

CONCRETE NOTES

1. CONCRETE MIXTURE, FORM-WORK, DELIVERY AND PLACEMENT SHALL CONFORM TO ALL REQUIREMENTS OF ACI 301 (LATEST EDITION), UNLESS OTHERWISE NOTED.
2. CONCRETE MATERIALS SHALL BE: TYPE 1 OR 2 PORTLAND CEMENT, SAND AND GRAVEL AGGREGATES. CONCRETE SHALL BE AIR-ENTRAINED PER ACI RECOMMENDATIONS. CONCRETE COMPRESSIVE STRENGTH, (F'C) IN 28 DAYS, WHEN TESTED IN ACCORDANCE WITH ACI 318-LATEST EDITION, SHALL BE AS FOLLOWS: ALL CONCRETE WORK - 4,000 PSI (REFER TO CONCRETE FORM DECK SECTION FOR CONCRETE SPECIFICATIONS FOR DECK SLABS.)
3. THE MAXIMUM CONCRETE SLUMP FOR FOUNDATION WALLS, FOOTINGS, PIERS, ETC., SHALL BE 4". THE MAXIMUM CONCRETE SLUMP FOR SLABS SHALL BE 3". EXCEPT FOR NON-EXPOSED INTERIOR CONCRETE SLABS ON GRADE AND DECK SLABS. ALL CONCRETE SHALL BE AIR ENTRAINED TO 5% (+/- 1%). CONCRETE USED AT CMU WALL INFILL AREAS AND AT FOOTINGS BELOW TENDONS SHALL INCLUDE SUPER PLASTICIZER W/ 6" TO 8" SLUMP
4. ALL MIXING, TRANSPORTING, PLACING AND CURING OF CONCRETE SHALL BE DONE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE CURRENT AMERICAN CONCRETE INSTITUTE SPECIFICATIONS AND GUIDELINES.
5. NO SLAB-ON-GRADE INFILLS HAVE BEEN DESIGNED FOR BUOYANCY UPLIFT FORCES DUE TO GROUNDWATER OR FLOODING.
6. CONTRACTOR SHALL SUBMIT CONCRETE MIX DESIGN WITH LIST OF ADMIXTURES FOR WRITTEN APPROVAL PRIOR TO THE MIXING AND PLACEMENT OF CONCRETE.
7. ALL GROUT SHALL BE NON-SHRINK AND NON-METALLIC WITH A MINIMUM COMPRESSIVE STRENGTH OF 5,000 PSI. THE MAXIMUM APPLICATION THICKNESS OF GROUT UNDER COLUMN BASES SHALL BE 1 1/2".
8. REINFORCING STEEL SHALL BE NEW DEFORMED BARS CONFORMING TO ASTM A615, GRADE 60, EXCEPT WHERE NOTED. ALL REINFORCING BARS WELDED TO A STEEL SECTION SHOULD BE OF WELDING GRADE 40. RUSTED BARS WILL BE IMMEDIATELY REJECTED AND REQUIRED TO BE REPLACED AT NO ADDITIONAL COST.
9. DETAILING OF CONCRETE REINFORCEMENT AND ACCESSORIES SHALL BE IN ACCORDANCE WITH ACI PUBLICATION 315 AND CURRENT CRSI SPECIFICATIONS, LATEST EDITIONS.
10. WELDED WIRE MESH (WWM) SHALL BE NEW AND FREE FROM RUST, CONFORMING TO ASTM A185 WITH A MINIMUM TENSILE STRENGTH OF 70,000 PSI. REFER TO PLAN FOR SIZES.
11. ALL LAP SPLICES IN WWM SHALL BE 8" MINIMUM OR ONE MESH SPACE PLUS 2" IN EACH DIRECTION.
12. PROVIDE MINIMUM TEMPERATURE REINFORCEMENT AS REQUIRED BY ACI 318-LATEST EDITION, IN ALL SLABS AND WALLS WHERE NO REINFORCEMENT IS INDICATED ON DRAWINGS.
13. UNLESS OTHERWISE SHOWN ON THE DRAWINGS, REINFORCING STEEL SHALL BE PLACED TO PROVIDE THE FOLLOWING MINIMUM CONCRETE COVER:

