DESIGN CRITERIA

1. THE CONSTRUCTION DOCUMENTS ARE BASED ON THE REQUIREMENTS OF THE *INTERNATIONAL RESIDENTIAL CODE* WITH LOCAL AMENDMENTS FROM THE AUTHORITY HAVING JURISDICTION.
   A. BUILDING CODE VERSION:........ **2018** INTERNATIONAL RESIDENTIAL CODE W. LOCAL AHJ AMENDMENTS
   B. AUTHORITY HAVING JURISDICTION:.... MONTGOMERY COUNTY
2. DEAD LOADS:
   A. DEAD LOADS ARE BASED UPON ASSUMED CONVENTIONAL LIGHT FRAME WOOD ASSEMBLIES . ASSUMPTIONS FOR WALL AND ROOF ASSEMBLIES ARE SHOWN BELOW:
      a. CEILING - 2X6 CEILING JOISTS @ 16" OC W. INSULATION AND 1/2" GYPSYM BOARD - 7 PSF
      b. FLOOR - 2X12 FLOOR JOISTS @ 16" OC W. 1 1/8" SUBFLOOR, 1/2" GYPSUM BOARD & CARPET/WOOD FLORING - 12 PSF
      c. ROOF - 2X6 RAFTERS @ 16" OC, FIBERGLASS SHINGLES, 15# FELT, 7/16" SHEATHING - 8 PSF
      d. WALL - 2X6 STUDS @ 16" OC, 5/8" GYPSUM, INSULATION, 7/16" WOOD STRUCTURAL PANEL SIDING - 12 PSF
      e. CURTAIN WALLS / WINDOWS - 10 PSF
      f. STONE / BRICK VENEER - 40 PSF
      g. ADHERED STONE/BRICK - 10 PSF
   B. EQUIPMENT
      a. HANGING CEILING AND MECHANICAL LOADS: AN ALLOWANCE OF **5** PSF HAS BEEN MADE FOR HANGING CEILING AND MECHANICAL EQUIPMENTS SUCH AS DUCT WORK AND SPRINKLER PIPES.
3. LIVE LOADS:
   A. ATTICS
      a. UNINHABITABLE ATTICS WITHOUT STORAGE........10 PSF
      b. UNINHABITABLE ATTICS WITH LIMITED STORAGE........20 PSF
   B. BALCONIES (EXTERIOR) AND DECKS........40 PSF
   C. GUARDRAILS AND HANDRAILS........200 LB
   D. PASSENGER VEHICLE GARAGES........50 PSF
   E. SLEEPING ROOMS........30 PSF
   F. ROOMS OTHER THAN SLEEPING ROOMS........40 PSF
   G. STAIRS........40 PSF

SCOPE OF DRAWINGS:

SCOPE	DESCRIPTION	INCLUDED?
REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE (RDPiRC)	REGISTERED DESIGN PROFESSIONAL OR PRIME CONSULTANT WORKING DIRECTLY FOR THE REGISTERED DESIGN PROFESSIONAL WHO IS RESPONSIBLE FOR ENSURING THE PROJECT CONSTRUCTION DOCUMENTS ARE IN COMPLIANCE WITH THE APPLICABLE REQUIREMENTS OF ANY GOVERNING BUILDING AUTHORITIES. RESPONSIBLE FOR REVIEWING AND COORDINATING SUBMITTAL DOCUMENTS PREPARED BY OTHERS, INCLUDING PHASED AND DEFERRED SUBMITTAL ITEMS, FOR COMPATIBILITY WITH THE DESIGN OF THE BUILDING. TYPICALLY THIS IS THE ARCHITECT OR CIVIL ENGINEER-OF-RECORD.	NO
STRUCTURAL ENGINEER-OF-RECORD	STRUCTURAL CONSULTANT UNDER THE RDPiRC WHO IS RESPONSIBLE FOR ENSURING THE PRIMARY STRUCTURAL SYSTEM IS DESIGNED IN ACCORDANCE WITH THE APPLICABLE STRUCTURAL REQUIREMENTS OF ANY GOVERNING AUTHORITIES. FOR THIS PROJECT, THE CLIENT HAS NOT RETAINED DUDLEY FOR THE SUPERSTRUCTURE DESIGN, THEREFORE WE HAVE PROVIDED THE REQUIRED PERFORMANCE CRITERIA AND EXPECT THAT THE SUPERSTRUCUTRE WITH EITHER BE DESIGNED PER THE PRESCRIPTIVE REQUIREMENTS OF THE BUILDING CODE FOR LIGHT FRAME CONSTRUCTION OR THAT A STRUCTURAL ENGINEER WILL BE ENGAGED FOR THIS DESIGN, IF REQUIRED.	YES
SPECIALTY STRUCTURAL ENGINEER (SSE) SUPERSTRUCTURE DESIGN	STRUCTURAL ENGINEER RESPONSIBLE FOR THE SUPERSTRUCTURE. IT IS THE OWNER/CONTRACTOR'S RESPONSIBILTY TO ENSURE THAT ALL PROJECT PLANS AND SPECIFICATIONS COMPLY WITH THE APPLICABLE REQUIREMENTS OF ANY GOVERNING BUILDING AUTHORITIES. IT IS ASSUMED THAT THE SUPERSTRUCTURE WILL ADHERE TO PRESCRIPTIVE REQUIREMENTS OF THE MINIMUM REQUIREMENTS OF THE BUILDING CODE FOR LIGHT FRAME CONSTRUCTION OR THAT A STRUCTURAL ENGINEER WILL BE ENGAGED FOR THIS DESIGN, IF REQUIRED.	NO

FOUNDATION DESIGN CRITERIA

1. GEOTECHNICAL REPORT: THIS FOUNDATION DESIGN IS BASED ON THE RECOMMENDATIONS PROVIDED IN SITE-SPECIFIC GEOTECHNICAL REPORT. IN DESIGNING THE FOUNDATION FOR THE PROPOSED STRUCTURE, THE FOUNDATION DESIGN ENGINEER DOES NOT ASSUME RESPONSIBILITY FOR THE ACCURACY OF THE GEOTECHNICAL ENGINEER'S REPORT OR ANY INFORMATION CONTAINED THEREIN. INFORMATION CONTAINED IN THE GEOTECHNICAL REPORT(S) REFLECTS CONDITIONS AS FOUND AT THE LOCATION OF THE BORINGS. ACTUAL CONDITIONS AT LOCATIONS BETWEEN AND SURROUNDING THE BORINGS MAY DIFFER FROM THE SOIL STRATIGRAPHY DEPICTED BY THE BORINGS. IF THERE ARE ANY CONDITIONS DIFFERING FROM THOSE DESCRIBED IN THE GEOTECHNICAL REPORT, OR IF ANY CHANGES HAVE BEEN IMPOSED ON THE SOILS IN QUESTION SINCE THE REPORT WAS WRITTEN, THEN THE DESIGN ENGINEER OF RECORD SHOULD BE NOTIFIED IN WRITING PRIOR TO CONSTRUCTION OF THE FOUNDATION IN ORDER TO REVIEW THE EFFECTS ON THE PERFORMANCE OF THE DESIGNED FOUNDATION.
   A. GEOTECHNICAL ENGINEER:........ ***DUDLEY***
   B. REPORT NUMBER: ***23-00195***
   C. REPORT DATE: .... ***MAY 16, 2023***
2. THE FOUNDATION DESIGN PARAMETERS PROVIDED WILL NOT ELIMINATE POST-CONSTRUCTION FOUNDATION MOVEMENT. AS SUCH, MEASURES SHALL BE TAKEN TO INCREASE THE TOLERANCE OF THE STRUCTURE SUPPORTED BY THE FOUNDATION. MEASURES INCLUDE BUT ARE NOT LIMITED TO FREQUENT CONTRACTION (CONTROL) JOINTS FOR MASONRY/BRICK/STONE/STUCCO EXTERIOR VENEER (15'-0 MAXIMUM), VERTICALLY SLOTTED CLIPS TO ATTACH ROOF TRUSSES TO NON-LOAD BEARING WALLS, ETC.
3. **ABNORMAL CONDITIONS:** IF THE FOUNDATION IS INSTALLED DURING A DRY OR WET PERIOD, WHICH IS CONSIDERED EXTREME OR ABNORMAL, THEN THE BUILDER SHALL NOTIFY THE GEOTECHNICAL ENGINEER AND FOUNDATION ENGINEER PRIOR TO CONSTRUCTION FOR POSSIBLE SOIL CONDITIONING OR FOUNDATION RE-DESIGN .
4. **FOUNDATION MOVEMENT:** THE FOUNDATION HAS BEEN DESIGNED WITH THE ASSUMPTION THAT MOVEMENT CAN BE TOLERATED WITHIN A STANDARD PERFORMANCE LIMIT:
   A. STANDARD PERFORMANCE DEFLECTION LIMIT: ***L/360***
   B. STANDARD PERFORMANCE TILT LIMIT: ***1%***
5. **SOIL MOISTURE LEVEL:** A REASONABLY UNIFORM SOIL MOISTURE LEVEL IS REQUIRED TO BE MAINTAINED AROUND THE FOUNDATION FOR THE LIFE OF THE STRUCTURE.
6. **FOUNDATION MAINTENANCE:** POSITIVE DRAINAGE AWAY FROM THE STRUCTURE SHALL BE MAINTAINED FOR THE LIFE OF THE STRUCTURE AND THE CONTRACTOR SHALL CONVEY THIS REQUIREMENT TO THE OWNER. THE INITIAL AND ALL SUBSEQUENT OWNERS MAINTAIN THE FOUNDATION IN ACCORDANCE WITH THE LATEST REVISION OF DOCUMENT NO. FPA-SC-07, "FOUNDATION MAINTENANCE AND INSPECTION GUIDE FOR RESIDENTIAL AND OTHER LOW-RISE BUILDINGS", AVAILABLE ON THE FOUNDATION PERFORMANCE ASSOCIATION'S WEBSITE: WWW.FOUNDATIONPERFORMANCE.ORG. CONTRACTOR SHALL PROVIDE THIS DOCUMENT TO OWNER.
7. **EXPIRATION:** PLANS ARE VALID FOR 6-MONTHS FROM THE DATE THE PLANS ARE ISSUED OR REVISED BY THE ENGINEER. CONTACT ENGINEER FOR REVIEW IF PLANS HAVE EXPIRED OR IF CONSTRUCTION OF THE FOUNDATION HAS NOT COMMENCED WITHIN THIS TIME FRAME.

GENERAL CONDITIONS

1. THE DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE SCOPE AND DESIGN INTENT. MEANS, METHODS, PROCEDURES AND SEQUENCES OF CONSTRUCTION ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO MAINTAIN AND ENSURE THE INTEGRITY OF THE STRUCTURE AT ALL STAGES OF CONSTRUCTION. THE PURPOSE OF THESE DRAWING AND SPECIFICATIONS ARE NOT TO SERVE AS AN INSTRUCTION MANUAL SHOWING THE CONTRACTOR HOW TO ASSEMBLE A STRUCTURE, BUT INSTEAD DEFINE PROJECT SCOPE AND DESIGN INTENT. THE CONTRACTOR'S WORK PLAN FOR THE MEANS-AND-METHODS OF CONSTRUCTION (I.E. SHOP DRAWINGS, SCHEDULES, SUBCONTRACTS, ETC.) MUST DEFINE WHEN AND HOW THE STRUCTURE WILL BE CONSTRUCTED.
2. REVIEW AND/OR ANALYSIS OF EQUIPMENT, MATERIAL STOCKPILING, ETC. TO BE PLACED ON THE STRUCTURE ARE NOT WITHIN THE STRUCTURAL ENGINEER OF RECORDS BASIC SCOPE OF SERVICES. THESE SERVICES CAN BE PROVIDED AS AN ADDITIONAL SERVICE OR THE CONTRACTOR CAN ENGAGE A SPECIALTY STRUCTURAL ENGINEER TO CONDUCT THE REVIEW/ANALYSIS.
3. REFER TO DRAWINGS/SPECIFICATIONS OTHER THAN STRUCTURAL FOR COMPLETE INFORMATION REGARDING: SLEEVES, CURBS, INSERTS, DEPRESSIONS, OPENINGS, ETC.
4. IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR TO OBTAIN ALL CONTRACT DOCUMENTS AND LATEST REVISIONS/ADDENDA AND TO SUBMIT SUCH DOCUMENTS TO ALL SUBCONTRACTORS AND MATERIAL SUPPLIERS PRIOR TO THE SUBMITTAL OF SHOP DRAWINGS OR MATERIAL PROCUREMENT.
5. THE USE OR REPRODUCTIONS OF THESE CONTRACT DRAWINGS BY ANY CONTRACTOR OR MATERIAL SUPPLIER IN LIEU OF PREPARATION OF SHOP DRAWINGS SIGNIFIES THEIR ACCEPTANCE OF ALL INFORMATION SHOWN HEREON AS CORRECT, AND OBLIGATES THEMSELVES TO ANY JOB EXPENSE, REAL OR IMPLIED, DUE TO ANY ERRORS THAT MAY OCCUR HEREON.
6. ALL WORK SHALL CONFORM TO OSHA STANDARDS.
7. THE CONTRACTOR SHALL BE SOLELY RESPONSIBLE FOR ALL EXCAVATION PROCEDURES INCLUDING LAGGING, SHORING AND PROTECTION OF ADJACENT PROPERTY, STRUCTURES, STREETS AND UTILITIES IN ACCORDANCE WITH ALL CODES AND REQUIREMENTS OF THE AUTHORITY HAVING JURISDICTION.
8. THE CONTRACTOR SHALL COMPARE ALL DESIGN DISCPLINE DRAWINGS AND REPORT ANY DISCREPANCIES BETWEEN EACH SET OF DRAWINGS AND WITHIN EACH SET OF DRAWINGS TO THE DESIGN TEAM PRIOR TO THE BUY-OUT, FABRICATION AND INSTALLATION OF ANY STRUCTURAL MEMBERS.
9. FRAMING LAYOUTS ARE PROVIDED TO REPRESENT DESIGN CONCEPTS AND SYSTEMS CONSTRUCTION. THE CONTRACTOR AND SUBCONTRACTORS ARE RESPONSIBLE FOR MATERIAL QUANTITIES AND ANY AND ALL UNSPECIFIED COMPONENTS REQUIRED FOR CONSTRUCTION.
10. WHERE MEMBER LOCATIONS ARE NOT SPECIFICALLY DIMENSIONED, MEMBERS ARE EITHER LOCATED ON COLUMN LINES OR ARE EQUALLY SPACED BETWEEN THE LOCATED MEMBERS.
11. IF CERTAIN FEATURES ARE NOT FULLY SHOWN OR SPECIFIED ON THE DRAWINGS OR IN THE SPECIFICATIONS, THEIR CONSTRUCTION SHALL BE OF THE SAME CHARACTER AS SHOWN OR SPECIFIED IN SIMILAR CONDITIONS.
12. WHERE CONFLICT EXISTS AMONG THE VARIOUS PARTS OF THE STRUCTURAL CONTRACT DOCUMENTS, STRUCTURAL DRAWINGS, GENERAL NOTES AND SPECIFICATIONS, THE STRICTEST REQUIREMENTS, AS INDICATED BY THE ENGINEER, SHALL GOVERN.
13. ANY CHANGE ORDERS OR CONSTRUCTION CHANGE DIRECTIVES RELEVANT TO THE STRUCTURAL ENGINEER'S SCOPE OF WORK MUST BE PROMPTLY SENT TO THE STRUCTURAL ENGINEER FOR REVIEW & APPROVAL PRIOR TO ISSUANCE.
14. THE FLOOR DESIGN LIVE LOAD FOR EACH ELEVATED FLOOR STRUCTURE OR PORTION THEREOF THAT EXCEEDS 50 POUNDS PER SQUARE FOOT (PSF) SHALL BE STATED ON DURABLE SIGNS AND CONSPICUOUSLY POSTED BY THE OWNER IN THE APPLICABLE AREA(S) OF THE BUILDING.
15. ALL STRUCTURES REQUIRE PERIODIC MAINTENANCE TO EXTEND LIFESPAN AND ENSURE STRUCTURAL INTEGRITY FROM EXPOSURE TO THE ENVIRONMENT. A PLANNED PROGRAM OF MAINTENANCE SHALL BE ESTABLISHED BY THE BUILDING OWNER. THIS PROGRAM SHALL INCLUDE SUCH ITEMS AS, BUT NOT LIMITED TO, PAINTING OF STRUCTURAL STEEL, PROTECTIVE COATING FOR CONCRETE, SEALANTS, CAULKED JOINTS, EXPANSION JOINTS, CONTRACTION (CONTROL) JOINTS, SPALLS AND CRACKS IN CONCRETE, AND PRESSURE WASHING OF EXPOSED STRUCTURAL ELEMENTS EXPOSED TO A SALT ENVIRONMENT OR OTHER HARSH CHEMICALS.
16. THE STRUCTURAL ENGINEER'S ROLE DURING CONSTRUCTION
   A. THE ENGINEER SHALL NOT HAVE CONTROL NOR CHARGE OF, AND SHALL NOT BE RESPONSIBLE FOR, CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, OR PROCEDURES, FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK, FOR THE ACTS OR OMISSION OF THE CONTRACTOR, SUBCONTRACTOR, OR ANY OTHER PERSONS PERFORMING ANY OF THE WORK, OR FOR THE FAILURE OF ANY OF THEM TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DOCUMENTS.
      a. PERIODIC SITE OBSERVATION BY FIELD REPRESENTATIVES OF THE STRUCTURAL ENGINEER IS SOLELY FOR THE PURPOSE OF BECOMING GENERALLY FAMILIAR WITH THE PROGRESS AND QUALITY OF THE WORK COMPLETED AND DETERMINING, IN GENERAL, IF THE WORK OBSERVED IS BEING PERFORMED IN A MANNER INDICATING THAT THE WORK, WHEN FULLY COMPLETED, WILL BE IN ACCORDANCE WITH THE STRUCTURAL CONTRACT DOCUMENTS. THIS LIMITED SITE OBSERVATION(S) BY THE ENGINEER SHOULD NOT BE CONSTRUED AS EXHAUSTIVE OR CONTINUOUS TO CHECK THE QUALITY OR QUANTITY OF THE WORK, AS THAT IS THE RESPONSIBILTY OF INSPECTIONS & SPECIAL INSPECTIONS. THE ENGINEER'S PERIODIC OBSERVATIONS ARE IN AN EFFORT TO GUARD THE OWNER AGAINST DEFECTS OR DEFICIENCIES IN THE WORK OF THE CONTRACTOR.
      b. THE CONTRACTOR IS RESPONSIBLE FOR NOTIFYING THE STRUCTURAL ENGINEER OF SCHEDULED DATES FOR CONSTRUCTION INCLUDING BUT NOT LIMITED TO THE FOLLOWING, IF APPLICABLE:
         - FIRST STRUCTURAL CONCRETE POUR
         - FIRST ELEVATED CONCRETE POUR ON STRUCTURE
         - FRAMING COMPLETION AFTER MEP ROUGH-IN.
      c. THE CONTRACTOR MUST PROVIDE A MINIMUM 48-HOURS NOTICE TO THE STRUCTURAL ENGINEER.
17. WATERPROOFING OF THE BUILDING ENVELOPE IS OF CRITICAL IMPORTANCE TO LONG-TERM STRUCTURAL PERFORMANCE. WATERPROOFING DESIGN SHALL BE THE RESPONSIBILITY OF THE ARCHITECT/CONTRACTOR AND SHALL BE IN ACCORDANCE WITH BEST PRACTICES FOR THE LOCALITY AND THE PARTICULAR ASSEMBLY.
18. ANY SUSPENDED EQUIPMENT, CEILING, ETC. TO BE HUNG FROM THE STRUCTURE, SHALL NOT EXCEED THE ALLOWABLE HANGING CEILING & MECHANICAL LOAD IDENTIFIED IN THE DESIGN CRTIERA. FURTHERMORE, ANY CONNECTION TO THE STRUCTURE SHALL BE DONE TO WHERE THE LOAD IS CONCENTRIC TO THE MEMBER (I.E. BEAM CLAMPS ONLY ON ONE SIDE OF THE MEMBER ARE NOT ALLOWED).
19. FLATWORK (SIDEWALK, PAVEMENT, STOOPS, ETC.) ADJACENT TO THE STRUCTURE IS NOT WITHIN THE SCOPE OF THE STRUCTURAL ENGINEER-OF-RECORD. THE CIVIL ENGINEER & CONTRACTOR SHALL FOLLOW ALL RECOMMENDATIONS FROM THE GEOTECHNICAL REPORT AND REQUIREMENTS OF THE BUILDING CODE (IMPERVIOUS SURFACE SHALL BE PERMITTED TO BE SLOPED LESS THAN 2% WHERE THE SURFACE IS A DOOR LANDING OR RAMP. THE PROCEDURE USED TO ESTABLISH THE FINAL GROUND LEVEL ADJACENT TO THE FOUNDATION SHALL ACCOUNT FOR ADDITIONAL SETTLEMENT OF BACKFILL, FREEZE/THAW DUE TO FROST, AND HEAVE/SUBSIDENCE DUE TO EXPANSIVE SOIL.)

