THAN 5 YEARS FROM THE DATE OF PROJECT INITIATION. IF TRAINING HAS NOT BEEN COMPLETED OR IF TRAINING OCCURRED MORE THAN 5 YEARS BEFORE THE DATE OF PROJECT INITIATION, THE CONTRACTOR SHALL ARRANGE AN ANCHOR MANUFACTURER'S REPRESENTATIVE TO PROVIDE ON-SITE INSTALLATION TRAINING. CONTRACTOR SHALL SUBMIT DOCUMENT CONFIRMING THAT ALL PERSONNEL INSTALLING ANCHORS HAVE PASSED THE TRAINING COURSE PRIOR TO THE COMMENCEMENT OF INSTALLING ANCHORS.
2. ADHESIVE ANCHORS INSTALLED HORIZONTALLY OR UPWARDLY INCLINED INTO CONCRETE THAT WILL SUPPORT SUSTAINED TENSION LOADS WILL BE MARKED WITH (SUSTAINED) ON THE DRAWINGS. PERSONNEL WHO WILL INSTALL THESE ANCHORS SHALL BE CERTIFIED BY THE ACI/CRSI ADHESIVE ANCHOR INSTALLER CERTIFICATION PROGRAM. CONTRACTOR SHALL SUBMIT A DOCUMENT CONFIRMING THAT PERSONNEL HAVE PASSED THE CERTIFICATION PROGRAM PRIOR TO INSTALLING ANCHORS.
3. ALL POST INSTALLED ANCHORS AND REBAR SHALL BE INSTALLED ACCORDING TO MANUFACTURER'S INSTALLATION INSTRUCTIONS.
4. THE FOLLOWING CONDITIONS MUST BE MET FOR ALL ADHESIVE ANCHORS AND ADHESIVE ANCHORED REINFORCEMENT UNLESS WRITTEN APPROVAL IS RECEIVED FROM THE ENGINEER PRIOR TO INSTALLATION.
   A. DRY CONCRETE UNLESS NOTED OTHERWISE
   B. CONCRETE TEMPERATURE AT TIME OF INSTALLATION THROUGH CURE TIME MUST BE WITHIN THE TEMPERATURE RANGE SPECIFIED IN MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS. SEE MANUFACTURER'S PRINTED INSTALLATION INSTRUCTIONS FOR ADHESIVE GEL AND CURE TIMES.
   C. ANCHOR HOLES SHALL BE HAMMER DRILLED.
   D. ANCHOR HOLES TO BE CLEANED PER MANUFACTURER'S PRINTED INSTALLATION INSTRUCTION PRIOR TO ADHESIVE INJECTION.
   E. CONCRETE MUST BE AT LEAST 21 DAYS OLD BEFORE INSTALLATION OF ANCHORS.
5. THE LOCATION OF EXISTING REINFORCING STEEL BARS, POST-TENSIONED STEEL STRANDS, OR PRE-TENSIONED STEEL STRANDS SHALL BE ESTABLISHED PRIOR TO INSTALLING POST INSTALLED ANCHORS OR REINFORCEMENT. LOCATION SHALL BE ESTABLISHED BY USING A SCANNER, GPR, X-RAY, CHIPPING OR OTHER MEANS. EXISTING REINFORCEMENT OR STRAND SHALL NOT BE DAMAGED UNLESS PRIOR APPROVAL IS GIVEN BY THE ENGINEER.
6. ALTERNATE PRODUCTS MUST BE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER PRIOR TO USE. CONTRACTOR SHALL PROVIDE CALCULATIONS AND PRODUCT DATA SHOWING THAT THE SUBSTITUTED PRODUCT IS IN COMPLIANCE WITH THE RELEVANT BUILDING CODES, LOAD RESISTANCE, INSTALLATION CATEGORY, CREEP, IN-SERVICE TEMPERATURE AND INSTALLATION TEMPERATURE OF THE SPECIFIED PRODUCT.

POST INSTALLED ANCHORS & REBAR

ANCHOR TYPE	PRODUCT	REMARKS
ADHESIVE ANCHORS / REBAR IN CONCRETE	HILTI HIT - HY 200 V3 SIMPSON AT-XP	---
ADHESIVE ANCHORS / REBAR IN CONCRETE W/ > 12" EMBEDMENT	HILTI HIT - RE 500 V3 SIMPSON SET-3G	---
ADHESIVE ANCHORS / REBAR IN GROUT FOR HOLLOW MASONRY	HILTI HIT - HY 270 SIMPSON SET-XP	PROVIDE MANUFACTURER'S RECOMMENDED SCREEN TUBES IN HOLLOW MASONRY
EXPANSION ANCHORS IN CONCRETE	HILTI KWIK BOLT TZ SIMPSON STRONG BOLT 2	---
EXPANSION ANCHORS IN GROUTED MASONRY	HILTI KWIK BOLT 3 SIMPSON STRONG BOLT 2	---
SCREW ANCHORS IN CONCRETE OR GROUTED MASONRY	SIMPSON TITEN HD	---

STRUCTURAL STEEL:

1. STEEL SHALL CONFORM TO ASTM A992 (Fy=50 KSI) FOR ALL W-SHAPES, AND ASTM A36 (Fy=36 KSI) FOR ALL OTHER MISCELLANEOUS SHAPES AND PLATES. STRUCTURAL TUBING SHALL CONFORM TO ASTM A500, GRADE B OR GRADE C (Fy=46 KSI). STRUCTURAL PIPE SHALL CONFORM TO ASTM A53, GRADE B, TYPE "E" OR "S" (Fy=35 KSI).
2. STEEL SHALL CONFORM TO THE LATEST EDITION OF AISC SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS.
3. ALL SHOP CONNECTIONS TO BE WELDED (UTILIZING E70XX ELECTRODES) AND FIELD CONNECTIONS TO BE BOLTED, UNLESS OTHERWISE NOTED. STEEL TO RECEIVE ONE SHOP COAT AND ONE FIELD TOUCH UP COAT OF APPROVED PAINT, EXCEPT WHERE GALVANIZED IS INDICATED ON THE DRAWINGS.
4. WELDS FOR ALL EXPOSED STRUCTURAL STEEL SHALL BE GROUND SMOOTH UNLESS NOTED OTHERWISE.
5. ALL BOLTED CONNECTIONS SHALL CONSIST OF 3/4" DIA. (MIN.) ASTM F3125 GRADE F1852 (A325-TC) BOLTS, UNLESS NOTED OTHERWISE.
   A. FAILURE OF A BOLT OR NUT DURING INSTALLATION PROCESS RESULTING IN A CRACK IN THE BOLT OR NUT SHALL BE GROUNDS FOR REJECTION OF ALL THE FAILED BOLTS OR NUTS COMING FROM THE SAME LOT. IF THE DOCUMENTATION OF THE LOT OF ORIGIN FOR THE FAILED NUT(S) OR BOLT(S) DOES NOT EXIST, OR IS NOT PROVIDED, THEN ALL OF THE BOLT(S) OR NUT(S) SHALL BE ASSUMED TO COME FROM THE LOT CONTAINING THE FAILED NUT(S) OR BOLT(S).
6. CONTRACTOR SHALL MAINTAIN ERECTION TOLERANCES OF STRUCTURAL STEEL AND ARCHITECTURALLY EXPOSED STRUCTURAL STEEL WITHIN AISC'S CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES.
7. ANCHOR BOLT HOLES IN STRUCTURAL STEEL SHALL BE OVERSIZED PER THE AISC MANUAL.

SPECIAL INSPECTION AND TESTING:

1. SEE DETAILED INSPECTION AND TESTING REQUIREMENTS AS INDICATED ON SHEET S-002 & S-003.

SAFE ROOM:

1. SAFE ROOM AS INDICATED ON S-101 HAS THE INTENDED USE OF COMMUNITY PROTECTION AGAINST TORNADOS.
2. SAFE ROOM IS INTENDED FOR USE BY THE GENERAL PUBLIC.
3. THE DESIGN OF THE STORM SHELTER CONFORMS TO THE PROVISIONS OF THE 2023 ICC 500 STANDARD FOR THE DESIGN AND CONSTRUCTION OF STORM SHELTERS AND FEMA P-361 SAFE ROOMS FOR TORNADOS AND HURRICANES, GUIDANCE FOR COMMUNITY AND RESIDENTIAL SAFE ROOMS, FOURTH ADDITION.
4. SAFE ROOM IS NOT LOCATED IN A FLOOD PLANE AND COMPLIES WITH SECTION 402.1 OF THE 2023 ICC 500.
5. THE COMPONENTS OF THE STORM SHELTER MEET IMPACT REQUIREMENTS THROUGH TESTING AS OUTLINED IN THE PUBLISHED PAPER "CONSTRUCTION MATERIALS THRESHOLD TESTING" PREPARED BY THE WIND SCIENCE AND ENGINEERING RESEARCH CENTER AT TEXAS TECH UNIVERSITY.
6. QUALITY ASSURANCE TESTING AND INSPECTIONS SHALL INCLUDE THE FOLLOWING ITEMS AT A MINIMUM PER ICC 500 107.2.
   - WALL CONNECTIONS TO ROOF DIAPHRAGM
   - ROOF DIAPHRAGM SYSTEMS INCLUDING CONNECTORS, DRAG STRUTS AND BOUNDRY ELEMENTS.
   - MAIN WIND FORCE RESISTING SYSTEMS INCLUDING SHEAR WALLS.
   - MAIN WIND FORCE RESISTING SYSTEM CONNECTIONS TO THE FOUNDATION.
   - FABRICATION AND INSTALLATION OF COMPONENTS AND ASSEMBLIES OF THE SHELTER ENVELOPE REQUIRED TO MEET MISSILE IMPACT TEST REQUIREMENT OF ICC 500 CHAPTER 3.
   - FOUNDATION DESIGN
7. ELEVATION CORRESPONDING TO 100' - 0" (FINISHED FLOOR ELEVATION) IS 1348.88'. VERIFY WITH CIVIL AND ARCHITECTURAL DRAWINGS BEFORE CONSTRUCTION COMMENCES.

SYMBOLS LEGEND

INDEX TO STRUCTURAL SHEETS

SHT NO	SHEET NAME
S-001	STRUCTURAL GENERAL NOTES
S-002	STRUCTURAL GENERAL NOTES CONT & IBC INSPECTION TABLES
S-003	IBC INSPECTION TABLES CONT
S-004	CONCRETE SURFACE REQUIREMENTS
S-005	WIND UPLIFT & LATERAL LOAD PLANS
S-101	FOUNDATION & ROOF FRAMING PLANS
S-501	DETAILS
S-601	STANDARD DETAILS / SCHEDULES

SHEET IDENTIFICATION

SHEET TYPE DESIGNATORS

0	GENERAL (SYMBOLS LEGEND, NOTES, ETC)
1	PLANS (HORIZONTAL VIEWS)
2	ELEVATIONS (VERTICAL VIEWS)
3	SECTIONS (SECTIONAL VIEWS)
4	LARGE SCALE VIEWS (PLANS, ELEV, OR SECTIONS, NOT DETAILS)
5	DETAILS
6	SCHEDULES AND DIAGRAMS
7	USER DEFINED
8	USER DEFINED
9	3D REPRESENTATIONS (ISOMETRICS, PERSPECTIVES, PHOTOGRAPHS)

COORDINATE SYSTEM

STRUCTURAL HATCH PATTERNS

REG. NO. 11135
BLAKE M. TIDEMAN
12-31-25

Albertson Engineering Inc.
605.343.9606
www.albertsonengineering.com
Offices in Rapid City -
Sioux Falls - Winner, SD
and Cheyenne, WY

CONSULTANT

PROJECT IDEN:
ALEXANDRIA SAFE ROOM

ISSUE BLOCK:

NO	ISSUE TYPE	ISSUE DATE

MANAGEMENT:
PROJECT NO: 25-119
DRAWN BY: JAB
CHECKED BY: BMT

SHEET TITLE:
STRUCTURAL GENERAL NOTES

SHEET IDENTIFICATION:
S-001

24X36 TITLE BLOCK

PRECAST / PRESTRESS CONCRETE:

1. PRECAST FRAMING SYSTEM SHALL CONSIST OF 8" SOLID WALL PANELS AND 12" HOLLOW CORE ROOF SLAB UNITS.
   PRECAST / PRESTRESSED SYSTEMS SHALL BE DESIGNED AND DETAILED BY THE MANUFACTURER TO SUSTAIN SELF WEIGHT OF THE MEMBERS AND UNIFORM LOADS AS INDICATED ON THIS SHEET.
2. PRECAST / PRESTRESSED CONCRETE MANUFACTURER (P/C MFR.) SHALL SUBMIT SHOP DRAWINGS, CONCRETE TEST REPORTS OF THEIR PRODUCT, AND CALCULATIONS TO THE ENGINEER FOR REVIEW AND APPROVAL PRIOR TO FABRICATION. SHOP DRAWINGS SHALL BEAR THE SIGNATURE AND SEAL OF A PROFESSIONAL ENGINEER REGISTERED IN WHICH THE PROJECT IS LOCATED.
3. PRECAST CONCRETE DESIGN AND INSTALLATION SHALL BE IN ACCORDANCE WITH 2021 IBC AND THE FOLLOWING:
   A. ACI 301 & 318
   B. AWS D1.1 - STRUCTURAL WELDING CODE
   C. AWS D12.1 - REINFORCING STEEL WELDING CODE
   D. PCI MNL - 116
4. MATERIALS:
   A. PORTLAND CEMENT - ASTM C150, TYPE II, OR IIIL, 5,000 PSI (MIN.) COMPRESSIVE STRENGTH
   B. AGGREGATE - ASTM C33
   C. WATER - ASTM C1602
   D. REINFORCING STEEL BARS - ASTM A615
   E. WELDED WIRE REINFORCEMENT - ASTM A1064
   F. PRESTRESSING STRAND - UNCOATED, 7 WIRE, STRESS RELIEVED STRAND, ASTM A416, 270 KSI ULTIMATE STRENGTH
5. ALL STEEL INSERTS, ANGLES, WELDING TIES, ETC., CAST INTO PRECAST OR CAST-IN-PLACE CONCRETE COMPONENTS SHALL BE DESIGNED AND FURNISHED BY THE P/C MANUFACTURER. ITEMS EMBEDDED IN CAST-IN-PLACE SHALL BE INSTALLED BY THE GENERAL OR SUBCONTRACTOR THEREOF.
6. PRECAST WALL PANEL TO CAST-IN-PLACE FOUNDATION WALL CONNECTIONS SHALL BE CONCEALED AS SHOWN IN THE DRAWINGS.
7. PRECAST WALL PANELS ARE TO BE TEMPORARILY SHORED AND BRACED UNTIL ALL PERMANENT SUPPORT DIAPHRAGMS AND SYSTEMS HAVE BEEN INSTALLED.

DELEGATED DESIGN - RESPONSIBILITIES AND SUBMITTAL REQUIREMENTS FOR CONTRACTOR:

1. IF PROFESSIONAL DESIGN SERVICES OR CERTIFICATIONS BY A DESIGN PROFESSIONAL RELATED TO SYSTEMS, MATERIALS, OR EQUIPMENT ARE SPECIFICALLY REQUIRED OF THE CONTRACTOR BY THE CONTRACT DOCUMENTS; THE ARCHITECT AND/OR ALBERTSON ENGINEERING, INC. WILL SPECIFY THE PERFORMANCE AND DESIGN CRITERIA THAT SUCH SERVICES MUST SATISFY WITHIN THE CONTRACT DOCUMENTS.
2. THE CONTRACTOR SHALL BE ENTITLED TO RELY UPON THE ADEQUACY AND ACCURACY OF THE PERFORMANCE AND DESIGN CRITERIA PROVIDED IN THE CONTRACT DOCUMENTS. THE CONTRACTOR SHALL CAUSE SUCH SERVICES OR CERTIFICATIONS TO BE PROVIDED BY AN APPROPRIATELY LICENSED DESIGN PROFESSIONAL"SPECIALTY ENGINEER", WHOSE SIGNATURE AND SEAL SHALL APPEAR ON ALL DRAWINGS, CALCULATIONS, SPECIFICATIONS, CERTIFICATIONS, SHOP DRAWINGS, AND OTHER SUBMITTALS PREPARED BY THE "SPECIALTY ENGINEER".
3. SHOP DRAWINGS AND OTHER SUBMITTALS RELATED TO THE WORK, DESIGNED OR CERTIFIED BY THE "SPECIALTY ENGINEER" SHALL BEAR THE "SPECIALTY ENGINEER'S" WRITTEN APPROVAL AND CONFIRMATION THAT SUCH WORK COMPLIES WITH ALL APPLICABLE CODES AND THE DESIGN CRITERIA WHEN SUBMITTED TO THE ARCHITECT AND/OR ALBERTSON ENGINEERING, INC.
4. THE OWNER, ARCHITECT, AND ALBERTSON ENGINEERING, INC. SHALL BE ENTITLED TO RELY UPON THE ADEQUACY AND ACCURACY OF THE SERVICES, CERTIFICATIONS, AND APPROVALS PERFORMED OR PROVIDED BY SUCH DESIGN PROFESSIONALS, PROVIDED THE CONTRACT DOCUMENTS HAVE SPECIFIED TO THE CONTRACTOR THE PERFORMANCE AND DESIGN CRITERIA THAT SUCH SERVICES MUST SATISFY.
5. ARCHITECT AND/OR ALBERTSON ENGINEERING, INC. WILL REVIEW OR TAKE OTHER APPROPRIATE ACTION ON SUBMITTALS ONLY FOR THE LIMITED PURPOSE OF CHECKING FOR CONFORMANCE WITH INFORMATION GIVEN AND THE DESIGN CONCEPT EXPRESSED IN THE CONTRACT DOCUMENTS.
6. ALL SHOP DRAWINGS SUBMITTED FOR APPROVAL FOR WHICH PROFESSIONAL DESIGN SERVICES OR CERTIFICATIONS BY A DESIGN PROFESSIONAL ARE REQUIRED RELATED TO SYSTEMS, MATERIALS, OR EQUIPMENT ARE TO BE COMPLETED TO A LEVEL SUCH THAT THE OWNER, ARCHITECT, AND ALBERTSON ENGINEERING, INC. SHALL BE ENTITLED TO RELY UPON THE ADEQUACY AND ACCURACY OF THE SERVICES, CERTIFICATIONS, AND APPROVALS SUBMITTED. THE "SPECIALTY ENGINEER" SHALL COMPLETE WORK WITH ACCEPTANCE THAT ALBERTSON ENGINEERING, INC. WILL NOT UNDERTAKE A REVIEW OF THE "SPECIALTY ENGINEER'S" CALCULATIONS AND SUBMITTALS AND THE "SPECIALTY ENGINEER" ACKNOWLEDGES THAT THEY ARE SOLELY RESPONSIBLE FOR THE DELEGATED DESIGN WORK CERTIFIED BELOW AND ARE NOT RELYING UPON ALBERTSON ENGINEERING, INC. FOR ANY REVIEW.

   THESE PROVISIONS ARE CONTRACTED REQUIREMENTS FOR SAID PROJECT AND THE "SPECIALTY ENGINEER" IS BOUND BY THESE PROVISIONS.
7. DELEGATED DESIGN ITEMS INCLUDE:
   A. PRECAST COMPONENTS SUCH AS SOLID WALL PANELS, SOLID ROOF SLABS, AND ALL PRECAST CONNECTIONS.
   B. SUPPORT OF NON-STRUCTURAL ITEMS FROM ROOF FRAMING.

MASONRY MATERIALS:

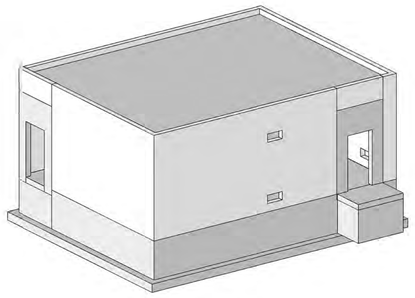
1. MASONRY UNITS SHALL MEET ASTM C90 FOR HOLLOW LOAD BEARING TYPE MASONRY WITH A UNIT STRENGTH OF 2,800 PSI ON THE NET AREA (f'm = 2,000 PSI).
2. MORTAR SHALL BE TYPE "M" (BELOW GRADE) OR "S" (ABOVE GRADE) AND SHALL MEET ASTM C270. GROUT SHALL BE 3,000 PSI PEA-GRAVEL CONCRETE AND SHALL MEET ASTM C476. MORTAR MIX SHALL BE A PRE-BLENDED MIX AS MANUFACTURED BY SPEC-MIX, OR APPROVED EQUAL. GROUT SHALL BE A READY-MIX GROUT AND SHALL HAVE THE MIX DESIGN SUBMITTED FOR APPROVAL PRIOR TO CONSTRUCTION.

MASONRY AND REINFORCING MASONRY PLACEMENT:

1. ALL MASONRY SHALL BE LAID IN RUNNING BOND UNLESS NOTED OTHERWISE. MATERIALS TO BE LAID AND MATERIALS TO BE BUILT UPON SHALL BE FREE FROM SNOW & ICE.
2. PROVIDE HOOKED DOWELS INTO FOOTINGS FOR ALL VERTICAL REINFORCING ABOVE AS SHOWN IN THE DRAWINGS. LAP SPLICES A MINIMUM OF 48 BAR DIAMETERS. AT THE OPTION OF THE CONTRACTOR, DOWELS MAY BE DRILLED AND EPOXIED INTO FOOTINGS IN LIEU OF HOOKS. EPOXY SHALL BE AS NOTED ON THIS SHEET UNDER "CHEMICAL ANCHORS", 6" MIN. EMBEDMENT FOR #5 OR SMALLER DOWELS, 8" MIN. EMBEDMENT FOR #6 DOWELS.
3. PROVIDE 9 GA LADDER OR TRUSS HORIZONTAL JOINT REINFORCEMENT AT EACH SECOND COURSE IN RUNNING BOND, AND EACH COURSE IN STACKED BOND, UNLESS NOTED OTHERWISE. DISCONTINUE HORIZONTAL JOINT REINFORCEMENT AT CONTROL JOINTS.
4. PROVIDE BOND BEAMS REINFORCED WITH (2) #5 BARS EVERY 6'-0" OF VERTICAL WALL, AT TOPS OF ALL MASONRY WALLS, AND WHERE SHOWN ON DRAWINGS. AT BOND BEAM CORNERS AND TEE JOINTS, PROVIDE BENT BARS TO MATCH QUANTITY AND BAR SIZE IN THE BOND BEAM. LAPS IN BOND BEAMS SHALL BE 48 BAR DIAMETERS OR A MINIMUM OF 2'-0", WHICHEVER IS GREATER.
5. WHERE SHOWN ON THE DRAWINGS, CORES IN CONCRETE BLOCKS UNITS SHALL BE FILLED WITH 3,000 PSI CONCRETE GROUT FROM TOP OF FOOTING TO BOTTOM OF BEARING, OR TO THE TOP OF WALL, DEPENDING ON THE CONDITION. INSPECTION OF OPENING AT BOTTOM IS REQUIRED.
6. WHERE REINFORCING STEEL IS CALLED FOR IN FILLED CORES, IT SHALL EXTEND FROM TOP OF FOOTING TO BOTTOM OF BEARING, OR TOP OF WALL. DEPENDING ON CONDITION.
7. WHERE REINFORCING STEEL IS INTERRUPTED BY AN OPENING IN THE WALL, THE QUANTITY OF BARS INTERRUPTED ARE TO BE MOVED TO EACH SIDE OF THE OPENING, HALF OF REINFORCING TO ONE SIDE AND REMAINING HALF TO THE OTHER SIDE. REINFORCING SHALL BE FROM TOP OF FOOTING TO TOP OF WALL. PROVIDE A MINIMUM OF (2) #5 VERTICAL REINFORCING BARS AT EACH JAMB. SEE PLAN NOTES AND / OR DETAILS FOR VERTICAL REINFORCING SPACING.
8. WHERE VERTICAL REINFORCING STEEL IS SPLICED IN MASONRY, PROVIDE A MINIMUM OF 48 BAR DIAMETERS, LAP SPLICE, UNLESS NOTED OTHERWISE.
9. THE MINIMUM DISTANCE BETWEEN PARALLEL BARS, EXCEPT IN COLUMNS, SHALL BE NOT LESS THAN THE DIAMETER OF THE BAR EXCEPT THAT LAPPED SPLICES MAY BE WIRED TOGETHER. THE CENTER TO CENTER SPACING OF BARS WITHIN A COLUMN SHALL BE NOT LESS THAN 2 AND ONE-HALF TIMES THE BAR DIAMETER.
10. ALL BARS SHALL BE COMPLETELY EMBEDDED IN MORTAR OR CONCRETE. REINFORCEMENT EMBEDDED IN HORIZONTAL MORTAR JOINTS SHALL HAVE NOT LESS THAN 5/8" MORTAR COVERAGE FROM THE EXPOSED FACE. ALL OTHER REINFORCING SHALL HAVE A MINIMUM COVERAGE OF ONE BAR DIAMETER OVER ALL BARS, BUT NOT LESS THAN 3/4", EXCEPT WHERE EXPOSED TO WEATHER OR SOIL IN WHICH CASE THE MINIMUM COVERAGE SHALL BE 2".
11. WHERE REINFORCING IS SHOWN TO BE LOCATED ALONG TWO FACES OF A MASONRY BLOCK WALL, THE CONTRACTOR SHALL BREAK OUT THE SHELL OF THE LOWEST MASONRY BLOCK TO GAIN ACCESS TO THE REINFORCING STEEL. THE REINFORCING STEEL SHALL THEN BE WIRED INTO ITS CORRECT POSITION, AND THE ACCESS HOLE COVERED. THE CONCRETE GROUT FILL SHALL BE PUDDLED OR VIBRATED TO ASSURE COMPLETE FILLING OF THE CORE.
12. REINFORCED MASONRY PIERS AND COLUMNS SHALL HAVE THE REINFORCING STEEL ACCURATELY LOCATED BY WIRING THE TOP AND BOTTOM OF ALL VERTICAL STEEL INTO ITS CORRECT POSITION. PROVIDE AN ACCESS HOLE AT THE BOTTOM OF ALL COLUMNS OR PIERS.
13. ALL REINFORCED HOLLOW UNIT MASONRY SHALL BE BUILT TO PRESERVE THE UNOBSTRUCTED VERTICAL CONTINUITY OF THE CELLS TO BE FILLED. WALLS AND CROSS WEBS FORMING SUCH CELLS TO BE FILLED SHALL BE FULLBEDDED IN MORTAR TO PREVENT LEAKAGE OF CONCRETE GROUT. ALL HEAD (OR END) JOINTS SHALL BE SOLIDLY FILLED WITH MORTAR FOR A DISTANCE IN FROM THE FACE OF THE WALL OR UNIT NOT LESS THAN THE THICKNESS OF THE LONGITUDINAL FACE SHELLS. BOND SHALL BE PROVIDED BY LAPPING UNITS IN SUCCESSIVE VERTICAL COURSES OR BY EQUIVALENT MECHANICAL ANCHORAGE.
   A. VERTICAL CELLS TO BE FILLED SHALL HAVE VERTICAL ALIGNMENT SUFFICIENT TO MAINTAIN A CLEAR, UNOBSTRUCTED CONTINUOUS VERTICAL CELL MEASURING NOT LESS THAN 2"x3".
   B. CLEANOUT OPENINGS SHALL BE PROVIDED AT THE BOTTOM OF ALL CELLS TO BE FILLED AT EACH POUR OF CONCRETE WHERE SUCH CONCRETE POUR IS IN EXCESS OF 6' IN HEIGHT. ANY OVERHANGING MORTAR, OTHER OBSTRUCTION OR DEBRIS SHALL BE REMOVED AND / OR CLEANED AT TIME OF INSPECTION AND PRIOR TO CORE FILLING. INSPECT AND SEAL ALL OPENINGS BEFORE CONCRETING.
   C. VERTICAL REINFORCEMENT SHALL BE HELD IN POSITION AT TOP AND BOTTOM AND AT INTERVALS NOT EXCEEDING 192 DIAMETERS OF THE REINFORCEMENT.
   D. ALL CELLS CONTAINING REINFORCEMENT SHALL BE FILLED SOLIDLY WITH CONCRETE. CONCRETE SHALL BE POURED IN LIFTS OF 8' MAXIMUM HEIGHT. ALL CONCRETE SHALL BE CONSOLIDATED AT THE TIME OF POURING BY PUDDLING FOR LIFTS OF 4' OR LESS, OR BY VIBRATING FOR LIFTS GREATER THAN 4'. CONCRETE SHOULD LATER BE CONSOLIDATED AGAIN BY PUDDLING, BEFORE PLASTICITY IS LOST.
   E. WHEN TOTAL CONCRETE POUR EXCEEDS 8' IN HEIGHT, THE CONCRETE SHALL BE PLACED IN 4' MAXIMUM LIFTS MINIMUM CELL DIMENSION SHALL BE 3".
   F. WHEN CONCRETING IS STOPPED FOR ONE HOUR OR LONGER, HORIZONTAL CONSTRUCTION JOINTS SHALL BE FORMED BY STOPPING THE POUR OF CONCRETE 1 1/2" BELOW THE TOP OF THE UPPERMOST UNIT.
14. PROVIDE A MINIMUM OF 8" BEARING FOR ALL MASONRY LINTELS.
15. WHERE LINTEL BLOCKS ARE USED IN LIEU OF HOLLOW MASONRY BLOCKS, THE REINFORCING STEEL SHALL BE ANCHORED TO THE LOWER STEEL OR DOWELS AND THE LINTEL BLOCKS LAID AROUND THE STEEL. THE CONCRETE FILL SHALL BE INSTALLED IN LIFTS NO TO EXCEED 2' IN HEIGHT. THE REINFORCING STEEL SHALL BE MAINTAINED IN THE SAME POSITION AS THE DOWELS. STOP THE POUR OF THE CONCRETE 1 1/2" BELOW THE TOP OF THE UPPERMOST UNIT.
16. SPECIFICATION REQUIREMENTS FOR COLD WEATHER AND HOT WEATHER MASONRY CONSTRUCTION SHALL BE MAINTAINED.

