

STRUCTURAL NOTES

A. GENERAL

1. THE STRUCTURE IS DESIGNED IN ACCORDANCE WITH THE INTERNATIONAL BUILDING CODE, 2003 EDITION, WITH LOCAL AMENDMENTS.
2. THE DESIGN GRAVITY LOADS ARE AS FOLLOWS:
SUPERIMPOSED DEAD LOAD (INCLUDED BUT NOT LIMITED TO THE FOLLOWING):
- | | |
|------------------------|-------------|
| MECHANICAL AND CEILING | 5 PSF |
| BALLASTED ROOF SYSTEM | 11 PSF |
| FINISHES | AS REQUIRED |
| SPRINKLER SYSTEMS | AS REQUIRED |
| FLOORING | 4 PSF |

(FIRE SPRINKLER PIPING SUPPORTED BY THE STRUCTURAL SYSTEM IS TO BE DISTRIBUTED SO THAT THE WEIGHT OF THE WATER-FILLED PIPE DIVIDED BY TRIBUTARY AREA OF THE SUPPORTING MEMBER DOES NOT EXCEED 5 POUNDS PER SQUARE FOOT, AND THE LOADING IMPARTED TO ANY ONE STRUCTURAL MEMBER DOES NOT EXCEED 50 POUNDS PER LINEAR FOOT. EACH STRUCTURAL SUPPORT OF THE PIPING SHALL BE DESIGNED TO SUPPORT A LOAD EQUAL TO THE WEIGHT OF THE WATER-FILLED PIPE PLUS 250 POUNDS).

LIVE LOADS

ROOF	20 PSF
ROOF NET UPLIFT LOADING	25 PSF
RETAIL/DINING	100 PSF
FORESTAIR TERRACES	100 PSF
PERMANENT CORRIDORS	100 PSF
MECHANICAL EQUIPMENT AND PADS	ACTUAL WEIGHTS

3. HANDRAILS AND GUARDS SHALL BE DESIGNED IN ACCORDANCE WITH TABLE 1607.1 OF THE INTERNATIONAL BUILDING CODE AS FOLLOWS:

- A. HANDRAIL ASSEMBLIES AND GUARDS SHALL BE DESIGNED TO SUPPORT A LATERAL LOAD OF 50 POUNDS PER LINEAR FOOT (PLF) APPLIED IN ANY DIRECTION AT THE TOP AND TO TRANSFER THIS LOAD THROUGH THE SUPPORTS TO THE STRUCTURE.
- B. INTERMEDIATE RAILS, BALUSTERS, AND PANEL FILLERS SHALL BE DESIGNED TO SUPPORT A HORIZONTALLY APPLIED NORMAL LOAD OF 50 PSF ON AN AREA NOT TO EXCEED ONE SQUARE FOOT INCLUDING OPENINGS AND SPACE BETWEEN RAILS. REACTION DUE TO THIS LOADING ARE NOT REQUIRED TO BE SUPERIMPOSED WITH THOSE IN NOTE (A) ABOVE OR NOTE (C) BELOW.

- C. HANDRAIL ASSEMBLIES AND GUARDS SHALL BE DESIGNED TO SUPPORT A LOAD OF 200 POUNDS APPLIED IN ANY DIRECTION AT ANY POINT ON THE RAIL. THESE LOADS NEED NOT BE ASSUMED TO ACT CUMULATIVELY WITH THOSE IN NOTE (B) ABOVE.

4. STAIR TREADS AND STRINGERS SHALL BE DESIGNED FOR A UNIFORM LOAD OF 100 PSF. INDIVIDUAL STAIR TREADS SHALL ALSO BE DESIGNED TO SUPPORT A 300 LB. LOAD ON A 4 SQUARE INCH AREA IN A POSITION THAT WILL CAUSE MAXIMUM STRESS.

5. EXCEPT FOR AREAS OF PUBLIC ASSEMBLY, AND EXCEPT FOR LIVE LOADS WHICH EXCEED 100 PSF, FLOOR LIVE LOADS ARE REDUCED FOR SLAB SYSTEMS, BEAMS, GIRDERS, COLUMNS, PIERS, WALLS, AND FOUNDATIONS WHICH SUPPORT A FLOOR AREA OF 150 SQUARE FEET OR GREATER. THE FLOOR LIVE LOAD IS REDUCED AT THE RATE OF 0.08 PERCENT PER SQUARE FOOT OF FLOOR AREA SUPPORTED IN EXCESS OF 150 SQUARE FEET. THE REDUCTION DOES NOT EXCEED 40 PERCENT FOR MEMBERS RECEIVING LOADS FROM ONE LEVEL ONLY, 60 PERCENT FOR OTHER MEMBERS, NOR 70% AS DETERMINED BY $R = 23/(1+DEAD\ LOAD/LIVE\ LOAD)$, IN ACCORDANCE WITH SECTION 1607 OF THE BUILDING CODE.

6. THE STRUCTURE HAS BEEN DESIGNED TO WITHSTAND THE WIND PRESSURES SPECIFIED IN CHAPTER 16, SECTION 1609, OF THE INTERNATIONAL BUILDING CODE, USING EXPOSURE CATEGORY C AND USING A BASIC WIND SPEED OF 90 MILES PER HOUR AT A STANDARD HEIGHT OF 33 FEET ABOVE THE GROUND.

