

CEDAR CREEK

CIVIL

KFC ENGINEERING

STRUCTURAL

SALAS O'BRIEN

MECHANICAL/ELECTRICAL



CC

drawn by

BB

checked by

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date

revisions



MOORE PUBLIC SCHOOLS

WESTMOORE HIGH
SCHOOL ENTRY
UPGRADES

sheet no.

S100

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1) GENERAL INFORMATION

- GOVERNING BUILDING CODE: IBC-2018 "INTERNATIONAL BUILDING CODE" WITH CITY OF OKLAHOMA CITY AMENDMENTS.
- BUILDING RISK CATEGORY: THE BUILDING RISK CATEGORY ACCORDING TO IBC-2018 TABLE 1604.5 AND ASCE 7-16 TABLE 1.5-1 IS CATEGORY III.
- ELEVATIONS: REFERENCE FINISHED FLOOR ELEVATIONS OF 100'-0" EQUALS ACTUAL EXISTING FINISH FLOOR ELEVATION OF 1220.77'.

D. CONTRACT DOCUMENTS:

- 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.
- 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.
- 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.
- 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.
- 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.
- 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.
- 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.

- FIELD MODIFICATIONS: CONTRACTOR OR SUBCONTRACTOR FIELD MODIFICATIONS TO THE STRUCTURE WITHOUT THE PRIOR WRITTEN CONSENT OF THE STRUCTURAL ENGINEER ARE EXPRESSLY PROHIBITED AND MAY REQUIRE SUBSEQUENT REMEDIATION DIRECTED BY THE STRUCTURAL ENGINEER AT CONTRACTOR'S EXPENSE.

2) DESIGN LOADS

- GOVERNING STANDARD FOR DESIGN LOADS: ASCE 7-16 "MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES"
- DEAD LOAD: SELF WEIGHT OF MATERIALS, UNLESS NOTED OTHERWISE
- ROOF DEAD LOAD:
 - BUILT-UP ROOFING SYSTEM.....6 PSF
 - RIGID INSULATION.....2 PSF
 - METAL ROOF DECK.....3 PSF
 - JOIST SELF-WEIGHT.....2 PSF
 - CEILING SYSTEM.....2 PSF
 - ROOF COLLATERAL (MEP, BRIDGING & MISC. FRAMING).....5 PSF
 - TOTAL.....20 PSF
- UNIFORM LIVE LOADS:
 - ROOF LIVE LOAD (UNREDUCEABLE).....20 PSF
 - SLAB-ON-GRADE.....250 PSF
- CONCENTRATED LIVE LOADS:
 - ROOFS (ON AN AREA 2.5 FT. X 2.5 FT.).....300 LBS
- WIND LOADS:
 - RISK CATEGORY:.....III
 - EXPOSURE CATEGORY:.....C
 - ENCLOSURE CLASSIFICATION:.....ENCLOSED
 - INTERNAL PRESSURE COEFFICIENT, GCPI:.....+/- 0.18
 - TOPOGRAPHIC FACTOR, KZT:.....1.0
 - DIRECTIONALITY FACTOR, KD:.....0.85
 - ULTIMATE DESIGN WIND SPEED, Vult:.....120 MPH
 - NOMINAL DESIGN WIND SPEED, Vasd:.....90 MPH
- SNOW LOADS:
 - SNOW IMPORTANCE FACTOR, Is:.....1.1
 - GROUND SNOW LOAD, Pg:.....10 PSF
 - EXPOSURE OF ROOF:.....PARTIALLY EXPOSED
 - SURFACE ROUGHNESS CATEGORY:.....C
 - EXPOSURE FACTOR, Ce:.....1.0
 - THERMAL FACTOR, Ct:.....1.0
 - ROOF SLOPE FACTOR, Cs:.....1.0
 - CALCULATED FLAT ROOF SNOW LOAD, Pf:.....7.7 PSF
 - MINIMUM FLAT ROOF SNOW LOAD, I*Pg:.....11 PSF
 - RAIN ON SNOW SURCHARGE LOAD:.....5 PSF
- RAIN LOADS:
 - 15-MINUTE RAIN INTENSITY:.....8.72 INCHES/HOUR
 - 60-MINUTE RAIN INTENSITY:.....4.44 INCHES/HOUR
 - 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
 - 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
- SEISMIC DESIGN CRITERIA:
 - RISK CATEGORY:.....III
 - SEISMIC IMPORTANCE FACTOR, Ie:.....1.25
 - SOIL SITE CLASSIFICATION:.....C
 - 0.2 SEC. MAPPED SPECTRAL ACCELERATION, Ss:.....0.274
 - 1.0 SEC. MAPPED SPECTRAL ACCELERATION, S1:.....0.079
 - SITE COEFFICIENT, 0.2 SEC. PERIOD, Fv:.....1.30
 - SITE COEFFICIENT, 1.0 SEC. PERIOD, Fv:.....1.50
 - 0.2 SEC. DESIGN SPECTRAL ACCELERATION, Sds:.....0.237
 - 1.0 SEC. DESIGN SPECTRAL ACCELERATION, Sd1:.....0.079
 - SEISMIC DESIGN CATEGORY:.....B
 - SEISMIC PARAMETERS FOR BUILDING:
 - SEISMIC FORCE RESISTING SYSTEM: ORDINARY REINFORCED MASONRY SHEAR WALLS
 - RESPONSE MODIFICATION COEFFICIENT, R:.....2.00
 - SYSTEM OVERSTRENGTH FACTOR, O:.....2.00
 - DEFLECTION AMPLIFICATION FACTOR, Cd:.....1.75
 - ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE METHOD.
 - SEISMIC RESPONSE COEFFICIENT, Cs:.....0.148
 - TOTAL LATERAL BASE SHEAR, V:.....165 KIPS

