A. DESIGN CRITERIA

1. BUILDING CODE: INTERNATIONAL BUILDING CODE (IBC), 2009 EDITION, INCLUDING LOCAL SUPPLEMENTS, ASCE 7-98, & FEMA TORNADOE PERFORMANCE CRITIRIA

2. GRAVITY LOADS:

LOCATION	UNIFORM LIVE LOAD	CONCENTRATED LIVE LOAD	UNIFORM DEAD LOAD
ROOF	100 PSF	----------	75 PSF
GROUND SNOW	15 PSF	----------	--------
SLAB ON GRADE	100 PSF	2000 LB	---------

LIVE LOAD REDUCTION ON SUPPORTING ELEMENTS SHALL BE IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE (IBC), 2009 EDITION. NO LIVE LOAD REDUCTION OF ROOF LOADING IS PERMITTED. DRIFTING OF SNOW IN ACCORDANCE WITH CODE. UNIFORM DEAD LOAD IS ADDITIVE TO ACTUAL STRUCTURAL WEIGHTS.

3. LATERAL LOADS:

A. BASIC WIND SPEED SHALL BE 250 MPH. EXPOSURE C, I=1.0.

B. SEISMIC LOAD SHALL BE FOR ZONE 1.

Z=0.075 I=1.00 RW=8 Co=0.19 Cv=0.26 SOIL PROFILE TYPE=SE

B. SOIL PREPERATION AND FOUNDATIONS

1. A COPY OF THE SUBSURFACE GEOTECHNICAL REPORT IS AVAILABLE FOR INSPECTION AT THE ARCHITECTS PLACE OF BUSINESS.

2. SOIL SUPPORTED FOUNDATIONS:

A. DESIGN BEARING PRESSURE (NET) IS 2,500 PSF FOR FOUNDATIONS BEARING ON UNDISTURBED SOIL OR 1,500 PSF ON APPROVED ENGINEERED FILL MATERIAL. BEARING MATERIALS SHALL BE VERIFIED BY A LICENSED SOIL ENGINEER.

B. ALL FOUNDATIONS ARE DESIGNED WITH FORMED SIDES. IF EARTH FORMED SIDES ARE APPROVED BY THE ENGINEER, THE TOP 7 1/4" SHALL BE FORMED TO THE DESIGN DIMENSION AND ONE INCH SHALL BE ADDED TO EACH SIDE OF THE EARTH FORMED AREA TO PROVIDE ADEQUATE COVER OVER THE REINFORCING AT THE CONTRACTOR'S EXPENSE.

C. REINFORCING SHALL BE SUPPORTED FROM ABOVE OR WITH 3" SBP (WITH BOTTOM PLATE) AT 4'-0" CENTERS MAXIMUM FOR ALL FOUNDATION REINFORCING.

3. DO NOT BACKFILL FOUNDATION WALLS UNTIL THE RESTRAINING SLABS OR ADEQUATE BRACING ARE IN PLACE. ALL BACK FILL SHALL BE PLACED AND COMPACTED IN ACCORDANCE WITH THE SPECIFICATION.

4. EXTERIOR SLABS SHALL SLOPE AWAY FROM THE STRUCTURE A MINIMUM OF 1/4" PER FOOT UNLESS NOTED OTHERWISE.

C. CAST-IN-PLACE CONCRETE

1. ALL STRUCTURAL CONCRETE HAS BEEN DESIGNED IN ACCORDANCE WITH THE ACI 318-95 AND THE BUILDING CODE.

2. THE CONCRETE REQUIREMENTS ARE:

A. CEMENT SHALL BE TYPE I OR II CONFORMING TO ASTM C150

B. FINE AND COURSE AGGREGATES SHALL CONFORM TO ASTM C33.

C. MIX REQUIREMENTS ARE:

LOCATION	MIN. F'C PSI	MIN. F'CI PSI	MIN. CEM PCY	MAX. W/C RATIO	AIR ENT.
FOUNDATIONS	4000	N/A	470	0.50	5%+/-1%
GRADE BEAMS	4000	N/A	470	0.50	5%+/-1%
INTERIOR SLAB*	4000	N/A	564	0.50	NR

* SLAB ON GRADE SHALL HAVE A FLEXURAL STRENGTH OF 650 PSI

D. CONCRETE CLEAR COVER OVER REINFORCING SHALL BE IN ACCORDANCE WITH ACI 318-95, AS LISTED BELOW, UNLESS NOTED OTHERWISE.