IBC 2021 TABLE 1705.6
REQUIRED VERIFICATION AND INSPECTION OF SOILS

VERIFICATION AND INSPECTION TASKS	FREQUENCY OF INSPECTION: CONTINUOUS SPECIAL INSPECTION	FREQUENCY OF INSPECTION: PERIODIC SPECIAL INSPECTION	REQUIRED ON PROJECT
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	-	X	YES
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.	-	X	YES
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.	-	X	YES
4. DURING FILL PLACEMENT, VERIFY USE OF PROPER MATERIALS AND PROCEDURES IN ACCORDANCE WITH THE PROVISIONS OF THE APPROVED GEOTECHNICAL REPORT. VERIFY DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X	-	YES
5. PRIOR TO PLACEMENT OF COMPACTED FILL, INSPECT SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	-	X	YES



1 S-002 **STRUCTURAL 3D**

SCALE: NTS

IBC 2021 TABLE 1705.3 REQUIRED SPECIAL INSPECTION AND TESTS OF CONCRETE CONSTRUCTION

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD[a]	IBC REFERENCE	REQUIRED ON PROJECT
1. INSPECTION REINFORCEMENT, INCLUDING PRESTRESSING TENDONS, AND VERIFY PLACEMENT	-	X	ACI 318 CH 20, 25.2, 25.3, 26.6.1-26.6.3	1908.4	YES
2. REINFORCING BAR WELDING:					
A. VERIFY WELDABILITY OF REINFORCING BARS OTHER THAN ASTM A706.	-	X	AWS D1.4, ACI 318: 26.6.4	-	NO
B. INSPECT SINGLE-PASS FILLET WELDS, MAXIMUM 5/16".		X			
C. INSPECT ALL OTHER WELDS	X	-			
3. INSPECT ANCHORS CAST IN CONCRETE.	-	X	ACI 318: 17.8.2	-	YES
4. INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS.[b]					
A. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS.	X	-	ACI 318: 17.8.2.4, ACI 318: 17.8.2	-	NO
B. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 4A.	-	X			YES
5. VERIFY USE OF REQUIRED DESIGN MIX.	-	X	ACI 318: CH. 19, 26.4.3, 26.4.4	1904.1, 1904.2	YES
6. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X	-	ASTM C172, ASTM C31, ACI 318: 26.5, 26.12	-	YES
7. INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES	X	-	ACI 318: 26.5	1908.6, 1908.7, 1908.8	YES
8. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	-	X	ACI 318: 26.5.3-26.5.5	1908.9	YES
9. INSPECT OF PRESTRESSED CONCRETE FOR:					
A. APPLICATION OF PRESTRESSING FORCES.	X	-	ACI 318: 26.10	-	NO
B. GROUTING OF BONDED PRESTRESSING TENDONS.	X	-			
10. INSPECT ERECTION OF PRECAST CONCRETE MEMBERS.	-	X	ACI 318: CH. 26.9	-	YES
11. FOR PRECAST CONCRETE DIAPHRAGM CONNECTIONS OR REINFORCEMENT AT JOINTS CLASSIFIED AS MODERATE OR HIGH DEFORMABILITY ELEMENTS (MDE OR HDE) IN STRUCTURES ASSIGNED TO SEISMIC DESIGN CATEGORY C, D, E, OR F, INSPECT SUCH CONNECTIONS AND REINFORCEMENT IN THE FIELD FOR:			ACI 318: 26.13.1.3	-	NO
A. INSTALLATION OF EMBEDDED PARTS.	X	-		-	
B. COMPLETION OF THE CONTINUITY OF REINFORCEMENT ACROSS JOINTS.	X	-	ACI 550.5	-	
C. COMPLETION OF CONNECTIONS IN THE FIELD.	X	-		-	
12. INSPECT INSTALLATION TOLERANCES OF PRECAST CONCRETE DIAPHRAGM CONNECTIONS FOR COMPLIANCE WITH ACI 550.5.	-	X	ACI 318: 26.13.1.3	-	NO
13. VERIFY IN-SITU CONCRETE STRENGTH, PRIOR TO STRESSING OF TENDONS IN POST-TENSIONED CONCRETE AND PRIOR TO REMOVAL OF SHORES AND FORMS FROM BEAMS AND STRUCTURAL SLABS.	-	X	ACI 318: 26.11.2	-	NO
14. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	-	X	ACI 318: 26.11.1.2(b)	-	YES

a. WHERE APPLICABLE, SEE SECTION 1705.13, SPECIAL INSPECTIONS FOR SEISMIC RESISTANCE.

b. SPECIFIC REQUIREMENTS FOR SPECIAL INSPECTION SHALL BE INCLUDED IN THE RESEARCH REPORT FOR THE ANCHOR ISSUED BY AN APPROVED SOURCE IN ACCORDANCE WITH 17.8.2 IN ACI 318, OR OTHER QUALIFICATION PROCEDURES. WHERE SPECIFIC REQUIREMENTS ARE NOT PROVIDED, SPECIAL INSPECTION REQUIREMENTS SHALL BE SPECIFIED BY THE REGISTERED DESIGN PROFESSIONAL AND SHALL BE APPROVED BY THE BUILDING OFFICIAL PRIOR TO THE COMMENCEMENT OF THE WORK.

MATERIAL TESTS.
IN THE ABSENCE OF SUFFICIENT DATA OR DOCUMENTATION PROVIDING EVIDENCE OF CONFORMANCE TO QUALITY STANDARDS FOR MATERIALS IN CHAPTERS 19 AND 20 OF ACI 318, THE BUILDING OFFICIAL SHALL REQUIRE TESTING OF MATERIALS IN ACCORDANCE WITH THE APPROPRIATE STANDARDS AND CRITERIA FOR THE MATERIAL IN CHAPTERS 19 AND 20 OF ACI 318.

MOST COMMONLY USED STRUCTURAL ABBREVIATIONS

** NOT LISTED IN THE NCS MANUAL

SYMBOLS USED AS ABBREVIATIONS:

&	AND
∠	ANGLE
LL	DOUBLE ANGLE
@	AT
CL ℄ ℄	CENTER LINE
//	PARALLEL
d	PENNY (NAIL)
⊥	PERPENDICULAR
PL	PLATE
#	POUND OR NUMBER
Ø	ROUND OR DIAMETER

ABBREVIATIONS:

(A)----------	
A/E	ARCHITECT/ENGINEER
AB	ANCHOR BOLT/ROD
ABV	ABOVE
ADDL	ADDITIONAL
ADDM	ADDENDUM
ADH	ADHESIVE
ADJ	ADJUSTABLE, ADJACENT, ADJOINING
AFF	ABOVE FINISH FLOOR
AGGR	AGGREGATE
AHR	ANCHOR, ANCHORAGE
ALT	ALTERNATE
APPROX	APPROXIMATE
**AR	ANCHOR ROD
ARCH	ARCHITECT (URAL)
(B)----------	
BEV	BEVELED
BFF	BELOW FINISH FLOOR
**BL	BRICK LEDGE
BLDG	BUILDING
BLW	BELOW
**BLK	BLOCK (ING)
BM	BEAM
BOT	BOTTOM
**BO	BOTTOM OF
**BOC	BOTTOM OF CONCRETE
**BOF	BOTTOM OF FOOTING
BRG	BEARING
**BRK	BRICK
BSMT	BASEMENT
BTWN	BETWEEN
BU	BUILT-UP
(C)----------	
C	CHANNEL
CAM*(C=)	CAMBER
CB	CARRIAGE BOLT
CU FT	CUBIC FEET OR FOOT
CHFR	CHAMFER
CIP	CAST-IN-PLACE
**CIPC	CAST-IN-PLACE CONCRETE
CJ	CONTROL JOINT
CL	CENTER LINE
CLG	CEILING
CLR	CLEAR, CLEARANCE
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONN	CONNECT (ION)
CONSTR	CONSTRUCTION
CONT	CONTINUOUS, CONTINUE
CONTR	CONTRACT (OR)
COORD	COORDINATE
CTR	CENTER
CU	CUBIC
CU YD	CUBIC YARD
(D)----------	
D	DEEP, DEPTH, PENNY (NAIL)
DBL	DOUBLE
DEMO	DEMOLITION, DEMOLISH
DET	DETAIL
DIA	DIAMETER
DIAG	DIAGONAL, DIAGRAM
DIM	DIMENSION
DIR	DIRECTION
DIV	DIVIDE, DIVISION
**DKG	DECKING
DL	DEAD LOAD
DOUG FIR	DOUGLAS FIR
DR	DRAIN
DT	DRAIN TILE
DWG	DRAWING (S)
(E)----------	
**(E)	EXISTING (SEE EXIST)
EA	EACH
**EAB	EPOXY ANCHOR BOLT
EF	EACH FACE
EJ	EXPANSION JOINT
EL	ELEVATION
**EMB	EMBED (ED)
EPS	EXPANDED POLYSTYRENE
EQ	EQUAL
EQUIP	EQUIPMENT
EST	ESTIMATE
EW	EACH WAY
EXIST	EXISTING
EXP	EXPANSION, EXPOSED
EXP BT	EXPANSION BOLT
EXT	EXTERIOR, EXTERNAL
(F)----------	
FD	FLOOR DRAIN
**FND	FOUNDATION
FF EL	FINISH FLOOR ELEVATION
FIN	FINISH (ED)
FLG	FLANGE
FLR	FILLER, FLOOR (ING)
**FO	FACE OF
FOC	FACE OF CONCRETE
FOM	FACE OF MASONRY
FOS	FACE OF STUD
**FOW	FACE OF WALL
FS	FAR SIDE
FT	FOOT, FEET
FTG	FOOTING
FRMG	FRAMING
FUT	FUTURE
**FV	FIELD VERIFY
(G)----------	
GA	GAGE, GAUGE
GALV	GALVANIZED
GC	GENERAL CONTRACTOR
**GL	GLUE LAMINATED (BEAM)
GLU LAM	GLUE LAMINATED (BEAM)
GR BM	GRADE BEAM
GRTG	GRATING
GYP	GYPSUM
GYP BD	GYPSUM BOARD
(H)----------	
H	HIGH
**HAB	HEADED ANCHOR BOLT
**HAS	HEADED ANCHOR STUD
HC	HOLLOW CORE
HDR	HEADER
HGR	HANGER
HORIZ	HORIZONTAL
HS	HIGH STRENGTH
**HSB	HIGH STRENGTH BOLT
**HSS	HOLLOW STRUCTURAL SHAPE
HT	HEIGHT
(I)----------	
ID	INSIDE DIAMETER
INCL	INCLUDE (D), INCLUDING
INFO	INFORMATION
INSUL	INSULATE (D), INSULATION
INT	INTERIOR
INV EL	INVERT ELEVATION
(J)----------	
**JST	JOIST
**JT	JOINT
(K)----------	
K	THOUSAND (KIP)
**KCJ	KEYED CONSTRUCTION JOINT
KIP	THOUSAND POUND
KLF	KIPS PER LINEAR FOOT
KSF	KIPS PER SQUARE FOOT
KSI	KIPS PER SQUARE INCH
(L)----------	
L	ANGLE
LAM	LAMINATE (ED)
**LB	POUND
LF	LINEAR FEET
**LGR	LEDGER
LL	LIVE LOAD
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LOC	LOCATION
LONG	LONGITUDINAL
*LSL	LAMINATED STRAND LUMBER
**LVL	LAMINATED VENEER LUMBER
LVR	LOUVER
(M)----------	
MACH	MACHINE
MB	MACHINE BOLT
MATL	MATERIAL
MAX	MAXIMUM
MBR	MEMBER
**MC	MISCELLANEOUS CHANNEL
MECH	MECHANICAL
MEZZ	MEZZANINE
MFD	MANUFACTURED
MFR	MANUFACTURER
MFR REC	MANUFACTURER'S RECOMMENDATION
MIN	MINIMUM
MISC	MISCELLANEOUS
MTL	METAL
(N)----------	
**(N)	NEW
NA	NOT APPLICABLE
NIC	NOT IN CONTRACT
NO	NUMBER
NOM	NOMINAL
NS	NEAR SIDE
NTS	NOT TO SCALE
(O)----------	
OC	ON CENTER
OD	OUTSIDE DIAMETER
OH DR	OVERHEAD DOOR
OPNG	OPENING
OPP	OPPOSITE
**OSB	ORIENTED STRAND BOARD
**OVS	OVERSIZED
(P)----------	
**PAF	POWDER ACTUATED FASTENER
PAR	PARALLEL
PCF	POUNDS PER CUBIC FOOT
PED	PEDESTAL
PERF	PERFORATED
PERP	PERPENDICULAR
PL	PLATE
PLF	POUNDS PER LINEAR FOOT
PLYWD	PLYWOOD
PNL	PANEL
PR	PAIR, PIPE RAIL
PRCST	PRECAST CONCRETE
PREFAB	PREFABRICATE
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
**PSL	PARALLEL STRAND LUMBER
PT	POST TENSION (ED), PRESSURE TREATED
PVC	POLYVINYL CHLORIDE
(R)----------	
R	RADIUS/RISE (R)
RCP	REINFORCED CONCRETE PIPE
REF	REFERENCE
REINF	REINFORCE (D), (ING)
REQ	REQUIRE
REQD	REQUIRED
REV	REVISION (S), REVISED
RO	ROUGH OPENING
RS	ROUGH SAWN
RVS	REVERSE (SIDE)
(S)----------	
SCHED	SCHEDULE
SECT	SECTION
SHT	SHEET
SHTHG	SHEATHING
SIM	SIMILAR
**SL	SNOW LOAD
SLNT	SEALANT
SLV	SLEEVE
**SOG	SLAB-ON-GRADE
SPEC	SPECIFICATION (S)
SQ	SQUARE
**SSL	SHORT SLOTTED (HOLE)
**SSLT	SHORT SLOTTED (HOLE) TRANSVERSE
SST	STAINLESS STEEL
STD	STANDARD
STIF	STIFFENER
STL	STEEL
STRUCT	STRUCTURAL
SUB FL	SUBFLOOR
SUSP	SUSPENDED
**SW	SHEAR WALL
SYMM	SYMMETRY, SYMMETRICAL
(T)----------	
T	TREAD
T&B	TOP AND BOTTOM
T&G	TONGUE AND GROOVE
**TBD	TO BE DETERMINED
**TCX	TOP CHORD EXTENSION
THD	THREAD (ED) (S)
THK	THICKNESS
THRU	THROUGH
**TL	TOTAL LOAD
TO	TOP OF
TOB	TOP OF BEAM
TOC	TOP OF CONCRETE
TOF	TOP OF FOOTING
TOM	TOP OF MASONRY
TOP	TOP OF PIER
TO PAR	TOP OF PARAPET
TOS	TOP OF STEEL, SLAB
TO SHTHG	TOP OF SHEATHING
TO SUB FL	TOP OF SUBFLOOR
TOW	TOP OF WALL
**TRANS	TRANSVERSE
TRTD	TREATED
TS	TUBE STEEL
TYP	TYPICAL
(U)----------	
UNO	UNLESS NOTED OTHERWISE
(V)----------	
*V	SHEAR
VERT	VERTICAL
VIF	VERIFY IN FIELD
VR	VAPOR RETARDER
VRFY	VERIFY
(W)----------	
W	WIDTH
W/	WITH
W/O	WITHOUT
**WA	WEDGE ANCHOR
WD	WOOD
WF (W)	WIDE FLANGE
WL	WIND LOAD
WLD	WELD (ED)
WP	WATERPROOFING, WORKING POINT
**WS	WALL STEP
WT	WEIGHT
WWR	WELDED WIRE REINFORCEMENT
(X)----------	
XPS	EXTRUDED POLYSTYRENE
(Y)----------	
YD	YARD

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605.343.9606
www.albertsonengineering.com
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CONSULTANT

PROJECT IDEN:

ALEXANDRIA SAFE ROOM

ISSUE BLOCK:

NO	ISSUE TYPE	ISSUE DATE

MANAGEMENT:

PROJECT NO: 25-119

DRAWN BY: JAB

CHECKED BY: BMT

SHEET TITLE:

STRUCTURAL GENERAL NOTES CONT & IBC INSPECTION TABLES

SHEET IDENTIFICATION:

S-002

24X36 TITLE BLOCK

MASONRY CONSTRUCTION

THIS PROJECT SHALL FOLLOW LEVEL 2 VERIFICATION AND INSPECTION REQUIREMENTS

TMS 602-16 SECTION 1.6A TABLE 3 MINIMUM VERIFICATION REQUIREMENTS

MINIMUM VERIFICATION	REQUIRED FOR QUALITY ASSURANCE[a]			REFERENCE FOR CRITERIA
	LEVEL 1	LEVEL 2	LEVEL 3	TMS 602
PRIOR TO CONSTRUCTION, VERIFICATION OF COMPLIANCE OF SUBMITTALS.	R	R	R	ART 1.5
PRIOR TO CONSTRUCTION, VERIFICATION OF F' m AND F' AAC, EXCEPT WHERE SPECIFICALLY EXEMPTED BY THE CODE.	NR	R	R	ART 1.4 B
DURING CONSTRUCTION, VERIFICATION OF SLUMP FLOW AND VISUAL STABILITY INDEX (VSI) WHEN SELF-CONSOLIDATING GROUT IS DELIVERED TO THE PROJECT SITE.	NR	R	R	ART 1.5 & 1.6.3
AAC, FOR EVERY 5,000 SQ. FT. (465 SQ.M.) DURING CONSTRUCTION, VERIFICATION OF F' m AND F'	NR	R	R	ART 1.4 B
DURING CONSTRUCTION, VERIFICATION OF PROPORTIONS OF MATERIALS AS DELIVERED TO THE PROJECT SITE FOR PREMIXED OR PREBLENDED MORTAR, PRESTRESSING GROUT, AND GROUT OTHER THAN SELF-CONSOLIDATING GROUT.	NR	NR	R	ART 1.4 B

(a) R = REQUIRED, NR = NOT REQUIRED

TMS 602-16 SECTION 1.6A TABLE 4 MINIMUM SPECIAL INSPECTION REQUIREMENTS

INSPECTION TASK	FREQUENCY[a]			REFERENCE FOR CRITERIA	
	LEVEL 1	LEVEL 2	LEVEL 3	TMS 402	TMS 602
1. AS MASONRY CONSTRUCTION BEGINS, VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE.					
A. PROPORTIONS OF SITE-PREPARED MORTAR	NR	P	P		ART. 2.1, 2.6 A & 2.6 C
B. GRADE AND SIZE OF PRESTRESSING TENDONS AND ANCHORAGES	NR	P	P		ART. 2.4 B & 2.4 H
C. GRADE, TYPE AND SIZE OF REINFORCEMENT, CONNECTORS, PRESTRESSING TENDONS AND ACHORAGES	NR	P	P		ART. 3.4 & 3.6 A
D. PRESTRESSING TECHNIQUE	NR	P	P		ART. 3.6 B
E. PROPERTIES OF THIN-BED MORTAR FOR AAC MASONRY	NR	C[b] P[c]	C		ART. 2.1, DC.1
F. SAMPLE PANEL CONSTRUCTION	NR	P	C		ART. 1.6D
2. PRIOR TO GROUTING, VERIFY THAT THE FOLLOWING ARE IN COMPLIANCE.					
A. GROUT SPACE	NR	P	C		ART. 3.2 D & 3.2F
B. PLACEMENT OF PRESTRESSING TENDONS AND ANCHORAGES	NR	P	P	SEC. 10.8 & 10.9	ART. 2.4 & 3.6
C. PLACEMENT OF REINFORCEMENT, CONNECTORS, AND ANCHOR BOLTS	NR	P	C	SEC. 6.1, 6.3.1, 6.3.6 & 6.3.7	ART. 3.2 E & 3.4
D. PROPORTIONS OF SITE-PREPARED GROUT AND PRESTRESSING GROUT FOR BONDED TENDONS	NR	P	P		ART. 2.6 B & 2.4 G.1.B
3. VERIFY COMPLIANCE OF THE FOLLOWING DURING CONSTRUCTION.					
A. MATERIALS AND PROCEDURES WITH THE APPROVED SUBMITTALS	NR	P	P		ART. 1.5
B. PLACEMENT OF MASONRY UNITS AND MORTAR JOINT CONSTRUCTION	NR	P	P		ART. 3.3 B
C. SIZE AND LOCATION OF STRUCTURAL MEMBERS	NR	P	P		ART. 3.3 F
D. TYPE, SIZE, AND LOCATION OF ANCHORS, INCLUDING OTHER DETAILS OF ANCHORAGE OF MASONRY TO STRUCTURAL MEMBERS, FRAMES, OR OTHER CONSTRUCTION	NR	P	C	SEC. 1.2.1(C), 6.2.1 & 6.3.1	
E. WELDING OF REINFORCEMENT	NR	C	C	SEC. 6.1.7.3	
F. PREPERATION, CONSTRUCTION, AND PROTECTION OF MASONRY DURING COLD WEATHER (TEMPERATURE BELOW 40°F (4.4°C)) OR HOT WEATHER (TEMPERATURE ABOVE 90°F (32.2°C))	NR	P	P		ART. 1.8 C & 1.8 D
G. APPLICATION AND MEASUREMENT OF PRESTRESSING FORCE	NR	C	C		ART. 3.6 B
H. PLACEMENT OF PRESTRESSING GROUT FOR BONDED TENDONS IS IN COMPLIANCE	NR	C	C		ART. 3.5 & 3.6 C
I. PLACEMENT OF AAC MASONRY UNITS AND CONSTRUCTION OF THIN-BED MORTAR JOINTS	NR	C[b] P[c]	C		ART. 3.3 B.9 & 3.3 F.1.B
4. OBSERVE PREPARATION OF GROUT SPECIMENS, MORTAR SPECIMENS, AND/OR PRISMS.	NR	P	C		ART. 1.4 B.2.a.3, 1.4 B.2.b.3, 1.4 B.2.c.3, 1.4 B.3 & 1.4 B.4

(a) FREQUENCY REFERS TO THE FREQUENCY OF INSPECTIONS, WHICH MAY BE CONTINUOUS DURING THE LISTED TASK OR PERIODICALLY DURING THE LISTED TASK, AS DEFINED IN THE TABLE.
NR = NOT REQUIRED, P = PERIODIC, C = CONTINUOUS
(b) REQUIRED FOR THE FIRST 5,000 SQUARE FEET. (465 SQ METERS) OF AAC MASONRY.
(c) REQUIRED AFTER THE FIRST 5,000 SQUARE FEET. (465 SQ METERS) OF AAC MASONRY.

ICC 500 - QUALITY ASSURANCE PLAN

ICC QUALITY ASSURANCE PLAN

1 MAIN WIND FORCE RESISTING SYSTEM CONSISTS OF THE FOLLOWING:
A. PRECAST CONCRETE SHEAR WALLS.
B. RIGID DIAPHRAGM CONSISTING OF SOLID PRECAST SLABS AND A CAST-IN-PLACE CONCRETE TOPPING.

2. PERFORM SPECIAL INSPECTIONS AND TESTING OF MATERIALS AS STATED IN THE IBC INSPECTION TABLES PROVIDED ON SHEETS S-002 & S-003.

3. PERFORM TESTING AND SPECIAL INSPECTIONS AT INTERVALS STATED IN IBC INSPECTION TABLES ON SHEETS S-002 & S-003.

4. STRUCTURAL OBSERVATIONS MADE BY ALBERTSON ENGINEERING INC SHALL OCCUR TWICE DURING THE CONSTRUCTION PERIOD. CONSTRUCTION OBSERVATIONS SHALL INCLUDE A GENERAL REVIEW OF CONSTRUCTION FOR CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS.

5. A REPORT OF ALL TESTING, SPECIAL INSPECTIONS, AND CONSTRUCTION OBSERVATIONS SHALL BE DISTRIBUTED TO THE ARCHITECT NO MORE THAN 3 DAYS AFTER THE TESTING, SPECIAL INSPECTION, OR OBSERVATION WAS MADE.

STEEL CONSTRUCTION

AISC 360-16 TABLE N5.4-1 INSPECTION TASKS PRIOR TO WELDING

INSPECTION TASKS PRIOR TO WELDING	INSPECTION INTERVAL	REQUIRED ON PROJECT
WELDER QUALIFICATION RECORDS AND CONTINUITY RECORDS	P	YES
WELDING PROCEDURE SPECIFICATIONS (WPSs) AVAILABLE	P	YES
MANUFACTURER CERTIFICATIONS FOR WELDING CONSUMABLES AVAILABLE	P	YES
MATERIAL IDENTIFICATION (TYPE/GRADE)	O	YES
WELDER IDENTIFICATION SYSTEM[a]	O	YES
FIT-UP OF GROOVE WELDS (INCLUDING JOINT GEOMETRY) • JOINT PREPARATION • DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL) • CLEANLINESS (CONDITION OF STEEL SURFACES) • TACKING (TACK WELD QUALITY AND LOCATION)	O	YES
FIT-UP OF CJP GROOVE WELDS OF HSS T-, Y- AND K-JOINTS WITHOUT BACKING • JOINT PREPARATIONS • DIMENSIONS (ALIGNMENT, ROOT OPENING, ROOT FACE, BEVEL) • CLEANLINESS (CONDITION OF STEEL SURFACES) • TACKING (TACK WELD QUALITY AND LOCATION)	P	YES
CONFIGURATION AND FINISH OF ACCESS HOLES	O	YES
FIT-UP OF FILLET WELDS • DIMENSIONS (ALIGNMENT, GAPS AT ROOT) • CLEANLINESS (CONDITION OF STEEL SURFACES) • TACKING (TACK WELD QUALITY AND LOCATION)	O	YES
CHECK WELDING EQUIPMENT	O	YES

[a] THE FABRICATOR OR ERECTOR, AS APPLICABLE, SHALL MAINTAIN A SYSTEM BY WHICH A WELDER WHO HAS WELDED A JOINT OR MEMBER CAN BE IDENTIFIED. STAMPS, IF USED, SHALL BE THE LOW-STRESS TYPE.

AISC 360-16 TABLE N5.4-2 INSPECTION TASKS DURING WELDING

INSPECTION TASKS DURING WELDING	INSPECTION INTERVAL	REQUIRED ON PROJECT
USE OF QUALIFIED WELDERS	O	YES
CONTROL AND HANDLING OF WELDING CONSUMABLES • PACKAGING • EXPOSURE CONTROL	O	YES
NO WELDING OVER CRACKED TACK WELDS	O	YES
ENVIRONMENTAL CONDITIONS • WIND SPEED WITHIN LIMITS • PRECIPITATION AND TEMPERATURE	O	YES
WPS FOLLOWED • SETTINGS ON WELDING EQUIPMENT • TRAVEL SPEED • SELECTED WELDING MATERIALS • SHIELDING GAS TYPE/FLOW RATE • PREHEAT APPLIED • INTERPASS TEMPERATURE MAINTAINED (MIN/MAX) • PROPER POSITION (F, V, H, OH)	O	YES
WELDING TECHNIQUES • INTERPASS AND FINAL CLEANING • EACH PASS WITHIN PROFILE LIMITATIONS • EACH PASS MEETS QUALITY REQUIREMENTS	O	YES
PLACEMENT AND INSTALLATION OF STEEL HEADED STUD ANCHORS	P	YES

AISC 360-16 TABLE N5.4-3 INSPECTION TASKS AFTER WELDING

INSPECTION TASKS AFTER WELDING	INSPECTION INTERVAL	REQUIRED ON PROJECT
WELDS CLEANED	O	YES
SIZE, LENGTH AND LOCATION OF WELDS	P	YES
WELDS MEET VISUAL ACCEPTANCE CRITERIA: • CRACK PROHIBITION • WELD/BASE-METAL FUSION • CRATER CROSS SECTION • WELD PROFILES • WELD SIZE • UNDERCUT • POROSITY	P	YES
ARC STRIKES	P	YES
k-AREA[a]	P	YES
WELD ACCESS HOLES IN ROLLED HEAVY SHAPES AND BUILT-UP HEAVY SHAPES[b]	P	YES
BACKING REMOVED AND WELD TABS REMOVED (IF REQUIRED)	P	YES
REPAIR ACTIVITIES	O	YES
DOCUMENT ACCEPTANCE OR REJECTION OF WELDED JOINT OR MEMBER	O	YES
NO PROHIBITED WELDS HAVE BEEN ADDED WITHOUT THE APPROVAL OF THE EOR	O	YES

[a] WHEN WELDING OF DOUBLER PLATES, CONTINUITY PLATES OR STIFFENERS HAS BEEN PERFORMED IN THE k-AREA, VISUALLY INSPECT THE WEB k-AREA FOR CRACKS WITHIN 3" (75 mm) OF THE WELD.