CONTRACTOR QUALIFICATION

1. WORK SHALL BE PERFORMED BY A QUALIFIED CONSTRUCTION CONTRACTOR AND SUBCONTRACTOR EXPERIENCED IN THIS TYPE OF WORK. SUCH KNOWLEDGE SHALL INCLUDE MAKING ALLOWANCES FOR PERFORMING WORK OF THIS NATURE FOLLOWING INDUSTRY STANDARDS OF CARE.
2. THE CONSTRUCTION CONTRACTOR AND SUBCONTRACTORS SHALL UNDERSTAND THE NATURE OF DRAWING PRODUCTION AND COORDINATION BETWEEN CONSULTANTS AND SHALL NOT ENTER INTO A CONTRACT BASED ON DRAWINGS THAT ARE BELIEVED TO CONTAIN DISCREPANCIES OR ARE OTHERWISE INCOMPLETE UNLESS PROPER ALLOWANCES HAVE BEEN MADE FOR COST IMPLICATIONS THAT MAY ARISE DUE TO FUTURE DRAWING CHANGES MADE IN PREPARATION OF FINAL CONSTRUCTION DOCUMENTS.
3. IN THE COURSE OF PRODUCING AND ISSUING DRAWINGS, VARIOUS STAGES OF COMPLETION ARE DEVELOPED. THE CONSTRUCTION CONTRACTOR AND SUBCONTRACTORS SHALL UNDERSTAND THE PURPOSE AND CONTENT CONTAINED IN PERMIT, PRICING, AND CONSTRUCTION DRAWINGS. COST IMPLICATIONS AND CONTRACTIBILITY ARE THE RESPONSIBILITY OF THE CONSTRUCTION CONTRACTOR AND SUBCONTRACTORS UNLESS PRIOR ARRANGEMENTS HAVE BEEN MADE WITH THE OWNER.

FUTURE EXPANSION

1. NO PROVISIONS FOR ANY FUTURE EXPANSION HAVE BEEN MADE IN THE STRUCTURAL DESIGN.

INSPECTIONS:

1. CONSTRUCTION OR WORK FOR WHICH A PERMIT IS REQUIRED SHALL BE SUBJECT TO INSPECTION BY THE BUILDING OFFICIAL AND SUCH CONSTRUCTION OR WORK SHALL REMAIN ACCESSIBLE AND EXPOSED FOR INSPECTION PURPOSES UNTIL APPROVED. REQUIRED TESTING INCLUDES BUT IS NOT LIMITED TO THE FOLLOWING:
   A. FOUNDATION INSPECTION:
      a. FOOTING AND FOUNDATION INSPECTIONS SHALL BE MADE AFTER EXCAVATIONS FOR FOOTINGS ARE COMPLETE AND ANY REQUIRED REINFORCING STEEL IS IN PLACE. FOR CONCRETE FOUNDATIONS, ANY REQUIRED FORMS SHALL BE IN PLACE PRIOR TO INSPECTION. MATERIALS FOR THE FOUNDATION SHALL BE ON THE JOB, EXCEPT WHERE CONCRETE IS READY MIXED IN ACCORDANCE WITH ASTM C94, THE CONCRETE NEED NOT BE ON THE JOB.
   B. CONCRETE SLAB AND UNDER-FLOOR INSPECTION:
      a. CONCRETE SLAB AND UNDER-FLOOR INSPECTIONS SHALL BE MADE AFTER IN-SLAB OR UNDER-FLOOR REINFORCING STEEL AND BUILDING SERVICE EQUIPMENT, CONDUIT, PIPING ACCESSORIES AND OTHER ANCILLARY EQUIPMENT ITEMS ARE IN PLACE, BUT BEFORE ANY CONCRETE IS PLACED OR FLOOR SHEATHING INSTALLED, INCLUDING THE SUBFLOOR.
   C. FRAME INSPECTION:
      a. FRAMING INSPECTIONS SHALL BE MADE AFTER THE ROOF DECK OR SHEATHING, ALL FRAMING, FIREBLOCKING AND BRACING ARE IN PLACE AND PIPES, CHIMNEYS AND VENTS TO BE CONCEALED ARE COMPLETE AND THE ROUGH ELECTRICAL, PLUMBING, HEATING WIRES, PIPES AND DUCTS ARE APPROVED.
   1. SPECIAL INSPECTIONS - REFER TO THE STATEMENT OF SPECIAL INSPECTION FOR REQUIRED STRUCTURAL SPECIAL INSPECTIONS
   2. ADDITIONAL INSPECTIONS/OBSERVATIONS REQUIRED BY STRUCTURAL ENGINEER: REFERENCE SPECIFICATIONS / GENERAL CONDITIONS

DRAWING INTERPRETATION:

1. DRAWING VIEWS LABELED AS TYPICAL
   A. PARTIAL PLANS, ELEVATIONS, SECTIONS, DETAIL OR SCHEDULES LABELED WITH "TYPICAL" AT THE BEGINNING OF THEIR TITLE SHALL APPLY TO ALL SITUATIONS OCCURRING ON THE PROJECT THAT ARE THE SAME OR SIMILAR TO THE THOSE SPECIFICALLY SHOWN. THE APPLICABILITY OF THE CONTENT OF THESE VIEWS TO LOCATIONS ON THE PLAN CAN BE DETERMINED FROM THE TITLE OF THE VIEW. SUCH VIEWS SHALL APPLY WHETHER OR NOT THEY ARE KEYED IN AT EACH LOCATION. DECISIONS REGARDING APPLICABILITY OF THESE "TYPICAL" VIEWS SHALL BE DETERMINED BY THE STRUCTURAL ENGINEER.
2. COLOR: THESE DRAWINGS ARE INTENDED TO BE VIEWED IN COLOR. IF THE FOLLOWING COLORS ARE NOT RED GREEN BLUE THEN THIS DRAWING SET IS NOT BEING VIEWED AS INTENDED.
3. SCALE: IF THE FOLLOWING LINE IS NOT EXACTLY 1" LONG, THEN THIS SET HAS BEEN SCALED. 1"

REINFORCING STEEL - 03 20 00

1. THE CONTRACTOR MUST SUBMIT PLACING DRAWINGS COMPLETE WITH LAYOUT, SYMBOLS AND NOTATION, AND SCHEUDLES WITH THE REINFORCING STEEL SHOP DRAWINGS. IF THE CONTRACTOR ONLY SUBMITS SCHEDULES (BAR LISTS, CUT AND BEND INFORMATION), THE SUBMITTAL WILL NOT BE REVIEWED AND WILL BE RETURNED REVISE AND RESUBMIT. DETAILING OF CONCRETE REINFORCEMENT BARS AND ACCESSORIES SHALL CONFORM TO THE FOLLOWING: ACI 315 "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT", CRSI "REINFORCING BAR DETAILING" , AND CRSI "MANUAL OF STANDARD PRACTICE". ALL REFERENCES SHALL BE THE LATEST EDITION AVAILABLE.
2. PLACING DRAWINGS ARE DETAILED WORKING DRAWINGS THAT SHOW THE QUANTITY, SIZE, DIMENSIONS, SPACING, LOCATIONS, AND OTHER INFORMATION REQUIRED FOR REINFORCEMENT FABRICATION AND INSTALLATION. PLACING DRAWINGS SHALL BE USED BY THE IRONWORKERS ON THE PROJET TO PLACE (INSTALL) THE REINFORCING STEEL.
   A. LAYOUT: THE PLACING DRAWINGS MUST INCLUDE PLANS, DETAILS, ELEVATIONS, GRAPHICS, SCHEDULES, MATERIAL LISTS, AND BENDING DETAILS OF REINFORCEMENT AND REINFORCEMENT SUPPORTS, AS APPLICABLE TO THIS PROJECT.
   B. FIELD CONDITIONS, FIELD MEASUREMENTS, LOCATION OF CONSTRUCTION, CONTRACTION (CONTROL), AND EXPANSION JOINTS SHALL BE IMPLEMENTED INTO THE PLACING DRAWINGS.
   C. THE PLACING DRAWINGS MUST BE PREPARED BASED UPON THE LATEST CONSTRUCTION DOCUMENTS ALONG WITH SHOP DRAWINGS FOR OTHER TRADES THAT EFFECT THE REINFORCEMENT.
   D. THE PLACING DRAWINGS MUST BE COMPUTER GENERATED.
3. COMPLETE REINFORCING PLACING DRAWINGS PREPARED IN ACCORDANCE WITH ACI 315 SHALL BE REVIEWED BY THE ENGINEER AND AVAILABLE ON THE JOB SITE PRIOR TO & DURING THE PLACING OF CONCRETE.
4. CONCRETE REINFORCEMENT BARS SHALL CONFORM TO ASTM A615, GRADE 60, WITH SUPPLEMENTARY REQUIREMENTS.
5. ALL REINFORCING STEEL SHALL BE SUPPORTED AT DESIGNED DEPTH USING PLASTIC OR METALLIC CHAIRS SPACED AT 48" OC IN ALL DIRECTIONS TO SUPPORT FULL LENGTH OF REINFORCEMENT. IF ALTERNATE IS TO BE USED, PROPOSED CHAIR IS TO BE SUBMITTED IN WRITING AND APPROVED BY EOR
   A. PRECAST CONCRETE SUPPORTS (UTILITY BRICKS) MAY ONLY BE USED AT THE BOTTOM OF GRADE BEAMS WITH A DEPTH OF AT LEAST 18" OR WITH WRITTEN PERMISSION FROM THE EOR. WHEN PERMITTED, PRECAST SUPPORTS SHALL HAVE A SURFACE AREA OF NOT LESS THAN 4 IN^2 AND HAVE A COMPRESSIVE STRENGTH EQUAL TO OR GREATER THAN THE CONCRETE STRENGTH.
6. END HOOKS, DEVELOPMENT LENGTHS, AND SPLICES SHALL CONFORM TO THE REQUIREMENTS OF ACI 318.
7. REINFORCEMENT MAY BE PLACED IN BUNDLES OF NOT MORE THAN TWO W/ THE CLEAR DISTANCE BETWEEN BUNDLES OF REINFORCEMENT OR TENDONS OF 3 INCHES MINIMUM. CONCRETE COVER NOT SPECIFICALLY DETAILED ON THE DRAWINGS SHALL BE IN ACCORDANCE WITH ACI 318.
8. COVERAGE: THE FOLLOWING SHALL BE THE MINIMUM REINFORCEMENT CONCRETE COVERAGE (INCLUDING TENDONS):
   A. CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH .... 3"
   B. CONCRETE EXPOSED TO EARTH OR WEATHER:
      a. NO. 6 AND LARGER .... 2"
      b. NO. 5 BAR AND SMALLER .... 1½"
   C. CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND .... ¾"
9. UNO, ALL LAP SPLICES OF REINFORCEMENT IN GROUND SUPPORTED ELEMENTS (GRADE BEAMS, FOOTINGS, TURN DOWNS) SHALL BE A MINIMUM OF 48Ø, WHERE Ø = THE DIAMETER OF THE BAR, REINFORCEMENT IN STRUCTURAL SLABS, WALLS OR ELEVATED STRUCTURES SHALL REFER TO THE TYPICAL LAP SPLICE DETAIL.
10. HEADED CONCRETE STUD ANCHORS ("HSA") FASTENED TO AN EMBED PLATE SHALL BE NELSON OR KSM HEADED CONCRETE ANCHORS (OR APPROVED ALTERNATIVE). ANCHORS SHALL BE AUTOMATICALLY END WELDED WITH SUITABLE STUD WELDING EQUIPMENT IN THE SHOP OR IN THE FIELD. WELDING SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE NELSON STUD WELDING COMPANY OR THE KSM WELDING SYSTEMS COMPANY.

REINFORCED CONCRETE - 03 30 00

1. GENERAL
   A. CONCRETE WORK SHALL CONFORM TO THE LATEST ED. OF ACI 301 (SPECIFICATIONS FOR STRUCTURAL CONCRETE) UNO IN THESE CONSTRUCTION DOCUMENTS.
   B. POINT OF DELIVERY = AT DISCHARGE FROM THE CONCRETE MIX TRUC (END OF THE CHUTE)
   C. POINT OF PLACEMENT = AT THE LOCATION WHERE CONCRETE IS PLACED TO HARDEN. IF PUMPING, THIS WILL BE AT THE END OF THE PUMP HOSE
   D. WELDING OF REINFORCEMENT IS NOT ALLOW WITHOUT WRITTEN PERMISSION FROM ENGINEER.
2. CONCRETE MIX DESIGN & PLACEMENT:
   A. ALL CONCRETE MIXES SHALL CONFORM TO ACI 301, UNO. MIX DESIGN DATA RESULTS EITHER COMPLYING WITH THE FIELD EXPERIENCE OR TRIAL MIXTURE METHOD PER ACI 301/318 SHALL BE SUBMITTED FOR EACH CONCRETE MIX. PROPORTIONS OF MATERIALS FOR CONCRETE SHALL BE ESTABLISHED TO:
      a. PROVIDE WORKABILITY AND CONSISTENCY TO PERMIT CONCRETE TO BE WORKED READILY INTO FORMS AND AROUND REINFORCEMENT UNDER CONDITIONS OF PLACEMENT TO BE EMPLOYED, WITHOUT SEGREGATION OR EXCESSIVE BLEEDING.
      b. MEET REQUIREMENTS FOR APPLICABLE EXPOSURE REQUIREMENTS.
      c. MEET OR EXCEED THE REQUIRED F'C.
      d. NOT EXCEED THE MAXIMUM W/C RATIO.
   B. ADHERE TO THE MINIMUM CEMENTITOUS MATERIAL CONTENT FOR FLOORS (REF ACI 301 TABLE 4.2.2.1).
   C. THE CONTRACTOR MUST INDICATE THE PLANNED PLACEMENT METHOD FOR EACH CONCRETE MIX.
   D. NO WATER SHALL BE ADDED AT THE SITE (RE-TEMPERING) WITHOUT THE SPECIAL INSPECTOR PRESENT TO ENSURE THAT THE W/C IS NOT EXCEEDED. THE READY-MIX COMPANY MUST INDICATE THE WATER WITHHELD AT THE PLANT ON EACH BATCH TICKET. WHEN THE SLUMP IS BELOW REQUIRED, WATER CAN BE ADDED, BUT MUST BE DONE IN ACCORDANCE WITH ACI 301 AND ASTM C94, SEE BELOW. IF ADDITIONAL SLUMP BEYOND THAT INDICATED IN THE CONCRETE MIX SUBMITTAL IS REQUIRED FOR PLACEMENT AND FINISH OF THE CONCRETE, THEN THE CONTRACTOR SHALL COORDINATE WITH THE CONCRETE SUPPLIER TO ADD ADDITIONAL WORKABILITY VIA PLASTICIZER, SUPERPLASTICIZER, ETC. WITHOUT INCREASING THE W/C RATIO. EXCEEDING THE W/C RATIO HAS DETRIMENTAL EFFECTS OUTSIDE OF LOWERING THE COMPRESSIVE STRENGTH INCLUDING HIGHER FRENQUENCY OF SHRINKAGE CRACKS, MORE POROUS CONCRETE AND LESS DURABLE CONCRETE
      a. ACI 301 §4.3.2.1 SLUMP ADJUSTMENT—WHEN CONCRETE SLUMP TEST RESULTS ARE BELOW THE REQUIRED SLUMP, THE SLUMP MAY BE ADJUSTED BY ADDING WATER UP TO THE AMOUNT ALLOWED IN THE ACCEPTED MIXTURE PROPORTIONS. ADDITION OF WATER SHALL BE IN ACCORDANCE WITH ASTM C94/ C94M. DO NOT EXCEED THE SPECIFIED W/CM, SLUMP OR ADD WATER IN EXCESS OF THAT WITHHELD AT THE BATCH PLANT
      b. ASTM C94 REQUIREMENTS
         - DO NOT EXCEED THE MAXIMUM WATER CONTENT FOR THE BATCH AS ESTABLISHED BY THE ACCEPTED CONCRETE MIXTURE PROPORTIONS.
         - NO CONCRETE HAS BEEN DISCHARGED FROM THE MIXER EXCEPT FOR SLUMP TESTING.
         - ALL WATER ADDITIONS SHALL BE COMPLETED WITHIN 15 MINUTES FROM THE START OF THE FIRST WATER ADDITION.
         - WATER SHALL BE INJECTED INTO THE MIXER WITH SUCH PRESSURE AND DIRECTION OF FLOW TO ALLOW FOR PROPER DISTRIBUTION WITHIN THE MIXER.
         - THE DRUM SHALL BE TURNED AN ADDITIONAL 30 REVOLUTIONS OR MORE AT MIXING SPEED TO ENSURE A HOMOGENOUS MIXTURE.
   E. SLUMP TESTS SHALL BE PERFORMED AT THE POINT OF PLACEMENT WITH THE EXCEPTIONS NOTED BELOW:
      a. IF THE POINT OF DELIVERY IS THE SAME AS THE POINT OF PLACEMENT (CONCRETE IS PLACED DIRECTLY FROM TRUCK)
      b. IF THE CONTRACTOR HAS DEVELOPED AN ACCEPTABLE (APPROVED BY SPECIAL INSPECTOR AND EOR) CORRELATION BETWEEN FRESH CONCRETE PROPERTIES AT THE POINT OF DELIVERY AND POINT OF PLACEMENT.
   F. AIR-ENTRAINED CONCRETE SHALL NOT BE USED IN ANY NORMALWEIGHT CONCRETE FLOOR SLAB THAT IS TO RECEIVE A HARD-TROWELED FINISH.
3. CONCRETE CONSTRUCTION MATERIALS: (FOR ALL MATERIALS APPROVED EQUIVALENTS ARE ACCEPTABLE - IT IS THE CONTRACTORS RESPONSIBILTY TO ESTABLISH THE THAT SUBSITUTE PRODUCT IS EQUAL TO OR BETTER THAN THE SPECIFIED PRODUCT)
   A. HYDRAULIC CEMENT:
      a. USE ASTM C150 TYPE I OR TYPE III OR ASTM C595 TYPE IL, EXCEPT WHERE SPECFICALLY INDICATED OTHERWISE IN TABLE BELOW.
   B. FLY ASH:
      a. FLY ASH MAY BE USED TO REPLACE A PORTION OF THE PORTLAND CEMENT, SUBJECT TO THE APPROVAL OF THE ARCHITECT AND STRUCTURAL ENGINEER NOT TO EXCEED THE AMOUNTS LISTED IN THE CONCRETE TABLE.
      b. USE ASTM C618 CLASS C OR F.
   C. NORMAL WEIGHT AGGREGATE:
      a. USE ASTM C33.
      b. MATERIAL CERTIFICATES FROM THE AGGREGATE SUPPLIER MUST BE SUBMITTED WITH THE CONCRETE MIX DESIGN.
      c. PEA STONE (PEA GRAVEL) AGGREGATES ARE NOT ACCEPTABLE.
   D. WATER
      a. COMPLY WITH THE REQUIREMENTS OF ASTM C1602.
   E. COMPRESSIBLE (JOINT) FILLER AT ISOLATION AND/OR EXPANSION JOINTS
      a. MUST ADHERE TO ASTM D1751 ASPHALT-SATURATED CELLULOSIC FIBER
   F. ADHESIVE ANCHORING SYSTEMS
      a. TWO-COMPONENT SYSTEMS THAT ADHERE TO ASTM C881 (HILTI HY-200, SIMPSON SET-XP, POWERS PE 1000+)
4. CHLORIDE ION
   A. FOR CORROSION PROTECTION OF REINFORCEMENT IN CONCRETE, MAXIMUM WATER SOLUBLE ION CONCENTRATIONS IN HARDENED CONCRETE AT AGES FROM 28 TO 42 DAYS CONTRIBUTED FROM THE THE INGREDIENTS INCLUDING WATER, AGGREGATES, CEMENTITIOUS MATERIALS, AND ADMIXTURES SHALL NOT EXCEED THE LIMITS INDICATED IN THE TABLE BELOW.
5. PLACEMENT:
   A. CONCRETE SHALL BE PLACED CAREFULLY SO AS NOT TO DEVIATE REINFORCEMENT FROM THE DESIGN LOCATION.
   B. CONCRETE SHALL BE PROPERLY VIBRATED, ESPECIALLY AROUND POST-TENSIONED ANCHORAGES AND CONGESTED AREAS SUCH AS COLUMN JOINTS.
   C. PLACEMENT OF CONCRETE SHALL BE COMPLETED WITHIN 90 MINUTES AFTER THE INTRODUCTION OF THE MIXING WATER (BATCH TIME), IN ACCORDANCE WITH ASTM C94.
   D. TOLERANCES FOR CONCRETE CONSTRUCTION SHALL CONFORM TO THE LATEST ED. OF ACI 117 (SPECIFICATION FOR TOLERANCES FOR CONCRETE CONSTRUCTION AND MATERIALS).
6. FORMWORK - NOT APPLICABLE TO GROUND SUPPORTED FORMWORK
   A. THE CONTRACTOR SHALL SUBMIT FORMWORK DRAWINGS, PREPARED UNDER THE SUPERVISION AND SEALED BY THE FORMWORK DESIGN ENGINEER, SHALL BE SUBMITTED FOR OWNER'S RECORD AND SHALL BE REVIEWED BY THE ENGINEER FOR CONFORMANCE TO STRUCTURAL LAYOUT ONLY. SUCH SHOP DRAWINGS SHALL INDICATE ALL DIMENSIONS AND TYPES OF MATERIALS, SIZES, LENGTHS, CONNECTION DETAILS, DESIGN ALLOWANCE FOR CONSTRUCTION LOADS, ANCHORS, FORM TIES, SHORES, BRACES, CONSTRUCTION JOINTS, REVEALS, CAMBER, OPENINGS, FORMWORK COATINGS, AND ALL OTHER PERTINENT INFORMATION.
   B. THE MINIMUM COMPRESSIVE STRENGTH OF CONCRETE FOR FORMWORK REMOVAL SHALL BE 75% OF THE SPECIFIED f'_c

