1. GENERAL INFORMATION

A. GOVERNING BUILDING CODE: 2015 INTERNATIONAL BUILDING CODE (IBC-2015).

B. BUILDING RISK CATEGORY: THE BUILDING RISK CATEGORY ACCORDING TO IBC-2015 TABLE 1604.5 AND ASCE 7-10 TABLE 1.5-1 IS CATEGORY II.

C. ELEVATIONS: REFERENCE FINISHED FLOOR ELEVATIONS OF 100'-0" EQUALS ACTUAL EXISTING FINISH FLOOR ELEVATION OF 1269.125'.

D. CONTRACT DOCUMENTS:

1) THE CONTRACT DOCUMENTS CONSIST OF THE AGREEMENT BETWEEN THE OWNER AND CONTRACTOR, CONDITIONS OF THE CONTRACT, DRAWINGS, SPECIFICATIONS, ADDENDA ISSUED PRIOR TO EXECUTION OF THE CONTRACT, OTHER DOCUMENTS LISTED IN THE AGREEMENT AND MODIFICATIONS ISSUED AFTER EXECUTION OF THE CONTRACT.

2) THE GENERAL CONTRACTOR IS RESPONSIBLE FOR OBTAINING AND DISSEMINATING ALL CONTRACT DOCUMENTS AND LATEST ADDENDA TO ALL SUB-CONTRACTORS PRIOR TO DETAILING, FABRICATION OR INSTALLATION OF WORK.

3) CORRELATION OF THE CONTRACT DOCUMENTS: THE CONTRACT DOCUMENTS ARE COMPLEMENTARY, AND WHAT IS REQUIRED BY ONE SHALL BE AS BINDING AS IF REQUIRED BY ALL. IF CONFLICTING REQUIREMENTS ARE FOUND BETWEEN THE DRAWINGS, SPECIFICATIONS AND/OR THESE GENERAL NOTES, THE MORE STRINGENT AND HIGHEST COST REQUIREMENT SHALL CONTROL UNLESS DIRECTED OTHERWISE IN WRITING BY THE OWNER'S REPRESENTATIVE.

4) THE GENERAL CONTRACTOR SHALL COMPARE THE ARCHITECTURAL AND STRUCTURAL DRAWINGS FOR DISCREPANCIES BETWEEN EACH SET, AND WITHIN EACH SET OF DRAWINGS, AND REPORT DISCREPANCIES, IF ANY, TO THE OWNER'S REPRESENTATIVE PRIOR TO THE DETAILING, FABRICATION AND INSTALLATION OF AFFECTED WORK.

5) GENERAL CONTRACTOR SHALL COORDINATE SIZES AND LOCATIONS OF OPENINGS THROUGH FLOORS, ROOF, AND WALLS SHOWN ON ELECTRICAL, PLUMBING, AND FIRE SUPPRESSION SYSTEM DESIGN DOCUMENTS WITH ASSOCIATED SUBCONTRACTORS.

6) ALTHOUGH NOT NECESSARILY SPECIFICALLY REFERENCED IN THE CONTRACT DOCUMENTS, TYPICAL DETAILS AND GENERAL NOTES APPLY TO THE ENTIRE PROJECT WHEREVER CONDITIONS SIMILAR TO THOSE DETAILED OR NOTED EXIST.

7) THE USE OF ELECTRONIC FILES OR REPRODUCTION OF CONTRACT DOCUMENTS BY ANY TRADE OR MATERIAL SUPPLIER IN LIEU OF COMPLETELY INDEPENDENT PREPARATION OF SHOP DRAWINGS SIGNIFIES THE SUPPLIER'S CERTIFICATION THAT ALL INFORMATION SHOWN IN THE SHOP DRAWINGS IS CORRECT, AND ASSIGNS THEMSELVES TO RESPONSIBILITY FOR ANY JOB EXPENSE ARISING DUE TO ANY ERRORS OCCURRING THEREIN.

2. SHELTER DESIGN LOADS

A. DEAD LOAD: SELF WEIGHT OF MATERIALS, UNLESS NOTED OTHERWISE

B. ROOF DEAD LOAD:
1) BUILT UP ROOFING SYSTEM......................................6 PSF
2) RIGID INSULATION..2 PSF
3) CONCRETE DECK (4" NW CONC ON 2" COMP. DECK - 6" TOTAL)......63 PSF
4) STEEL BEAMS...7 PSF
5) MISC (MEP, CEILING, ETC.)...................................7 PSF
6) TOTAL..85 PSF

C. UNIFORM LIVE LOADS:
1) ROOF LIVE LOAD (UNREDUCIBLE)..............................100 PSF

D. CONCENTRATED LIVE LOADS:
1) ROOFS (ON AN AREA 2.5 FT. X 2.5 FT.)......................300 LBS

E. WIND LOADS:
1) GOVERNING CODE:......................................ICC 500-2014
2) EXPOSURE CATEGORY:..C
3) INTERNAL PRESSURE COEFFICIENT, GCPI:....... ....+/- 0.55
4) TOPOGRAPHIC FACTOR, KZT:......................................1.0
5) DIRECTIONALITY FACTOR, KD:....................................1.0
6) ULTIMATE DESIGN WIND SPEED, Vult:..........................250 MPH

F. SNOW LOADS:
1) GOVERNING CODE:...ASCE 7-10
2) SNOW IMPORTANCE FACTOR, Is:...................................1.1
3) GROUND SNOW LOAD, Pg:......................................10 PSF
4) EXPOSURE OF ROOF: ....PARTIALLY EXPOSED
5) EXPOSURE FACTOR, Ce:..1.0
6) THERMAL FACTOR, Ct:...1.0
7) ROOF SLOPE FACTOR, Cs:..1.0
8) CALCULATED FLAT ROOF SNOW LOAD, Pf:........................7.7 PSF
9) MINIMUM FLAT ROOF SNOW LOAD, I*Pg:..........................11 PSF
10) RAIN ON SNOW SURCHARGE LOAD:................................5 PSF

G. RAIN LOADS:
1) GOVERNING CODE:...ASCE 7-10
2) DEPTH OF WATER ON THE UNDEFLECTED ROOF UP TO THE INLET OF THE SECONDARY DRAINAGE SYSTEM WHEN THE PRIMARY DRAINAGE SYSTEM IS BLOCKED (I.E., THE STATIC HEAD), ds....................4.0 INCHES
3) ADDITIONAL DEPTH OF WATER ON THE UNDEFLECTED ROOF ABOVE THE INLET OF THE SECONDARY DRAINAGE SYSTEM AT ITS DESIGN FLOW (I.E., THE HYDRAULIC HEAD), dh..................................2.0 INCHES

H. SEISMIC DESIGN CRITERIA: (INFORMATION TBD FROM SITE SPECIFIC GEOTECHNICAL REPORT)
1) GOVERNING CODE:...ASCE 7-10
2) SEISMIC IMPORTANCE FACTOR, Ie:...............................1.25
3) SOIL SITE CLASSIFICATION:.....................................TBD
4) 0.2 SEC. MAPPED SPECTRAL ACCELERATION, Ss:..................0.272
5) 1.0 SEC. MAPPED SPECTRAL ACCELERATION, S1:..................0.079
6) SITE COEFFICIENT, 0.2 SEC. PERIOD, Fa:........................TBD
7) SITE COEFFICIENT, 1.0 SEC. PERIOD, Fv:........................TBD
8) 0.2 SEC. DESIGN SPECTRAL ACCELERATION, Sds:...................TBD
9) 1.0 SEC. DESIGN SPECTRAL ACCELERATION, Sd1:...................TBD
10) SEISMIC DESIGN CATEGORY:.....................................TBD
11) SEISMIC PARAMETERS FOR BUILDING:
A) SEISMIC FORCE RESISTING SYSTEM: ORDINARY REINFORCED CONCRETE SHEAR WALLS.
B) RESPONSE MODIFICATION COEFFICIENT, R:.....................4.00
C) SYSTEM OVERSTRENGTH FACTOR, O:............................2.50
D) DEFLECTION AMPLIFICATION FACTOR, Cd:......................4.00
E) ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE METHOD.
F) SEISMIC RESPONSE COEFFICIENT, Cs:..........................TBD
G) TOTAL LATERAL BASE SHEAR, V:...............................TBD

3. MATERIAL DESIGN VALUES

A. CONCRETE (MINIMUM ULTIMATE COMPRESSIVE STRENGTH AT 28 DAYS, NORMAL WEIGHT U.N.O.)
1) FOUNDATIONS:...3,500 PSI
2) SLABS:...4,000 PSI
3) WALLS:...4,000 PSI
4) ALL OTHER STRUCTURAL CONCRETE, U.N.O:..................4,000 PSI

B. REINFORCED CONCRETE MASONRY
1) DETERMINATION OF COMPRESSIVE STRENGTH:........UNIT STRENGTH METHOD
2) DESIGN COMPRESSIVE STRENGTH OF CONCRETE MASONRY, f'm:....2,000 PSI
3) NET AREA COMPRESSIVE STRENGTH OF CONCRETE MASONRY UNITS (ASTM C90)..2,000 PSI
4) MORTAR (ASTM C270, PROPORTION SPECIFICATION, TYPE S).....1,800 PSI
5) GROUT (ASTM C476, PROPORTION SPECIFICATION)..............2,000 PSI

C. CONCRETE AND MASONRY REINFORCEMENT (MINIMUM YIELD STRENGTH)
1) ALL PLAIN AND DEFORMED BARS (ASTM A615, GRADE 60)......FY = 60 KSI
2) WELDABLE REINFORCING BARS (ASTM A706) ....FY = 60 KSI

D. STRUCTURAL STEEL (MINIMUM YIELD STRENGTH)
1) ALL WIDE FLANGE SHAPES (ASTM A992)....................FY = 50 KSI
2) SQUARE AND RECTANGULAR HSS (ASTM A500, GRADE C)........FY = 50 KSI
3) ANCHOR RODS (ASTM F1554, GRADE 105)...................FY = 105 KSI
4) DEFORMED BAR ANCHORS (AWS D1.1 TYPE C, ASTM A496)......FY = 70 KSI
5) HEADED STUD ANCHORS (AWS D1.1 TYPE B, ASTM A29, GRADES 1010 THROUGH 1020)...FY = 51 KSI
6) ALL OTHER SHAPES AND PLATES UNLESS NOTED (ASTM A36)....FY = 36 KSI

E. COLD FORMED STEEL (MINIMUM YIELD STRENGTH)
1) ROOF DECK (ASTM A653, SS GRADE 33, G-60 GALVANIZED)....FY = 33 KSI
2) COMPOSITE DECK (ASTM A653, SS GRADE 40, G-60 GALV.)....FY = 40 KSI
3) COLD FORMED METAL STUDS, 43 MIL AND LIGHTER (ASTM A1003/A, GRADE ST33H, G-60 GALVANIZED)...............................FY = 33 KSI
4) COLD FORMED METAL STUDS, 54 MIL AND HEAVIER (ASTM A1003/A, GRADE ST50H, G-60 GALVANIZED)...............................FY = 50 KSI
5) COLD FORMED METAL CLIPS (ASTM A653, SS GRADE 50,G-90 GALVANIZED)...FY = 50 KSI

4. CONSTRUCTION LOADS AND STABILITY

A. THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL TEMPORARY CONSTRUCTION LOADS CAN BE SAFELY SUPPORTED BY THE STRUCTURE DURING CONSTRUCTION.

B. THE STRUCTURAL FRAMING SYSTEM AND FOUNDATIONS HAVE BEEN DESIGNED AS A COMPLETE STRUCTURAL SYSTEM FOR SUPPORT OF THE LOADS INDICATED IN THE CONSTRUCTION DOCUMENTS. THE STRUCTURE HAS NOT BEEN DESIGNED OR CHECKED FOR TEMPORARY CONSTRUCTION LOADS NOR HAS IT BEEN DESIGNED OR CHECKED FOR ADEQUACY OR STABILITY AS A PARTIALLY ERECTED STRUCTURE.

C. THE CONTRACTOR SHALL BE RESPONSIBLE FOR CONFIRMING THE ABILITY OF THE PARTIALLY COMPLETED OR FULLY COMPLETED STRUCTURE TO RESIST ALL CONSTRUCTION LOADS INCLUDING BUT ARE NOT NECESSARILY LIMITED TO MATERIAL STAGING, PERSONNEL, AND EQUIPMENT.

D. THE CONTRACTOR SHALL PROVIDE TEMPORARY SHORES, GUYS, BRACES, AND OTHER SUPPORTS DURING CONSTRUCTION TO KEEP STRUCTURAL FRAMING COMPONENTS SECURE, PLUMB, AND IN ALIGNMENT AGAINST TEMPORARY CONSTRUCTION LOADS AND LOADS EQUAL IN INTENSITY TO DESIGN LOADS. THE TEMPORARY SUPPORTS SHALL BE SUFFICIENT TO SECURE THE PARTIALLY ERECTED STRUCTURE OR ANY PORTION THEREOF AGAINST LOADS THAT ARE LIKELY TO BE ENCOUNTERED DURING CONSTRUCTION, INCLUDING THOSE DUE TO WIND AND THOSE THAT RESULT FROM CONSTRUCTION OPERATIONS.

E. THE CONTRACTOR SHALL NOT REMOVE TEMPORARY SUPPORTS UNTIL THE INSTALLATION OF ALL STRUCTURAL ELEMENTS IS COMPLETE. FOR THE PURPOSES OF THIS PARAGRAPH, "ALL STRUCTURAL ELEMENTS" INCLUDES, BUT IS NOT NECESSARILY LIMITED TO, THE FOLLOWING STRUCTURAL ELEMENTS:
1) FOUNDATIONS
2) STRUCTURAL STEEL FRAMING WITH COMPLETED STEEL CONNECTIONS, INCLUDING PERMANENT VERTICAL AND/OR HORIZONTAL BRACING
3) STEEL JOISTS INCLUDING JOIST BRIDGING
4) ROOF DECK

NOTE:
FOUNDATION NOTES ARE PRELIMINARY UNTIL A SITE SPECIFIC GEOTECHNICAL REPORT IS RECEIVED.

5. FOUNDATION NOTES

A. GEOTECHNICAL REPORT: A SITE SPECIFIC GEOTECHNICAL ENGINEERING SERVICES REPORT FOR THE NEW SHELTER ADDITION AT KELLEY ELEMENTARY SCHOOL, IN MOORE, OKLAHOMA WAS YET TO BE PERFORMED/RECEIVED. THE FOLLOWING NOTES ARE PRELIMINARY AND UPON RECEIPT OF SITE SPECIFIC GEOTECHNICAL REPORT THESE NOTES SHALL BE REVISED.

B. SITE SUB-GRADE PREPARATION:

1) STRIPPING: VEGETATION, CONCRETE, DELETERIOUS MATERIALS, AND SOFT AND LOOSE SOIL IN THE CONSTRUCTION AREAS, SHALL BE STRIPPED FROM THE SITE. THE DEPTH OF REMOVAL SHALL BE DETERMINED BY A REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER AT THE TIME OF CONSTRUCTION. UTILITIES SHALL BE LOCATED AND REROUTED AS NECESSARY.

2) UNDERCUTTING: AFTER STRIPPING AND MAKING ANY REQUIRED CUTS, THE BUILDING PAD SHALL BE UNDERCUT TO A MINIMUM OF 2'-0" AND REPLACED WITH LOW VOLUME CHANGE STRUCTURAL FILL AS OUTLINED BELOW.

3) PROOF-ROLLING: AFTER STRIPPING AND UNDERCUTTING, BUT BEFORE PLACING FILL,THE CONSTRUCTION AREA SHALL BE PROOF-ROLLED WITH A TANDEM AXLE DUMP TRUCK WEIGHING ATLEAST 25 TONS. THE PROOFROLLING SHOULD INVOLVE OVERLAPPING PASSES IN MUTUALLY PERPENDICULAR DIRECTIONS AND SOILS WHICH ARE OBSERVED TO RUT OR DEFLECT EXCESSIVELY UNDER THE MOVING LOAD SHALL BE UNDERCUT AND RECOMPACTED IN PLACE OR REPLACED WITH PROPERLY COMPACTED ENGINEERED FILL. THE RECOMPACTED SOIL OR STRUCTURAL FILL SHALL BE MOISTURE CONDITIONED DURING PLACEMENT. THE PROOF-ROLLING AND UNDERCUTTING ACTIVITIES SHALL BE WITNESSED BY A REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER AND SHALL BE PERFORMED DURING A PERIOD OF DRY WEATHER.

4) SCARIFICATION: AFTER STRIPPING, UNDERCUTTING AND PROOF ROLLING, BUT BEFORE FILL PLACEMENT, THE EXPOSED SOILS SHALL BE SCARIFIED TO A MINIMUM DEPTH OF 8 INCHES AND THEN PROCESSED AT A MOISTURE CONTENT AT OR ABOVE ITS OPTIMUM VALUE AS DETERMINED BY THE STANDARD PROCTOR TEST. THE SUBGRADE SOILS SHALL BE RECOMPACTED TO AT LEAST 95 PERCENT OF ITS MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR TEST METHOD (ASTM D-698).

5) ACCEPTABLE FILL: STRUCTURAL FILL MATERIALS SHALL BE FREE OF ORGANIC OR OTHER DELETERIOUS MATERIAL, HAVE A MAXIMUM PARTICLE SIZE OF 3 INCHES, HAVE A LIQUID LIMIT NOT MORE THAN 35, A PLASTICITY INDEX IN THE RANGE OF 5 AND 18 AND FINE MATERIAL PASSING THE NO. 200 SEIVE NOT LESS THAN 60%.

6) FILL PLACEMENT: FILL SHALL BE PLACED IN MAXIMUM LIFTS OF 8 INCHES OF LOOSE MATERIAL AND SHALL BE COMPACTED WITHIN THE RANGE OF 2 PERCENTAGE POINTS BELOW AND 3 PERCENTAGE POINTS ABOVE THE OPTIMUM MOISTURE CONTENT. EACH LIFT OF COMPACTED ENGINEERED FILL SHALL BE TESTED BY A REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF SUBSEQUENT LIFTS. THE EDGES OF COMPACTED FILL SHALL EXTEND 1 FOOT LATERALLY BEYOND THE BUILDING FOOTPRINT FOR EACH FOOT OF FILL REQUIRED. STRUCTURAL FILL SHALL BE COMPACTED TO AT LEAST 95 PERCENT OF STANDARD PROCTOR MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698.

7) DEPTH OF FILL: FOOTINGS SHALL BE SUPPORTED ON NATIVE SOILS OR STRUCTURAL FILL. GROUND FLOOR SLABS SHALL BE GRADE SUPPORTED ON 2'-0" OF COMPACTED STRUCTURAL FILL PLACED AS DESCRIBED ABOVE.

8) FILL PLACEMENT TESTING: EACH LIFT OF COMPACTED FILL SHALL BE TESTED BY A GEOTECHNICAL ENGINEER PRIOR TO PLACEMENT OF SUBSEQUENT LIFTS. FIELD DENSITY TESTS SHALL BE TAKEN AT A MINIMUM OF ONE PER EVERY 2500 SF, BUT AT LEAST THREE SETS OF DENSITY TESTS SHALL BE TAKEN FOR EACH LIFT.

9) SITE DRAINAGE: GRADING OF THE SITE AROUND THE STRUCTURE'S PADS SHALL BE ACCOMPLISHED TO ENABLE POSITIVE DRAINAGE AWAY FROM THE PADS BY PROVIDING AN ADEQUATE GRADIENT. THE SURFACE GRADIENT PROVIDED WILL BE DEPENDENT ON THE LANDSCAPING TYPE AND VEGETATION. WATER INFILTRATION AND SEEPAGE INTO THE FOUNDATION SHALL BE REDUCED AS MUCH AS POSSIBLE. IF IT IS POSSIBLE FOR WATER TO COLLECT BENEATH THE FOUNDATION AND FOUNDATION AREAS, IT WILL BE NECESSARY TO USE INTERCEPTOR DRAINS TO REMOVE THE COLLECTED WATER.

10) MAINTENANCE OF SOIL MOISTURE: SOIL MOISTURE SHALL BE MAINTAINED UP UNTIL CONCRETE PLACEMENT TO PREVENT SHRINKAGE AND SUBSEQUENT POST-CONSTRUCTION SWELL OF SUBGRADE SOILS.

C. DRILLED PIER FOUNDATIONS:

1) PIER DESIGN PARAMETERS: THE PROPOSED SHELTER SHALL BE SUPPORTED ON DRILLED PIER FOUNDATIONS BASED ON THE FOLLOWING DESIGN PARAMETERS:
A) BEARING STRATUM: BEDROCK
B) ALLOWABLE END BEARING PRESSURE: 15,000 PSF
C) ALLOWABLE SKIN FRICTION (DOWNWARD LOADS): 1,000 PSF

2) MINIMUM EMBEDMENT: DRILLED SHAFTS SHALL BEAR A MINIMUM OF 3 FEET OR ONE PIER DIAMETERS INTO THE BEARING STRATUM INDICATED ABOVE. SKIN FRICTION IS BASED UPON THE ACTUAL PORTION OF DRILLED PIER EMBEDDED MORE THAN 3 FEET INTO THE BEARING STRATUM.

3) EXPECTED SETTLEMENT: PROPERLY CONSTRUCTED PIERS BEARING IN THE UNDERLYING WEATHERED SHALE BEDROCK ARE EXPECTED TO EXPERIENCE TOTAL MAXIMUM SETTLEMENTS ON THE ORDER OF 1/2 INCH.

4) CASING REQUIREMENTS: TEMPORARY CASING MAY BE REQUIRED IN ORDER TO SEAL OUT GROUNDWATER OR SLOUGHING SOILS, HOWEVER THE FINAL DETERMINATION SHALL BE MADE AT THE TIME OF CONSTRUCTION.
A) THE CONTRACTOR SHALL PROVIDE UNIT PRICING TO ADD THE COST OF EACH LINEAL FOOT OF CASING FOR EACH PIER DIAMETER IN THE EVENT CASINGS ARE REQUIRED. UNIT LENGTHS OF CASING SHALL BE FROM DETAILED TOP OF PIER ELEVATION TO TOP OF BEARING STRATUM ELEVATION.
B) THE CONTRACTOR SHALL PROVIDE UNIT PRICING FOR THE COST OF ABANDONED CASINGS THAT CANNOT BE REMOVED FOR REASONS BEYOND THE CONTROL OF THE CONTRACTOR.

5) PIER LENGTHS AND BIDDING CONSIDERATIONS: TOP OF PIER ELEVATIONS SHOWN IN THE DRAWINGS ARE RELATIVE TO A REFERENCE FINISHED FLOOR ELEVATION OF 100'-0". THE OVERALL PIER LENGTHS INDICATED IN THE PLAN ARE APPROXIMATE AND ARE BASED ON ESTIMATED CONTOURS DEVELOPED FROM THE BEARING STRATA DETERMINED FROM THE GEOTECHNICAL REPORT BORING LOGS. ACTUAL PIER LENGTHS MAY VARY AS UNDULATIONS IN THE BEARING STRATA ELEVATION ARE ENCOUNTERED. LENGTH OF PIERS SHALL BE DETERMINED ONCE THE MINIMUM EMBEDMENT INTO THE SPECIFIED BEARING STRATA IS ACHIEVED. THE CONTRACTOR SHALL PROVIDE ADD/DEDUCT UNIT PRICING FOR ALL PIER SIZES SHOWN.