LOCATION	CLEAR COVER INCHES
CAST AGAINST EARTH	3
EXPOSED TO EARTH OR WEATHER #6 AND LARGER	2
EXPOSED TO EARTH OR WEATHER #5 AND SMALLER	1 1/2
SLABS AND WALLS NOT EXPOSED TO WEATHER	3/4
BEAMS AND COLUMNS NOT EXPOSED TO WEATHER	1 1/2
SLABS ON GRADE (OVER FROM TOP OF SLAB)	1 1/2

3. CONCRETE REINFORCING SHALL MEET THE FOLLOWING

A. REINFORCING BARS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A615 GRADE 60. REINFORCING BARS REQUIRED TO BE WELDED SHALL CONFORM TO THE REQUIREMENTS OF ASTM A706 GRADE 60. WELDING OF REINFORCING OTHER THAN SPECIFIED IS PROHIBITED.

B. WELDED WIRE FABRIC SHALL CONFORM TO THE REQUIREMENTS OF ASTM A185.

C. ALL REINFORCNIG SHALL BE CONTINUOUS. CONTINUOUS BARS SHALL LAP IN ACCORDANCE WITH TABLE A UNLESS NOTED OTHERWISE. PROVIDE BENT BARS AT ALL CORNERS.

D. WELDED WIRE FABRIC SHALL LAP ONE FULL SQUARE PLUS 2".

E. SHOP DRAWINGS SHALL BE SUBMITTED WITH REINFORCING STEEL DETAILED IN ACCORDANCE WITH ACI 315.

4. FORMING AND EMBEDMENTS SHALL MEET THE FOLLOWING:

A. ALL EXPOSED EDGES OF CONCRETE SHALL BE CHAMFERED ¾" INSIDE FORMS OR TOOLED TO ¾" RAD., UNLESS NOTED OTHERWISE.

B. SLABS ON GRADE SHALL HAVE CONSTRUCTION JOINTS AND CONTROL JOINTS (SAW JOINTS). LOCATED AS SHOWN ON THE DRAWINGS. CONTRACTOR SHALL LOCATE SLAB JOINTS ON SHOP DRAWINGS.

C. WHERE NECESSARY, VERTICAL CONSTRUCTION JOINTS SHALL BE LOCATED AT MIDSPAN. ALL JOINTS SHALL BE THOROUGHLY CLEANED AND PURPOSELY ROUGHENED TO ¼" PRIOR TO PLACING ADJACENT CONCRETE.

D. THE CONTRACTOR SHALL BE RESPONSIBLE FOR THE DESIGN OF ALL FORMING. TEMPORARY BRACING AND SHORING.

E. NO ALUMINUM SHALL BE EMBEDDED IN CONCRETE. CONDUITS AND PIPING EMBEDDED IN CONCRETE SHALL BE SPACED A MINIMUM OF FOUR DIAMETERS AND THE OUTSIDE DIAMETER SHALL BE LESS THAN 30% OF THE MEMBER THICKNESS PLACED BETWEEN LAYERS OF REINFORCING.

D. PRECAST CONCRETE

1. ALL PRECAST CONCRETE PRODUCTS SHALL BE DESIGNED IN ACCORDANCE WITH THE BUILDING CODE, ACI 318-95 AND PCI DESIGN HANDBOOK, FIFTH EDITION. SHOP DRAWINGS AND CALCULATIONS OF PRECAST PRODUCTS AND CONNECTIONS SHALL BE SUBMITTED BEARING THE SEAL OF AN ENGINEER REGISTERED IN THE STATE WHERE THE PROJECT IS LOCATED. PRECAST SUPPLIER SHALL BE CERTIFIED BY PCI.

2. ADDITIONAL DESIGN REQUIREMENTS ARE:

A. BEARING PADS SHALL BE DESIGNED AND SUPPLIED BY THE PRECAST MANUFACTURER TO ABSORB ALL REQUIRED MOVEMENT WITHOUT SUPPORT. THE MINIMUM THICKNESS OF BEARING PADS SHALL BE ¼" UNLESS NOTED OTHERWISE. BEARING PADS SHALL BE LOCATED A MINIMUM OF ½" AWAY FROM THE FACE OF THE SUPPORT.