7. THE STRUCTURE HAS BEEN DESIGNED FOR THE FOLLOWING SNOW LOADING PARAMETERS, IN ACCORDANCE WITH SECTION 1608 OF THE INTERNATIONAL BUILDING CODE:

GROUND SNOW LOAD	5 PSF
FLAT ROOF SNOW LOAD	5 PSF
SNOW EXPOSURE FACTOR	0.9
SNOW IMPORTANCE FACTOR	1.0

8. THE STRUCTURE HAS BEEN DESIGNED TO WITHSTAND THE SEISMIC FORCES SPECIFIED IN CHAPTER 16, SECTION 1613, OF THE INTERNATIONAL BUILDING CODE. SEISMIC DOES NOT CONTROL FOR THIS REGION.

9. METHODS, PROCEDURES, AND SEQUENCES OF CONSTRUCTION ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO MAINTAIN AND INSURE THE INTEGRITY OF THE STRUCTURE AT ALL STAGES OF CONSTRUCTION.

10. THE STRUCTURE HAS BEEN DESIGNED FOR THE IN-SERVICE LOADS ONLY. THE METHODS, PROCEDURES, AND SEQUENCES OF CONSTRUCTION ARE THE RESPONSIBILITY OF THE CONTRACTOR. SUPPORTING FORMWORK FOR THE CONCRETE CONSTRUCTION SHALL NOT BE REMOVED BEFORE THE CONCRETE HAS GAINED SUFFICIENT STRENGTH TO SAFELY SUPPORT THE DEAD AND SUPERIMPOSED LOADS WHICH WOULD BE SUBSEQUENTLY APPLIED. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO MAINTAIN AND INSURE THE INTEGRITY OF THE STRUCTURE AT ALL STAGES OF CONSTRUCTION.

11. STRUCTURAL MEMBERS HAVE BEEN LOCATED AND DESIGNED TO ACCOMMODATE THE MECHANICAL EQUIPMENT AND OPENINGS SPECIFIED BY THE MECHANICAL CONSULTANT. ANY SUBSTITUTIONS RESULTING IN REVISIONS TO THE STRUCTURE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH HAYNES WHALEY ASSOCIATES, INC.

12. THE GENERAL CONTRACTOR AND SUB-CONTRACTORS SHALL DETERMINE THE SCOPE OF THE STRUCTURAL WORK FROM THE CONTRACT DOCUMENTS TAKEN AS A WHOLE. THE STRUCTURAL DRAWINGS SHALL NOT BE CONSIDERED SEPARATELY FOR THE PURPOSE OF BRIDGING THE STRUCTURAL WORK. DUE CONSIDERATION SHALL BE GIVEN TO OTHER STRUCTURAL WORK OR WORK RELATED TO THE STRUCTURE, INCLUDING NECESSARY COORDINATION DESCRIBED OR IMPLIED BY THE ARCHITECTURAL AND MECHANICAL DRAWINGS.

13. THE REPRODUCTIVE USE OF THE STRUCTURAL CONTRACT DOCUMENTS OR ELECTRONIC FILES AS STRUCTURAL SHOP DRAWING DOCUMENTS BY THE CONTRACTOR OR SUB-CONTRACTORS IS AT THEIR OWN RISK. HAYNES WHALEY ASSOCIATES, INC. ASSUMES NO LIABILITY AS THE RESULT OF THE REPRODUCTIVE USE OF THE STRUCTURAL CONTRACT DOCUMENTS FOR SHOP DRAWINGS.

14. SCALES NOTED ON THE DRAWINGS ARE FOR GENERAL REFERENCE ONLY. NO DIMENSIONAL INFORMATION SHALL BE OBTAINED BY DIRECT SCALING OF THE DRAWINGS.

15. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF ALL RESULTING REVISIONS TO THE STRUCTURAL SYSTEM OR OTHER TRADES AS A RESULT OF ACCEPTANCE OF CONTRACTOR PROPOSED ALTERNATIVES OR SUBSTITUTIONS.

16. PRINCIPAL OPENINGS IN THE STRUCTURE ARE INDICATED ON THE CONTRACT DOCUMENTS. REFER TO THE ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS FOR SLEEVES, CURBS, INSERTS, ETC. NOT HEREIN INDICATED. OPENINGS IN SLABS WITH A MAXIMUM SIZE DIMENSION OR DIAMETER OF 12 INCHES OR LESS SHALL NOT REQUIRE ADDITIONAL FRAMING OR REINFORCEMENT, UNLESS NOTED OTHERWISE. THE LOCATION OF SLEEVES OR OPENINGS IN STRUCTURAL MEMBERS SHALL BE SUBMITTED TO HAYNES WHALEY ASSOCIATES, INC. FOR REVIEW.

17. ELEVATOR SHAFT AND SUPPORT BEAMS HAVE BEEN DESIGNED AND DETAILED BASED ON A THYSSEN KRUPP SEVILLE 30 MODEL ELEVATOR. THE ELEVATOR CONTRACTOR SHALL BE RESPONSIBLE FOR THE CONNECTION OF THE MACHINE BEAMS AND/OR SECONDARY BEAMS TO THE STRUCTURE. SHOP DRAWINGS FOR THE ELEVATORS SHOWING CONNECTION DETAILS, LOCATION AND MAGNITUDE OF LOADS APPLIED TO THE STRUCTURE, ETC. SHALL BE SUBMITTED TO HAYNES WHALEY ASSOCIATES, INC. FOR VERIFICATION OF DESIGN ASSUMPTIONS.

B. FOUNDATION AND SLAB ON GRADE

1. THE SUBSURFACE INFORMATION AND FOUNDATION DESIGN ARE BASED ON A REPORT PREPARED BY TERRACON, INC., REPORT NUMBER 16055218, DATED FEBRUARY 2, 2008. THE CONTRACTOR SHALL PERFORM EXCAVATIONS, FOOTING CONSTRUCTION, AND PREPARATION OF THE SUBGRADE UNDER THE SLAB ON GRADE IN ACCORDANCE WITH THE RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT AND THE PROJECT SPECIFICATIONS.