CONCRETE MIX REQUIREMENTS

ELEMENT	f'c	EXPOSURE CATEGORY	MAX CL-	MAX FLY ASH	MAX W/CM RATIO	MAX COARSE AGG. SIZE	MIN. AIR CONTENT[E]
SLABS-ON-GROUND[A] (W.OUT FREEZE/THAW)	3,500	F0,S0,P(W)0,C1	0.30	20%	0.45	1"	N/A (3% MAX)

N/A = MINIMUM AIR CONTENT FOR FREEZE/THAW REQUIREMENTS IS NOT APPLICABLE (APPLIES TO F0 EXPOSURE CATEGORY ONLY)

NOTES:
A. CONCRETE MIXES FOR SLABS SHALL HAVE AN ULTIMATE DRY SHRINKAGE STRAIN LESS THAN 520 MILLIONTHS WHEN PLACED ON A DRY BASE MATERIALS. CONTRACTOR SHALL SUBMIT CERTIFICATION THAT THE PROPOSED MIX DESIGN COMPLIES.
B. "P(W)X" REFERS TO PERMEABILITY REQUIREMENTS OF THE CONCRETE. WHEN REFERENCING ACI318-11, CATEGORY SHOULD BE READ AS "PX". WHEN REFERENCING ACI318-14 OR ACI318-19, CATEGORY SHOULD BE READ AS "WX".
C. SLUMP REQUIREMENTS SHALL BE DETERMINED BY THE CONTRACTOR AND CONCRETE PRODUCER BASED UPON HANDLING, PLACING, FINISHING AND CURING CRITERIA FOR CONCRETE CONSTRUCTION. IF THE CONTRACTOR IS NOT ABLE TO DETERMINE SLUMP REQUIREMENTS, THEN IT SHALL BE IN ACCORDANCE WITH ACI 301 (SLUMP = 4" ± 1" AT THE POINT OF PLACEMENT). PUMPED CONCRETE LIKLEY WILL A REQUIRE A SLUMP GREATER THAN 4 AT THE POINT OF DELIVERY TO ACCOUNT FOR SLUMP LOSS DURING PUMPING.
D. UNLESS NOTED OTHERWISE, REMOVAL OF SHORING, BRACING, FORMWORK OR BACKFILLING OF STRUCTURES SHALL NOT OCCUR UNITL THE CONCRETE HAS OBTAINED A MINIMUM OF 75% OF f'c. SHORING, BRACING, FORMWORK AND BACKFILLING OPERATIONS ARE MEANS AND METHOD OF CONSTRUCTION AND THUS THE CONTRACTOR IS SOLEY RESPONSIBLE FOR THESE OPERATIONS. QUESTIONS ON CAPACITY OF THE STRUCTURE TO SUPPORT TEMPORARY LOADING CONDITIONS SHALL BE ADDRESSED IN WRITING TO THE ENGINEER. IN MANY CASES, THE CONTRACTOR WILL NEED TO CONSULT A SPECIALITY STRUCTURAL ENGINEER TO DESIGN SHORING, BRACING, ETC., TO FACIILATE THEIR SELECTED MEANS AND METHODS OF CONSTRUCTION.
E. MAXIMUM LIMITS APPLY TO SLABS THAT ARE TO RECEIVE A HARD TROWEL FINISH. THE TOLERANCE FOR AIR CONTENT IS ± 1%.

BELOW SLAB VAPOR RETARDER - SLAB-ON-GRADE (07 26 17)

A. REFER TO SPECIFICATION 07 26 17, IF APPLICABLE.
B. PRODUCT QUALITY STANDARD: ASTM E 1745, CLASS A, EXCEPT WATER VAPOR PERMEANCE PROPERTY SHALL NOT EXCEED 0.03 PERMS ACCORDING TO ASTM E 96, METHOD B.
C. DESCRIPTION: PREFABRICATED, FLEXIBLE, LIGHTWEIGHT MATERIAL MANUFACTURED FROM RAW OR VIRGIN POLYETHYLENE OR POLYOLEFIN RESINS (POST-CONSUMER, RECYCLED RESINS ARE NOT PERMITTED);
D. THICKNESS: REFER TO PLAN AND/OR ARCHITECTUAL DRAWINGS/SPECIFICATIONS FOR THE MINIMUM THICKNESS.

CONCRETE FINISHING AND CURING

1. FINISHING: FINISHING OPERATIONS AND BULL FLOATING SHALL BE COMPLETED PRIOR TO THE ACCUMULATION OF BLEED WATER ON THE SURFACE. FINAL FINISHING SHOULD NOT BEGIN UNTIL THE BLEED WATER HAS EVAPORATED AND THE WATER SHEEN HAS DISAPPEARED FROM THE SURFACE. TROWELLING THE WET SURFACE WILL WEAKEN IT AND CAN RESULT IN SURFACE CRAZING AND DUSTING. REFER TO ARCHITECTURE FOR FINAL FINISHING REQUIREMENTS (STEEL TROWEL, BROOM FINISH, ETC.).
2. EXCESSIVE BLEED WATER REMOVAL: BLEEDING (FREE SURFACE WATER) OCCURS AS AGGREGATES SETTLE IN THE PLACED CONCRETE, DISPLACING WATER TO THE SURFACE. IF ALLOWED TO REMAIN ON THE SURFACE, IT DILUTES THE CEMENT CONTENT, SIGNIFICANTLY REDUCING THE STRENGTH NEAR THE SURFACE. THE CONTRACTOR SHALL REMOVE BLEED WATER. ONE METHOD OF REMOVING BLEED WATER IS TO DRAG THE SURFACE WITH A GARDEN HOSE.
3. CONTRACTION (CONTROL) JOINTS (SAW CUTS) IF REQUIRED, SHALL BE MADE AS SOON AS THE CONCRETE CAN SUPPORT THE WEIGHT OF WORKER AND THE EQUIPMENT.
4. CURING: IMMEDIATELY AFTER FINISHING THE SLAB, THE SLAB MUST BE CURED FOR A MINIMUM OF 7 DAYS BY EITHER:
   A. APPLYING A WATER-BASED DISSIPATING RESIN TYPE CURING COMPOUND WHICH CHEMICALLY BREAKS DOWN AFTER APPROXIMATELY 4 WEEKS. MEMBRANE FORMING COMPOUND SHALL ADHERE TO ASTM C 309, TYPE O OR 1D, CLASS B. THE COMPOUND SHALL BE APPLIED IN TWO COATS, EACH AT RIGHT ANGLES TO THE OTHER TO ENSURE A TIGHTLY SEALED SURFACE.
   B. WET-CURED BY KEEPING THE SURFACE WET AFTER THE CONCRETE HAS SET AND FINISHING IS COMPLETE.

CONCRETE CRACKS

1. EVEN WITH PROPER DESIGN AND CONSTRUCTION ALL CONCRETE WILL CRACK. PLASTIC SHRINKAGE CRACKS CONTINUE TO OPEN AS THE SLAB AGES UP TO APPROXIMATELY ONE YEAR, AND REACH 50% OF THEIR FINAL SIZE IN APPROXIMATELY 30 DAYS. MANY PLASTIC SHRINKAGE CRACKS ARE VERY SMALL WHICH MAKE THEM BARELY NOTICEABLE AND INCONSEQUENTIAL TO THE STRUCTURAL PERFORMANCE OF THE CONCRETE. CRACKS WIDER THAN APPROXIMATELY 0.06" ARE LIKELY INDICATIVE OF CONCRETE THAT DID NOT ADHERE TO THE CONCRETE MIX REQUIREMENTS, PLACEMENT, FINISHING AND CURING REQUIREMENTS. IN ADDITION TO BEING VISIBLY OBJECTIONABLE, IF THESE CRACKS EXIST IN REGULAR CONSISTENCY, THEY MAY REDUCE THE STRUCTURAL PERFORMANCE OF THE CONCRETE AND REQUIRE STRUCTURAL REPAIR (FILL CRACKS WITH EPOXY PRODUCT) OR REPLACEMENT.
2. PLASTIC SHRINKAGE CRACKS: OCCUR SOON AFTER THE CONCRETE IS PLACED AND WHILE IT IS STILL PLASTIC. IT IS CAUSED BY OVERLY RAPID DRYING OF THE SURFACE, USUALLY DUE TO HOT WEATHER, HIGH WIND, LOW HUMIDITY, OR A DELAY IN APPLYING THE CURING MEMBRANE.

RETEMPERING (ADDING WATER TO CONCRETE ON-SITE)

1. WATER SHALL NOT BE ADDED TO THE MIX TRUCKS ON THE JOB SITE IN EXCESS OF THE VOLUME OF WATER THAT IS SPECIFICALLY INDICATED TO HAVE BEEN WITHHELD FROM THE READY MIX SUPPLIER.
2. PRIOR TO ADDING WATER, THE CONTRACTOR SHALL CONFIRM THAT THE MIX IS NOT ALREADY WITHIN TOLERANCE ON SLUMP. WATER SHALL ONLY BE ADDED IF THE SLUMP IS BELOW TOLERANCE AND THE READY MIX SUPPLIER HAD INDICATED THE VOLUME OF WITHHELD (TRIM) WATER.

RECOMMENDED TESTING AND INSPECTION
SLAB-ON-GROUND FOUNDATIONS - IRC ONLY

THE FOLLOWING INSPECTION AND MATERIAL TESTING ITEMS ARE RECOMMENDED FOR QUALITY ASSURANCE OF THE FOUNDATION, BUT ARE NOT A REQUIREMENT OF THE ADOPTED CODE - INTERNATIONAL RESIDENTIAL CODE.

SOILS

VERIFICATION AND INSPECTION	RECOMMENDED
VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY	YES
VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIALS	YES
PERFORM CLASSIFICATION AND TESTING OF COMPACTED MATERIALS	YES
VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESS DURING PLACEMENT AND COMPACTION OF COMPACTED FILL **[TEST AT A FREQUENCY OF 2,000 SF/ LIFT MINIMUM]**	YES
PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THE SITE HAS BEEN PREPARED PROPERLY	YES

CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	RECOMMENDED
INSPECTION OF REINFORCING STEEL INCLUDING: SIZE, CLEAR COVER, SPACING, LAP SPLICES, ETC.	YES
VERIFYING USE OF REQUIRED MIX DESIGN	YES
AT THE TIME FRESH CONCRETE IS SAMPLED, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE **[TEST EVERY 100 YARDS OF CONCRETE PLACED]**	YES
INSPECTION OF CONCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	YES
INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED	YES

IRC FINISHED FLOOR REQUIREMENTS

THE FINISHED FLOOR ELEVATION SHALL BE A MINIMUM OF 6" ABOVE FINAL GRADE, EXCEPT WHERE MASONRY VENEER IS PRESENT THIS CAN BE REDUCE TO A MINIMUM OF 4" ABOVE FINA FINAL GRADE.

Revision Schedule		
Revision Number	Revision Description	Revision Date

CATTLEMEN LOT 112 RESIDENCE
3814 VAIL COURT
MONTGOMERY, TX 77356

STATE OF TEXAS
DREW S DUDLEY
123798
LICENSED PROFESSIONAL ENGINEER
5/26/2023

CATTLEMEN LOT 112 RESIDENCE
3814 VAIL COURT
MONTGOMERY, TX 77356

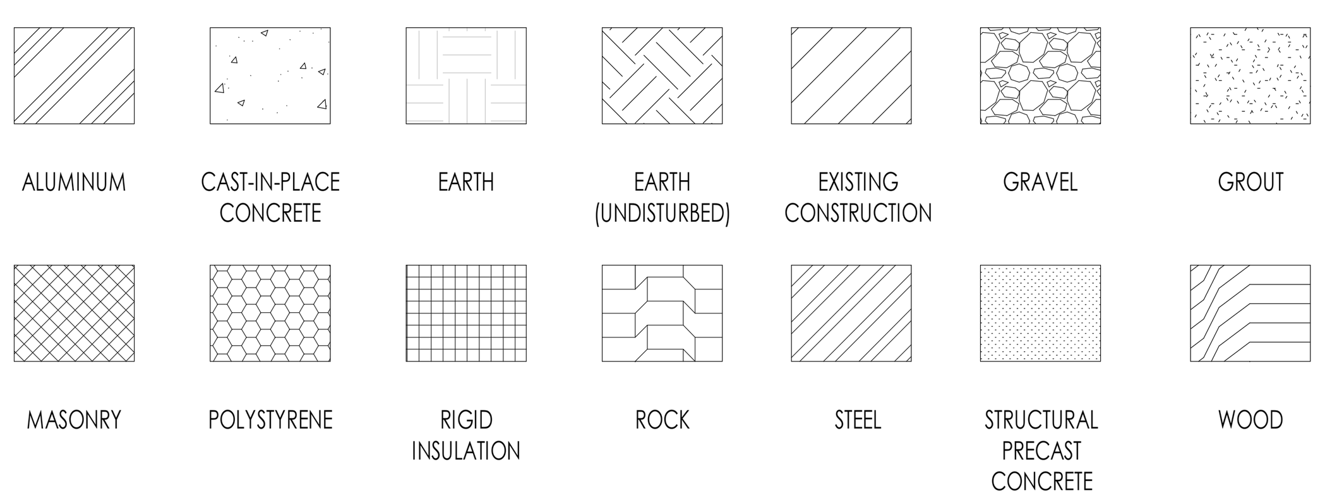
DUDLEY
GEOTECHNICAL | STRUCTURAL | ENVIRONMENTAL
Dudley Engineering LLC dba **DUDLEY**
6102 Imperial Loop Drive | College Station, Texas 77845
(o) 979.777.0720 | TBPE Firm No. F-18677

