

GENERAL NOTES

THESE DRAWINGS SHALL NOT BE REPRODUCED, COPIED, OR USED WITHOUT WRITTEN AUTHORITY FROM APPLIED BUILDING SCIENCES, INC.

THESE DRAWINGS SHALL BE USED IN CONJUNCTION AND COORDINATED WITH THE ARCHITECTURAL DRAWINGS AND OTHER CONTRACT DOCUMENTS.

THESE GENERAL NOTES ARE NOT INTENDED TO REPLACE SPECIFICATIONS. SEE SPECIFICATIONS FOR REQUIREMENTS IN ADDITION TO GENERAL NOTES.

THE STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE, AND, EXCEPT WHERE SPECIFICALLY SHOWN, DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, PROCEDURES, TECHNIQUES, AND SEQUENCE. ALL APPLICABLE SAFETY REGULATIONS TO BE FOLLOWED STRICTLY.

THE STRUCTURE HAS BEEN DESIGNED TO RESIST DESIGN LOADS ONLY AS A COMPLETED STRUCTURE. APPLICATIONS OF CONSTRUCTION LOADS TO THE PARTIALLY COMPLETED STRUCTURE SHALL BE CONSIDERED BY THE CONTRACTOR AND SO INCLUDED IN THE DESIGN OF SHORING, BRACING, FORM WORK, AND ANY OTHER SUPPORTING ELEMENTS PROVIDED FOR CONSTRUCTION OF THE STRUCTURE. DURING ERECTION AND UNTIL ALL PERMANENT CONNECTIONS ARE MADE, THE CONTRACTOR MUST PROVIDE TEMPORARY BRACING FOR THE STRUCTURE IN ALL DIRECTIONS.

THE GENERAL CONTRACTOR SHALL CHECK AND VERIFY ALL DIMENSIONS AND GRADE CONDITIONS, BOTH NEW AND EXISTING, REPORTING ANY DISCREPANCIES TO THE ARCHITECT PRIOR TO ORDERING MATERIALS OR PROCEEDING WITH ANY PHASE OF THE WORK.

THE CONTRACTOR SHALL COMPARE STRUCTURAL SECTIONS WITH ARCHITECTURAL SECTIONS AND REPORT ANY DISCREPANCY TO THE ARCHITECT PRIOR TO FABRICATION OR INSTALLATION OF STRUCTURAL MEMBERS.

DO NOT SCALE DIMENSIONS FROM DRAWINGS. THE CONTRACTOR SHALL REQUEST, FROM THE ARCHITECT, NECESSARY DIMENSIONS NOT SHOWN ON THE DRAWINGS.

THE GENERAL CONTRACTOR SHALL VERIFY THE SIZE AND LOCATION OF ALL SLEEVES, PADS, DEPRESSIONS, OPENINGS, ETC., AS REQUIRED BY THE VARIOUS TRADES. SLEEVES, INSERTS AND OTHER ITEMS TO BE CAST IN CONCRETE SHALL BE SET BY THE GENERAL CONTRACTOR AT LOCATIONS DESIGNED BY AND UNDER THE SUPERVISION OF A REPRESENTATIVE OF EACH TRADE.

PRINCIPAL OPENINGS IN THE STRUCTURE ARE SHOWN ON THESE DRAWINGS. THE GENERAL CONTRACTOR SHALL EXAMINE THE ARCHITECTURAL MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS FOR REQUIRED OPENINGS AS THEY SHALL BE PROVIDED FOR WHETHER SHOWN ON THESE DRAWINGS OR NOT. GENERAL CONTRACTOR SHALL VERIFY SIZE AND LOCATION OF ALL OPENINGS WITH ALL SUB-CONTRACTORS PRIOR TO CONSTRUCTION.

SEE ARCHITECTURAL DRAWINGS FOR FLOOR ELEVATIONS, FLOOR SLOPES, AND THE LOCATION OF DERESSED FLOOR AREAS.

IF ANY BIDDER IS IN DOUBT AS TO THE INTENT OF THE PLANS OR SPECIFICATIONS, THEY SHALL REQUEST AN INTERPRETATION FROM THE ARCHITECT IN WRITING AT LEAST TEN DAYS PRIOR TO THE SCHEDULED BID DATE.

HORIZONTAL RUNS OF MECHANICAL AND ELECTRICAL CONDUIT SHALL NOT BE PLACED IN ELEVATED CONCRETE SLABS OR IN CONCRETE FILL PLACED OVER COMPOSITE METAL DECKING.

THIS PROJECT REQUIRES SPECIAL INSPECTIONS AS DESCRIBED IN SECTION 1704 OF THE 2012 NORTH CAROLINA STATE BUILDING CODE. SEE STATEMENT OF SPECIAL INSPECTIONS OR REQUIRED INSPECTIONS. CONTRACTOR SHALL COORDINATE WITH SPECIAL INSPECTOR ALL WORK REQUIRING SPECIAL INSPECTIONS AND TESTING.