3) MATERIAL DESIGN VALUES

- CONCRETE (MIN. COMPRESSIVE STRENGTH AT 28 DAYS, NORMAL WEIGHT U.N.O.)
 - FOUNDATIONS:.....3,500 PSI
 - SLABS-ON-GRADE:.....4,000 PSI
 - ALL OTHER STRUCTURAL CONCRETE, U.N.O.:.....4,000 PSI
- REINFORCED CONCRETE MASONRY
 - DETERMINATION OF COMPRESSIVE STRENGTH.....UNIT STRENGTH METHOD
 - DESIGN COMPRESSIVE STRENGTH OF CONCRETE MASONRY, f'm:.....2,000 PSI
 - NET AREA COMPRESSIVE STRENGTH OF CONCRETE MASONRY UNITS (ASTM C90).....2,000 PSI
 - MORTAR (ASTM C270, PROPORTION SPECIFICATION, TYPE S).....1,800 PSI
 - GROUT (ASTM C476, PROPORTION SPECIFICATION).....2,000 PSI
- CONCRETE AND MASONRY REINFORCEMENT (MINIMUM YIELD STRENGTH)
 - ALL PLAIN AND DEFORMED BARS (ASTM A615, GRADE 60).....FY = 60 KSI
 - WELDED PLAIN WIRE REINFORCEMENT (ASTM A1064).....FY = 65 KSI
 - WELDED DEFORMED WIRE REINFORCEMENT (ASTM A1064).....FY = 70 KSI
 - WELDABLE REINFORCING BARS (ASTM A706).....FY = 60 KSI
- STRUCTURAL STEEL (MINIMUM YIELD STRENGTH)
 - ALL WIDE FLANGE SHAPES (ASTM A992).....FY = 50 KSI
 - SQUARE AND RECTANGULAR HSS (ASTM A500, GRADE C).....FY = 50 KSI
 - ROUND HSS (ASTM A500, GRADE C).....FY = 46 KSI
 - PIPES (ASTM A53, GRADE B).....FY = 35 KSI
 - ANCHOR RODS (ASTM F1554, GRADE 55, SUPPLEMENTARY REQUIREMENT S1, WELDABLE).....FY = 55 KSI
 - DEFORMED BAR ANCHORS (AWS D1.1 TYPE C, ASTM A1064).....FY = 70 KSI
 - HEADED STUD ANCHORS (AWS D1.1 TYPE B, ASTM A29, GRADES 1010 THROUGH 1020).....FY = 51 KSI
 - ALL OTHER SHAPES AND PLATES UNLESS NOTED (ASTM A36).....FY = 36 KSI (FABRICATOR MAY OPTIONALLY USE ASTM A572-50 PLATE MATERIAL)
- COLD FORMED STEEL (MINIMUM YIELD STRENGTH)
 - ROOF DECK (ASTM A653, SS GRADE 33, G-60 GALVANIZED).....FY = 33 KSI
 - COMPOSITE FLOOR DECK (ASTM A653, SS GRADE 40, G-60 GALVANIZED).....FY = 40 KSI
 - COLD FORMED METAL STUDS, 43 MIL AND LIGHTER (ASTM A1003/A, GRADE ST33H, G-60 GALVANIZED).....FY = 33 KSI
 - COLD FORMED METAL STUDS, 54 MIL AND HEAVIER (ASTM A1003/A, GRADE ST50H, G-60 GALVANIZED).....FY = 50 KSI
 - COLD FORMED METAL CLIPS (ASTM A653, SS GRADE 50, G-90 GALVANIZED).....FY = 50 KSI