2. THE FOUNDATION FOR THE STRUCTURE HAS BEEN DESIGNED FOR THE FOLLOWING ALLOWABLE SOIL BEARING PRESSURES AT A BEARING DEPTH AS INDICATED ON PLAN BELOW EXISTING GRADE AT THE TIME THAT THE GEOTECHNICAL REPORT WAS PREPARED:

TOTAL END BEARING LOAD	15,000 PSF
TOTAL DOWNWARD SKIN FRICTION LOAD (NEGLECT UPPER 5'-0")	1,000 PSF
TOTAL UPWARD SKIN FRICTION LOAD (NEGLECT UPPER 5'-0")	1,000 PSF

PIERS SHALL BEAR A MINIMUM OF AT LEAST 12 FEET BELOW THE EXISTING NATURAL GROUND SURFACE AT THE TIME OF THE BORINGS. IN ADDITION, THE PIERS SHALL BEAR AT LEAST 5 FEET INTO THE NATURAL STRATIGRAPHY IN TWO SILL CLAY SOILS.

3. DRILLED PIERS SHALL BE EXCAVATED, CLEANED, AND REINFORCED, AND THE CONCRETE SHALL BE PLACED ON THE SAME DAY. DRILLED PIERS WITH LESS THAN 2'-0" CLEAR BETWEEN BELLS OR SHAFTS SHALL BE EXCAVATED AND CONCRETE PLACED A MINIMUM OF 24 HOURS APART. IF BELLS CANNOT BE FORMED WITHOUT CAVING OF THE SOIL, THE ARCHITECT, GEOTECHNICAL ENGINEER, AND HAYNES WHALEY ASSOCIATES, INC., SHALL BE NOTIFIED BEFORE FURTHER CONSTRUCTION IS ATTEMPTED.

4. TEMPORARY STEEL CASING MAY BE REQUIRED DURING THE INSTALLATION OF DRILLED PIERS (SEE GEOTECHNICAL REPORT). THE CONTRACTOR SHALL PROVIDE A UNIT PRICE FOR THE USE OF STEEL CASING AS A SEPARATE ITEM IN THE CONTRACT.

5. EXCAVATIONS FOR CONTINUOUS FOOTINGS SHALL BE CLEANED AND HAND TAMPED TO A UNIFORM SURFACE. FOOTING EXCAVATIONS SHALL HAVE THE SIDES AND BOTTOMS TEMPORARILY UNED WITH MIL VIBRODIEP IF PLACEMENT OF CONCRETE DOES NOT OCCUR WITHIN 24 HOURS OF THE EXCAVATION OF THE FOOTING.

6. FOUNDATION CONDITIONS NOTED DURING CONSTRUCTION, WHICH DIFFER FROM THOSE DESCRIBED IN THE GEOTECHNICAL REPORT SHALL BE REPORTED TO THE ARCHITECT, GEOTECHNICAL ENGINEER AND HAYNES WHALEY ASSOCIATES, INC., BEFORE FURTHER CONSTRUCTION IS ATTEMPTED.

7. GENERAL CONTRACTOR SHALL NOTIFY THE ARCHITECT AND HAYNES WHALEY ASSOCIATES, INC., 24 HOURS PRIOR TO PLACEMENT OF CONCRETE IN THE FOOTINGS.

8. REINFORCEMENT PLACEMENT SEQUENCE FOR FOOTINGS IS NOTED ONLY FOR MAJOR REINFORCEMENT BAR LAYERS. IN SPREAD FOOTINGS AND MATS THE CONTRACTOR SHALL SEQUENCE ALL OTHER BAR PLACEMENTS AS REQUIRED TO CONFORM TO THE CONTRACT DOCUMENTS.

9. DURING CONSTRUCTION, THE CONTRACTOR SHALL PROVIDE TEMPORARY SHORING OF WALLS WHICH ARE ULTIMATELY SUPPORTED TOP AND BOTTOM. SUCH SHORING SHALL NOT BE REMOVED UNTIL THE SUPPORTING ELEMENTS ARE IN PLACE. THE CONCRETE IN THE WALLS AND SUPPORTING ELEMENTS HAS ATTAINED THE SPECIFIED 28 DAY COMPRESSIVE STRENGTH (F'c) AND COMPACTION OF THE BACKFILL AGAINST THE WALL HAS BEEN COMPLETED.

10. SUBGRADE UNDER SLABS ON FILL SHALL BE PREPARED, PLACED AND COMPACTED IN ACCORDANCE WITH THE RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT.

11. THE FLOOR SUBGRADE SHALL BE PROPERLY COMPACTED AND PROOFROLLED AND SHALL BE FREE OF STANDING WATER, MUD AND FROZEN SOIL.

12. A VAPOR BARRIER WITH A PERFORMANCE EQUIVALENT TO A 10 MIL STEADYSTATE SHALL BE PLACED BENEATH THE SLAB ON GRADE.

13. SLABS ON GRADE SHALL HAVE CONSTRUCTION JOINTS OR CRACK CONTROL JOINTS AT EACH COLUMN LINE IN EACH DIRECTION. ADDITIONAL CRACK CONTROL JOINTS SHALL BE PROVIDED, SUCH THAT NO AREA BOUNDED BY CONSTRUCTION AND/OR CRACK CONTROL JOINTS CONTAINS MORE THAN 450 SQUARE FEET OF SLAB AREA, THE SPACING OF THE JOINTS DOES NOT EXCEED 36 TIMES THE SLAB THICKNESS, AND THE RESULTING ASPECT RATIO OF THE DIMENSIONS OF SLAB AREA DOES NOT EXCEED 1.5 TO 1. CRACK CONTROL JOINTS SHALL BE MADE USING A "SOFT-CUT" CONCRETE SAW AS SOON AS THE SLAB WILL SUPPORT THE WEIGHT OF THE SAW AND OPERATOR WITHOUT DISTURBING THE FINAL FINISH. THE CRACK CONTROL JOINTS SHALL BE CUT A MAXIMUM WIDTH OF 1/8 INCH AND A MINIMUM DEPTH OF 1/3 THE SLAB THICKNESS. REFER TO THE DRAWINGS FOR INFORMATION ON CONTROL JOINTS, CONSTRUCTION JOINTS, REINFORCEMENT DETAILS AND JOINT SEALANT DETAILS.