CONCRETE

ALL CONCRETE WORK SHALL BE DONE IN ACCORDANCE WITH ACI 318-05 "BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE" AND ACI 301-08 "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS"

NORMAL WEIGHT CONCRETE SHALL HAVE ASTM C33 COARSE AND FINE AGGREGATE WITH A MAXIMUM UNIT WEIGHT OF 150 PCF. LIGHTWEIGHT CONCRETE SHALL HAVE ASTM C330 EXPANDED SHELL OR SLATE AGGREGATE BY ROTARY-KILN METHOD WITH A MAXIMUM UNIT WEIGHT OF 120 PCF. NOMINAL MAXIMUM COARSE AGGREGATE SIZE FOR LIGHTWEIGHT CONCRETE IS 3/4" CONCRETE COMPRESSIVE STRENGTH FC AT 28-DAYS:

|                                 |           |                 |
|---------------------------------|-----------|-----------------|
| SLABS ON GRADE                  | 3,000 PSI | (NORMAL WEIGHT) |
| FOOTINGS                        | 3,000 PSI | (NORMAL WEIGHT) |
| FOUNDATION WALL, PIERS, COLUMNS | 3,000 PSI | (NORMAL WEIGHT) |
| THERMAL MASS WALL               | 4,000 PSI | (NORMAL WEIGHT) |

MINIMUM CONCRETE COMPRESSIVE STRENGTH FC AND AGE AT CONSTRUCTION STAGES:  
RESPECTIVE FOUNDATION PRIOR STRUCTURAL STEEL ERECTION 21 DAYS, 2,600 PSI  
RETAINING WALL, FOUNDATION, PRIOR TO BACKFILLING 21 DAYS, 2,600 PSI  
CONCRETE FILL ON COMPOSITE METAL DECK, CONSTRUCTION LOADS 21 DAYS, 2,600 PSI

CONCRETE CONSTRUCTION JOINTS

CONTRACTOR SHALL PROVIDE NECESSARY CONSTRUCTION JOINTS IN MONOLITHIC CONCRETE POURS SO THAT THE QUALITY OF PLACEMENT AND FINISH MEETS THE REQUIREMENTS OF PLANS AND SPECIFICATIONS. THE CONTRACTOR SHALL SUBMIT A PLAN SHOWING THE LOCATION OF ALL CONSTRUCTION JOINTS TO THE STRUCTURAL ENGINEER FOR APPROVAL.

THERE SHALL BE NO HORIZONTAL CONSTRUCTION JOINTS IN CONCRETE POURS. ALL VERTICAL CONSTRUCTION JOINTS IN SLABS AND BEAMS SHALL BE MADE WITH BULKHEADS. ADDITIONAL REINFORCING AT CONSTRUCTION JOINTS SHALL BE AS SPECIFIED BY THE STRUCTURAL ENGINEER. SEE TYPICAL CONSTRUCTION JOINT DETAILS.

WHERE THE SLAB IS SAW CUT FOR A CONTROL JOINT, THE SLAB SHALL BE SAW CUT AS SOON AS POSSIBLE WITHOUT TEARING THE AGGREGATE FROM THE SLAB SURFACE BUT NO LATER THAN 12 HOURS AFTER CONCRETE PLACEMENT.

REINFORCING STEEL

REINFORCING STEEL SHALL BE NEW BILLET STEEL, DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60. REINFORCING TO BE WELDED [INCLUDING DEFORMED BAR ANCHORS(GBA)] CONFORMING TO ASTM A706.

WELDED WIRE FABRIC SHALL BE COLD DRAWN, CONFORMING TO ASTM SPECIFICATION A185, A82 WITH SIZES AS INDICATED ON THE DRAWINGS. [FURNISHED IN FLAT SHEETS ONLY]

BAR SUPPORTS, DESIGN, DETAILING, FABRICATION, AND PLACING OF REINFORCING STEEL SHALL BE IN ACCORDANCE WITH ACI 318-02, ACI 301R-95, AND THE "MANUAL OF STANDARD PRACTICE" FOR DETAILING REINFORCED CONCRETE STRUCTURES." ACI 315 LATEST EDITION].

FOR SLABS ON GRADE, SLAB AND GRADE BEAM REINFORCING SHALL BE HELD IN PLACE BY BAR SUPPORTS WITH SAND PLATES, OR PRECAST CONCRETE BAR SUPPORTS AS DESCRIBED IN CHAPTER 3 OF THE CRSI MANUAL OF STANDARD PRACTICE. BAR SUPPORTS SHALL BE SPACED AT A MAXIMUM OF 4'-0" ON BOTH WAYS. ROCKS, CHALK OR CLAY BRICK WILL NOT BE USED AS SUPPORTS.

REFER TO THE DRAWINGS FOR REINFORCING LAP REQUIREMENTS, WHERE LAP SPLICES ARE NOT SHOWN, LAP PER ACI 318 OR CRSI STANDARDS. LAP WELDED WIRE FABRIC SHEETS 8 INCHES MINIMUM.

PROVIDE HORIZONTAL CORNER BARS AT CORNERS AND INTERSECTIONS OF WALLS AND INTERSECTIONS OF CONTINUOUS WALL FOOTINGS. BARS TO BE PLACED AT SPACING AND LOCATION TO MATCH HORIZONTAL BARS. LAP SPLICE TO BE 1-1/4" EACH DIRECTION.

PROVIDE DOWELS IN WALL FOOTINGS TO MATCH WALL VERTICAL REINFORCING. LAP 30 BAR DIAMETERS [6 INCHES MINIMUM], EXTEND 8" MINIMUM INTO 12" FOOTINGS. USE STANDARD 90 DEGREE HOOK.

ALL FOOTING REINFORCING SHALL BE CONTINUOUS THROUGH WALL FOOTINGS AND ADJACENT COLUMN FOOTINGS. HORIZONTAL WALL REINFORCING SHALL BE CONTINUOUS THROUGH CONCRETE COLUMNS AND PIERS.

PROVIDE DIAGONAL BARS AT CORNERS AND RE-ENTRANT CORNERS OF OPENINGS IN SUPPORTED SLABS ON METAL DECK. USE 1-#4 x 4'-0" LONG AT EACH CORNER PLACED DIAGONALLY TO SIDES OF OPENING.