6) PIER CONSTRUCTION:
A) THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING ALL EXISTING UTILITIES, BOTH CHARTED AND UNCHARTED, PRIOR TO COMMENCING WITH EXCAVATION OR PIER DRILLING OPERATIONS AND SHALL IMMEDIATELY NOTIFY THE OWNER'S REPRESENTATIVE OF ANY POTENTIAL CONFLICTS BETWEEN EXISTING CONDITIONS AND PLANNED CONSTRUCTION.
B) SOFT OR LOOSE SOIL ZONES ENCOUNTERED AT THE BEARING LEVEL SHALL BE REMOVED FROM THE DRILLED SHAFTS. IF THE EXPOSED BEARING MATERIALS BECOME SIGNIFICANTLY WET OR DRY, THEY SHALL BE DEEPENED UNTIL MORE UNIFORM MOISTURE CONDITIONS ARE ACHIEVED AS DIRECTED BY THE GEOTECHNICAL ENGINEER.
C) CONCRETE FOR PIERS SHALL BE CAST AS SOON AS PRACTICAL AFTER DRILLING. IN GENERAL, NO PIER HOLE SHALL BE LEFT OPEN OVERNIGHT. IF THE PIERS ARE LEFT OPEN OVERNIGHT OR LONGER, THE PIER DRILLING CONTRACTOR SHALL DEEPEN PIERS A MINIMUM OF ONE PIER DIAMETER AT THE CONTRACTOR'S EXPENSE.
D) CONCRETE PLACEMENT FOR PIERS:
(i) PIERS WITH A DIAMETER LESS THAN 30-INCHES SHALL BE DEPOSITED USING A TREMMIE OR PUMPED THROUGH A HOSE. CONCRETE SHALL NOT BE ALLOWED TO FALL MORE THAN 10 FEET TO THE BOTTOM OF THE EXCAVATION.
(ii) PIERS WITH A DIAMETER EQUAL TO OR GREATER THAN 30-INCHES AND A DEPTH OF UP TO 60 FEET MAY BE PLACED AS FREE-FALL.
(iii) PIERS WITH A DIAMETER EQUAL TO OR GREATER THAN 30-INCHES AND A DEPTH EXCEEDING 60 FEET SHALL BE DEPOSITED USING A TREMMIE OR PUMPED THROUGH A HOSE. CONCRETE SHALL NOT BE ALLOWED TO FALL MORE THAN 10 FEET TO THE BOTTOM OF THE EXCAVATION.
E) THE TOP FIVE FEET OF ALL PIERS SHALL BE VIBRATED AFTER TEMPORARY CASING HAS BEEN WITHDRAWN OR WHEN CASING IS PERMANENT AND CONCRETE SLUMP IS LESS THAN 6 INCHES.
F) ANY CONCRETE OVERPOUR AT TOP OF PIERS (MUSHROOMS) SHALL BE REMOVED TO PRODUCE THE SPECIFIED PIER DIAMETER.

D. GRADE BEAMS AND PIER CAPS (SHELTER AREA):

1) CONSTRUCTION: GRADE BEAMS AND PIER CAPS SHALL BE STRUCTURALLY CONNECTED TO THE TOP OF SUPPORTING PIERS. GRADE BEAMS SHALL EXTEND AT LEAST TWENTY FOUR (24) INCHES BELOW THE FINAL EXTERIOR ADJACENT GRADE. A MINIMUM VOID SPACE OF FOUR (4) INCHES BENEATH GRADE BEAMS AND PIER CAPS SHALL BE MAINTAINED USING VOID FORMS. EXCAVATIONS FOR GRADE BEAMS AND PIER CAPS SHALL BE FREE OF LOOSE MATERIAL.

2) VOID FORMS: VOID FORMS SHALL BE CONSTRUCTED OF BIODEGRADABLE PAPER SURFACE, TREATED FOR MOISTURE RESISTANCE, AND STRUCTURALLY SUFFICIENT TO SUPPORT WEIGHT OF PLASTIC CONCRETE AND OTHER SUPERIMPOSED LOADS. TRAPEZOIDAL VOID FORMS ARE PROHIBITED. BACKFILL RETAINERS ARE REQUIRED ON BOTH SIDES OF GRADE BEAMS AND PIER CAPS.

3) EARTH FORMING:
A) EARTH-FORMED GRADE BEAMS AND PIER CAPS ARE NOT PERMITTED WHERE BRICK LEDGES OR EXPOSED SURFACES REQUIRE FORMING AND/OR WHERE SOIL SIDE WALLS SLOUGH INTO THE TRENCH.
B) IF GRADE BEAMS AND PIER CAPS ARE SPECIFIED TO HAVE VOID FORMS, EARTH FORMING IS NOT ALLOWED.

4) PIPE PENETRATIONS: ALL HORIZONTAL PIPE OR SIMILAR PENETRATIONS OR SLEEVES THROUGH GRADE BEAMS SHALL PREFERABLY OCCUR WITHIN THE MIDDLE THIRD OF THE GRADE BEAM DEPTH AND SHALL HAVE A MAXIMUM OPENING DIAMETER OF ONE-FOURTH THE GRADE BEAM DEPTH. AT PENETRATIONS, PROVIDE FOUR (4) #5 DIAGONAL BARS AT EACH FOOTING FACE THREE (3) INCHES CLEAR BETWEEN BAR AND PENETRATION AND THREE (3) INCHES CLEAR FROM FOOTING BEARING). IF PENETRATION MUST OCCUR NEAR THE BOTTOM OF THE GRADE BEAM, REFER TYPICAL DETAILS FOR STANDARD DETAIL TO TRANSITION & THICKEN GRADE BEAM TO ACCOMMODATE PENETRATION.

E. SLAB-ON-GRADE CONSTRUCTION:

1) SLAB THICKNESS AND REINFORCING: SLABS-ON-GRADE SHALL BE 4" THICK CONCRETE REINFORCED WITH #3 BARS AT 15" ON CENTER EACH WAY. REINFORCING BARS SHALL BE PLACED 1½" CLEAR FROM TOP OF SLAB USING CHAIRS OR SLAB BOLSTERS COMPLYING WITH CRSI'S "MANUAL OF STANDARD PRACTICE".

2) SLAB SUBGRADE: THE FLOOR SLAB SHALL BE GRADE-SUPPORTED ON 2'-0" OF STRUCTURAL FILL AS OUTLINED IN THE SITE SUB-GRADE PREPARATION NOTES SHOWN ABOVE.

3) CONSTRUCTION MONITORING: CONSTRUCTION ACTIVITY MAY CAUSE DAMAGE AND DETERIORATION TO THE PREPARED SUBGRADE. A FIELD REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER SHALL OBSERVE THE FINAL SUBGRADE PRIOR TO PLACEMENT OF THE SLAB ON GRADE, PERFORM FURTHER TESTING AS NECESSARY, AND DETERMINE IF ANY REMEDIAL MEASURES ARE NECESSARY PRIOR TO SLAB PLACEMENT.

4) AGGREGATE BASE COURSE: A 4-INCH THICK, FREE-DRAINING AGGREGATE BASE COURSE SHALL BE PLACED BENEATH THE FLOOR SLAB TO ENHANCE DRAINAGE AND PROVIDE INCREASED SUBGRADE STRENGTH. AT THE TIME OF THE SLAB PLACEMENT, THE GRANULAR BASE SHALL BE MOIST, BUT FREE OF ANY STANDING OR SELF-DRAINING WATER. THE AGGREGATE BASE COURSE MATERIAL SHALL MEET THE FOLLOWING CRITERIA:
A) 100 PERCENT SHALL PASS THE 1½" SIEVE
B) LESS THAN 5 PERCENT SHALL PASS THE #8 SIEVE
C) PLASTICITY INDEX, PI, SHALL BE LESS THAN OR EQUAL TO 6
D) COMPACTED TO 98% STANDARD PROCTOR MAXIMUM DRY DENSITY.

5) VAPOR RETARDER: A 15 MIL VAPOR RETARDER SHALL BE PLACED IMMEDIATELY BELOW THE CONCRETE SLAB. VAPOR RETARDER SHALL BE SEALED AT ALL LAPS AND SEALED TO PREVIOUSLY PLACED CONCRETE AS RECOMMENDED BY VAPOR RETARDER MANUFACTURER. BEFORE PLACING CONCRETE, PATCH AND SEAL ANY RIPS, TEARS OR HOLES IN VAPOR RETARDER INCURRED DURING CONSTRUCTION.

6) MOIST CURING OF SLAB: SLABS-ON-GRADE SHALL BE WATER CURED FOR A MINIMUM OF 7 DAYS BY PONDING, SPRAYING, SPRINKLING OR BY USE OF SATURATED COVERINGS. CURING COMPOUNDS ARE EXPRESSLY PROHIBITED.

7) ISOLATION JOINTS: PROVIDE SLAB ISOLATION AROUND COLUMNS PENETRATING THE SLAB-ON-GRADE. PROVIDE 1/2 INCH PREMOLDED EXPANSION JOINT MATERIAL AROUND PERIMETER OF ISOLATION JOINTS. REFER TO TYPICAL DETAILS AND ADDITIONAL INFORMATION.

8) SLAB JOINTS: SLAB JOINTS SHALL BE PROVIDED AS SHOWN ON THE PLANS AND TYPICAL DETAILS. THE FOLLOWING JOINT TYPES ARE SHOWN ON THE DRAWINGS:
A) CJ = CONSTRUCTION JOINT
B) SJ = SAWED CONTRACTION JOINT

F. FOUNDATION MISCELLANEOUS

1) GROUNDWATER CONDITIONS: GROUNDWATER WAS ENCOUNTERED IN SOME OF THE BORINGS AT THE TIME OF DRILLING. HOWEVER, IT IS POSSIBLE THAT TRANSIENT OVER-SATURATED GROUND CONDITIONS COULD DEVELOP AT SHALLOWER DEPTHS AT A LATER TIME DUE TO PERIODS OF HEAVY PRECIPITATION, LANDSCAPE WATERING, LEAKING WATER LINES, OR OTHER UNFORESEEN CAUSES. THE CONTRACTOR SHALL DETERMINE THE ACTUAL GROUNDWATER LEVELS AT TIME OF CONSTRUCTION. IF GROUNDWATER ISSUES ARE ENCOUNTERED DURING CONSTRUCTION, THE GEOTECHNICAL ENGINEER SHALL BE CONTACTED.

2) DRAINAGE CONSIDERATIONS DURING CONSTRUCTION: DUE TO ADVERSE EFFECT ON STRUCTURES, WATER SHALL NOT BE ALLOWED TO COLLECT IN THE FOUNDATION EXCAVATION OR ON PREPARED SUBGRADE OF THE CONSTRUCTION AREA EITHER DURING OR AFTER CONSTRUCTION. UNDERCUT OR EXCAVATED AREAS SHALL BE SLOPED TOWARD ONE CORNER TO FACILITATE REMOVAL OF ANY COLLECTED RAINWATER, OR POSITIVE RUNOFF SHALL BE PROVIDED. THE CONTRACTOR SHALL EXERCISE CARE IN CREATING DRAINAGE PATHS FOR WATER DURING THE CONSTRUCTION PHASE OF THE PROJECT. TO REDUCE INFILTRATION OF SURFACE WATER AROUND THE PERIMETER OF THE BUILDING AND BENEATH THE FLOOR SLABS, POSITIVE DRAINAGE SHALL BE PROVIDED DURING ALL PHASES OF CONSTRUCTION.

3) FINAL SITE GRADING: PER SECTION 1804.4 OF IBC-2015, THE GROUND IMMEDIATELY ADJACENT TO THE FOUNDATION SHALL BE SLOPED AWAY FROM THE BUILDING AT A SLOPE OF NOT LESS THAN ONE UNIT VERTICAL IN 20 UNITS HORIZONTAL (5-PERCENT SLOPE) FOR A MINIMUM DISTANCE OF 10 FEET PERPENDICULAR TO THE FACE OF THE WALL. IF PHYSICAL OBSTRUCTIONS OR LOT LINES PROHIBIT 10 FEET OF HORIZONTAL DISTANCE, A 5-PERECNT SLOPE SHALL BE PROVIDED TO AN APPROVED ALTERNATIVE METHOD OF DIVERTING WATER AWAY FROM THE FOUNDATION. SWALES USED FOR THIS PURPOSE SHALL BE SLOPED A MINIMUM OF 2-PERECNT WHERE LOCATED WITHIN 10 FEET OF THE BUILDING FOUNDATION. IMPERVIOUS SURFACES WITHIN 10 FEET OF THE BUILDING SHALL BE SLOPED A MINIMUM OF 2-PERCENT AWAY FROM THE BUILDING.

4) EXCAVATION AND TEMPORARY SLOPES: THE CONTRACTOR, DESIGNATED AS "RESPONSIBLE PERSON" IN OSHA CONSTRUCTION STANDARDS FOR EXCAVATIONS, 29 CFR PART 1926, IS SOLELY RESPONSIBLE FOR PLANNING AND IMPLEMENTING ALL SAFETY PROCEDURES. ALL EXCAVATION HEIGHT, SLOPE, AND DEPTH MUST ADHERE TO ALL SPECIFICATIONS OUTLINED IN LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS. THE STRUCTURAL ENGINEER DOES NOT ASSUME ANY RESPONSIBILITY FOR CONSTRUCTION SITE SAFETY OR ANY PARTY'S, INCLUDING THE CONTRACTOR'S, COMPLIANCE WITH THE APPLICABLE LOCAL, STATE, AND FEDERAL SAFETY REGULATIONS OR ANY OTHER APPLICABLE REGULATIONS.

5) TRENCH BACKFILL: ALL REQUIRED TRENCH BACKFILL SHALL BE ACCEPTABLE FILL MATERIAL AS DEFINED ABOVE AND SHALL BE MECHANICALLY COMPACTED IN LAYERS TO AT LEAST 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 698. SOME SETTLEMENT OF THE BACKFILL MAY BE EXPECTED AND ANY UTILITIES WITHIN THE TRENCHES SHALL BE CONSTRUCTED TO ALLOW THESE DIFFERENTIAL MOVEMENTS. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL REQUIREMENTS.

6) CONSTRUCTION MONITORING: A GEOTECHNICAL ENGINEER SHALL BE RETAINED TO PROVIDE OBSERVATIONS AND TESTING OF SOILS EXPOSED DURING PROJECT CONSTRUCTION IN ORDER TO VERIFY THAT SOIL CONDITIONS ARE AS ANTICIPATED. CONSTRUCTION ACTIVITIES PERTAINING TO EARTHWORK AND OTHER RELATED ACTIVITIES SHALL ALSO BE OBSERVED BY THE GEOTECHNICAL ENGINEER AS OUTLINED ABOVE.

6. CONCRETE CONSTRUCTION NOTES

A. DESIGN CRITERIA: THE DESIGN OF CONCRETE IS GOVERNED BY "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE (ACI 318-14) AND COMMENTARY (ACI 318R-14)."

B. CONCRETE CONSTRUCTION CRITERIA: ALL CONCRETE CONSTRUCTION SHALL COMPLY WITH THE PROVISIONS OF "SPECIFICATIONS FOR STRUCTURAL CONCRETE (ACI 301-16)."

C. TOLERANCES: TOLERANCES FOR CONCRETE CONSTRUCTION SHALL BE IN ACCORDANCE WITH "SPECIFICATION FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS (ACI 117-10) AND COMMENTARY (ACI 117R-10)."

D. CONCRETE MIXTURES:

1) CEMENTITIOUS MATERIALS
A) PORTLAND CEMENT: ASTM C150 TYPE I OR II UNLESS SPECIFICALLY NOTED OTHERWISE.
B) FLY ASH: ASTM C618 CLASS F OR C. THE MAXIMUM PERCENTAGE OF FLY ASH SHALL NOT EXCEED 25 PERCENT OF THE TOTAL CEMENTITIOUS MATERIAL FOR FOOTINGS AND 5 PERCENT OF THE TOTAL CEMENTITIOUS MATERIAL FOR SLABS.

2) ALL CONCRETE MIXES SHALL BE COMPRISED OF NORMAL WEIGHT AGGREGATES CONFORMING TO ASTM C33, EXCEPT WHERE SPECIFICALLY INDICATED AS LIGHTWEIGHT, IN WHICH CASE AGGREGATES SHALL CONFORM TO ASTM C330.

3) MIXING WATER SHALL CONFORM TO ASTM C1062. MIXING WATER, INCLUDING THAT PORTION OF MIXING WATER CONTRIBUTED IN THE FORM OF FREE MOISTURE ON AGGREGATES, SHALL NOT CONTAIN DELETERIOUS AMOUNTS OF CHLORIDE IONS.

4) ADMIXTURES, IF USED, SHALL CONFORM TO THE FOLLOWING:
A) WATER REDUCTION AND SETTING TIME MODIFICATION: ASTM C494.
B) PRODUCING FLOWING CONCRETE: ASTM C1017.
C) AIR ENTRAINMENT: ASTM C260.
D) INHIBITING CHLORIDE INDUCED CORROSION: ASTM C1582.
E) MOISTURE VAPOR REDUCING ADMIXTURE, MVRA: ASTM C494 & ASTM D5084

5) MIX DESIGNS SHALL BE PROPORTIONED BASED ON THE FOLLOWING MIX CHARACTERISTICS;

A) DRILLED CONCRETE PIERS AND SHAFTS
1) FREEZING AND THAWING EXPOSURE CATEGORY (F): CLASS F0
2) SULFATE EXPOSURE CATEGORY (S): CLASS S0
3) WATER EXPOSURE CATEGORY (W): CLASS W1
4) CORROSION PROTECTION CATEGORY (C): CLASS C0
5) 28-DAY COMPRESSIVE STRENGTH: 3,500 PSI
6) MAXIMUM WATER/CEMENT RATIO: 0.55
7) MAXIMUM AGGREGATE SIZE: 1 1/2 INCHES
8) TARGET AIR CONTENT: NO AIR ENTRAINMENT REQUIRED.
9) SLUMP: 5 TO 7 INCHES
10) MAXIMUM WATER-SOLUBLE CHLORIDE ION CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT: 0.30
11) WATER REDUCING AND RETARDING ADMIXTURE: AS REQUIRED TO ENSURE MINIMUM SLUMP REQUIREMENT IS MAINTAINED DURING REMOVAL OF TEMPORARY CASINGS.

B) BELOW GRADE FOUNDATIONS
1) FREEZING AND THAWING EXPOSURE CATEGORY (F): CLASS F1
2) SULFATE EXPOSURE CATEGORY (S): CLASS S0
3) WATER EXPOSURE CATEGORY (W): CLASS W0
4) CORROSION PROTECTION CATEGORY (C): CLASS C1
5) 28-DAY COMPRESSIVE STRENGTH: 3,500 PSI
6) MAXIMUM WATER/CEMENT RATIO: 0.55
7) MAXIMUM AGGREGATE SIZE: 1 1/2 INCHES
8) TARGET AIR CONTENT: 4.5 PERCENT PLUS OR MINUS 1.5 PERCENT
9) MAXIMUM WATER-SOLUBLE CHLORIDE ION CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT: 0.30

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C) INTERIOR SLABS-ON-GRADE
1) FREEZING AND THAWING EXPOSURE CATEGORY (F): CLASS F0
2) SULFATE EXPOSURE CATEGORY (S): CLASS S0
3) WATER EXPOSURE CATEGORY (W): CLASS W0
4) CORROSION PROTECTION CATEGORY (C): CLASS C0
5) 28-DAY COMPRESSIVE STRENGTH: 4,000 PSI
6) MAXIMUM WATER/CEMENT RATIO: 0.45
7) MAXIMUM AGGREGATE SIZE: 1 1/2-INCHES
8) TARGET AIR CONTENT: DO NOT ALLOW AIR CONTENT OF TROWEL-FINISHED FLOORS TO EXCEED 3 PERCENT
9) MAXIMUM WATER-SOLUBLE CHLORIDE ION CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT: 1.00

D) INTERIOR ELEVATED SLABS ON METAL DECK
1) FREEZING AND THAWING EXPOSURE CATEGORY (F): CLASS F0
2) SULFATE EXPOSURE CATEGORY (S): CLASS S0
3) WATER EXPOSURE CATEGORY (W): CLASS W0
4) CORROSION PROTECTION CATEGORY (C): CLASS C0
5) 28-DAY COMPRESSIVE STRENGTH: 4,000 PSI
6) MAXIMUM WATER/CEMENT RATIO: 0.45
7) MAXIMUM AGGREGATE SIZE: 3/4-INCHES
8) TARGET AIR CONTENT: DO NOT ALLOW AIR CONTENT OF TROWEL-FINISHED FLOORS TO EXCEED 3 PERCENT
9) MAXIMUM WATER-SOLUBLE CHLORIDE ION CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT: 1.00

E) ABOVE GRADE FOUNDATIONS AND WALLS
1) FREEZING AND THAWING EXPOSURE CATEGORY (F): CLASS F2
2) SULFATE EXPOSURE CATEGORY (S): CLASS S0
3) WATER EXPOSURE CATEGORY (W): CLASS W0
4) CORROSION PROTECTION CATEGORY (C): CLASS C1
5) 28-DAY COMPRESSIVE STRENGTH: 4,500 PSI
6) MAXIMUM WATER/CEMENT RATIO: 0.45
7) MAXIMUM AGGREGATE SIZE: 1 1/2 INCHES
8) TARGET AIR CONTENT: 5.5 PERCENT PLUS OR MINUS 1.5 PERCENT
9) MAXIMUM WATER-SOLUBLE CHLORIDE ION CONTENT IN CONCRETE, PERCENT BY WEIGHT OF CEMENT: 0.30

6) CONCRETE MIX PROPORTIONS SHALL BE ESTABLISHED IN ACCORDANCE WITH ARTICLE 4.2.3 OF "SPECIFICATIONS FOR STRUCTURAL CONCRETE (ACI 301)." SO THAT THE CONCRETE SATISFIES THE FOLLOWING THREE REQUIREMENTS:
A) THE CONCRETE CAN BE PLACED READILY WITHOUT SEGREGATION INTO FORMS AND AROUND REINFORCEMENT UNDER ANTICIPATED PLACEMENT CONDITIONS. THE CONCRETE PRODUCER SHALL DETERMINE WHETHER ADMIXTURES ARE NECESSARY FOR WATER REDUCTION, SET TIME, OR SLUMP REQUIREMENTS.
B) THE CONCRETE SHALL MEET REQUIREMENTS FOR THE ASSIGNED EXPOSURE CLASSES OUTLINED HEREIN.
C) THE CONCRETE SHALL CONFORM TO STRENGTH TEST REQUIREMENTS FOR STANDARD-CURED SPECIMENS.

7) DOCUMENTATION OF CONCRETE MIXTURE CHARACTERISTICS SHALL BE SUBMITTED FOR REVIEW BEFORE THE MIXTURE IS USED. EVIDENCE OF THE ABILITY OF THE PROPOSED MIXTURE TO COMPLY WITH THE CONCRETE MIXTURE REQUIREMENTS IN THE CONSTRUCTION DOCUMENTS SHALL BE INCLUDED IN THE SUBMITTAL. THE EVIDENCE SHALL BE BASED ON FIELD TEST RECORDS OR LABORATORY TRIAL BATCHES.

E. CONCRETE REINFORCING:

1) ALL DETAILING, FABRICATION, AND PLACING OF REINFORCING STEEL, UNLESS OTHERWISE NOTED, SHALL FOLLOW ALL SECTIONS OF THE ACI "DETAILING MANUAL-2004" (SP-66 04), THE ACI "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" (ACI 318-14), AND ALL SECTIONS OF THE CONCRETE REINFORCING STEEL INSTITUTE (CRSI) "MANUAL OF STANDARD PRACTICE."

2) UNLESS OTHERWISE NOTED, LAP SPLICES OF DEFORMED REINFORCING BARS SHALL CONFORM TO ACI REQUIREMENTS FOR CLASS B TENSION SPLICES. REFER TO LAP LENGTH SCHEDULES FOR TYPICAL LAP REQUIREMENTS.

3) PROVIDE CORNER BARS IN BOTH FACES OF ALL CONTINUOUS FOOTINGS. NUMBER, SIZE, AND SPACING OF CORNER BARS SHALL BE EQUAL TO NUMBER, SIZE AND SPACING OF HORIZONTAL REINFORCING WITH WHICH THEY LAP AND SHALL HAVE CLASS B TENSION LAP SPLICES IN EACH DIRECTION. REFER TO TYPICAL DETAILS FOR ADDITIONAL INFORMATION.