BOTTOM OF FOOTINGS	3"
FORMED SIDES OF FOOTINGS	2"
FOUNDATION WALLS	1 1/2"
SLAB ON GRADE	2" BELOW TOP SURFACE
14. COLUMN ANCHOR BOLTS ARE TO BE FURNISHED AND INSTALLED ACCORDING TO DESIGN PLAN AND APPROVED SHOP DRAWINGS. ALL COLUMN ANCHOR BOLTS SHALL BE SET BY TEMPLATE.
15. ALL CONTINUOUS REINFORCEMENT SHALL HAVE CLASS "B" SPLICES (ACI 318-LATEST EDITION, SECTION 12-15) OR SHALL BE LAPPED 40 BAR DIAMETERS MINIMUM, UNLESS NOTED OTHERWISE.
16. HORIZONTAL WALL AND FOOTING REINFORCING SHALL BE CONTINUOUS AND SHALL HAVE 90-DEGREE BENDS ON EXTENSIONS AT CORNERS AND INTERSECTIONS; OR PROVIDE 2'-0" X 2'-0" CORNER BARS SIZE TO MATCH, AS SHOWN ON TYPICAL BAR PLACING DETAILS.
17. REINFORCING BARS MAY NOT BE WELDED WITHOUT APPROVAL OF THE STRUCTURAL ENGINEER. WHEN APPROVED, WELDING OF REINFORCING BARS SHALL BE IN ACCORDANCE WITH THE CURRENT A.W.S.
18. ALL CONCRETE SHALL BE PROTECTED AGAINST FROST UNTIL PROJECT IS COMPLETED. PROVIDE PROPER CONCRETE PROTECTION OR HEAT IN COLD WEATHER AND MAINTAIN PROPER CURING PROCEDURES IN ACCORDANCE WITH ALL CURRENT ACI CODE OF STANDARD PRACTICE SPECIFICATIONS AND GUIDELINES.
19. ALL REINFORCING BARS SHALL BE COLD BENT IN ACCORDANCE TO THE PROPER RADIUS ESTABLISHED BY THE ACI. UNDER NO CIRCUMSTANCES SHALL HEAT BE APPLIED TO THE BARS TO OBTAIN BENDS.
20. FORMS SHALL BE OILED PRIOR THEIR THE ERECTION. REINFORCING BARS WHICH ARE COATED WITH FORM OIL OR ANY OTHER BOND BREAKING MATERIAL WILL BE REJECTED AND WILL REQUIRE REPLACEMENT AT NO ADDITIONAL COST. FORM OIL SHALL NOT BE PETROLEUM BASED IF DETERMINED (BY THE ENGINEER OR ARCHITECT) TO BE A COMPATIBILITY ISSUE WITH WATERPROOFING OR DAMPROOFING.
21. CONCRETE MAY CONTAIN FLY-ASH OR SLAG. A MAXIMUM OF 15% IS ALLOWED
22. ADDITION OF WATER TO CONCRETE MIXES AT THE SITE IS NOT ALLOWED EXCEPT FOR SUPRERPLASTICIZED MIXES. SUCH CONCRETE SHALL BE IMMEDIATELY REJECTED.
23. ALL CONCRETE SHALL BE READY-MIXED AT PLANT COMPLYING WITH ASTM C94 AND ASTM C1116. SITE MIXING IS NOT ALLOWED.