14. WHERE THE SLAB IS TO RECEIVE SENSITIVE ARCHITECTURAL FLOOR FINISHES, ALL JOINTS IN THE SLAB CONSTRUCTION SHALL BE PLACED TO ALIGN WITH JOINTS IN THE FLOOR FINISHES.

C. CONCRETE DECK ON STEEL FORMS

1. FLOOR SLAB SYSTEM SHALL BE NORMAL WEIGHT CONCRETE 3 1/2 INCHES THICK, ON CORRUGATED PERMANENT STEEL FORMS. STEEL FORMS SHALL BE 28 GAGE COLD-FORMED STEEL CONFORMING TO ASTM A1008, GRADE 33 (MIN.), STEEL FORMS SHALL BE 9/16 INCHES DEEP AND SHALL HAVE A MINIMUM SECTION MODULUS OF 0.035 INCHES CUBED PER FOOT OF WIDTH. REINFORCE SLAB WITH 6X8-W2.1 X W2.1 WELDED WIRE FABRIC.

2. PROPERTIES AND ALLOWABLE STRESSES OF STEEL FLOOR DECKS SHALL BE BASED ON THE AISI "SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS". STEEL FLOOR DECK SHALL BE PLACED TO HAVE A THREE SPAN CONFIGURATION WHERE POSSIBLE AND AT LEAST A TWO SPAN CONFIGURATION UNLESS NOTED OTHERWISE. GENERAL CONTRACTOR SHALL COORDINATE WITH DECK SUPPLIER TO DETERMINE DECK GAGE REQUIRED FOR SINGLE SPAN CONDITIONS.

3. WELD DECK TO SUPPORTING STEEL AND ADJOINING DECK SHEETS USING MINIMUM OF 5/8 INCH PUDDLE WELDS IN ACCORDANCE WITH THE AMERICAN WELDING SOCIETY STANDARD D1.3. THE DECK SHALL BE WELDED AT ENDS AND ALONG SIDES AT A MAXIMUM SPACING OF 12 INCHES ON CENTER. OTHER DECK WELDS SHALL BE LOCATED IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE DECK MANUFACTURER UNLESS NOTED OTHERWISE. IF WELDING IS NOT SPECIFIED BY THE DECK MANUFACTURER, WELD FORTS TO SUPPORTING MEMBERS (BEAMS, GIRDERS, AND EDGE ANGLES) WITH WELDS SPACED AT NOT MORE THAN 12 INCHES ON CENTER AT SUBSTS AND ALONG EDGES. DECK FLUTES SHALL BE ALIGNED AND DECK ENDS MAY BE BUTTED OR LAPPED OVER SUPPORTS.

4. IF NO OTHER SIDE LAP FASTENER CRITERIA IS PROVIDED, STEEL DECK UNITS WITH SPANS GREATER THAN 5 FEET SHALL HAVE SIDE LAPS FASTENED AT MIDSPAN OR 36 INCH INTERVALS MINIMUM WHICHEVER DISTANCE IS SMALLER AND SIDE LAP FASTENERS SHALL BE WELDS, SCREWS, OR CRIMPS (BUTTON PUNCHING).

5. FOR DECK UNITS THINNER THAN 22 GAGE, USE WELDING WASHERS FOR ALL WELDS.

6. IN ADDITION TO THE SPECIFICATIONS NOTED ELSEWHERE, THE FLOOR DECK CONCRETE SHALL CONFORM TO THE FOLLOWING:
MAXIMUM WATER CEMENT RATIO BY WEIGHT 0.45
MAXIMUM SLUMP PRIOR TO PLASTICIZERS 4 + 1/2 INCHES
MAXIMUM AGGREGATE SIZE 1 INCH

7. STEEL DECK SHALL BE FREE FROM OIL, DIRT, AND ANY OTHER DELETERIOUS MATERIALS THAT WOULD TEND TO REDUCE THE BOND BETWEEN THE CONCRETE AND THE STEEL DECK.

8. PROVIDE SUFFICIENT CHAIRS, BOLSTER BARS, ETC. TO MAINTAIN THE WELDED WIRE FABRIC AND REINFORCEMENT BARS AT THE DEPTH SPECIFIED.

9. SLUMP TESTS SHALL BE MADE PRIOR TO THE ADDITION OF PLASTICIZERS. CONCRETE FOR THE PREPARATION OF TEST CYLINDERS SHALL BE TAKEN FROM THE HOSE END FOR CONCRETE PLACED BY PUMP.