4) AT INTERSECTING FOUNDATIONS, EXTEND ALL HORIZONTAL REINFORCING OF THE INTERSECTING MEMBERS BEYOND THE POINT OF INTERSECTION TO THE OPPOSITE FACE. BEND TO A STANDARD 90 DEGREE HOOK OR PROVIDE BENT DOWELS OF EQUAL SIZE AND SPACING AND LAP AS REQUIRED FOR A CLASS B TENSION SPLICE (BUT NOT LESS THAN 12") IN EACH DIRECTION. REFER TO TYPICAL DETAILS FOR ADDITIONAL INFORMATION.

5) CONCRETE COVER OVER STEEL REINFORCING FOR CAST-IN-PLACE CONSTRUCTION SHALL CONFORM TO THE TABLE PROVIDED IN THE TYPICAL CONCRETE DETAILS.

F. OPENINGS IN CONCRETE STRUCTURES:

1) THE SIZE AND LOCATION OF ALL FLOOR PITS, TRENCH DRAINS, AND OPENINGS FOR ALL DUCTS AND PIPES THROUGH FLOORS, AND FOUNDATION WORK SHALL BE VERIFIED WITH THE MECHANICAL, PLUMBING, FIRE PROTECTION AND ELECTRICAL CONTRACTOR'S REQUIREMENTS PRIOR TO THE START OF ANY CONCRETE WORK.

G. JOINTS IN CONCRETE CONSTRUCTION:

1) CONCRETE SLABS-ON-GRADE: REFER TO SLAB-ON-GRADE CONSTRUCTION NOTES ABOVE FOR INFORMATION REGARDING JOINTS.

2) CONTINUOUS FOOTINGS: A SINGLE CONCRETE POUR SHALL NOT EXCEED 100 FEET IN THE SAME DIRECTION FOR CONTINUOUS SHALLOW.

3) CURING AT CONSTRUCTION JOINTS: CONCRETE POURS EITHER SIDE OF CONSTRUCTION JOINTS SHALL NOT BE CONCURRENT. CONCRETE SHALL BE ALLOWED TO CURE A MINIMUM OF 7 DAYS PRIOR TO PLACEMENT OF ADJACENT CONCRETE.

H. CONCRETE MISCELLANEOUS:

1) WATERSTOPS AND WATERPROOFING: ALL CONSTRUCTION JOINTS (VERTICAL AND HORIZONTAL) IN BELOW-GRADE CONCRETE WALLS, TRENCHES AND PITS SHALL BE KEYED AND HAVE BENTONITE WATERSTOPS INSTALLED UNLESS NOTED OTHERWISE. ALL BELOW-GRADE CONCRETE WALLS, PITS AND TRENCHES SHALL BE WATERPROOFED AS SHOWN IN ARCHITECTURAL DRAWINGS, UNLESS NOTED OTHERWISE.

2) EQUIPMENT PADS: PROVIDE CONCRETE EQUIPMENT PADS OF SIZE REQUIRED FOR EQUIPMENT FURNISHED. SEE MECHANICAL, PLUMBING, FIRE PROTECTION AND ELECTRICAL DRAWINGS FOR NUMBER, SIZE, AND LOCATION OF SUCH PADS. UNLESS OTHERWISE SHOWN, MINIMUM PAD THICKNESS SHALL BE 4" AND SHALL EXTEND A MINIMUM OF 6" BEYOND THE FACE OF THE EQUIPMENT. MINIMUM REINFORCING SHALL BE #4 BARS AT 12" O.C. EACH WAY. TOOLED OR CHAMFERED EDGES SHALL BE PROVIDED AT ALL EQUIPMENT PADS. ANCHORAGE TO SUPPORTING SLAB SHALL BE MADE. REFER TO TYPICAL DETAILS.

3) CHAMFERED EDGES: UNLESS NOTED OTHERWISE ON ARCHITECTURAL DRAWINGS, PROVIDE 3/4" CHAMFER ON ALL EXPOSED CONCRETE EDGES.

4) SURFACE FINISH: ALL HORIZONTAL CONCRETE SURFACES SHALL HAVE A TROWELED FINISH UNLESS NOTED OTHERWISE IN ARCHITECTURAL DRAWINGS OR FLOORING SPECIFICATIONS.

5) MOIST CURING OF SLABS: SLABS-ON-GRADE AND SLABS-ON-DECK SHALL BE WATER CURED FOR A MINIMUM OF 7 DAYS BY PONDING, SPRAYING, SPRINKLING OR BY USE OF SATURATED COVERINGS. CURING COMPOUNDS ARE EXPRESSLY PROHIBITED.

7. REINFORCED HOLLOW CONCRETE MASONRY NOTES

A. MASONRY DIMENSIONS: REFER TO ARCHITECTURAL DRAWINGS FOR ALL DIMENSIONS RELEVANT TO ALL CONCRETE MASONRY CONSTRUCTION.

B. CONCRETE MASONRY UNITS:

1) ALL CONCRETE MASONRY UNITS SHALL BE 1 OR 2-CELL LIGHTWEIGHT CONCRETE BLOCK WITH AN OVEN DRY WEIGHT OF LESS THAN 105 LBS PER CUBIC FOOT.

2) ALL CONCRETE MASONRY UNITS SHALL HAVE A MINIMUM COMPRESSIVE STRENGTH OF 2000 PSI ON THE NET AREA (INDIVIDUAL STRENGTH PER ASTM C 90).

C. MORTAR:

1) MORTAR MATERIALS: CONCRETE MASONRY SHALL BE CONSTRUCTED WITH PORTLAND CEMENT/LIME, TYPE S MORTAR CONFORMING TO THE PROPORTION SPECIFICATION OF ASTM C270.

2) MORTAR SUBMITTAL REQUIREMENTS: BECAUSE THE PROPORTION SPECIFICATION FOR MORTAR IS PRESCRIPTIVE, THERE ARE NO MORTAR TESTS REQUIRED. SUBMITTAL INFORMATION SHALL INCLUDE THE PROPORTIONS OF MORTAR MATERIALS AND CERTIFICATES OF COMPLIANCE FOR EACH RAW MATERIAL USED.

3) MORTAR MIX PROPORTIONS: MORTAR MATERIAL PROPORTIONS BY VOLUME SHALL BE AS FOLLOWS:
A) PORTLAND CEMENT: 1
B) HYDRATED LIME OR LIME PUTTY: OVER 0.25 TO 0.50
C) AGGREGATE RATIO (MEASURED IN DAMP LOOSE CONDITIONS): NOT LESS THAN 2.25 AND NOT MORE THAN 3.0 TIMES THE SUM OF THE VOLUMES OF CEMENT AND LIME MATERIALS.

4) MORTAR MIXING: MIX CEMENTITIOUS MATERIALS AND AGGREGATES BETWEEN 3 AND 5 MINUTES IN A MECHANICAL BATCH MIXER WITH A SUFFICIENT AMOUNT OF WATER TO PRODUCE A WORKABLE CONSISTENCY. UNLESS SPECIFICALLY ALLOWED BY THE OWNER'S REPRESENTATIVE, DO NOT HAND MIX MORTAR. MAINTAIN WORKABILITY OF MORTAR BY REMIXING OR RETEMPERING. DISCARD MORTAR WHICH HAS BEGUN TO STIFFEN OR IS NOT USED WITHIN 2.5 HOURS AFTER INITIAL MIXING.

5) ADMIXTURES: DO NOT USE ADMIXTURES CONTAINING MORE THAN 0.2 PERCENT CHLORIDE IONS.

6) MORTAR QUALITY ASSURANCE: TESTING AGENCY SHALL PERIODICALLY OBSERVE AND CONFIRM THAT THE PROPORTIONS OF SITE-PREPARED MORTAR COMPLY WITH THE PROPORTIONS OUTLINED ABOVE.

D. GROUT:

1) GROUT MATERIALS: GROUT USED IN THE CONSTRUCTION OF MASONRY SHALL CONFORM TO THE PROPORTION SPECIFICATION OF ASTM C476. GROUT AGGREGATES SHALL COMPLY WITH ASTM C404.

2) GROUT SUBMITTAL REQUIREMENTS: BECAUSE THE PROPORTION SPECIFICATION FOR GROUT IS PRESCRIPTIVE, THERE ARE NO GROUT TESTS REQUIRED. SUBMITTAL INFORMATION SHALL INCLUDE THE PROPORTIONS OF GROUT MATERIALS AND CERTIFICATES OF COMPLIANCE FOR EACH RAW MATERIAL USED.

3) GROUT MIX PROPORTIONS: GROUT MATERIAL PROPORTIONS BY VOLUME SHALL BE AS FOLLOWS:

GROUT TYPE	CEMENT	LIME	AGGREGATE (DAMP, LOOSE)*	
			FINE	COARSE
FINE	1	0 TO 1/10	2.25 TO 3	-
COARSE	1	0 TO 1/10	2.25 TO 3	1 TO 2

*TIMES THE SUM OF THE VOLUMES OF THE CEMENT & LIME MATERIALS

4) GROUT SLUMP: SITE-MIX GROUT TO A CONSISTENCY THAT HAS A SLUMP BETWEEN 8 AND 11 INCHES. DISCARD GROUT THAT DOES NOT MEET THE SPECIFIED SLUMP WITHOUT ADDING WATER AFTER INITIAL MIXING.

5) GROUT QUALITY ASSURANCE: TESTING AGENCY SHALL PERIODICALLY OBSERVE AND CONFIRM THAT THE PROPORTIONS AND SLUMP OF SITE-PREPARED GROUT COMPLY WITH THE REQUIREMENTS OUTLINED ABOVE.

E. PREPARATION:

1) CLEANING:
A) CLEAN REINFORCEMENT AND SHANKS OF ANCHOR BOLTS BY REMOVING MUD, OIL, OR OTHER MATERIALS THAT WILL ADVERSELY AFFECT OR REDUCE BOND AT THE TIME MORTAR OUR GROUT IS PLACED.
B) PRIOR TO PLACING MASONRY, REMOVE LAITANCE, LOOSE AGGREGATE, AND ANYTHING ELSE THAT WOULD PREVENT MORTAR FROM BONDING TO THE FOUNDATION.

2) WETTING: DO NOT WET CONCRETE MASONRY UNITS BEFORE LAYING. WET CUTTING IS PERMITTED.

3) DEBRIS: CONSTRUCT GROUT SPACES FREE OF MORTAR DROPPING, DEBRIS, LOOSE AGGREGATES, AND ANY MATERIAL DELETERIOUS TO MASONRY GROUT.

4) REINFORCEMENT: PLACE REINFORCEMENT AND TIES IN GROUT SPACES PRIOR TO GROUTING.

5) CLEANOUTS: PROVIDE CLEANOUTS IN THE BOTTOM COURSE OF MASONRY FOR EACH GROUT POUR WHEN THE GROUT POUR HEIGHT EXCEEDS 5 FT 4 IN.
A) CONSTRUCT CLEANOUTS SO THAT THE SPACE TO BE GROUTED CAN BE CLEANED AND INSPECTED. IN SOLID GROUTED MASONRY, SPACE CLEANOUTS HORIZONTALLY A MAXIMUM OF 32 IN. ON CENTER.
B) CONSTRUCT CLEANOUTS WITH AN OPENING OF SUFFICIENT SIZE TO PERMIT REMOVAL OF DEBRIS. THE MINIMUM OPENING DIMENSION SHALL BE 3 IN.
C) AFTER CLEANING, CLOSE CLEANOUTS WITH CLOSURES BRACED TO RESIST GROUT PRESSURE.

F. MASONRY ERECTION:

1) BOND PATTERN: UNLESS OTHERWISE INDICATED, LAY MASONRY IN RUNNING BOND.

2) PLACING MORTAR UNITS: COMPLY WITH ARTICLE 3.3 B OF ACI 530.1-13 "SPECIFICATION FOR MASONRY STRUCTURES AND COMMENTARY" INCLUDING BUT NOT LIMITED TO THE FOLLOWING;
A) BED JOINTS AT FOUNDATIONS: IN THE STARTING COURSE ON FOUNDATIONS AND OTHER SUPPORTING MEMBERS, CONSTRUCT BED JOINTS SO THAT THE BED JOINT THICKNESS IS AT LEAST 1/4 IN. AND NOT MORE THAN:
(i) 3/4 IN. WHEN THE MASONRY IS UNGROUTED OR PARTIALLY GROUTED
(ii) 1-1/4 IN. WHEN THE FIRST COURSE OF MASONRY IS SOLID GROUTED AND SUPPORTED BY A CONCRETE FOUNDATION.
B) OPENINGS IN TROUGH BLOCKS: AT ALL VERTICAL REINFORCING LOCATIONS, THE BOTTOM OF TROUGH BLOCKS SHALL BE CUT TO PROVIDE A MINIMUM 2-INCH DIAMETER HOLE TO ALLOW PLACEMENT OF VERTICAL REINFORCING AND PLACEMENT OF GROUT THROUGH THE HOLE.

3) EMBEDDED ITEMS AND ACCESSORIES: COMPLY WITH ARTICLE 3.3 D OF ACI 530.1-13 "SPECIFICATION FOR MASONRY STRUCTURES AND COMMENTARY."

4) TEMPORARY BRACING OF MASONRY: DESIGN, PROVIDE, AND INSTALL TEMPORARY BRACING THAT WILL ASSURE STABILITY OF MASONRY DURING CONSTRUCTION.

5) SITE TOLERANCES: ERECT MASONRY WITHIN THE TOLERANCES DEFINED IN ARTICLE 3.3 F OF ACI 530.1-13 "SPECIFICATION FOR MASONRY STRUCTURES AND COMMENTARY."

6) PLACING REINFORCING: COMPLY WITH ALL PROVISIONS OF ARTICLE 3.4 OF ACI 530.1-13 "SPECIFICATION FOR MASONRY STRUCTURES AND COMMENTARY." MAINTAIN CLEAR DISTANCE BETWEEN REINFORCING BARS AND ANY FACE OF MASONRY UNIT OR FORMED SURFACE, BUT NOT LESS THAN 1/4-IN FOR FINE GROUT OR 1/2-IN. FOR COARSE GROUT.

7) PENETRATIONS: OPENINGS FOR ALL DUCTS AND PIPES PENETRATING MASONRY WALLS SHALL BE VERIFIED AND COORDINATED WITH MECHANICAL AND ELECTRICAL CONTRACTORS REQUIREMENTS. PENETRATIONS THROUGH WALLS SHALL HAVE ADDITIONAL REINFORCING AS SHOWN ON IN THE TYPICAL DETAILS.

8) LINTELS: LINTELS SHALL BE PROVIDED WHERE REQUIRED ACCORDING TO TYPICAL LINTEL DETAILS AND SCHEDULE OR AS INDICATED ON PLAN SHEETS. SOLID BOTTOM TROUGH BLOCKS SHALL BE USED AT THE HEADS OF ALL OPENINGS.

9) PERMANENT BRACING: UNLESS BRACED BY ATTACHMENT TO A STRUCTURAL SLAB OR METAL DECK, THE TOP OF MASONRY WALLS SHALL BE BRACED IN ACCORDANCE WITH THE TYPICAL DETAILS SHOWN IN THE DRAWINGS.

G. CONCRETE MASONRY REINFORCING:

1) MINIMUM HORIZONTAL AND VERTICAL REINFORCING IN CMU WALLS SHALL BE PROVIDED AS FOLLOWS:

MINIMUM REINFORCING IN CMU WALLS					
WALL TYPE	CMU TYPE	GROUTED VERTICAL CELL REINFORCING		HORIZONTAL BOND BEAM REINFORCING	
		BARS	SPACING OF GROUTED CELLS	BARS	SPACING OF BOND BEAMS
EXTERIOR	8"	(1)#5	48" O.C.	(2)#4	48" O.C.
INTERIOR LOAD-BEARING	8"	(1)#5	48" O.C.	(2)#4	48" O.C.
INTERIOR PARTITION	8"	(1)#5	48" O.C.	(2)#4	48" O.C.

NOTES:
1. ALL SINGLE BAR REINFORCING IN VERTICAL CELLS SHALL BE CENTERED IN CELL UNLESS NOTED OTHERWISE.
2. FOR DOUBLE BAR REINFORCING IN VERTICAL CELLS:
a. THE CLEAR DISTANCE BETWEEN PARALLEL BARS SHALL NOT BE LESS THAT THE NOMINAL DIAMETER OF THE BAR, NOR LESS THAN 1 IN.
b. REINFORCING BARS SHALL HAVE A THICKNESS OF GROUT BETWEEN THE BARS AND MASONRY UNITS NOT LESS THAN 1/4 IN. FOR FINE GROUT OR 1/2 IN. FOR COARSE GROUT.
3. AN ADDITIONAL VERTICAL BAR OF THE SAME SIZE AND LENGTH AS THE NORMAL REINFORCING BAR SHALL BE PLACED IN GROUTED CELLS:
a. IN FIRST TWO JAMB CELLS ON EACH SIDE OF WALL OPENINGS.
b. IN CELLS ON EACH SIDE OF CONTROL JOINTS OR EXPANSION JOINTS.
c. IN CELL AT ALL WALL INTERSECTIONS AND FIRST ADJACENT CELL IN EACH DIRECTION.
4. ADDITIONAL BOND BEAMS SHALL BE PROVIDED FOR ALL MASONRY LINTELS AND WALL OPENINGS AS SHOWN IN TYPICAL DETAILS.

2) THE MINIMUM LENGTH OF LAP SPLICES OF REINFORCING STEEL IN MASONRY SHALL BE AS SHOWN IN THE CMU REINFORCING LAP SCHEDULE.

3) FOUNDATION DOWELS:
A) THERE SHALL BE A FOUNDATION DOWEL FOR EACH VERTICAL WALL REINFORCING BAR.
B) THE MINIMUM REQUIRED EMBEDMENT OF DOWELS IN CONCRETE FOUNDATIONS SHALL BE AS REQUIRED FOR A CLASS B SPLICE FOR THE SPECIFIED COMPRESSIVE STRENGTH FOR THE FOUNDATION. REFER TO CONCRETE LAP LENGTH SCHEDULES FOR TYPICAL LAP REQUIREMENTS. ALTERNATIVELY, THE FOUNDATION DOWELS MAY BE DEVELOPED WITH A STANDARD ACI 90 DEGREE HOOK INTO THE FOUNDATION.
C) FOUNDATION DOWELS SHALL EXTEND UP INTO THE GROUTED CELLS TO PROVIDE THE MINIMUM LAP SPLICE LENGTH SHOWN IN THE CMU REINFORCING LAP SCHEDULE.
D) FOUNDATION DOWELS THAT INTERFERE WITH UNIT WEBS ARE PERMITTED TO BE BENT A MAXIMUM OF 1 IN. HORIZONTALLY FOR EVERY 6 IN. OF VERTICAL HEIGHT. REFER TYPICAL DETAIL FOR PERMITTED BENDING OF FOUNDATION DOWELS.

4) NORMAL VERTICAL WALL REINFORCING SHALL EXTEND CONTINUOUSLY FROM THE TOP OF FOUNDATION. THE DIAPHRAGM BOND BEAM SHALL BE DEFINED AS THE BOND BEAM AT THE FLOOR OR ROOF LEVEL OR WHERE KICKER ANGLES OR CLIP ANGLES ARE PROVIDED TO PROVIDE LATERAL SUPPORT.

5) BOND BEAM REINFORCING STEEL FOR INTERIOR AND EXTERIOR WALLS SHALL BE CONTINUOUS THROUGHOUT, EXCEPT AT CONTROL JOINTS. AT CONTROL JOINTS, INTERMEDIATE BOND BEAM REINFORCEMENT SHALL BE CUT, BUT SHALL BE CONTINUOUS AT DIAPHRAGM BOND BEAMS. EXTEND REINFORCING BARS NOT LESS THAN THAT SPECIFIED ON LAP SCHEDULE. REFER TO TYPICAL DETAILS AND LAP SCHEDULE FOR ADDITIONAL INFORMATION.

H. GROUT PLACEMENT:

1) GROUT PLACING TIME: PLACE GROUT WITHIN 1-1/2 HOURS FROM INTRODUCING WATER IN THE MIXTURE AND PRIOR TO INITIAL SET.

2) GROUT POUR HEIGHT: DO NOT EXCEED THE MAXIMUM GROUT POUR HEIGHT GIVEN IN THE TABLE BELOW. THE GROUT POUR HEIGHT IS DEFINED AS THE TOTAL HEIGHT OF MASONRY TO BE GROUTED PRIOR TO ERECTION OF ADDITIONAL MASONRY. A GROUT POUR CONSISTS OF ONE OR MORE GROUT LIFTS.

GROUT SPACE REQUIREMENTS PER ACI 530-13 BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES, TABLE 3.2.1			
GROUT TYPE1	MAXIMUM GROUT POUR HEIGHT, FT.	MINIMUM CLEAR WIDTH OF GROUT SPACE,2,3 IN.	MINIMUM CLEAR GROUT SPACE DIMENSIONS FOR GROUTING CELLS OF HOLLOW UNITS,3,4 IN. X IN.
FINE	1	3/4	1-1/2 X 2
FINE	5.33	2	2 X 3
FINE	12.67	2-1/2	2-1/2 X 3
FINE	24	3	3 X 3
COARSE	1	1-1/2	1-1/2 X 3
COARSE	5.33	2	2-1/2 X 3
COARSE	12.67	2-1/2	3 X 3
COARSE	24	3	3 X 4

FOOTNOTES:
1. FINE AND COARSE GROUTS ARE DEFINED IN ASTM C476.
2. FOR GROUTING BETWEEN MASONRY WYTHES.
3. MINIMUM CLEAR WIDTH OF GROUT SPACE AND MINIMUM CLEAR GROUT SPACE DIMENSION ARE THE NET DIMENSION OF THE SPACE DETERMINED BY SUBTRACTING MASONRY PROTRUSIONS AND THE DIAMETERS OF HORIZONTAL BARS FROM THE AS-BUILT CROSS-SECTION OF THE GROUT SPACE. SELECT THE GROUT TYPE AND MAXIMUM GROUT POUR HEIGHT BASED ON THE MINIMUM CLEAR SPACE.
4. AREA OF VERTICAL REINFORCEMENT SHALL NOT EXCEED 6 PERCENT OF THE AREA OF THE GROUT SPACE.

3) GROUT LIFT HEIGHT: PLACE GROUT IN LIFTS NOT EXCEEDING 5 FT. 4 IN. A GROUT LIFT IS DEFINED AS AN INCREMENT OF GROUT HEIGHT WITHIN A TOTAL GROUT POUR.

4) GROUT CONSOLIDATION: CONSOLIDATE GROUT POURS BY MECHANICAL VIBRATION, AND RECONSOLIDATE BY MECHANICAL VIBRATION AFTER INITIAL WATER LOSS AND SETTLEMENT HAS OCCURRED.

5) GROUT KEY: WHEN GROUTING, FORM GROUT KEYS BETWEEN GROUT POURS. FORM GROUT KEYS BETWEEN GROUT LIFTS WHEN THE FIRST LIFT IS PERMITTED TO SET PRIOR TO PLACEMENT OF THE SUBSEQUENT LIFT.
A) FORM A GROUT KEY BY TERMINATING THE GROUT A MINIMUM OF 1-1/2 IN. BELOW A MORTAR JOINT.
B) DO NOT FORM GROUT KEYS WITHIN BOND BEAMS.
C) AT BOND 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.

8. STEEL CONSTRUCTION NOTES

A. GOVERNING STANDARDS: ALL STRUCTURAL STEEL SHALL BE DETAILED, FABRICATED, AND ERECTED IN ACCORDANCE WITH THE FOLLOWING STANDARDS AND AS SUPPLEMENTED BY THESE GENERAL NOTES AND THE PROJECT DRAWINGS AND SPECIFICATIONS.