HEADED CONCRETE ANCHORS SHALL CONFORM TO THE REQUIREMENTS OF ASTM A108, GRADES 1010, 1015, 1017, OR 1020. STUDS SHALL BE AUTOMATICALLY END WELDED IN THE SHOP OR FIELD IN ACCORDANCE WITH THE MANUFACTURERS RECOMMENDATIONS.

EMBED PLATES MUST BE SET IN THE FORM BEFORE PLACING CONCRETE, NOT PLACED INTO TOP OF WET CONCRETE. THE CONTRACTOR SHALL CONTACT THE ARCHITECT FOR CORRECTIVE DETAILS FOR ANY EMBED PLATES LEFT OUT OF CONCRETE POURS.

THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER FAR ENOUGH IN ADVANCE OF EACH CONCRETE PLACEMENT TO ALLOW AMPLE TIME TO CHECK THE LAYOUT OF THE STEEL BEFORE THE BEGINNING OF THE ACTUAL CONCRETE PLACEMENT, BUT NOT IN ADVANCE OF THE TIME THAT 80% OF THE STEEL HAVING BEEN PLACED.

CLEAR COVER OF REINFORCING STEEL FROM FACE OF CAST IN PLACE CONCRETE SHALL BE AS FOLLOWS UNLESS NOTED ON CONTRACT DRAWINGS:

FOOTINGS AND OTHER PRINCIPAL STRUCTURAL MEMBERS IN WHICH THE CONCRETE IS DEPOSITED AGAINST THE EDGE.....3 INCHES

MEMBERS WITH FORMED SURFACES EXPOSED TO THE WEATHER OR GROUND:

- A. #6 BARS OR LARGER .....2 INCHES
- B. #5 BARS OR SMALLER .....1 1/2 INCHES

CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:

- A. WALLS.....3/4 INCHES
- B. COLUMN PIERS, TIES.....1 1/2 INCHES

REINFORCING IN SLABS ON GRADE.....1/2 INCHES FROM TOP OF SLAB.

STRUCTURAL STEEL

DESIGN, DETAILING, FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE AISC "STEEL CONSTRUCTION MANUAL", THIRTEENTH EDITION AND AISC "SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS", (ANSI/AISC 341-05, 341a1-05).

STRUCTURAL STEEL:

WIDE FLANGE SHAPES [W SECTIONS]: ASTM A992, GRADE 50, FY= 50 KSI  
CHANNELS, ANGLES, PLATES, ROGS, AND BARS: ASTM A36, FY= 36 KSI  
SQUARE AND RECTANGULAR TUBES: ASTM A500, GRADE 5, FY= 46 KSI  
PIPPES: ASTM A53, GRADE B, FY= 36 KSI  
STRUCTURAL GUSSET PLATES FOR SEISMIC CONNECTIONS AND BRACES: ASTM A992, FY=50 ksi.

ALL WELDING SHALL BE E70 SERIES OR SUBMERGED ARC, GRADE SAW-2 UNLESS NOTED. OTHERWISE, ALL SHOP WELDING SHALL BE BY CERTIFIED WELDERS AND SHALL CONFORM TO AWS STANDARDS.

STRUCTURAL STEEL SHALL BE FABRICATED IN A PLANT BY A QUALIFIED FABRICATOR WHO IS CURRENTLY CERTIFIED BY THE AISC QUALITY CERTIFICATION PROGRAM FOR STRUCTURAL STEEL FABRICATORS AND IS DESIGNATED AS AISC CERTIFIED FABRICATOR, STANDARD FOR STEEL BUILDING STRUCTURES. AND MUST DEMONSTRATE A CONSISTENT RECORD OF AT LEAST TEN (10) SUCCESSFUL PROJECTS OF EQUAL OR GREATER MAGNITUDE OVER THE PRECEDING TWO (2) YEARS. THE CONTRACTOR SHALL SUBMIT EVIDENCE IN WRITING VERIFYING THE ABOVE. REQUIRED QUALIFICATIONS: STRUCTURAL STEEL SHALL BE ERECTED BY A QUALITY CERTIFIED STEEL ERECTOR [CSE] ACCORDING TO THE QUALITY CERTIFICATION PROGRAM BY THE AMERICAN INSTITUTE OF STEEL CONSTRUCTION.

SHEAR STUD CONNECTORS, BOLTED CONNECTIONS DESIGNATED AS "SC" [BSP CRITICAL], MOMENT CONNECTIONS DESIGNATED AS "MC", AND WELD SYMBOLS DESIGNATED WITH SYMBOLS "U" [ULTRASONIC TESTING], "MPT" [MAGNETIC PARTICLE TESTING] OR "XRT" [RADIOGRAPHIC X-RAY TESTING] REPRESENTS CONNECTIONS TO BE INSPECTED AND TESTED BY A NONDESTRUCTIVE METHOD. SEE SPECIFICATIONS. THE CONNECTIONS SHALL BE TESTED BY AN INDEPENDENT MATERIAL TESTING LABORATORY, PAID BY THE OWNER, IN ACCORDANCE WITH THE SPECIFICATIONS. THE REPORT FROM THE MATERIAL TESTING LABORATORY SHALL BE REVIEWED BY THE STRUCTURAL ENGINEER PRIOR TO PLACING ANY CONCRETE OVER THE RESPECTIVE METAL FLOOR OR ROOF COMPOSITE DECK.