(b) AFTER ROLLED HEAVY SHAPES (SEE SECTION A3.1c) AND BUILT-UP HEAVY SHAPES (SEE SECTION A3.1d) ARE WELDED, VISUALLY INSPECT THE WELD ACCESS HOLE FOR CRACKS.

AISC 360-16 TABLE N5.6-1 INSPECTION TASKS PRIOR TO BOLTING

INSPECTION TASKS PRIOR TO BOLTING	INSPECTION INTERVAL	REQUIRED ON PROJECT
MANUFACTURER'S CERTIFICATIONS AVAILABLE FOR FASTENER MATERIALS	O	YES
FASTENERS MARKED IN ACCORDANCE WITH ASTM REQUIREMENTS	O	YES
CORRECT FASTENERS SELECTED FOR THE JOINT DETAIL (GRADE, TYPE, BOLT LENGTH IF THREADS ARE TO EXCLUDED FROM SHEAR PLANE)	O	YES
CORRECT BOLTING PROCEDURE SELECTED FOR JOINT DETAIL	O	YES
CONNECTING ELEMENTS, INCLUDING THE APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET APPLICABLE REQUIREMENTS	O	YES
PRE-INSTALLATION VERIFICATION TESTING BY INSTALLATION PERSONNEL OBSERVED AND DOCUMENTED FOR FASTENER ASSEMBLIES AND METHODS USED	P	YES
PROTECTED STORAGE PROVIDED FOR BOLTS, NUTS, WASHERS AND OTHER FASTENER COMPONENTS	O	YES

AISC 360-16 TABLE N5.6-2 INSPECTION TASKS DURING BOLTING

INSPECTION TASKS DURING BOLTING	INSPECTION INTERVAL	REQUIRED ON PROJECT
FASTENER ASSEMBLIES PLACED IN ALL HOLES AND WASHERS AND NUTS ARE POSITIONED AS REQUIRED	O	YES
JOINT BROUGHT TO THE SNUG-TIGHT CONDITION PRIOR TO THE PRETENSIONING OPERATION	O	YES
FASTENER COMPONENT NOT TURNED BY THE WRENCH PREVENTED FROM ROTATING	O	YES
FASTENERS ARE PRETENSIONED IN ACCORDANCE WITH THE RCSC SPECIFICATION, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID POINT TOWARD THE FREE EDGES	O	YES

AISC 360-16 TABLE N5.6-3 INSPECTION TASKS AFTER BOLTING

INSPECTION TASKS AFTER BOLTING	INSPECTION INTERVAL	REQUIRED ON PROJECT
DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS	P	YES

- O-OBSERVE THESE ITEMS ON A RANDOM BASIS. OPERATIONS NEED NOT BE DELAYED PENDING THESE INSPECTIONS. P-PERFORM THESE TASKS FOR EACH WELDED JOINT OR MEMBER.
- OBSERVATION OF WELDING OPERATIONS AND VISUAL INSPECTION OF IN-PROCESS AND COMPLETED WELDS SHALL BE THE PRIMARY METHOD TO CONFIRM THAT THE MATERIALS, PROCEDURES AND WORKMANSHIP ARE IN CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS.
- FOR STRUCTURES IN RISK CATEGORY III / IV (ASCE/SEI 7, TABLE 1.5-1), ULTRASONIC TESTING SHALL BE PERFORMED ON ALL COMPLETE-JOINT-PENETRATION GROOVE WELDS SUBJECT TO TRANSVERSELY APPLIED TENSION LOADING IN BUTT, T- AND CORNER JOINTS, IN MATERIALS 5/16" (8 MM) THICK OR GREATER.
- ALL NONDESTRUCTIVE TESTING OF WELDED JOINTS SHALL BE DOCUMENTED.
- SEE AISC360-16 CHAPTER N FOR ADDITIONAL WELD INSPECTION REQUIREMENTS.
- SEE AISC360-16 CHAPTER N FOR ADDITIONAL BOLT INSPECTION REQUIREMENTS.
- EXPOSED CUT SURFACES OF GALVANIZED STRUCTURAL STEEL MAIN MEMBERS AND EXPOSED CORNERS OF RECTANGULAR HSS SHALL BE VISUALLY INSPECTED FOR CRACKS SUBSEQUENT TO GALVANIZING.
- INSPECTION SHALL OCCUR DURING THE PLACEMENT OF ANCHOR RODS AND OTHER EMBEDMENTS SUPPORTING STRUCTURAL STEEL FOR COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS, INCLUDING DIAMETER, GRADE, TYPE AND LENGTH OF THE ANCHOR ROD OR EMBEDDED ITEM, AND THE EXTENT OR DEPTH OF EMBEDMENT INTO THE CONCRETE.
- FABRICATED STEEL AND ERECTED STEEL FRAMES, AS APPROPRIATE, SHALL BE INSPECTED FOR COMPLIANCE WITH THE DETAILS SHOWN ON THE CONSTRUCTION DOCUMENTS, INCLUDING BRACES, STIFFENERS, MEMBER LOCATIONS AND PROPER JOINT DETAIL APPLICATION.

SPECIAL INSPECTION AND TESTING:

1. SPECIAL INSPECTION AND MINIMUM TESTING SHALL BE PERFORMED IN ACCORDANCE WITH 2021 IBC AND ALL REFERENCED MATERIALS AND TABLES.
2. INSPECTION SHALL BE PROVIDED BY AN INDEPENDENT TESTING AGENCY HIRED AT THE OWNER'S EXPENSE. AGENCY INSPECTION PERSONNEL SHALL MEET THE INSPECTOR QUALIFICATIONS FOR EACH MATERIAL ITEM AS INDICATED IN THE SPECIFICATIONS.
3. ANY MATERIAL OR PLACEMENT DEVIATIONS FROM MINIMUMS SHOWN ON THE DRAWINGS OR IN SPECIFICATIONS SHALL BE BROUGHT TO THE ATTENTION OF THE ENGINEER.
4. IN ADDITION TO THE IBC INSPECTION TABLES, THE INSPECTOR SHALL VERIFY THAT ALL STEEL MAINTAIN ERECTION TOLERANCES OF STRUCTURAL STEEL AND ARCHITECTURALLY EXPOSED STRUCTURAL STEEL WITHIN AISC'S CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES.
5. IN ADDITION TO THE CONCRETE IBC INSPECTION TABLES, THE INSPECTOR SHALL VERIFY THAT ALL CONCRETE AND MASONRY MAINTAIN TOLERANCES SPECIFIED IN ACI 117-10 STANDARD SPECIFICATIONS FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS.
6. TESTING - ANY FAILED FIELD TEST SHALL BE REPORTED TO ALBERTSON ENGINEERING INC IMMEDIATELY.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 11135
BLAKE M. TIDEMAN
STATE OF SOUTH DAKOTA
12-31-25

Albertson Engineering Inc.
605.343.9606
www.albertsonengineering.com
Offices in Rapid City - Sioux Falls - Winner, SD and Cheyenne, WY

CONSULTANT

PROJECT IDEN:
ALEXANDRIA SAFE ROOM

ISSUE BLOCK:

NO	ISSUE TYPE	ISSUE DATE

MANAGEMENT:
PROJECT NO: 25-119
DRAWN BY: JAB
CHECKED BY: BMT

SHEET TITLE:
IBC INSPECTION TABLES CONT

SHEET IDENTIFICATION:
S-003

24X36 TITLE BLOCK

CONCRETE FINISH SCHEDULE

UNLESS SPECIFICALLY NOTED OTHERWISE, THE FOLLOWING REQUIREMENTS APPLY TO ALL CAST-IN-PLACE AND PRECAST CONCRETE

ITEM	BASE CONCRETE SURFACE CATEGORY	MODIFICATIONS TO DEFAULT REQUIREMENTS	REMARKS
DRILLED PIERS	N/A	NONE	NONE
FOOTINGS	CSC1	NONE	NONE
FOUNDATION WALLS WITHOUT ANY PORTION VISIBLE	CSC1	NONE	NONE
FOUNDATION WALLS WITH PORTIONS VISIBLE	CSC2	NONE	NONE
BASEMENT WALLS	CSC2	NONE	NONE
PRECAST ITEMS	CSC3	TEXTURE - T4 COLOR UNIFORMITY - CU4	SPECIALIZED FINISHES SUCH AS EXPOSED AGGREGATE NOT SUBJECT TO SURFACE VOID RATIO LIMITS
CONCRETE EXPOSED IN UTILITARIAN AREAS SUCH AS MECHANICAL ROOMS OR JANITOR CLOSETS	CSC2	NONE	NONE
ALL OTHER EXPOSED CONCRETE	CSC3	NONE	NONE
ALL OTHER CONCRETE NOT EXPOSED	CSC2	NONE	NONE

ADDITIONAL REMARKS:

SEE TABLE 1 - DESCRIPTION OF FORMED CONCRETE SURFACE CATEGORIES, TABLE 3.1B, TABLE 3.1C, AND 3.1D FOR ADDITIONAL SPECIFIC REQUIREMENTS.

SPECIALIZED FINISHES INCLUDE EXPOSED AGGREGATE, SANDBLAST FINISHES, ACID WASHES, COLORED CONCRETE, AND OTHER SIMILAR ITEMS. SPECIALIZED FINISHES MUST HAVE MOCK UP PANEL CONSTRUCTED AND SUBMITTED FOR APPROVAL OF ARCHITECT. APPROVED MOCK UP PANEL TO BE USED AS A BASIS FOR THE ACCEPTABILITY OF THE FINISHES. ARCHITECT SHALL BE THE SOLE JUDGE IN DETERMINING THE ACCEPTABILITY OF SPECIALIZED FINISHES.

TOLERANCES SHALL BE MEASURED AT INITIAL CONSTRUCTION INSTALLATION PRIOR TO ANY REPAIRS. ANY REPAIR WORK MUST BE SUBMITTED TO THE ARCHITECT AND ENGINEER. ACCEPTANCE OF REPAIRS WILL BE AT THE DISCRETION OF THE ARCHITECT OR ENGINEER.

TOLERANCES SPECIFIED IN ACI 117, ACI 301 AND THE PCI MANUAL SHALL STILL APPLY TO ALL CONCRETE SURFACES IN THIS PROJECT, BUT IN AREAS OF CONFLICT, THESE TABLES SHALL BE USED AS A REFERENCE AND GUIDE.

TABLE 3.1C - FORM-FACING CATEGORIES

CRITERION	FORM-FACING CATEGORY		
	FC1	FC2	FC3
HOLES, GREATER THAN 3/16 IN.	PLUG OR DISK COVERS ARE ACCEPTABLE	ACCEPTABLE IF PATCHED, SANDED AND SEALED OR GROUNDED TO MATCH ADJACENT FORM SURFACE	VISIBLE FILLING IS UNACCEPTABLE
HOLES, 3/16 IN. OR LESS	ACCEPTABLE	ACCEPTABLE WITHOUT PATCHING, PROVIDED FORM SURFACE IS NOT DAMAGED OR TORN AROUND HOLE(S)	ACCEPTABLE IF PATCHED, SANDED AND SEALED OR GROUNDED TO MATCH ADJACENT FORM SURFACE
VIBRATOR BURNS	ACCEPTABLE	UNACCEPTABLE	UNACCEPTABLE
SCRATCHES / DENTS	ACCEPTABLE	ACCEPTABLE IF PATCHED, SANDED AND SEALED OR GROUNDED TO MATCH ADJACENT FORM SURFACE	UNACCEPTABLE UNLESS OTHERWISE APPROVED
CONCRETE REMNANTS [a]	ACCEPTABLE	UNACCEPTABLE	UNACCEPTABLE
CEMENT RESIDUE [b]	ACCEPTABLE	ACCEPTABLE	SHOULD NOT AFFECT FINISHED CONCRETE SURFACE
SWELLING OF FACING AT FASTENER OR TIE HOLES	ACCEPTABLE	UNACCEPTABLE	UNACCEPTABLE
PATCHING [c]	ACCEPTABLE	ACCEPTABLE	SHOULD NOT AFFECT FINISHED CONCRETE SURFACE

ADDITIONAL REMARKS:

a. CONCRETE REMNANT IS HARDENED CONCRETE ON THE FORM FACE.

b. CEMENT RESIDUE IS A THIN FILM REMAINING ON THE FORM FACE.

c. PERFORM AND INSPECT REPAIRS OF FORM FACING AND MAKE ACCEPTABLE FOR THE INTENDED FORMED CONCRETE SURFACE.

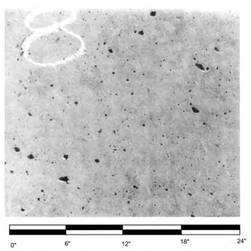
TABLE 3.1D - CONCRETE SURFACE VOID RATIO (SVR) ON AS-CAST FORMED SURFACES

SURFACE VOID RATIO	SVR1	SVR2	SVR3	SVR4
VOID AREA OF PORES OF SURFACE* OCCURRING WITHIN A 24 IN. x 24 IN. SQUARE	6.9 $IN.^2$, Dmax = 3/4 IN.	5.8 $IN.^2$, Dmax = 5/8 IN.	3.5 $IN.^2$, Dmax = 3/8 IN.	1.7 $IN.^2$, Dmax = 1/4 IN.

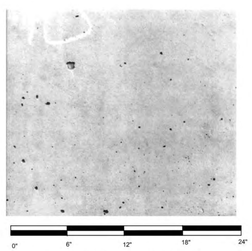
ADDITIONAL REMARKS:

* VOID AREA IS THE SUMMATION OF THE AREAS OF ALL VOIDS WITHIN THE SAMPLE SPACE OF 24 IN. x 24 IN. VOIDS WITH AN AVERAGE DIAMETER OF d < 3/32 IN. ARE EXCLUDED FROM THE CALCULATION OF THE VOID AREA.

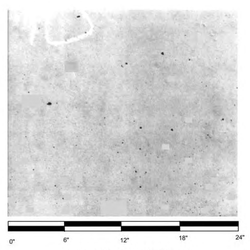
Dmax IS MAXIMUM DIMENSION OF ANY VOID IN ANY DIRECTION.



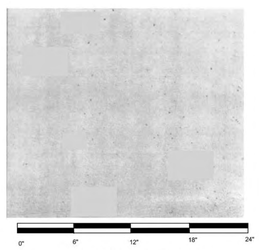
24" x 24" CONCRETE SURFACE VOID RATIO - MAX VOID RATIO FOR SVR1



24" x 24" CONCRETE SURFACE VOID RATIO - MAX VOID RATIO FOR SVR2



24" x 24" CONCRETE SURFACE VOID RATIO - MAX VOID RATIO FOR SVR3



24" x 24" CONCRETE SURFACE VOID RATIO - MAX VOID RATIO FOR SVR4

TABLE 3.1B - DESCRIPTION OF VISIBLE EFFECTS ON AS-CAST FORMED SURFACE

CRITERION	CLASSIFICATION	CHARACTERISTICS
TEXTURE PANEL-JOINT	T1	- ACCEPTABLE GAPS IN ADJACENT FORMWORK COMPONENTS ≤ 3/4 IN. - ACCEPTABLE DEPTH OF MORTAR LOSS ≤ 1/2 IN. - ACCEPTABLE SURFACE OFFSETS OF PANEL JOINTS UP TO 1 IN. (ACI 117-10, SECTION 4.8.3, CLASS D). - ALLOWABLE PROJECTIONS 1 IN. FROM ADJACENT SURFACE. (ACI 301-16, SECTION 5.3.3.3.a). - FORM-FACING MATERIAL EXAMPLES: ROUGH SAWN LUMBER, CDX PLYWOOD, AND PARTICLE BOARD. - IMPRINTS OF MODULAR PANEL FRAMES ARE ACCEPTABLE.
	T2	- ACCEPTABLE GAPS IN ADJACENT FORMWORK COMPONENTS ≤ 1/2 IN. - ACCEPTABLE DEPTH OF MORTAR LOSS ≤ 3/8 IN. - ACCEPTABLE SURFACE OFFSETS OF PANEL JOINTS UP TO 1/2 IN. (ACI 117-10, SECTION 4.8.3, CLASS C). - ALLOWABLE PROJECTIONS 1/2 IN. FROM ADJACENT SURFACE. - FORM-FACING MATERIAL EXAMPLES: CLASS BBOES PLYWOOD, MDO PLYWOOD. - IMPRINTS OF MODULAR PANEL FRAMES ARE ACCEPTABLE.
	T3	- ACCEPTABLE GAPS IN ADJACENT FORMWORK COMPONENTS ≤ 1/4 IN. - ACCEPTABLE DEPTH OF MORTAR LOSS ≤ 1/4 IN. - ACCEPTABLE SURFACE OFFSETS OF PANEL JOINTS UP TO 1/4 IN. (ACI 117-10, SECTION 4.8.3, CLASS B). - ALLOWABLE PROJECTIONS 1/4 IN. FROM ADJACENT SURFACE. (ACI 301-16, SECTION 5.3.3.3.b). - FORM-FACING MATERIAL EXAMPLES: HDO PLYWOOD, PHENOLIC SURFACE FILM, PLASTIC OR STEEL. - IMPRINTS OF MODULAR PANEL FRAMES ARE ACCEPTABLE.
	T4	- FORMWORK SHOULD BE GROUT TIGHT. AVOID GROUT / MORTAR LEAKAGE AND CORRECT WHERE OCCURS. - PERMISSIBLE SURFACE OFFSETS OF PANEL JOINTS UP TO 1/8 IN. (ACI 117-10, SECTION 4.8.3, CLASS A). - ALLOWABLE PROJECTIONS 1/8 IN. FROM ADJACENT SURFACE. (ACI 301-16, SECTION 5.3.3.3.C). - FORM-FACING MATERIAL EXAMPLES: HDO PLYWOOD, PSF PLYWOOD, FULL PLASTIC, STEEL AND FIBERGLASS. - IMPRINTS OF MODULAR PANEL FRAMES ARE UNACCEPTABLE UNLESS DEMONSTRATED AND APPROVED IN THE MOCKUP.
SURFACE VOID RATIO (SVR)	SVR1-SVR4	- REFER TO TABLE 3.1D.
COLOR UNIFORMITY	CU1	- LIGHT AND DARK COLOR VARIATIONS ARE ACCEPTABLE. - COLOR VARIATIONS BETWEEN ADJACENT PLACEMENTS AND LAYER LINES ARE ACCEPTABLE. - RUST AND DIRT STAINS ARE ACCEPTABLE.
	CU2	- GRADUAL LIGHT AND DARK COLOR VARIATIONS ARE ACCEPTABLE. - COLOR CONSISTENCY BETWEEN ADJACENT PLACEMENTS AND LAYER LINES SHOULD BE MOSTLY UNIFORM. - MAXIMUM TONAL VARIATION FOR CONCRETE SHALL BE CONTAINED WITHIN 3 TONAL RANGES (FOR EXAMPLE LIGHTEST BEING 2.0 AND DARKEST BEING 4.0). - CONCRETE SOURCE MATERIALS AND FORM-FACING MATERIAL SHOULD BE CONSISTENT TYPE, GRADE, AND SOURCE TO AVOID CAUSING DEVIATIONS IN APPEARANCE. - RUST AND DIRT STAINS ARE ACCEPTABLE.
	CU3	- DISCOLORATIONS CAUSED BY CONCRETE SOURCE MATERIAL OF DIFFERENT TYPE AND ORIGIN, DIFFERENT TYPES OF FACING MATERIALS, OR INCONSISTENT TREATMENT OF CONCRETE SURFACES ARE UNACCEPTABLE. - MAXIMUM TONAL VARIATION FOR CONCRETE SHALL BE CONTAINED WITHIN 2 TONAL RANGES (FOR EXAMPLE LIGHTEST BEING 2.0 AND DARKEST BEING 3.0). - RUST STAINS, DIRT STAINS AND VISIBLE POURING LAYERS ARE UNACCEPTABLE.
	CU4	- DISCOLORATIONS CAUSED BY CONCRETE SOURCE MATERIAL OF DIFFERENT TYPE AND ORIGIN, DIFFERENT TYPES OF FACING MATERIALS, OR INCONSISTENT TREATMENT OF CONCRETE SURFACES ARE UNACCEPTABLE. - MAXIMUM TONAL VARIATION FOR CONCRETE SHALL BE CONTAINED WITHIN 1 TONAL RANGE (FOR EXAMPLE LIGHTEST BEING 2.0 AND DARKEST BEING 2.5 OR LIGHTEST BEING 1.5 AND DARKEST BEING 2.0). - RUST STAINS, DIRT STAINS AND VISIBLE POURING LAYERS ARE UNACCEPTABLE.
SURFACE IRREGULARITIES [a]	SI1	- ACI 117-10, SECTION 4.8.3, CLASS D - SURFACE. - MAXIMUM GRADUAL DEVIATION OVER A DISTANCE OF 5 FT. OR ABRUPT DEVIATION IS 1 IN. - LIMIT DEFLECTION OF FORMWORK STRUCTURE TO L/240. - ACI 117-10, SECTION 4.8.2 DOES NOT APPLY.
	SI2	- ACI 117-10, SECTION 4.8.3, CLASS C - SURFACE. - MAXIMUM GRADUAL DEVIATION OVER A DISTANCE OF 5 FT. OR ABRUPT DEVIATION IS 1/2 IN. - LIMIT DEFLECTION OF FORMWORK STRUCTURE TO L/360. - ACI 117-10, SECTION 4.8.2 DOES NOT APPLY.
	SI3	- ACI 117-10, SECTION 4.8.3, CLASS B - SURFACE. - MAXIMUM GRADUAL DEVIATION OVER A DISTANCE OF 5 FT. OR ABRUPT DEVIATION IS 1/4 IN. - LIMIT DEFLECTION OF FORMWORK STRUCTURE TO L/360. - ACI 117-10, SECTION 4.8.2 DOES NOT APPLY.
	SI4	- ACI 117-10, SECTION 4.8.3, CLASS A - SURFACE. - MAXIMUM GRADUAL DEVIATION OVER A DISTANCE OF 5 FT. OR ABRUPT DEVIATION IS 1/8 IN. - LIMIT DEFLECTION OF FORMWORK STRUCTURE TO L/400. - ACI 117-10, SECTION 4.8.2 DOES APPLY.
CONSTRUCTION AND FACING JOINTS [b]	CJ1	- ACCEPTABLE OFFSET OF SURFACES BETWEEN TWO ADJACENT PLACEMENTS ≤ 1 IN.
	CJ2	- ACCEPTABLE OFFSET OF SURFACES BETWEEN TWO ADJACENT PLACEMENTS ≤ 1/2 IN. - THE USE OF CHAMFER STRIPS OR SIMILAR REVEALS ARE RECOMMENDED AT CONSTRUCTION JOINTS.
	CJ3	- ACCEPTABLE OFFSET OF SURFACES BETWEEN TWO ADJACENT PLACEMENTS ≤ 1/4 IN. - THE USE OF CHAMFER STRIPS OR SIMILAR REVEALS ARE RECOMMENDED AT CONSTRUCTION JOINTS. - CONSTRUCTION JOINT LOCATIONS SHOULD BE COORDINATED WITH ARCHITECTURAL DESIGN
	CJ4	- ACCEPTABLE OFFSET OF SURFACES BETWEEN TWO ADJACENT PLACEMENTS ≤ 1/8 IN. OFFSETS LESS THAN 1/8 IN. SHOULD BE SPECIFIED IN DESIGN DOCUMENTS. - THE USE OF CHAMFER STRIPS OR SIMILAR REVEALS ARE RECOMMENDED AT CONSTRUCTION JOINTS. - CONSTRUCTION JOINT LOCATIONS SHOULD BE COORDINATED WITH ARCHITECTURAL DESIGN AND APPROVED BY ARCHITECT OR ENGINEER. - THE MOCKUP SHOULD CONTAIN ALL FEATURES REPRESENTATIVE TO THE FINISHED PRODUCT.

ADDITIONAL REMARKS:

a. SURFACE IRREGULARITIES DO NOT APPLY FOR WORKED OR TEXTURED AREAS.

b. CONSTRUCTION JOINTS THAT REMAIN VISIBLE. LIMITS ALSO APPLY TO VERTICAL OFFSET OF FORMWORK, REVEALS, FINISH LIMITS, ETC.

DESCRIPTION OF FORMED CONCRETE SURFACE CATEGORIES (CSC)

FORMED CONCRETE SURFACE CATEGORY		COMMON APPLICATION	TEXTURE [a]	SURFACE VOID RATIO [b]	COLOR UNIFORMITY [c]	SURFACE IRREGU-LARITIES [d]	CONSTRUCTION AND FACING JOINT [d]	MOCKUP	FORM-FACING CATEGORY [e]
CONCRETE SURFACE FINISH WITH	CSC1	CONCRETE SURFACES IN AREAS WITH NO VISIBILITY OR OF LIMITED IMPORTANCE WITH REGARD TO FORMED CONCRETE SURFACE REQUIREMENTS, OR COVERED WITH SUBSEQUENT FINISH MATERIALS CAPABLE OF ACCOMMODATING THE TOLERANCES OF THIS CATEGORY	T1	SVR1	CU1	SI1	CJ1	OPTIONAL	FC1
	CSC2	CONCRETE SURFACES WHERE VISUAL APPEARANCE IS EXPOSED BUT NOT TO PUBLIC VIEW OR OTHERWISE SPECIFIED	T2	SVR2	CU2	SI2	CJ2	OPTIONAL	FC1
	CSC3	CONCRETE SURFACES THAT ARE IN PUBLIC VIEW OR WHERE APPEARANCE IS IMPORTANT, SUCH AS EXTERIOR OR INTERIOR EXPOSED BUILDING ELEMENTS.	T3	SVR3	CU3	SI3	CJ3	REQUIRED	FC2
	CSC4	CONCRETE SURFACES WHERE THE EXPOSED CONCRETE IS A PROMINENT FEATURE OF THE COMPLETED STRUCTURE OR VISUAL APPEARANCE IS IMPORTANT.	T4	SVR4	CU4	SI4	CJ4	REQUIRED	FC3

ADDITIONAL REMARKS:

a. THESE REQUIREMENTS/ FEATURES ARE DESCRIBED IN DETAIL IN TABLE 3.1B

b. VOID AREA OF PORES SURFACE. REFER TO TABLE 3.1D

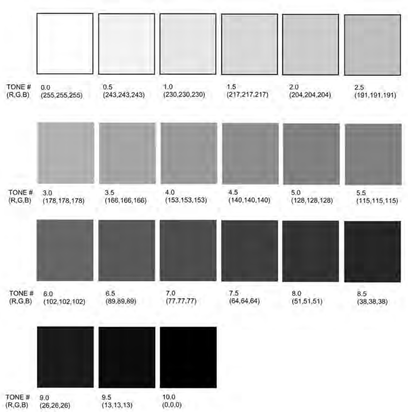
c. DISCOLORATIONS CAN USUALLY BE SEEN ONLY AFTER A LONGER PERIOD OF TIME AND FOR AT LEAST 8 WEEKS.

d. REFER TO TABLE 3.1B.

e. REFER TO TABLE 3.1C.

UNLESS OTHERWISE SPECIFIED, THE REQUIREMENTS GIVEN APPLY TO CAST-IN-PLACE AND PRECAST CONCRETE. REQUIREMENTS APPLY TO ALL CAST-IN-PLACE CONCRETE WITH EXCEPTION OF SLABS ON GRADE AND TOP SURFACE OF STRUCTURAL CAST-IN-PLACE SLABS. REQUIREMENTS APPLY TO ALL FACES OF PRECAST CONCRETE INCLUDING SURFACES THAT MAY NOT BE FORMED.