24. THE USE OF CONTROL JOINTS IN THE SLABS IS REQUIRED TO CONTROL CRACKING. SAW CUT CONTROL JOINTS 1/4" WIDE TO A DEPTH OF 1/4 SLAB THICKNESS WITHIN 24 HOURS OF CONCRETE PLACEMENT. REINFORCING STEEL SHALL EXTEND CONTINUOUS THROUGH SLAB AT CONTROL JOINTS.
25. NOTIFY ENGINEER FOR INSPECTION OF COMPLETED INSTALLATION OF REINFORCEMENT AT LEAST TWO (2) FULL WORK DAYS PRIOR TO SCHEDULED PLACEMENT OF CONCRETE. DO NOT PLACE CONCRETE WITHOUT PRIOR APPROVAL OF THE STRUCTURAL ENGINEER.
26. SUBMIT COMPLETE REINFORCING STEEL SHOP DRAWINGS ALONG WITH COMPLETE CONCRETE MIX DESIGN (INCLUDING ALL ADDITIVES AND THEIR CONTENT) FOR REVIEW AND APPROVAL PRIOR TO FABRICATING REINFORCING STEEL.
27. CONCRETE USED FOR ALL FOUNDATIONS (WALLS, FOOTINGS, ETC.) AND SLAB-ON-GRADE INFILLS SHALL BE TESTED BY AN INDEPENDENT ACI CERTIFIED TESTING LAB, HIRED, SCHEDULED, AND PAID FOR BY THE OWNER. THE FOLLOWING MINIMUM TESTING SHALL BE PERFORMED, AND FIELD/LAB-RESULT REPORTS SUBMITTED FOR APPROVAL:
 - * AIR ENTRAINMENT AT PLACEMENT - ASTM C-231-97
 - * SLUMP - ASTM C-143
 - * COMPRESSIVE STRENGTH - ASTM C-39CONCRETE CYLINDER SAMPLES SHALL BE OBTAINED FROM EVERY CONCRETE DELIVERY TRUCK FOR COMPRESSIVE STRENGTH TESTING. SIX (6) CYLINDERS SHALL BE MADE FROM EACH SAMPLE. TWO (2) CYLINDERS WILL BE TESTED AT 7-DAY CURE, AND TWO (2) CYLINDERS WILL BE TESTED AT 28-DAY CURE TO DETERMINE COMPRESSIVE STRENGTH OF THE CONCRETE IN ACCORDANCE WITH ASTM C39. TWO (2) REMAINING CYLINDERS WILL BE STORED FOR 56 DAY TESTING IF NEEDED. AIR ENTRAINMENT AND SLUMP WILL BE TESTED AT EACH SAMPLE AS WELL. TEST RESULTS WHICH ARE DETERMINED BY THE ENGINEER TO BE DEFICIENT OR QUESTIONABLE WILL REQUIRE THAT THE CONTRACTOR PAY FOR ADDITIONAL TESTING AND CORING OF THE IN-PLACE CONCRETE, INCLUDING PETROGRAPHIC EXAMINATION WITH REPORT AS DIRECTED BY THE ENGINEER. CONCRETE DETERMINED BY THE ENGINEER TO REMAIN DEFICIENT AFTER FINAL TESTING SHALL BE ENTIRELY REMOVED AND REPLACED AT NO ADDITIONAL COST.