4) CONSTRUCTION LOADS AND STABILITY

- THE CONTRACTOR SHALL BE RESPONSIBLE FOR VERIFYING ALL TEMPORARY CONSTRUCTION LOADS CAN BE SAFELY SUPPORTED BY THE STRUCTURE DURING CONSTRUCTION.
- 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 ERRECTED STRUCTURE.
- 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.
- 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 ERRECTED 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.
- THE CONTRACTOR SHALL NOT REMOVE TEMPORARY SUPPORTS UNTIL THE INSTALLATION OF ALL STRUCTURAL ELEMENTS IS COMPLETE AND HAS BEEN ACCEPTED AS COMPLETE BY THE ENGINEER. FOR THE PURPOSES OF THIS PARAGRAPH, "ALL STRUCTURAL ELEMENTS" INCLUDES, BUT IS NOT NECESSARILY LIMITED TO, THE FOLLOWING STRUCTURAL ELEMENTS:
 - FOUNDATIONS
 - LOAD-BEARING MASONRY WALLS
 - MASONRY SHEAR WALLS
 - STRUCTURAL STEEL FRAMING WITH COMPLETED STEEL CONNECTIONS, INCLUDING PERMANENT VERTICAL AND/OR HORIZONTAL BRACING
 - STEEL JOISTS INCLUDING JOIST BRIDGING
 - ROOF DECK