1) ANSI/AISC 360-10 "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" (JUNE 22, 2010).
2) AISC 303-10 "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" (APRIL 14, 2010).
3) ANSI/AWS "D1.1-STRUCTURAL WELDING CODE - STEEL", 2011 EDITION.
4) RCSC-2010 "SPECIFICATION FOR STRUCTURAL JOINTS USING HIGH-STRENGTH BOLTS" (DECEMBER 31, 2009).

B. STRUCTURAL BOLTS & ANCHOR RODS:

1) STEEL CONTRACTOR SHALL FURNISH ERECTION BOLTS AS REQUIRED FOR FIELD CONNECTIONS.

2) ALL BOLTS SHALL BE 3/4 IN. DIAMETER ASTM A325 WITH SUITABLE WASHERS AND NUTS UNLESS OTHERWISE SHOWN IN THE CONSTRUCTION DOCUMENTS OR APPROVED IN WRITING BY THE OWNER'S REPRESENTATIVE.

3) ALL BOLTS SHALL BE TIGHTENED TO THE SNUG-TIGHTENED JOINT REQUIREMENTS OF RCSC-10 EXCEPT AT SLIP-CRITICAL JOINTS OR WHERE NOTED OTHERWISE IN CONSTRUCTION DOCUMENTS OR IN FABRICATOR'S CONNECTION DESIGN.

4) UNLESS OTHERWISE INDICATED IN THE DRAWINGS, ALL ANCHOR RODS SHALL CONFORM TO THE SPECIFIED MATERIAL GRADE SHALL BE A MINIMUM 3/4 INCH DIAMETER WITH A MINIMUM FOUNDATION EMBEDMENT AS INDICATED IN STRUCTURAL DETAILS. THE EMBEDDED END SHALL HAVE EITHER A STANDARD BOLT HEAD, A HEAVY HEX NUT WITH THE THREADS SPOILED ABOVE AND BELOW THE NUT, OR JAMMED DOUBLE NUTS. BASE PLATES SHALL BE LEVELED WITH LEVELING NUTS AND OVERSIZED WASHER PLATES OR WITH SHIM PACKS AT THE ERECTOR'S OPTION.

5) STEEL PLATE TEMPLATES SHALL BE PROVIDED TO FACILITATE PLACEMENT OF ANCHOR RODS IN DETAILED PLAN POSITIONS AND ELEVATIONS WHILE PLACING CONCRETE.

6) AFTER FINAL BASE PLATE POSITIONING, ANCHOR ROD NUTS SHALL BE INSTALLED TO A SNUG-TIGHT CONDITION AND WASHER PLATES SHALL BE FIELD WELDED AS INDICATED IN THE CONSTRUCTION DOCUMENTS.

C. STEEL FABRICATION & FINISH:

1) SHOP DRAWINGS SHALL BE SUBMITTED TO AND REVIEWED BY THE OWNER'S REPRESENTATIVE PRIOR TO COMMENCING FABRICATION. ANY FABRICATION INITIATED PRIOR TO APPROVAL OF SHOP DRAWINGS WILL BE AT THE SOLE RISK OF THE FABRICATOR.

2) ALL SHOP AND FIELD WELDS SHALL BE MADE IN ACCORDANCE WITH THE ANSI/AWS "D1.1-STRUCTURAL WELDING CODE - STEEL", 2011 EDITION. ALL WELDING SHALL USE LOW HYDROGEN PROCESSES.

3) ALL BEAMS THAT ARE REQUIRED TO HAVE CAMBER SHALL BE FABRICATED WITH CAMBER UPWARD. BEAMS WITHOUT SPECIFIED CAMBER SHALL BE FABRICATED SUCH THAT AFTER ERECTION, ANY NATURAL CAMBER DUE TO ROLLING OR SHOP FABRICATION IS UPWARD.

4) CUTS, HOLES, COPING, ETC. REQUIRED FOR WORK OF OTHER TRADES SHALL BE SHOWN ON THE SHOP DRAWINGS AND MADE IN THE SHOP. CUTS OR BURNING OF HOLES IN STRUCTURAL STEEL MEMBERS IN THE FIELD WILL NOT BE PERMITTED.

5) THE FABRICATOR SHALL BE RESPONSIBLE FOR ALL ERECTION AIDS. ANY SUCH ERECTION AIDS SHALL BE REMOVED FROM THE COMPLETED STRUCTURE IF DIRECTED BY THE OWNER'S REPRESENTATIVE.

6) ALL EXTENSION BARS, RUN-OFF PLATES, AND BACKING BARS USED IN WELDED CONNECTIONS SHALL BE REMOVED AND THE JOINTS SHALL BE GROUND SMOOTH WHERE SUCH CONNECTION IS PERMANENTLY EXPOSED TO VIEW OR IS DESIGNATED AS ARCHITECTURALLY EXPOSED STRUCTURAL STEEL.

7) HEADED STUDS AND DEFORMED BAR ANCHORS

A) ALL HEADED STUDS AND DEFORMED BAR ANCHORS SHALL BE INSTALLED USING AUTOMATIC END-WELDING EQUIPMENT RECOMMENDED BY THE STUD OR ANCHOR MANUFACTURER. MANUAL WELDING OF HEADED STUDS OR DEFORMED BAR ANCHORS WILL NOT BE ALLOWED.
B) IF A VISUAL INSPECTION REVEALS ANY STUD THAT DOES NOT SHOW A FULL 360-DEGREE FLASH OR ANY STUD THAT HAS BEEN REPAIRED BY MANUAL WELDING, SUCH STUD SHALL BE BENT TO AN ANGLE APPROXIMATELY 15-DEGREES FROM ITS ORIGINAL AXIS. THE DIRECTION OF BENDING FOR STUDS WITH LESS THAN A 360-DEGREE FLASH SHALL BE OPPOSITE TO THE MISSING PORTION OF THE FLASH.
C) HEADED STUDS AND DEFORMED BAR ANCHORS THAT HAVE SUCCESSFULLY PASSED THE BEND TEST WITHOUT SIGN OF FAILURE SHALL BE ACCEPTABLE FOR USE AND LEFT IN THE BENT POSITION UNLESS DIRECTED OTHERWISE BY THE ENGINEER.
D) WELDED STUDS NOT CONFORMING TO THE REQUIREMENTS OF THE AWS D1.1 "STRUCTURAL WELDING CODE - STEEL" SHALL BE REPAIRED OR REPLACED BY THE CONTRACTOR. THE CONTRACTOR SHALL REVISE THE WELDING PROCEDURE AS NECESSARY TO ENSURE THAT SUBSEQUENT STUD WELDING WILL MEET AWS D1.1 REQUIREMENTS.

8) STEEL EMBEDMENTS IN CONCRETE: ALL STEEL COMPONENTS TO BE EMBEDDED IN CONCRETE SHALL HAVE COATINGS AS DEFINED IN THE TABLE BELOW.

COATINGS FOR STEEL EMBEDMENTS IN CONCRETE		
EXPOSURE	FIELD WELDING	FINISH
EXTERIOR	EITHER	GALVANIZED
INTERIOR	YES	UNPAINTED
	NO	GALVANIZED

FOOTNOTES:
ALL WELDING TO PREVIOUSLY GALVANIZED COMPONENTS WILL REQUIRE REMOVAL OF THE GALVANIZING WITH GRINDING FOR AT LEAST 3-IN. FROM EITHER SIDE OF THE INTENDED WELD AND ON BOTH SIDES OF THE WORKPIECE.

FIELD WELDED AREAS AND OTHER AREAS WITH REMOVAL OF, OR DAMAGE TO, THE GALVANIZED COATING SHALL HAVE THEIR COATING RESTORED IN ACCORDANCE TO ASTM A780, USING PAINT CONTAINING ZINC DUST OR SIMILAR PERMITTED PRODUCTS CAPABLE OF PROVIDING A MINIMUM ZINC-RICH COATING THICKNESS OF 2.0 MILS IN A SINGLE APPLICATION.

9) SHOP PRIMER
A) ALL STEEL EXPOSED TO EXTERIOR WEATHER OR AN UNCONTROLLED ENVIRONMENT SHALL BE BLAST CLEANED AND PRIMED WITH A SUBMITTED AND APPROVED ZINC-RICH PRIMER.
B) INTERIOR STEEL SHALL BE SHOP PRIMED WITH THE FABRICATORS STANDARD SHOP PRIMER.
C) SHOP PRIMER SHALL NOT BE APPLIED TO THE FOLLOWING AREAS:

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i) SURFACES EMBEDDED IN CONCRETE OR MORTAR. EXTEND PRIMING OF PARTIALLY EMBEDDED MEMBERS TO A DEPTH OF 2 INCHES.
ii) SURFACES TO BE FIELD WELDED.
iii) SURFACES TO BE HIGH-STRENGTH BOLTED WITH SLIP-CRITICAL CONNECTIONS.
iv) SURFACES TO RECEIVE SPRAYED FIRE-RESISTIVE MATERIALS.
v) GALVANIZED SURFACES.

D. STEEL MISCELLANEOUS:

1) ALL EDGE ANGLES SUPPORTING ROOF OR FLOOR DECK SHALL BE SPLICED OVER SUPPORTS.

2) ALL ELEVATED MECHANICAL EQUIPMENT SHALL BE SUPPORTED BY STEEL FRAMING. IF SPECIFIC FRAMING SIZES ARE NOT PROVIDED ON THE FRAMING PLAN, REFER TYPICAL DETAILS FOR ROOF OPENING FRAME DETAIL.

3) SUBSTITUTION OF POST-INSTALLED ANCHORS FOR EMBEDDED ANCHORS SHOWN ON THE DRAWINGS WILL NOT BE PERMITTED UNLESS SPECIFICALLY APPROVED IN WRITING BY THE OWNER'S REPRESENTATIVE.

4) WHERE POST-INSTALLED ANCHORS ARE USED IN CONTINUOUS ANGLES, FABRICATE ANGLE WITH OPTIONAL HOLE LOCATIONS TO ALLOW REMEDIATION OF CASES WHERE ANCHORS FOUL WITH REBAR. AS AN EXAMPLE, FOR A CONTINUOUS ANGLE WITH ANCHORS AT 24" ON CENTER, PROVIDE HOLES AT 6" ON CENTER.

5) GALVANIZED LOOSE LEDGE ANGLES SHALL BE PROVIDED OVER ALL MASONRY VENEER OPENINGS OR RECESSES DEEPER THAN 1". LINTELS SHALL HAVE 1" OF BEARING AT EACH END FOR EVERY FOOT OF SPAN, WITH A MINIMUM OF 4" AND SIZED AS FOLLOWS UNLESS SHOWN OTHERWISE IN THE DRAWINGS.
A) UP TO 4'-0".....L3-1/2 x 3-1/2 x 3/8
B) 4'-1" to 5'-0".....L4 x 3-1/2 x 3/8 (LLV)
C) 5'-1" to 6'-6".....L5 x 3-1/2 x 3/8 (LLV)
D) 6'-7" to 8'-0".....L6 x 3-1/2 x 3/8 (LLV)

9. METAL DECK NOTES:

A. COMPOSITE FLOOR DECK:

1) COMPOSITE FLOOR SYSTEM: COMPOSITE FLOOR DECK SHALL CONSIST OF 4" NORMAL WEIGHT CONCRETE REINFORCED WITH #4 REBAR AT 12" O.C.E.W. OVER 2" DEEP, 18 GAGE, GALVANIZED, COMPOSITE STEEL DECK. TOTAL SLAB THICKNESS = 6" UNLESS NOTED OTHERWISE.

2) BASIS OF DESIGN: VULCRAFT TYPE 2VLI COMPOSITE METAL DECK WITH THE CHARACTERISTICS AND STRUCTURAL PROPERTIES OUTLINED BELOW. COMPOSITE FLOOR DECKS OF OTHER MANUFACTURERS ARE ACCEPTABLE IF THEY PROVIDE SIMILAR LOAD-CARRYING CAPACITY FOR THE DECK SPANS APPLICABLE TO THIS PROJECT.
A) SDI DECK TYPE: COMPOSITE
B) DEPTH: 2 IN.
C) THICKNESS: 18 GAGE
D) FINISH: GALVANIZED
E) Ip = 0.559 IN4/FT
F) In = 0.558 IN4/FT
G) Sp = 0.495 IN3/FT
H) Sn = 0.504 IN3/FT
I) Fy = 50 KSI
J) SIDE LAPS: OVERLAPPED
K) UNIT WEIGHT OF NORMAL WEIGHT CONCRETE FILL: 145 PCF

3) NON-COMPOSITE STRENGTH REQUIRED: THE COMPOSITE DECK SHALL BE CAPABLE OF SAFELY AND NON-COMPOSITELY SUPPORTING THE WET WEIGHT OF CONCRETE, INCLUDING AN ADDITIONAL CONCRETE PONDING WEIGHT OF 6 PSF DUE TO DEFLECTION OF DECK AND SUPPORTING STEEL FRAMING, PLUS TEMPORARY CONSTRUCTION LOADS WITHOUT REQUIRING SHORING. THE DECK SUPPLIER SHALL INFORM OWNER'S REPRESENTATIVE IF ANY PROJECT SPAN CONDITIONS DO NOT COMPLY WITH THIS REQUIREMENT AND RECOMMEND AREAS THAT MUST BE TEMPORARILY SHORED UNTIL CONCRETE HAS CURED FOR A MINIMUM OF 7 DAYS.

4) DECK ORIENTATION: COMPOSITE FLOOR DECK SHALL BE PLACED WITH RIBS PERPENDICULAR TO SUPPORTING STEEL FRAMING EXCEPT AT SKEWED FRAMING MEMBERS.

5) SUPPORT FASTENERS: ENDS OF COMPOSITE METAL DECKING SHALL BE BUTTED AND CONNECTED TO SUPPORTS WITH MINIMUM 5/8" DIAMETER PUDDLE WELDS AT MAXIMUM 12" SPACING.(EACH SIDE OF BUTTED JOINT)

6) SIDE LAP FASTENERS: PROVIDE 1" LONG WELDED SIDELAPS 24" ON CENTER. SIDE LAP CONNECTIONS ARE DECK TO DECK CONNECTIONS.

7) MINIMUM BEARING LENGTH: MINIMUM EXTERIOR AND INTERIOR BEARING LENGTHS SHALL BE AS RECOMMENDED BY THE DECK MANUFACTURER FOR THE SPECIFIC DECK TYPE, GAGE AND SLAB THICKNESS USED.

B. SUBSTITUTION OF WELDING OR PINS FOR MECHANICAL SCREW ANCHORS WILL NOT BE PERMITTED.

C. SUPPORTS FOR DECKING ARE DEFINED AS MEMBERS PROVIDING DIRECT TRANSVERSE SUPPORT AS WELL AS CONTINUOUS PARALLEL EDGE SUPPORT.

D. ALL DECKING SHALL BE PLACED WITH RIBS PERPENDICULAR TO SUPPORTING ROOF OR FLOOR MEMBERS AND SHALL SPAN A MINIMUM OF 3 SPANS UNLESS SHOWN OTHERWISE IN STRUCTURAL DRAWINGS.

E. METAL DECKING SHALL NOT BE USED TO SUPPORT ANY HANGING LOADS INCLUDING, BUT NOT LIMITED TO, SUSPENDED MECHANICAL, ELECTRICAL, OR PLUMBING EQUIPMENT, CABLE TRAYS OR RACEWAYS, CEILING FINISHES OR CEILING FRAMING.

F. ALL DECK OPENINGS UP TO 8-IN. SHALL BE REINFORCED WITH A MINIMUM 16-GAGE PLATE AS SHOWN IN TYPICAL ROOF DECK REINFORCING DETAIL.

G. ALL DECK OPENINGS GREATER THAN 8-IN. SHALL BE SUPPORTED BY AN ANGLE FRAME. IF SPECIFIC FRAMING SIZES ARE NOT PROVIDED ON THE FRAMING PLAN, REFER TYPICAL DETAILS FOR ROOF OPENING FRAME DETAIL.

H. PROVIDE SHEET STEEL COLUMN CLOSURES, Z-CLOSURES, CELL CLOSURES, POUR STOPS AND GIRDER FILLERS OF SAME MATERIAL AND FINISH AS DECK WITH THICKNESS AND PROFILE RECOMMENDED IN SDI FLOOR DECK DESIGN MANUAL, SECOND EDITION (JUNE 2020). WELD TO SUPPORTING STRUCTURE ACCORDING TO SDI RECOMMENDATIONS AND AS CONCEPTUALLY SHOWN IN TYPICAL FLOOR DECK CLOSURE DETAILS.

I. ALL FLOOR DECK EDGES SHALL BE SUPPORTED WITH POUR STOPS OR BENT PLATES. IF BENT PLATES ARE NOT SHOWN IN THE STRUCTURAL DRAWINGS, PROVIDE GAGE METAL POUR STOPS COMPLYING WITH SDI FLOOR DECK DESIGN MANUAL, SECOND EDITION (JUNE 2020), SECTION 5, TABLE 11 AND AS SHOWN IN TYPICAL DETAILS.

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KELLEY ELEMENTARY SCHOOL

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1. SHELTER GENERAL INFORMATION

A. TYPE OF SHELTER: TORNADO.

B. SHELTER WIND DESIGN GUIDELINES: ICC/NSSA STANDARD FOR THE DESIGN AND CONSTRUCTION OF STORM SHELTERS - 2014 (ICC 500-2014).

C. ROOF SYSTEMS HAVE BEEN SELECTED IN ACCORDANCE WITH DEBRIS IMPACT TESTING IN ACCORDANCE WITH ASTM E 1886 AT TEXAS TECH UNIVERSITY (REFER SUMMARY REPORT DATED JUNE 2003 PREPARED BY WIND SCIENCE AND ENGINEERING RESEARCH CENTER). REFER SECTION A1 4" THICK CONCRETE-#4 REBAR REINFORCEMENT 12 INCHES ON CENTER EACH WAY (TESTED FOR 162 MPH)-67 MPH REQUIRED.

D. WALL SYSTEMS HAVE BEEN SELECTED IN ACCORDANCE WITH DEBRIS IMPACT TESTING IN ACCORDANCE WITH ASTM E 1886 AT TEXAS TECH UNIVERSITY (REFER SUMMARY REPORT DATED JUNE 2003 PREPARED BY WIND SCIENCE AND ENGINEERING RESEARCH CENTER). REFER SECTION A1 6" THICK CONCRETE WALLS-#4 REBAR REINFORCEMENT 12 INCHES ON CENTER EACH WAY (TESTED FOR 162 MPH) - 100 MPH REQUIRED.

E. REFERENCE ELEVATION OF 100'-0" EQUALS DATUM FINISHED FLOOR ELEVATION OF 1269.125' FOR THE STORM SHELTER.

F. BASED ON THE FLOOD INSURANCE RATE MAPS (FIRM) FOR OKLAHOMA COUNTY (MAP NUMBER 40027C0160J) THE FINISHED FLOOR ELEVATION OF 1269.125' FOR THE STORM SHELTER IS GREATER THAN THE HIGHEST FLOOD ELEVATION OF 1266.00' WHICH HAS A 0.2-PERCENT ANNUAL CHANCE OF BEING EQUALED OR EXCEEDED IN ANY GIVEN YEAR. THE SHELTER IS NOT LOCATED IN AN AREA SUSCEPTIBLE TO FLOODING.

G. REFER MECHANICAL DRAWINGS FOR LOCATIONS OF SHELTER VENTILATION.

H. FURNISH LOOSE CONNECTION HARDWARE AND ANCHORAGE ITEMS TO BE EMBEDDED IN OR ATTACHED TO OTHER CONSTRUCTION BEFORE STARTING THAT WORK. PROVIDE LOCATIONS, SETTING DIAGRAMS, TEMPLATES, INSTRUCTIONS, AND DIRECTIONS, AS REQUIRED, FOR INSTALLATION.

2. SHELTER DESIGN LOADS

A. DEAD LOAD: SELF WEIGHT OF MATERIALS, UNLESS NOTED OTHERWISE

B. ROOF DEAD LOAD:
1) BUILT UP ROOF.....6 PSF
2) RIGID INSULATION.....2 PSF
3) CONCRETE DECK (4" NW CONC. ON 2" COMP. - 6" TOTAL).....63 PSF
4) STEEL BEAMS.....7 PSF
5) MISC (LIGHTING, DUCTWORK, PIPING, ETC.).....7 PSF
6) TOTAL.....85 PSF

C. LIVE LOADS:
1) ROOF LIVE LOAD (SHELTER).....100 PSF

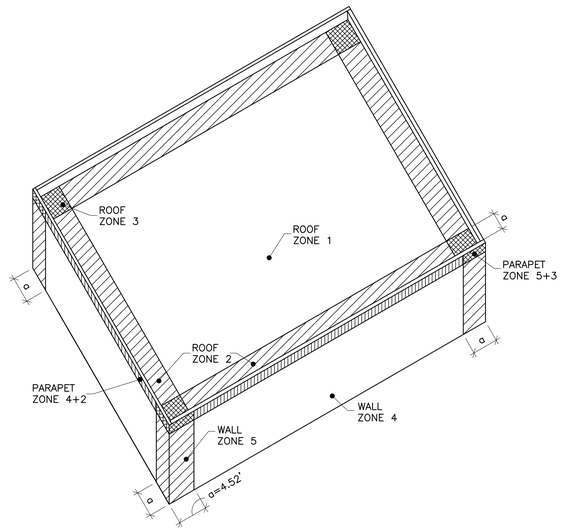
D. SHELTER WIND PARAMETERS:
1) GOVERNING CODE:.....ICC 500-2014
2) EXPOSURE CATEGORY:.....C
3) INTERNAL PRESSURE COEFFICIENTS, PARTIALLY ENCLOSED, GCPI...+/-0.55
4) TOPOGRAPHIC FACTOR, KZT.....1.0
5) DIRECTIONALITY FACTOR, KD.....1.0
6) WIND VELOCITY, V:.....250 MPH

E. EXTREME WIND PRESSURES-MAIN WIND FORCE RESISTING SYSTEM:
1) +GCPI
A) WINDWARD WALL:.....18 PSF IN
B) LEEWARD WALL:.....132 PSF OUT
C) SIDE WALL:.....156 PSF OUT
2) -GCPI
A) WINDWARD WALL:.....167 PSF IN
B) LEEWARD WALL:.....24 PSF IN
C) SIDE WALL:.....6 PSF OUT
3) WINDWARD PARAPET:.....207 PSF IN
4) LEEWARD PARAPET:.....138 PSF OUT
5) ROOF 0'-0" TO 12'-8" FROM LEADING EDGE:.....179 PSF OUT
6) ROOF 12'-8" TO 25'-4" FROM LEADING EDGE:.....132 PSF OUT
7) ROOF BEYOND 25'-4" FROM LEADING EDGE:.....109 PSF OUT
8) ROOF:.....54 PSF IN

F. SNOW LOADS:
1) GOVERNING CODE:.....ASCE 7-10
2) IMPORTANCE FACTOR, Is:.....1.10
3) GROUND SNOW LOAD, Pg:.....10 PSF
4) EXPOSURE FACTOR, Ce:.....1.0
5) THERMAL FACTOR, Ct:.....1.0
6) ROOF SLOPE FACTOR, Cs:.....1.0
7) CALCULATED FLAT ROOF SNOW LOAD, Pf:.....7.7 PSF
8) MINIMUM FLAT ROOF SNOW LOAD, I*Pf:.....11 PSF
9) RAIN ON SNOW SURCHARGE LOAD (3/8" PER FT > W/50):.....5 PSF
10) DRIFT LOADS:.....ASCE 7-10

G. SEISMIC DESIGN CRITERIA:
1) GOVERNING CODE:.....ASCE 7-10
2) IMPORTANCE FACTOR, Ie:.....1.25
3) SOIL SITE CLASSIFICATION:.....TBD
4) 0.2 SEC. MAPPED SPECTRAL ACCELERATION, Ss:.....0.272
5) 1.0 SEC. MAPPED SPECTRAL ACCELERATION, S1:.....0.079
6) SITE COEFFICIENT, 0.2 SEC. PERIOD, Fa:.....TBD
7) SITE COEFFICIENT, 1.0 SEC. PERIOD, Fv:.....TBD
8) 0.2 SEC. DESIGN SPECTRAL ACCELERATION, Sds:.....TBD
9) 1.0 SEC. DESIGN SPECTRAL ACCELERATION, Sd1:.....TBD
10) SEISMIC DESIGN CATEGORY:.....TBD
11) SEISMIC PARAMETERS:
A) SEISMIC FORCE RESISTING SYSTEM: ORDINARY REINFORCED CONCRETE SHEAR WALLS
B) RESPONSE MODIFICATION COEFFICIENT, R:.....4.00
C) SYSTEM OVERSTRENGTH FACTOR, O:.....2.50
D) DEFLECTION AMPLIFICATION FACTOR, Cd:.....4.00
E) ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE METHOD.
F) SEISMIC RESPONSE COEFFICIENT, Cs:.....TBD
G) TOTAL LATERAL BASE SHEAR, V:.....TBD

H. IN ADDITION TO REQUIREMENTS OF THE SPECIAL INSPECTOR, THE OWNER SHALL EMPLOY A LICENSED PROFESSIONAL STRUCTURAL ENGINEER TO INSPECT THE FOLLOWING ELEMENTS OF THE MAIN WIND FORCE RESISTING SYSTEM OF THE SHELTER TO VERIFY CONFORMANCE WITH THE CONTRACT DOCUMENTS:
1) CONCRETE REBAR SIZE, SPACING, LAP LENGTHS AND EMBED PLATES
2) BEAM/COLUMN SIZE AND CONNECTIONS
3) HEADED STUD ANCHORS AND THE QUALITY OF THEIR CONNECTION TO THE TOP OF BEAM FLANGES
4) COMPOSITE METAL DECK SIZE AND ATTACHMENT



1 S103 COMPONENT AND CLADDING ISOMETRIC
SCALE: 1/16"=1'-0"

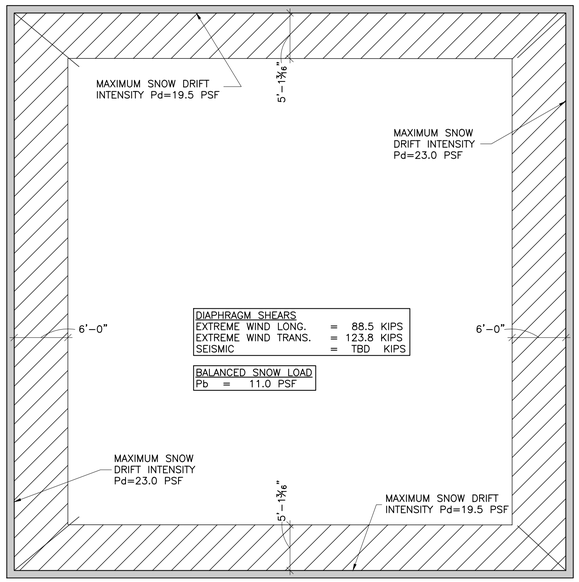
NOTE: POSITIVE PRESSURES ARE DIRECTED INWARD ON THE EXTERIOR SURFACE.
NEGATIVE PRESSURES ARE DIRECTED OUTWARD ON THE EXTERIOR SURFACE.