FOUNDATION NOTES

1. ALL FOOTINGS SHALL BEAR LEVEL ON SPECIFIED CRUSHED STONE ATOP UNDISTURBED, ACCEPTABLE SOIL OR COMPACTED STRUCTURAL FILL (AS SPECIFIED), HAVING A MINIMUM ALLOWABLE BEARING CAPACITY OF 1.0 TON PER SQUARE FOOT. ACCEPTABLE MATERIALS ARE CONSIDERED TO BE PROOF ROLLED EXISTING GRANULAR FILL OR NATURAL MARINE SAND.
2. SUBSOIL BEARING STRATA SHALL BE FREE FROM ALL VEGETATION, LOAM, AND ORGANIC MATERIAL IN NO CASE SHALL FOUNDATIONS BEAR UPON UNACCEPTABLE EXISTING SOILS. ALL SILT, FILL, TOPSOIL, AND OTHER UNACCEPTABLE SOIL MATERIALS SHALL BE EXCAVATED AND REMOVED FROM THE SITE AT ALL FOUNDATION AND SLAB-ON-GRADE LOCATIONS. SPECIFIED STRUCTURAL, COMPACTED FILL SHALL BE SUBSTITUTED AT THESE LOCATIONS.
3. IF BEARING MATERIALS (OTHER THAN THOSE DESCRIBED ABOVE) WITH A LOWER ALLOWABLE BEARING CAPACITY THAN 1.0 TONS PER SQUARE FOOT ARE ENCOUNTERED, THE UNSUITABLE MATERIALS SHALL BE REMOVED AND REPLACED WITH SUITABLE MATERIAL AS SPECIFIED AND APPROVED BY THE STRUCTURAL ENGINEER AND GEOTECHNICAL ENGINEER. COASTAL ENGINEERING REQUIRES THAT A LICENSED GEOTECHNICAL ENGINEER BE RETAINED TO PROVIDE CONSTRUCTION PHASE SERVICES TO OBSERVE COMPLIANCE WITH THE DESIGN. REFER TO EARTH WORK SPECIFICATIONS FOR GEOTECHNICAL FIELD REQUIREMENTS.
4. BOTTOM OF EXTERIOR WALL FOOTINGS SHALL BE NO LESS THAN 4'-0" BELOW FINISH GRADE.
5. BACKFILL ALL WALLS, PIERS, ETC. SIMULTANEOUSLY ALONG EACH SIDE WITH SPECIFIED OR ACCEPTABLE COMPACTED FILL. DO NOT LOAD EXTERIOR ADJACENT GRADE AREAS OF THE FOUNDATION UNTIL FLOOR FRAMING AND CONNECTIONS ARE COMPLETED.
6. ALL FOOTINGS SHALL BE PLACED ON A 12" MIN. LAYER OF COMPACTED, CRUSHED STONE ATOP PROOFROLLED ACCEPTABLE SOILS OR COMPACTED STRUCTURAL FILL, COMPACTED TO 95% MODIFIED PROCTOR DENSITY, AFTER REMOVAL OF UNSUITABLE MATERIALS. BACKFILL UNDER ANY PORTION OF THE BUILDING FOUNDATIONS SHALL BE COMPACTED IN 6" TO 8" LIFTS OF 95% MODIFIED PROCTOR DENSITY.
7. SLABS ON GRADE SHALL BEAR ON SPECIFIED STONE BASE ATOP NATURAL, UNDISTURBED, ACCEPTABLE SOIL OR ON CONTROLLED COMPACTED FILL. REMOVE EXISTING FILL MATERIAL WHERE NECESSARY AND REPLACE WITH CLEAN STRUCTURAL FILL COMPACTED IN 6" - 8" LAYERS TO OBTAIN 95% MODIFIED PROCTOR DENSITY AT THE OPTIMUM MOISTURE CONTENT. PROVIDE AN 8" MINIMUM COMPACTED LAYER OF SPECIFIED CRUSHED STONE DIRECTLY BELOW THE SLABS.
8. TOP OF FOOTINGS (T.O.F.), TOP OF FOUNDATION WALL (T.O.W.), TOP OF CONCRETE PIERS (T.O.P.) AND TOP OF CONCRETE (T.O.C.) VALUES ARE BASED UPON DESIGN ELEVATIONS, AND EXISTING BUILDING DATA.
9. THE STRUCTURAL ENGINEER ASSUMES NO RESPONSIBILITY FOR THE VALIDITY OF THE SUBSURFACE CONDITIONS. SEE NOTE 3 ABOVE.
10. NO FOUNDATION OR SLAB SHALL BE PLACED IN WATER OR ON FROZEN GROUND. SUCH FOUNDATIONS OR SLABS PLACED IN SUCH CONDITIONS WILL BE IMMEDIATELY REJECTED AND REQUIRED TO BE FULLY REPLACED AT NO ADDITIONAL COST OR CONTRACT TIME EXTENSION.
11. ALTHOUGH GROUNDWATER ISSUES DURING CONSTRUCTION ARE NOT EXPECTED, THE CONTRACTOR SHALL PROVIDE ALL SUFFICIENT MEANS OF SITE DEWATERING, AS NECESSARY, TO ENSURE FOUNDATIONS AND SLABS ARE PLACED AS SPECIFIED.
12. ALL FOUNDATIONS SHALL BE WATERPROOFED AS SPECIFIED.
13. STRUCTURAL FILL: IMPORTED STRUCTURAL FILL MUST BE FREE OF ORGANIC, FROZEN, OR OTHER DELETERIOUS MATERIAL AND CONFORM TO THE GRADATION REQUIREMENTS OUTLINED BELOW. STRUCTURAL FILL SHOULD BE PLACED IN LOOSE LIFTS NOT EXCEEDING 12 INCHES THICK FOR SELF-PROPELLED VIBRATORY ROLLERS, AND 8 INCHES FOR VIBRATORY PLATE COMPACTORS. STRUCTURAL FILL SHALL BE PLACED WITHIN THE FOOTING-BEARING (1H:1V) ZONE AND BELOW ALL SLABS.