5) EXISTING CONSTRUCTION

- ALL VERTICAL AND HORIZONTAL DIMENSIONS, FINISHED FLOOR AND ROOF ELEVATIONS, PLUMBNESS, AND DETAILS FOR THE EXISTING STRUCTURE SHALL BE VERIFIED IN THE FIELD PRIOR TO PROCEEDING WITH ANY DEMOLITION OR INSTALLATION OF NEW WORK.
- PRIOR TO DEMOLITION OR INSTALLATION OF NEW WORK, THE CONTRACTOR SHALL MAKE WRITTEN DOCUMENTATION IF UNFORESEEN CONDITIONS OCCUR IN THE EXISTING CONSTRUCTION. THESE UNFORESEEN CONDITIONS SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE FOR REVIEW AND A WRITTEN RESPONSE BEFORE PROCEEDING WITH THE WORK.
- THE CONTRACTOR SHALL PROVIDE AND INSTALL ALL SHORING, PROPS, AND GUYS REQUIRED FOR THE TEMPORARY SUPPORT OF THE EXISTING STRUCTURE, UTILITIES, ETC. AS MAY BE NECESSARY TO SAFELY COMPLETE DEMOLITION OR NEW WORK.
- THE CONTRACTOR SHALL BE RESPONSIBLE FOR LOCATING EXISTING UTILITIES, BOTH CHARTED AND UNCHARTED BEFORE COMMENCING WITH ANY EXCAVATION OR DEMOLITION WORK. DEPTH OF CONCRETE SAW SHALL BE SET SO AS NOT TO CUT ANY LOCAL EMBEDDED OR UNDER-FLOOR PIPING OR WIRING WHICH IS TO REMAIN.
- ALL DRILLING, CUTTING, DEMOLITION OR OTHER MODIFICATIONS TO EXISTING CONSTRUCTION SHALL BE PERFORMED IN A MANNER THAT WILL NOT REDUCE THE STABILITY OR STRUCTURAL INTEGRITY OF THE EXISTING CONSTRUCTION. WHEN SAW CUTTING, SPECIAL CARE SHALL BE TAKEN TO NOT OVER CUT INTO AN EXISTING AREA OF STRUCTURE THAT WILL REMAIN.
- CORING FOR PIPING OR CONDUIT THROUGH EXISTING STRUCTURAL MEMBERS IS NOT ALLOWED UNLESS SPECIFICALLY SHOWN IN THE CONTRACT DOCUMENTS OR SPECIFICALLY ALLOWED BY THE STRUCTURAL ENGINEER IN WRITING.
- DAMAGE TO PORTIONS OF THE EXISTING STRUCTURE OR OTHER EXISTING BUILDING COMPONENTS CAUSED BY DEMOLITION OPERATIONS SHALL BE REPAIRED BY THE CONTRACTOR AT THE CONTRACTOR'S EXPENSE AND TO A LEVEL ACCEPTABLE TO THE OWNER'S REPRESENTATIVE.
- WHEN EXISTING FOUNDATIONS ARE TO BE DEMOLISHED, EXCAVATION DEPTHS EXCEEDING 4 FEET SHALL BE BACKFILLED WITH PROPERLY COMPACTED CRUSHED STONE OR FLOWABLE FILL TO WITHIN 4 FEET OF THE REQUIRED FINISHED BACKFILL ELEVATION. THE REMAINING DEPTH OF BACKFILL SHALL BE COMPLETED WITH PROPERLY COMPACTED STRUCTURAL FILL AS OUTLINED IN THE FOUNDATION NOTES.
- THE PROJECT AREA SHALL BE MAINTAINED AS CLEAN AS POSSIBLE WITH DUST BEING LIMITED AS MUCH AS PRACTICAL.