10. WATER SHALL NOT BE ADDED TO THE CONCRETE AT THE JOBSITE UNLESS THE TOTAL WATER QUANTITY INCLUDING THE WATER ADDED AT THE JOBSITE DOES NOT EXCEED THE TOTAL WATER QUANTITY OF THE REVIEWED MIX DESIGN. IT SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE THE REQUIREMENTS OF THE CONCRETE SUPPLIER AND PUMPER TO MEET THIS REQUIREMENT AND TO ENSURE A PUMPABLE AND WORKABLE MIX. THE USE OF PLASTICIZERS, RETARDANTS, AND OTHER ADDITIVES SHALL BE AT THE OPTION OF THE CONTRACTOR SUBJECT TO THE APPROVAL OF HAYNES WHALEY ASSOCIATES. FOLLOW THE RECOMMENDATIONS OF THE MANUFACTURER FOR THE PROPER USE OF ADDITIVES. THE USE OF CALCIUM CHLORIDE OR OTHER CHLORIDE BEARING SALTS IS NOT PERMITTED.

11. PLACE CONCRETE IN A MANNER SO AS TO PREVENT SEGREGATION OF THE MIX. DELAY FLOATING AND TROWELING OPERATIONS UNTIL THE CONCRETE HAS LOST SURFACE WATER SHEEN OR ALL FREE WATER. DO NOT SPRINKLE FINE CEMENT ON THE SLAB SURFACE. FINISHING OF SLAB SURFACES SHALL COMPLY WITH THE RECOMMENDATIONS OF ACI 302.1 AND 304.

12. PRIOR TO CURING OF DECK IMMEDIATELY AFTER FINISHING, REFER TO THE SPECIFICATIONS FOR REQUIREMENTS. PROTECT THE CONCRETE SURFACE BETWEEN FINISHING OPERATIONS ON HOT, DRY, OR WINDY DAYS OR ANY TIME PLASTIC SHRINKAGE CRACKS COULD DEVELOP BY USING WET BURLAP, PLASTIC MEMBRANES, OR FOGGING. PROTECT CONCRETE DECK AT ALL TIMES FROM RAIN, HAIL, OR OTHER MAJOUR EFFECTS.

13. THE CONTRACTOR SHALL SUBMIT FOR THE REVIEW A MIX DESIGN FOR THE PROPOSED CONCRETE. MIX DESIGNS SHALL SHOW WEIGHT PROPORTIONS FOR ALL COMPONENTS OF THE MIX. THE CONTRACTOR SHALL NOT VARY FROM THE MIX DESIGN WITHOUT THE APPROVAL OF HAYNES WHALEY ASSOCIATES, INC.

D. STEEL ROOF DECK

1. ROOF DECK SHALL BE RIGID INSULATION BOARD ON GALVANIZED TYPE B STEEL ROOF DECK (GENERAL CONTRACTOR SHALL COORDINATE ABILITY OF INSULATION BOARD TO SPAN OVER FLUTES OF TYPE "B" DECK). TYPE B STEEL ROOF DECK SHALL BE 22 GAGE COLD-FORMED STEEL CONFORMING TO ASTM A653 STRUCTURAL QUALITY GRADE 33 WITH COATING DESIGNATION G60. STEEL ROOF DECK SHALL BE 1 1/2 INCHES DEEP WITH A MINIMUM SECTION MODULUS (Sx) OF 0.186 INCHES CUBED PER FOOT OF WIDTH.

2. PROPERTIES AND ALLOWABLE STRESSES OF STEEL ROOF DECKS SHALL BE BASED ON THE AISI "SPECIFICATION FOR THE DESIGN OF COLD-FORMED STEEL STRUCTURAL MEMBERS". STEEL ROOF DECK SHALL BE PLACED TO HAVE A THREE SPAN CONFIGURATION WHERE POSSIBLE AND AT LEAST A TWO SPAN CONFIGURATION UNLESS NOTED OTHERWISE. GENERAL CONTRACTOR SHALL COORDINATE WITH DECK SUPPLIER TO DETERMINE DECK GAGE REQUIRED FOR SINGLE SPAN CONDITIONS.

3. PLUG WELD DECK TO SUPPORTING STEEL AND ADJOINING DECK SHEETS IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE AMERICAN WELDING SOCIETY STANDARD D1.3. SEE ROOF DECK ATTACHMENT PLAN ON ROOF PLAN SHEET FOR WELD PATTERNS AND SIDE LAP SCREW SPACINGS.

E. CONCRETE

1. CONCRETE IN THE FOLLOWING AREAS SHALL HAVE NATURAL SAND FINE AGGREGATE AND NORMAL WEIGHT COARSE AGGREGATES CONFORMING TO ASTM C33, TYPE I PORTLAND CEMENT CONFORMING TO ASTM C150, AND SHALL HAVE THE FOLLOWING COMPRESSIVE STRENGTH (F'c) AT 28 DAYS:

DRILLED PIERS	3000 PSI
PIER CAPS	3000 PSI
PUNTHS	3000 PSI
GRADE BEAMS	3000 PSI
SLABS ON GRADE	3500 PSI
WALLS	3000 PSI
SLABS ON STEEL DECK	3500 PSI

2. FLY ASH MAY BE USED AS A POZZOLAN TO REPLACE A PORTION OF THE PORTLAND CEMENT IN A CONCRETE MIX, SUBJECT TO THE APPROVAL OF THE GENERAL CONTRACTOR AND THE STRUCTURAL ENGINEER. FLY ASH, WHEN USED, SHALL CONFORM TO ASTM C618, TYPE C OR F. CONCRETE MIXES USING FLY ASH SHALL BE PROPORTIONED TO ACCOUNT FOR THE PROPERTIES OF THE SPECIFIC FLY ASH USED AND TO ACCORD TO THE SPECIFIC PROPERTIES OF THE FLY ASH CONCRETE. THIS RESULTING THE RATIO OF THE AMOUNT OF THE FLY ASH TO THE TOTAL AMOUNT OF FLY ASH AND CEMENT IN THE MIX SHALL NOT EXCEED 25 PERCENT.