GENERAL NOTES

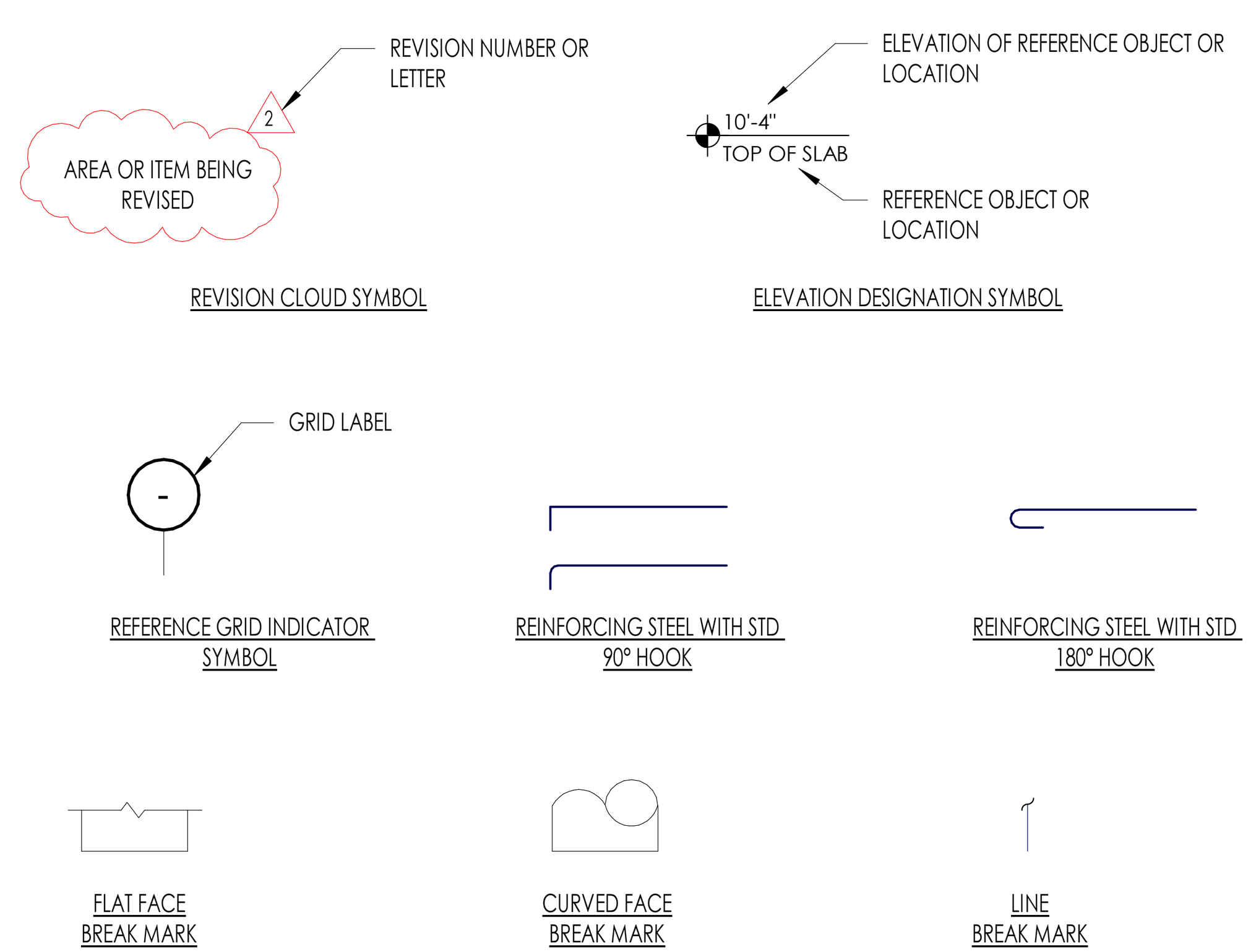
S0.0

Date:	5/26/2023
Project No:	23-00195

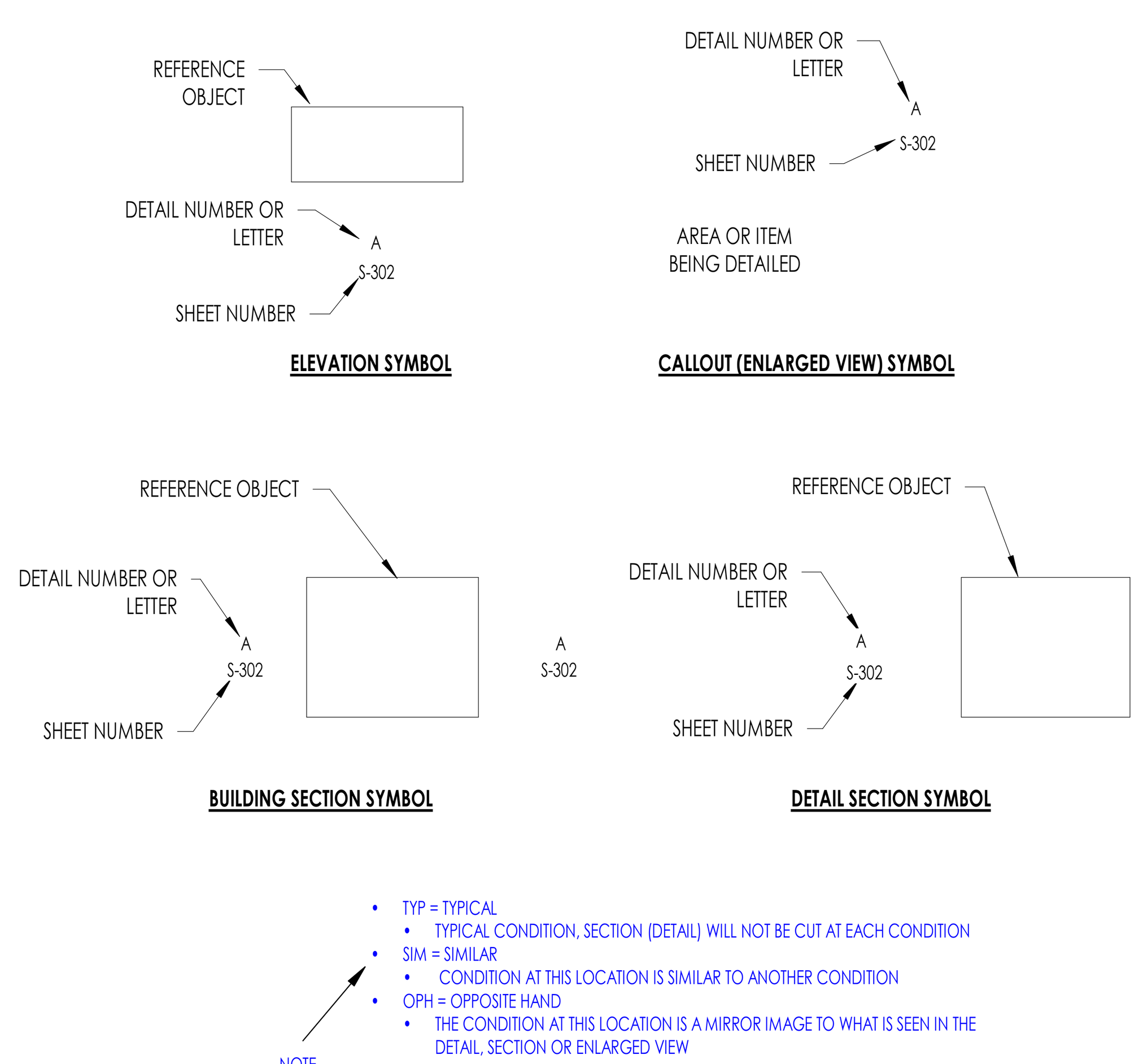
MATERIAL IDENTIFICATION SYMBOLS



UNIVERSAL SYMBOLS



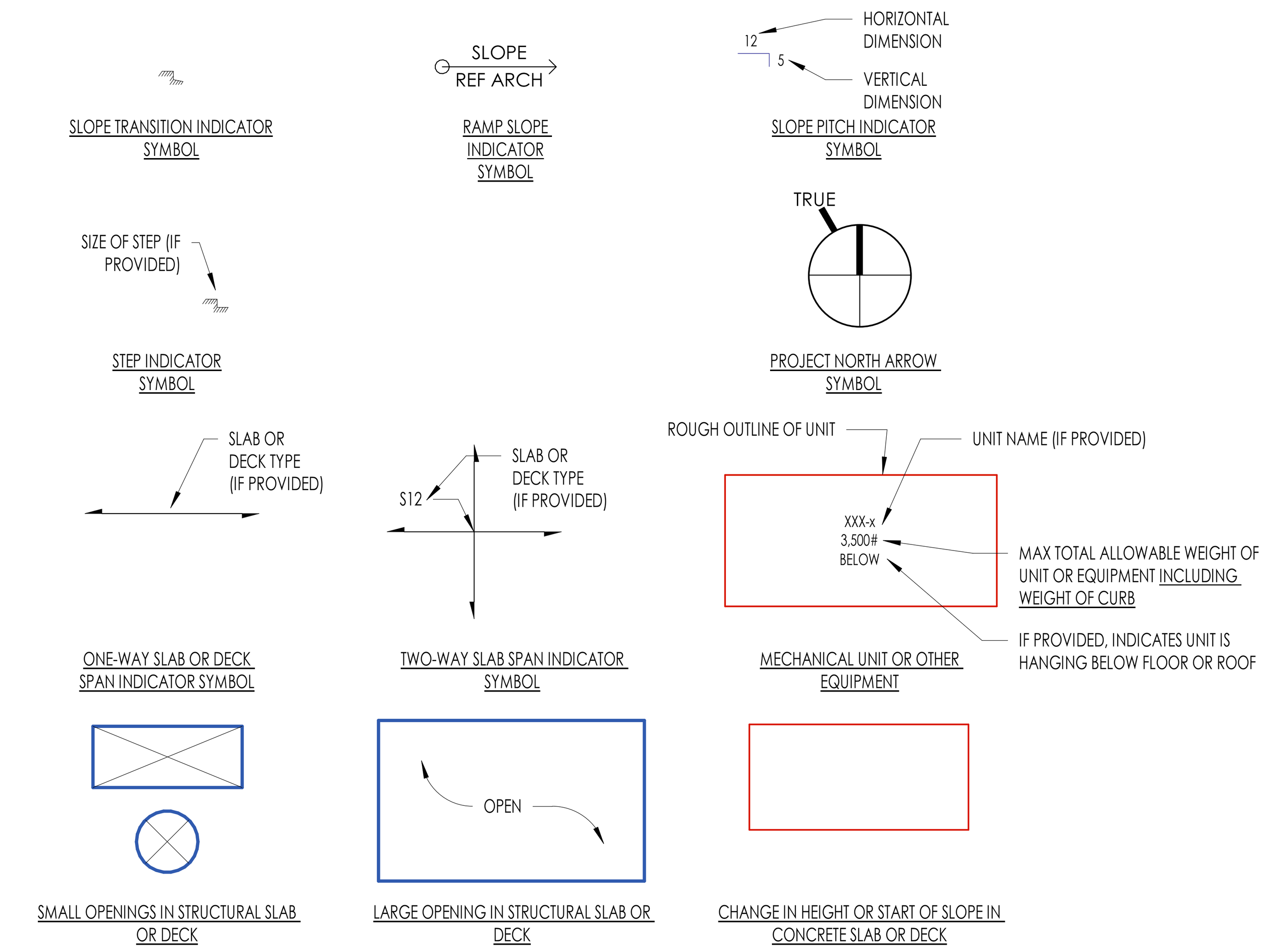
VIEW REFERENCE SYMBOLS



ABBREVIATIONS

@	AT
&	AND
#	NUMBER
Ø	ROUND, DIAMETER
ADDL	ADDITIONAL
AESS	ARCHITECTURAL EXPOSED STRUCTURAL STEEL
AFF	ABOVE FINISHED FLOOR
AHU	AIR HANDLING UNIT
ALT	ALTERNATE
APPROX	APPROXIMATE
ARCH	ARCHITECTURAL
BLDG	BUILDING
BO	BOTTOM OF
BOD	BOTTOM OF DECK
BOT	BOTTOM
BRDG	BRIDGING
BRG	BEARING
BTWN	BETWEEN
C	CAMBER
CANT	CANTILEVER
CFS	COLD-FORMED STEEL
CIP	CAST-IN-PLACE
CJ	CONSTRUCTION/CONTRACTION (CONTROL) JOINT
CJP	COMPLETE JOINT PENETRATION
CL	CENTERLINE
CMU	CONCRETE MASONRY UNIT
COL	COLUMN
CONC	CONCRETE
CONN	CONNECTION
CONSTR	CONSTRUCTION
CONT	CONTINUOUS
COORD	COORDINATE
CTRS	CENTERS
db	BAR DIAMETER
DBA	DEFORMED BAR ANCHOR
DF	DOUGLAS FIR (WOOD)
DIA (Ø)	DIAMETER
DIM	DIMENSION
DWG	DRAWING
EA	EACH
EF	EACH FACE
EJ	EXPANSION JOINT
EL (ELEV)	ELEVATION
EMBED	EMBEDMENT, EMBEDDED
ENGR	ENGINEER
EQ	EQUAL
EQUIP	EQUIPMENT
EQUIV	EQUIVALENT
EW	EACH WAY
EXIST	EXISTING
EXP	EXPANSION
EXT	EXTERIOR
FAB	FABRICATE
f'c	28 DAY CONCRETE STRENGTH
f'm	28 DAY MASONRY STRENGTH
FD	FLOOR DRAIN
FDN	FOUNDATION
FF	FAR FACE
FFE	FINISHED FLOOR ELEVATION
FIN	FINISH(ED)
FLR	FLOOR
FS	FAR SIDE
FTG	FOOTING
FUT	FUTURE
FV	FIELD VERIFY
Fy	YIELD STRENGTH
GALV	GALVANIZE(D)
GEN	GENERAL
GR	GRADE
H	HORIZONTAL REACTION
HGR	HANGER
HORIZ	HORIZONTAL
HSA	HEADED STUD ANCHOR
HSS	HOLLOW STRUCTURAL SECTION
ID	INSIDE DIAMETER
INFO	INFORMATION
INT	INTERIOR
JT	JOINT
K	KIPS (1000 LBS)
KSF	KIPS PER SQUARE FOOT
KSI	KIPS PER SQUARE INCH
LBS	POUNDS
Ld	DEVELOPMENT LENGTH
LLBB	LONG LEG BACK TO BACK
LLH	LONG LEG HORIZONTAL
LLV	LONG LEG VERTICAL
LONG	LONGITUDINAL
LSH	LONG SIDE HORIZONTAL
LSV	LONG SIDE VERTICAL
LWC	LIGHTWEIGHT CONCRETE
M	MOMENT
MAX	MAXIMUM
MC	MOMENT CONNECTION
MECH	MECHANICAL
MEZZ	MEZZANINE
MFR	MANUFACTURER
MH	HORIZONTAL MOMENT
MIN	MINIMUM
MISC	MISCELLANEOUS
MTL	METAL
NF	NEAR FACE
NIC	NOT IN CONTRACT
NS	NEAR SIDE
NTS	NOT TO SCALE
NWC	NORMALWEIGHT CONCRETE
N/A	NOT APPLICABLE
N/R	NOT REQUIRED
OC	ON CENTER
OD	OUTSIDE DIAMETER
OPH	OPPOSITE HAND
OPNG	OPENING
OPP	OPPOSITE
OSB	ORIENTED STRAND BOARD (WOOD)
OVS	OVERSIZED HOLE
P	AXIAL LOAD
PAF	POWDER ACTUATED FASTENER
PAR	PARALLEL
PCC	PRECAST CONCRETE
PCF	POUNDS PER CUBIC FOOT
PCY	POUNDS PER CUBIC YARD
PERP	PERPENDICULAR
PL	PLATE
PLF	POUNDS PER LINEAR FOOT
PJP	PARTIAL JOINT PENETRATION
PRELIM	PRELIMINARY
PROP	PROPERTY
PSF	POUNDS PER SQUARE FOOT
PSI	POUNDS PER SQUARE INCH
PT	POST-TENSION(ED)
QTY	QUANTITY
V	VERTICAL SHEAR REACTION
RAD	RADIUS
REF	REFERENCE
REINF	REINFORCEMENT
REQD	REQUIRED
REV	REVISION
RTU	ROOF TOP UNIT
SC	SLIP CRITICAL
SCHED	SCHEDULE(D)
SECT	SECTION
SER	STRUCTURAL ENGINEER OF RECORD
SHT	SHEET
SIM	SIMILAR
SLBB	SHORT LEG BACK TO BACK
SLRS	SEISMIC LOAD RESISTING SYSTEM
SOG	SLAB-ON-GRADE
SPA	SPACING
SPEC	SPECIFICATION
SQ	SQUARE
SSE	SPECIALTY STRUCTURAL ENGINEER
STD	STANDARD
STIF	STIFFENER
STL	STEEL
STRUCT (STR)	STRUCTURE, STRUCTURAL
SW	SHEAR WALL
SYMM	SYMMETRIC, SYMMETRICAL
SYP	SOUTHERN YELLOW PINE
T	TORSION
TC	TOP OF COLUMN
TO	TOP OF
TOC	TOP OF CONCRETE
TOM	TOP OF MASONRY
TOS	TOP OF STEEL, TOP OF SLAB
TRANS	TRANSVERSE
TYP	TYPICAL
UNO	UNLESS NOTED OTHERWISE
VERT	VERTICAL
WF (W)	WIDE FLANGE
WP	WORK POINT
WS	WATERSTOP
WSP	WOOD STRUCTURAL PANEL
WT	WEIGHT
WWR	WELDED WIRE REINFORCEMENT
XS	EXTRA STRONG (SCH. 40 PIPE)
XXS	DOUBLE EXTRA STRONG (SCH. 80 PIPE)

PLAN SYMBOLS



DEFINITIONS

1. **HORIZONTAL LATERAL LOAD RESISTING SYSTEM (DIAPHRAGM):** A STRUCTURAL ELEMENT WHICH TRANSMITS LATERAL LOADS TO THE VERTICAL LATERAL LOAD RESISTING SYSTEM.
2. **PRIMARY STRUCTURAL SYSTEM** IS THE COMPLETED COMBINATION OF ELEMENTS WHICH SERVE TO SUPPORT THE BUILDING'S SELF-WEIGHT, THE APPLICABLE LIVE LOAD WHICH IS BASED UPON THE OCCUPANCY AND USE OF THE SPACES AND THE ENVIRONMENTAL LOADS SUCH AS WIND, SEISMIC, AND THERMAL. CURTAIN WALL MEMBERS, NON-LOAD BEARING WALLS AND EXTERIOR FAÇADE ARE EXAMPLES OF ITEMS WHICH ARE NOT PART OF THE PRIMARY STRUCTURAL SYSTEM.
3. **PRIME DESIGN PROFESSIONAL** IS THE LEADER OF THE DESIGN TEAM CHARGED WITH THE DESIGN OF A FACILITY, EITHER AN ARCHITECT OR AN ENGINEER. THE PRIME DESIGN PROFESSIONAL IS RESPONSIBLE FOR DETERMINING AND INTERPRETING THE NEEDS OF THE CLIENT AND FOR COORDINATING THE WORK OF THE OTHER MEMBERS OF THE DESIGN TEAM. PRIME DESIGN PROFESSIONAL IS ALSO THE REGISTERED DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE (RDPIRC) AND MUST FULFILL THE DUTIES OUTLINED AS SUCH IN THE BUILDING CODE ADOPTED BY THE RELEVANT AUTHORITY HAVING JURISDICTION.
4. **REGISTERED DESIGN PROFESSION IN RESPONSIBLE CHARGE (RDPIRC)** OR PRIME DESIGN PROFESSIONAL WORKING DIRECTLY FOR THE REGISTERED DESIGN PROFESSIONAL WHO IS RESPONSIBLE FOR ENSURING THE PROJECT CONSTRUCTION DOCUMENTS COMPLY WITH THE APPLICABLE REQUIREMENTS OF ANY GOVERNING BUILDING AUTHORITIES. RESPONSIBLE FOR REVIEWING AND COORDINATING SUBMITTAL DOCUMENTS PREPARED BY OTHERS, INCLUDING PHASED AND DEFERRED SUBMITTAL ITEMS, FOR COMPATIBILITY WITH THE DESIGN OF THE BUILDING. TYPICALLY, THIS IS THE ARCHITECT OR CIVIL ENGINEER-OF-RECORD.
5. **REGISTERED DESIGN PROFESSIONAL** IS AN INDIVIDUAL WHO IS REGISTERED OR LICENSED TO PRACTICE THEIR RESPECTIVE DESIGN PROFESSION AS DEFINED BY THE STATUTORY REQUIREMENTS OF THE PROFESSIONAL REGISTRATION LAWS OF THE STATE OR JURISDICTION IN WHICH THE PROJECT IS TO BE CONSTRUCTED.
6. **SECONDARY STRUCTURAL ELEMENTS** ARE ELEMENTS THAT ARE STRUCTURALLY SIGNIFICANT FOR THE FUNCTION THEY SERVE BUT DO NOT CONTRIBUTE TO THE STRENGTH OR STABILITY OF THE PRIMARY STRUCTURE. EXAMPLES MAY INCLUDE BUT ARE NOT LIMITED TO: SUPPORT BEAMS ABOVE THE PRIMARY ROOF STRUCTURE WHICH CARRY A CHILLER OR OTHER EQUIPMENT, EXTERIOR NON-LOAD BEARING WALLS OR CLADDING SYSTEMS, STAIRS, ELEVATOR SUPPORT RAILS AND BEAMS, RETAINING WALLS INDEPENDENT OF THE PRIMARY BUILDING, AND FLAGPOLE OR LIGHT POLE FOUNDATIONS.
7. **SPECIALTY STRUCTURAL ENGINEER (SSE**) IS A LICENSED PROFESSIONAL ENGINEER, NOT THE STRUCTURAL ENGINEER OF RECORD, WHO PERFORMS ADDITIONAL STRUCTURAL ENGINEERING FUNCTIONS FOR SOME OF THE ELEMENTS OF A PROJECT NOT DESIGNED BY THE SER AS LIMITED IN THIS AGREEMENT.
8. **STRUCTURAL ENGINEER OF RECORD (SER)** IS THE ENGINEER LEGALLY ELIGIBLE TO SEAL THE STRUCTURAL DOCUMENTS FOR THE PROJECT. THIS SEAL ACKNOWLEDGES THAT HE OR SHE HAS PERFORMED OR SUPERVISED THE ANALYSIS, DESIGN AND DOCUMENT PREPARATION FOR THE BUILDING STRUCTURE AND HAS KNOWLEDGE OF THE REQUIREMENTS FOR THE LOAD CARRYING STRUCTURAL SYSTEM. THE SER IS RESPONSIBLE FOR THE DESIGN OF THE PRIMARY STRUCTURAL SYSTEM.
9. **VERTICAL LATERAL LOAD RESISTING SYSTEM**: ELEMENTS OF THE PRIMARY STRUCTURAL SYSTEM WHICH TRANSFER THE LATERAL LOADS INDUCED UPON THE STRUCTURE TO THE FOUNDATION AND ULTIMATELY INTO THE EARTH.