SPECIALIZED FINISHES, AND THE MEANS AND METHODS USED TO OBTAIN THOSE SURFACES, SHALL NOT AFFECT ANY SURFACES EXCEPT FOR THE SPECIFIC SURFACES SPECIFIED. EXAMPLES OF UNACCEPTABLE ACTIONS INCLUDE, BUT ARE NOT LIMITED TO, CHEMICAL TREATMENTS (RETARDERS, ACIDS, ETC) AFFECTING SURFACES NOT INTENDED TO RECEIVE SUCH TREATMENTS.



REGISTERED PROFESSIONAL ENGINEER
REG. NO.
11135
BLAKE M. TIDEMAN
STATE OF IOWA
12-31-25

Albertson Engineering Inc.
605.343.9606
www.albertsonengineering.com
Offices in Rapid City - Sioux Falls - Winner, SD and Cheyenne, WY

CONSULTANT

PROJECT IDEN:

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ISSUE BLOCK:

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MANAGEMENT:

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DRAWN BY: Author

CHECKED BY: Checker

SHEET TITLE:

CONCRETE SURFACE REQUIREMENTS

SHEET IDENTIFICATION:

S-004

24X36 TITLE BLOCK

WIND UPLIFT SCHEDULE

STORM SHELTER ROOF

HATCH DESIGNATION	WIDTH	PRESSURE (PSF)			
		EFFECTIVE WIND AREA (SQ FT)			
		0 - 20	20 - 50	50 - 100	> 100
	SEE PLAN FOR DIMENSIONS	120	120	120	120
	SEE PLAN FOR DIMENSIONS	186	176	162	152
	SEE PLAN FOR DIMENSIONS	236	223	205	192
	SEE PLAN FOR DIMENSIONS	310	284	249	223

ADDITIONAL REMARKS:

1. WIND UPLIFT PRESSURES SHOWN ARE ULTIMATE WIND UPLIFT PRESSURES FROM ASCE 7-16. TO OBTAIN SERVICE WIND UPLIFT PRESSURES MULTIPLY TABLE VALUE BY 0.6.

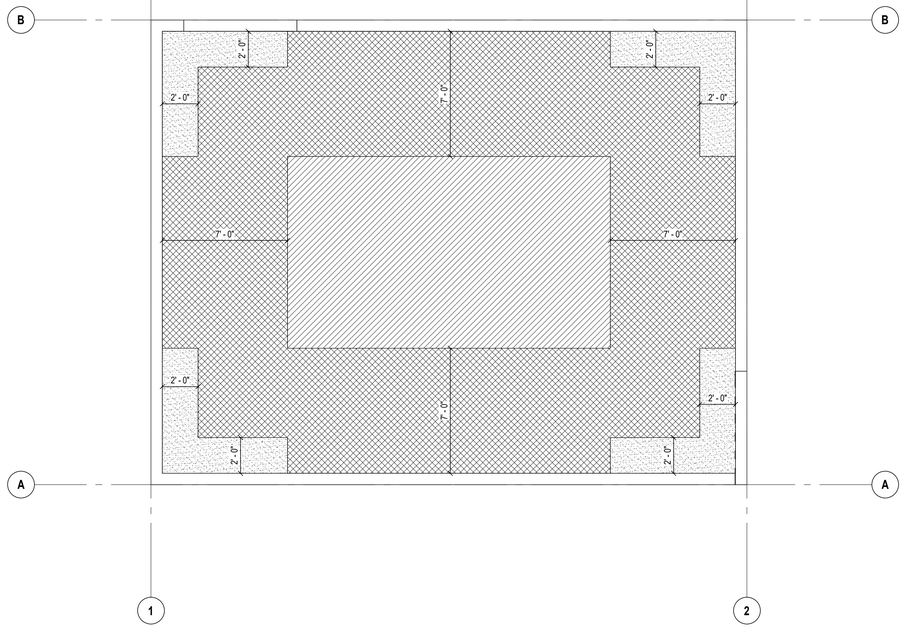
WIND COMPONENTS & CLADDING SCHEDULE

STORM SHELTER WALLS

ZONES			PRESSURE (PSF)			
DESIGNATION	WIDTH	ULTIMATE WIND PRESSURES	EFFECTIVE WIND AREA (SQ FT)			
			0 - 20	20 - 50	50 - 100	> 100
ZONE 4	REMAINDER	PRESSURE	123	119	114	110
		SUCTION	115	112	106	102
ZONE 5	3' - 0"	PRESSURE	145	137	127	119
		SUCTION	115	112	106	102

ADDITIONAL REMARKS:

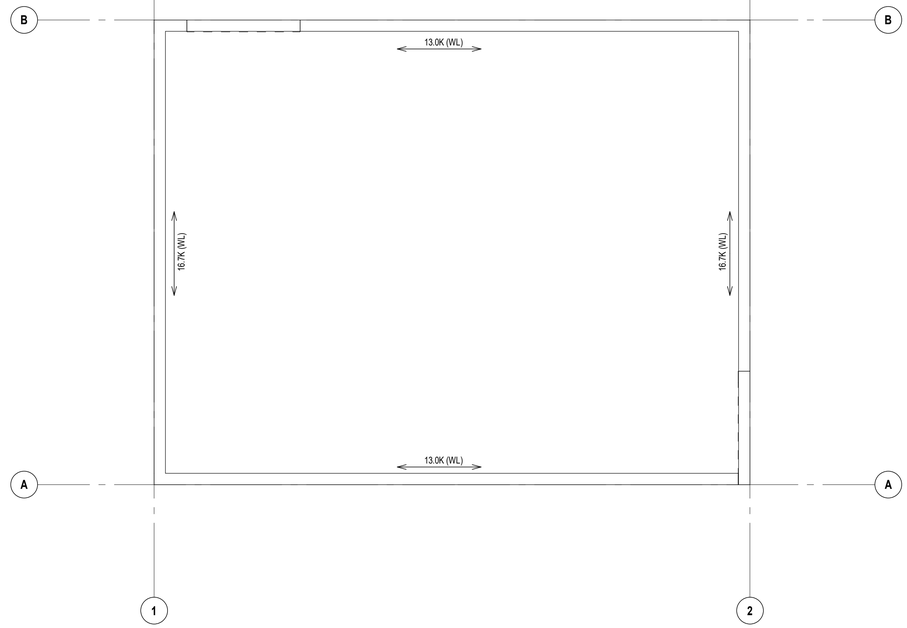
1. WIND PRESSURES SHOWN ARE ULTIMATE WIND PRESSURES FROM ASCE 7-16. TO OBTAIN NOMINAL WIND PRESSURES MULTIPLY TABLE VALUE BY 0.6.
2. ZONE 5 SHALL INCLUDE THE WALL AREA WITHIN THE "WIDTH" VALUE FROM EACH BUILDING CORNER.
3. ZONE 4 APPLIES TO THE REMAINING WALL AREA.



A1 S-005

WIND UPLIFT PLAN

SCALE: 1/4" = 1'-0"



A3 S-005

LATERAL LOAD PLAN

SCALE: 1/4" = 1'-0"

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
11135
BLAKE M. TIDEMAN
STATE OF IOWA
12-31-25

Albertson Engineering Inc.
605.343.9606
www.albertsonengineering.com
Offices in Rapid City -
Sioux Falls - Winner, SD
and Cheyenne, WY

CONSULTANT

PROJECT IDEN:

ALEXANDRIA SAFE ROOM

ISSUE BLOCK:

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MANAGEMENT:

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SHEET TITLE:

WIND UPLIFT & LATERAL LOAD PLANS

SHEET IDENTIFICATION:

S-005

24X36 TITLE BLOCK

SHEET NOTES

FOUNDATION & FLOOR SLAB PLAN NOTES

1. SEE SHEETS S-001 & S-002 FOR STRUCTURAL NOTES.
2. VERIFY ALL DIMENSIONS & ELEVATIONS WITH ARCHITECTURAL DRAWINGS BEFORE CONSTRUCTION COMMENCES.
3. ELEVATIONS ON THE STRUCTURAL DRAWINGS REFER TO THE TOP OF CONCRETE REFERENCE ELEVATION SET AT 100' - 0" (MAIN FLOOR).
4. CAST-IN-PLACE FOUNDATION WALL REINFORCING SHALL BE CONTINUOUS AROUND CORNERS.
5. **TOP OF FOOTING ELEVATION (TOF) = 95' - 4"**, UNO. SEE THIS SHEET FOR CONCRETE FOOTING SCHEDULE.
6. **TOP OF WALL ELEVATION (TOW) = 100' - 0"**, UNO.
7. CENTERLINE OF FOOTING SHALL COINCIDE WITH THE FOUNDATION WALL & COLUMN CENTERLINE, UNLESS SHOWN OTHERWISE.
8. CONCRETE SLAB-ON-GRADE SHALL BE AS SHOWN IN PLAN.
9. CONCRETE SLAB-ON-GRADE CONTROL JOINTS SHALL BE TOOLED OR SAWCUT. THE JOINT PATTERN SHALL BE APPROXIMATELY AS SHOWN.
10. FOR TYPICAL SLAB JOINTS, SEE T2 / S-601.
11. PROVIDE (2) #4x60" REINFORCING BARS IN SLAB-ON-GRADE AT ALL SLAB RE-ENTRANT CORNERS.
12. SEE ARCHITECTURAL & MECHANICAL DRAWINGS FOR SLOPES, DROPS, AND DRAIN LOCATIONS IN FLOOR SLAB.
13. SEE MECHANICAL DRAWINGS FOR REQUIREMENTS RELATED TO ISOLATION OF NOISE AND VIBRATION FOR ALL MECHANICAL WORK.
14. SEE MECHANICAL DRAWINGS FOR SIZE AND LOCATION OF MECHANICAL EQUIPMENT PADS.
15. BACKFILL & COMPACT BOTH SIDES OF FOUNDATION WALLS SIMULTANEOUSLY.
16. SEE CIVIL DRAWINGS FOR EXTERIOR GRADING.
17. SEE ARCHITECTURAL DRAWINGS FOR PANEL JOINT SPACING AND OPENINGS IN WALLS.
18. JOINT WIDTH BETWEEN EXTERIOR PRECAST WALL PANELS AND THE 8" CMU WALL SHALL BE 3/8" MAXIMUM. JOINT SHALL BE FILLED WITH BACKER ROD AND CAULK. SEE ARCHITECTURAL DRAWINGS.
19. SHADED AREA DENOTES EXTENTS OF THE TORNADO SAFE ROOM.
20. PRECAST WALLS SHALL BE REINFORCED WITH A MINIMUM OF #4 HORIZONTAL REBAR IN EACH DIRECTION SPACED AT 24" OC. FINAL DESIGN SHALL BE BY PRECAST MANUFACTURER PER SHELTER LOADING LISTED ON SHEET S-001.

ROOF FRAMING PLAN NOTES

1. SEE SHEETS S-001 & S-002 FOR STRUCTURAL NOTES.
2. VERIFY ALL DIMENSIONS & ELEVATIONS WITH ARCHITECTURAL DRAWINGS BEFORE CONSTRUCTION COMMENCES.
3. ELEVATIONS ON THE STRUCTURAL DRAWINGS REFER TO THE TOP OF CONCRETE REFERENCE ELEVATION SET AT 100' - 0" (MAIN FLOOR).

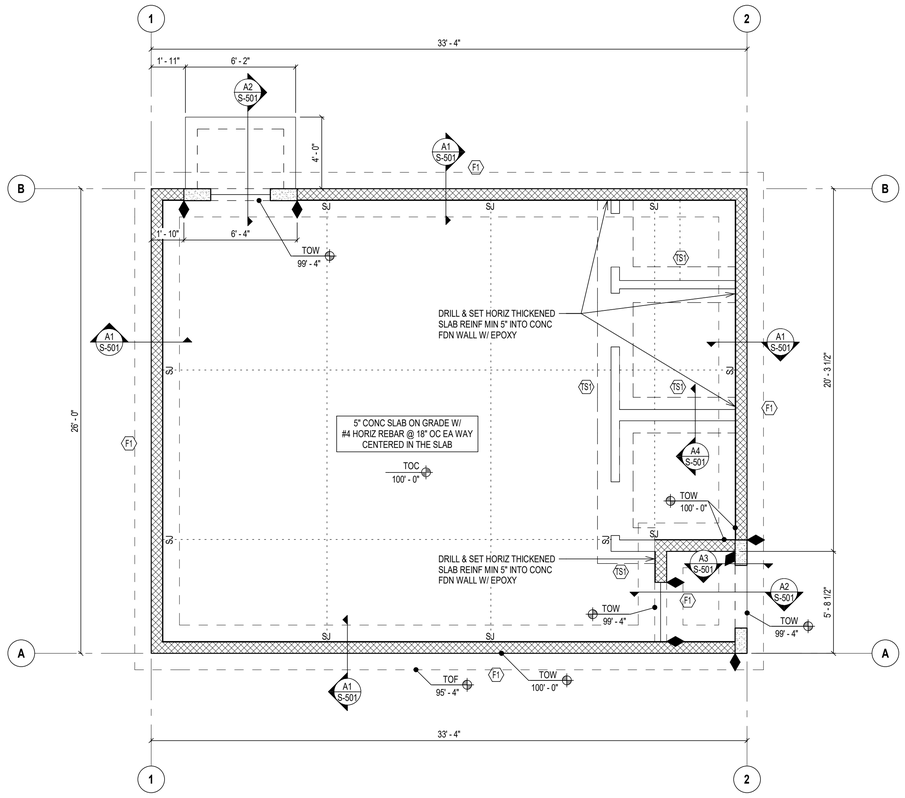
SHEET LEGEND

- SJ - - - - - - - - DENOTES CONCRETE SLAB CONTROL JOINTS (SJ)
- Fx — DENOTES FOOTING (SPREAD OR ISOLATED) SEE PLAN & SCHEDULE
- DENOTES LOAD-BEARING 8" CMU WALL. REINFORCE WITH (1) #5 VERTICAL REBAR @ 16" OC (MAX) CENTERED IN GROUT FILLED CELLS. SEE TYPICAL DETAILS FOR ADDITIONAL VERTICAL REINFORCING AT CORNERS AND EDGES OF OPENINGS. PROVIDE THE FOLLOWING HORIZONTAL REINFORCMENT:
  - CONT 8" BOND BEAM W/ (2) #5 HORIZONTAL REBAR @ 6' - 0" OC (MAX)
  - 9 GAUGE LADDER JOINT REINFORCEMENT AT 16" OC (MAX)
- DENOTES NON-LOAD-BEARING 6" OR 8" CMU WALL. REINFORCE WITH (1) #5 VERTICAL REBAR @ 48" OC (MAX) CENTERED IN GROUT FILLED CELLS. SEE TYPICAL DETAILS FOR ADDITIONAL VERTICAL REINFORCING AT CORNERS AND EDGES OF OPENINGS. PROVIDE THE FOLLOWING HORIZONTAL REINFORCMENT:
  - CONT 8" BOND BEAM W/ (2) #5 HORIZONTAL REBAR @ 6' - 0" OC (MAX)
  - 9 GAUGE LADDER JOINT REINFORCEMENT AT 16" OC (MAX)
- DENOTES EXTENTS OF 8" SOLID PRECAST WALL PANEL. SEE ARCHITECTURAL DRAWINGS.

SCHEDULES

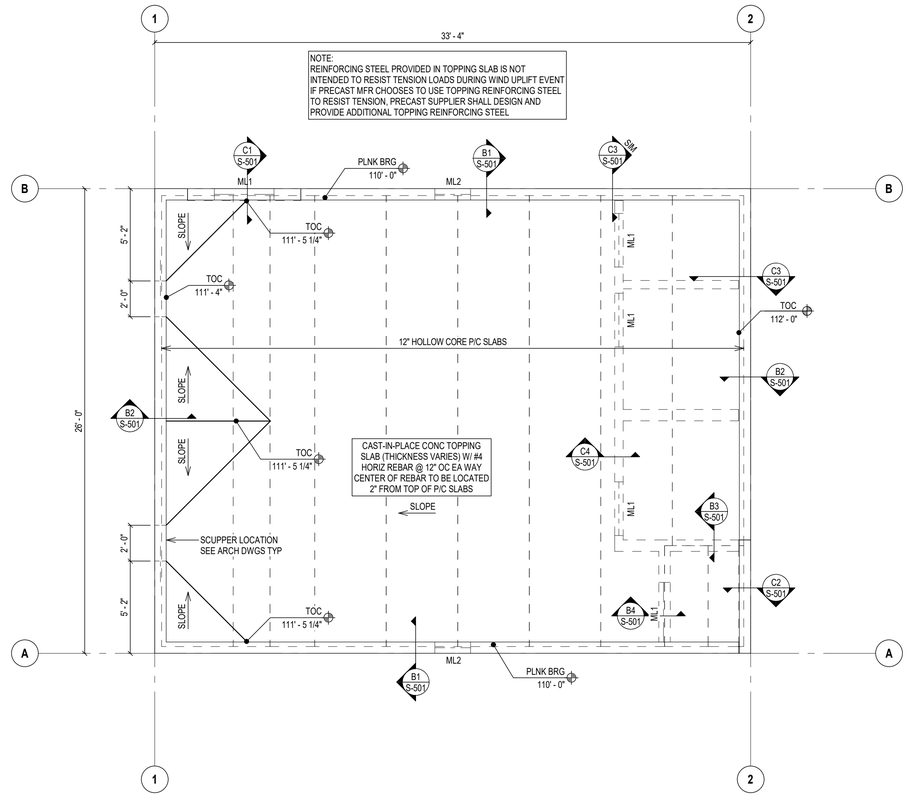
FOOTING SCHEDULE

MARK	FOOTING SIZE	REINFORCING	REMARKS
F1	CONT x 2' - 6" x 1' - 0"	(4) #5 CONT	BOTTOM
TS1	CONT x 2' - 0" x 1' - 0"	(3) #5 CONT	BOTTOM



A1 S-101 **FND & FLOOR SLAB PLAN**

SCALE: 1/4" = 1'-0"



A3 S-101 **ROOF FRAMING PLAN**

SCALE: 1/4" = 1'-0" REFERENCED FROM:

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REGISTERED PROFESSIONAL ENGINEER
REG. NO. 11135
BLAKE M. TIDEMAN
STATE OF SOUTH DAKOTA
12-31-25

CONSULTANT

PROJECT IDEN:

ALEXANDRIA SAFE ROOM

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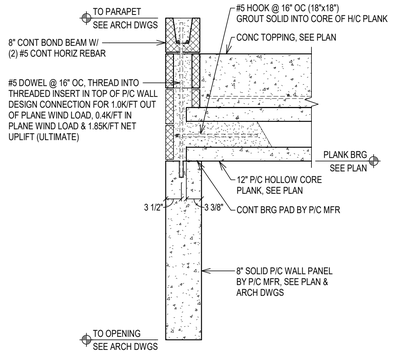
FOUNDATION & ROOF FRAMING PLANS

SHEET IDENTIFICATION:

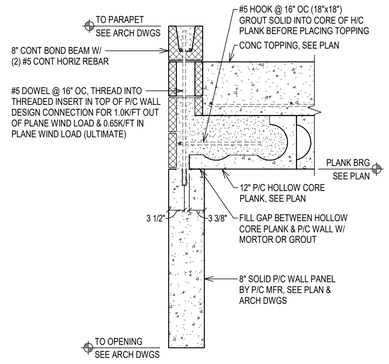
S-101

24X36 TITLE BLOCK



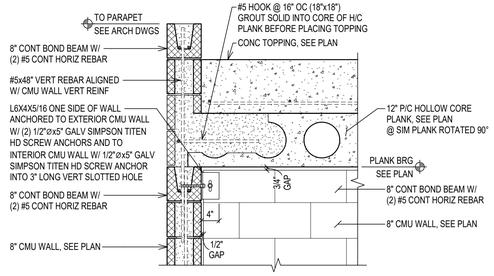
C1 S-501 **ROOF FRAMING DETAIL**

SCALE: 3/4" = 1'-0" REFERENCED FROM: A3 / S-101



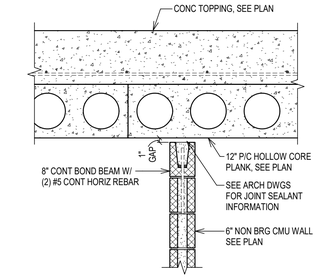
C2 S-501 **ROOF FRAMING DETAIL**

SCALE: 3/4" = 1'-0" REFERENCED FROM: A3 / S-101



C3 S-501 **ROOF FRAMING DETAIL**

SCALE: 3/4" = 1'-0" REFERENCED FROM: A3 / S-101



C4 S-501 **ROOF FRAMING DETAIL**

SCALE: 3/4" = 1'-0" REFERENCED FROM: A3 / S-101

B1 S-501 **ROOF FRAMING DETAIL**

SCALE: 3/4" = 1'-0" REFERENCED FROM: A3 / S-101

B2 S-501 **ROOF FRAMING DETAIL**

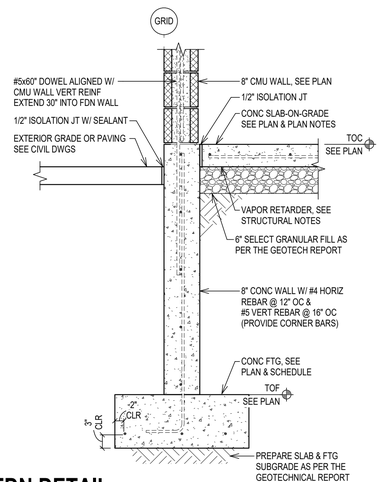
SCALE: 3/4" = 1'-0" REFERENCED FROM: A3 / S-101

B3 S-501 **ROOF FRAMING DETAIL**

SCALE: 3/4" = 1'-0" REFERENCED FROM: A3 / S-101

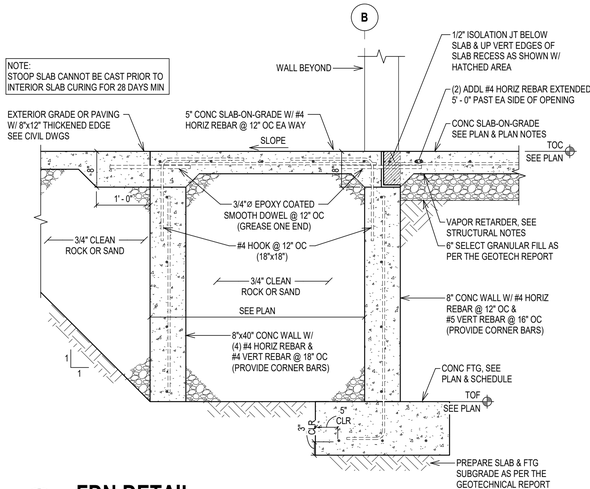
B4 S-501 **ROOF FRAMING DETAIL**

SCALE: 3/4" = 1'-0" REFERENCED FROM: A3 / S-101



A1 S-501 **FDN DETAIL**

SCALE: 3/4" = 1'-0" REFERENCED FROM: A1 / S-101



A2 S-501 **FDN DETAIL**

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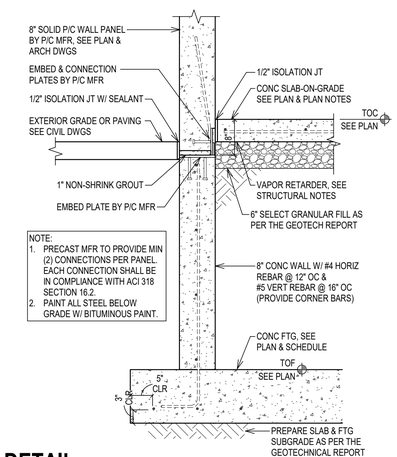

A3 S-501 **FDN DETAIL**

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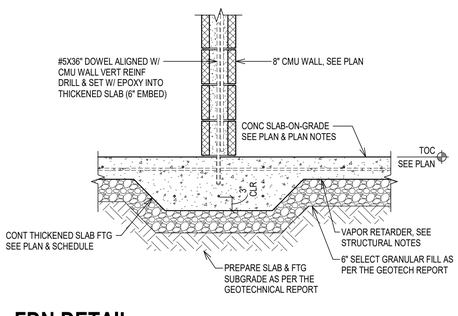

A4 S-501 **FDN DETAIL**

SCALE: 3/4" = 1'-0" REFERENCED FROM: A1 / S-101

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 11135
BLAKE M. TIDEMAN
SOUTH DAKOTA
12-31-25

Albertson Engineering Inc.
605.343.9606
www.albertsonengineering.com
Offices in Rapid City - Sioux Falls - Winner, SD and Cheyenne, WY

CONSULTANT

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ALEXANDRIA SAFE ROOM

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CHECKED BY: BMT

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SHEET IDENTIFICATION:

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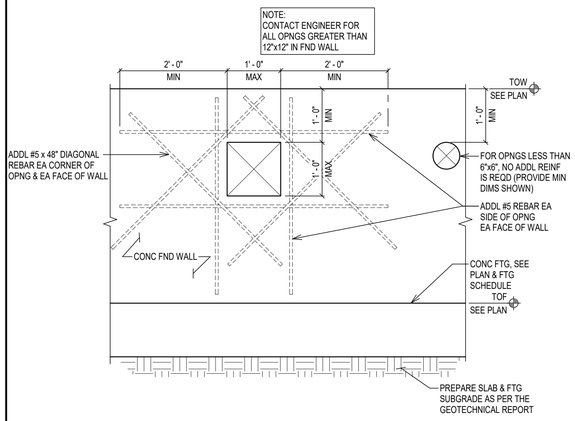
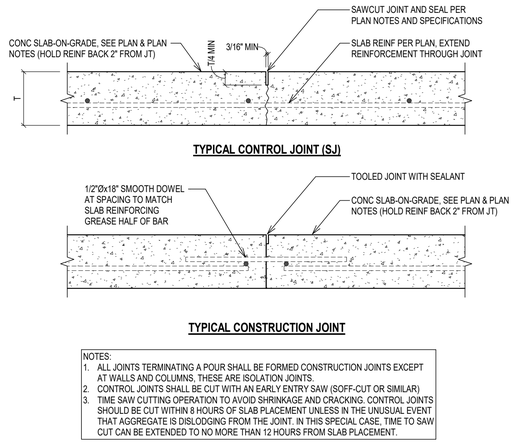
24X36 TITLE BLOCK



T1 S-601

TYP CIPC FND WALL OPENING

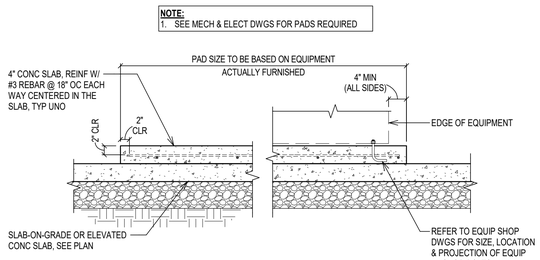
SCALE: NTS



T2 S-601

TYP CIPC SOG JOINTS

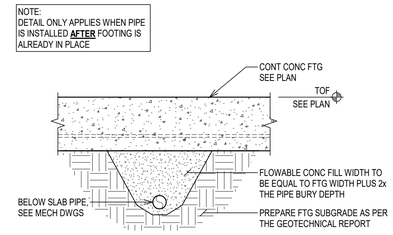
SCALE: NTS



T3 S-601

TYP CIPC SOG EQUIP PAD - INTERIOR

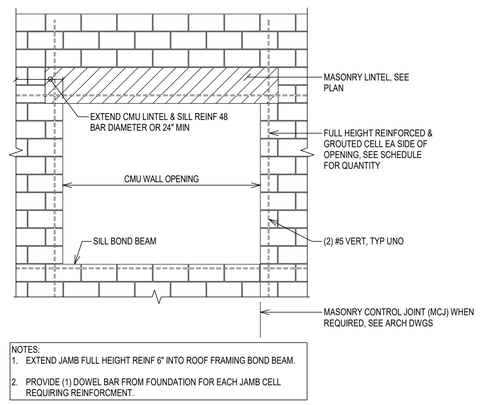
SCALE: NTS



T4 S-601

TYP FTG - UTILITY PIPE BLW

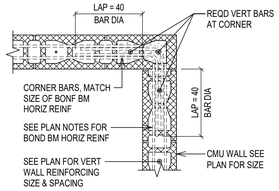
SCALE: NTS



T5 S-601

TYP CMU JAMB

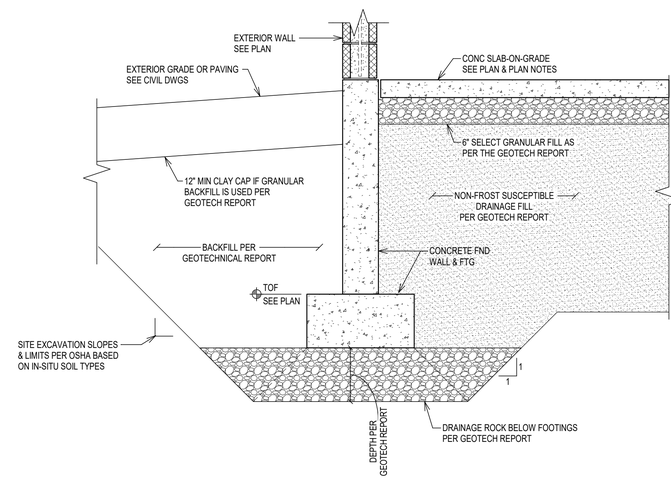
SCALE: NTS



T6 S-601

TYP CMU BOND BM CORNER

SCALE: NTS



T7 S-601

TYP FTG EXCAVATION & BACKFILL EXTERIOR WALL

SCALE: NTS

REBAR LAP SPLICE SCHEDULE

BAR SIZE	SPLICE IN CONCRETE	
	HORIZ BAR	VERT BAR
#3	18"	14"
#4	24"	18"
#5	30"	24"
#6	36"	28"
#7	56"	44"
#8	70"	54"
#9	88"	68"

ADDITIONAL REMARKS:

T8 S-601

SCHEDULE - REBAR LAP SPLICE

SCALE: NTS

MASONRY LINTEL SCHEDULE

MARK	WALL TYPE	LINTEL SIZE & REINF	FULL HT REINFORCED & GROUTED CELLS EA SIDE OF OPENING	REMARKS
ML1	8" CMU	16" BOND BEAM W/ (2) #5 HORIZ REBAR	(1)	SEE LINTEL DIAGRAM L1 & TYP CMU JAMB DETAIL THIS SHEET
ML2	8" CMU	8" BOND BEAM W/ (2) #5 HORIZ REBAR	(1)	SEE LINTEL DIAGRAM L1 & TYP CMU JAMB DETAIL THIS SHEET

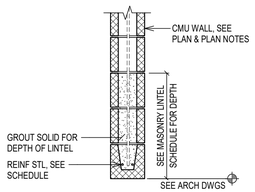
ADDITIONAL REMARKS:

1. PROVIDE 8" BOND BEAM W/ (2) #5 HORIZONTAL REBAR BELOW ALL CMU OPENINGS.
2. PROVIDE (1) #5 FULL HEIGHT REINFORCING STEEL IN EACH FULL HEIGHT REINFORCED & GROUTED CELLS NOTED IN THIS SCHEDULE.