3. GROUT FOR BASE PLATES SHALL BE NONSHRINKABLE, NON-METALLIC CONFORMING TO ASTM C827, AND SHALL HAVE A SPECIFIED COMPRESSIVE STRENGTH AT 28 DAYS OF 3000 PSI. PREGROUTING OF BASE PLATES WILL NOT BE PERMITTED.

4. DETAILING OF CONCRETE REINFORCEMENT BARS AND ACCESSORIES SHALL CONFORM TO THE RECOMMENDATIONS OF ACI 315 "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT" AND ACI SP-68 "DETAILING MANUAL". PLACING OF REINFORCING BARS SHALL CONFORM TO THE RECOMMENDATIONS OF ACI 308 "MANUAL OF ENGINEERING AND PLACING DRAWINGS FOR REINFORCED CONCRETE STRUCTURES" AND CRSI "MANUAL OF STANDARD PRACTICE".

5. MIXING, TRANSPORTING, AND PLACING OF CONCRETE SHALL CONFORM TO ACI 301.

6. MINIMUM CONCRETE COVER PROTECTION FOR REINFORCEMENT BARS SHALL BE AS FOLLOWS: (SEE ACI 318 SECTION 7.7 FOR CONDITIONS NOT NOTED)

CONCRETE EXPOSED TO WEATHER	1 + 1/2 INCHES
#5 BARS AND SMALLER	2 INCHES
ALL OTHER BARS	2 INCHES
CONCRETE CAST AGAINST EARTH	3 INCHES
GRADE BEAMS:	
TOP	1 + 1/2 INCHES
BOARD FORMED SIDES	2 INCHES
EARTH FORMED SIDES	3 INCHES
BOTTOM	3 INCHES
SLABS ON GRADE	
SINGLE LAYER OR TOP LAYER	2 INCHES
BOTTOM LAYER CAST AGAINST SOIL	2 INCHES
PLASTER & PUNTHS	2 INCHES
SLABS ON METAL FORMS	3/4 INCHES (TOP)
WALLS BELOW GRADE (BACKFILL) SIDE	2 INCHES
WALLS BELOW GRADE (NO BACKFILL)	3/4 INCHES

PROVIDE STANDARD BAR CHAIRS AND SPACERS AS REQUIRED TO MAINTAIN CONCRETE PROTECTION SPECIFIED.

7. CONCRETE REINFORCEMENT BARS SHALL CONFORM TO ASTM A615, GRADE 60.

8. WELDED WIRE FABRIC SHALL CONFORM TO ASTM A185. FABRIC SHALL BE SUPPLIED IN FLAT SHEETS. FABRIC SHALL BE LAPPED TWO MESH AT MINIMUM.

9. REINFORCEMENT BARS SHALL NOT BE TACK WELDED, WELDED, HEATED, OR CUT UNLESS INDICATED ON THE CONTRACT DOCUMENTS OR REVIEWED BY THE STRUCTURAL ENGINEER.

10. WELDING OF REINFORCEMENT BARS, WHEN ACCEPTED BY THE STRUCTURAL ENGINEER, SHALL CONFORM TO THE AMERICAN WELDING SOCIETY STANDARD D1.4. ELECTRODES FOR SHOP AND FIELD WELDING OF REINFORCEMENT BARS SHALL CONFORM TO ASTM A233, CLASS EXXXXX.

11. REINFORCEMENT DESIGNATED AS "CONTINUOUS" MAY BE SPLICED USING TYPE "B" SPLICES. REINFORCEMENT BAR SPICE LENGTHS IN BEAMS WHICH ARE LOCATED AT THE CENTERLINE OF SUPPORTS FOR BOTTOM BARS AND AT MIDSPAN FOR TOP BARS MAY BE 36 BAR DIAMETERS, UNLESS NOTED OTHERWISE. PROVIDE STANDARD ACI HOOKS FOR TOP AND BOTTOM BARS AT DISCONTINUOUS ENDS OF ALL GRADE BEAMS.

12. HORIZONTAL FOOTING AND HORIZONTAL WALL REINFORCEMENT SHALL BE CONTINUOUS AND SHALL HAVE 90-DEGREE BENDS AND EXTENSIONS, OR CORNER BARS OF EQUIVALENT SIZE LAPPED 36 BAR DIAMETERS, AT CORNERS AND INTERSECTIONS.

13. HORIZONTAL JOINTS WILL NOT BE PERMITTED IN CONCRETE CONSTRUCTION EXCEPT AS SHOWN ON THE CONTRACT DOCUMENTS. VERTICAL JOINTS MAY OCCUR AT CENTER OF SPANS AT LOCATIONS REVIEWED BY HAYNES WHALEY ASSOCIATES, INC..

14. CONSTRUCTION JOINTS BETWEEN PIERS AND PIER CAPS SHALL BE PREPARED BY ROUGHENING THE CONTACT SURFACE TO A FULL AMPLITUDE OF APPROXIMATELY 1/4 INCH LEAVING THE CONTACT SURFACE CLEAN AND FREE OF LAITANCE.

15. PROVIDE 1- NO. 4 REINFORCEMENT BAR X 4'-0" AT RE-ENTRANT CORNERS AND AROUND RECTANGULAR HOLES IN SLABS UNLESS NOTED OTHERWISE. PLACE BAR DIAGONAL TO CORNER WITH 1" CLEARANCE FROM THE TOP AND THE SIDE OF THE SLAB AT THE CORNER.