Revision Schedule

Revision Number	Revision Description	Revision Date

STATE OF TEXAS
DREW S DUDLEY
123798
LICENSED PROFESSIONAL ENGINEER
5/26/2023

CATTLEMEN LOT 112 RESIDENCE

3814 VAIL COURT
MONTGOMERY, TX 77356

DUDLEY
GEOTECHNICAL | STRUCTURAL | ENVIRONMENTAL
Dudley Engineering LLC dba DUDLEY

SYMBOLS AND NOTATIONS

S0.1

Date: 5/26/2023

Project No: 23-00195

STRUCTURAL REFERENCE SHEETS

FOUNDATION DETAILS: S2

S3

PLAN NOTES

1. VERIFY ALL EDGE OF FOUNDATION DIMENSIONS WITH FINAL ARCHITECTURE FLOOR PLANS.
2. FORM DIMENSIONS: SLAB DROPS, SLOPES, ETC. ARE SHOWN AS AN AID TO THE CONTRACTOR ONLY. VERIFY EXACT DIMENSIONS AND LOCATIONS WITH ARCH./OWNER.
3. DIMENSIONS ARE TO CL OF GRADE BEAMS OR EDGE OF SLAB UNLESS NOTED OTHERWISE.
4. REFER TO MEP DRAWINGS FOR PENETRATIONS AND UNDERGROUND UTILITIES. ALL PENETRATIONS SHALL BE SHOWN IN REBAR PLACEMENT DRAWINGS.
5. CONTRACTION (CONTROL) JOINTS (GROOVED OR SAW-CUTS) ARE RECOMMENDED TO REDUCE CRACKS IN SLAB WHICH WILL BE VISIBLE, BUT ARE NOT REQUIRED FOR STRUCTURAL REQUIREMENTS. FOR THE RECOMMENDED MAXIMUM JOINT SPACING, REF DETAIL 6 / S2
6. FOR FLATWORK OR PAVEMENT ABUTTING THE BUILDING FOUNDATION, REF DETAIL 13 / S2
7. CONCRETE IS ASSUMED TO RECEIVE A STEEL TROWEL FINISH UNLESS NOTED OTHERWISE. NOTIFY ENGINEER IF ARCHITECTURALLY EXPOSED CONCRETE (STAINED, POLISHED, ETC.) IS PLANNED FOR ADDITIONAL SHRINKAGE CRACKING MITIGATION METHODS.
8. SUPERSTRUCTURE DESIGN: THIS FOUNDATION HAS BEEN DESIGNED BASED UPON AN ASSUMED FRAMING LAYOUT. DUDLEY SHALL BE PROVIDED THE FINAL FRAMING DESIGN/LAYOUT (WHEN COMPLETED) FOR REVIEW IN ORDER TO VERIFY THAT NO UNANTICIPATED LOADS WILL BE APPLIED TO THE FOUNDATION. IT IS ASSUMED THAT ANY WALL WITH A TOTAL FACTORED LOAD DEMAND IN EXCESS OF **500** PLF (POUNDS PER LINEAR FOOT) WILL BE POSITIONED ABOVE A GRADE BEAM OR TURNDOWN. ANY LOAD BEARING POSTS/COLUMN MUST BE LOCATED ABOVE A GRADE BEAM/TURN DOWN.
9. ANCHOR BOLT / HOLDOWNS: REFERENCE FRAMING PLAN (BY OTHERS) FOR ALL ANCHOR BOLT AND HOLDOWN SIZES AND SPACING/LOCATION REQUIREMENTS.
10. FOR THE TYPICAL SUBGRADE PREPARATION DETAIL, REF 1 / S2

PLAN LEGEND

- FOUNDATION PERIMETER
- SLAB ELEVATION CHANGE
- FOOTING OUTLINE
- RECOMMENDED CONTRACTION (CONTROL) JOINT REF 6 / S2
- SLAB DROP, REF PLAN NOTE 1
- SLAB DROP W. SLOPE, REF PLAN NOTE 1
- RE-ENTRANT CORNER BARS REF 7 / S2
- SLOPE IN TOP SURFACE OF SLAB, REF ARCH FOR EXTENTS AND MAGNITUDE — SLOPE DOWN REF ARCH
- EXPOSED CONCRETE LIGHT BROOM FINISH

FOUNDATION & SLAB NOTES

FOUNDATION TYPE:	BRAB TYPE III - STIFFENED NON-STRUCTURAL SLAB-ON-GROUND		
SUBGRADE MODULUS	175 PCI		
SLAB THICKNESS:	4"	DESIGN CONCENTRATED LOAD	3,000 LBS OVER 2.5'x2.5' (900IN^2)AREA
SLAB REINFORCEMENT:	#4 @ 16" OC EACH WAY - REF DETAIL 5 / S2		
DESIGN METHOD:	ACI 318, ACI 360		
VAPOR RETARDER:	MINIMUM 10 MIL (UNLESS THICKER REQ'D BY ARCHITECT)		

BEAM ID[1]	DESCRIPTION	WIDTH	DEPTH[3]	TOP BARS	BOTTOM BARS	STIRRUPS[2]
B1	TYPICAL BEAM	12"	30"	(2) - #6	(3) - #6	#3 @ 24" OC
TD	TURNDOWN	12"	12"	N/R	(2) - #4	N/R

NOTES:
1. BEAMS ARE TYPE B1 UNO.
2. LOCATE THE FIRST STIRRUP A MAXIMUM OF 3" FROM FACE OF SUPPORT.
3. BEAM DEPTH INDICATED IN THE SCHEDULE IS A STRUCTURAL MINIMUM THAT THE BEAM REINFORCEMENT CAGE MAY BE BASED UPON. REFERENCE GEOTECHNICAL REPORT FOR MINIMUM GRADE BEAM EMBEDMENT BELOW ADJACENT FINAL GRADE OR FLATWORK/PAVEMENT. FOR VERTICAL MOISTURE BARRIERS THE DEPTH PROVIDED ARE AS FOLLOWS:
   A. (BEAM CAGE DEPTH / MINIMUM EMBEDMENT BELOW FINAL GRADE)
4. N/R = NOT REQUIRED
5. FOR ALLOWABLE SPLICE LOCATIONS, REF 4 /S2

REFERENCE DRAWING(S):
SLAB DIMENSIONS SHOWN ARE BASED UPON THE FOLLWING CAD (COMPUTER-AIDED DESIGN) REFERENCE FILE(S), BY OTHERS.
- FILE FORMAT: REVIT
- FILE NAME: CONROE LOT 112.0002
- DATE OF FILE: MAY 17, 2023
- FILE AUTHOR: THETFORD ARCHITECTS

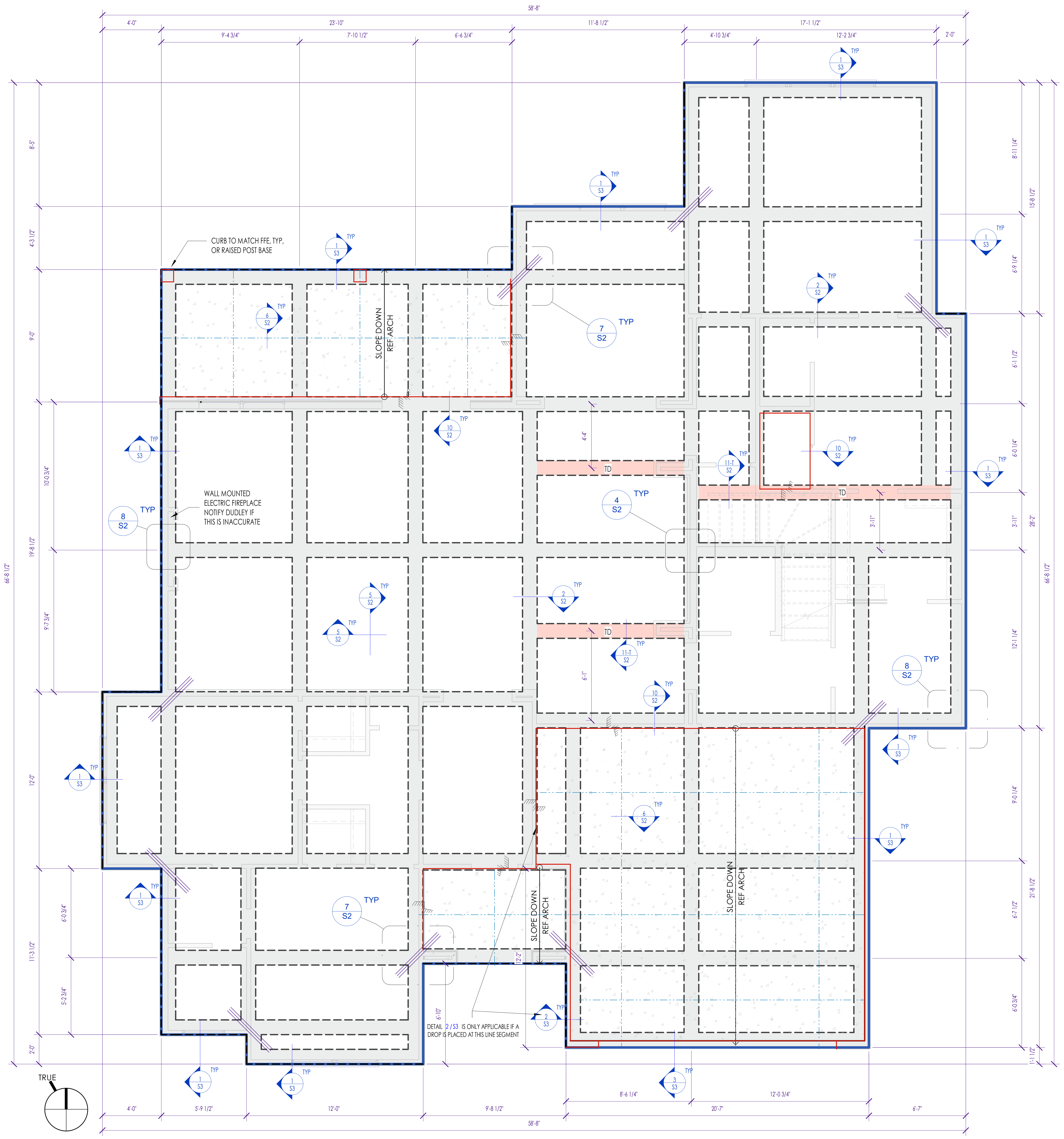
PTI PARAMETERS

e_m - CENTER	9.0'
e_m - EDGE	4.7'
Y_m - CENTER	0.75"
Y_m - EDGE	1.25"
EFFECTIVE PLASTICITY INDEX	25
ALLOW. BEARING (PSF)	2250
MIN **PERIMETER** BEAM EMBEDMENT BELOW **FINAL** GRADE / FLATWORK	12"

SLAB GEOMETRY

AREA (SF)	3010
PERIMETER (FT)	263
SHAPE FACTOR	23

AREA AND PERIMETER OF THE SLAB ARE PROVIDED FOR PURPOSES OF CALCULATING THE SHAPE FACTOR FOR THE SLAB ONLY AND SHALL NOT BE USED FOR ANY OTHER PURPOSE.



1 FOUNDATION PLAN
1/4" = 1'-0"

SUBGRADE AND BUILDING PAD NOTES (PER GEOTECHNICAL REPORT):

1. SUBGRADE IMPROVEMENT:
   A. PROVIDE A MINIMUM **2** FEET OF COMPACTED SELECT FILL TO TOP OF BUILDING PAD ELEVATION. THE SELECT FILL PAD MUST BE OF UNIFORM THICKNESS UNO BY GEOTECHNICAL ENGINEER.
2. SITE PREPARATION:
   A. SOFT SOILS SHOULD BE REMOVED UNTIL FIRM SOIL IS REACHED. THE SOFT SOILS CAN BE AERATED AND PLACED BACK IN SIX-INCH LOOSE LIFTS AND COMPACTED TO 95% AS SPECIFIED BY ASTM D-698. TREE STUMPS, TREE ROOTS, OLD SLABS, OLD FOUNDATIONS AND EXISTING PAVEMENTS SHOULD BE REMOVED FROM THE STRUCTURE AREA. IF THE TREE STUMPS AND ROOTS ARE LEFT IN PLACE, SETTLEMENT AND TERMITE INFESTATION MAY OCCUR. ONCE A ROOT SYSTEM IS REMOVED, A VOID IS CREATED IN THE SUBSOIL. IT IS RECOMMENDED TO FILL THESE VOIDS WITH STRUCTURAL FILL OR CEMENT-STABILIZED SAND AND COMPACT TO 95% AS SPECIFIED BY ASTM D-698.
   B. ANY LOW-LYING AREAS INCLUDING RAVINES, DITCHES, SWAMPS, ETC. SHOULD BE FILLED WITH STRUCTURAL FILL AND PLACED IN EIGHT-INCH LIFTS. EACH LIFT SHOULD BE COMPACTED TO 95% OF THE MAXIMUM DRY DENSITY AS SPECIFIED BY ASTM D-698.
   C. THE EXPOSED SUBGRADE SHOULD BE SCARIFIED TO A MINIMUM DEPTH OF SIX (6) INCHES FOUNDATION AREAS OR PER SUBGRADE IMPROVEMENT REQUIREMENTS. THE SUBGRADE SHOULD THEN BE COMPACTED TO 95% OF THE MAXIMUM DENSITY AS DETERMINED BY THE STANDARD MOISTURE DENSITY RELATIONSHIP (ASTM D-698). IN THE EVENT THAT THE UPPER SIX (6) INCHES CANNOT BE COMPACTED DUE TO EXCESSIVE MOISTURE, WE RECOMMEND THAT THESE SOILS BE EXCAVATED AND REMOVED OR CHEMICALLY STABILIZED TO PROVIDE A FIRM BASE FOR FILL PLACEMENT. PROOF ROLLING SHOULD BE PERFORMED USING A HEAVY TIRED LOADED TRUCK OR PNEUMATIC RUBBER-TIRED WEIGHING 20 TONS.
   D. THE SELECT FILL SOILS SHALL BE LIMITED TO THE FOOTPRINT OF THE FOUNDATION. IF OVERBUILD IS REQUIRED, INSTALL HORIZONTAL CLAY CAP TO COVER THE FILL OVERBUILD.
   E. THE FLOOR SLAB SHOULD BE PLACED AS SOON AS POSSIBLE AFTER THE BUILDING PAD IS PREPARED. IF THE BUILDING PAD IS LEFT EXPOSED TO RAINFALL, PERCHED GROUNDWATER CONDITIONS MAY DEVELOP WHICH WILL UNDERMINE THE INTEGRITY OF THE FLOOR SLAB. ALL TRENCHES (WATER, CABLE, ELECTRICAL) SHOULD BE PROPERLY BACKFILLED AND COMPACTED TO 95% OF THE MAXIMUM DRY DENSITIES. SAND OR PERMEABLE MATERIALS SHOULD NOT BE USED AS BACKFILL. IMPROPERLY BACKFILLED AND IMPROPERLY COMPACTED TRENCH, IF LEFT EXPOSED WILL ALSO BE ANOTHER SOURCE FOR PERCHED GROUNDWATER CONDITIONS. IN GENERAL PERCHED WATER TENDS TO BE TRAPPED WITHIN THE FILL. THE TRAPPED GROUNDWATER TENDS TO SOFTEN THE SUBGRADE. POSITIVE DRAINAGE SHOULD BE MAINTAINED ACROSS THE ENTIRE BUILDING PAD.
   F. A QUALIFIED SOIL TECHNICIAN SHOULD MONITOR ALL EARTHWORK OPERATIONS. FIELD DENSITY TESTS SHOULD BE CONDUCTED ON EACH LIFT USING A NUCLEAR DENSITY GAUGE. THE GAUGE SHOULD BE CALIBRATED EVERY DAY. PRIOR TO FIELD DENSITY TESTS, A 50-POUND SAMPLE FROM THE SUBGRADE SOILS SHOULD BE OBTAINED. A SIMILAR SAMPLE SHOULD BE OBTAINED FROM THE FILL SOILS. A STANDARD MOISTURE DENSITY RELATIONSHIP (ASTM D-698) SHOULD BE PERFORMED ON EACH SAMPLE IN ORDER TO OBTAIN AN OPTIMUM MOISTURE CONTENT AND A MAXIMUM DRY DENSITY. THE FIELD DENSITY TESTS SHOULD BE COMPARED TO THESE RESULTS EVERY TIME THE SOILS ARE TESTED IN THE FIELD.
3. LOW SWELL POTENTIAL STRUCTURAL FILL (SELECT FILL)
   A. LOW SWELL POTENTIAL SELECT FILL SHOULD CONSIST OF COHESIVE SOILS FREE OF ORGANICS OR OTHER DELETERIOUS MATERIALS AND SHOULD HAVE A PLASTICITY INDEX NOT LESS THAN 7 OR MORE THAN 20. SANDY CLAYS ARE RECOMMENDED FOR USE. THE LOW SWELL POTENTIAL SELECT FILL SHOULD BE CLEANED AND FREE OF ORGANIC MATTER OR OTHER DELETERIOUS MATERIAL. THE FILL SHOULD BE PLACED IN MAXIMUM 8-INCH LOOSE LIFTS AND COMPACTED TO A MINIMUM OF 95 PERCENT OF THE MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D 698 (STANDARD PROCTOR). THE MOISTURE CONTENT AT THE TIME OF COMPACTION SHOULD BE -2%, +3% OF THE OPTIMUM VALUE AS DEFINED BY ASTM D 698. THE REFERENCED MOISTURE CONTENT AND DENSITY SHOULD BE MAINTAINED UNTIL CONSTRUCTION IS COMPLETE.
4. HORIZONTAL MOISTURE BARRIER
   A. WHERE THE PERIMETER OF THE FOUNDATION DOES NOT HAVE LOW PERMEABILITY FLATWORK (SIDEWALK, PAVEMENT, PATIO, ETC.) ABUTTING THE FOUNDATION, A HORIZONTAL MOISTURE BARRIER VIA CLAY CAP AND VAPOR RETARDER MUST BE PROVIDED.
      a. CLAY CAP: A MINIMUM 5' WIDE LOW PERMEABILITY CLAY "CAP" SHALL BE PLACED ALONG THE EXTERIOR OF THE FOUNDATION TO HELP MINIMIZE MOISTURE INFILTRATION INTO THE SELECT FILL SOIL PADS. THE LOW PERMEABILITY, 1-FOOT THICK CLAY "CAP" SHALL HAVE A PLASTICITY INDEX (PI) BETWEEN 20 & 35.
      b. VAPOR RETARDER: BELOW THE CLAY CAP, A MIN 10 MIL VAPOR RETARDER MUST BE PROVIDED ON A MINIMUM 5% SLOPE. RETARDER MUST BE SECURED TO THE FOUNDATION.
5. DRAINAGE
   A. ROOF DRAINAGE SHOULD BE COLLECTED BY A SYSTEM OF GUTTERS AND DOWNSPOUTS AND TRANSMITTED A MINIMUM DISTANCE OF 10' AWAY FROM THE FOUNDATION TO AN AREA WITH POSITIVE DRAINAGE AWAY FROM THE FOUNDATION, PREFERABLY TO A PAVED SURFACE WHERE WATER CAN DRAIN RAPIDLY AWAY FROM THE STRUCTURE. SIDEWALKS, PARKING AREAS, BUILDING ACCESS DRIVES, AND THE GENERAL GROUND SURFACE SHOULD BE SLOPED SO THAT WATER WILL DRAIN AWAY FROM THE STRUCTURE. WATER SHOULD NOT BE ALLOWED TO POND NEAR THE BUILDING FOUNDATIONS.
   B. FINAL GRADES SHALL SLOPE A MINIMUM OF 5% (6") FOR THE FIRST 10 FEET AWAY FROM THE FOUNDATION IN ALL DIRECTIONS, WITH THE EXCEPTIONS BELOW. [NOTE: THIS SLOPE SHALL OCCUR IN THE SELECT FILL OR IN-SITU SOIL. MERELY SLOPING TOPSOIL IS NOT SUFFICIENT.] REFER TO CIVIL DRAWINGS FOR ALL DRAINAGE REQUIREMENTS.
      a. EXCEPTIONS:
         - WHERE LOT LINES, WALLS, SLOPES OR OTHER PHYSICAL BARRIERS PROHIBIT 6 INCHES OF FALL WITHIN 10 FEET, A 5% SLOPE SHALL BE PROVIDED TO EITHER DRAINS OR SWALES TO ENSURE DRAINAGE AWAY FROM THE STRUCTURE.
           1. SWALES USE FOR THIS PURPOSE SHALL BE SLOPED NOT LESS THAN 2% WHERE LOCATED WITHIN 10' OF THE BUILDING FOUNDATION.
         - IMPERVIOUS SURFACES WITHIN 10 FEET OF THE BUILDING FOUNDATION SHALL BE SLOPED A MINIMUM OF 2% AWAY FROM THE BUILDING.
6. LANDSCAPING
   A. DO NOT USE METAL EDGING OR OTHER DAMMING DEVICES WITHIN FIVE FEET OF THE FOUNDATION. THE ROOTS OF TREES AND LARGE PLANTS REMOVE LARGE QUANTITIES OF WATER FROM THE SOIL. IF THESE TREES AND SHRUBS ARE NEAR THE FOUNDATION AND IF SUFFICIENT WATER IS NOT SUPPLIED, THE SOILS MAY SHRINK IF EXPANSIVE, CAUSING SUBSIDENCE IN THE FOUNDATION. DURING DRY PERIODS, ENOUGH WATER SHOULD BE SUPPLIED TO TREES TO MINIMIZE SHRINKING OF EXPANSIVE SOILS AROUND THEM. MOST OF THE IRRIGATION WATER SHOULD BE APPLIED WELL AWAY FROM THE FOUNDATION TO ATTRACT THE TREE ROOTS IN THAT DIRECTION. WHEN TREES MATURE TO THE POINT OF SHADING THE ENTIRE LOT, REGULAR PRUNING WILL BE NEEDED TO REDUCE THEIR WATER UPTAKE. LANDSCAPING (PLANTS, SHRUBS, FLOWERS, ETC.) SHOULD NOT TRAP WATER AGAINST THE FOUNDATION. PROVIDE A SLOPE IN SOILS BELOW LANDSCAPE BEDDING AND IN THE BEDDING AWAY FROM THE FOUNDATION. ALTERNATIVELY, PROVIDE SWALES AROUND AND THROUGH THE LANDSCAPING TO DRAIN WATER AWAY. PROVIDE UNIFORM GROUND COVER AROUND THE FOUNDATION. THIS WILL HELP KEEP THE MOISTURE EVAPORATION RATE UNIFORM. IN AREAS THAT ARE NOT PLANTED, USE MULCH. EXTEND THE GROUND COVER AT LEAST FIVE FEET FROM THE FOUNDATION.
   B. ANY/ALL TREES SHALL BE PLANTED AT A MINIMUM DISTANCE EQUIVALENT TO THE HEIGHT OF THE TREE OR THE DRIP LINE PLUS 10 FEET WHICHEVER IS GREATER.
7. SOIL MOISTURE
   A. EXPANSIVE SOILS HEAVE AND SUBSIDE DUE TO CHANGES IN MOISTURE CONTENT. CHANGES IN MOISTURE CONTENT CAN CAUSE VERY LARGE CHANGES IN SOIL VOLUME WHEN GOING FROM A DRY TO A SATURATED CONDITION, AND VICE VERSA. THIS MOVEMENT DOES NOT MEAN THE FOUNDATION IS IMPROPERLY DESIGNED OR THAT IT HAS FAILED. THE FOUNDATION DESIGN ENGINEER CANNOT CONTROL THE MOISTURE CONTENT OF THE SOIL, BUT OFTEN THE OWNER/TENANT CAN. UNIFORMITY IS THE KEY: UNIFORM MOISTURE CONTENT IN THE SOIL, UNIFORMLY MAINTAINED IN ALL AREAS AROUND THE FOUNDATION. IF CHANGES IN MOISTURE CONTENT ARE UNIFORM, THEN MOVEMENT OF THE FOUNDATION WILL BE UNIFORM AND LESS DISTRESS WILL BE CREATED IN THE STRUCTURE. IF CHANGES IN MOISTURE CONTENT ARE NON-UNIFORM, THEN THERE MAY BE DIFFERENTIAL MOVEMENT IN THE FOUNDATION. DIFFERENTIAL MOVEMENT CAN CAUSE GREATER (AND MORE OBVIOUS) DISTRESS IN THE STRUCTURE. LEAKING POOLS, LEAKING PLUMBING LINES, LEAKING DRAINS, DRIPPING FAUCETS, DRIPPING AIR CONDITIONING CONDENSATE LINES, AND MISDIRECTED WATER FROM CLOGGED AND BROKEN GUTTERS AND DOWNSPOUTS CAN CAUSE LOCAL HIGH MOISTURE CONTENTS THAT CAN RESULT IN DIFFERENTIAL MOVEMENT IN AREAS OF EXPANSIVE SOILS. THESE CONDITIONS SHOULD BE REMEDIED AS SOON AS POSSIBLE. TREES IN OR NEAR THE FOOTPRINT OF THE FOUNDATION, EITHER REMOVED OR PLANTED DURING CONSTRUCTION, CAUSE THE MAJORITY OF FOUNDATION PROBLEMS REQUIRING REPAIR IN THIS AREA. TREES REMOVED DURING CONSTRUCTION TEND TO CAUSE HEAVE OF EXPANSIVE SOILS DURING THE FIRST FEW YEARS, WITH INITIAL DISTRESS OFTEN EVIDENT AT THE TIME OF MOVE-IN. TREES PLANTED DURING OR AFTER CONSTRUCTION TEND TO CAUSE SUBSIDENCE OF EXPANSIVE SOILS. HOWEVER, SIGNIFICANT SUBSIDENCE DISTRESS WILL USUALLY NOT OCCUR FOR TEN TO TWENTY YEARS AS THE TREES MATURE.
8. CLIMATE
   A. DURING PERIODS OF DRY WEATHER, THE SOIL AROUND THE FOUNDATION SHOULD BE IRRIGATED IF THE BUILDING IS LOCATED IN AN AREA WHERE EXPANSIVE SOILS ARE KNOWN TO OCCUR. THE MOST COMMONLY USED IRRIGATION SYSTEM IS ABOVEGROUND TIMED SPRINKLERS WITH A MANUAL OVERRIDE SO THEY CAN BE TURNED OFF IN RAINY WEATHER. AN AUTOMATIC BELOWGROUND IRRIGATION SYSTEM THAT SENSES THE MOISTURE CONTENT OF THE SOIL MAY ALSO BE USED. TEND TO KEEP THE IRRIGATION SYSTEM SET ON "MANUAL", AND ONLY USE IT IN DRIER PERIODS WHEN WILTING OF THE LAWN GRASSES AND OTHER VEGETATION OCCURS. THE IRRIGATION SHOULD BE DONE AT LEAST ONE TO TWO FEET AWAY FROM THE FOUNDATION, AND THEN LIGHTLY SO THAT TREE ROOTS ARE NOT ATTRACTED THERE. DO NOT ALLOW SPRINKLERS TO SPRAY WATER AGAINST THE STRUCTURE. IN EXTENDED DRY PERIODS, SHOULD THE SOIL CRACK AND PULL AWAY FROM THE FOUNDATION, DO NOT WATER DIRECTLY INTO THE GAP.
9. UTILITIES
   A. CONNECTIONS FOR UTILITIES (PLUMBING, ELECTRICAL, GAS, ETC.) THAT ARE UNDERNEATH, GO THROUGH OR ARE ATTACHED TO THE FOUNDATION SHALL HAVE BE FLEXIBLE TO ACCOMMODATE FOUNDATION MOVEMENT OF AT LEAST 2". ALL DRAINAGE PIPING, AND GENERAL PLUMBING SYSTEMS ASSOCIATED WITH THE FOUNDATION OR IN PROXIMITY TO THE FOUNDATION SHALL BE LEAK TESTED FOLLOWING INSTALLATION AND ON AN ANNUAL BASIS.
10. ARCHITECTURAL FINISHES
   A. FLOORING FINISHES SHALL BE JOINTED AT CONSTRUCTION, EXPANSION OR CONTROL JOINTS IN THE CONCRETE.
   B. BRITTLE FLOOR FINISHES SUCH AS CERAMIC, STONE, ETC. FLOORS SHALL HAVE AN UNCOUPLING POLYETHYLENE MEMBRANE BENEATH THE TILE THAT ALLOWS IN-PLANE MOVEMENT. EXAMPLE PRODUCTS: SCHLUTER-DITRA, NUHEAT UNCOUPLING MEMBRANE
   C. WALL COVERINGS (DRYWALL, GYPSYM BOARD, MASONRY VENEER, ETC.) SHALL BE JOINTED ON EACH SIDE OF DOOR AND WINDOW OPENINGS.
   D. ALL ARCHITECTURAL FINISHES SHALL MIRROR CONTROL, EXPANSION OR CONSTRUCTION JOINTS IN THE FOUNDATION.
11. FUTURE STRUCTURES:
   A. THE OWNER/CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER IF FUTURE STRUCTURES SUCH AS SWIMMING POOLS, JACUZZI OR ANY OTHER STRUCTURE THAT HAS A FOUNDATION AND IS LOCATED WITHIN 30 FEET FROM THE PRIMARY BUILDING FOUNDATION IS PLANNED AS SUCH STRUCTURES CAN HAVE AN AFFECT ON THE PERFORMANCE OF THE PRIMARY BUILDING FOUNDATION.