B. MEMBERS SHALL NOT BE REMOVED FROM THE FORMS UNTIL THE CONCRETE HAS REACHED SUFFICIENT STRENGTH TO RESIST REMOVAL WITHOUT DAMAGE. IN NO CASE, SHALL PRECAST MEMBERS BE REMOVED PRIOR TO ATTAINING A MINIMUM COMPRESSIVE STRENGTH OF 2,500 PSI.

C. PRECAST MEMBERS AND THEIR CONNECTIONS SHALL BE DESIGNED FOR THE LOADS SHOWN ON THE DRAWINGS, IN ADDITION TO THE SELF WEIGHT OF THE MEMBER AND FOR ALL THE CONDITIONS NOTED IN ACI 318-95. CONNECTIONS SHALL BE DESIGNED FOR FORCES AND MOVEMENTS DUE TO VOLUMETRIC CHANGES RESULTING FROM TEMPERATURE CHANGE. ELASTIC DEFORMATIONS, CREEP AND SHRINKAGE. BEAM TO BEAM AND BEAM TO COLUMN CONNECTIONS SHALL BE DESIGNED FOR A MINIMUM ULTIMATE FORCE (HORIZONTAL SHEAR OR TENSION) OF 6 KIPS.

D. ALL COLUMNS AND WALL PANELS SUPPORTED ON FOUNDATIONS, SHALL HAVE THE HORIZONTAL JOINT GROUTED WITH A NON-SHRINK GROUT WHICH HAS A COMPRESSIVE STRENGTH AT 28 DAYS EQUAL TO OR GREATER THAN THAT OF THE SUPPORTED MEMBER.

E. FLOOR AND ROOF MEMBERS SHALL BE CONNECTED TO ADJACENT MEMBERS WITH WELDED SIDE ANCHORS SPACED AT 10'-0" CENTERS MAXIMUM, AND A MINIMUM OF TWO ANCHORS PER MEMBER ON EACH SIDE UNLESS NOTED OTHERWISE.

3. MATERIALS SHALL MEET THE FOLLOWING REQUIREMENTS:

CONCRETE	MIN F'C PSI	MIN CMT FAC	MAX W/C RAT	AIR ENT.
EXTERIOR WALL PANELS	5000	470	0.50	4%+/-1%
ROOF TEES	5000	470	0.50	NR

REINFORCING	ASTM GRADE
REINFORCING BARS	A615 60
WELDABLE REINFORCING BARS	A706 60
WELDED WIRE FABRIC	A185 60

E. MASONRY

1. ALL MASONRY HAS BEEN DESIGNED BASED ON ALL MASONRY RECEIVING SPECIAL FIELD INSPECTION.

2. CONCRETE MASONRY UNITS (CMU) MATERIALS SHALL BE:

A. ALL CONCRETE MASONRY UNITS (CMU) SHALL BE TWO CELL LIGHTWEIGHT AGGREGATE UNITS WITH A SPECIFIED MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI ON NET ARE (1000 PSI ON GROSS ARE) AT 28 DAYS CONFORMING TO ASTM C90. CMU LOCATED BELOW GRADE, SHALL BE NORMAL WEIGHT AGGREGATE UNITS.

B. ALL MORTAR SHALL BE TYPE "S" OR "M" WITH A MINIMUM MORTAR COMPRESSIVE STRENGTH OF 1800 PSI AT 28 DAYS CONFORMING TO ASTM C270. THE MINIMUM COMPRESSIVE STRENGTH (f'm) OF A PRISM ASSEMBLED OF CMU AND MORTAR SHALL BE 1350 PSI AT 28 DAYS ON THE NET AREA.

C. GROUT SHALL CONFORM TO ASTM C476 WITH 3/8" AGGREGATED WITH THE FOLLOWING REQUIREMENTS.

	MIN F'C PSI	MIN CMT PCY	MAX W/C RATIO	AIR ENT
CMU GROUT	3000	611	0.65	NR

D. REINFORCING STEEL SHALL MEET THE REQUIREMENTS OF ASTM A615, GR 60

E. JOINT REINFORCING STEEL SHALL MEET THE REQUIREMENTS OF ASTM A82 WIRE WITH A MINIMUM YIELD GREATER THAN 70 KSI. LONGITUDINAL WIRES SHALL BE 9 CA (0.1483" DIA) WITH TRUSS TYPE WIRES CONNECTED AT 16" CENTERS. REINFORCING SHALL BE MILL GALVANIZED PER ASTM A641, CLASS 3.