16. CONDUIT, PIPES, AND SLEEVES EMBEDDED IN CONCRETE SHALL CONFORM TO THE REQUIREMENTS OF ACI 318, CHAPTER 6.3.

F. STRUCTURAL STEEL

1. CONTRACTOR SHALL FABRICATE AND ERECT STEEL IN ACCORDANCE WITH OSHA'S SAFETY REQUIREMENTS, INCLUDING 29 CFR PART 1926 SAFETY STANDARDS FOR STEEL ERECTION.

2. STRUCTURAL STEEL WIDE FLANGE SHAPES SHALL CONFORM TO ASTM A992, GRADE 50 EXCEPT AS NOTED.

3. OTHER ROLLED STEEL SHAPES (W, S, HP, SHAPES, CHANNELS, AND ANGLES) SHALL CONFORM TO ASTM A36, EXCEPT AS NOTED.

4. PLATES SHALL CONFORM TO ASTM A 36, EXCEPT AS NOTED.

5. STRUCTURAL STEEL PIPE SHALL CONFORM TO ASTM A53, TYPE E OR TYPE S, GRADE B, OR ASTM A500 GRADE B. MILL TEST REPORTS FOR THE STEEL PIPE SHALL BE SUBMITTED FOR REVIEW.

6. STRUCTURAL STEEL TUBING SHALL CONFORM TO ASTM A500, GRADE B.

7. ANCHOR BOLTS (ANCHOR RODS) SHALL CONFORM TO ASTM F1554 GRADE 55, UNLESS NOTED OTHERWISE.

8. CONNECTION BOLTS FOR STRUCTURAL STEEL MEMBERS SHALL BE HIGH STRENGTH BOLTS WHICH MEET OR EXCEED THE REQUIREMENTS OF ASTM A325, TYPE N, X, OR SC CLASS A. BOLTS SHALL BE DESIGNED AS BEARING TYPE BOLTS, EXCEPT AS NOTED. BOLTS SHALL BE INSTALLED IN ACCORDANCE WITH THE "MANUAL OF STANDARD PRACTICE FOR STRUCTURAL STEEL" (ACI 308) OR THE "MANUAL OF STANDARD PRACTICE FOR STRUCTURAL STEEL" (ACI 308) USING ASTM A325 OR A490 BOLTS. BOLTS SHALL HAVE A HARDENED WASHER PLACED UNDER THE ELEMENT TO BE TIGHTENED. CONNECTIONS WITH OVERSIZES ROUND HOLES AND CONNECTIONS WITH HOLES SLOTTED IN THE DIRECTION OF LOAD, AND CONNECTIONS NOTED ON THE DRAWINGS TO BE "SLIP CRITICAL" (SC CLASS A) BOLTS, AND SHALL BE DESIGNED AS SUCH. BOLTS FOR SLIP-CRITICAL CONNECTIONS SHALL BE TIGHTENED BY THE USE OF THE TURN-OF-THE-NUT METHOD OR THE USE OF LOAD-INDICATING TYPE BOLTS, OR LOAD-INDICATING WASHERS INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.

9. STRUCTURAL STEEL DETAILING, FABRICATION AND ERECTION SHALL CONFORM TO THE AISI "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" AND THE MARCH 2000 VERSION OF THE AISI "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES".

10. TYPICAL BEAM CONNECTION DETAILS ARE DETAILED ON THE DRAWINGS. FOR NON-COMPOSITE BEAMS, THE END REACTION OF THE CONNECTED BEAM SHALL BE DETERMINED FROM AISI "MANUAL OF STEEL CONSTRUCTION-ALLOWABLE STRESS DESIGN", NINTH EDITION, PART 2 "ALLOWABLE LOADS ON BEAMS, UNLESS A DESIGN REACTION IS INDICATED ON THE PLANS. IF NO CASE SHALL THE END REACTION BE TAKEN AS LESS THAN 12.0 KIIPS. IF ALTERNATE BEAM CONNECTION DESIGNS ARE USED AND FOR ALL OTHER CONNECTIONS NOT DETAILED ON THE DRAWINGS, THE FABRICATOR SHALL HAVE A REGISTERED PROFESSIONAL ENGINEER PREPARE THE CONNECTION DESIGNS IN ACCORDANCE WITH AISI "MANUAL OF STEEL CONSTRUCTION-VOLUME II CONNECTIONS" AND "HOLLOW STRUCTURAL SECTIONS-CONNECTIONS MANUAL". SUCH DESIGNS SHALL BE SUBMITTED PRIOR TO PREPARATION OF THE SHOP DRAWINGS AND SHALL BEAR THE SEAL OF THIS RESPONSIBLE PROFESSIONAL ENGINEER.

11. PRIOR TO DETAILING CONNECTIONS FOR STRUCTURAL STEEL, THE STEEL FABRICATOR SHALL SUBMIT FOR APPROVAL REPRESENTATIVE DETAILS AND CALCULATIONS FOR EACH TYPE OF STRUCTURAL STEEL CONNECTION TO BE UTILIZED. AFTER APPROVAL, THE CONNECTIONS MAY BE INCORPORATED INTO THE SHOP DRAWINGS, ALONG WITH A TABLE OF DESIGN CAPACITIES FOR THE RANGE OF CONNECTIONS TO BE USED.