ALL CONNECTIONS SHALL BE BEARING TYPE USING 3/4" OR 7/8" DIAMETER ASTM A325-X, A325-N HIGH STRENGTH BOLTS UNLESS INDICATED OTHERWISE ON THE DRAWINGS. SHEAR CONNECTIONS FOR NON-COMPOSITE STEEL BEAMS AND GIRDERS SHALL BE FOR 60% OF THE MAXIMUM TOTAL FACTORED LOAD AND SHEAR CONNECTIONS FOR COMPOSITE STEEL BEAMS AND GIRDERS SHALL BE FOR 100% OF THE MAXIMUM TOTAL FACTORED LOAD FOR THE APPROPRIATE STEEL STRENGTH, SHAPE DESIGNATION, AND RESPECTIVE SPAN LENGTH IN FEET AS LISTED IN THE MAXIMUM TOTAL FACTORED UNIFORM LOAD TABLES OF THE AISC "MANUAL OF STEEL CONSTRUCTION," THIRTEENTH EDITION.

FILLET WELD SIZE FOR BEAM STIFFENER PLATES SHALL BE BASED ON TABLE J2.4 [AISC LRFD MANUAL 3RD EDITION WITH A MINIMUM FILLET WELD SIZE OF 3/16" UNLESS NOTED OR DETAILED OTHERWISE.

PROTECT COLUMN BASE PLATES, ANCHOR BOLTS AND PORTIONS OF COLUMNS BELOW GROUND LEVEL WITH TWO FIELD-APPLIED COATS OF ASPHALT PAINT BEFORE FLOOR SLAB IS POURED.

COORDINATE LOCATION AND SIZE OF ROOF HATCH OPENINGS WITH THE ARCHITECTURAL DRAWINGS. COORDINATE SIZE AND LOCATION OF ALL ROOF OPENINGS WITH THE PLUMBING AND MECHANICAL CONTRACTORS.

PROVIDE 1 1/2 x 3 x 1/4 AROUND ALL OPENINGS UNDER ROOF TOP MECHANICAL UNITS, AROUND ALL OPENINGS AT ROOF DRAINS, AND AROUND ALL OTHER OPENINGS GREATER THAN 8" IN DIAMETER. PROVIDE 1/4" X 1/4" X 1/4" UNDER ALL WEIR EQUIPMENT SUPPORT CURBS. ANGLES SHALL RUN PERPENDICULAR TO MAIN STEEL BEAMS OR OPEN WEB JOIST. SEE ADDITIONAL SUPPORT ANGLES FOR OPEN WEB JOIST.

COORDINATE MASONRY SUPPORT ANGLES, PLATES, ETC. WITH MASONRY CONTROL JOINTS AND ARCHITECTURAL DRAWINGS. PROVIDE SUPPORTS FOR MASONRY SUPPORT ANGLES AND PLATES AT COLUMN LOCATIONS, MITER AND BUTT WELD ANGLES AND PLATES CONTINUOUS AROUND CORNERS AT COLUMNS AND TURNS IN MASONRY. PROVIDE MASONRY SUPPORT ANGLES THAT ARE SLOPED GREATER THAN 10 DEGREES, SHOP ATTACH A 3/8" SQUARE BAR X 3" LONG AT 12" ON TO THE STEEL SUPPORT ANGLE.

NO STRUCTURAL STEEL MEMBERS UNLESS DETAILED ON THE STRUCTURAL DRAWINGS SHALL BE SPliced WITHOUT THE WRITTEN APPROVAL OF THE STRUCTURAL ENGINEER. FIELD MODIFICATIONS TO THE STRUCTURAL STEEL SHALL NOT BE PERFORMED WITHOUT PRIOR REVIEW AND APPROVAL BY THE STRUCTURAL ENGINEER. FIELD MODIFICATIONS INCLUDE, BUT ARE NOT LIMITED TO, CUTTING, CHIPPING, TORCHING AND WELDING OF SHOP FABRICATION OF BOLTED CONNECTIONS.

ALL BASE PLATES SUPPORTING STEEL COLUMNS SHALL BE GROUTED SOLID WITH HIGH STRENGTH [50,000PSI MIN], NON-SHRINK GROUT IMMEDIATELY AFTER STRUCTURAL STEEL IS IN PLACE AND PLUMB AND PRIOR TO PLACING ANY CONCRETE FOR THE SUPPORTED FLOORS SUPPORTED BY THE RESPECTIVE COLUMN.

UNLESS NOTED OTHERWISE OR AS REQUIRED BY DESIGN, MINIMUM BEAM SHEAR CONNECTIONS SHALL USE MINIMUM 5/8" THICK ANGLES EACH SIDE OF WEB WITH THE FOLLOWING MINIMUM NUMBER OF ROWS OF 3/4" DIAMETER A325-X, N HIGH STRENGTH BOLTS: PROVIDE MINIMUM 3/8" SINGLE SHEAR PLATE FOR SKewed CONNECTIONS AND SINGLE ANGLES FOR OFFSET COLUMN CONNECTIONS.

| SHAPE | BEAM/GIRDER CONN. DOUBLE ANGLES | COLUMN CONNECTION DOUBLE ANGLES | BEAM/GIRDER/COL. CONN. SINGLE ANGLE/SHEAR PL. |
|-------|---------------------------------|---------------------------------|---|
|       | A325-N                          | A325-X                          | A325-N  |
| W6x   | 2 COLS                          | 2 COLS                          | 2 COLS  |
| W8x   | 2 ROWS                          | 2 ROWS                          | 2 ROWS  |
| W10x  | 2 ROWS                          | 2 ROWS                          | 2 ROWS  |
| W12x  | 3 ROWS                          | 3 ROWS                          | 3 ROWS  |
| W14x  | 3 ROWS                          | 3 ROWS                          | 3 ROWS  |
| W16x  | 4 ROWS                          | 4 ROWS                          | 4 ROWS  |
| W18x  | 5 ROWS                          | 4 ROWS                          | 5 ROWS  |
| W21x  | 6 ROWS                          | 5 ROWS                          | 6 ROWS  |
| W24x  | 6 ROWS                          | 6 ROWS                          | 6 ROWS  |