Revision Schedule

Revision Number	Revision Description	Revision Date

STATE OF TEXAS
DREW S DUDLEY
123798
LICENSED PROFESSIONAL ENGINEER
5/26/2023

CATTLEMEN LOT 112 RESIDENCE
3814 VAIL COURT
MONTGOMERY, TX 77356

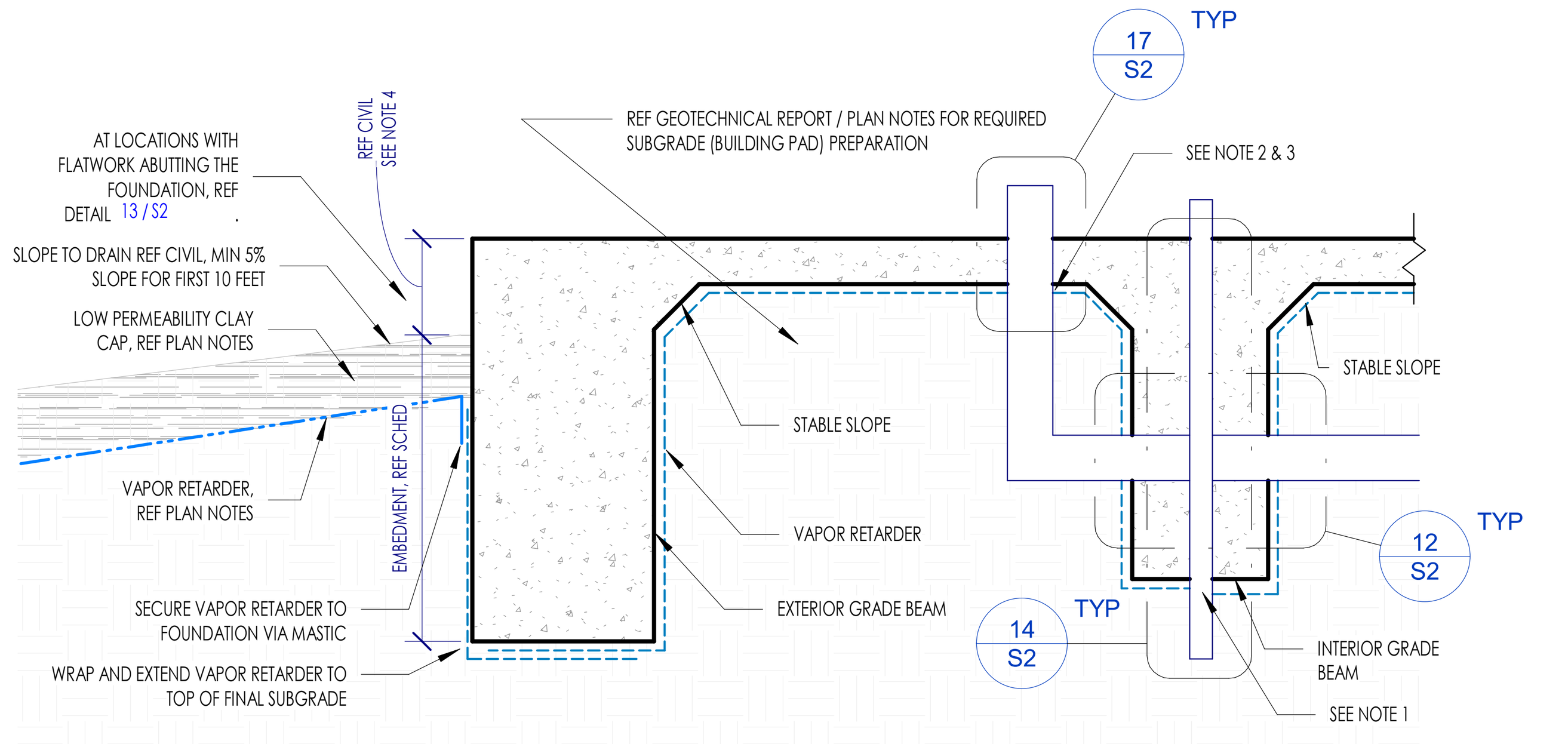
DUDLEY
GEOTECHNICAL | STRUCTURAL | ENVIRONMENTAL

FOUNDATION PLAN

S1

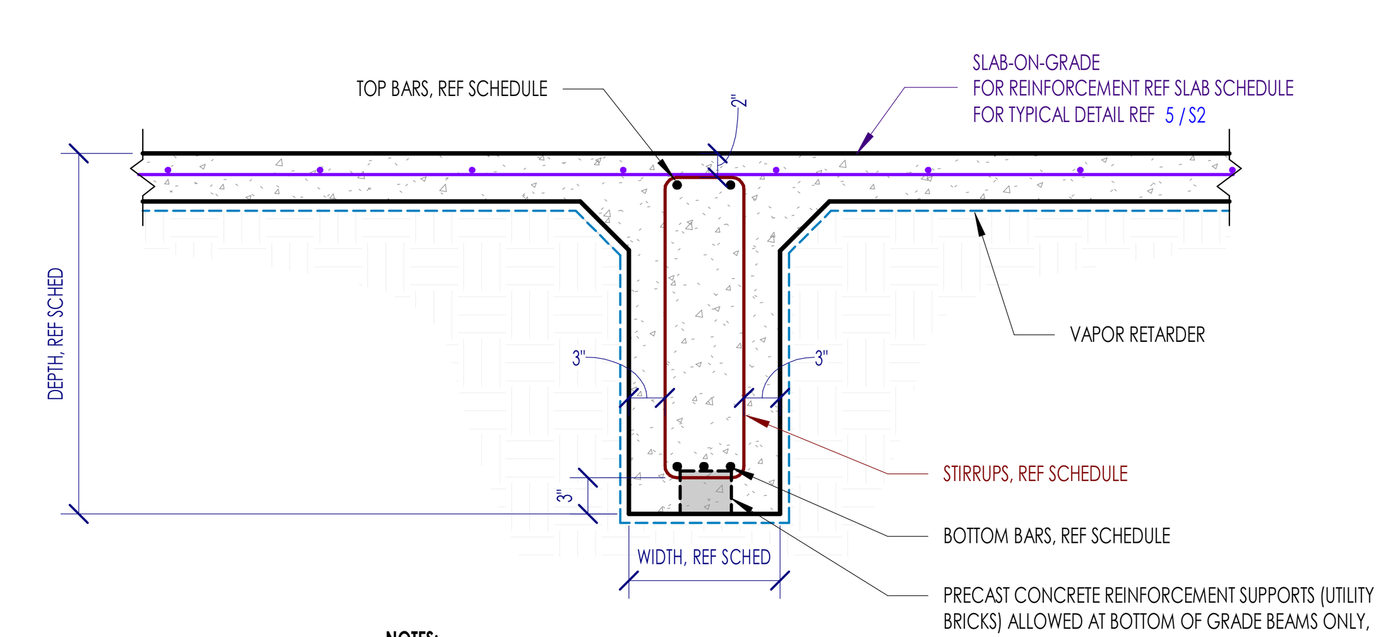
Date: 5/26/2023

Project No: 23-00195



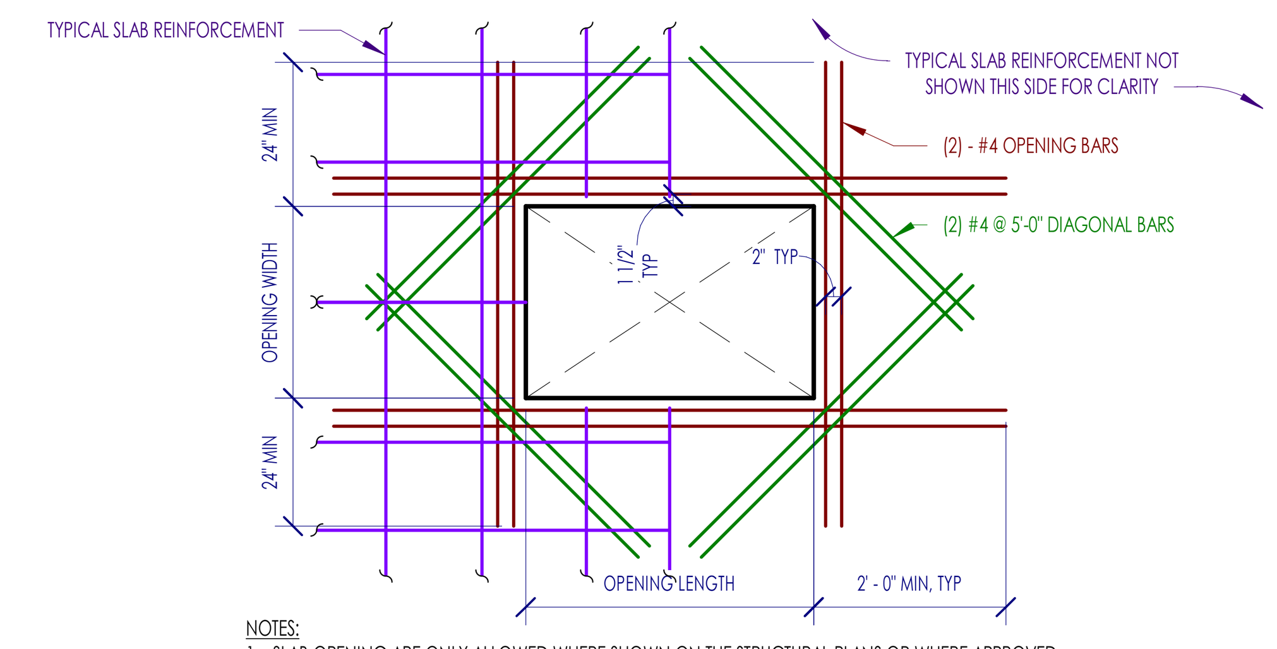
NOTES:
1. CUT AND/OR LAP THE VAPOR RETARDER AT THE BOTTOM OF INTERIOR GRADE BEAMS. THE VAPOR RETARDER SHALL BE SECURED TO THE SIDES OF THE GRADE BEAM. IF LAPS ARE REQUIRED ON TOP OF THE SLAB, THEY MUST BE TAPED PER MFR RECOMMENDATIONS.
2. ALL PIPE, DUCTING, REBAR, WIRE PENETRATIONS AND BLOCK OUTS SHOULD BE SEALED USING MFR RECOMMENDED WRAP, TAPE AND/OR MASTIC
3. IN THE EVENT THAT THE VAPOR RETARDER IS DAMAGED DURING OR AFTER INSTALLATION, REPAIRS MUST BE MADE. FOR HOLES, CUT A PIECE OF VAPOR RETARDER TO A SIZE AND SHAPE THAT COVERS ANY DAMAGE BY A MINIMUM OVERLAP OF 6" IN ALL DIRECTIONS. CLEAN ALL ADHESION AREAS OF DUST, DIRT, MOISTURE, AND FROST. TAPE DOWN ALL EDGES USING MFR RECOMMENDED TAPE.
4. THE FINISH FLOOR ELEVATION SHALL BE A MINIMUM OF 6" ABOVE FINAL GRADE (GROUND) UNLESS IMPERVIOUS COVER IS PROVIDED. THE GROUND IMMEDIATELY ADJACENT TO THE FOUNDATION SHALL BE SLOPED AWAY FROM THE BUILDING AT A SLOPE OF NOT LESS THAN 5% FOR A MINIMUM DISTANCE OF 10' MEASURED PERPENDICULAR TO THE FACE OF THE FOUNDATION. IF PHYSICAL OBSTRUCTIONS OR LOT LINES PROHIBIT 10' OF HORIZONTAL DISTANCE, A 5% SLOPE SHALL BE PROVIDED TO AN APPROVED ALTERNATIVE SYSTEM OF DIVERTING WATER AWAY FROM THE FOUNDATION. SWALES USED FOR THIS PURPOSE SHALL BE SLOPED NOT LESS THAN 2% WHERE LOCATED WITHIN 10' OF THE BUILDING FOUNDATION. IMPERVIOUS SURFACES WITHIN 10' OF THE BUILDING FOUNDATION SHALL BE SLOPED NOT LESS THAN 2% AWAY FROM THE BUILDING. IMPERVIOUS SURFACE SHALL BE PERMITTED TO BE SLOPED LESS THAN 2% WHERE THE SURFACE IS A DOOR LANDING OR RAMP. THE PROCEDURE USED TO ESTABLISH THE FINAL GROUND LEVEL ADJACENT TO THE FOUNDATION SHALL ACCOUNT FOR ADDITIONAL SETTLEMENT OF BACKFILL, FREEZE/THAW DUE TO FROST, AND HEAVE/SUBSIDENCE DUE TO EXPANSIVE SOIL. FLATWORK (SIDEWALK, PAVEMENT, STOOPS, ETC.) IS NOT WITHIN THE SCOPE OF THE STRUCTURAL ENGINEER-OF-RECORD, REFER TO CIVIL.