EXTREME WIND COMPONENTS AND CLADDING LOADS

BUILDING ELEMENT	SPAN (FT)	WIDTH (FT)	AREA (FT^2)	WIND PRESSURE ZONE 1 (PSF)	WIND PRESSURE ZONE 2 (PSF)	WIND PRESSURE ZONE 3 (PSF)	WIND PRESSURE ZONE 4+2 (PSF)	WIND PRESSURE ZONE 5+3 (PSF)	WIND PRESSURE ZONE 4 (PSF)	WIND PRESSURE ZONE 5 (PSF)
12'-8" WALL	12.67	1.00	54						-193/181	-214/181
14'-0 1/4" WALL	14.02	1.00	66						-191/179	-210/179
WINDWARD + LEEWARD PARAPET	3.33	1.00	4				372	509		
ROOF BEAM	43.50	6.33	631	-197/102	-224/102	-224/102				
ROOF DECK	6.33	1.00	13	-209/114	-307/114	-426/114				
STORM DOOR	-	-	10						-209/197	-246/197

ROOF LATERAL SHEAR FORCES
EXTREME WIND = 44.3 KIPS
SEISMIC = TBD KIPS

DIAPHRAGM CHORD FORCES
EXTREME WIND = 20.1 KIPS
SEISMIC = TBD KIPS



ROOF LATERAL SHEAR FORCES
EXTREME WIND = 44.3 KIPS
SEISMIC = TBD KIPS

DIAPHRAGM CHORD FORCES
EXTREME WIND = 20.1 KIPS
SEISMIC = TBD KIPS

NORTH

2 S103 SHELTER LOAD PLAN
SCALE: 1/8"=1'-0"

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OKLAHOMA
10/17/2022

CJC
drawn by

BWB
checked by

OCTOBER 2022
date

revisions

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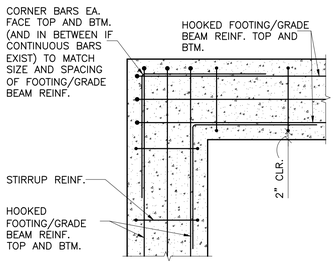
KELLEY ELEMENTARY SCHOOL

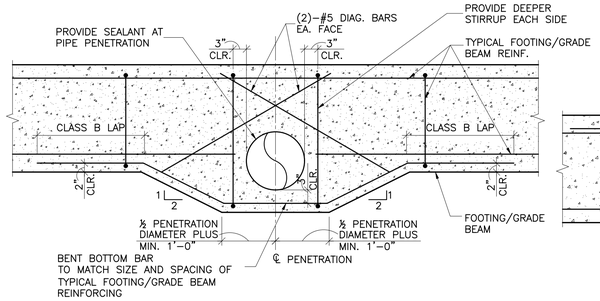
sheet no:

S103



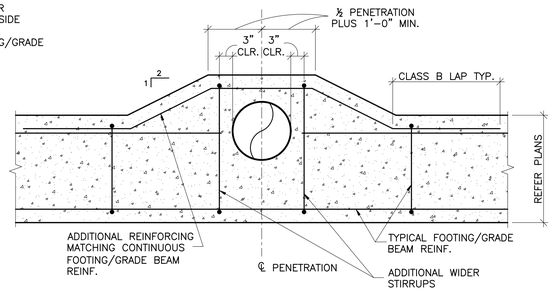
1 TYP. FOOTING/GRADE BEAM CORNER REINF.

SCALE: NONE



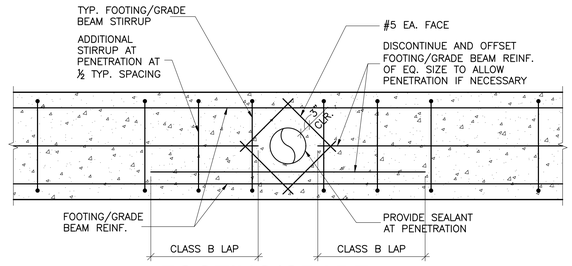
2 TYP. FOOTING/GRADE BEAM PENETRATION

SCALE: NONE



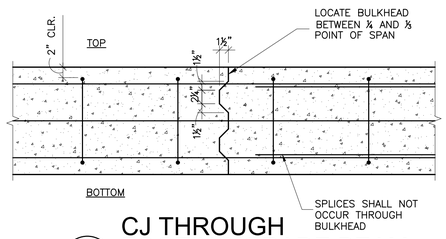
3 PLAN SECTION AT TYPICAL VERTICAL PENETRATION

SCALE: NONE



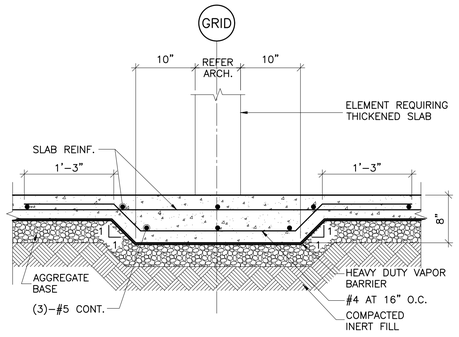
4 FOOTING/GRADE BEAM PENETRATION

SCALE: NONE



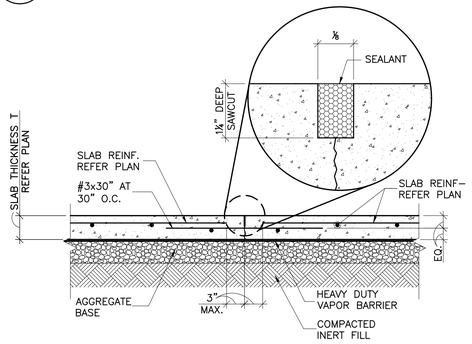
5 CJ THROUGH FOOTING/GRADE BEAM

SCALE: NONE



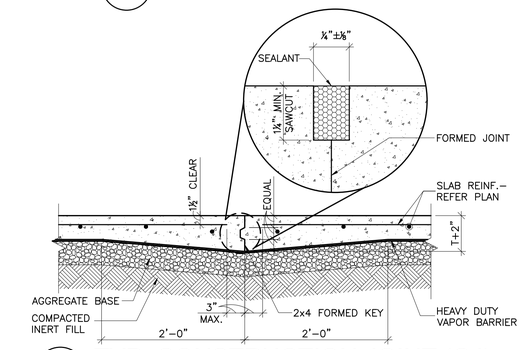
6 TYP. THICKENED SLAB

SCALE: NONE



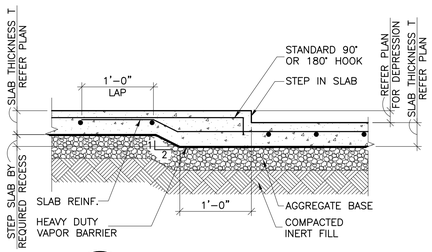
7 TYP. SAWED JOINT (SJ)

SCALE: NONE



8 TYP. CONSTRUCTION JOINT (CJ)

SCALE: NONE



9 TYP. SLAB STEP

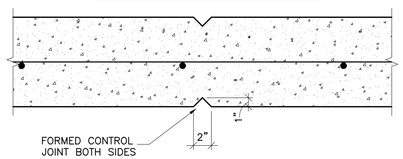
SCALE: NONE

CONCRETE EXPOSURE	MEMBER	REINFORCEMENTS	SPECIFIED COVER, IN.
CAST AGAINST AND PERMANENTLY IN CONTACT WITH GROUND	ALL	ALL	3
EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	ALL	NO. 6 THROUGH NO. 18 BAR	2
		NO. 5 BAR, W31 OR D31 WIRE, AND SMALLER	1–1/2
NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND	SLAB, JOISTS, AND WALLS	NO. 14 AND NO. 18 AND SMALLER	1–1/2
		NO. 11 BAR AND SMALLER	3/4
	BEAMS, COLUMNS, PEDESTALS, AND TENSION TIES	PRIMARY REINFORCEMENT, STIRRUPS, TIES, SPIRALS, AND HOOPS	1–1/2

10 TYP. MIN. CONCRETE COVER

SCALE: NONE

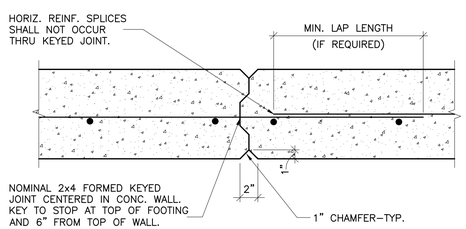
NOTES:
1. 30' MAX. SPACING TO BE COORDINATED WITH EOR AND SHOWN ON SUBMITTAL DRAWINGS.
2. WALL CONTROL JOINT SHALL NOT BE PLACED WITHIN WIND ZONE 5. REFER COMPONENT AND CLADDING ISOMETRIC ON SHELTER LOADING SHEET. COORDINATE FINAL LOCATION PRIOR TO INSTALLATION OF WALL REINF.



11 VERTICAL CONTROL JOINT

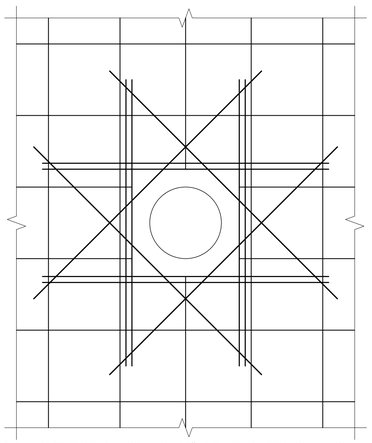
SCALE: NONE

NOTE:
WALL C.J. SHALL NOT BE PLACED WITHIN WIND ZONE 5. REFER COMPONENT AND CLADDING ISOMETRIC ON SHELTER LOADING SHEET. COORDINATE FINAL LOCATION PRIOR TO INSTALLATION OF WALL REINF.



12 OPTIONAL VERTICAL CONSTRUCTION JOINT (C.J.)

SCALE: NONE



REINF. BARS SPACED LESS THAN 12" O.C. TO BE SPREAD WITHOUT INTERRUPTION TO CLEAR PENETRATIONS LESS THAN 12" DIAM. SIZE OF DIAGONAL AND EXTRA PARALLEL BARS TO EQUAL SIZE OF TYPICAL SLAB OR WALL REINFORCING BARS.
SEE DESIGN DRAWINGS FOR DIAMETER AND LOCATION OF PENETRATIONS NUMBER OF EXTRA PARALLEL BARS PLACED EACH WAY AROUND PENETRATION TO BE EQUAL TO NUMBER OF BARS INTERRUPTED. (TYPICAL FOR EACH FACE OF SLAB OR WALL). MINIMUM OF ONE BAR EACH WAY, EACH FACE OF SLAB OR WALL.
FOR PENETRATIONS LESS THAN 12"ø, PROVIDE 4–#4x4'–0" DIAGONAL BARS EACH FACE.

13 TYP. PENETRATION THRU CONC. SLAB OR WALL

SCALE: NONE

TENSION DEVELOPMENT AND LAP–SPLICE LENGTHS FOR UNCOATED REINFORCING BARS

BAR SIZE	LAP CLASS	LENGTHS (IN.) PER CONCRETE STRENGTH f'c=3500 psi (NORMAL WEIGHT) TOP BARS CASE 1	TOP BARS CASE 2	OTHER BARS CASE 1	OTHER BARS CASE 2
#3	A	20	30	16	23
	B	26	39	20	30
#4	A	27	40	21	31
	B	35	52	27	40
#5	A	33	50	26	39
	B	43	65	33	50
#6	A	40	60	31	46
	B	52	78	40	60
#7	A	58	87	45	67
	B	75	113	58	87
#8	A	66	99	51	77
	B	86	129	66	99
#9	A	75	112	58	86
	B	97	145	75	112
#10	A	84	126	65	97
	B	109	164	84	126
#11	A	93	140	72	108
	B	121	182	93	140
#14	N/A	112	168	86	129
#18	N/A	149	224	115	172

TENSION DEVELOPMENT AND LAP–SPLICE LENGTHS FOR UNCOATED REINFORCING BARS

BAR SIZE	LAP CLASS	LENGTHS (IN.) PER CONCRETE STRENGTH f'c=4000 psi (NORMAL WEIGHT) TOP BARS CASE 1	TOP BARS CASE 2	OTHER BARS CASE 1	OTHER BARS CASE 2
#3	A	19	28	15	22
	B	24	36	19	28
#4	A	25	37	19	29
	B	32	48	25	37
#5	A	31	47	24	36
	B	40	60	31	47
#6	A	37	56	29	43
	B	48	72	37	56
#7	A	54	81	42	63
	B	70	106	54	81
#8	A	62	93	48	71
	B	80	121	62	93
#9	A	70	105	54	81
	B	91	136	70	105
#10	A	79	118	61	91
	B	102	153	79	118
#11	A	87	131	67	101
	B	113	170	87	131
#14	N/A	105	157	81	121
#18	N/A	139	209	107	161

NOTES: 1 in.=25.4 mm.
1. TABULATED VALUES ARE BASED ON GRADE 60 REINFORCING BARS AND NORMAL WEIGHT CONCRETE. LENGTHS ARE IN INCHES.
2. TENSION DEVELOPMENT LENGTHS AND TENSION LAP–SPLICE LENGTHS ARE CALCULATED PER ACI 318, SECTIONS 25.4.2.2 AND 25.5.2.1, RESPECTIVELY. TABULATED VALUES FOR BEAMS OR COLUMNS ARE BASED ON TRANSVERSE REINFORCEMENT AND CONCRETE COVER MEETING MINIMUM CODE REQUIREMENTS.
3. CASES 1 AND 2, WHICH DEPEND ON THE TYPE OF STRUCTURAL ELEMENT, CONCRETE COVER, AND CENTER–TO–CENTER SPACING OF THE BARS, ARE DEFINED AS: BEAMS OR COLUMNS: CASE 1–COVER AT LEAST 1.0d_b AND CENTER–TO–CENTER SPACING AT LEAST 2.0d_b AND CASE 2–COVER LESS THAN 1.0d_b OR CENTER–TO–CENTER SPACING LESS THAN 2.0d_b. ALL OTHERS: CASE 1–COVER AT LEAST 1.0d_b AND CENTER–TO–CENTER SPACING AT LEAST 3.0d_b. CASE 2–COVER LESS THAN 1.0d_b OR CENTER–TO–CENTER SPACING LESS THAN 3.0d_b.
4. LAP SPLICE LENGTHS ARE MULTIPLES OF TENSION DEVELOPMENT LENGTHS; CLASS A=1.0l_d AND CLASS B=1.3l_d (ACI 318, SECTION 25.5.2.1).
5. ACI 318 DOES NOT ALLOW TENSION LAP SPLICES OF #14 OR #18 BARS. THE TABULATED VALUES FOR THOSE BAR SIZES ARE THE TENSION DEVELOPMENT LENGTHS.
6. TOP BARS ARE HORIZONTAL BARS WITH MORE THAN 12 in. OF CONCRETE CAST BELOW THE BARS.
7. FOR LIGHTWEIGHT–AGGREGATE CONCRETE, MULTIPLY THE TABULATED VALUES BY 1.3.

14 REINFORCING LAP LENGTHS

SCALE: NONE

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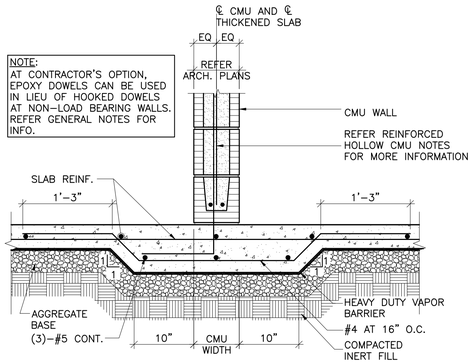
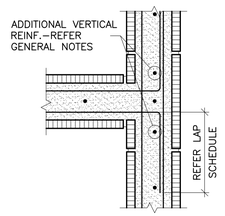
NEW ADDITION
KELLEY ELEMENTARY SCHOOL

sheet no:

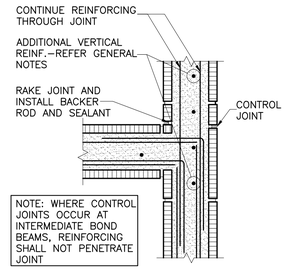
S104



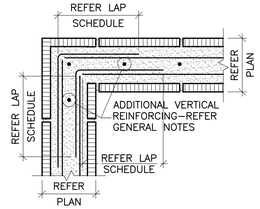
1 THICKENED SLAB AT CMU
SCALE: NONE



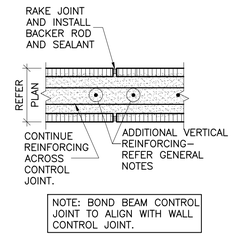
2 DETAIL AT BOND BEAM CORNER W/ NO CONTROL JT
SCALE: NONE



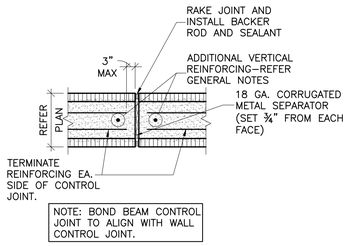
3 DETAIL AT FLOOR/ROOF BOND BEAM CORNER W/ CONTROL JT
SCALE: NONE



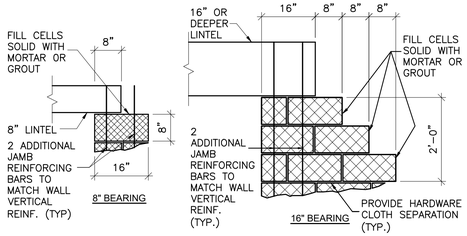
4 CORNER BOND BEAM WITH NO CONTROL JT
SCALE: NONE



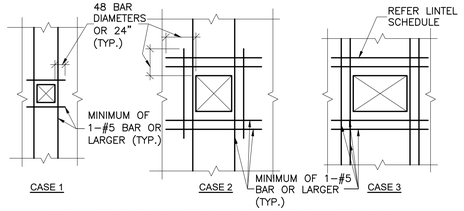
5 CONTROL JT AT FLOOR/ROOF BOND BEAM
SCALE: NONE



6 CONTROL JT AT INTERMEDIATE BOND BEAM
SCALE: NONE



7 BEARING DETAILS TYP. LINTEL TYPES
SCALE: NONE



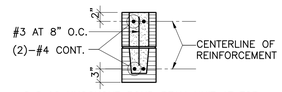
CASE 1 APPLIES TO: ALL OPENINGS 2 FEET OR LESS BOTH WAYS.

CASE 2 APPLIES TO: ALL OPENINGS EXCEEDING 2 FEET BUT NOT MORE THAN 4 FEET BOTH WAYS, WHERE NO LINTEL IS INDICATED

CASE 3 APPLIES TO: ALL OPENINGS EXCEEDING 4 FEET AND WIDER

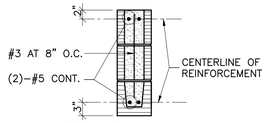
NOTE: 1.) WHERE VERTICAL REINFORCING CONSISTS OF 2 BARS OR MORE EACH BAR SHALL BE PLACED IN A SEPARATE CELL
2.) WHERE OPENING IS SUPPORTED BY A PERPENDICULAR WALL AND ONLY 8" OF WALL EXTENDS BEYOND THE OPENING, HOOK LINTEL AND SILL REINFORCING 90°

8 REINFORCING AROUND CMU WALL OPENING
SCALE: NONE



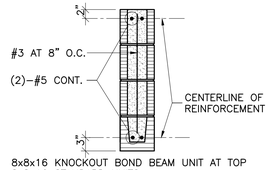
8x8x16 KNOCKOUT BOND BEAM UNIT AT TOP
8x8x16 SOLID BOTTOM BOND BEAM UNIT

LINTEL TYPE 1



8x8x16 KNOCKOUT BOND BEAM UNIT AT TOP
8x8x16 STANDARD UNITS
8x8x16 SOLID BOTTOM BEAM UNIT AT BOTTOM

LINTEL TYPE 2



8x8x16 KNOCKOUT BOND BEAM UNIT AT TOP
8x8x16 STANDARD UNITS
8x8x16 SOLID BOTTOM BEAM UNIT AT BOTTOM

LINTEL TYPE 3

NON-LOAD BEARING CMU LINTEL SCHEDULE	
TYPE	SPAN IN FEET
⟨1⟩	UP TO 4'-0"
⟨2⟩	4'-1" TO 6'-8"
⟨3⟩	6'-9" TO 9'-4"

NOTE: REFER ⟨#⟩ ON PLANS FOR LINTEL TYPES.