3. HORIZONTAL WALL REINFORCING

A. PROVIDE BOND BEAM COURSES IN ALL WALLS AT THE TOP OF WALL OR PARAPET. AT FLOOR LEVELS (ABOVE GRADE) AT TOP OF OPENINGS OR IMMEDIATELY AVOBE LINTELS, BELOW OPENINGS AND AT BEARING LOCATIONS. BOND BEAMS SHALL BE REINFORCED AS FOLLOWS:

WALL TYPE	BOND BEAM REINF
8" CMU	2-#5

ALL INTERIOR STRUCTURAL WALLS (SHEAR AND/OR BEARING) SHALL HAVE INTERMEDIATE BOND BEAMS LOCATED AT THE SAME LEVELS AS EXTERIOR BOND BEAMS.

B. PROVIDE BOND BEAMS AT INTERMEDIATE LOCATIONS IN EVERY SIXTH COURSE (@ 4'-0" CENTERS)

4. VERTICAL REINFORCING

A. PROVIDE AN ADDITIONAL VERTICAL REINFORCING BAR WITH DOWELS INTO SUPPORTING MEMBERS WITH SAME SIZE AND LENGTH AS THE NORMAL REINFORCING BAR AT THE FOLLOWING LOCATIONS.

1. ON EACH SIDE OF A CONTROL OF ISOLATION JOINT
2. AT INTERSECTION OF WALLS
3. EACH SIDE OF A WALL OPENING
4. AT EACH END OF WALL
5. AT EACH BEAM BEARING

B. VERTICAL REINFORCING SHALL EXTEND CONTINUOUSLY FROM THE TOP OF THE SUPPORTING MEMBER TO EMBED AT LEAST 6" INTO THE TOP BOND BEAM. THERE SHALL BE A DOWEL CAST INTEGRAL WITH THE SUPPORTING MEMBER FOR EACH VERTICAL REINFORCING BAR EXCEPT AS NOTED.

5. REINFORCING SHALL MEET THE FOLLOWING LAP, SPLICE AND EMBEDMENT REQUIREMENTS.

REINF. BAR SIZE	LAP OR SPLICE LENGTH IN WALL	FOUNDATION EMBEDMENT WITH HOOK INTO FOUND.	DOWELS STRAIGHT EMBEDMENT INTO FOUND.
JOINT	16"	N/A	N/A
4	24"	8"	15"
5	25"	10"	19"

HOOKS IF USED SHALL BE ACI STANDARD HOOKS

6. INTERMEDIATE REINFORCING SHALL BE DISCONTINUOUS AT CONTROL JOINTS. REINFORCEMENT IN BOND BEAMS AT FLOOR AND ROOF DIAPHRAGM LEVELS SHALL BE CONTINUOUS.

7. BARS AROUND PERIMETER OF OPENINGS SHALL EXTEND NOT LESS THAT 40 BAR DIAMETERS OR 24" , WHICHEVER IS LARGER, BEYOND THE CORNER OF THE OPENING. VERTICAL JAMB BARS SHALL BE THE SAME SIZE AND NUMBER AS THE NORMAL VERTICAL REINFORCING. FOUNDATION DOWELS ARE ONLY

F. STRUCTURAL WOOD

1. ALL WOOD PRODUCTS IN DIRECT CONTACT WITH THE CONCRETE SHALL BE PRESSURE TREATED PER SPECIFICATION.

2. CONNECTIONS SHALL MEET THE FOLLOWING REQUIREMENTS:

A. ALL BOLTS SHALL BE ASTM A307. OVERSIZED WASHERS SHALL BE USED BETWEEN THE HEAD OR NUT.

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JEFFERSON COUNTY
FULTONDALE STORM SHELTER
FULTONDALE, ALABAMA

NO.	DESCRIPTION	DATE

DRAWN : GLS
CHECKED : GLS
DATE : 1-19-17
JOB NO : 15-211
SHEET :
S2

STRUCTURAL NOTES
NTS

File Name n:\jobs\2015\15-211\15-211 Safe Room.dwg