6) DEFERRED SUBMITTALS

- SOME STRUCTURAL AND/OR OTHER BUILDING ELEMENTS ARE DESIGNATED AS VENDOR-DESIGNED IN THE CONSTRUCTION DOCUMENTS. THESE ELEMENTS HAVE NOT BEEN INCLUDED IN THE BUILDING PERMIT ISSUED BY THE BUILDING OFFICIAL AND REQUIRE THEIR DESIGN BE SUBSTANTIATED BY DEFERRED SUBMITTALS.
- DEFERRED DESIGN SUBMITTALS ARE TO BE SUBMITTED TO THE OWNER'S REPRESENTATIVE AND SHALL INCLUDE BOTH SHOP DRAWINGS AND SIGNED AND SEALED CALCULATIONS PERFORMED BY AN ENGINEER LICENSED IN THE STATE WHERE THE PROJECT IS LOCATED AND EXPERIENCED IN THE DESIGN OF THE SPECIFIC BUILDING ELEMENT BEING SUBMITTED. THE FOLLOWING ITEMS ARE CONSIDERED DEFERRED SUBMITTALS:
 - STRUCTURAL STEEL CONNECTIONS
 - STEEL JOISTS
 - COLD-FORMED METAL FRAMING SYSTEMS
 - TEMPORARY BRACING OF CONCRETE WALLS
 - ROOF MOUNTED EQUIPMENT AND ASSOCIATED ANCHORAGES
 - ANALYSIS OF CONCRETE SLABS FOR SUPPORT OF PROPOSED LIFT EQUIPMENT (FOR KFC FILE ONLY, WILL NOT BE REVIEWED AND RETURNED)
 - EXTERIOR WINDOW AND/OR CURTAIN WALL SYSTEMS
- DOCUMENTS FOR DEFERRED SUBMITTAL ITEMS SHALL BE SUBMITTED TO THE OWNER'S REPRESENTATIVE WHO SHALL REVIEW THEM AND FORWARD THEM TO THE BUILDING OFFICIAL WITH A NOTATION INDICATING THAT THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN REVIEWED AND FOUND TO BE IN GENERAL CONFORMANCE TO THE DESIGN OF THE BUILDING.
- THE DEFERRED SUBMITTAL ITEMS SHALL NOT BE INSTALLED UNTIL THE DEFERRED SUBMITTAL DOCUMENTS HAVE BEEN APPROVED BY BOTH THE OWNER'S REPRESENTATIVE AND THE BUILDING OFFICIAL.
- ADDITIONAL ITEMS IMPACTING STRUCTURAL DESIGN, INCLUDING BUT NOT LIMITED TO, ELEVATORS AND MECHANICAL EQUIPMENT WEIGHTS, SHALL BE SUBMITTED TO OWNER'S REPRESENTATIVE FOR EVALUATION