SIEVE SIZE	STRUCTURAL FILL* (PERCENT PASSING BY WEIGHT)
8"	100
3"	70-100
3/4"	45-95
NO. 4	30-90
NO. 10	25-80
NO. 40	10-50
NO. 200	0-12

*NOTES: THREE INCH MAXIMUM PARTICLE SIZE WITHIN 12 INCHES OF SLAB GRADE.

14. CRUSHED STONE SHALL BE 3/4" ANGULAR, WASHED STONE (NO FINES) OF LIMESTONE OR GRANITE QUARRY, COMPACTED TO ACHIEVE AN EQUIVALENT OF 95% MODIFIED PROCTOR DENSITY COMPACTION.

TEMPORARY JACKING AND SHORING

1. THE CONTRACTOR MUST PROVIDE TEMPORARY STRUCTURAL SUPPORT OR SHORING, AS REQUIRED, TO INSTALL FOUNDATIONS AND FRAMING WORK AS SHOWN ON THE DRAWINGS.
2. THE CONTRACTOR MUST PROVIDE ADEQUATE LATERAL BRACING. ALL SHORES MUST BE CARRIED DOWN TO FIRM BEARING MATERIAL AND THE LOAD MUST BE ADEQUATELY SPREAD OUT ON THE EXISTING SOIL OR CONCRETE SLAB.
3. NEW STRUCTURAL COLUMNS UNDER EXISTING ROOF BEAMS SHALL BE PLACED IN SUCH A MANNER TO TRANSFER ALL EXISTING LOADS TO THE FOUNDATIONS OR SUPPORT BEAMS BELOW. TEMPORARY JACKING AND SHORING OF THE EXISTING STRUCTURE IS REQUIRED, TO RELIEVE ALL EXISTING APPLIED LOADS UNTIL NEW SUPPORTS AND CONNECTIONS HAVE BEEN COMPLETELY PLACED AND SECURED. JACKS MAY NOT BE RELIEVED, NOR SHORES REMOVED, UNTIL ALL NEW CONSTRUCTION WORK IS COMPLETE, THEREBY TRANSFERRING APPLIED LOADS TO NEW STRUCTURAL ELEMENTS. CONTRACTOR TO SUBMIT THE INTENDED JACKING AND SHORING SCHEME TO THE STRUCTURAL ENGINEER FOR APPROVAL PRIOR TO STARTING WORK.
4. DURING THE CONSTRUCTION PHASE IT IS THE RESPONSIBILITY OF THE CONTRACTOR TO PROVIDE ALL NECESSARY TEMPORARY SHORING AND BRACING TO MAKE THE STRUCTURE STABLE AND PLUMB BEFORE COMPLETION OF CONNECTIONS. TEMPORARY BRACING SHALL NOT BE REMOVED UNTIL THE STRUCTURAL FRAME IS PROPERLY SECURED TO THE LATERAL LOAD RESISTING ELEMENTS IN THE STRUCTURE. THE STABILITY OF THE FRAME DURING ERECTION IS THE CONTRACTOR'S RESPONSIBILITY.

ADHESIVE ANCHOR BOLTS WHERE SPECIFIED AT COLUMN BASES

1. ALL HOLES TO BE DRILLED TO 1/8"-1/4" LARGER DIAMETER THAN ROD DIAMETER.
2. ALL DRILLED HOLES MUST BE THOROUGHLY CLEANED AFTER DRILLING USING BRUSH, VACUUM, AND OIL-FREE COMPRESSED AIR.
3. SELECTED ADHESIVES MUST BE AN APPROVED STRUCTURAL EPOXY RESIN AS SPECIFIED.
4. DRILLING APPARATUS SHALL INCLUDE BI-LEVEL ATTACHMENT TO ENSURE PLUMB HOLES.
5. REFER TO DRAWING DETAILS FOR TYPES, STYLES, LENGTHS, AND MATERIALS.