T9 S-601

SCHEDULE - MASONRY LINTEL

SCALE: NTS



CMU LINTEL SECTION L1

CONCRETE SLAB SCHEDULE OF CURING METHODS AND TREATMENTS

FLOOR TYPE (a)	CURING OPTIONS (b)	DENSIFIER/HARDENERS (b)	OTHER TREATMENTS (b)
SEALED CONCRETE (AREAS WITH EXPOSED CONCRETE SLAB)	1. LIQUID NON-MEMBRANE FORMING CURING COMPOUND(c) A. MED CURE BY WR MEADOWS B. OR APPROVED EQUAL (e) 2. DISSIPATING LIQUID MEMBRANE FORMING COMPOUND (c) (e) A. 1100 - WR MEADOWS B. CLEAR CURVE VOC J7WB - DAYTON SUPERIOR C. OR APPROVED EQUAL(e) 3. SATURATED BURLAP (7 DAYS MIN) 4. PLASTIC FILM (7 DAYS MIN)	NONE REQUIRED	1. WATER BASED CONCRETE SEALER A. ULTRA SEAL EF - DAYTON SUPERIOR B. VOCOMP - 25 - WR MEADOWS C. OR APPROVED EQUAL (e)

ADDITIONAL REMARKS:

a. REFER TO ARCHITECTURAL FINISH PLANS FOR SPECIFIC LOCATIONS OF FLOOR TYPE.
b. SEE SPECIFICATION FOR SPECIFIC INFORMATION RELATED TO CURING METHODS, DENSIFIER/HARDENER, OR OTHER PRODUCTS LISTED.
c. CONTRACTOR MUST VERIFY COMPATIBILITY OF CURING COMPOUND WITH FLOORING MANUFACTURER IN WRITING.
d. WHERE THE USE OF MULTIPLE MANUFACTURERS FOR CURING COMPOUNDS, DENSIFIERS/HARDENERS, AND OTHER TREATMENTS ARE USED, A WRITTEN STATEMENT OF COMPATIBILITY FROM EACH MANUFACTURER IS REQUIRED.
e. SUBMIT PRODUCT DATA FOR REVIEW.
f. CURING COMPOUND MUST BE REMOVED PRIOR TO THE APPLICATION OF ANY OTHER TREATMENTS TO THE SLAB PER THE REQUIREMENTS OF THE LATTER APPLIED TREATMENTS.

T10 S-601

SCHEDULE - CONCRETE SLAB CURING METHODS AND TREATMENT

SCALE: NTS

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
11135
BLAKE M. TIDEMAN
STATE OF IOWA
12-31-25

Albertson Engineering Inc.
605.343.9606
www.albertsonengineering.com
Offices in Rapid City - Sioux Falls - Winner, SD and Cheyenne, WY

CONSULTANT

PROJECT IDEN:

ALEXANDRIA SAFE ROOM

ISSUE BLOCK:

NO	ISSUE TYPE	ISSUE DATE

MANAGEMENT:

PROJECT NO: 25-119

DRAWN BY: JAB

CHECKED BY: BMT

SHEET TITLE:

STANDARD DETAILS / SCHEDULES

SHEET IDENTIFICATION:

S-601

24X36 TITLE BLOCK

MECHANICAL LEGEND

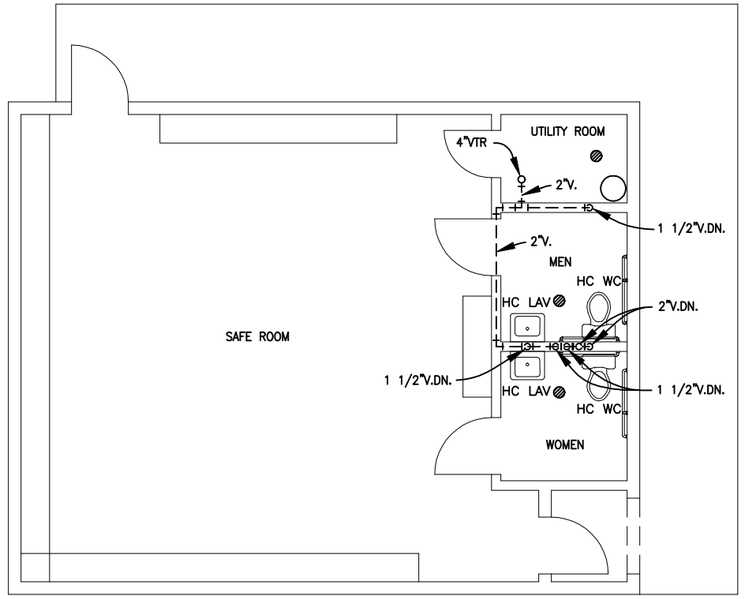
	WASTE & VENT BELOW GRADE	VTR	VENT THROUGH ROOF
	VENT ABOVE GRADE	V	VENT
	COLD WATER	W	WASTE
	HOT WATER	CW	COLD WATER
	UNION	HW	HOT WATER
	GATE VALVE	CO	CLEAN OUT
	BALL VALVE	FD	FLOOR DRAIN
	BUTTERFLY VALVE	HB	HOSE BIB
	CHECK VALVE	WC	WATER CLOSET
	GLOBE VALVE	LAV	LAVATORY
	RELIEF VALVE	GPM	GALLONS PER MINUTE
	BALANCE COCK	MBH	1000 Btu PER HOUR
	CAP	CF	CEILING FAN
	TEE UP	CFM	CUBIC FEET PER MINUTE
	TEE DOWN	REG	REGISTER
	ELBOW UP	EXH	EXHAUST
	ELBOW DOWN	(M)	MOTORIZED DAMPER

NOTE:

1/2" HOT & COLD WATER TO HC LAV
1/2" COLD WATER TO HC WATER CLOSET
3/4" HOT & COLD WATER TO HOSE BIBS
3/4" HOT & COLD WATER TO WATER HEATER

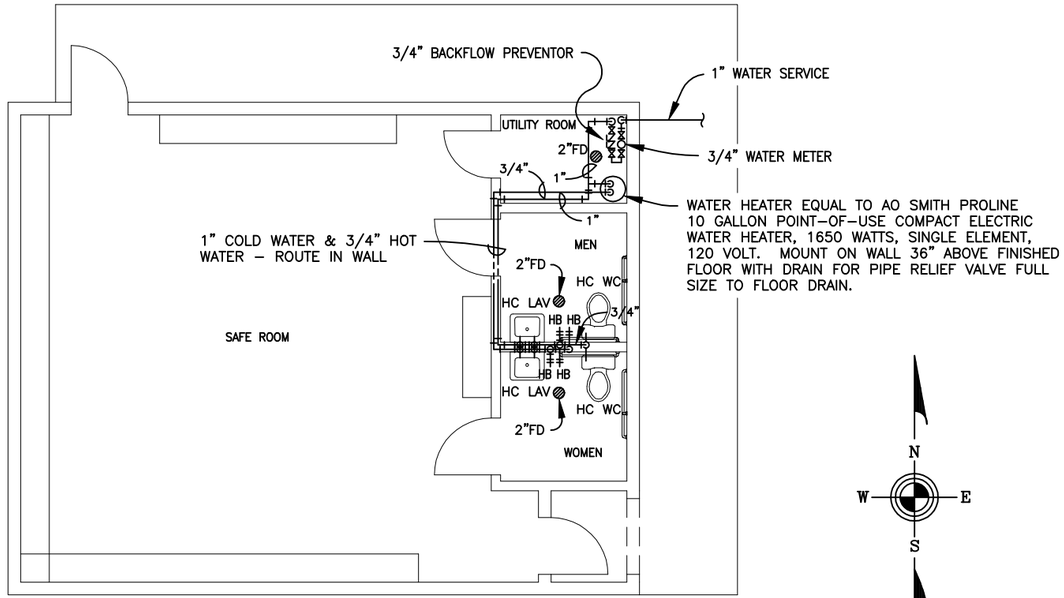
NOTE:

FOR EACH LAVATORY – FURNISH AND INSTALL A THERMOSTATIC MIXING VALVE EQUAL TO LAWLER MODEL 570. INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURES RECOMMENDATIONS



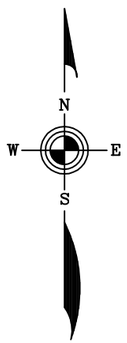
FLOOR PLAN - VENT PIPING

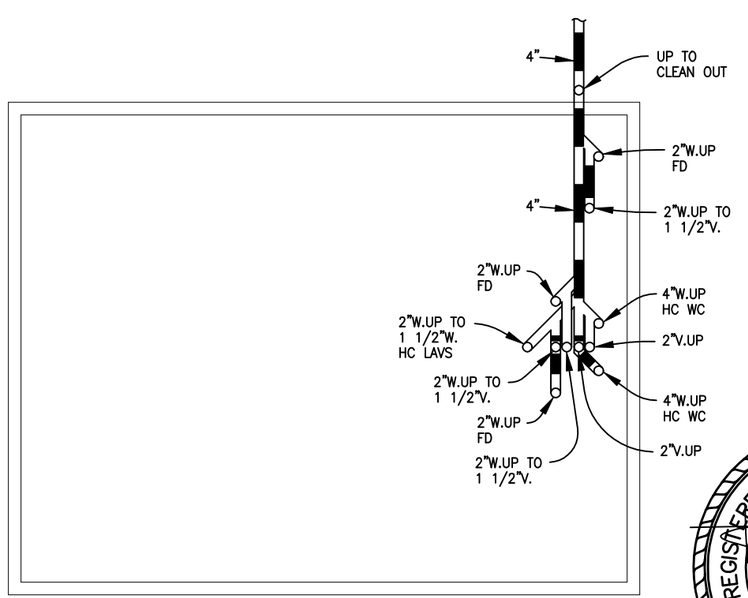
SCALE: 1/8"=1'-0"



FLOOR PLAN - PLUMBING

SCALE: 1/8"=1'-0"





FOUNDATION PLAN - WASTE PIPING

SCALE: 1/8"=1'-0"

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 5287
ROBERT B. EVERSON, JR.
12-31-25
SOUTH DAKOTA

ROBY, QUINTAL & EVERSON
CONSULTING ENGINEERS
MITCHELL, SOUTH DAKOTA

L.L. JIRSA ARCHITECT
P.O. BOX 925
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605-770-6424

PROJECT NAME
CITY OF ALEXANDRIA
TORNADO SAFE ROOM
SPORTS FIELD COMPLEX
ALEXANDRIA, SOUTH DAKOTA

REVISIONS:

NO.	DATE:	DESCRIPTION:

PROJECT NO. 51-2025
DATE DEC. 31, 2025
SHEET TITLE MECHANICAL FLOOR PLAN PLUMBING
SHEET NO. M-1 OF 9

CEILING FAN SCHEDULE

UNIT NO.	MANUFACTURER AND MODEL NO.	SERVES	CFM	EXT. SP	RPM	WTS	POWER (V/Ø)	REMARKS
CF#1	COOK GC-146	TOILET	82	0.31	900	33.3	120/1	TERMINATE WITH MANUFACTURERS WALL CAP
CF#2	COOK GC-146	TOILET	82	0.31	900	33.3	120/1	TERMINATE WITH MANUFACTURERS WALL CAP

NATURAL VENTILATION CALCULATIONS.

125 PEOPLE @ 6 SQUARE INCHES PER PERSON

$125 \times 6 = \frac{750 \text{ IN. SQ.}}{144 \text{ IN. } \frac{\text{SQ.}}{\text{SF.}}}$

5.21 SF. REQUIRED

18"x18" = 324 IN. SQ. PER LOUVER = 2.25 SQ. FT. PER LOUVER

4 LOW x 2.25 SQ. FT. = 9.0 SF. TOTAL INTAKE (LOW) AND TOTAL OUT (HIGH)

9.0 SF. > 5.21 SF.

NATURAL VENTILATION CALCULATIONS.

125 PEOPLE @ 6 SQUARE INCHES PER PERSON

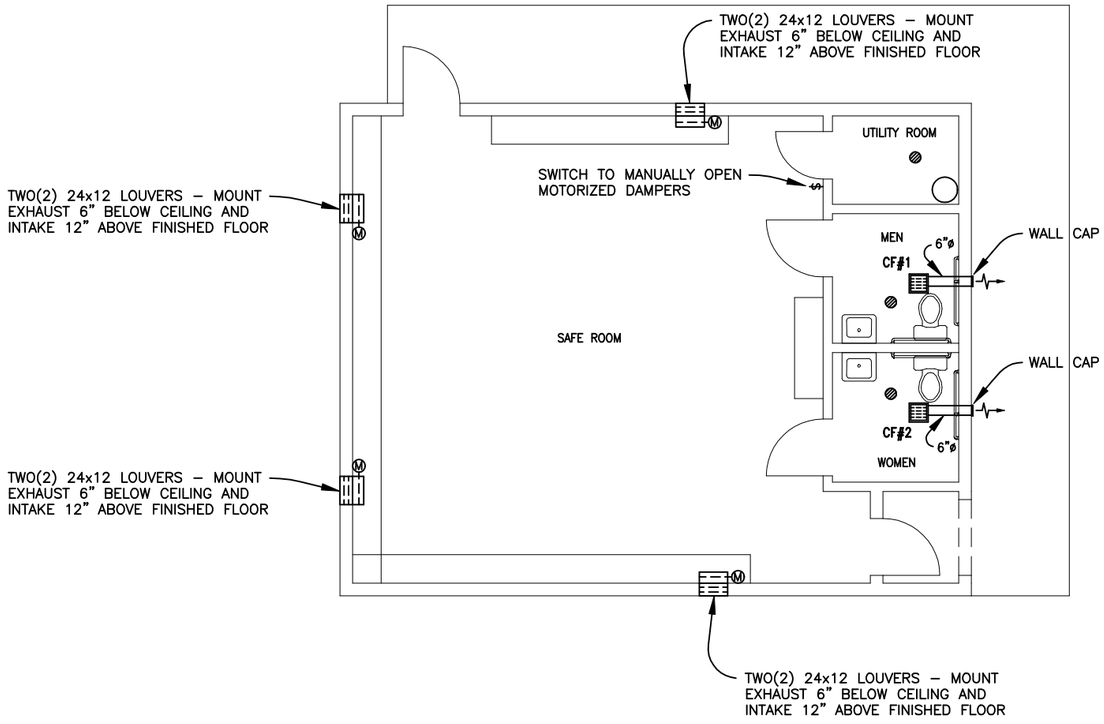
$125 \times 6 = \frac{750 \text{ IN. SQ.}}{144 \text{ IN. } \frac{\text{SQ.}}{\text{SF.}}}$

5.21 SF. REQUIRED

24"x12" = 288 IN. SQ. PER LOUVER = 2 SQ. FT. PER LOUVER

4 LOW x 2 SQ. FT. = 8.0 SF. TOTAL INTAKE (LOW)
4 HIGH x 2 SQ. FT. = 8.0 SF. TOTAL OUT (HIGH)

8.0 SF. > 5.21 SF.



FLOOR PLAN - VENTILATION

SCALE: 1/8"=1'-0"

L.L. JIRSA ARCHITECT
P.O. BOX 925
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605-770-6424

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 5287
ROBERT B. EVERSON, JR.
12-31-25
SOUTH DAKOTA

ROBY, QUINTAL & EVERSON
CONSULTING ENGINEERS
MITCHELL, SOUTH DAKOTA

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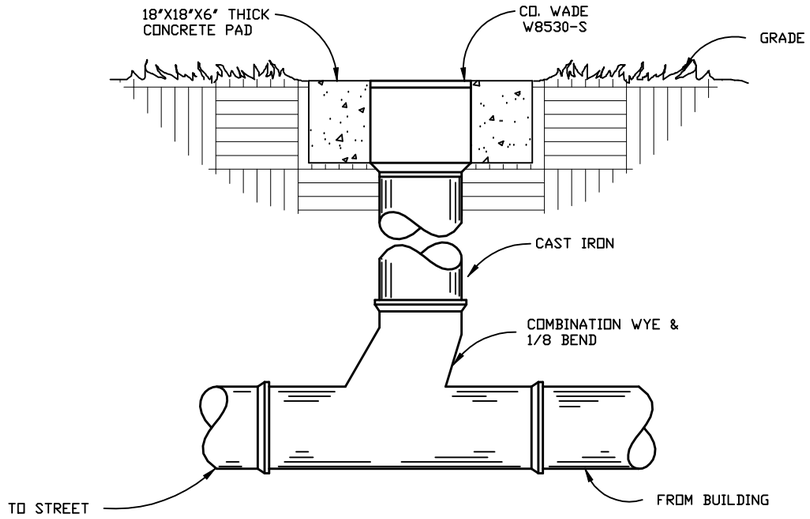
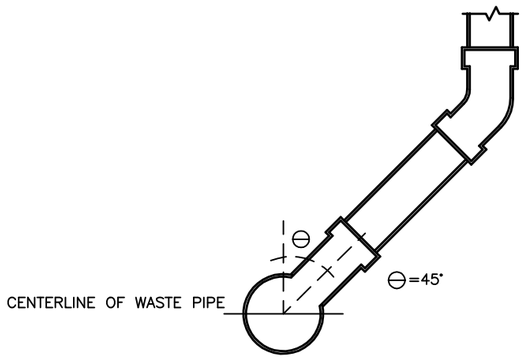
REVISIONS:

NO.	DATE:	DESCRIPTION:

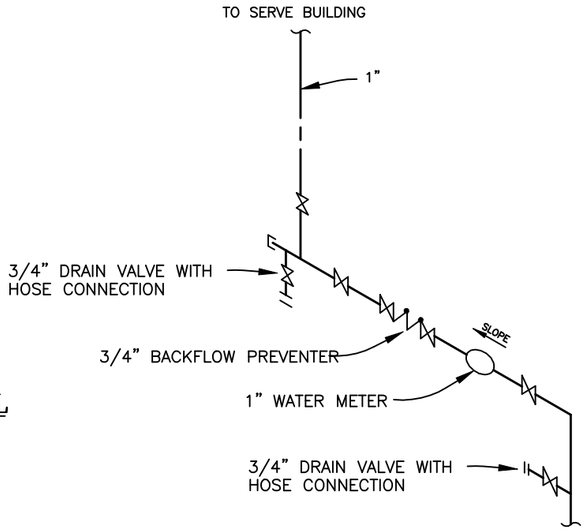
PROJECT NO. 51-2025
DATE DEC. 31, 2025
SHEET TITLE MECHANICAL FLOOR PLAN VENTILATION
SHEET NO. M-2 OF 9



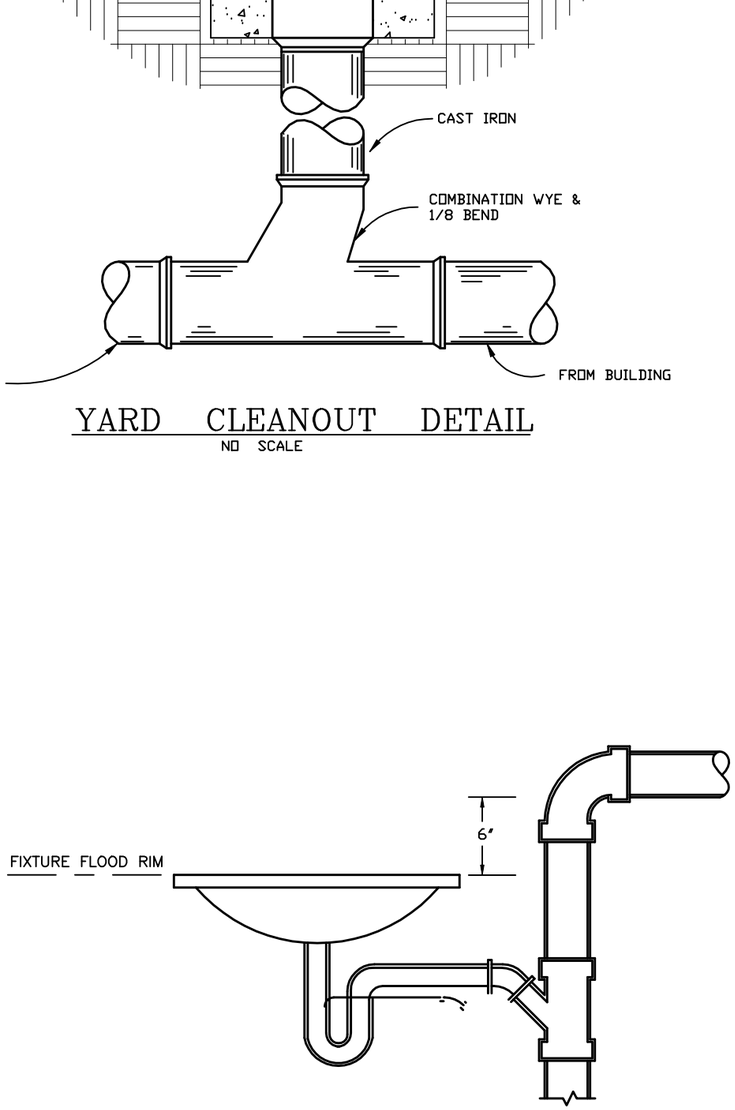
YARD CLEANOUT DETAIL
NO SCALE



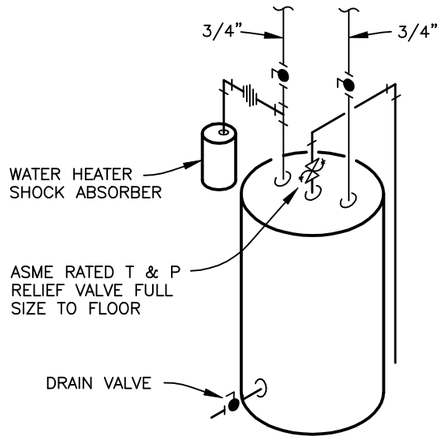
TYPICAL VENT FROM WASTE PIPING DETAIL
NO SCALE



COLD WATER HEADER DETAIL
NO SCALE



TYPICAL FIXTURE VENTING DETAIL
NO SCALE



WATER HEATER PIPING SCHEMATIC
NO SCALE

L.L. JIRSA ARCHITECT
P.O. BOX 925
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605-770-6424

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REVISIONS:

NO.	DATE:	DESCRIPTION:

PROJECT NO. 51-2025
DATE DEC. 31, 2025
SHEET TITLE MECHANICAL DETAILS
SHEET NO. M-3 OF 9

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 5287
ROBERT B. EVERSON, JR.
12-31-25
SOUTH DAKOTA

ROBY, QUINTAL & EVERSON
CONSULTING ENGINEERS
MITCHELL, SOUTH DAKOTA

SECTION 15000 – MECHANICAL

1. REFERENCE

a. The General and Special Conditions attached are a part of this Mechanical Specification.

b. Where this specification and/or the General and Special Conditions mention "contractor" or "this contractor", the reference applies to the mechanical contractor, whose responsibility it is to provide a complete plumbing installation, including fixtures, air conditioning, and ventilation system consisting of variable refrigerant system, exhaust fan, ductwork and registers.

2. ORDINANCES AND CODES

a. All work shall be installed in accordance with all applicable state codes and statutes, local codes and ordinances, Fire Marshal Regulations, the Uniform Plumbing Code, Uniform Mechanical Code, Uniform Building Code, and Life Safety Code (NFPA–101) 2024 Edition, where applicable.

b. All plumbing work shall be inspected by the State Plumbing Board or the State approved Municipal Inspector. Copies of the final accepted inspection certificates shall be provided to the Engineer prior to the release of final payment for the project.

c. When specifications call for materials or construction of better quality or larger size than required by the codes, the provisions of the specifications shall govern. Any conflict between the specifications or plans and the codes, or suspected error in the specifications or plans, shall be brought to the attention of the Engineer immediately.

d. All fees, permits, licenses, etc., necessary to complete the work in this section shall be paid for by this contractor.

3. PROHIBITED LOCATION OF PIPING AND DUCTWORK

a. The mechanical drawings show the general arrangement and routing of the piping and ductwork, but this contractor shall vary the exact location to avoid interference with electrical equipment.

b. No piping, ductwork, or appurtenances shall be installed above electrical panels, switchboards, or motor control centers; or through or above the clearance space in front of this electrical equipment, in compliance with Article 384 of the National Electric Code. The mechanical contractor shall verify this space requirement with the electrical contractor on this project, prior to routing any piping in the vicinity of electrical equipment.

4. SCOPE OF THE WORK

a. Work included in these specifications and the accompanying drawings is the furnishing and installing of all piping, fixtures, ductwork, and equipment herein specified or shown on the drawings, ready for normal operation. Everything obviously necessary for a complete installation as herein specified and as shown on the drawings must be furnished and installed whether specifically mentioned or shown.

b. Piping, ductwork, and equipment are shown on the drawings, and anything not clear to the contractor shall be taken up with the engineer before the bids are submitted. In all cases, pipe nipples must be of the same material as the pipe line in which they occur. All piping in finished rooms must be concealed, except where otherwise noted.

c. Installation shall be made in accordance with all state, federal, and local laws. In any instance, if the plans and specifications conflict with the laws, the law shall take preference. This, however, shall not be construed as relieving this contractor from complying with any requirements of the drawings and specifications that may be in excess of the rules and not contrary to same.

d. The contractor must operate all equipment to determine whether same is ready for normal operation, and shall oil or grease such equipment requiring same before operating it.

e. Also included is all air conditioning and ventilation work, including ductwork, registers, exhaust systems, and refrigerant piping.

5. SYSTEMS OF VENTILATION AND AIR CONDITIONING

a. The building is designed for use in late spring, summer, and early fall. The building is to be drained down in winter. No heating is provided for winter use. There are two (2) ceiling exhaust fans to exhaust the toilet areas, one fan serves each toilet space.

6. EXCAVATING AND BACKFILLING

a. This contractor shall do all excavating and trench work necessary for the installation of pipe to be installed underground or under the floors. Bell holes shall be excavated to insure sewer pipe resting for its entire length upon the bottom of the trench. Banks of trenches shall be kept as nearly vertical as possible and, if required, shall be properly sheeted and braced.

b. After piping has been tested and approved, trenches outside the building shall be backfilled with the excavated materials free from clods or stones larger than 3" in any direction, carefully deposited in layers not to exceed 6" in thickness on both sides of the pipe, thoroughly and carefully tamped until enough fill has been placed to provide a cover of not less than 1' above the pipe. The balance of the fill in exterior trenches shall be deposited in layers not to exceed 9" thickness, moistened and compacted to 95% Proctor density in accordance with ASTM D698.

c. Trenches within the building shall be backfilled with pit run gravel, maximum size 1–1/4".

d. The trenches within the building may be backfilled with "engineered fill" and compacted to 95% of Standard Proctor, density as per ASTM D698. The contractor shall be responsible for hiring an independent testing laboratory. Tests shall be taken every 18" of lift, and one test per 50' of trench.