7) FOUNDATION NOTES

- GEOTECHNICAL REPORT: A GEOTECHNICAL ENGINEERING SERVICES REPORT FOR THE WESTMOORE HIGH SCHOOL ADDITION, IN OKLAHOMA CITY, OKLAHOMA WAS PERFORMED BY STANDARD ENGINEERING & FIELD SERVICES, DATED MAY 14, 2025 (STANDARD PROJECT NUMBER: 2530-0264).
- SITE SUB-GRADE PREPARATION:
 - STRIPPING: SITE PREPARATION FOR THE BUILDING PAD SHALL INCLUDE REMOVING ANY SOFT OR UNSUITABLE MATERIALS ENCOUNTERED DURING CONSTRUCTION. VEGETATION ROOTS, PAVEMENTS, UTILITIES, GRAVEL, EXISTING FOOTINGS, EXISTING SLABS AND ANY TOPSOIL WILL REQUIRE REMOVAL DURING INITIAL SITE STRIPPING. REMOVAL DEPTHS SHALL BE DETERMINED BY A GEOTECHNICAL ENGINEER.
 - UNDERCUTTING: AFTER STRIPPING AND MAKING ANY REQUIRED CUTS, THE BUILDING PAD SHALL BE UNDERCUT TO A MINIMUM OF 4'-0" AND REPLACED WITH LOW VOLUME CHANGE STRUCTURAL FILL AS OUTLINED BELOW.
 - PROOF-ROLLING: AFTER UNDERCUTTING, THE BUILDING PAD SHALL BE PROOF-ROLLED (UNDER OBSERVATION OF A GEOTECHNICAL ENGINEER) WITH A TWENTY FIVE (25) TON LOADED, TANDEM AXLE DUMP TRUCK TO LOCATE ANY SOFT OR UNSTABLE AREAS. THE PROOF-ROLLING SHALL BE PERFORMED WITH OVERLAPPING PASSES IN MUTUALLY PERPENDICULAR DIRECTIONS. SOILS IN AREAS WHERE RUTTING (DEFLECTIONS GREATER THAN 1 INCH) OR PUMPING OCCURS DURING PROOF-ROLLING SHALL BE OVER-EXCAVATED, MOISTURE CONDITIONED AND REPLACED WITH PROPERLY COMPACTED LOW VOLUME CHANGE SOILS AS DIRECTED BY A GEOTECHNICAL ENGINEER.
 - SCARIFICATION: AFTER STRIPPING, EXCAVATING AND PROOF-ROLLING, THE EXPOSED SOILS SHALL BE SCARIFIED TO A DEPTH OF 8 INCHES AND THEN ADJUSTED TO WITHIN 2% POINTS OF THE SOILS OPTIMUM VALUE PRIOR TO BEING COMPACTED TO AT LEAST 95 PERCENT OF THE SOILS MAXIMUM DRY DENSITY AS DETERMINED BY THE STANDARD PROCTOR TEST METHOD (ASTM D-698).
 - ACCEPTABLE FILL: STRUCTURAL FILL MATERIALS SHALL BE FREE OF ORGANIC OR OTHER DELETERIOUS MATTER AND BE A LOW VOLUME CHANGE SOIL OF COHESIVE MATERIALS HAVING A LIQUID LIMIT OF LESS THAN 35 AND A PLASTICITY INDEX BETWEEN 5 AND 15 WITH AT LEAST 60% PASSING THE #200 U.S. STANDARD SIEVE.
 - FILL PLACEMENT: AFTER SCARIFICATION IS COMPLETE, FILL PLACEMENT TO ESTABLISH SITE DESIGN GRADES MAY BEGIN. THE ZONE OF FILL COMPACTED TO MEET THESE CRITERIA SHALL EXTEND BEYOND THE BUILDING FOOTPRINT AT LEAST 1 FOOT LATERALLY FOR EACH FOOT OF FILL REQUIRED TO DEVELOP DESIGN GRADE, BUT UNDER NO CIRCUMSTANCE SHALL IT BE LESS THAN 5 FEET. THE FILL SHALL BE PLACED IN MAXIMUM LOOSE LIFTS OF 8 INCHES, ADJUSTED TO WITHIN 2% POINTS BELOW TO 2% POINTS ABOVE OF ITS OPTIMUM MOISTURE CONTENT AND COMPACTED TO 95 PERCENT OF THE SOIL'S STANDARD PROCTOR MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D-698.
 - DEPTH OF FILL: THE FLOOR SLAB SHALL BE GRADE SUPPORTED ON A MINIMUM DEPTH OF 4'-0" OF MOISTURE CONDITIONED LOW-PLASTICITY STRUCTURAL FILL.
 - 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 TWO SETS OF DENSITY TESTS SHALL BE TAKEN FOR EACH LIFT.
 - SITE DRAINAGE: THE CONTRACTOR SHALL PROVIDE POSITIVE DRAINAGE AWAY FROM THE AREAS OF EXCAVATION DURING CONSTRUCTION TO PREVENT PONDING UNDER FUTURE FLOOR SLABS AND FOOTINGS. THE CONTRACTOR SHALL PROVIDE POSITIVE CUTOFF IN UTILITY TRENCHES AS REQUIRED TO PREVENT WATER MIGRATION INTO AREAS OF EXCAVATIONS AND FUTURE FLOOR SLABS AND FOOTINGS.
 - MAINTENANCE OF SOIL MOISTURE: SOIL MOISTURE SHALL BE MAINTAINED UP UNTIL CONCRETE PLACEMENT TO PREVENT SHRINKAGE AND SUBSEQUENT POST-CONSTRUCTION SWELL OF SUBGRADE SOILS.
- SHALLOW FOUNDATIONS:
 - FOOTING DESIGN PARAMETERS: THE PROPOSED BUILDING SHALL BE SUPPORTED ON CONVENTIONAL SHALLOW SPREAD FOOTINGS BASED ON THE FOLLOWING DESIGN PARAMETERS:
 - BEARING MATERIAL: PROPERLY COMPACTED ENGINEERED FILL AS OUTLINED
 - ALLOWABLE BEARING PRESSURE FOR SPOT FOOTINGS: 2000 PSF
 - ALLOWABLE BEARING PRESSURE FOR CONTINUOUS FOOTINGS: 2000 PSF
 - OBSERVATION OF BEARING CONDITIONS: A REPRESENTATIVE OF THE GEOTECHNICAL ENGINEER SHALL OBSERVE THE FOUNDATION EXCAVATIONS PRIOR TO STEEL OR CONCRETE PLACEMENT TO DETERMINE IF THE FOUNDATION MATERIALS ARE CAPABLE OF SUPPORTING THE DESIGN LOADS AND ARE CONSISTENT WITH THE MATERIALS DISCUSSED ABOVE.
 - IMPROVEMENT OF BEARING CONDITIONS: SOFT OR LOOSE SOIL ZONES ENCOUNTERED AT THE BOTTOM OF THE FOOTING EXCAVATIONS SHALL BE REMOVED TO THE LEVEL OF STIFF OR DENSE SOIL AS DIRECTED BY THE GEOTECHNICAL ENGINEER. CAVITIES FORMED AS A RESULT OF EXCAVATION OF SOFT OR LOOSE SOIL ZONES SHALL BE BACKFILLED WITH ENGINEERED FILL, LEAN CONCRETE OR FLOWABLE FILL, AS DETERMINED BY THE GEOTECHNICAL ENGINEER. CARE SHALL BE TAKEN TO PREVENT WETTING OR DRYING OF THE BEARING MATERIALS DURING CONSTRUCTION. ANY EXTREMELY WET OR DRY MATERIAL, OR ANY LOOSE OR DISTURBED MATERIAL IN THE BOTTOM OF THE FOOTING EXCAVATIONS SHALL BE REMOVED PRIOR TO PLACING CONCRETE.