BEAM CAMBER

THE DIMENSION FOLLOWING THE LETTER "C" SUCH AS C = 3/4" WHICH FOLLOWS THE BEAM SECTION DESIGNATION REPRESENTS THE INITIAL MID-SPAN UPWARD CAMBER IN THE UNLOADED CONDITION. TOLERANCES SHALL BE PLUS OR MINUS 1/4".

METAL ROOF DECK

METAL ROOF DECK SHALL BE GALVANIZED, 1/16" INCHES DEEP, TYPE B, WITH A LENGTH TO PROVIDE THE MINIMUM OF THREE SPAN SUPPORT CONDITION. GAGES DECK SHALL BE AS INDICATED ON THE DRAWINGS [20 GAGE MINIMUM]. FLOOR DECK SHALL BE GALVANIZED, 9-30.

METAL ROOF DECK SHALL BE SECURELY WELDED ONTO THE SUPPORTING MEMBERS IN ACCORDANCE WITH THE SPECIFICATIONS AND UL FIRE RATED DESIGN REQUIREMENTS. METAL DECK UNITS SHALL BE PLACED WITH A MINIMUM OF THREE SPANS AND ATTACHED TO THE STEEL SUPPORTS AT THE ENDS AND AT ALL INTERMEDIATE SUPPORTS BY WELD NOT LESS THAN 5/8" HIGH IN DIAMETER, SPACED IN ACCORDANCE WITH THE WELD PATTERN SPECIFIED IN THE SHEET NOTES. IN EACH UNIT AT EACH SUPPORT, THE SIDE LAPS OF ADJACENT UNITS SHALL BE WELDED AT EACH SUPPORT AND SCREWED [80 HX SCREW] TOGETHER BETWEEN SUPPORTS AT INTERVALS NOT EXCEEDING 18 INCHES. THE EXTREME EDGE SIDE CONNECTIONS SHALL BE 5/8" DIAMETER RIDGLE WELDS AT 12 INCHES ON CENTER. ALL ENDS SHALL BE OVER A SUPPORT AND ALL END JOINTS SHALL BE LAPPED 3 INCHES. ADDITIONAL TOP WELDS AT DECK SPLICES SHALL BE MADE IN A PATTERN THAT WILL ENSURE THE INTEGRAL LOAD-BEARING CAPACITY OF THE FURNISHED DECK. SEE DETAILS FOR WELDING LAYOUTS.

MISCELLANEOUS METALS

SHOP DRAWINGS FOR THE FABRICATION AND ERECTION OF ALL ASSEMBLIES OF MISCELLANEOUS IRON WORK WHICH ARE NOT COMPLETELY SHOWN BY MANUFACTURERS DATA SHEETS. INCLUDE PLANS AND ELEVATIONS AT NOT LESS THAN 3/4" TO 1"-0" SCALE, AND INCLUDE DETAILS OF SECTIONS AND CONNECTIONS AT NOT LESS THAN 3/4" TO 1"-0" SCALE. SHOW ANCHORAGE AND ACCESSORY ITEMS. ENGINEERING DATA BEFORE ANY STAIRS, LADDERS AND RAILINGS ARE FABRICATED. SUBMIT ENGINEERING DATA DRAWINGS TO THE ARCHITECT FOR REVIEW INDICATING HOW PERFORMANCE STANDARDS SPECIFIED HERE SHALL BE MET. THE CONTRACTOR IS RESPONSIBLE FOR THE STRUCTURAL DESIGN AND SUPPORTS FOR THESE SYSTEMS AND MUST SHOW HIS PROPOSED SYSTEMS ON THESE DRAWINGS. THESE DRAWINGS MUST SHOW ALL LOAD CONDITIONS AND DESIGN CALCULATIONS RELATIVE TO CONNECTIONS, FASTENING DEVICES AND ANCHORAGE, AS WELL AS SIZE AND GAUGE OF MEMBERS. CALCULATIONS AND DRAWINGS MUST BE PREPARED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE OF NORTH CAROLINA AND SHALL BE SIGNED AND SEALED BY THIS ENGINEER.

STEEL JOIST

STEEL JOIST SHALL BE DESIGNED, FABRICATED AND ERECTED IN CONFORMANCE WITH THE SJI SPECIFICATIONS FOR OPEN WEB STEEL JOIST, K-SERIES [1994 EDITION]. ANY LOADS SUSPENDED FROM JOISTS SHALL BE FROM PANEL POINTS ONLY. HORIZONTAL BRIDGING SHALL BE SPACED ACCORDING TO SJI SPECIFICATIONS OR AS INDICATED ON THE DRAWINGS.