1 TYPICAL SUBGRADE AND VAPOR RETARDER PREPARATION
NOT TO SCALE (© Dudley Engineering LLC)



NOTES:
1. BEAM SCHEDULE IS ON SHEET S1

2 TYPICAL INTERIOR GRADE BEAM & TYPICAL CLEAR COVER FOR BEAM REINFORCEMENT
NOT TO SCALE (© Dudley Engineering LLC)

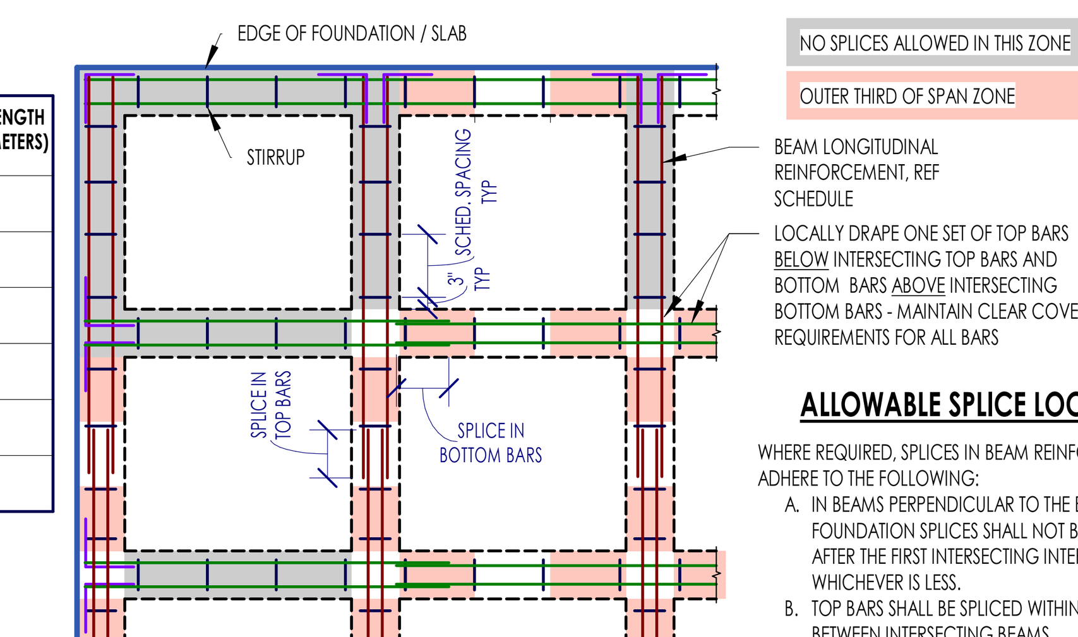


NOTES:
1. SLAB OPENING ARE ONLY ALLOWED WHERE SHOWN ON THE STRUCTURAL PLANS OR WHERE APPROVED IN WRITING BY THE STRUCTURAL ENGINEER

3 TYPICAL REINFORCEMENT AT SLAB BLOCKOUT / OPENING
NOT TO SCALE (© Dudley Engineering LLC)

FOR BEAM SCHEDULE REFERENCE SHEET S1

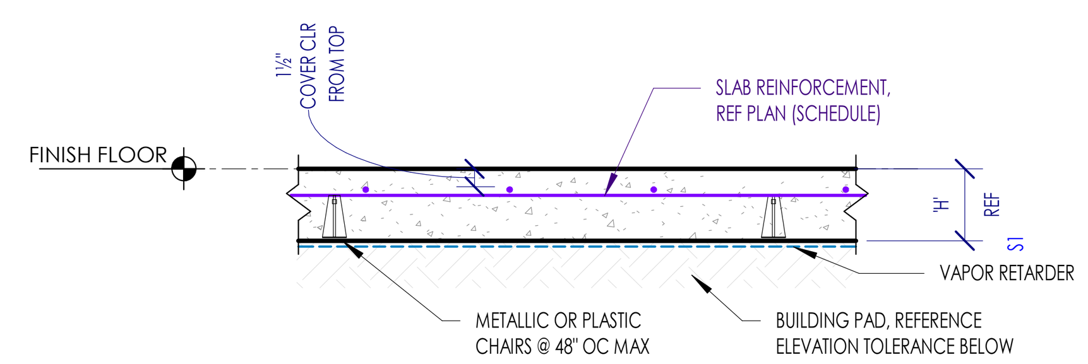
BAR DIAMETER	LAP SPLICE LENGTH (48 BAR DIAMETERS)
#3	18"
#4	24"
#5	30"
#6	36"
#7	42"
#8	48"



ALLOWABLE SPLICE LOCATIONS

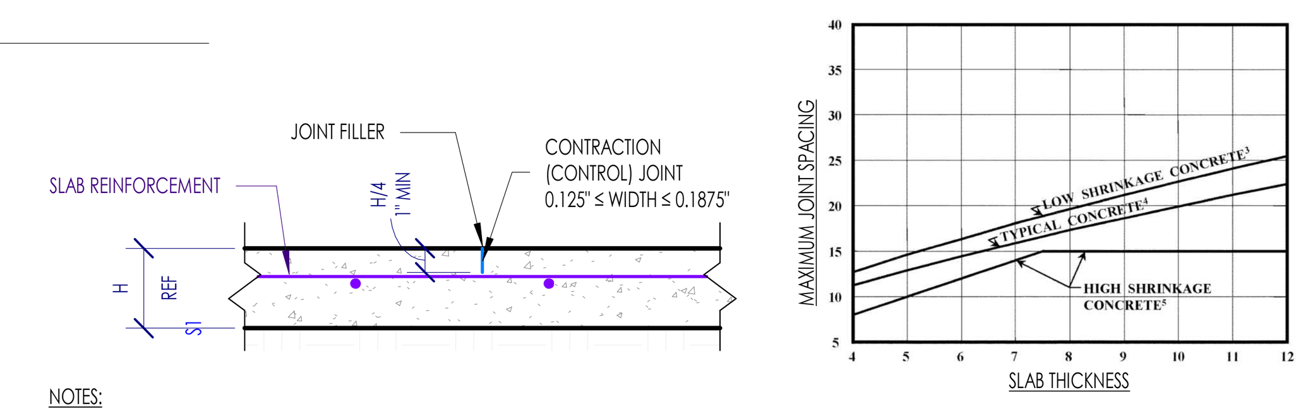
WHERE REQUIRED, SPLICES IN BEAM REINFORCMENT SHALL ADHERE TO THE FOLLOWING:
A. IN BEAMS PERPENDICULAR TO THE EDGE OF THE FOUNDATION SPLICES SHALL NOT BE LOCATED UNTIL AFTER THE FIRST INTERSECTING INTERIOR BEAM OR 15' WHICHEVER IS LESS.
B. TOP BARS SHALL BE SPLICED WITHIN THE MIDDLE THIRD BETWEEN INTERSECTING BEAMS.
C. BOTTOM BARS SHALL BE SPLICED OUTSIDE THE OUTER-THIRDS OF THE SPANS BETWEEN INTERSECTING BEAMS.
D. DO NOT SPLICE BARS AT BEAM INTERSECTIONS

4 TYPICAL BEAM LONGITUDINAL BAR SPLICE & INTERIOR BEAM INTERSECTION - SCHEMATIC LAYOUT
NOT TO SCALE (© Dudley Engineering LLC)



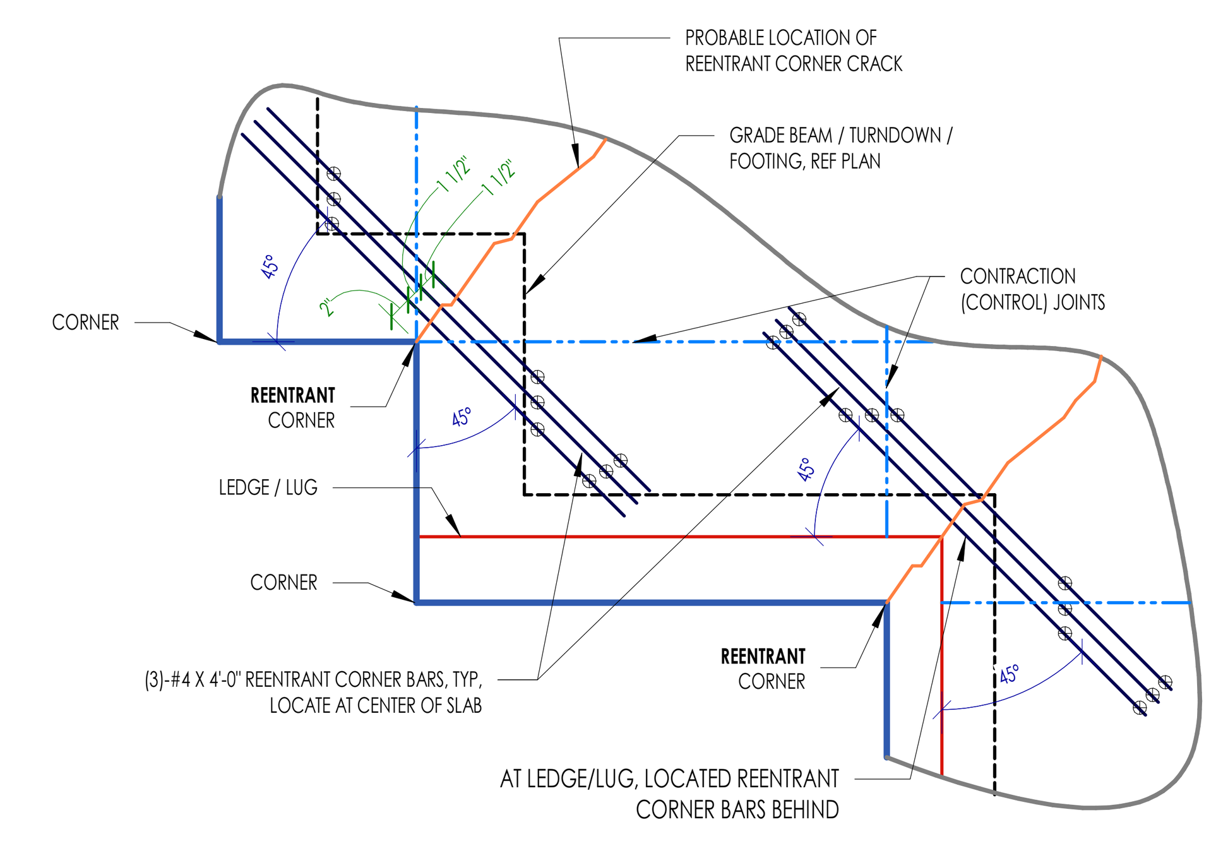
TOLERANCES FOR SLAB-ON-GRADE CONSTRUCTION (BASED ON ACI 117-10):
1. DEVIATION FROM ELEVATION:
   A. TOP SURFACE OF SLAB: ± 3/4"
   B. FINE GRADE OF SOIL IMMEDIATELY BELOW SLABS-ON-GROUND: ± 3/4"
2. THICKNESS OF SLABS-ON-GROUND:
   A. AVERAGE OF ALL SAMPLE: -3/8"
   B. INDIVIDUAL SAMPLE: -3/4"
3. PLASTIC OR STEEL WIRE CHAIR ONLY (NO MASONRY) IN ACCORDANCE WITH CRS
4. FOR CONTRACTION (CONTROL) JOINTS IN SLAB-ON-GRADE, REF 6 / S2
5. LAP SPLICES IN SLAB REINFORCEMENT SHALL BE STAGGERED A MINIMUM OF 5' APART

5 TYPICAL NON-STRUCTURAL SLAB-ON-GRADE SECTION
NOT TO SCALE (© Dudley Engineering LLC)



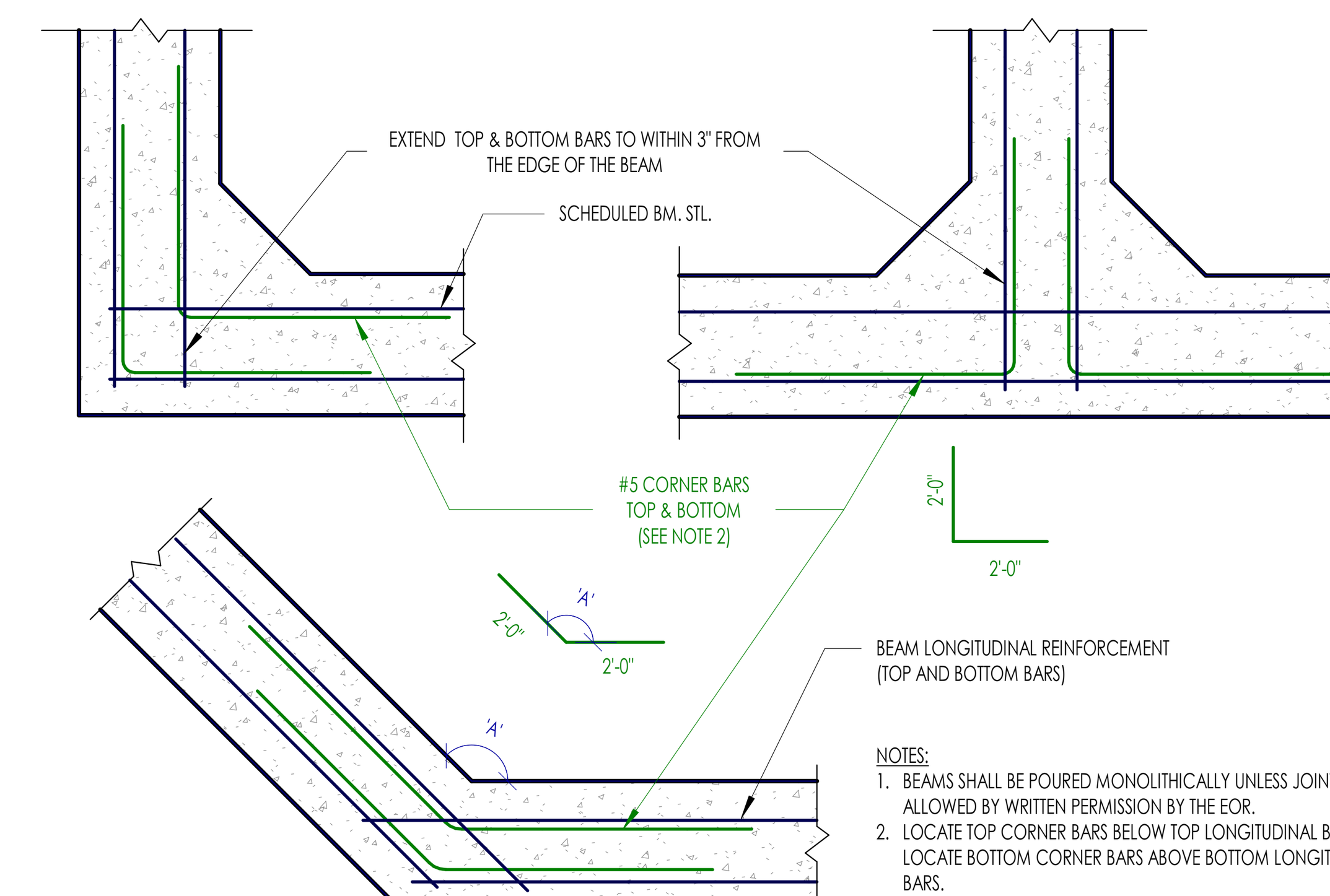
NOTES:
1. ****CONTRACTION (CONTROL) JOINTS SHALL BE PLACED AS SOON AS THE CONCRETE BEGINS TO COOL, AS SOON AS THE CONCRETE SURFACE IS FIRM ENOUGH TO NOT BE TORN OR DAMAGED BY THE BLADE (IF SAW CUTTING) AND HAS SET ENOUGH TO SUPPORT THE WEIGHT OF THE EQUIPMENT AND WORKER****
2. CONTRACTION (CONTROL) JOINT CAN EITHER BE TOOLED OR SAW-CUT (WITH AN EARLY ENTRY DRY-CUT SAW WITH DEPTH INDICATOR) INTO THE CONCRETE
3. CONTRACTION (CONTROL) JOINTS WHICH ARE USED TO CONTROL CRACKING ARE INAFFECTIVE IF THE FOLLOWING OCCUR:
   A. PLACED TOO LATE
   B. NOT DEEP ENOUGH
   C. SUBGRADE HAS ABRUPT CHANGES IN ELEVATION OUTSIDE OF ACI 117 TOLERANCES
4. REFERENCE CONCRETE MATRIX FOR WHETHER LOW SHRINKAGE CONCRETE IS SPECIFIED. (ULTIMATE DRY SHRINKAGE STRAIN LESS THAN 520 MILLIONTHS PLACED ON A DRY BASE MATERIALS)
5. UNLESS NOTED OTHERWISE, CONCRETE IS ASSUMED TO BE OF NORMAL SHRINKAGE (ULTIMATE DRY SHRINKAGE STRAIN OF 520 TO 780 MILLIONTHS PLACED ON A DRY BASE MATERIALS)
6. HIGH SHRINKAGE CONCRETE SHALL NOT BE USED. ADDING WATER OVER THE W/C CAN LEAD TO A HIGH SHRINKAGE RATE.
7. JOINT FILLER
   A. FILLER MATERIAL SHALL ADHERE TO ASTM D2240 AND HAVE A MINIMUM SHORE (A) HARDNESS OF 80. MFR. PRODUCTS SHALL BE MM-80 BY METZGER/MCGUIRE, EUCO 700 BY EUCLID OR APPROVED EQUIVALENT.
   B. FILLER MATERIAL SHALL BE APPLIED A MINIMUM OF 90 DAYS AFTER SLAB CONSTRUCTION AND PREFERRABLY AFTER SHELL CONSTRUCTION IS COMPLETE.
   C. ALL VISIBILY EXPOSED SLAB JOINTS SHALL BE FILLED WITH FILLER MATERIAL UNO BY ARCH.
   D. WHERE WET CONDITIONS OR HYGIENIC REQUIREMENTS EXIST, JOINTS SHALL BE SEALED WITH AN ELASTOMERIC LIQUID SEALANT.
8. NON-FLEXIBLE FLOOR FINISHES PLACED OVER THE JOINT SHALL BE INSTALLED TO ACCOMODATE UP TO 1/8" OF HORIZONTAL MOVEMENT.

6 TYPICAL CONTRACTION (CONTROL) JOINT IN SLAB-ON-GRADE
NOT TO SCALE (© Dudley Engineering LLC)



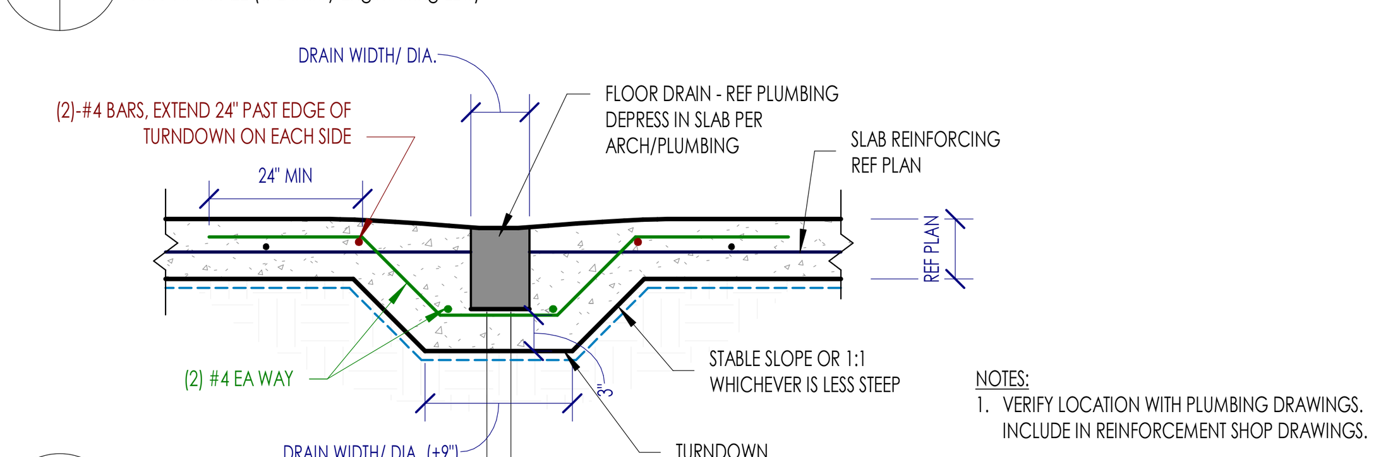
NOTES:
1. REENTRANT CORNER BARS WILL NOT ELIMINATE REENTRANT CORNER CRACKS, THEY WILL MITIGATE THE WIDTH OF THE CRACKS. FOR OPTIMAL MITIGATION OF CRACKS, PLACE CONTRACTION (CONTROL) JOINTS AS SOON AS POSSIBLE.