- ANTICIPATED SETTLEMENT: IT IS ESTIMATED THAT FOUNDATIONS CONSTRUCTED IN ACCORDANCE WITH THE ABOVE RECOMMENDATIONS WILL EXPERIENCE TOTAL SETTLEMENTS GENERALLY LESS THAN 1-INCH WITH DIFFERENTIAL SETTLEMENTS GENERALLY LESS THAN 3/8 INCHES WITHIN THE BUILDING AREA. ADDITIONAL SETTLEMENT OF APPROXIMATELY 1 TO 2 PERCENT OF PLACED FILL HEIGHT IS ALSO ANTICIPATED.
- TRENCHED FOOTINGS: EARTH-FORMED TRENCHED FOOTINGS ARE PERMITTED, EXCEPT WHERE BRICK LEDGES OR EXPOSED SURFACES REQUIRE FORMING AND/OR WHERE SOIL SIDE WALLS SLOUGH INTO THE TRENCH. IN ORDER TO ACHIEVE 3" MINIMUM CONCRETE COVER OVER STEEL REINFORCING ON SIDEWALLS, EARTH FORMED TRENCHES SHALL BE A MINIMUM OF 2" WIDER THAN THE FORMED DIMENSIONS SHOWN IN ALL SECTIONS AND DETAILS.
- PIPE PENETRATIONS: ALL HORIZONTAL PIPE OR SIMILAR PENETRATIONS OR SLEEVES THROUGH FOOTINGS SHALL PREFERABLY OCCUR WITHIN THE MIDDLE 1/3 OF THE FOOTING DEPTH AND SHALL HAVE A MAXIMUM OPENING DIAMETER OF ONE-FOURTH THE FOOTING DEPTH. AT PENETRATIONS, PROVIDE (4) #5 DIAGONAL BARS AT EACH FOOTING FACE (3" CLEAR BETWEEN BAR AND PENETRATION AND 3" CLEAR FROM FOOTING BEARING). IF PENETRATION MUST OCCUR NEAR THE BOTTOM OF FOOTING, REFER TYPICAL DETAILS FOR STANDARD DETAIL TO TRANSITION & THICKEN FOOTING TO ACCOMMODATE PENETRATION.