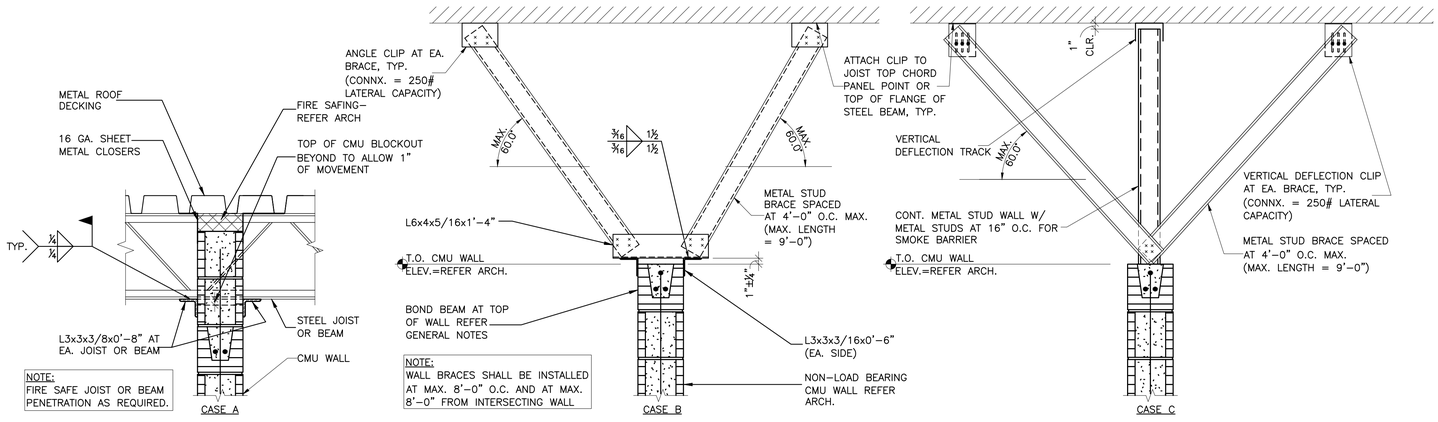
9 TYP. LINTEL TYPES
SCALE: NONE

BAR SIZE	LENGTH (in.) CENTER 6" CMU	8" CMU	12" CMU	EDGE (2 IN CLEAR COVER) 6", 8", 12" CMU
3	1'-0"	1'-0"	1'-0"	1'-3"
4	1'-6"	1'-2"	1'-0"	2'-2"
5	2'-4"	1'-11"	1'-2"	3'-4"
6	**	3'-5"	2'-2"	**
7	**	**	**	**
8	**	**	**	**

10 CMU REINFORCING LAP SCHEDULE
SCALE: NONE

NOTES:
1. f'm= 1500 psi
2. fy= 60,000 psi
3. MULTIPLY LAP LENGTH BY 1.3 FOR EPOXY COATED REBAR

*SCHEDULE ALSO APPLIES TO EMBEDMENT LENGTHS
**MECHANICAL SPLICES SHALL BE USED



11 TYP. BRACING AT TOP OF NON-LOAD BEARING CMU
SCALE: NONE

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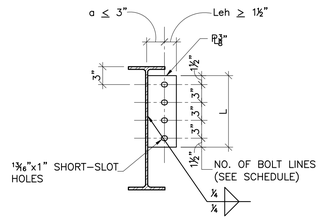
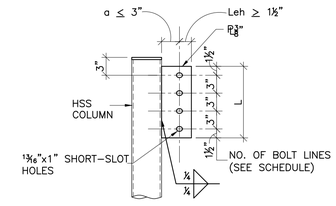
¾"ø A325–N BOLT SCHEDULE FOR SINGLE PLATE SHEAR TAB CONNECTIONS (FACTORED LOADS)	
END REACTION	NO. OF BOLTS
0 THRU 24.8 KIPS	2–¾ø
24.9 THRU 43.4 KIPS	3–¾ø
43.5 THRU 62.5 KIPS	4–¾ø
62.6 THRU 81.3 KIPS	5–¾ø
81.4 THRU 100 KIPS	6–¾ø
101 THRU 118 KIPS	7–¾ø
119 THRU 137 KIPS	8–¾ø

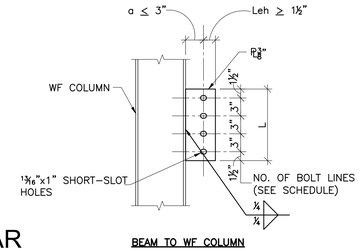
NOTES:
1. VALUES SHOWN ARE APPLICABLE FOR SINGLE PLATE SHEAR TAB CONNECTIONS
2. SEE PLAN FOR END REACTIONS
3. L = PLATE LENGTH ≥ T/2 OF CONNECTED BEAM.
4. AT HSS OR PIPE COLUMNS, A THROUGH–PLATE WITH EQUAL WELD ON THE BACK SIDE OF THE COLUMN IS REQUIRED UNDER EITHER OF THE FOLLOWING CIRCUMSTANCES:
   A. FOR SQUARE OR RECTANGULAR HSS:
      WHEN $\frac{B-2.79t}{0.93t} > 35.1$
   B. FOR ROUND HSS OR PIPE:
      WHEN $\frac{D}{t} > \frac{3,190}{Fy}$
   WHERE:
   B = NOMINAL COLUMN WIDTH ACROSS THE COLUMN FACE WITH THE SINGLE PLATE CONNECTION, IN.
   D = OUTSIDE DIAMETER OF ROUND HSS OR PIPE, IN.
   t = NOMINAL THICKNESS OF COLUMN,IN.
   Fy = YIELD STRENGTH OF COLUMN, KSI
5. PLATE YIELD STRENGTH, FY, SHALL BE A MINIMUM OF 36 KSI.
6. CONNECTIONS SHOWN WITH AXIAL LOADS ON FRAMING PLANS SHALL BE DESIGNED BY FABRICATOR.



BEAM TO BEAM

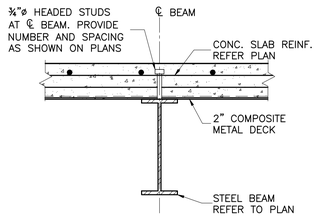


BEAM TO HSS COLUMN

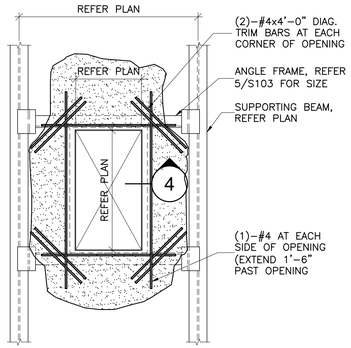


BEAM TO WF COLUMN

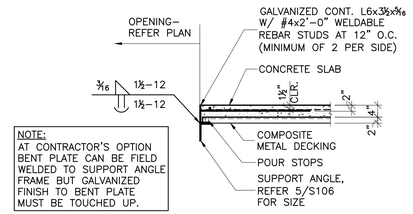
1 SINGLE PLATE SHEAR TAB CONNECTIONS (LRFD-AISC 14TH EDITION MANUAL)
SCALE: NONE



2 SECTION
SCALE: NONE

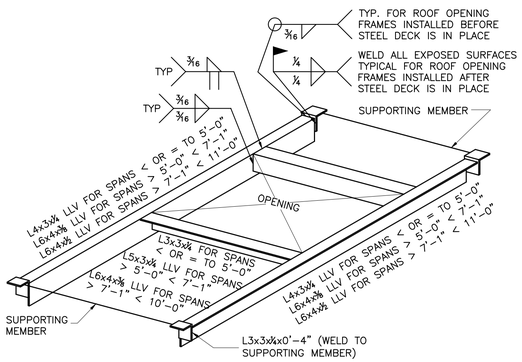


3 TYPICAL SHELTER ROOF ANGLE DETAIL
SCALE: NONE

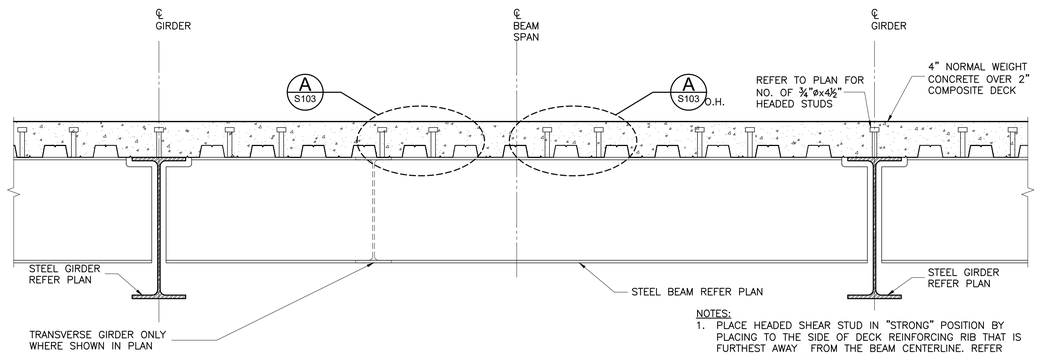


NOTE:
AT CONTRACTOR'S OPTION BENT PLATE CAN BE FIELD WELDED TO SUPPORT ANGLE FRAME BUT GALVANIZED FINISH TO BENT PLATE MUST BE TOUCHED UP.

4 TYPICAL SECTION AT FLOOR OPENING
SCALE: NONE

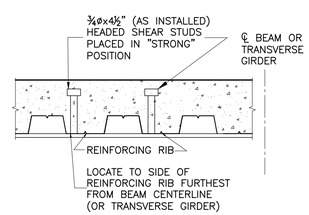


5 TYP. ROOF OPENING FRAME AND MECHANICAL UNIT SUPPORT
SCALE: NONE



NOTES:
1. PLACE HEADED SHEAR STUD IN "STRONG" POSITION BY PLACING TO THE SIDE OF DECK REINFORCING RIB THAT IS FURTHEST AWAY FROM THE BEAM CENTERLINE. REFER DETAIL A FOR ADDITIONAL INFORMATION.
2. IN SOME CASES, TRANSVERSE GIRDERS FRAME INTO THE BEAM NOT AT CENTERLINE, BUT WITHIN A FEW FEET. AT THIS CONDITION, PLACE STUDS IN "STRONG" POSITION RELATIVE TO TRANSVERSE GIRDER AND NOT CENTERLINE OF BEAM.

6 TYPICAL BEAM ELEVATION
SCALE: NONE



A DETAIL
SCALE: NONE

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NEW ADDITION
KELLEY ELEMENTARY SCHOOL

sheet no:

S106

1. STATEMENT OF SPECIAL INSPECTIONS NOTES:

A. THIS STATEMENT OF SPECIAL INSPECTIONS IS INCLUDED AS REQUIRED BY CHAPTER 17 OF 2015 INTERNATIONAL BUILDING CODE AND AISC 360.

B. SPECIAL INSPECTIONS SHALL CONFORM TO CHAPTER 17 OF THIS SHEET, SPECIFICATIONS, AISC 360, AND 2015 INTERNATIONAL BUILDING CODE. GENERAL REQUIREMENTS ARE LISTED BELOW AND IN THE ATTACHED INSPECTION TABLES.

C. REFER TO PROJECT SPECIFICATIONS FOR ADDITIONAL SPECIAL INSPECTION REQUIREMENTS. IF CONFLICTING REQUIREMENTS ARE FOUND BETWEEN STATEMENTS OF SPECIAL INSPECTIONS AND THE PROJECT SPECIFICATIONS, THE MORE STRINGENT PROVISION SHALL CONTROL UNLESS DIRECTED OTHERWISE IN WRITING BY THE STRUCTURAL ENGINEER OF RECORD.

D. THE GENERAL CONTRACTOR SHALL EMPLOY ONE OR MORE SPECIAL INSPECTORS FOR THIS PROJECT. THE SPECIAL INSPECTOR SHALL BE A QUALIFIED PERSON WHO SHALL DEMONSTRATE COMPETENCE, TO THE SATISFACTION OF THE BUILDING OFFICIAL, FOR THE INSPECTION OF THE PARTICULAR TYPE OF CONSTRUCTION OR OPERATION REQUIRING SPECIAL INSPECTION.

E. THE SPECIAL INSPECTOR SHALL PROVIDE WRITTEN DOCUMENTATION TO THE BUILDING OFFICIAL DEMONSTRATING HIS OR HER COMPETENCE AND RELEVANT EXPERIENCE OR TRAINING. EXPERIENCE OR TRAINING SHALL BE CONSIDERED RELEVANT WHEN THE DOCUMENTED EXPERIENCE OR TRAINING IS RELATED IN COMPLEXITY TO THE SAME TYPE OF SPECIAL INSPECTION ACTIVITIES FOR PROJECTS OF SIMILAR COMPLEXITY AND MATERIAL QUALITIES.

F. THE SPECIAL INSPECTOR SHALL PROVIDE CONTINUOUS OR PERIODIC INSPECTIONS AS SHOWN IN THE ATTACHED INSPECTION TABLES

1) CONTINUOUS INSPECTION: THE SPECIAL INSPECTOR SHALL BE PRESENT AT ALL PROCEDURAL EVENTS.
2) PERIODIC INSPECTION: THE SPECIAL INSPECTOR SHALL BE PRESENT AT THE START OF THE WORK AND PERIODIC INSPECTION IS MADE TO VERIFY PROGRESS OF WORK IS IN COMPLIANCE.

G. INSPECTION OF FABRICATORS: WHERE FABRICATION OF STRUCTURAL LOADBEARING MEMBERS AND ASSEMBLIES IS BEING PERFORMED ON THE PREMISES OF A FABRICATOR'S SHOP, SPECIAL INSPECTION OF THE FABRICATED ITEMS SHALL BE REQUIRED BY SECTION 1704.2.5 OF THE 2015 INTERNATIONAL BUILDING CODE AND AS REQUIRED ELSEWHERE IN THE CODE.

H. FABRICATOR APPROVAL: SPECIAL INSPECTIONS REQUIRED BY SECTION 1704 ARE NOT REQUIRED WHERE THE WORK IS DONE ON THE PREMISES OF A FABRICATOR REGISTERED AND APPROVED TO PERFORM SUCH WORK WITHOUT SPECIAL INSPECTION. APPROVAL SHALL BE BASED UPON REVIEW OF THE FABRICATOR'S WRITTEN PROCEDURAL AND QUALITY CONTROL MANUALS AND PERIODIC AUDITING OF FABRICATION PRACTICES BY AN APPROVED SPECIAL INSPECTION AGENCY. AT COMPLETION OF FABRICATION, THE APPROVED FABRICATOR SHALL SUBMIT A CERTIFICATE OF COMPLIANCE TO THE BUILDING OFFICIAL STATING THAT THE WORK WAS PERFORMED IN ACCORDANCE WITH THE APPROVED CONSTRUCTION DOCUMENTS.

I. REPORT REQUIREMENTS: SPECIAL INSPECTORS SHALL KEEP RECORDS OF INSPECTIONS. THE SPECIAL INSPECTOR SHALL FURNISH INSPECTION REPORTS TO THE BUILDING OFFICIAL, AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE. REPORTS SHALL INDICATE THAT WORK INSPECTED WAS OR WAS NOT COMPLETED IN CONFORMANCE TO APPROVED CONSTRUCTION DOCUMENTS. DISCREPANCIES SHALL BE BROUGHT TO THE IMMEDIATE ATTENTION OF THE CONTRACTOR FOR CORRECTION. IF THEY ARE NOT CORRECTED, THE DISCREPANCIES SHALL BE BROUGHT TO THE ATTENTION OF THE BUILDING OFFICIAL AND TO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE PRIOR TO THE COMPLETION OF THAT PHASE OF THE WORK. A FINAL REPORT DOCUMENTING REQUIRED SPECIAL INSPECTIONS AND CORRECTION OF ANY DISCREPANCIES NOTED IN THE INSPECTIONS SHALL BE SUBMITTED AT A POINT IN TIME AGREED UPON PRIOR TO THE START OF WORK BY THE APPLICANT AND THE BUILDING OFFICIAL.

J. THE CONTRACTOR IS RESPONSIBLE FOR PROVIDING REASONABLE NOTICE TO THE SPECIAL INSPECTOR(S) REGARDING WHEN ELEMENTS OF THE PROJECT WILL BE READY FOR EFFICIENT IMPLEMENTATION OF SPECIAL INSPECTIONS.

K. THE CONTRACTOR SHALL PROVIDE ACCESS TO THE LATEST VERSION OF ALL APPROVED PLANS AND SHOP DRAWINGS FOR THE SPECIAL INSPECTOR'S USE IN PERFORMING SPECIAL INSPECTIONS.

L. CONTRACTOR SHALL GRANT ACCESS TO OWNER'S SPECIAL INSPECTOR AS IS REASONABLY NECESSARY FOR THE PROPER PERFORMANCE OF SPECIAL INSPECTIONS.

M. SPECIAL INSPECTIONS DO NOT RELIEVE THE CONTRACTOR OF RESPONSIBILITY TO COMPLY WITH ALL REQUIREMENTS OF THE CONTRACT DOCUMENTS. CONSTRUCTION MEANS AND METHODS AND JOBSITE SAFETY ARE SOLELY THE RESPONSIBILITY OF THE CONTRACTOR.

N. STEEL QUALITY INSPECTOR QUALIFICATIONS.

1) QUALITY CONTROL INSPECTOR OF ERECTOR/FABRICATOR SHALL BE QUALIFIED TO THE SATISFACTION OF THE ERECTOR/ FABRICATOR'S QC PROGRAM AND AISC 360 SECTION N.4.1 REQUIREMENTS.
2) QUALITY ASSURANCE INSPECTOR SHALL BE QUALIFIED BY A QA AGENCY AND AISC 360 SECTION N.4.2 REQUIREMENTS.
3) NON-DESTRUCTIVE TESTING PERSONNEL, OR OTHER THAN VISUAL, SHALL BE QUALIFIED IN ACCORDANCE W/ EMPLOYER'S WRITTEN PRACTICE MEETING OR EXCEEDING REQUIREMENTS OF AWS D1.1/D1.1M AND EITHER ANST SNT-TC-1A OR ANST CP-189 REQUIREMENTS.

P. EACH CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION, FABRICATION, OR INSTALLATION OF A MAIN WINDFORCE-RESISTING SYSTEM OR ANY COMPONENT LISTED IN THE OWNER'S QUALITY ASSURANCE PLAN SHALL SUBMIT A WRITTEN STATEMENT OF RESPONSIBILITY TO THE AUTHORITY HAVING JURISDICTION, THE RESPONSIBLE DESIGN PROFESSIONAL AND THE OWNER PRIOR TO THE COMMENCEMENT OF WORK ON THE SYSTEM OR COMPONENT. THE CONTRACTOR'S STATEMENT OF RESPONSIBILITY SHALL CONTAIN:

1) ACKNOWLEDGEMENT OF AWARENESS OF THE SPECIAL REQUIREMENTS CONTAINED IN THE QUALITY ASSURANCE PLAN.
2) ACKNOWLEDGEMENT THAT QA/QC WILL BE EXERCISED TO OBTAIN COMPLIANCE WITH THE CONSTRUCTION DOCUMENTS.
3) PROCEDURES FOR EXERCISING QA/QC WITHIN THE CONTRACTOR'S ORGANIZATION, THE METHOD AND FREQUENCY OF REPORTING AND THE DISTRIBUTION OF QA/QC REPORTS.
4) IDENTIFICATION AND QUALIFICATIONS OF THE PERSON(S) EXERCISING SUCH CONTROL AND THEIR POSITION(S) IN THE ORGANIZATION.

Q. IN ADDITION TO THE REQUIREMENTS OF THE SPECIAL INSPECTOR, THE OWNER SHALL EMPLOY A LICENSED PROFESSIONAL STRUCTURAL ENGINEER TO INSPECT THE FOLLOWING ELEMENTS OF THE MAIN WIND FORCE RESISTING SYSTEM OF THE SHELTER TO VERIFY CONFORMANCE WITH THE CONTRACT DOCUMENTS:
1) CONCRETE REBAR SIZE, SPACING, LAP LENGTHS AND EMBED PLATES.
2) BEAM/COLUMN SIZE AND CONNECTIONS.
3) HEADED STUD ANCHORS AND THE QUALITY OF THEIR CONNECTION TO THE TOP OF BEAM FLANGES.
4) METAL DECK SIZE AND ATTACHMENT.

REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

VERIFICATION AND INSPECTION	FREQUENCY OF INSPECTION: CONTINUOUS (inspect each joint/member)	FREQUENCY OF INSPECTION: PERIODIC (inspect random joint/members)	REFERENCED STANDARD
1. Material verification of high-strength bolts, nuts and washers:			
a. Identification markings to conform to ASTM standards specified in the approved construction documents.	-	QC and QA	AISC 360, Section A3.3 and applicable ASTM material standards
b. Manufacturer's certifications available for fastener materials.	QA	QC	AISC 360, Table N5.6-1
c. Fasteners marked in accordance with ASTM requirements.	-	QC and QA	
d. Proper fasteners selected for the joint detail (grade, type, bolt length if threads are to be excluded from shear plane).	-	QC and QA	
e. Proper bolting procedure selected for joint detail.	-	QC and QA	
f. Connecting elements, including the appropriate faying surface condition and hole preparation, if specified, meet applicable requirements.	-	QC and QA	
g. Pre-installation verification testing by installation personnel observed and documented for fastener assemblies and methods used.	QC	QA	
h. Proper storage provided for bolts, nuts, washers and other fastener components.	-	QC and QA	
2. Inspection of high-strength bolting: • For bolts requiring pretensioning, the special inspector shall observe the preinstallation testing and calibration procedures; determine that all plies of connected materials have been drawn together and properly snugged prior to pretentioning and monitor the installation of bolts to verify that fasteners are pretensioned in accordance with the RCSC Specification, progressing systematically from the most rigid point to the free edges. • For joints required to be tightened only to the snug-tight condition, the special inspector need only verify that the connected materials have been drawn together and properly snugged.			
a. Snug-tight joints.	-	QC and QA	AISC 360, Section M2.5
b. Pretensioned and slip-critical joints using turn-of-nut with matchmarking, twist-off bolt or direct tension indicator methods of installation.	-	QC and QA	
c. Pretensioned and slip-critical joints using turn-of-nut without matchmarking or calibrated wrench methods of installation.	QC and QA	-	
d. Fastener assemblies, of suitable condition, placed in all holes and washers (if required) are positioned as required.	-	QC and QA	AISC 360, Table N5.6-2
e. Fastener component not turned by the wrench prevented from rotating.	-	QC and QA	
f. Document acceptance or rejection of bolted connections.	QC and QA	-	AISC 360, Table N5.6-3
3. Material verification of structural steel and cold-formed steel deck U.N.O.:			
a. For structural steel, identification markings to conform to AISC 360.	-	QC and QA	AISC 360, Section M1
b. For other steel, identification markings to conform to ASTM standards specified in the approved construction documents.	-	QC and QA	Applicable ASTM material standards
4. Inspection prior to welding:			
a. Verify identification markings of weld filler materials conform to AWS specification in the approved construction documents.	-	QC and QA	AISC 360, Section A3.5 and applicable AWS AS documents
b. Welding procedure specifications are available.	QC and QA	-	AISC 360, Table N5.4-1
c. Manufacturer certifications for welding consumables available.	QC and QA	-	
d. Material identification (type/grade) and welded identification system.	-	QC and QA	
e. Fit-up of welds including but not limited to joint preparation, dimensions, cleanliness, tacking, and backing type/fit as applicable.	-	QC and QA	
f. Configuration and finish of access holes	-	QC and QA	
g. Check welding equipment.	-	QC	

REQUIRED VERIFICATION AND INSPECTION OF STEEL CONSTRUCTION

VERIFICATION AND INSPECTION	FREQUENCY OF INSPECTION: CONTINUOUS (inspect each joint/member)	FREQUENCY OF INSPECTION: PERIODIC (inspect random joint/members)	REFERENCED STANDARD
5. Inspection of welding:			
a. AISC 360 requirements for welding structural steel			
1) Use of qualified welders	-	QC and QA	AISC 360, Table N5.4-2 During Welding
2) Packaging and exposure control and handling of welding consumables.	-	QC and QA	
3) Welding over cracked tack welds	-	QC and QA	
4) Environmental conditions including but not limited to precipitation, temperature and wind.	-	QC and QA	
5) Verify settings on equipment, travel speeds, elected materials, shielding gas type/flow rate, preheating interpass temperatures and proper position meets WPS standards.	-	QC and QA	
6) Verify welding techniques for interpass, final cleaning, profile limitations, and quality requirements.	-	QC and QA	
7) Welds are cleaned and painted where required.	-	QC and QA	AISC 360, Table N5.4-2 After Welding
8) Verify size, length and locations of welds.	QC and QA	-	
9) Visually verify welds for crack prohibition, weld/base-metal fusion, crater cross section, weld profiles, weld size, undercutting, and porosity.	QC and QA	-	
10) Arc strikes, k-area cracks within 3" of weld, removal of backing, and repair activities as applicable.	QC and QA	-	
11) Documentation of acceptance or rejection of welded joint or member.	QC and QA	-	
b. American Welding Society requirements for structural steel and cold-formed steel deck:			
1) Complete and partial joint penetration groove welds.	X	-	AWS D1.1
2) Multipass fillet welds.	X	-	
3) Single-pass fillet welds > 5/ 16"	X	-	
4) Plug and slot welds.	X	-	
5) Single-pass fillet welds ≤ 5/ 16"	-	X	
6) Floor and roof deck welds.	-	X	AWS D1.3
7) Welded studs & deformed bar anchors (DBA's).	-	X	AWS D1.1
8) Welded sheet steel for cold-formed steel members	-	X	AWS D1.3
9) Welding of stairs & railing systems	-	X	AWS D1.1
c. Reinforcing steel:			AWS D1.4, ACI 318: Section 3.5.2
1) Verification of weldability of reinforcing steel other than ASTM A 706.	-	X	
2) Reinforcing steel resisting flexural and axial forces in intermediate and special moment frames, and boundary elements of special structural walls of concrete and shear reinforcement.	X	-	
3) Shear reinforcement.	X	-	
4) Other reinforcing steel.	-	X	
6. Inspection of steel elements of composite construction prior to concrete placement:			
a. Placement and installation of steel deck.	QC and QA	-	AISC 360, Table N6.1
b. Placement and installation of steel HSA.	QC and QA	-	AISC 360, Table N6.1
c. Documentation of acceptance or rejection of steel elements.	QC and QA	-	AISC 360, Table N6.1

TABLE 1705.3
REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION	REFERENCED STANDARD	IBC REFERENCE
1) Inspect reinforcement, including prestressing tendon, and verify placement.	-	X	ACI 318 Ch. 20, 25.2, 25.3, 26.6.1-26.6.3	1908.4
2) Reinforcing bar welding: a) Verify weldability of reinforcing bars other than ASTM A706; b) Inspect single-pass fillet welds, maximum 5/16"; and c) Inspect all other welds.	- / - / X	X / X / -	AWS D1.4 ACI 318: 26.5.4	-
3) Inspect anchors cast in concrete.	-	X	ACI 318:17.8.2	-
4) Inspect size, embedment, and installation of post-installed anchors.	X	-	Manuf. Requirements	
5) Verify use of required design mix.	-	X	ACI 318: Ch. 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
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 C 172 ASTM C 31 ACI 318: 26.4, 26.12	1908.10
7) Inspect concrete and shotcrete placement for proper application techniques.	X	-	ACI 318: 26.5	1908.6, 1908.7, 1908.8
8) Verify maintenance of specified curing temperature and techniques.	-	X	ACI 318: 26.5.3-26.5.5	1908.9
9) Inspect prestressed concrete for: a) Application of prestressing forces; and b) Grouting of bonded prestressing tendons.	X / X	- / -	ACI 318: 26.10	-
10) Inspect erection of precast concrete members.	-	X	ACI 318: Ch. 26.8	-
11) 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	-
12) Inspect formwork for shape, location and dimensions of the concrete member being formed.	-	X	ACI 318: 26.11.1.2(b)	-

TABLE 1705.6
REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1. Verify materials below shallow foundations are adequate to achieve the design bearing capacity.	-	X
2. Verify excavations are extended to proper depth and have reached proper material.	-	X
3. Perform classification and testing of compacted fill materials.	-	X
4. Verify use of proper materials, densities and lift thicknesses during placement and compaction of compacted fill.	X	-
5. Prior to placement of compacted fill, inspect subgrade and verify that site has been prepared properly.	-	X

TABLE 1705.8
REQUIRED SPECIAL INSPECTIONS AND TESTS OF CAST-IN-PLACE DEEP FOUNDATION ELEMENTS

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1. Inspect drilling operations and maintain complete and accurate records for each element.	X	-
2. Verify placement locations and plumbness, confirm element diameters, bell diameters (if applicable), lengths, embedment into bedrock (if applicable), and adequate end-bearing strata capacity. Record concrete or grout volumes.	X	-
3. For concrete elements, perform tests and additional special inspections in accordance with Section 1705.3.	-	-

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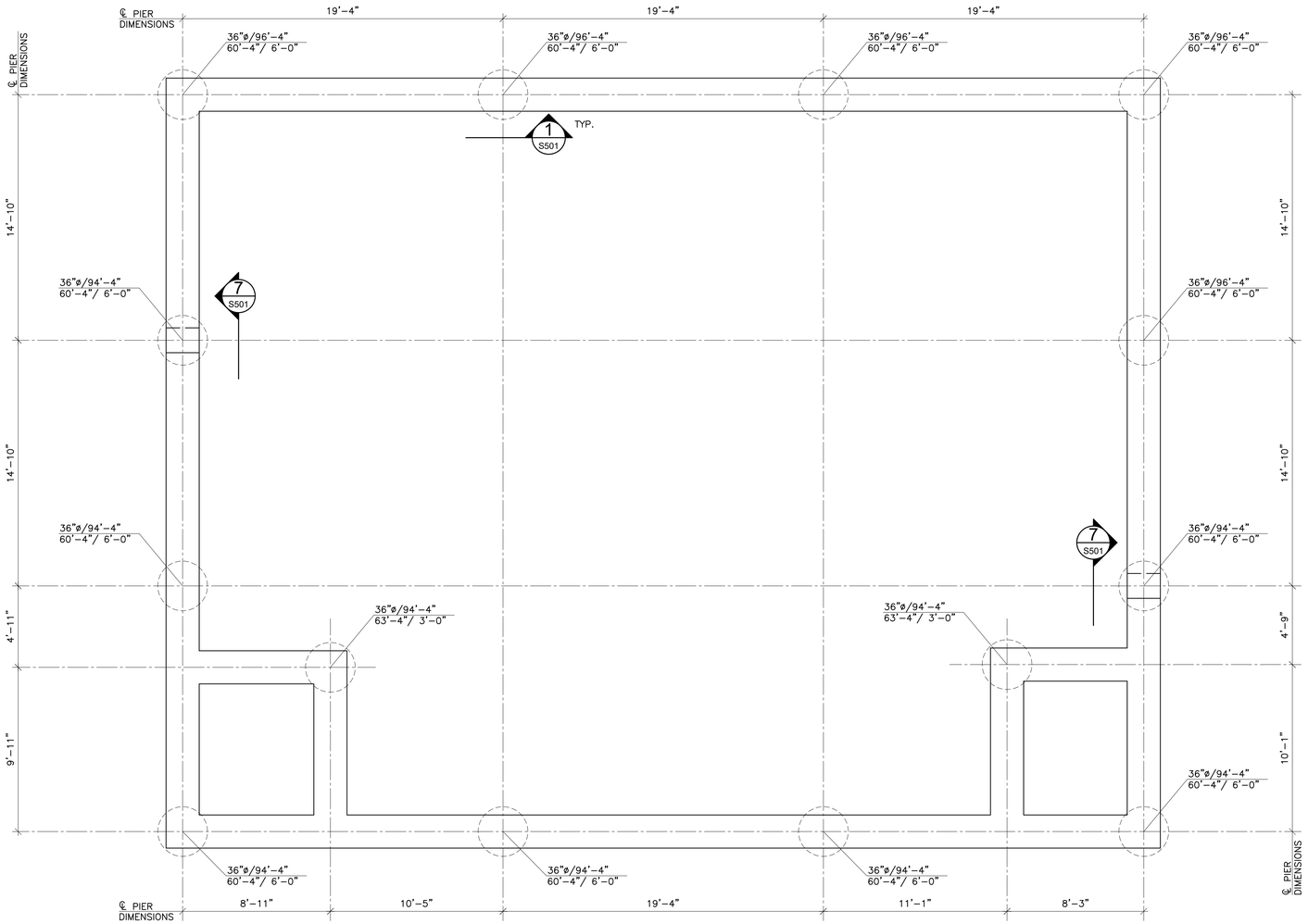


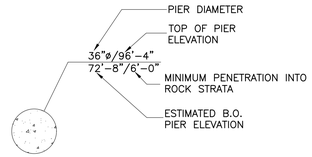
NORTH

1 S200 SHELTER PIER PLAN

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

NOTE:
FOUNDATION DESIGNS ARE PRELIMINARY UNTIL A SITE SPECIFIC GEOTECHNICAL REPORT IS RECEIVED.

PIER PLAN LEGEND:



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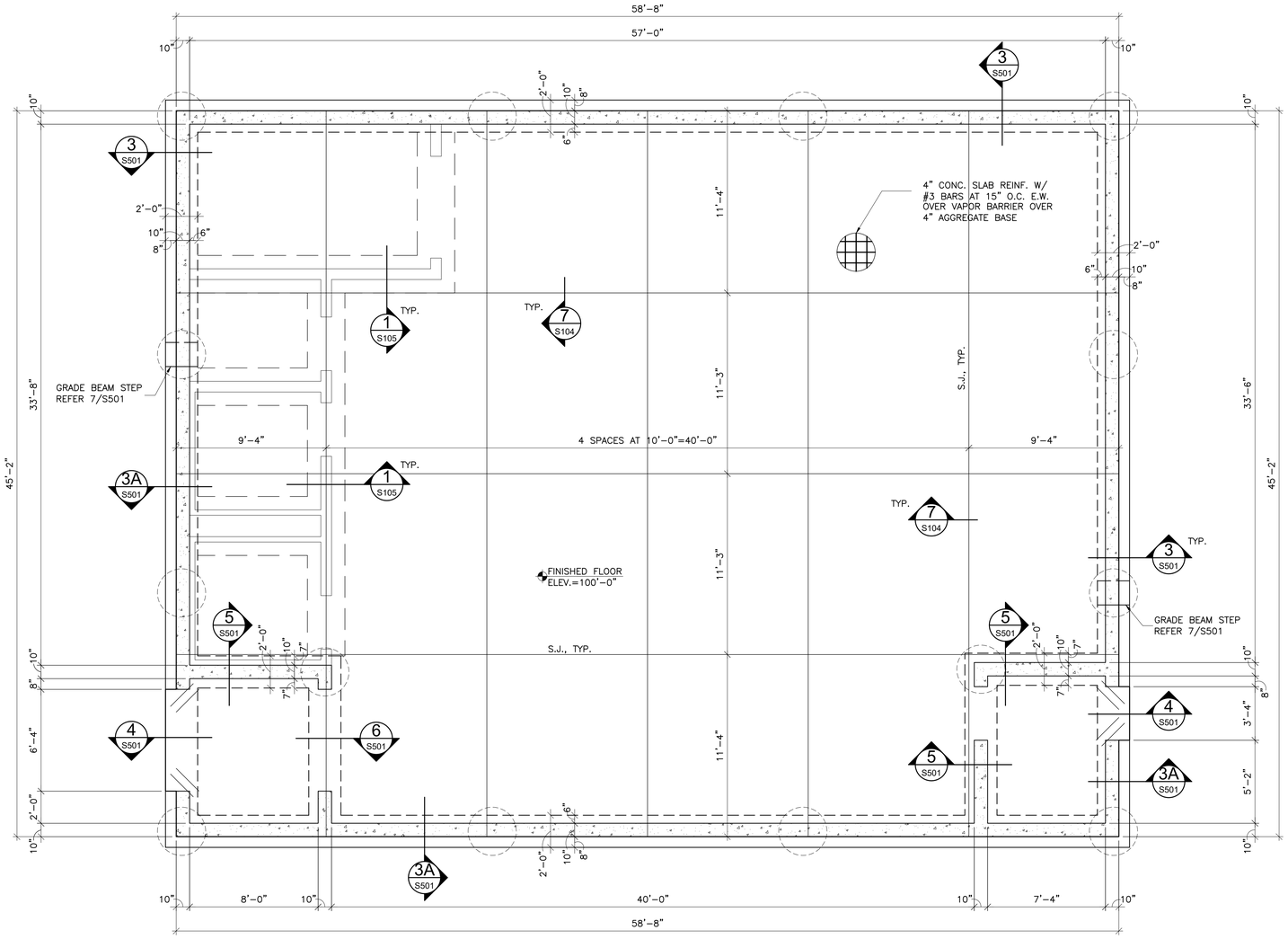

NORTH

1 S201 SHELTER FOUNDATION PLAN

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

NOTE:
FOUNDATION DESIGNS ARE PRELIMINARY UNTIL A SITE SPECIFIC GEOTECHNICAL REPORT IS RECEIVED.

FOUNDATION PLAN NOTES:

1. FOUNDATION AND SLAB SUBGRADE SHALL BE PREPARED AS OUTLINED IN THE STRUCTURAL GENERAL NOTES.
2. REFERENCE ELEVATION OF 100'-0" EQUALS DATUM FINISHED FLOOR ELEVATION OF 1269.125' FEET FOR THE NEW AND EXISTING BUILDING.MATCH EXISTING ELEVATION.
3. EXCEPT WHERE SHOWN OTHERWISE, SLABS-ON-GRADE SHALL BE 4" THICK CONCRETE REINFORCED WITH #3 BARS AT 15" ON CENTER EACH WAY OVER A 15 MIL VAPOR RETARDER OVER A 4" AGGREGATE BASE COURSE. REINFORCING BARS SHALL BE PLACED 1½" CLEAR FROM TOP OF SLAB USING CHAIRS OR SLAB BOLSTERS COMPLYING WITH CRSI'S "MANUAL OF STANDARD PRACTICE".
4. SLABS-ON-GRADE SHALL BE WATER CURED FOR A MINIMUM OF 7 DAYS BY PONDING, SPRAYING, SPRINKLING OR BY USE OF SATURATED COVERINGS. THE USE OF CURING COMPOUNDS FOR SLABS-ON-GRADE IS PROHIBITED.
5. SAWED JOINTS (SJ) AND REQUIRED CONSTRUCTION JOINTS (CJ) ARE SHOWN ON THE DRAWINGS. AT THE CONTRACTOR'S OPTION, ADDITIONAL CONSTRUCTION JOINTS MAY BE PLACED AT LOCATIONS INDICATED TO BE SAWED JOINTS.
6. // INDICATES (2)#4 BARSx4'-0" TO BE PLACED IN SLAB-ON-GRADE AT ALL RE-ENTRANT CORNERS. RE-ENTRANT CORNERS ARE DEFINED AS INTERIOR CORNERS WHERE JOINTS DO NOT OCCUR IN BOTH DIRECTIONS. SIMILAR BARS SHALL BE PLACED AT ANY DISCONTINUOUS ENDS OF SAWED JOINTS OR CONSTRUCTION JOINTS.
7. REFER MECHANICAL FOR FLOOR DRAIN (F.D.) INFORMATION.

FOUNDATION PLAN LEGEND:

= CAST-IN-PLACE CONCRETE SHELTER LOAD BEARING WALLS

= NON-LOAD BEARING CMU WALLS

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MECHANICAL / ELECTRICAL

PROFESSIONAL STRUCTURAL ENGINEER
BRANDON W. BIRCH
26145
OKLAHOMA
10/17/2022

CJC
drawn by

BWB
checked by

OCTOBER 2022
date

revisions

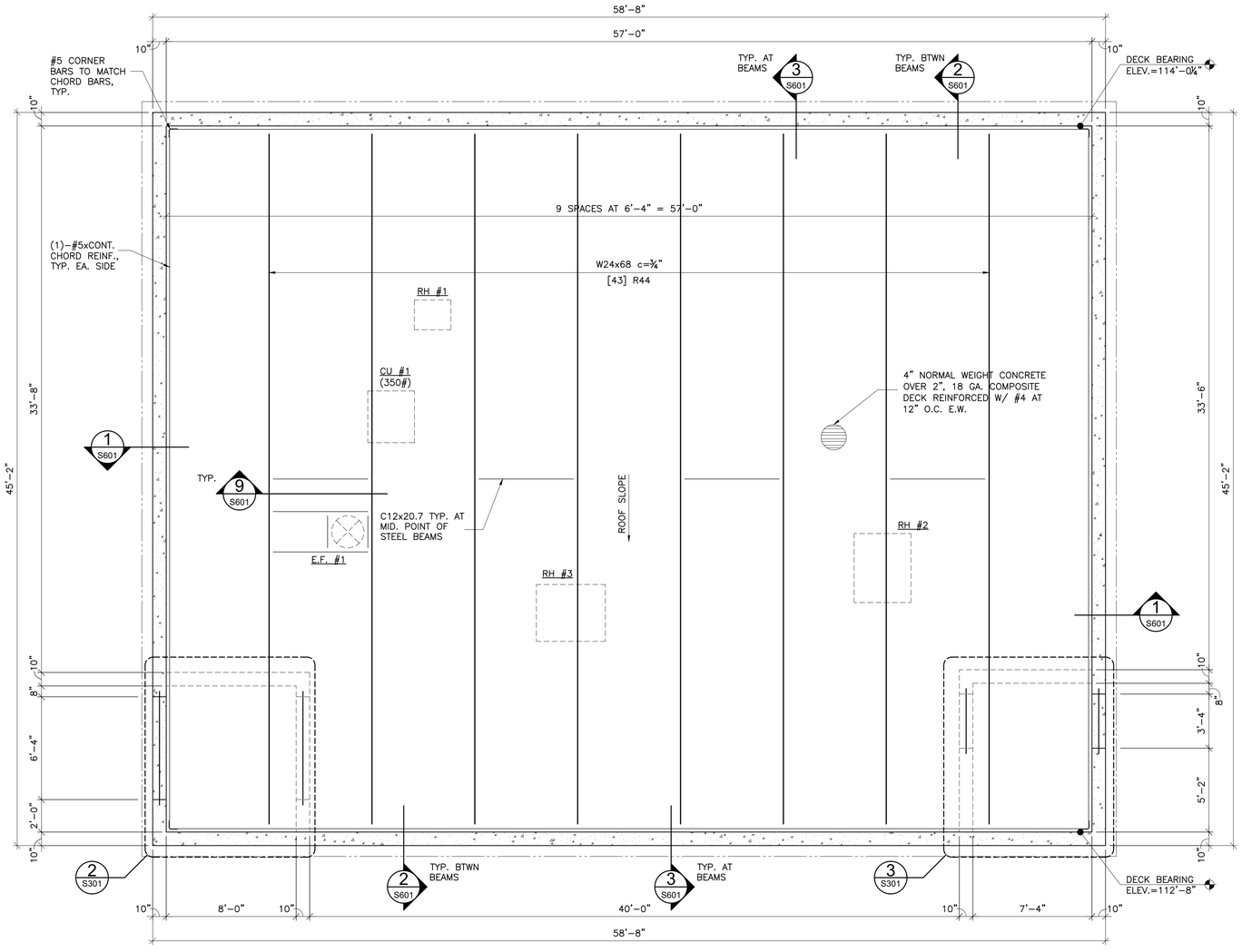
MOORE PUBLIC SCHOOLS
BOARD OF EDUCATION
MOORE, OKLAHOMA

MOORE Public Schools
LEARNING FOR LIFE

NEW ADDITION
KELLEY ELEMENTARY SCHOOL

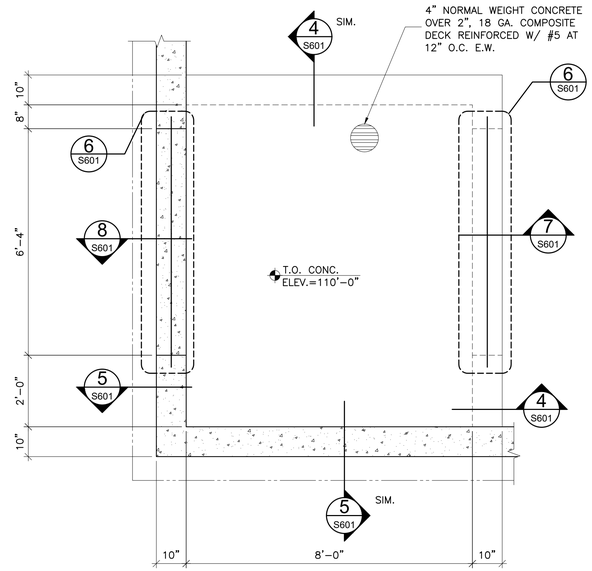
sheet no:

S201



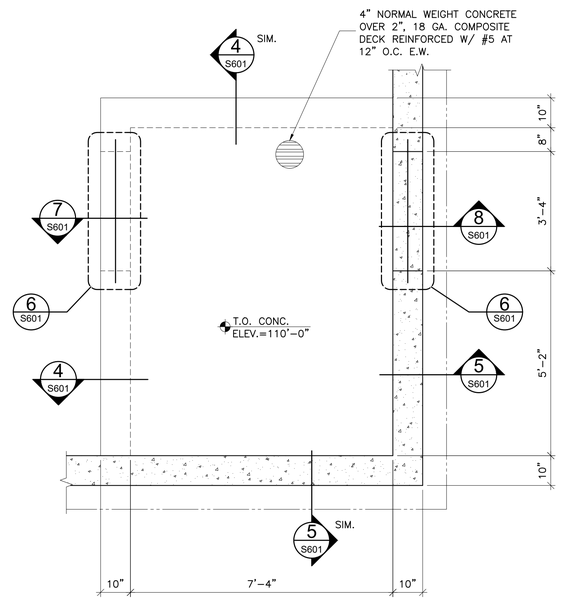
NORTH

1 S301 **SHELTER ROOF FRAMING PLAN**
SCALE: 1/4"=1'-0"



NORTH

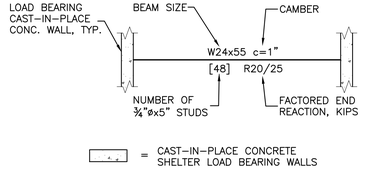
2 S301 **ENLARGED PLAN**
SCALE: 1/2"=1'-0"



NORTH

3 S301 **ENLARGED PLAN**
SCALE: 1/2"=1'-0"

FRAMING PLAN LEGEND:



= CAST-IN-PLACE CONCRETE SHELTER LOAD BEARING WALLS

NOTE:
IF ONLY ONE NUMBER IS PROVIDED FOR END REACTIONS, REACTION APPLIES TO BOTH ENDS. WHERE NO REACTION IS GIVEN, USE 10K.