THE JOIST MANUFACTURER SHALL SUBMIT COMPLETE DESIGN CALCULATIONS ALONG WITH THE JOIST EFFECTIVE MOMENT OF INERTIA AND THE SIZE AND AREA OF THE TOP AND BOTTOM CHORD FOR EACH JOIST SECTION SHOWN ON THE DRAWINGS. EACH JOIST SHALL HAVE THE MINIMUM EFFECTIVE MOMENT OF INERTIA AS SHOWN IN APPENDIX IV OF SJI TECHNICAL DIBEST 3, DATED MAY 1971. JOISTS SHALL BE DESIGNED FOR THE DEAD, LIVE, WIND AND SPECIAL LOADS AS LISTED BELOW AND IN ACCORDANCE WITH THE REQUIREMENTS OF THE STATE OF NORTH CAROLINA, AND THE STEEL JOIST INSTITUTE STANDARD SPECIFICATIONS FOR OPEN WEB STEEL JOISTS. CALCULATIONS SHALL BE PREPARED BY, OR UNDER THE SUPERVISION OF, A PROFESSIONAL ENGINEER LICENSED BY THE STATE OF NORTH CAROLINA. A SEALED LETTER OF CERTIFICATION SHALL BE SUBMITTED BY THE ENGINEER WITH THE DESIGN CALCULATIONS.

|             |                     |
|-------------|---------------------|
| ROOF LOADS: |                     |
| LIVE LOAD   | 20 PSF              |
| DEAD LOAD   | 30 PSF              |
| WIND LOAD   | 10 PSF [NET UPLIFT] |

LIGHTGAUGE COLD-FORMED STEEL (CFS) FRAMING

SUBMITTALS

PRODUCT DATA: FOR INFORMATION ONLY, SUBMIT COPIES OF MANUFACTURERS' PRODUCT INFORMATION AND INSTALLATION INSTRUCTIONS FOR EACH ITEM OF LIGHTGAUGE CFS FRAMING AND ACCESSORIES.

SHOP DRAWINGS:

SUBMIT SHOP DRAWINGS FOR SPECIAL COMPONENTS AND INSTALLATIONS NOT FULLY DIMENSIONED OR DETAILED IN MANUFACTURERS' PRODUCT DATA. INCLUDE PLACING DRAWINGS FOR FRAMING MEMBERS SHOWING SIZE AND GAGE DESIGNATIONS, NUMBER, TYPE, LOCATION AND SPACING. INDICATE SUPPLEMENTAL BRACING, SPLICES, ACCESSORIES AND DETAILS AS MAY BE REQUIRED FOR PROPER INSTALLATION.

IF THE CONTRACTOR ELECTS TO PREFABRICATE FRAMING MEMBERS INTO PANELS FOR ERECTION, HE SHALL SUBMIT SHOP DRAWINGS OF SUCH PANELS AT A SUITABLE SCALE SHOWING ALL DIMENSIONS, COMPONENTS AND METHODS OF FASTENING AND SUPPORT.

ENGINEERING DATA:

SUBMIT ENGINEERING DATA DRAWINGS TO THE ARCHITECT FOR REVIEW. THE CONTRACTOR IS RESPONSIBLE FOR THE STRUCTURAL DESIGN AND SUPPORTS FOR THE LIGHTGAUGE METAL FRAME AND MUST SHOW HIS PROPOSED SYSTEM ON THESE DRAWINGS.

THESE DRAWINGS MUST SHOW ALL LOAD CONDITIONS AND DESIGN CALCULATIONS RELATIVE TO CONNECTIONS, FASTENING DEVICES AND ANCHORAGE, AS WELL AS SIZE AND GAUGE OF MEMBERS. CALCULATIONS AND DRAWINGS MUST BE PREPARED BY A STRUCTURAL ENGINEER LICENSED IN THE STATE OF NORTH CAROLINA AND SHALL BE SIGNED AND SEALED BY THIS ENGINEER.

PERFORMANCE CRITERIA

ASIS "SPECIFICATIONS", CALCULATE STRUCTURAL CHARACTERISTICS OF COLD-FORMED METAL FRAMING ACCORDING TO AISIS "SPECIFICATION FOR THE DESIGN OF COLD-FORMED" STEEL STRUCTURAL MEMBERS" AND THE FOLLOWING:

CENTER FOR COLD-FORMED STEEL STRUCTURES [CFFSS] TECHNICAL BULLETIN, VOL. 2, NO. 1, FEBRUARY 1993 "AISIS SPECIFICATION PROVISIONS FOR SCREW CONNECTIONS"

STRUCTURAL PERFORMANCE: ENGINEER, FABRICATE, AND ERECT COLD-FORMED METAL FRAMING TO WITHSTAND DESIGN LOADS WITHIN LIMITS AND UNDER CONDITIONS REQUIRED. DESIGN SPACING OF STUDS SHALL NOT BE GREATER THAN 18" ON CENTER AND DESIGN GAGE SHALL NOT BE LESS THAN GAGE INDICATED HEREIN.

DESIGN LOADS (GRAVITY, WIND, SEISMIC), AS REQUIRED BY CHAPTER 16 OF THE INTERNATIONAL BUILDING CODE, 2012 EDITION, FOR A BASIC WIND SPEED OF 80 MPH IN ACCORDANCE WITH ASCE 7-05. OTHER LOADING CONDITIONS SHALL BE THE DEAD LOADS AS SHOWN ON THE DRAWINGS AND DETAILS. ALL COMBINATIONS OF LOADS SHALL BE CONSIDERED. DESIGN TO AISC COLD-FORMED STEEL DESIGN MANUAL.

DESIGN FRAMING SYSTEMS TO PROVIDE FOR MOVEMENT OF FRAMING MEMBERS WITHOUT DAMAGE OR OVERSTRESSING, SHEATHING FAILURE, CONNECTION FAILURE, UNIFORM STRAIN ON FASTENERS AND ANCHORS, OR OTHER DETRIMENTAL EFFECTS WHEN SUBJECT TO A MAXIMUM AMBIENT TEMPERATURE CHANGE RANGE OF 120 DEG. F.