12. OPEN WEB STEEL JOISTS AND BRIDGING FOR JOISTS SHALL CONFORM TO THE STEEL JOIST INSTITUTE "STANDARD SPECIFICATIONS FOR OPEN WEB STEEL JOISTS". JOISTS SHALL BE WELDED TO SUPPORTING STEEL MEMBERS. WHERE COLUMNS ARE NOT FRAMED IN AT LEAST TWO DIRECTIONS WITH STEEL BEAMS OR JOIST GIRDERS, THE JOIST AT THE COLUMN LINE SHALL BE BOLTED TO SUPPORTING MEMBERS DURING ERECTION. BRIDGING SHALL BE CONTINUOUS THROUGH OPEN WEB STEEL JOISTS AND BE ANCHORED TO SPAN END MEMBERS. PROVIDE DIAGONAL BRIDGING WITH BOLTED CONNECTIONS AT CHORDS AND INTERSECTIONS PER THE REQUIREMENTS OF THE S.A. CAMBER ALL JOISTS THE AMOUNT RECOMMENDED BY THE S.A. OPEN WEB STEEL JOISTS MARKED "SPECIAL" OR "SP" SHALL BE DESIGN BY THE JOIST MANUFACTURER TO SUPPORT THE DEAD AND LIVE UNIFORM AND CONCENTRATED LOADS AND/OR NET UPLIFT LOADS NOTED IN THE DRAWINGS.

13. AS REQUIRED BY THE BUILDING OFFICE, THE OPEN WEB STEEL JOIST MANUFACTURER SHALL BE AN APPROVED FABRICATOR, AND TESTING AND INSPECTION OF THE OPEN WEB JOISTS SHALL BE PERFORMED BY AN APPROVED AGENCY.

14. WELDING SHALL CONFORM TO THE AMERICAN WELDING SOCIETY STANDARD D1.1. ELECTRODES FOR SHOP AND FIELD WELDS SHALL CONFORM TO AWS A5.1 OR AWS A5.5, CLASS E70XX, LOW HYDROGEN.

15. SPLICING OF STRUCTURAL STEEL MEMBERS WHERE NOT DETAILED ON THE CONTRACT DOCUMENTS IS PROHIBITED WITHOUT THE PRIOR APPROVAL OF THE STRUCTURAL ENGINEER AS TO LOCATION, TYPE OF SPLICE, AND CONNECTION TO BE MADE.

16. NO MISFABRICATED STRUCTURAL STEEL MAY BE ERECTED PRIOR TO REVIEW BY THE ENGINEER.

17. PENETRATIONS SHALL NOT BE CUT IN STRUCTURAL STEEL MEMBERS UNLESS SO INDICATED IN THE DRAWINGS OR AS REVIEWED BY THE ENGINEER.

18. HEADED CONCRETE ANCHORS SHALL BE NELSON OR KSM HEADED CONCRETE ANCHORS (OR ACCEPTABLE EQUAL), AND SHALL CONFORM TO ASTM A108, GRADES C-1010 THROUGH C-1020. ANCHORS SHALL BE AUTOMATICALLY END WELDED WITH SUITABLE STUD WELDING EQUIPMENT. WELDING SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE NELSON STUD WELDING COMPANY OR THE KSM WELDING SYSTEMS COMPANY.

19. DEFORMED BAR ANCHORS (D.B.A.) SHALL BE NELSON OR KSM DEFORMED BAR ANCHORS (OR ACCEPTABLE EQUAL), AND SHALL BE MADE FROM COLD DRAWN WIRE PER ASTM A998 CONFORMING TO ASTM A108 WITH A MINIMUM YIELD STRENGTH OF 70 KSI. ANCHORS SHALL BE AUTOMATICALLY END WELDED WITH SUITABLE WELDING EQUIPMENT. WELDING SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE NELSON STUD WELDING COMPANY OR THE KSM WELDING SYSTEMS COMPANY.

20. BEAMS SHALL BE CAMBERED UPWARD WHERE SHOWN ON THE CONTRACT DOCUMENTS. WHERE NO UPWARD CAMBER IS INDICATED, ANY MILL CAMBER SHALL BE DETAILED UPWARD IN THE BEAMS.

21. WHERE INDICATED ON THE DRAWINGS, STRUCTURAL STEEL MEMBERS, FABRICATIONS, AND WELDED ASSEMBLIES SHALL BE GALVANIZED AFTER FABRICATION BY HOT DIP PROCESS IN ACCORDANCE WITH ASTM A123. WEIGHT OF ZINC COATING SHALL CONFORM TO THE REQUIREMENTS SPECIFIED UNDER "WEIGHT OF COATING" IN ASTM A123 OR ASTM A396, AS APPLICABLE. THE AFFECTED PORTIONS OF FIELD WELDED GALVANIZED ASSEMBLIES SHALL BE FIELD PAINTED WITH ZINC RICH CORROSION RESISTANT PAINT.

22. ARCHITECTURALLY EXPOSED STRUCTURAL STEEL MEMBERS AND CONNECTIONS SHALL CONFORM WITH THE REQUIREMENTS OF THE AISI "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES" FOR ARCHITECTURALLY EXPOSED STRUCTURAL STEEL (AESS), SECTION 10, UNLESS MORE STRINGENT REQUIREMENTS ARE SHOWN OR SPECIFIED ELSEWHERE.

23. STRUCTURAL STEEL MEMBERS TO RECEIVE PREPWORKING SHALL NOT BE PRIMED NOR PAINTED. PREPWORKING MATERIAL THICKNESS SHALL BE INCREASED AS REQUIRED FOR STEEL MEMBERS NOT CONFORMING TO THE MINIMUM SIZES INDICATED IN THE ULL FIRE RESISTANCE DIRECTORY-VOLUME 1 AND FOR STEEL MEMBERS DETERMINED UNRESTRAINED.

G. CONCRETE MASONRY

1. MASONRY CONSTRUCTION SHALL BE PERFORMED IN ACCORDANCE WITH ACI 530 "BUILDING CODE REQUIREMENTS FOR CONCRETE MASONRY CONSTRUCTION" AND ACI 530.1 "SPEC