SHELTER ROOF FRAMING PLAN NOTES:

1. ALL ELEVATIONS ARE REFERENCED FROM FINISHED FLOOR DATUM OF 100'-0". REFER GENERAL NOTES FOR ACTUAL ELEVATION.
2. [10] INDICATES THE NUMBER OF 3/4"øx5" HEADED STUDS THAT ARE REQUIRED. AT BEAMS, HEADED STUDS ARE UNIFORMLY SPACED ALONG BEAM LENGTH. AT GIRDERS, STUDS ARE UNIFORMLY SPACED BETWEEN INTERSECTING TRANSVERSE BEAMS. LENGTH OF STUD IS THE FINAL INSTALLED LENGTH AFTER WELDING. SELECT LENGTH OF STUD PRIOR TO WELDING BASED ON BURN THROUGH CONDITIONS, I.E., THROUGH METAL DECK OR DIRECTLY TO STEEL.
3. AT COMPOSITE BEAMS, PLACE HEADED STUDS IN THE "STRONG" POSITION. REFER TYPICAL DETAILS.
4. PROVIDE [2]-#4x4'-0" DIAGONAL BARS AT ALL RE ENTRANT CORNERS.
5. ALL CONCRETE SLABS SHALL BE WET CURED FOR A MINIMUM OF 7 DAYS. USE OF SPRAY-ON OR ROLL-ON CURING COMPOUND IS PROHIBITED.
6. PROVIDE CONTINUOUS BUTT SPLICE WELDING IN FIELD AT DECK ANGLES.
7. ALL ROOF OPENINGS FOR MECHANICAL ROOF TOP UNITS ARE APPROXIMATELY LOCATED. EXACT SIZE AND LOCATIONS SHALL BE COORDINATED WITH THE SUCCESSFUL MECHANICAL CONTRACTOR. ALL ROOF/WALL OPENINGS SHALL BE SUPPORTED WITH TYPICAL ANGLE FRAME AND PENETRATION/SHROUD DETAILS.
8. DETAILING FOR CAST IN PLACE CONSTRUCTION ALLOWS FOR SHEAR WALLS TO BE PLACED VERTICALLY BEFORE PLACING ADDITIONAL FRAMING. THIS WILL REQUIRE TEMPORARY BRACING OF VERTICAL 10" WALLS UNTIL ROOF LEVELS ARE PLACED. COORDINATE BRACING OF WALLS WITH ARCHITECT IF BRACING TO EXPOSED STRUCTURE.
9. T.O. PARAPET REFERS TO THE TOP OF CONCRETE WALL ELEVATION WITH REFERENCE TO FINISH FLOOR ELEVATION SPECIFIED ON THE FOUNDATION PLAN U.N.O.
10. MECHANICAL OPENINGS SHALL NOT OCCUR WITHIN 24" OF EMBEDDED STUD ANCHORS.

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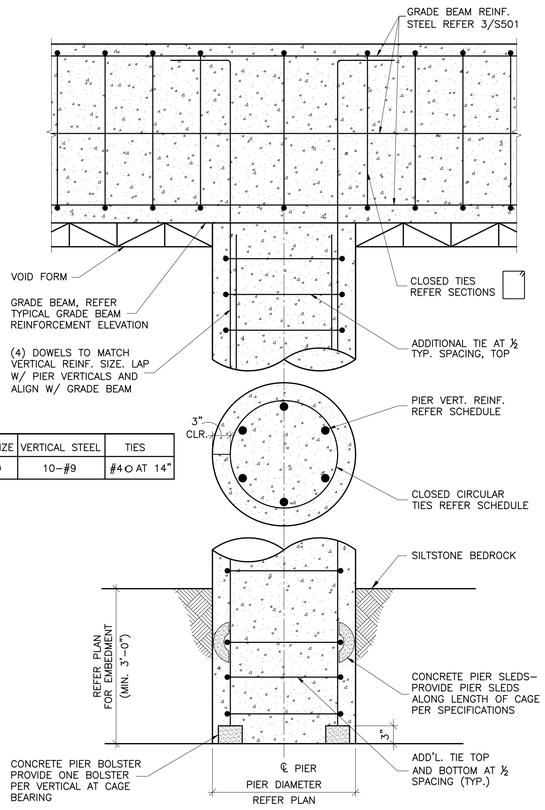
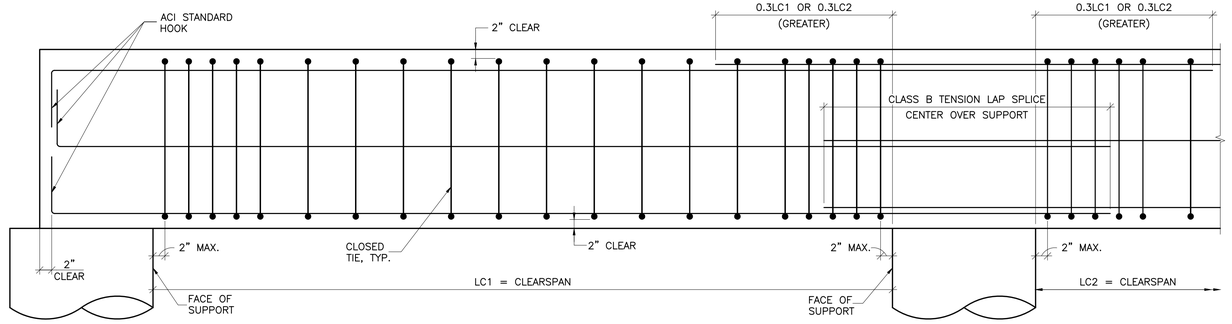
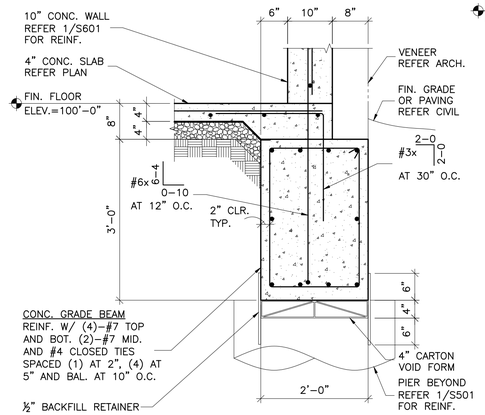


PIER SIZE	VERTICAL STEEL	TIES
36"ø	10-#9	#4 ○ AT 14"

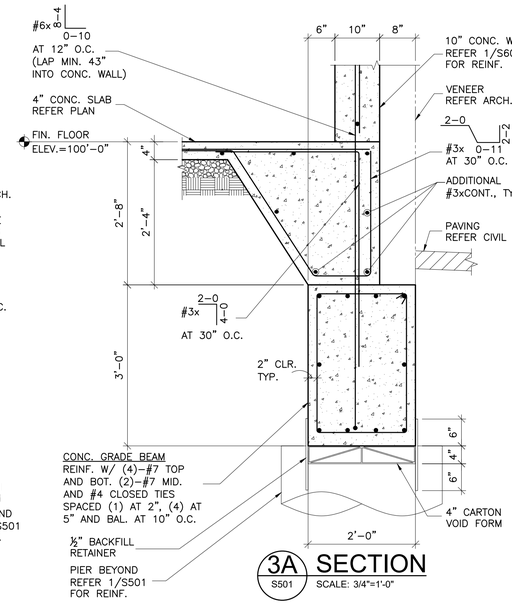
1 DRILLED PIER ELEVATION AT GRADE BEAM
S501 SCALE: NONE



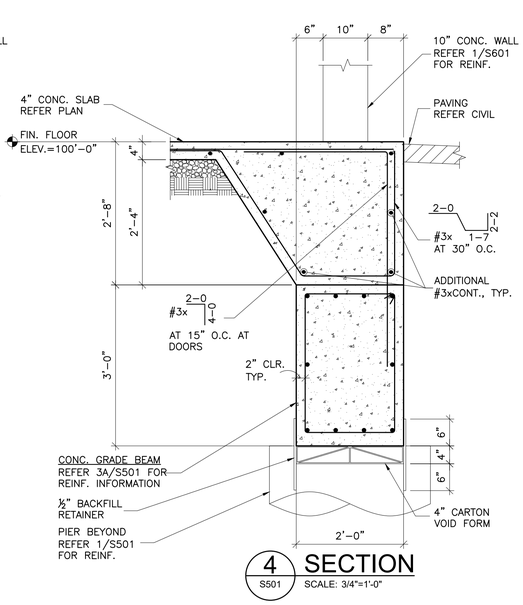
2 TYPICAL GRADE BEAM REINFORCEMENT LAYOUT
S501 SCALE: 1"=1'-0"



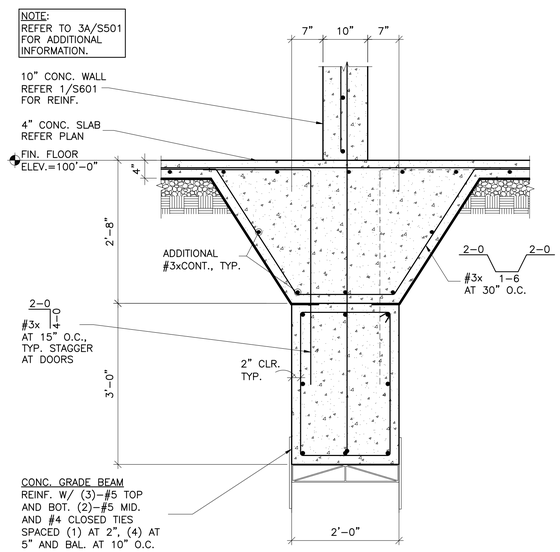
3 SECTION
S501 SCALE: 3/4"=1'-0"



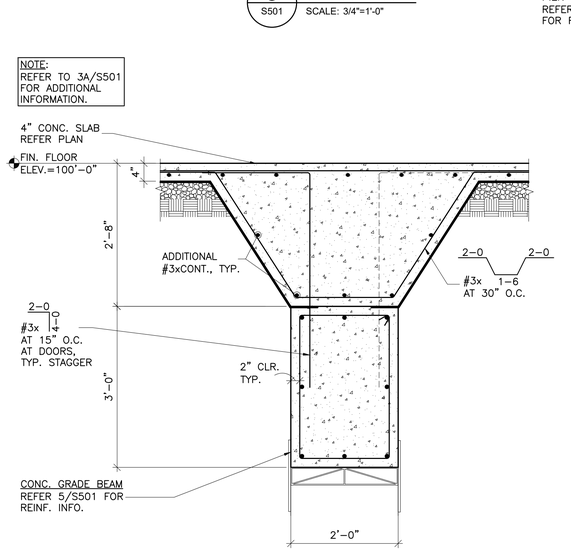
3A SECTION
S501 SCALE: 3/4"=1'-0"



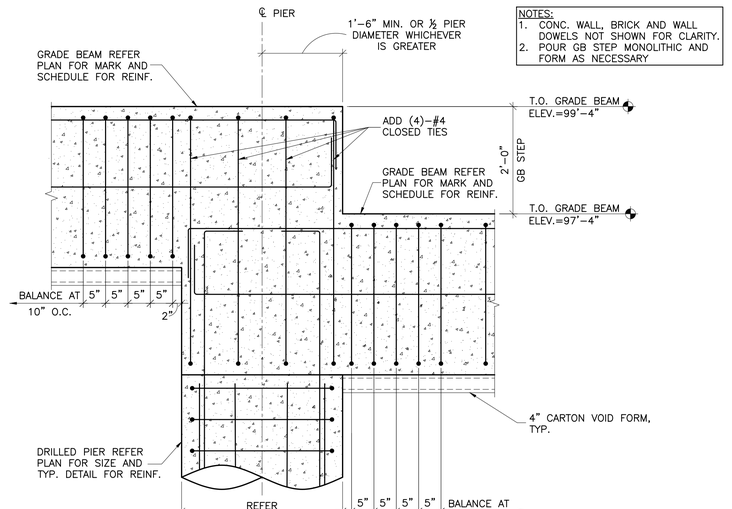
4 SECTION
S501 SCALE: 3/4"=1'-0"



5 SECTION
S501 SCALE: 3/4"=1'-0"



6 SECTION
S501 SCALE: 3/4"=1'-0"



7 ELEVATION AT G.B. STEP
S501 SCALE: 3/4"=1'-0"

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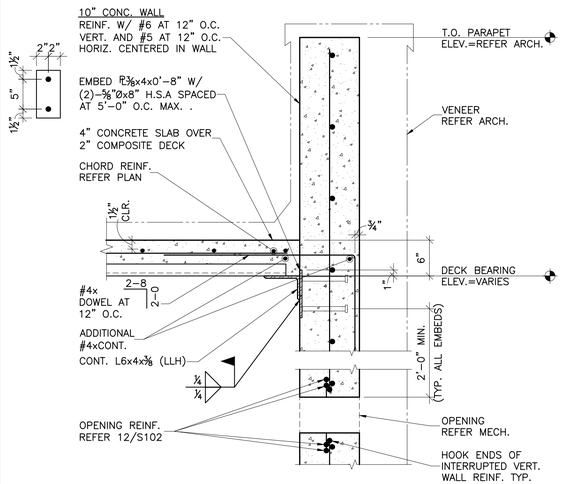
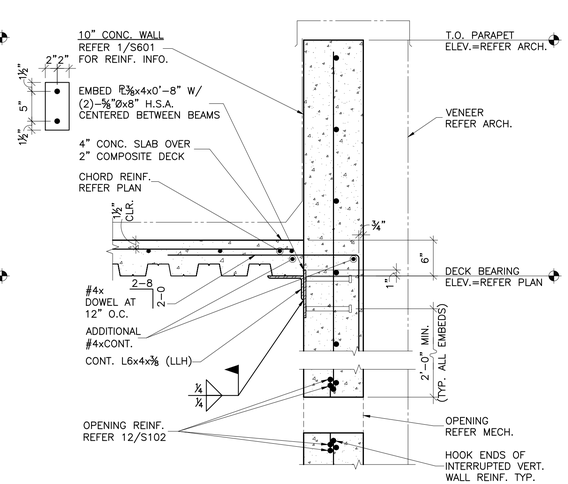
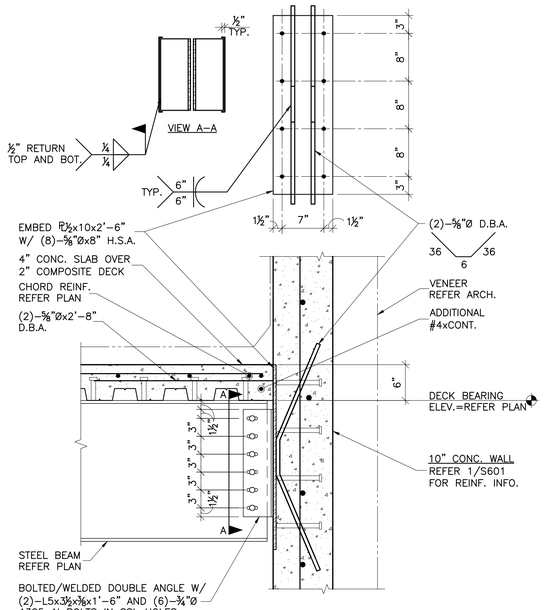


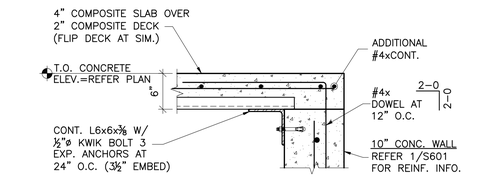
1 SECTION
S601 SCALE: 1"=1'-0"



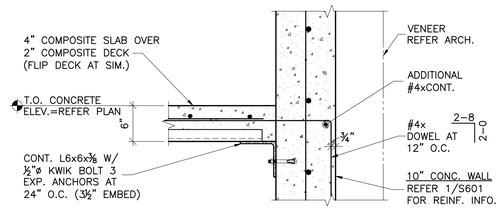
2 SECTION
S601 SCALE: 1"=1'-0"



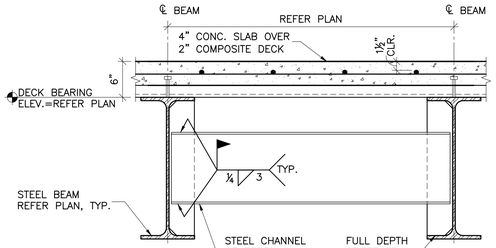
3 SECTION
S601 SCALE: 1"=1'-0"



4 SECTION
S601 SCALE: 1"=1'-0"

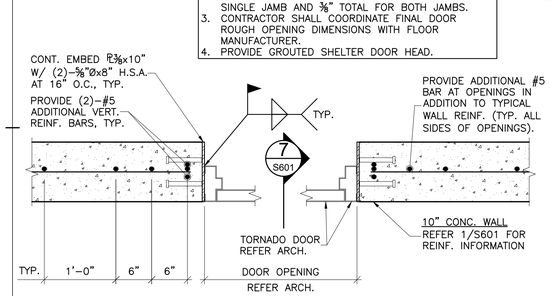


5 SECTION
S601 SCALE: 1"=1'-0"



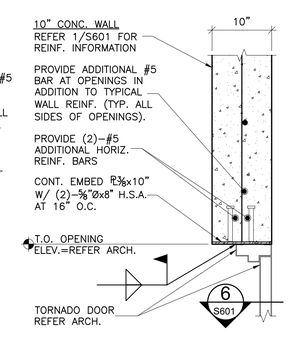
9 SECTION
S601 SCALE: 1"=1'-0"

NOTES:
1. COORDINATE ATTACHMENT OF DOOR FRAME TO EMBED R W/ DOOR MANUFACTURER.
2. COORDINATE FINAL CONSTRUCTION TOLERANCES AND DIMENSIONS WITH MANUFACTURER. IT IS ANTICIPATED MAXIMUM SHIM SPACE AT DOOR HEAD IS ¼" FOR SINGLE JAMB AND ⅜" TOTAL FOR BOTH JAMBS.
3. CONTRACTOR SHALL COORDINATE FINAL DOOR ROUGH OPENING DIMENSIONS WITH FLOOR MANUFACTURER.
4. PROVIDE GROUTED SHELTER DOOR HEAD.



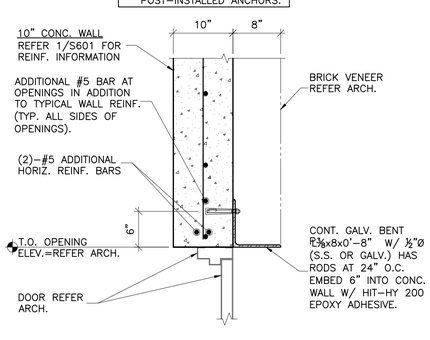
6 ENLARGED PLAN AT DOOR
S601 SCALE: 1"=1'-0"

NOTES:
1. COORDINATE ATTACHMENT OF DOOR FRAME TO EMBED R W/ DOOR MANUFACTURER.
2. COORDINATE FINAL CONSTRUCTION TOLERANCES AND DIMENSIONS WITH MANUFACTURER. IT IS ANTICIPATED MAXIMUM SHIM SPACE AT DOOR HEAD IS ¼".
3. PROVIDE GROUTED SHELTER DOOR HEAD.



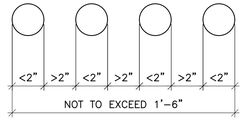
7 DOOR HEAD
S601 SCALE: 1"=1'-0"

NOTE:
1. DO NOT CUT WALL REINF. FOR INSTALLATION OF POST-INSTALLED ANCHORS.



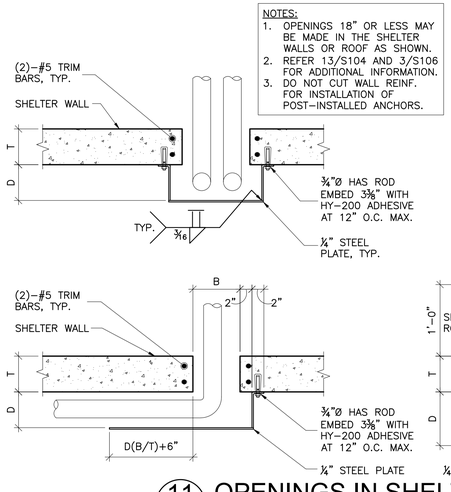
8 DOOR HEAD
S601 SCALE: 1"=1'-0"

NOTE:
OPENINGS 2" OR LESS MAY BE MADE IN THE SHELTER WALLS OR ROOF WITHOUT PROTECTION OR REGARD TO THE TYPICAL REINFORCING (SPECIAL REINFORCING AROUND OPENINGS SHALL NOT BE CUT). GROUPS OF UP TO 4 OPENINGS 2" OR LESS MAY BE MADE PROVIDED THE CLEAR SPACE BETWEEN OPENINGS EXCEEDS 2" AND THE TOTAL LENGTH OF THE GROUP DOES NOT EXCEED 18". OPENINGS CAN BE HORIZONTAL (AS SHOWN) OR VERTICAL

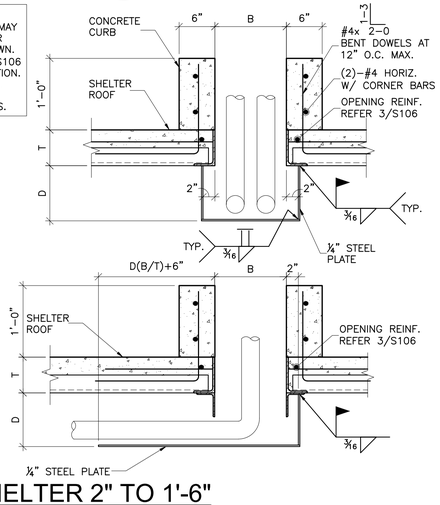


10 OPENINGS IN SHELTER 2" OR LESS
S601 SCALE: 1"=1'-0"

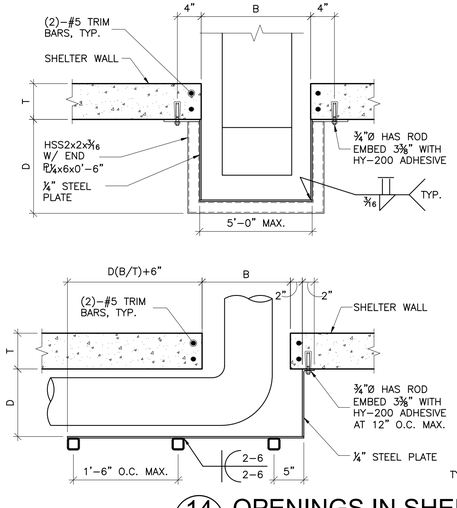
NOTES:
1. OPENINGS 18" OR LESS MAY BE MADE IN THE SHELTER WALLS OR ROOF AS SHOWN.
2. REFER 13/S104 AND 3/S106 FOR ADDITIONAL INFORMATION.
3. DO NOT CUT WALL REINF. FOR INSTALLATION OF POST-INSTALLED ANCHORS.

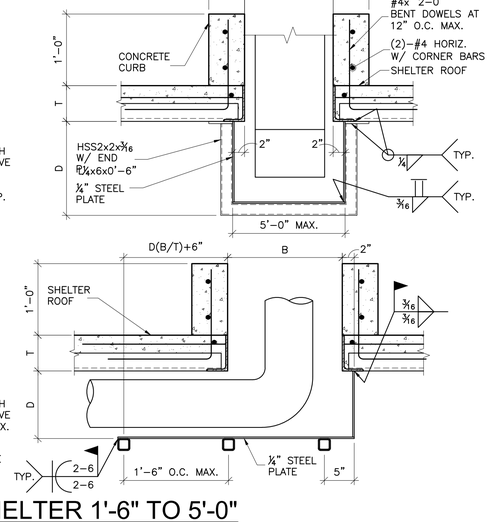


11 OPENINGS IN SHELTER 2" TO 1'-6"
S601 SCALE: 1"=1'-0"



NOTES:
1. IF AN OPENING LARGER THAN 5'-0" IS REQUIRED, CONTACT ENGINEER IMMEDIATELY FOR EVALUATION AND FURTHER INSTRUCTIONS.
2. REFER 13/S104 AND 3/S106 FOR ADDITIONAL INFORMATION.
3. DO NOT CUT WALL REINF. FOR INSTALLATION OF POST-INSTALLED ANCHORS.





14 OPENINGS IN SHELTER 1'-6" TO 5'-0"
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