DESIGN SYSTEM TO ACCOMMODATE CONSTRUCTION TOLERANCES, DEFLECTION OF BUILDING STRUCTURAL MEMBERS, AND CLEARANCES OF INTENDED OPENINGS.

DESIGN EXTERIOR LOAD BEARING AND NON-LOAD BEARING CURTAINWALL FRAMING TO ACCOMMODATE LATERAL DEFLECTION WITHOUT REGARD TO CONTRIBUTION OF SHEATHING MATERIALS. DEFLECTION CALCULATIONS SHALL BE BASED ON STUD PROPERTIES ONLY. MINIMUM BASE METAL THICKNESS: 0.0451 INCH, 1/43 MILS, REFERENCE GAUGE NUMBER 48.

ENGINEERING RESPONSIBILITY: ENGAGE A FABRICATOR WHO ASSUMES UNDIVIDED RESPONSIBILITY FOR ENGINEERING COLD-FORMED METAL FRAMING BY EMPLOYING A QUALIFIED PROFESSIONAL ENGINEER, REGISTERED IN NORTH CAROLINA, TO PREPARE DESIGN CALCULATIONS, SHOP DRAWINGS, AND OTHER STRUCTURAL DATA.

MAXIMUM ALLOWABLE DEFLECTION: 1/600 OF SPAN FOR ALL STUD BACK-UP FOR BRICK VENEER WALLS.

STRUCTURAL DESIGN

DESIGN, ANALYSIS, AND COMPUTATION OF SECTION PROPERTIES SHALL BE IN CONFORMANCE WITH THE SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS OF THE AMERICAN IRON AND STEEL INSTITUTE.

TECHNICAL TABULATIONS OF SECTION PROPERTIES AND LOAD CAPACITIES SHALL INDICATE DIMENSIONS, STEEL CHARACTERISTICS, AND ALLOWABLE STRESSES [UPON WHICH COMPUTATIONS ARE BASED].

DEFLECTION AND STRESS CALCULATIONS FOR THE COLD FORMED METAL STUDS SHALL BE BASED ON THE TOTAL SUPERIMPOSED LOADS APPLIED TO THE BUILDING EXTERIOR WALL SYSTEM FROM LATERAL WIND FORCES AND RESPECTIVE EXTERIOR WALL SEISMIC FORCES APPLIED AND TRANSFERRED DIRECTLY TO THE STUDS THROUGH THE MASONRY/CURTAIN WALL. VENEER ANCHOR SYSTEM WITHOUT REGARD TO ANY NON-COMPOSITE OR COMPOSITE CONTRIBUTION OF THE NON-STRUCTURAL WALL SHEATHING OR OTHER COMPONENTS.

FOUNDATIONS

FOUNDATION DESIGN IS BASED ON ECS CAROLINAS, LLP, "REPORT OF SUBSURFACE EXPLORATION," ECS PROJECT NO. 08-1990, DATED OCTOBER 31, 2016.

SHALLOW FOUNDATIONS SHALL BEAR ON UNDISTURBED RESIDUAL SOILS OR A PAD CONSTRUCTED OF ENGINEERED FILL. RESIDUAL SOIL SHALL HAVE A MINIMUM STANDARD PENETRATION RESISTANCE (N-VALUE) OF 15 BLOWS PER FOOT. NEW COMPACTED FILL OVERLYING UNDISTURBED RESIDUAL SOILS SHALL BE COMPACTED TO AT LEAST 95% OF ITS STANDARD PROCTOR MAXIMUM DRY DENSITY. SOILS USED IN COMPACTED FILLS SHALL BE FREE OF DEBRIS AND HAVE LESS THAN 5% BY WEIGHT FIBROUS ORGANIC MATERIAL. ONLY SOILS HAVING A PLASTICITY INDEX PI LESS THAN 30 SHALL BE USED FOR STRUCTURAL FILL [ASTM D423 AND ASTM D424]. NET ALLOWABLE BEARING PRESSURE FOR SHALLOW FOUNDATIONS PLACED IN RESIDUAL SOILS IS 3,000 POUNDS PER SQUARE FOOT [PSF] AND 3,000 PSF FOR FOUNDATIONS BEARING ON STRUCTURAL FILL.

EARTH DESIGN BEARING PRESSURE AS INDICATED FOR SHALLOW FOUNDATIONS SHALL BE VERIFIED BY A GEOTECHNICAL LABORATORY WHICH WILL BE EMPLOYED AND PAID FOR BY THE OWNER BEFORE ANY WORK IS PERFORMED. IF THE EARTH BEARING PRESSURES ARE LESS THAN THAT REQUIRED, THE CONTRACTOR SHALL NOT BEGIN WORK UNTIL NOTIFIED BY THE ARCHITECT/ENGINEER TO DO SO. A COPY OF THE REPORT SHALL BE FORWARDED TO THE ARCHITECT/ENGINEER.

FOOTINGS SHALL BE CARRIED TO LOWER ELEVATIONS THAN THOSE SHOWN ON THE DRAWINGS IF REQUIRED BY THE GEOTECHNICAL ENGINEER OR TESTING LAB TO REACH SOIL CAPABLE OF PROVIDING THE DESIGN ALLOWABLE SOIL BEARING PRESSURE.