7. EXISTING SERVICES

a. Active Services: When encountered in work, protect, brace or support existing active sewers, gas, electric and other services as required for proper execution of work. If existing active services require relocation, make request in writing to the engineer for determination. Do not proceed with work until written directions are received. Do not prevent or disturb operation of active services that are to remain.

b. Inactive Services: When encountered in work, remove, cap or plug inactive services. Notify utility company or municipal agency having jurisdiction. Protect or remove these services as directed. All removal or abandoning of inactive services shall be in strict accordance with the Utility, Municipality having jurisdiction, or applicable codes.

c. Interruption of Services: Where work requires temporary shutdown of services, shut down at night or such time as approved by the owner to cause least interference with established operating routine. Contractor shall work continuously, including overtime if required, to assure that services will be shut down only during time actually required to make necessary connection to existing work.

8. DRAWINGS & AS–BUILT DRAWINGS

a. Contract drawings for the mechanical work are, in part, diagrammatic, intended to convey the scope of the work and indicate general arrangement of equipment, ducts, pipe, and approximate sizes and locations of equipment. Mechanical trades shall follow these drawings in laying out their work, consult the general construction drawings, shop drawings, and electrical drawings to familiarize themselves with all conditions affecting their work. Verify spaces in which work will be installed; if job conditions require reasonable changes in locations or arrangement, make such changes without extra cost to the owner.

b. Where piping or ductwork locations are changed, with permission of the Engineer, the contractor shall provide the Engineer a marked up set of drawings showing final locations.

c. On exterior underground service lines, the contractor shall mark up a copy of the plot plan showing exact locations of all underground services with accurate dimensions from the building or permanent reference points so that such underground service can be located all along its route. Provide one copy of such marked up plot plan direct to the Engineer.

9. SEWER SERVICE

a. Furnish and install sanitary sewer service from a point 5'0" outside the building, into the building with PVC pipe; all in accordance with State Plumbing Code, and City specifications. Contractor may use code approved ABS pipe and fittings for exterior lines up to 5' from building. Joints in PVC or ABS shall be made as per manufacturer's recommendation using correct cleaner and adhesive. Test prior to backfill. Connect new building sewer to existing sewer main outside building, approximately 5' from building wall.

b. Sewer shall be installed to the grades shown; however, in no case shall grades exceed 2%.

c. Provide yard cleanouts where shown, or where required by Code. See "Cleanouts" specification hereinafter.

10. WATER SERVICE

a. Install water pipe from 5'0" outside the building, into the building as shown. Underground pipe to the building shall be 1" Type K copper, with no joints below grade. Cap and mark location of end of pipe. Contractor may use 3" C900 Blue Brute pipe in lieu of copper.

ROBY, QUINTAL & EVERSON
CONSULTING ENGINEERS
MITCHELL, SOUTH DAKOTA

L.L. JIRSA ARCHITECT
P.O. BOX 925
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605–770–6424

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 5287
ROBERT B. EVERSON, JR.
12–31–25
SOUTH DAKOTA

PROJECT NAME
CITY OF ALEXANDRIA
TORNADO SAFE ROOM
SPORTS FIELD COMPLEX
ALEXANDRIA, SOUTH DAKOTA

REVISIONS:

NO.	DATE:	DESCRIPTION:

PROJECT NO. 51–2025

DATE DEC. 31, 2025

SHEET TITLE MECHANICAL SPECIFICATIONS

SHEET NO. M–4 OF 9

b. Furnish and install stop and waste valve to drain the building side of water service outside the building. Extend valve box up to grade, and furnish a cover with WATER cast in it. Make connection to existing water main onsite. Contactor to verify exact size and location of existing water main.

c. Sterilization of Water Main: Calcium hypochloride in the amount of not less than one eighth (1/8) ounce per twenty feet of eight inch (8") water main shall be placed at the joints; all in accordance with city requirements and instructions of the State Board of Health. Such instructions are essentially as follows:

"Inasmuch as all chlorine disinfectants will lose strength on exposure to the atmosphere, it is essential that only fresh disinfectant be used, that preferably one of the more stable forms be employed and that the main be filled, allowed to stand and then flushed not later than one week after placing of the disinfectant. After the chlorine containing water has stood in the main in contact with the pipe surfaces for the required ten hours, a chlorine residual at representative points should show at least .5 p.p.m.".

"Disinfecting solution formed on filing the line shall be held in the main for at least ten hours and then flushed out so as to remove all chlorinous tastes which might prove objectionable. Mains shall be flushed till such time as the water flowing shows by the ortho-tolidine test a residual chlorine content not exceeding 0.3 p.p.m. Where chlorine is added after completion of the main, it shall be introduced into the lines in such a manner and in such quantity that all new mains will receive a chlorinated water containing at least 50 p.p.m. available chlorine. All mains as discussed previously shall be allowed to stand full with this disinfecting solution at least ten hours and then flushed till a chlorine residual content not exceeding 0.3 p.p.m. is indicated."

11. WATER METER

a. Furnish and install a new 3/4" water meter, where shown, of type acceptable to City Water Department; Niagara Frost Bottom type, or equal by Hersey, if the City does not have any minimum requirements. Meter shall be all bronze case.

b. furnish and install a stop valve on each side of meter and a drain on house side of meter. Ball valves shall be full port type.

c. Obtain City Engineer's signed approval before submitting shop drawings.

d. Meter shall be of remote reading type.

e. Meter shall handle 10 GPM with a pressure drop not to exceed 2 psi.

12. BACKFLOW PREVENTER

a. A double check valve assembly backflow preventer shall be installed on the water service, to prevent the backflow of contaminated water into the potable water supply. Modify existing piping as required to accommodate new backflow preventer. It shall be a complete assembly. The device, specified or indicated on plans, shall meet the requirements of ASSE Standard 1015, and the State Plumbing Code, and the City Utility Dept.. All gate valves shall be 125 psi rising stem.

b. Modify existing water service and meter installation to allow installation of backflow preventer.

c. Backflow preventer shall be 3/4" with pressure drop not to exceed 5 psi at 10 GPM.

d. Backflow preventer shall be Watts No. 709, or equal by Lawler, Mueller, ITT, or Hersey. Isolating valves shall be full port ball valves, Watts QT, or equal by Apollo, Crane, Wilkins, or Nibco.

13. PIPE AND FITTINGS

a. For soil, waste and vent piping above and below the floor, the contractor shall use PVC Schedule 40 pipe with drainage fittings. All connections made to threaded pipe shall be made with plastic adaptors. Schedule 40 PVC shall not be threaded. Use C-60 primer on pipe and fittings prior to the application of #715 solvent cement. Horizontal lines shall be offset to allow for expansion and contraction. Support pipe on 4' centers. See "Hanger" specifications hereinafter.

PVC plastic pipe shall be cut and joined as follows:

1) Cut pipe square. Use saw and mitre box or plastic tube cutter. Remove all burrs from both the inside and outside of the pipe with a knife, file or reamer. Remove dirt, grease and moisture. A thorough wipe with a clean dry rag is usually sufficient. Check dry fit. For proper interference fit, pipe should go easily into fitting 1/2 to 3/4 of the way.

2) Using a suitable applicator, apply primer to the socket of the fittings. (Care should be taken not to allow primer to puddle in fitting socket) Next, apply primer to pipe surface equal to the depth of the fitting socket. Apply primer again to fitting socket. (Primer is used to soften the surfaces of PVC pipe and fittings making them suitable for solvent cementing) With the same type of applicator, apply a full even coat of solvent cement to the pipe equal to the depth of the fitting socket. Coat the fitting socket with a medium layer. (Care should be taken not to allow cement to puddle in fitting socket) Apply a second full even layer to the pipe. Cement must be applied in sufficient quantities to fill the joint.

3) Without delay, assemble while cement is still wet. Use sufficient force to insure that pipe bottoms in socket. If possible, twist the pipe or fitting 1/8 to 1/4 turn as assembled. Hold together about 30 seconds to make sure joint does not separate. With a rag, wipe off excess cement. Avoid disturbing the joint. Allow about 15 minutes for good handling strength.

b. All water piping above ground shall be hard drawn copper tubing, Type L. Fittings shall be streamline, using 95/5 solder such as Engelhard Silverbrite 100, JW Harris, Bridgit, and approved "no lead" flux. Lead solders shall not be used. Use dielectric connectors when connecting to other metals. Copper tube and fittings shall be cleaned with fine steel wool before applying flux. Liquid cleaners shall not be used in lieu of steel wool. Copper fittings shall be wrought copper, Nibco, Mueller or approved equal. Copper tubing and fittings shall be of American manufacture.

c. Piping shall be run as shown on drawings, but the engineer reserves the right to make slight changes without extra cost to avoid interference with other work. Contractor shall consult with other contractors so as to obtain proper grouping of pipes and avoid interference. Where piping is shown exposed, it shall run plumb, straight, and parallel to building lines, securely anchored to walls and ceilings. Maintain maximum headroom. All pipes must be run with proper grade for easy drainage; provide necessary drain valves so entire system can be drained. Thoroughly ream piping before installation. Piping in areas such as pipe chases shall be skillfully routed so as to maintain maximum clearance for access and servicing of valves and equipment.

d. All horizontal piping shall be offset from the walls to allow for maintenance. Vertical pipes shall be supported using the Unistrut to keep pipe out away from the wall.

e. Water piping shall be piped to provide complete drainage of the pipe system. At all low points, furnish and install ball valve and hose thread to facilitate gravity drainage of system. Slope all piping to drain completely.

f. Natural gas piping shall be standard black steel pipe, with malleable iron fittings in exposed locations, welding fittings in concealed locations and all sizes larger than 1-1/4" and underground. Provide approved shut off gas cocks adjacent to each piece of equipment utilizing gas. Underground gas piping shall be mill-wrapped with fittings treated to match. No copper piping will be permitted. All reductions in pipe sizes shall be by means of reducing fittings. Bushings are prohibited and shall not be used. For purposes of this specification, concealed shall include any pipe above a ceiling whether ceiling is lay-in tile or not.

14. CLEANOUTS

a. Cleanouts shall be provided at all points where shown on the plans and called for in the State and Local plumbing codes. Cleanouts inside the wall between the building drain and building sewer shall be full size. Cleanouts shall be same size as pipe they are serving up to 4", and may be 4" for all larger sizes of pipe. Floor cleanouts shall finish flush with finish floor.

b. Cleanouts shall be Wade, or equal by Zurn, Blake, Josam, or Jay R. Smith, as follows:
Concrete or Ceramic Tile Floors: Wade 6000, nickel brass top, (where waterproof membrane is pierced, provide flange & clamping device) adjustable frame and cover with seal.

c. This contractor shall be responsible for setting cleanouts flush with finished floor and shall have a man present when slabs are poured to assure cleanouts are at the exact correct elevation.

d. Fittings in which cleanouts are installed shall be securely anchored.

15. SEWER VENTS

a. Vent stacks from sanitary sewer shall be extended at least 12" above the roof. This contractor shall provide a frostproof flashing.

b. Vent pipes through the roof shall be 4", and shall be cast iron. If plastic vent piping is used, the pipe vent through the roof shall be cast iron, and shall extend 12" into the building.

c. All vent pipes shall be securely anchored to roof structure.

d. Location of opening through roof shall be provided to the GC, who will furnish the opening for the vent pipe, and repair roof around vent pipe.

ROBY, QUINTAL & EVERSON
CONSULTING ENGINEERS
MITCHELL, SOUTH DAKOTA

L.L. JIRSA ARCHITECT
P.O. BOX 925
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605-770-6424

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 5287
ROBERT B. EVERSON, JR.
12-31-25
SOUTH DAKOTA

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TORNADO SAFE ROOM
SPORTS FIELD COMPLEX
ALEXANDRIA, SOUTH DAKOTA

REVISIONS:

NO.	DATE:	DESCRIPTION:

PROJECT NO. 51-2025
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SHEET TITLE MECHANICAL SPECIFICATIONS
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16. FLOOR DRAINS

a. Floor drains shall be cast iron body with double drainage flange and weep holes, adjustable round polished Nikaloy 5" diameter strainer in finished rooms and polished brass in unfinished rooms, similar to Josam Series 30000A, or as specified otherwise herein. Equal drains by Wade, Zurn, Blake, or Jay R. Smith may be used.

b. This contractor shall be responsible for setting floor drains at the proper elevation and shall be present when slabs are placed to assure that drains are properly placed and kept in place. Cut and patch existing floor as required for new floor drain piping.

c. Floor drains in floors on grade shall have deep seal cast iron P–trap; drains on floors above grade shall have deep seal drainage P–trap and flashing clamping device.

17. HOSE BIBS

a. Hose bibs shall be non–freeze wall hydrants, 3/4" Woodford Model B65 concealed box type, or equal by Josam, Smith, Zurn or Wade. Unit shall have brass castings with polished face, brass pipe casing, brass valve rod, renewable nylon seat and sweat connection. Provide handle for each valve. Mount exterior hose bibs 30" above finished grade, unless otherwise noted. Interior hose bibs shall be 24" above finished floor. Hose bibs shall be of sufficient length so valve portion is entirely in an interior partition. Hose bibs shall have integral hose end vacuum breakers. Vacuum breaker shall be automatic self draining. Provide 3/4" shut–off accessible gate or full port ball valve.

b. Interior hose bibs shall be Woodford Model 24C, or equal, permanent type brass valve body with hemispherical seating surface, with 3/4" hose threaded outlet and 3/4" threaded inlet. Make sweat connection with brass male to copper adaptor. Anchor securely to wall. Hose bibs shall be complete with hose end vacuum breakers. Finish to be polished brass. Mount at 36" above floor unless noted otherwise on the plans.

18. WATER HEATER SHOCK ABSORBER

a. For the water heater, furnish and install an Amtrol AST–5 Extol expansion absorber on the cold water inlet, as close to heater as possible.

19. VALVES

a. Furnish and install shut off, isolation or check valves where indicated on plans and as specified. Valves shall be one brand throughout the job. Specialty valves shall be one of the brands listed hereinafter. All valves shall be designed for 125 lbs. steam working pressure and be so stamped. A permanent metal tag or disc shall be attached to the valve handle wheel indicating the manufacturer's figure number. All valves shall be mounted in an accessible location so that they can be operated and serviced, and with their stems above the horizontal. Valves shall be of the type shown on the drawings, i.e. ball, gate, globe, etc.

b. Valves 2" and smaller shall be all bronze with threaded ends and rising stems, except valves in copper lines shall have solder ends for use with copper tubing.

c. Gate valves 2" and smaller shall be:

Powell fig.	500 (C to C 1821)
Nibco/Scott No.	T–111 (C to C S–111)
Milwaukee	1148

d. Check valves 2" and smaller shall be:

Powell fig.	578
Nibco/Scott	T413
Milwaukee	509

e. Ball valves shall be bronze, 2 or 3–piece construction, full port configuration, with reinforced TFE seats and seals, shall be in–line repairable, shall have blowout–proof stem design, and shall have adjustable packing gland. Valve shall have sweat ends for copper lines, and threaded ends for steel pipe. Ball shall be chrome plated steel. Valve handle shall be zinc plated steel with vinyl grip.
Ball valves used on cold water lines shall have stem extension to compensate for the insulation verify extension length required for the specified insulation thickness.

f. If 3" or 4" C900 water pipe is used, valve inside building may be equal to DeZurik Figure 6321 AR555–1 butterfly valve.

20. PIPE HANGERS AND SUPPORTS

a. All hangers shall be heavy wrought iron or malleable iron ring type of ample capacity to support pipe, with hanger rods to floor or ceiling construction. Hangers shall be spaced approximately 8' apart, or as required to rigidly support pipe. No strap hangers will be permitted. Hangers shall be Auto–grip, F&S, or Michigan. Pipe shall not lay on the joists. At the contractor's option, pipes may be hung using Unistrut type trapeze hangers with pipe clamps.

b. Hangers for copper pipe shall be same as above and shall be copper plated.

c. Pipes shall be neatly grouped to provide maximum clearance. This contractor shall cooperate with the Electrical Contractor in locating pipes to miss electrical conduit and fixtures, and the Ventilation Contractor to miss ductwork and equipment.

d. No piping shall be supported by strapping the pipe to the walls.

21. SLEEVES AND PLATES

a. Furnish and set sleeves where piping passes through concrete or masonry walls, partitions, and new floors. Sleeves through non–load bearing wall shall be of #24 G&S gauge galvanized iron. Sleeves through concrete floors, beams and structural concrete shall be standard weight black steel pipe. All sleeves shall be sufficient in size to include continuous pipe insulation, and finished in such a manner as to be easily covered with chrome plated wall or floor plates. In existing walls, sleeves may be omitted when holes are neatly drilled. Ragged or oversized holes shall have sleeves neatly grouted in place.

b. Uncovered, exposed pipe through walls or floors shall be fitted with at least 1/16" thick wall or floor plates, with set screws for locking around pipe. Plates on chromium plated pipe shall be finished with brass chromium plates.

c. Sleeves through beams and columns will not be permitted without permission from the architect.

d. Pack sleeves through walls and floors with Dow Corning 3 silicon elastomer Fire Stop Sealant or 3M Fire Barrier to prevent sound transmission and fire and smoke migration. Install as per manufacturer's recommendation.

22. SHOCK ABSORBERS

a. Provide shock absorber in water piping serving fixtures, equal to Sioux Chief Hydra–Rester. Installation shall be such that shock absorber is easy accessible maintenance. Installation shall be in accordance with manufacturer's recommendations.

23. UNIONS

a. Furnish and install Walworth #772, Crane, Stockham, General Fittings, or equal, ground joint unions in piping adjacent to each piece of equipment to facilitate making repairs. Unions to be 125 lb. W.P.

b. Unions in copper lines shall be all brass with sweat end, Nibco streamline Style C–108, or equal as made by Walworth, Crane or General Fittings.

c. All connections of copper pipe to dissimilar metal such as tanks and heaters shall be made with Epco or Nibco dielectric pipe unions.

24. WASTE AND VENT PIPING

a. Furnish all labor and material to rough–in for and connect all plumbing fixtures.

b. All piping shall be concealed, unless written permission is obtained from Engineer to run pipe exposed. Horizontal piping along ceilings shall be run in soffits by General Contractor.

ROBY, QUINTAL & EVERSON
CONSULTING ENGINEERS
MITCHELL, SOUTH DAKOTA

L.L. JIRSA ARCHITECT
P.O. BOX 925
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605–770–6424

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 5287
ROBERT B. EVERSON, JR.
12–31–25
SOUTH DAKOTA

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25. INSULATION (PIPE)

a. Piping shall be insulated with fiberglass pipe insulation inside building with Schuller AP–T Plus jacket, or equal. Jacket shall be high density, white, factory applied, foil–backed Kraft fire retardant paper jacket, reinforced with fiberglass yarn. The jacket shall have a pressure sensitive tape lap sealing system. The adhesive shall be protected by easy lift release paper. Insulation shall be furnished with matching pressure sensitive tape butt strips with the same adhesive and release paper. Insulate fittings, valves and flanges to match. Use Zeston 25/50 PVC, CSG, Proto, or CertainTeed insulation fitting covers for all exposed piping. The fitting covers shall have a maximum flame spread rating of 25 and a maximum smoke developed rating of 50. Seal fittings with adhesive and/or tape. All seams to be turned away from line of sight. Staples shall not be used for installing insulation cover or fitting covers; all joints shall be sealed with approved adhesive tapes.

b. Insulation thickness shall be as follows:

Type of Piping	Pipe Size	Insulation Thickness
Domestic Hot Water	All Sizes	1/2"
Domestic Cold Water	All Sizes	1/2"

Insulate domestic cold water service from where it enters the building. Insulate all new domestic cold water piping.

(NOTE: Vapor barrier on cold water shall be continuous; support pipes on galvanized saddles)

c. All insulation shall have a composite fire hazard as tested under NFPA 225, not exceeding flame spread of 25 and smoke developed rating of 50. Accessories such as adhesives, mastics, cements, fitting covers, and fitting insulating material shall have same component ratings as listed above. All mastics shall be fire resistant vapor barrier.

d. All work shall be in compliance with the manufacturer's recommended installation procedures, and a neat workmanlike job will be insisted upon throughout the project. Poorly insulated fittings or butt strips will not be accepted. Use scissors to cut cover––do not tear. No staples will be permitted.

e. Insulation and cover as manufactured by Schuller, Knauf, Owens Corning, or CertainTeed Saint Gobain may be used, subject to meeting all requirements of this specification.

26. PLUMBING FIXTURES

a. Plumbing fixtures are taken from the American Standard catalog and are selected on the basis of quality. Fixtures as made by Crane, Eljer, or Kohler, which are fully equal in the opinion of the engineer, may be used, subject to approval of shop drawings and brochures. Unless specified otherwise, all fixtures shall be of the same brand.
Stainless steel fixtures are Elkay or equal by Just or Crane.
Fixtures and trim for handicapped shall meet ADA requirements.

b. Flush valves shall be Sloan, as herein described, unless otherwise specified.

Exposed diaphragm type, chrome plated flushometer valve. Low consumption valves will have dual filtered type diaphragm kit for flush discharge accuracy. Valve will be non–hold–open and have no external volume adjustment. Valve will have ADA compliant handle with triple seal packing, skirted high back pressure vacuum breaker with bottom hex coupling nut, Bak–Chek control stop will have free spinning vandal resistant stop cap and sweat solder adapter kit with cast set screw wall flange. Valve body, cover, tailpiece, and control stop will be in conformance with ASTM Alloy Classification for Semi–Red Brass. Valve will be in compliance with the applicable sections of ASSE 1037, ANSI/ASME 112.19.6, and Military Specification V–29193 Standards. Furnish and install for urinal, a Sloan Optima RESS–U–1.0–MC battery powered, sensor operated, flushometer kit.

c. Exposed flush, waste and supply pipes at the fixture shall be chrome plated brass pipe, iron pipe size. Fittings for brass pipe shall be cast brass, chromium plated. The supply lines to each fixture in the building shall be equipped with high grade chromium plated stop valves. Use copper or red brass nipples from fixture supplies to water system piping.

d. Install chromium plated wall or floor plates where piping passes through walls or floors. Use chrome plated, tight fitting sleeves where required to conceal brass and copper pipe.

e. Where reference is made to chromium plated brass, same shall mean polished brass, first nickel plated and finished with chromium plating.

f. All fixtures fitted to walls shall have the backs ground square and true. Fill joint between fixtures and floor and wall with General Electric white silicone.

g. NOTE: This contractor shall examine the General Construction drawings for type of wall construction, and furnish and install all necessary backing, brackets, hangers, hanger plates, bolts, etc., to mount fixtures and trim securely to wall. Provide General Contractor cutout templates for all fixtures that are to be installed in cabinet or counter tops. Pay particular attention to mounting heights and clearances required for fixtures for handicapped.

h. Rough–in for fixtures for handicapped shall be carefully roughed–in for so that

- Flush valve is coordinated with grab bars
- Flush valve handle is on the side of the toilet adjacent to the larger space
- Rough–in of waste is offset for lavatories with offset in waste line
- Water supplies are kept back and as high as possible
- Mounting height of all fixtures is verified

i. Plumbing fixture types are as follows:

Item 1: Water Closet (HC) – #2108.408 elongated Cadet, siphon jet action, vitreous china bowl, 1–1/2" top spud, 17–1/2" floor to lip w/481310–100 bolt caps w/tank w/Church 5321.112 white Moltex open front seat for elongated bowl, no cover, stainless steel hinge with check, or equal by Beneke, Olsonite, or Sperzel. Provide any required special fittings. Mount toilet so centerline of fixture is minimum 18" from wall. Flush handle to be on side with largest area. Furnish with locking tank cover.

Item 2: Lavatory (HC) – Lucern 20"x18", #0355.012, 4" spread faucet holes, vitreous china, front overflow, integral back
w/2385.004 Reliant ceramic disc faucet with 0.5 GPM aerator, perforated grid drain with 1 1/4" tailpiece, with lever handle, all polished chrome finish. Equal faucet by Delta Commercial, T&S Brass, Cambridge Brass, Zurn, or Chicago Faucet.
w/1–1/4", 17 gauge cast brass, chrome plated P–trap
Provide special steel backup plates, as required, to support lavatory. Backup plates shall be bolted to walls.
Mount lavatories with clearance of 29" from floor to bottom of apron.
w/7723.018 4–1/2" offset tailpiece, "CAUTION" – Offset waste rough–in to keep trap back next to wall.

27. SHEET METAL WORK

a. All ductwork shall be fabricated of the best grade of aluminum sheets as manufactured by Wheeling Steel Corporation, Inland, or equal. Sheets shall be "Tight–Coat" grade or equal, and shall be guaranteed not to fracture when run through a lock–former.

b. Duct sizes shown on plans are "net" inside dimensions. Where these specifications call for duct to be lined with insulation, the size of the ducts shall be increased to maintain the net inside sizes shown on the plans.

c. All ductwork shall be fabricated and installed in accordance with the recommendations of the American Society of Heating, Refrigeration and Air Conditioning Engineer's (ASHRAE) Guide, 1983 Edition, or SMACNA 1985 Edition. Galvanized sheet metal gauges and type of transverse joints for various size ducts are listed below:

Steel U.S. Std. Gauge	Maximum Side Inches	Transverse Joint Connection	Bracing
26	Up to 12	S drive, pocket or bar slips on 7'–10" centers.	None.
24	13 to 18	Same as above.	None.
24	19 to 30	S drive	1"x1"x1/8" angles @ 60"
22	31 to 42	Same as above.	1–1/2"x1–1/2"x1/8" @ 60"
22	43 to 48	Standing S slip 1–1/2" angle or 1–1/2" pocket, or 1–1/2" bar slips on all 4 sides.	1–1/2"x1–1/2"x1/8" @ 60"

Longitudinal joints shall be made with Pittsburg lock, or may be formed with Rol–Formit machine.

ROBY, QUINTAL & EVERSON
CONSULTING ENGINEERS
MITCHELL, SOUTH DAKOTA

L.L. JIRSA ARCHITECT
P.O. BOX 925
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605–770–6424

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 5287
ROBERT B. EVERSON, JR.
12–31–25
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d. All rectangular ductwork insulated or uninsulated shall be cross broken on all sides.

e. All ducts shall be substantially supported to the ceiling construction or adjacent construction by means of 1" wide galvanized 16 gauge hangers placed not more than 8' on centers horizontally. Hangers shall be riveted or bolted to ducts and fastened to construction by means of expansion bolts or other approved means.

f. Flex duct shall not be used.

28. INSULATION

a. Duct insulation shall be CertainTeed Saint Gobain Monolithic Ultraliner, Owens–Corning Mat–faced, Knauf, or Schuller Microlite duct insulation. All duct insulation shall meet NFPA Bulletin 225 with flame spread under 25 and smoke developed under 50. Minimum density shall be 2 pound. All portions of duct designated to receive duct liner shall be completely covered with duct liner. Transverse joints shall be neatly butted and there shall be no interruptions or gaps.

b. Duct insulation to be installed on the inside of the ducts and shall be attached with Minnesota Mining Adhesive #33, 100% coverage, applied with spray gun. It shall rate "zero" on flame spread when tested against NFPA Standard 90A. Approved equal adhesive shall be Tuff Bond or Swift Company. In addition, all duct insulation on ducts 18" and wider shall be mechanically attached with stick clips, pin welders or sheet metal screws with large washers 12" on center both ways.

c. Insulate exhaust ducts with ½" liner.

29. VOLUME DAMPERS

a. Furnish and install volume dampers in all branches to registers, grilles, or diffusers, and where indicated on the plans and where called for in these specifications. Dampers shall be of the multiple opposed blade, low leakage type, with no blade wider than 6". Blades shall be made of 16 gauge sheet and shall operate together by means of a tie bar. Blades shall be mounted in bearings assembled in a 1"x1/2"x1/8" channel frame, and the entire assembly shall be firmly attached to the duct. Provide accessible locking type quadrant. Mark end of shaft to indicate damper position. Dampers shall be Ruskin or equal by Pottorff, Honeywell or Johnson Controls.

b. Volume dampers may be single blade type for ducts 18"x8" and smaller. Dampers for ducts larger than 18"x8" shall be multiple opposed blade type as specified above.