A. SLAB-ON-GRADE CONSTRUCTION

- 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 1/2" CLEAR FROM TOP OF SLAB USING CHAIRS OR SLAB BOLSTERS COMPLYING WITH CRSI'S "MANUAL OF STANDARD PRACTICE".
- SLAB SUBGRADE: THE FLOOR SLAB SHALL BE GRADE-SUPPORTED AS OUTLINED IN THE SITE SUB-GRADE PREPARATION NOTES SHOWN ABOVE.
- 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.
- 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:
 - 100 PERCENT SHALL PASS THE 1/2" SIEVE
 - LESS THAN 5 PERCENT SHALL PASS THE # 8 SIEVE
 - PLASTICITY INDEX, PI, SHALL BE LESS THAN OR EQUAL TO 6
 - COMPACTED TO 98% STANDARD PROCTOR MAXIMUM DRY DENSITY.
- 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.
- EVAPORATION RETARDER: UNIFORMLY APPLY EVAPORATION RETARDER TO CONCRETE SURFACES IF HOT, DRY, OR WINDY CONDITIONS CAUSE MOISTURE LOSS DUE TO EVAPORATION APPROACHING 0.2 LB/SQ.FT./H BEFORE AND DURING FINISHING OPERATIONS. APPLY ACCORDING TO MANUFACTURER'S WRITTEN INSTRUCTIONS AFTER PLACING, SCREEDING, AND BULL FLOATING OR DARBYING CONCRETE, BUT BEFORE FLOAT FINISHING. A METHODOLOGY FOR CALCULATING THE MOISTURE LOSS DUE TO EVAPORATION IS PROVIDED IN ACI 305.1-14 "SPECIFICATION FOR HOT WEATHER CONCRETING."
- 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.
- ISOLATION JOINTS: PROVIDE SLAB ISOLATION AROUND COLUMNS PENETRATING THE SLAB-ON-GRADE. PROVIDE 1/2 INCH PREMOULDED EXPANSION JOINT MATERIAL AROUND PERIMETER OF ISOLATION JOINTS. REFER TO TYPICAL DETAILS AND ADDITIONAL INFORMATION.
- SLAB JOINTS: SLAB JOINTS SHALL BE PROVIDED AS SHOWN ON THE PLANS AND TYPICAL DETAILS AND AS DESCRIBED FURTHER IN THE SLAB-ON-GRADE SCHEDULE. THE FOLLOWING JOINT TYPES ARE SHOWN ON THE DRAWINGS:
 - CJ = CONSTRUCTION JOINT
 - SJ = SAWS CONTRACTION JOINT
 - EJ = EXPANSION JOINT
- FOUNDATION MISCELLANEOUS

- GROUNDWATER CONDITIONS: GROUNDWATER WAS NOT ENCOUNTERED IN SOME OF THE BORINGS AT THE TIME OF DRILLING. HOWEVER, IT IS POSSIBLE THAT TRANSIENT OVER-SATURATED GROUND CONDITIONS COULD DEVELOP AT SHALLOW DEPTHS 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 AND REQUESTED TO ASSESS THE POSSIBLE NEED FOR REMEDIAL MEASURES.
- 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.
- FINAL SITE GRADING: PER SECTION 1804.4 OF IBC, 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-PERCENT 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-PERCENT WHERE LOCATED WITHIN 10 FEET OF IMPERVIOUS SURFACES WITHIN 10 FEET OF THE BUILDING SHALL BE SLOPED A MINIMUM OF 2-PERCENT AWAY FROM THE BUILDING.
- 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 DURING CONSTRUCTION. 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.
- 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.