ALL FOOTING EXCAVATIONS NOT PLACED WITH CONCRETE ON THE SAME DAY OF EXCAVATION SHALL BE PROTECTED BY A THREE-INCH THICK MID-SPAN UPWARD CAMBER IN 10" CONCRETE. WHERE USED, THE CONCRETE MID SLAB SHALL NOT DECREASE THE FOOTING DEPTH AS SPECIFIED IN THE FOOTING SCHEDULE FOR THE RESPECTIVE FOOTING.

CONCRETE FOUNDATION WALLS SHALL NOT BE BACKFILLED UNTIL CONCRETE HAS OBTAINED THE DESIGN STRENGTH AND THE CONCRETE FOR THE SLAB ON GRADE IS PLACED AND CURED.

UTILITY LINES SHALL NOT BE PLACED THROUGH OR BELOW FOUNDATIONS WITHOUT APPROVAL OF THE STRUCTURAL ENGINEER. CONTRACTOR SHALL SUBMIT DETAILED DRAWINGS OF ALL SUCH CONDITIONS PRIOR TO CONSTRUCTION.

MASONRY

CONCRETE MASONRY UNITS (CMU) SHALL BE LIGHT WEIGHT CELLULAR UNITS CONFORMING TO THE STANDARD SPECIFICATIONS FOR HOLLOW CONCRETE MASONRY UNITS ASTM C-90. CONCRETE MASONRY UNIT COMPRESSIVE STRENGTH SHALL BE NO LESS THAN 2,000 PSI IN ACCORDANCE WITH ASTM C-140, AND THE UNIT WEIGHT SHALL NOT EXCEED 105 PCF. DESIGN COMPRESSIVE STRENGTH OF CONCRETE MASONRY FOR Fm = 1,500 psi. THESE STRENGTH VALUES SHALL BE ON A NET CONCRETE MASONRY AREA FOR ALL HOLLOW UNITS. SUBMIT EVIDENCE IN WRITING TO THE ARCHITECT TO SUBSTANTIATE THESE VALUES.

MORTAR SHALL CONFORM TO ASTM C-270. GROUT SHALL CONFORM TO ASTM C-476. MORTAR SHALL BE TYPE "SI" WITH A MINIMUM AVERAGE 28-DAY COMPRESSIVE STRENGTH OF 2,000 psi. GROUT FOR ALL REINFORCED MASONRY SHALL HAVE A 28-DAY COMPRESSIVE STRENGTH OF 3,000 psi.

BOND BEAMS, LINTEL BEAMS, AND REINFORCED MASONRY WALLS SHALL BE FILLED SOLID WITH GROUT, NOT MORTAR. HOLLOW CONCRETE MASONRY UNITS SHALL BE LAID WITH FULL MORTAR COVERAGE ON HORIZONTAL AND VERTICAL FACE SHELLS AND WEBS. FILL ALL CELLS OF CONCRETE MASONRY UNITS BELOW GRADE WITH GROUT.

SPLICED REINFORCING SHALL BE LAPPED 48 BAR DIAMETERS [24 INCHES MINIMUM] OR AS SHOWN ON THE DRAWINGS, WHICHEVER IS GREATER. ALL SPLICES SHALL BE WIRE TIED TOGETHER.

PROVIDE REINFORCING BAR POSITIONERS FOR ALL VERTICAL AND HORIZONTAL REINFORCING PLACED IN CMU WALLS. BAR POSITIONERS SHALL BE 9 GAGE, HOT DIPPED GALVANIZED AND FABRICATED TO ACCOMMODATE CONCRETE MASONRY UNITS.

PROVIDE MINIMUM MASONRY WALL REINFORCING STEEL TO COMPLY WITH ACI 530 AS FOLLOWS:

- A. VERTICAL REINFORCING: NUMBER, SIZE, AND LOCATED AT:
  - 1. (3)-#5 LOCATED AT EACH CORNER OF ALL WALLS
  - 2. [2]-#5 LOCATED AT EACH SIDE OF EACH OPENING
  - 3. [1]-#5 LOCATED AT ENDS OF WALLS
- B. HORIZONTAL REINFORCING [2]-#5 CONT. IN CMU BOND BEAM LOCATED AT:
  - 1. TOP OF ALL DOOR OPENINGS OR WALL OPENINGS, EXTEND 24" PAST OPENING EACH SIDE
  - 2. AT ROOF LEVEL UNDER STRUCTURAL BEARING AND AT TOP OF WALLS
  - 3. AT BOTTOM OF WALL OR IN FOUNDATION WHEN WALL DOWELED TO FOOTING

STRUCTURAL DESIGN CRITERIA

APPLICABLE BUILDING CODES:

NORTH CAROLINA STATE BUILDING CODE [2012 EDITION]  
INTERNATIONAL BUILDING CODE [IBC], 2009 EDITION WITH NORTH CAROLINA AMENOMENTS.

REFERENCED STANDARDS:

ACI - AMERICAN CONCRETE INSTITUTE

318-08 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE

530-08 BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES

5301-08 SPECIFICATIONS FOR MASONRY STRUCTURES

AISC - AMERICAN INSTITUTE OF STEEL CONSTRUCTION

341-05, ANSI/AISC 341a1-05 SEISMIC PROVISIONS FOR STRUCTURAL STEEL BUILDINGS

STEEL CONSTRUCTION MANUAL, THIRTEENTH EDITION.

360-05, SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS.

SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS.

303-05, CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES.

AISI - AMERICAN IRON AND STEEL INSTITUTE

NAS-01 NORTH AMERICAN SPECIFICATIONS FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS, INCLUDING 2004 SUPPLEMENT.

GENERAL-04 STANDARD FOR COLD-FORMED STEEL FRAMING, GENERAL PROVISIONS