30. LOUVER

a. Wall louver shall be natural finish, extruded aluminum, factory built, 6" depth without flange, 0.100 frame, 0.081" stormproof blades set at 37–1/2° angle, with framed aluminum bird screen mounted on inside, manufactured by Ruskin, or equal by Air Balance, Penn, Dowco, Industrial Louver, Cesco, Airline, or Airolite. Blades shall have weather lip at edge and moisture eliminator baffle centered full length. Large louvers shall have concealed mullions. Color of louvers shall be as selected by the Architect.

b. Set louver 1/4" back from face of wall. Where louver enters wall, make tight by sealing with GE silicone. Louvers shall be mounted in gable ends of building.

c. Provide special wall sleeve through building, as required, to adapt to fit wall panel.

d. Louvers to have baked enamel finish of color selected by Architect/Engineer.

e. Make weathertight installation using GE silicone caulk.

f. Advise General Contractor of opening requirements and coordinate exact size and location of openings.

31. EXHAUST REGISTERS

a. Registers shall be aluminum. Registers shall be of one brand throughout (unless there are specialty registers called out hereinafter) and shall be the same brand as the supply air registers specified hereinbefore. Registers shall be installed plumb and square with building lines and tight to wall surface.

b. Register shall be a 45° deflection louvered register with horizontal front louvers. Opposed blade damper not required, as volume damper in the branch shall be used for balancing.

c. Register shall have a 1–1/4" border with tight fitting mitered corners (hairline joint) and with counter sunk screw holes so that screw fits flush with frame surface. The entire visible portion of the register shall have a baked flat white painted finish. The attachment screws shall be furnished with the registers and shall be 1–1/4"x #8 oval head and shall be factory painted to match the register finish. Each register shall be furnished with a sponge rubber gasket under the frame border to prevent streaking.

d. Registers shall be of all extruded aluminum construction including aluminum dampers; all parts shall be non–ferrous. Registers shall be:

Titus	3FL5 w/AG–15 OBD
Tuttle & Bailey	A77D–42 w/OBD
Krueger	S580H w/OBD
Annemostat	#X3HOD w/OBD
Carnes	RNRAH w/OBD
Metal Aire	RH w/OBD
J&J	990H w/OBD
EH Price	520 w/OBD

32. CONNECTIONS TO EQUIPMENT

a. Make all plumbing connections to all equipment shown on the plans as requiring same. If specific piping details are not shown, the equipment shall be roughed in for and connected in accordance with the manufacturer's recommendations. It will be this contractor's responsibility to obtain shop drawings from whomever furnishes the equipment.

33. ELECTRICAL WIRING

a. All equipment specified in this section of the specifications that requires electrical power wiring will be wired by the Electrical Contractor.

34. DISINFECTION OF POTABLE WATER SYSTEM

a. Upon completion of the water system, it shall be disinfected prior to use. The method to be followed shall be as follows:

1) The pipe system shall be flushed with potable water until no dirty water appears at the points of outlet.

2) The system, or part thereof, shall be filled with a water–chlorine solution containing at least 50 parts per million of chlorine, and the system, or part thereof, shall be valved off and allowed to stand for 24 hours; or the system, or part thereof, shall be filled with a water–chlorine solution containing at least 200 parts per million of chlorine and allowed to stand for 3 hours. All valves in the system shall be opened and closed several times during the contact period, and at least once for cleaning during the flushing period.

3) Following the allowed standing time, the system shall be flushed with potable water until no chlorine remains in the water coming from the system.

4) The procedure shall be repeated if it is shown by a bacteriological examination made by the Administrative Authority that contamination still persists in the system.

b. Contractor shall provide all isolating valves and drains as required to isolate, sterilize, and drain all of the new water piping.

c. Contractor shall advise engineer and/or job inspector when this work is to be accomplished, and shall provide signed certificate stating the above requirement has been met, and the date or dates it was accomplished.

35. TESTS AND CLEANING

a. Waste and vent piping shall be tested as per City and State plumbing code.

b. Water supply systems shall be tested by hydrostatic pressure of 150 pounds to the square inch and must be absolutely tight to the satisfaction of the engineer or his representative. All tests shall be made by the contractor at his expense, and he must furnish the engineer a certificate that a satisfactory test has been made. Should leaks appear during tests or immediately thereafter, same shall be repaired at once. All tests shall be made before insulation is applied. Notify engineer or inspector as to when tests are to be made.

c. Upon completion of the work, all rubbish must be cleaned away and all fixtures washed, leaving the job in first class operating condition. Remove all paper labels from fixtures. Final cleaning and polishing of fixtures must be done the day before final inspection.

ROBY, QUINTAL & EVERSON
CONSULTING ENGINEERS
MITCHELL, SOUTH DAKOTA

L.L. JIRSA ARCHITECT
P.O. BOX 925
MITCHELL, SD 57301
email: lljirsaarchitect@gmail.com
605–770–6424

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 5287
ROBERT B. EVERSON, JR.
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36. SHOP DRAWINGS

a. Furnish for approval, electronic copies of certified shop drawings on all equipment to be furnished under this contract. All shop drawings shall be submitted at one time within 45 days after the award of the contract.

b. Similar equipment, or component parts shall be of one brand throughout the entire project.

c. Prior to submitting drawings, the contractor shall check to see that equipment meets the specifications, that sizes and quantities are correct, and shall sign or stamp his approval. Job name and location must be clearly marked on each drawing or group of individual drawings. Send drawings to:

L. L. Jirsa Architect

d. This contractor shall be responsible for fitting equipment in the space available and verifying all dimensions.

e. If equipment submitted for approval varies from that specified, all variations shall be specifically noted on the drawings. Failure to do so will be cause, at the option of the engineer, to reject the equipment even though the incomplete shop drawings are approved.

f. Drawings shall show all features required by the specifications. Submittals of materials must clearly labeled to match the same item used in the specifications to positively identify each item.

g. Shop drawings of equipment with electrical components, motors, controllers, etc. shall give complete electrical information such as make, model, type and current. The cost of electrical modifications required by submitted material and/or equipment that is in excess of that provided for the specified brand, shall be the contractor's responsibility.

h. Where catalogs or catalog cuts are submitted, they shall clearly indicate which particular model and type is being submitted for approval, and any items listed on the submittal as "optional" shall clearly indicate whether the optional item is being furnished.

i. In general, equipment is specified by brand name, with several "equals" listed. Where one of the "equal" brands is used, or if an "equal" brand is approved by addenda and used by the contractor, he shall verify the space and other requirements of the "equal" brand used, and shall be responsible for all additional costs created by using the "equal" brand.

j. Provide catalog cut submittals on all valve, insulation materials, and hangers.

37. OPERATING INSTRUCTIONS

a. This contractor shall assemble two (2) complete copies of Operating and Maintenance Instructions, covering all equipment furnished under this contract. In addition to the normal operating and maintenance literature, provide a list of recommended spare parts and name and address of manufacturer's representative. Material shall be bound in a 3–hole, hard cover, vinyl binder, and delivered to the engineer.

b. Provide exploded views of all plumbing fixture trim and other mechanical devices showing part numbers and names.

c. Provide typewritten instructions indicating what equipment requires periodic maintenance, lubrication, etc.

d. Equipment warranties shall be included in the manuals.

38. COORDINATION AND COOPERATION AMONG TRADES

a. Contractors shall not install their materials without consideration for other trades on the basis of "we were here first". The drawings are generally schematic. In general, in congested areas, plumbing waste lines and ductwork would have first priority over other pipes and conduits. Should pipes, conduits or ducts be installed without regard to others, they shall be relocated, without cost, as instructed by the engineer so as to permit all trades to install their material, so as to maintain maximum headroom and clearance, and so as to obtain the most desirable installation as determined by the engineer.

b. This contractor shall coordinate the installation of his piping and equipment with the General, Ventilation, and Electrical Contractors before starting installation. All work shall be coordinated with Sprinkler Subcontractor.

39. GUARANTEE

a. In addition to the materials and workmanship guarantee in the General Conditions, this contractor shall further guarantee that true intent and scope of the Plans and Specifications will be fulfilled.

b. Where the selection of materials or methods of installation are left to the responsibility of the contractor, he shall faithfully pursue the best available materials or practice suitable for the purpose intended.

c. Where equipment specified hereinbefore is to be furnished with a warranty longer than one (1) year, copies of the warranty shall be included in the operating and maintenance manuals.

ROBY, QUINTAL & EVERSON
CONSULTING ENGINEERS
MITCHELL, SOUTH DAKOTA

L.L. JIRSA ARCHITECT
P.O. BOX 925
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ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
$	SINGLE POLE SWITCH
$3	THREE WAY SWITCH
$4	FOUR WAY SWITCH
$D	DIMMER SWITCH
$T	TIMER SWITCH
$O	OCCUPANCY SENSOR
$P	PILOT LIGHT SWITCH
$K	KEYED SWITCH
$F	VARIABLE SPEED FAN SWITCH
OS1	OCCUPANCY SENSOR – CEILING MOUNTED
PR	POWER PACK FOR LOW VOLTAGE OCCUPANCY SENSOR
	DUPLEX RECEPTACLE
	GROUND FAULT CIRCUIT INTERUPTER DUPLEX RECEPTACLE
	250V 4–WIRE RECEPTACLE
	DOUBLE DUPLEX RECEPTACLE
	TOP SWITCHED DUPLEX RECEPTACLE
	SPECIAL OUTLET
XX	DATA/PHONE OUTLET XX INDICATES NO. OF JACKS
54"	WALL PHONE OUTLET
	CEILING DATA/PHONE OUTLET
XX	FLOOR BOX WITH POWER AND DATA XX INDICATES # OF JACKS
	FLOOR BOX WITH POWER ONLY
M	MANUAL MOTOR STARTER
	MOTOR CONNECTION
	EXIT FIXTURE
	EMERGENCY WALL PACK
	LIGHTING FIXTURE E = EMERGENCY BALLAST NL = NIGHT LIGHT
	UNDER CABINET FIXTURE
	RECESSED FIXTURE
	WALL MOUNTED FIXTURE
PC	PHOTO CONTROL
	SECURITY CAMERA
S	WALL SPEAKER
C	CLOCK OUTLET
N	NURSE CALL PULL STATION
D	NURSE CALL DUTY STATION
	NURSE CALL CORRIDOR LIGHT

SYMBOL	DESCRIPTION
NCCP	NURSE CALL CONTROL PANEL
T	THERMOSTAT
S	INTERCOM SPEAKER
H	INTERCOM CALL STATION
J	JUNCTION BOX
TC	TIME CLOCK
V	VOLUME CONTROL
T	TRANSFORMER
TV	CABLE TV – ONE CAT6E AND ONE RG6 COAX CABLE
DH	DOOR HOLDER
	SMOKE DETECTOR
	HEAT DETECTOR (FT = FIXED TEMPERATURE)
M	MANUAL PULL STATION
XX	HORN/ STROBE XX CANDELA RATING
XX V	STROBE ONLY XX CANDELA RATING
FACP	FIRE ALARM CONTROL PANEL
ANNC	FIRE ALARM ANNUNCIATOR PANEL
TS	TAMPER SWITCH
FS	FLOW SWITCH
BT	BEAM TRANSMITTER
REC	BEAM RECEIVER
SD	SMOKE DAMPER
MD	MOTORIZED DAMPER
DSD	DUCT SMOKE DETECTOR
DS	DOOR STRIKE
CR	CARD READER/KEYPAD
	DISCONNECT SWITCH (F = FUSED)
	COMBINATION STARTER
R	RELAY
	CONNECT TO EXISTING
VFD	VARIABLE FREQUENCY DRIVE
WG	WIRE GUARD
WP	WEATHER PROOF
AC	ABOVE COUNTER
UC	UNDER COUNTER
UPS	UNINTERRUPTIBLE POWER SUPPLY
EXG	EXISTING

ELECTRICAL GENERAL NOTES:

A. CONTRACTOR SHALL VISIT THE SITE AND VERIFY ALL EXISTING CONDITIONS AND DIMENSIONS. NOTIFY THE ENGINEER IMMEDIATELY OF ANY DISCREPANCIES, INCLUDING ANY NECESSARY DEMOLITION.

B. REMOVE ELECTRICAL EQUIPMENT IN THE AREAS SHOWN ON THE PLAN, DISCONNECT CIRCUITS AND CONDUITS AND REMOVE TO A POINT OUT OF THE WAY OF THE GENERAL DEMOLITION. MARK ON THE PLAN TO CLEARLY SHOW WHERE THESE CIRCUITS ARE STOPPED. DISCONNECT THE POWER AND LIGHTING CIRCUITS IN THE PANELS TO ASSURE THAT THERE IS NO DANGER FROM ELECTRICAL SHOCK HAZARD PRESENT. DEMOLITION WORK SHALL BE COORDINATED WITH THE OWNER. SHOULD QUESTIONS ARISE REGARDING THE REMOVAL OF EQUIPMENT, CONFER WITH THE OWNER BEFORE SUCH EQUIPMENT IS DEMOLISHED. MATERIALS REMOVED BY DEMOLITION SHALL REMAIN THE PROPERTY OF THE OWNER UNLESS OTHERWISE SPECIFICALLY NOTED. MATERIAL THE OWNER DOES NOT WISH TO RETAIN SHALL BE REMOVED AND DISPOSED OF PROPERLY BY THE CONTRACTOR.

C. EQUIPMENT SHOWN ON DRAWINGS AS EXISTING IS BASED ON EXISTING PLANS AND LIMITED FIELD INVESTIGATION. THE FIELD SURVEY WAS CONDUCTED TO VERIFY, AS MUCH AS POSSIBLE, THE ACCURACY OF THE LOCATIONS SHOWN. THE CONTRACTOR SHALL VERIFY THE ACCURACY OF THE "EXISTING CONDITIONS" AS SHOWN ON THE DRAWINGS AS THE DEMOLITION WORK PROGRESSES. PERFORM MODIFICATIONS AND ADDITIONS AS NECESSARY TO CORRECT FOR THESE HIDDEN CONDITIONS AND ALLOW FOR THE COMPLETION OF THE NEW WORK.

D. PROVIDE PENETRATIONS TO THE BUILDING STRUCTURE AS REQUIRED FOR INSTALLATION. WHERE EXISTING OR TEMPORARY SYSTEMS ARE BEING DEMOLISHED, WHICH LEAVE OPENINGS IN THE EXISTING BUILDING STRUCTURE, THE BUILDING STRUCTURE SHALL BE PATCHED TO MATCH THE EXISTING CONSTRUCTION AND MAINTAIN THE EXISTING BUILDING FIRE RATINGS.

E. ALL ELECTRICAL WORK SHALL BE INSTALLED IN STRICT ACCORDANCE WITH ALL APPLICABLE LOCAL, STATE, NFPA AND NEC CODES, AND THE AUTHORITY HAVING JURISDICTION.

F. ALL 120V 20A RECEPTACLES SHALL BE TAMPER PROOF.

G. ALL ELECTRICAL OUTLETS SHALL BE RECESSED IN CONCRETE WALLS.

H. WIRING METHOD SHALL BE EMT CONDUIT. ALL DEVICES SHALL BE GRAY WITH STAINLESS STEEL WALL PLATES.

Tornado Safe Room
Sports Field Complex
Alexandria, South Dakota

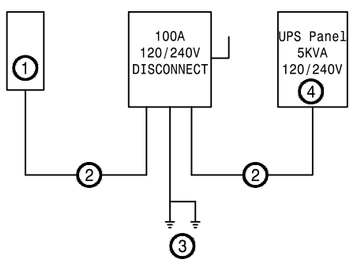
FEEDER SIZES

1. FEED FROM EXISTING CONCESSIONS BUILDING GE 100A PANEL. PROVIDE GE 90A 2P BREAKER. INCLUDE ALL CONCRETE CUTTING AND PATCHING OF SIDEWALK TO INSTALL CONDUIT FOR THIS CIRCUIT. REVIEW ALL SITE CONDITIONS. APPROXIMATE DISTANCE OF 45'.

2. 1-1/4" CONDUIT WITH (3) #3 CU. AND (1) #8 CU GRND. USE SCH 80 ABOVE GRADE.

3. GROUND PER NEC CODE. TWO 5/8" X 8' GROUND RODS WITH #4 CU, CONNECT TO FOOTING U-FER GROUND, AND METAL WATER SERVICE.

4. UPS: MEYERS-ILLUMINATOR SUPER NOVA # 4-I-05-S-R120-BA20016-M-MIP UPS CABINET PANEL COMBINATION WITH (16) 20A 120V BREAKERS.



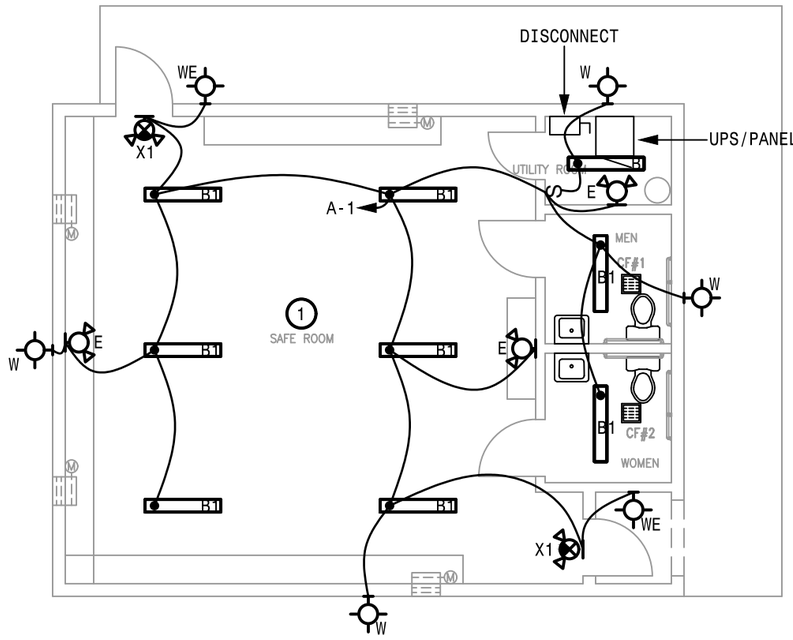
Power Riser Diagram

NOT TO SCALE

REVISED DATE	**Plans for** Tornado Safe Room Sports Field Complex Alexandria, SD	**Legends & Riser Diag** print 11"x17" to scale	DRAWN BY BW TRACED BY CHECKED BY JG	E1 OF-6
CERT. NO. C-8311	Efraimson Electric, Inc. Engineering Services	Aberdeen, S.D.	DATE 12/31/25	PROJECT NO. J9337

GENERAL NOTES FOR LIGHTING PLANS:

1. TYPICAL FOR LIGHTS CONTROLLED BY BUILT IN OCCUPANCY SENSOR. CONNECT TO POWER CIRCUIT IN THIS ROOM.



Lighting Plan

Scale: 1/8" = 1'-0"

FIXTURE SCHEDULE

TYPE	MANUFACTURERS	CAT. NO.	TYPE	WATTS (W)	LUMENS	COLOR TEMP. (K)	REMARKS
B	COLUMBIA, LITHONIA, METALUX, LSI, WILLIAMS, OR EQUAL	COOPER 4SLSTP4040DD-UNV	LED	44	4760	4000	4' LED SURFACE MOUNT STRIP LIGHT
B1	COLUMBIA, LITHONIA, METALUX, LSI, WILLIAMS, OR EQUAL	COOPER 4SLSTP4040CS-UNV	LED	41	4835	4000	4' LED SURFACE MOUNT STRIP LIGHT WITH OCCUPANCY SENSOR
W	COLUMBIA, LITHONIA, METALUX, LSI, WILLIAMS, OR EQUAL	MULE MERU-LED AC DB	LED	17	1600	4000	EXTERIOR WALL PACK WITH PHOTO EYE
WE	COLUMBIA, LITHONIA, METALUX, LSI, WILLIAMS, OR EQUAL	MULE MERU-LED ACEM DB IH	LED	32	1600	4000	EXTERIOR WALL PACK WITH PHOTO EYE EM BATTERY AND INTERNAL HEATER
E	DUAL-LITE, SURE-LITES, MULE LIGHTING, LIGHTALARMS, OR EQUAL	SURE-LITES APEL	LED	-	-	4000	EMERGENCY FIXTURE
X1	DUAL-LITE, SURE-LITES, MULE LIGHTING, LIGHTALARMS, OR EQUAL	SURE-LITE LPXC50SD	LED			4000	EXIT/EM COMBO LIGHT MOUNT FROM CEILING

REVISED DATE

CERT. NO. C-8311

Plans for
Tornado Safe Room
Sports Field Complex
Alexandria, SD

Efraimson Electric, Inc. Engineering Services

Lighting Plan

print 11"x17" to scale

Aberdeen, S.D.

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CHECKED BY JG

DATE 12/31/25

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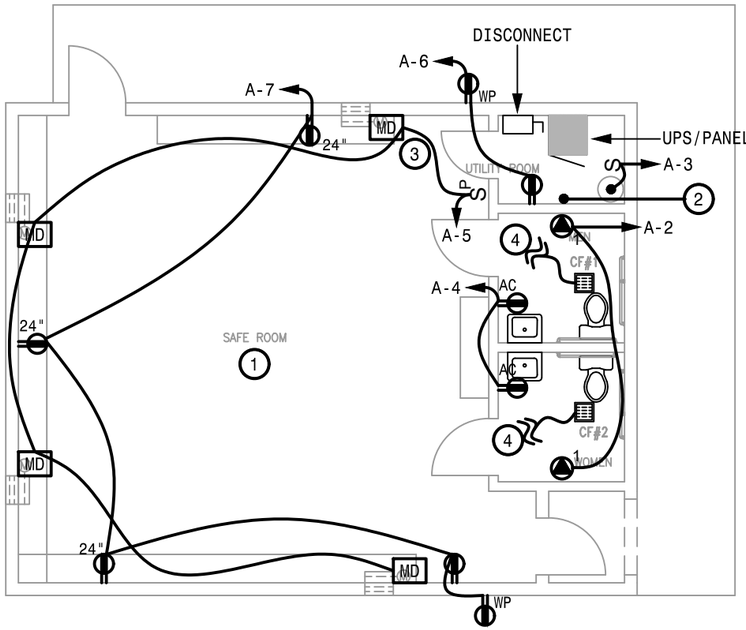
KEYNOTES FOR POWER PLANS:

1. TYPICAL ALL ELECTRICAL OUTLETS SHALL BE RECESSED IN PRECAST/BLOCK WALLS IN THE PUBLIC AREA. SURFACE MOUNTING IN MECHANICAL ONLY.
2. STUB OUT 1" CONDUIT FOR SPARE POWER/DATA APPROXIMATELY 10'
3. TYPICAL MOTORIZED DAMPER. CONNECT TO LIGHTED PILOT LIGHT 120V.
4. TYPICAL POWER CONNECTION FROM LIGHT.

SPECIAL OUTLETS FOR POWER PLANS:

1. HAND DRYER NON HEATING AIR ONLY 500 WATTS. EXCEL MODEL XL-SB-ECO



Power Plan

Scale: 1/8" = 1'-0"

UPS/PANEL A

MLO 120/240V 1 PHASE 3 WIRE 10KAIC SURFACE

LOAD	*P*	*CIR BRK*	*CIR NO*	*PHASE*	*CIR NO*	*CIR BRK*	*P*	*LOAD*
LIGHTS AND CF	1	20	1	A	2	20	1	HAND DRYERS
WATER HEATER	1	20	3	B	4	20	1	RESTROOM GFCI REC.
DAMPERS	1	20	5	A	6	20	1	OUTSIDE AND PANEL REC.
MAIN AREA RECEPTACLES	1	20	7	B	8	20	1	SPARE
SPARE	1	20	9	A	10	20	1	SPARE
SPARE	1	20	11	B	12	20	1	SPARE
SPARE	1	20	13	A	14	20	1	SPARE
SPARE	1	20	15	B	16	20	1	SPARE

NOTES:
USE SEPARATE NEUTRAL FOR ALL CIRCUITS.
PROVIDE ALL REQUIRED GFCI CIRCUIT BREAKERS AND BREAKERS MARKED WITH "*"
PROVIDE 5 KVA UPS PANEL MYERS ILLUMINATOR SUPER NOVA # 4-I-05-S-R120-BA20016-M-MIP

REVISED DATE	**Plans for** Tornado Safe Room Sports Field Complex Alexandria, SD	**Power Plan** print 11"x17" to scale	DRAWN BY BW / TRACED BY / CHECKED BY JG / E3 / OF-6
CERT. NO. C-8311	Efraimson Electric, Inc. Engineering Services	Aberdeen, S.D.	DATE 12/31/25 / PROJECT NO. J9337

ELECTRICAL SPECIFICATIONS

SCOPE

THE CONTRACTOR SHALL PROVIDE ALL LABOR AND MATERIALS REQUIRED TO COMPLETE THE ELECTRICAL INSTALLATION OF THE PROJECT AS SHOWN ON THE PLANS AND DESCRIBED IN THE SPECIFICATIONS.

DRAWINGS: ALL DRAWINGS ACCOMPANYING THESE SPECIFICATIONS SHALL BE CONSIDERED A PART OF THESE SPECIFICATIONS.

GENERAL TERMS AND CONDITIONS OF ARCHITECTURAL SPECIFICATIONS SHALL BE CONSIDERED PART OF THESE SPECIFICATIONS.

INSPECTION OF SITE: BEFORE SUBMITTING A PROPOSAL ON THE WORK CONTAINED IN THESE SPECIFICATIONS, EACH BIDDER SHALL EXAMINE THE SITE AND FAMILIARIZE THEMSELVES WITH ALL OF THE EXISTING CONDITIONS AND LIMITATIONS. NO EXTRAS WILL BE ALLOWED BECAUSE OF MISUNDERSTANDING OF THE ELECTRICAL CONTRACTOR AS TO THE AMOUNT OF WORK INVOLVED OR LACK OF KNOWLEDGE OF ANY PRE-EXISTING CONDITIONS.

WORKMANSHIP: ALL WORK ON THE PROJECT SHALL BE INSTALLED BY CRAFTSMEN SKILLED AND LICENSED IN THE TRADE. WORK SHALL BE COMPLETED IN A NEAT AND WORKMAN LIKE MANNER, ALL TO THE SATISFACTION OF THE PROJECT ENGINEER AND OWNER, MODIFICATIONS MADE TO SATISFY THIS REQUIREMENT SHALL BE MADE AT THE EXPENSE OF THE CONTRACTOR.

PERMITS AND INSPECTION FEES: THE CONTRACTOR SHALL OBTAIN AND PAY FOR ALL REQUIRED PERMITS AND INSPECTION FEES.

ELECTRICAL DRAWINGS

ELECTRICAL PLANS DIAGRAMMATICALLY INDICATE THE SCOPE OF WORK TO BE PROVIDED BY THE ELECTRICAL CONTRACTOR. THE CONTRACTOR SHALL REFER TO ARCHITECTURAL, STRUCTURAL, MECHANICAL AND EQUIPMENT DRAWINGS FOR EXACT DIMENSIONS AND LOCATIONS. NOTIFY THE A/E IN THE EVENT OF CONFLICTING DIMENSIONS AND ACTUAL FIELD MEASUREMENTS.

EQUIPMENT SHOWN ON DRAWINGS AS EXISTING ARE BASED ON EXISTING PLANS AND LIMITED FIELD INVESTIGATION. THE FIELD SURVEY WAS CONDUCTED TO VERIFY, AS MUCH AS POSSIBLE, THE ACCURACY OF THE LOCATIONS SHOWN. THE CONTRACTOR SHALL VERIFY THE ACCURACY OF THE “EXISTING CONDITIONS” AS SHOWN ON THE DRAWINGS. AS THE DEMOLITION WORK PROGRESSES PERFORM MODIFICATIONS AND ADDITIONS AS NECESSARY TO CORRECT FOR THESE HIDDEN CONDITIONS AND ALLOW FOR THE COMPLETION OF THE NEW WORK.

PRIOR APPROVAL REQUESTS

SUBMITTALS FOR SUBSTITUTIONS FOR SPECIFIED MATERIALS OR PRODUCTS MUST ARRIVE AT THE OFFICE OF THE ENGINEER NO LATER THAN SEVEN DAYS PRIOR TO THE BID DATE. EMAIL SUBMITTALS ARE ACCEPTABLE.

ANY APPROVALS WILL BE NOTED IN AN ADDENDUM.

SHOP DRAWINGS

SUBMIT SHOP DRAWINGS FOR THE PRODUCTS AND MATERIALS THAT ARE IDENTIFIED FOR REVIEW IN EACH SECTION OF THESE SPECIFICATIONS; INCLUDING BUT NOT LIMITED TO LIGHTING FIXTURES, WIRING DEVICES & FACEPLATES, RACEWAYS & BOXES, SWITCHBOARDS, PANELBOARDS, ENCLOSED SWITCHES & CIRCUIT BREAKERS, DATA, & FIRE ALARM.

ONLY COMPLETE SUBMITTALS WILL BE REVIEWED.

SIGN AND DATE EACH SET INDICATING THE CONTRACTOR HAS CHECKED FOR COMPLIANCE WITH SPECIFICATION REQUIREMENTS AND SPACE LIMITATIONS.

AS-BUILT DRAWINGS

THE CONTRACTOR SHALL MAINTAIN A SET OF AS-BUILT DRAWINGS AT THE PROJECT. NOTE THE FINAL LOCATION OF CIRCUIT AND CONDUIT ROUTES AND ANY CHANGES DUE TO CHANGE ORDERS.

SUBMIT AS-BUILT DRAWINGS WITH O&M MANUALS

BUILDING STRUCTURE PENETRATIONS

PROVIDE PENETRATION TO THE BUILDING STRUCTURE AS REQUIRED FOR INSTALLATION. WHERE EXISTING OR TEMPORARY SYSTEMS ARE BEING DEMOLISHED AND THE DEMOLITION LEAVES OPENINGS IN THE EXISTING BUILDING STRUCTURE, THEN THE BUILDING STRUCTURE SHALL BE PATCHED TO MATCH THE EXISTING CONSTRUCTION AND MAINTAIN THE EXISTING BUILDING FIRE RATINGS.

GUARANTEE

THE CONTRACTOR SHALL PROVIDE A ONE-YEAR WARRANTY, BEGINNING AT THE DATE OF SUBSTANTIAL COMPLETION, FOR ALL NEW WORK. ANY WORK THAT IS DEFECTIVE WITHIN THAT ONE-YEAR PERIOD SHALL BE REPLACED BY THE CONTRACTOR WITHOUT CHARGE. THIS DOES NOT INCLUDE INCANDESCENT LAMPS.

IF LONGER WARRANTIES ARE NOTED ELSEWHERE IN THE SPECIFICATIONS, THOSE WARRANTIES SHALL APPLY.

QUALITY ASSURANCE

ELECTRICAL COMPONENTS, DEVICES, AND ACCESSORIES: LISTED AND LABELED AS DEFINED IN NFPA 70, ARTICLE 100, BY A TESTING AGENCY ACCEPTABLE TO AUTHORITIES HAVING JURISDICTION, AND MARKED FOR INTENDED USE.

DEVICES FOR UTILITY COMPANY ELECTRICITY METERING: COMPLY WITH UTILITY COMPANY PUBLISHED STANDARDS.

COMPLY WITH NFPA 70.

COORDINATION

COORDINATE CHASES, SLOTS, INSERTS, SLEEVES, AND OPENINGS FOR ELECTRICAL SUPPORTS, RACEWAYS, AND CABLE WITH GENERAL CONSTRUCTION WORK.

SEQUENCE, COORDINATE, AND INTEGRATE INSTALLING ELECTRICAL MATERIALS AND EQUIPMENT FOR EFFICIENT FLOW OF THE WORK. COORDINATE INSTALLING LARGE EQUIPMENT THAT REQUIRES POSITIONING BEFORE CLOSING IN THE BUILDING.

COORDINATE ELECTRICAL SERVICE CONNECTIONS TO COMPONENTS FURNISHED BY UTILITY COMPANIES. COORDINATE INSTALLATION AND CONNECTION OF EXTERIOR UNDERGROUND AND OVERHEAD UTILITIES AND SERVICES, INCLUDING PROVISION FOR SERVICE ENTRANCES AND ELECTRICITY-METERING COMPONENTS.

COORDINATE LOCATION OF ACCESS PANELS AND DOORS FOR ELECTRICAL ITEMS THAT ARE CONCEALED BY FINISHED SURFACES. ACCESS DOORS AND PANELS ARE SPECIFIED IN DIVISION 8 SECTION "ACCESS DOORS AND FRAMES."

WHERE ELECTRICAL IDENTIFICATION DEVICES ARE APPLIED TO FIELD-FINISHED SURFACES, COORDINATE INSTALLATION OF IDENTIFICATION DEVICES WITH COMPLETION OF FINISHED SURFACE.

SUPPORTING DEVICES

MATERIAL: COLD-FORMED STEEL, WITH CORROSION-RESISTANT COATING.

METAL ITEMS FOR USE OUTDOORS OR IN DAMP LOCATIONS: HOT-DIP GALVANIZED STEEL.

SLOTTED-STEEL CHANNEL: FLANGE EDGES TURNED TOWARD WEB, AND 9/16-INCH- DIAMETER SLOTTED HOLES AT A MAXIMUM OF 2 INCHES O.C., IN WEBS. STRENGTH RATING TO SUIT STRUCTURAL LOADING.

SLOTTED CHANNEL FITTINGS AND ACCESSORIES: RECOMMENDED BY THE MANUFACTURER FOR USE WITH THE TYPE AND SIZE OF CHANNEL WITH WHICH USED.

RACEWAY AND CABLE SUPPORTS: MANUFACTURED CLEVIS HANGERS, RISER CLAMPS, STRAPS, THREADED C-CLAMPS WITH RETAINERS, CEILING TRAPEZE HANGERS, WALL BRACKETS, AND SPRING-STEEL CLAMPS OR CLICK-TYPE HANGERS.

EXPANSION ANCHORS: CARBON-STEEL WEDGE OR SLEEVE TYPE.

TOGGLE BOLTS: ALL-STEEL SPRINGHEAD TYPE.

POWDER-DRIVEN THREADED STUDS: HEAT-TREATED STEEL.

ELECTRICAL IDENTIFICATION

IDENTIFICATION DEVICE COLORS: USE THOSE PRESCRIBED BY ANSI A13.1, NFPA 70, AND THESE SPECIFICATIONS:

	120/208 V	120/240V DELTA	277/480V
PHASE A	BLACK	BLACK	BROWN
PHASE B	RED	ORANGE	ORANGE
PHASE C	BLUE	BLUE	YELLOW
NEUTRAL	WHITE	WHITE	GREY
GROUND	GREEN	GREEN	GREEN

COLORED ADHESIVE MARKING TAPE FOR RACEWAYS, WIRES, AND CABLES: SELF-ADHESIVE VINYL TAPE, NOT LESS THAN 1 INCH WIDE BY 3 MILS THICK.

TAPE MARKERS FOR CONDUCTORS: VINYL OR VINYL-CLOTH, SELF-ADHESIVE, WRAPAROUND TYPE WITH PREPRINTED NUMBERS AND LETTERS.

UNDERGROUND WARNING TAPE: PERMANENT, BRIGHT-COLORED, CONTINUOUS-PRINTED, VINYL TAPE COMPOUNDED FOR PERMANENT DIRECT-BURIAL SERVICE, AND WITH THE FOLLOWING FEATURES: NOT LESS THAN 6 INCHES WIDE BY 4 MILS THICK AND PRINTED LEGEND THAT INDICATES TYPE OF UNDERGROUND LINE.

ENGRAVED-PLASTIC LABELS, SIGNS, AND INSTRUCTION PLATES: ENGRAVING STOCK, MELAMINE PLASTIC LAMINATE PUNCHED OR DRILLED FOR MECHANICAL FASTENERS 1/16-INCH MINIMUM THICKNESS FOR SIGNS UP TO 20 SQ. IN. AND 1/8-INCH MINIMUM THICKNESS FOR LARGER SIZES. ENGRAVED LEGEND IN BLACK LETTERS ON WHITE BACKGROUND.

FASTENERS FOR NAMEPLATES AND SIGNS: SELF-TAPPING, GALVANIZED SCREWS OR NO. 10/32 GALVANIZED MACHINE SCREWS WITH NUTS AND FLAT AND LOCK WASHERS.

ELECTRICAL EQUIPMENT INSTALLATION

HEADROOM MAINTENANCE: IF MOUNTING HEIGHTS OR OTHER LOCATION CRITERIA ARE NOT INDICATED, ARRANGE AND INSTALL COMPONENTS AND EQUIPMENT TO PROVIDE MAXIMUM POSSIBLE HEADROOM.

MATERIALS AND COMPONENTS: INSTALL LEVEL, PLUMB, AND PARALLEL AND PERPENDICULAR TO OTHER BUILDING SYSTEMS AND COMPONENTS, UNLESS OTHERWISE INDICATED.

EQUIPMENT: INSTALL TO FACILITATE SERVICE, MAINTENANCE, AND REPAIR OR REPLACEMENT OF COMPONENTS. CONNECT FOR EASE OF DISCONNECTING, WITH MINIMUM INTERFERENCE WITH OTHER INSTALLATIONS.

RIGHT OF WAY: GIVE TO RACEWAYS AND PIPING SYSTEMS INSTALLED AT A REQUIRED SLOPE.

LIGHTING FIXTURES

PROVIDE LIGHTING FIXTURES AS LISTED IN THE FIXTURE SCHEDULE.

REGISTERED PROFESSIONAL ENGINEER
REG. NO. 12068
BLAKE A. WOODWARD
SOUTH DAKOTA
Blake Woodward
12-31-2025

REVISED DATE

CERT. NO. C-8311

Plans for
Tornado Safe Room
Sports Field Complex
Alexandria, SD

Efraimson Electric, Inc. Engineering Services

Specifications

print 11"x17" to scale

Aberdeen, S.D.

DRAWN BY BW
TRACED BY
CHECKED BY JG
DATE 12/31/25

E4
OF-6

PROJECT NO. J9337

ELECTRICAL SPECIFICATIONS

VOICE AND DATA COMMUNICATION CABLING

INSTALLER QUALIFICATIONS: SYSTEM INSTALLER MUST BE CERTIFIED BY THE MANUFACTURER IN THE INSTALLATION OF THE PRODUCTS USED AND HAS A MINIMUM OF A BICSI REGISTRATION AT THE INSTALLER LEVEL.

CABLE: GENERAL CABLE GENSPEED 6000 ENHANCED, CMP RATED, MANUFACTURES PART # 7131940.

TERMINAL AND CONNECTOR COMPONENTS AND DISTRIBUTION RACKS: PANDUIT.

PATCH PANELS: PROVIDE ENOUGH PATCH PANEL SPACE TO TERMINATE ALL OF THE CABLES PLUS 20% SPARES.

AT THE COMPLETION OF THE PROJECT ALL DATA CABLE SHALL BE TESTED BY STANDARD TEST METHODS SUCH AS WITH A FLUKE DTX 1800 TESTER, THE CONTRACTOR SHALL BE RESPONSIBLE TO REPLACE ANY CABLES AND TERMINATIONS THAT DO NOT MEET CAT 6 TIA/EIA-568-B AND TIA/EIA-569-B TEST STANDARDS.

WIRING DEVICES

STRAIGHT-BLADE-TYPE RECEPTACLES:

1. TAMPER RESISTANT: P&S TR20-COLOR OR EQUAL.
2. TAMPER RESISTANT HOSPITAL GRADE: P&S TR63H-COLOR OR EQUAL. IN PATIENT, LAB, HEALTHCARE AREAS.

GFCI SELF TESTING RECEPTACLES:

1. TAMPER RESISTANT: P&S 2097TR-COLOR OR EQUAL.
2. WEATHER RESISTANT, TAMPER RESISTANT: P&S 2097TRWR-COLOR OR EQUAL.
3. HOSPITAL GRADE TAMPER-RESISTANT: P&S TR2097HG-COLOR OR EQUAL.

SWITCHES TO BE ROCKER/DECORA TYPE, COLOR BY ARCHITECT. 20A 120/277V.

RACEWAY AND CABLE INSTALLATION

CONCEAL RACEWAYS AND CABLES, UNLESS OTHERWISE INDICATED, WITHIN FINISHED WALLS, CEILINGS, AND FLOORS.

KEEP LEGS OF RACEWAY BENDS IN THE SAME PLANE AND KEEP STRAIGHT LEGS OF OFFSETS PARALLEL.

USE RMC ELBOWS WHERE RNC TURNS OUT OF SLAB.

CONNECT MOTORS AND EQUIPMENT SUBJECT TO VIBRATION, NOISE TRANSMISSION, OR MOVEMENT WITH A MAXIMUM OF 72-INCHES FLEXIBLE CONDUIT. INSTALL LFMC IN WET OR DAMP LOCATIONS. INSTALL SEPARATE GROUND CONDUCTOR ACROSS FLEXIBLE CONNECTIONS.

SET FLOOR BOXES LEVEL AND TRIM AFTER INSTALLATION TO FIT FLUSH TO FINISHED FLOOR SURFACE.

WIRING METHODS FOR POWER, LIGHTING, AND CONTROL CIRCUITS

APPLICATION: USE WIRING METHODS SPECIFIED BELOW TO THE EXTENT PERMITTED BY APPLICABLE CODES AS INTERPRETED BY AUTHORITIES HAVING JURISDICTION.

EXPOSED FEEDERS: INSULATED SINGLE CONDUCTORS IN EMT OR RMC RACEWAY.

CONCEALED FEEDERS IN CEILINGS, AND WALLS: INSULATED SINGLE CONDUCTORS IN EMT RACEWAY.

CONCEALED FEEDERS IN CONCRETE AND BELOW FLOORS ON GRADE: INSULATED SINGLE CONDUCTORS IN RNM OR RMC RACEWAY.

EXPOSED BRANCH CIRCUITS INCLUDING IN CRAWLSPACES: INSULATED SINGLE CONDUCTORS IN EMT RACEWAY.

CONCEALED BRANCH CIRCUITS IN CEILINGS AND WALLS: INSULATED SINGLE CONDUCTORS IN EMT RACEWAY. OR TYPE MC CABLE IF PERMITTED BY LOCAL CODE.

CONCEALED BRANCH CIRCUITS IN CONCRETE AND BELOW FLOORS ON GRADE: INSULATED SINGLE CONDUCTORS IN RNC OR RMC RACEWAY.

UNDERGROUND FEEDERS AND BRANCH CIRCUITS: INSULATED SINGLE CONDUCTORS IN RNM OR RMC RACEWAY.

FIRE ALARM, REMOTE-CONTROL SIGNALING AND POWER-LIMITED CIRCUITS, CLASSES 1, 2, AND 3: INSULATED CONDUCTORS IN METAL RACEWAY UNLESS OTHERWISE INDICATED.

WIRING INSTALLATION

MAKE SPLICES AND TAPS THAT ARE COMPATIBLE WITH CONDUCTOR MATERIAL AND THAT POSSESS EQUIVALENT OR BETTER MECHANICAL STRENGTH AND INSULATION RATINGS THAN UNSPLICED CONDUCTORS.

IDENTIFICATION MATERIALS AND DEVICES

INSTALL AT LOCATIONS FOR MOST CONVENIENT VIEWING WITHOUT INTERFERENCE WITH OPERATION AND MAINTENANCE OF EQUIPMENT.

COORDINATE NAMES, ABBREVIATIONS, COLORS, AND OTHER DESIGNATIONS USED FOR ELECTRICAL IDENTIFICATION WITH CORRESPONDING DESIGNATIONS INDICATED IN THE CONTRACT DOCUMENTS OR REQUIRED BY CODES AND STANDARDS. USE CONSISTENT DESIGNATIONS THROUGHOUT PROJECT.

INSTALL ENGRAVED-LAMINATED EMERGENCY-OPERATING SIGNS WITH WHITE LETTERS ON RED BACKGROUND WITH MINIMUM 3/8-INCH- HIGH LETTERING FOR EMERGENCY INSTRUCTIONS ON POWER TRANSFER, LOAD SHEDDING, AND OTHER EMERGENCY OPERATIONS.

FIRESTOPPING

APPLY FIRESTOPPING TO CABLE AND RACEWAY SLEEVES AND OTHER PENETRATIONS OF FIRE-RATED FLOOR AND WALL ASSEMBLIES TO RESTORE ORIGINAL UNDISTURBED FIRE-RESISTANCE RATINGS OF ASSEMBLIES.

DEMOLITION

PROTECT EXISTING ELECTRICAL EQUIPMENT AND INSTALLATIONS INDICATED TO REMAIN. IF DAMAGED OR DISTURBED IN THE COURSE OF THE WORK, REMOVE DAMAGED PORTIONS AND INSTALL NEW PRODUCTS OF EQUAL CAPACITY, QUALITY, AND FUNCTIONALITY.

ACCESSIBLE WORK: REMOVE EXPOSED ELECTRICAL EQUIPMENT AND INSTALLATIONS, INDICATED TO BE DEMOLISHED, IN THEIR ENTIRETY.

ABANDONED WORK: CUT AND REMOVE BURIED RACEWAY AND WIRING, INDICATED TO BE ABANDONED IN PLACE, 2 INCHES BELOW THE SURFACE OF ADJACENT CONSTRUCTION. CAP RACEWAYS AND PATCH SURFACE TO MATCH EXISTING FINISH.

REMOVE, STORE, CLEAN, REINSTALL, RECONNECT, AND MAKE OPERATIONAL COMPONENTS INDICATED FOR RELOCATION.

CUTTING AND PATCHING

CUT, CHANNEL, CHASE, AND DRILL FLOORS, WALLS, PARTITIONS, CEILINGS, AND OTHER SURFACES REQUIRED TO PERMIT ELECTRICAL INSTALLATIONS. PERFORM CUTTING BY SKILLED MECHANICS OF TRADES INVOLVED.

REPAIR, REFINISH AND TOUCH UP DISTURBED FINISH MATERIALS AND OTHER SURFACES TO MATCH ADJACENT UNDISTURBED SURFACES.

METAL CONDUIT AND TUBING

RMC: RIGID METAL CONDUIT SHALL BE GALVANIZED STEEL WITH STEEL FITTINGS (ANSI C80.1).

EMT AND FITTINGS: ELECTRICAL METALLIC TUBING SHALL BE GALVANIZED STEEL (ANSI C80.3.)
FITTINGS DRY LOCATION: STEEL SET-SCREW TYPE SUCH AS RACO SERIES 2000.
FITTINGS WET LOCATION: STEEL COMPRESSION TYPE SUCH AS RACO SERIES 2902.

FMC: FLEXIBLE METAL CONDUIT SHALL BE ZINC-COATED STEEL, ½" MINIMUM SIZE.
FITTINGS DRY LOCATION: STEEL SQUEEZE TYPE SUCH AS RACO SERIES 2100.

LFMC: LIQUID TIGHT FLEXIBLE METAL CONDUIT WITH PVC JACKET.
FITTINGS: STEEL COMPRESSION TYPE SUCH AS RACO SERIES 3500.

NONMETALLIC CONDUIT AND TUBING

RNC: RIGID NON-METALLIC CONDUIT SCHEDULE 40 UNLESS OTHERWISE SPECIFIED ON THE PLANS. FITTINGS AND CONDUIT BODIES: COMPATIBLE AND OF EQUAL WALL STRENGTH AS THE CONDUIT.

METAL UNDERFLOOR BOXES

AVAILABLE MANUFACTURERS: STEEL CITY - 664-SC OR APPROVED EQUAL.

SURFACE RACEWAYS

SURFACE NONMETALLIC RACEWAYS: TWO-PIECE CONSTRUCTION, MANUFACTURED OF RIGID PVC COMPOUND WITH MATTE TEXTURE AND MANUFACTURER'S STANDARD COLOR.

AVAILABLE MANUFACTURERS:
HUBBELL, INC.; WIRING DEVICE DIVISION.
LAMSON & SESSIONS; CARLON ELECTRICAL PRODUCTS.
PANDUIT CORP.
WALKER SYSTEMS, INC.; WIREMOLD COMPANY (THE).
WIREMOLD COMPANY (THE); ELECTRICAL SALES DIVISION.

USE PANDUIT (OR EQUAL) TYPE TE-70, WITH DIVIDER WALL TE70DW, SNAP ON ELECTRICAL FACEPLATE T70PG, HANGING BOX TE70DW, DEVICE MOUNTING BRACKET T70DB-X, AND SLOPED SNAP ON DATA FACEPLATES. PROVIDE ALL OTHER MISC ITEMS NECESSARY FOR A COMPLETE SYSTEM.

BOXES, ENCLOSURES, AND CABINETS

SHEET METAL OUTLET AND DEVICE BOXES: USE WELDED STEEL METAL BOXES - MIN. SIZE 4"X4"X1 ½ ", SIZE AS REQUIRED TO MEET NEC. PROVIDE APPROPRIATE DEVICE RINGS AND COVERS.

HINGED-COVER ENCLOSURES: NEMA 250, TYPE 1, WITH CONTINUOUS HINGE COVER AND FLUSH LATCH.

METAL ENCLOSURES: STEEL, FINISHED INSIDE AND OUT WITH MANUFACTURER'S STANDARD ENAMEL.

CABINETS: NEMA 250, TYPE 1, GALVANIZED STEEL BOX WITH REMOVABLE INTERIOR PANEL AND REMOVABLE FRONT, FINISHED INSIDE AND OUT WITH MANUFACTURER'S STANDARD ENAMEL. HINGED DOOR IN FRONT COVER WITH FLUSH LATCH AND CONCEALED HINGE. KEY LATCH TO MATCH PANELBOARDS. INCLUDE METAL BARRIERS TO SEPARATE WIRING OF DIFFERENT SYSTEMS AND VOLTAGE AND INCLUDE ACCESSORY FEET WHERE REQUIRED FOR FREESTANDING EQUIPMENT.

REGISTERED PROFESSIONAL ENGINEER
REG. NO.
12068
BLAKE A.
WOODWARD
SOUTH DAKOTA
12-31-2025

REVISED DATE	**Plans for** Tornado Safe Room Sports Field Complex Alexandria, SD	**Specifications** print 11"x17" to scale	DRAWN BY BW TRACED BY ___ CHECKED BY JG	E5 OF-6
CERT. NO. C-8311	Efraimson Electric, Inc. Engineering Services	Aberdeen, S.D.	DATE 12/31/25	PROJECT NO. J9337

ELECTRICAL SPECIFICATIONS

RACEWAY APPLICATION

OUTDOORS:
- EXPOSED: RIGID STEEL OR IMC.
- CONCEALED: RIGID STEEL OR IMC.
- UNDERGROUND, SINGLE RUN: RNC.
- UNDERGROUND, GROUPED: RNC.
- CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR-DRIVEN EQUIPMENT): LFMC.
- BOXES AND ENCLOSURES: NEMA 250, TYPE 3R.

INDOORS:
- EXPOSED: EMT.
- CONCEALED: EMT.
- CONNECTION TO VIBRATING EQUIPMENT (INCLUDING TRANSFORMERS AND HYDRAULIC, PNEUMATIC, ELECTRIC SOLENOID, OR MOTOR-DRIVEN EQUIPMENT): FMC; EXCEPT USE LFMC IN DAMP OR WET LOCATIONS.
- DAMP OR WET LOCATIONS: RIGID STEEL CONDUIT.
- BOXES AND ENCLOSURES: NEMA 250, TYPE 1, EXCEPT AS FOLLOWS:
  - DAMP OR WET LOCATIONS: NEMA 250, TYPE 3R.
- MINIMUM RACEWAY SIZE: ½" TRADE SIZE ABOVE GROUND, ¾" BELOW GROUND OR UNDER FLOOR OR IN POURED CONCRETE.

INSTALLATION

KEEP RACEWAYS AT LEAST 6 INCHES AWAY FROM PARALLEL RUNS OF FLUES AND STEAM OR HOT-WATER PIPES. INSTALL HORIZONTAL RACEWAY RUNS ABOVE WATER AND STEAM PIPING.

COMPLETE RACEWAY INSTALLATION BEFORE STARTING CONDUCTOR INSTALLATION.

SUPPORT RACEWAYS AS SPECIFIED IN DIVISION 16 SECTION "BASIC ELECTRICAL MATERIALS AND METHODS."

INSTALL TEMPORARY CLOSURES TO PREVENT FOREIGN MATTER FROM ENTERING RACEWAYS.

PROTECT STUB-UPS FROM DAMAGE WHERE CONDUITS RISE THROUGH FLOOR SLABS. ARRANGE SO CURVED PORTIONS OF BENDS ARE NOT VISIBLE ABOVE FINISHED SLAB.

MAKE BENDS AND OFFSETS SO ID IS NOT REDUCED. KEEP LEGS OF BENDS IN SAME PLANE AND KEEP STRAIGHT LEGS OF OFFSETS PARALLEL, UNLESS OTHERWISE INDICATED.

CONCEAL CONDUIT AND EMT WITHIN FINISHED WALLS, CEILINGS, AND FLOORS, UNLESS OTHERWISE INDICATED.
- INSTALL CONCEALED RACEWAYS WITH A MINIMUM OF BENDS IN SHORTEST PRACTICAL DISTANCE, CONSIDERING TYPE OF BUILDING CONSTRUCTION AND OBSTRUCTIONS, UNLESS OTHERWISE INDICATED.

RACEWAYS EMBEDDED IN SLABS: INSTALL IN MIDDLE 1/3 OF SLAB THICKNESS WHERE PRACTICAL AND LEAVE AT LEAST 2 INCHES OF CONCRETE COVER.
- SECURE RACEWAYS TO REINFORCING RODS TO PREVENT SAGGING OR SHIFTING DURING CONCRETE PLACEMENT.
- SPACE RACEWAYS LATERALLY TO PREVENT VOIDS IN CONCRETE.
- RUN CONDUIT LARGER THAN 1-INCH TRADE SIZE PARALLEL OR AT RIGHT ANGLES TO MAIN REINFORCEMENT. WHERE AT RIGHT ANGLES TO REINFORCEMENT, PLACE CONDUIT CLOSE TO SLAB SUPPORT.
- CHANGE FROM NONMETALLIC CONDUIT TO RIGID STEEL CONDUIT BEFORE RISING ABOVE FLOOR.

INSTALL EXPOSED RACEWAYS PARALLEL OR AT RIGHT ANGLES TO NEARBY SURFACES OR STRUCTURAL MEMBERS AND FOLLOW SURFACE CONTOURS AS MUCH AS POSSIBLE.
- RUN PARALLEL OR BANKED RACEWAYS TOGETHER ON COMMON SUPPORTS.
- MAKE PARALLEL BENDS IN PARALLEL OR BANKED RUNS. USE FACTORY ELBOWS ONLY WHERE ELBOWS CAN BE INSTALLED PARALLEL; OTHERWISE, PROVIDE FIELD BENDS FOR PARALLEL RACEWAYS.

JOIN RACEWAYS WITH FITTINGS DESIGNED AND APPROVED FOR THAT PURPOSE AND MAKE JOINTS TIGHT.
- USE INSULATING BUSHINGS TO PROTECT CONDUCTORS, IN ANY RACEWAY 1 ½" OR LARGER.

TERMINATIONS:
- WHERE RACEWAYS ARE TERMINATED WITH LOCKNUTS AND BUSHINGS, ALIGN RACEWAYS TO ENTER SQUARELY AND INSTALL LOCKNUTS WITH DISHED PART AGAINST BOX. USE TWO LOCKNUTS, ONE INSIDE AND ONE OUTSIDE BOX.
- WHERE RACEWAYS ARE TERMINATED WITH THREADED HUBS, SCREW RACEWAYS OR FITTINGS TIGHTLY INTO HUB SO END BEARS AGAINST WIRE PROTECTION SHOULDER. WHERE CHASE NIPPLES ARE USED, ALIGN RACEWAYS SO COUPLING IS SQUARE TO BOX; TIGHTEN CHASE NIPPLE SO NO THREADS ARE EXPOSED.

FLEXIBLE CONNECTIONS: USE MAXIMUM OF 72 INCHES OF FLEXIBLE CONDUIT FOR RECESSED AND SEMI RECESSED LIGHTING FIXTURES; FOR EQUIPMENT SUBJECT TO VIBRATION, NOISE TRANSMISSION, OR MOVEMENT; AND FOR ALL MOTORS. USE LFMC IN DAMP OR WET LOCATIONS. INSTALL SEPARATE GROUND CONDUCTOR ACROSS FLEXIBLE CONNECTIONS.

SURFACE RACEWAYS: INSTALL A SEPARATE, GREEN, GROUND CONDUCTOR IN RACEWAYS FROM JUNCTION BOX SUPPLYING RACEWAYS TO RECEPTACLE OR FIXTURE GROUND TERMINALS.

SET FLOOR BOXES LEVEL AND FLUSH WITH FINISHED FLOOR SURFACE.

SET FLOOR BOXES LEVEL. TRIM AFTER INSTALLATION TO FIT FLUSH WITH FINISHED FLOOR SURFACE.

INSTALL HINGED-COVER ENCLOSURES AND CABINETS PLUMB. SUPPORT AT EACH CORNER.

PROTECTION

PROVIDE FINAL PROTECTION AND MAINTAIN CONDITIONS THAT ENSURE COATINGS, FINISHES, AND CABINETS ARE WITHOUT DAMAGE OR DETERIORATION AT TIME OF SUBSTANTIAL COMPLETION.
- REPAIR DAMAGE TO GALVANIZED FINISHES WITH ZINC-RICH PAINT RECOMMENDED BY MANUFACTURER.
- REPAIR DAMAGE TO PVC OR PAINT FINISHES WITH MATCHING TOUCHUP COATING RECOMMENDED BY MANUFACTURER.

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