7 TYPICAL REENTRANT CORNER BARS
NOT TO SCALE (© Dudley Engineering LLC)



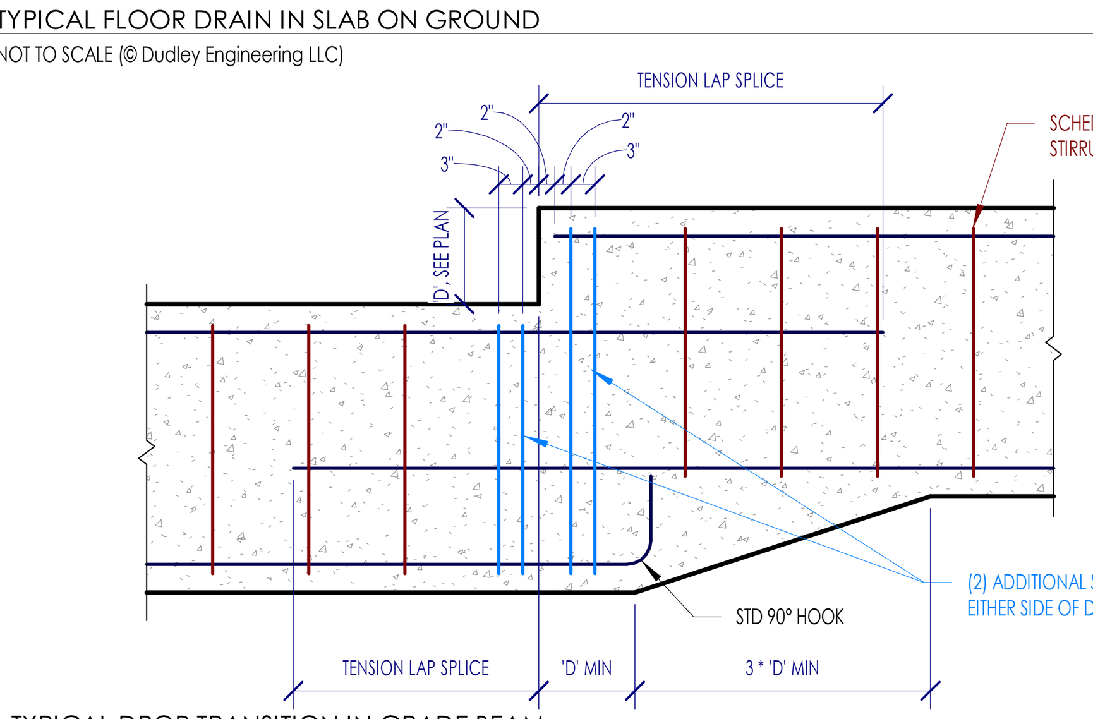
NOTES:
1. BEAMS SHALL BE POURED MONOLITHICALLY UNLESS JOINTS ARE ALLOWED BY WRITTEN PERMISSION BY THE EOR.
2. LOCATE TOP CORNER BARS BELOW TOP LONGITUDINAL BARS. LOCATE BOTTOM CORNER BARS ABOVE BOTTOM LONGITUDINAL BARS.

8 TYPICAL GRADE BEAM (CONTINUOUS FOOTING) CORNER BARS
NOT TO SCALE (© Dudley Engineering LLC)

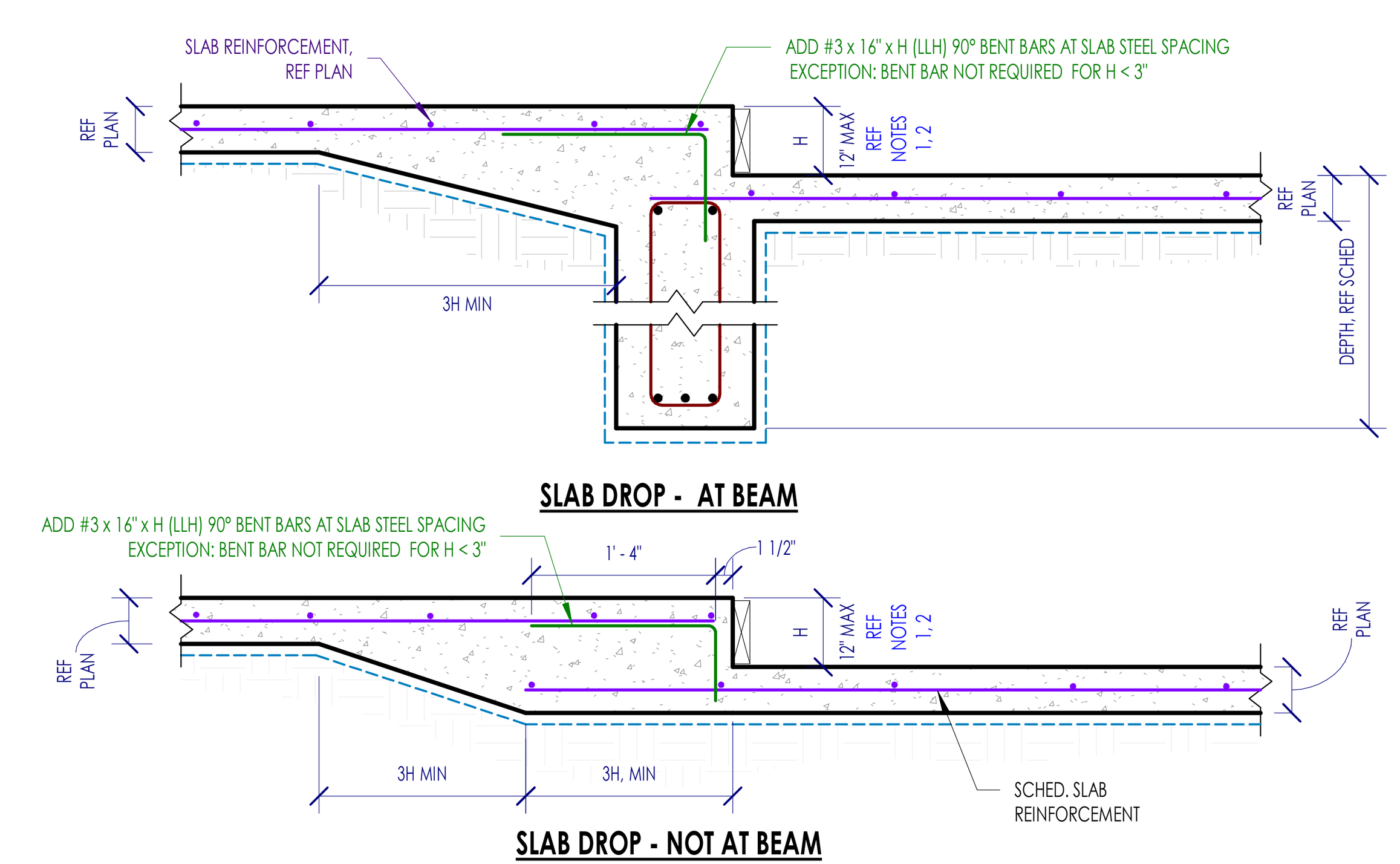


NOTES:
1. VERIFY LOCATION WITH PLUMBING DRAWINGS. INCLUDE IN REINFORCEMENT SHOP DRAWINGS.

9-T TYPICAL FLOOR DRAIN IN SLAB ON GROUND
NOT TO SCALE (© Dudley Engineering LLC)

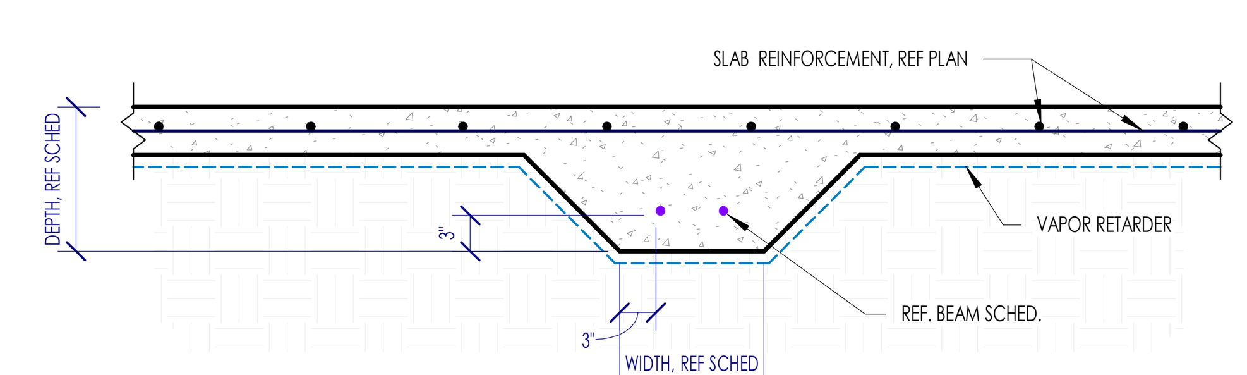


9 TYPICAL DROP TRANSITION IN GRADE BEAM
NOT TO SCALE (© Dudley Engineering LLC)

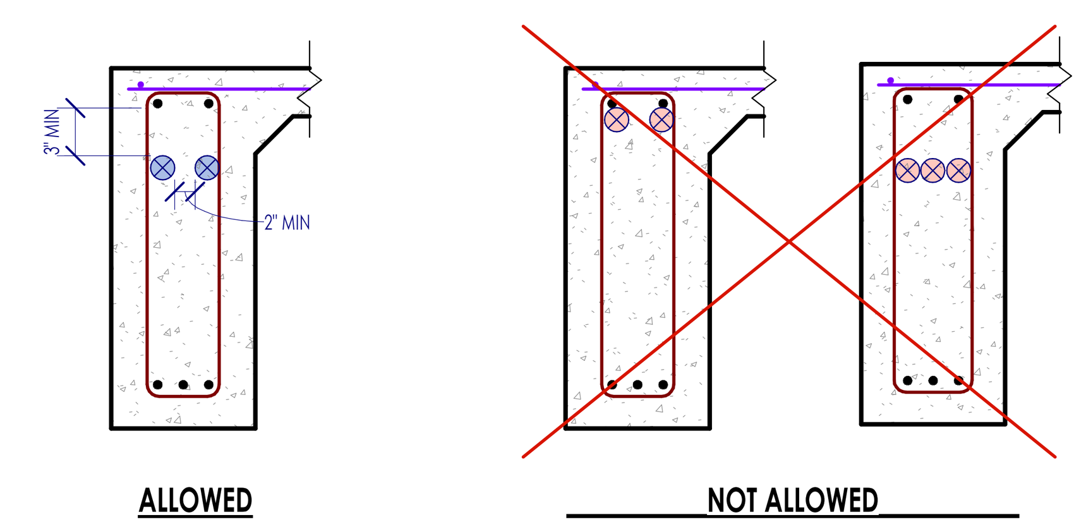


NOTES:
1. NOTIFY ENGINEER IF DROP EXCEED MAX LIMIT.
2. ADDITIONAL REINFORCEMENT/LAP NOT REQUIRED FOR DROPS LESS THAN OR EQUAL TO 1½". REINFORCEMENT SHALL BE GRADUALLY BENT TO ADJUST TO ELEVATION CHANGE IN THESE CASES.

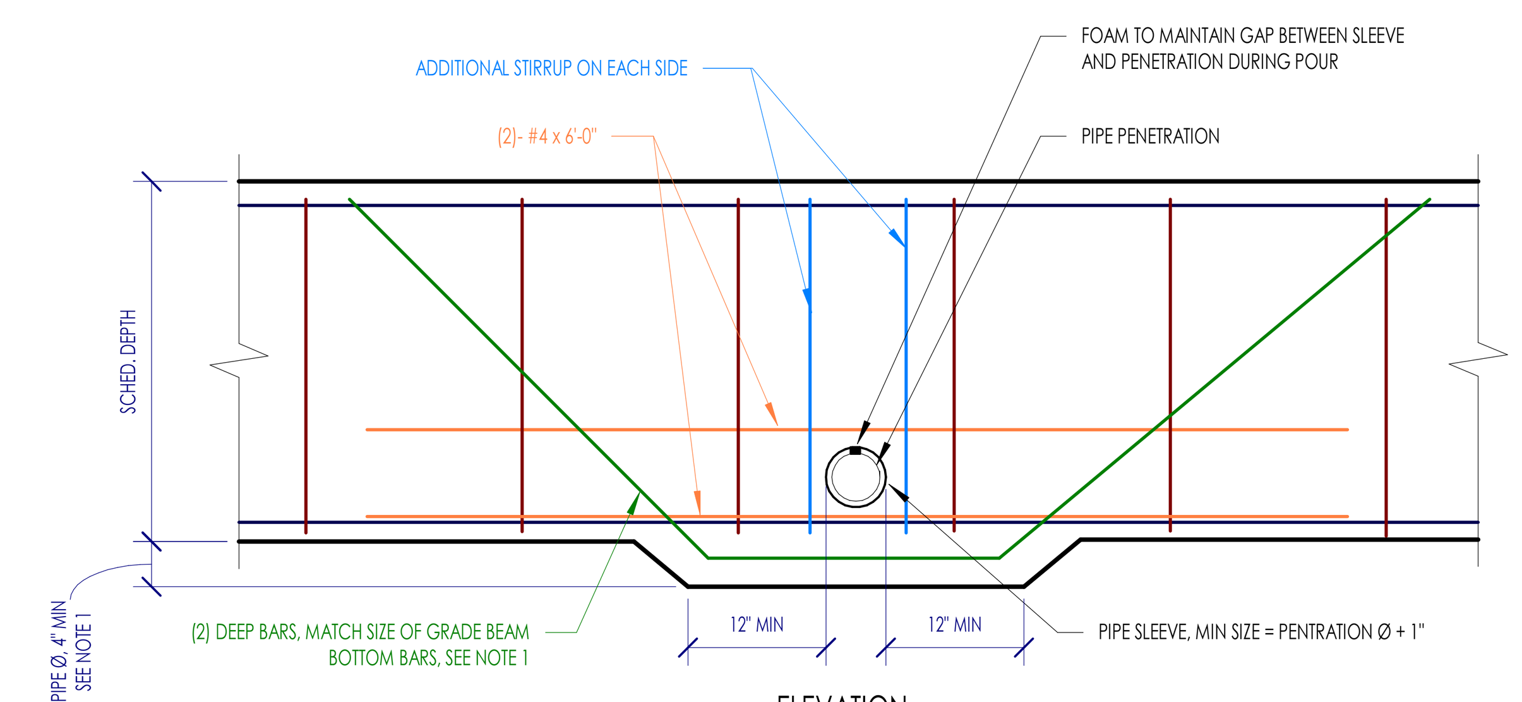
10 TYPICAL SLAB DROP - MAX DROP OF 12"
NOT TO SCALE (© Dudley Engineering LLC)



11-T TYPICAL TURN DOWN
NOT TO SCALE (© Dudley Engineering LLC)

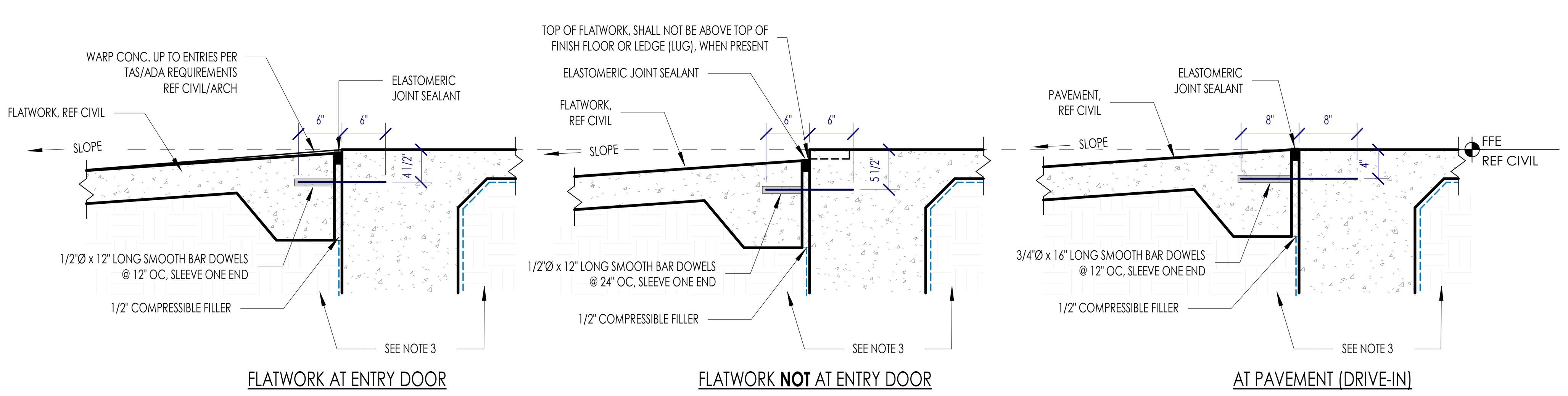


11 ALLOWABLE CONDUIT WITH BEAM CAGE PARALLEL TO LONGITUDINAL REINFORCEMENT
NOT TO SCALE (© Dudley Engineering LLC)



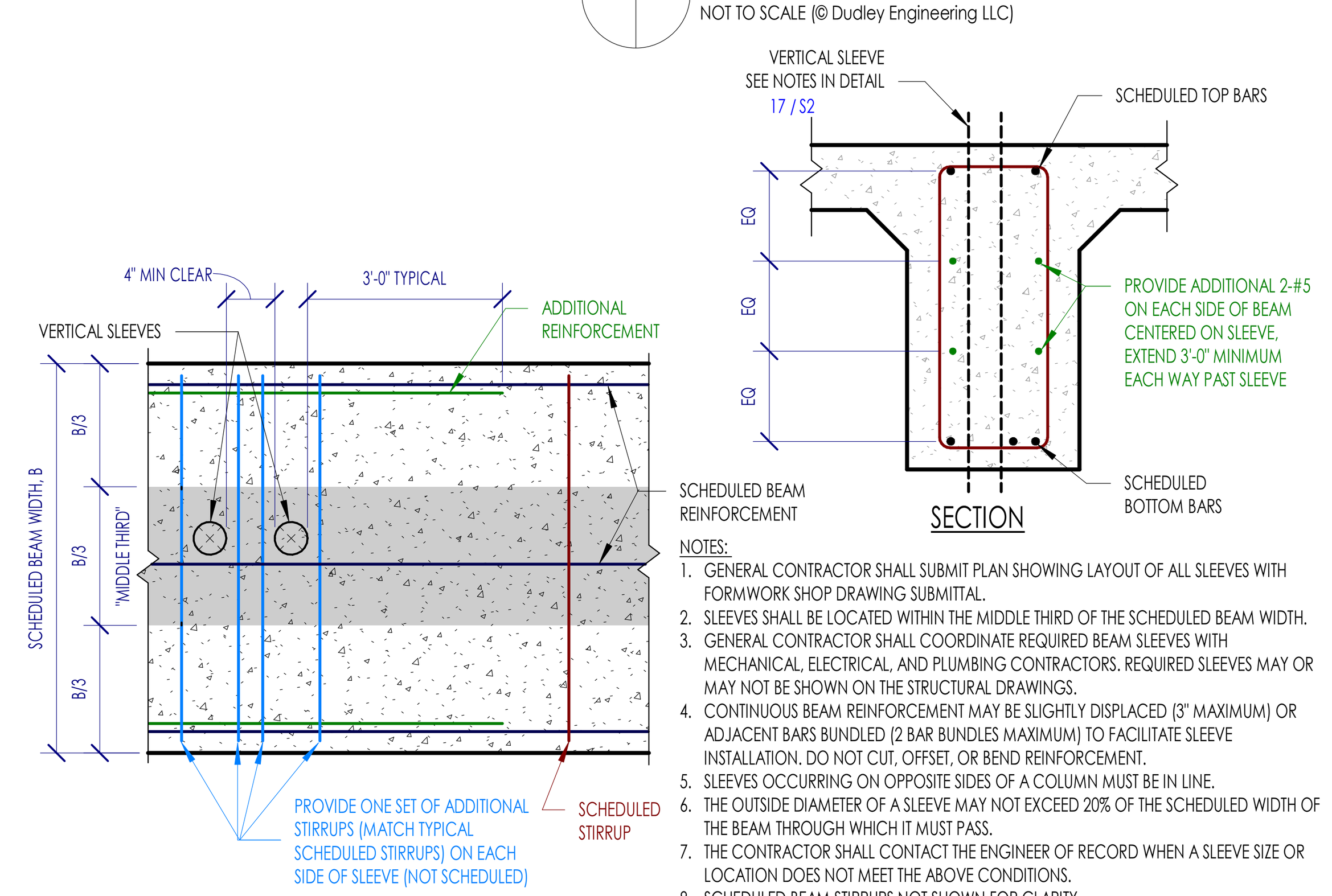
NOTES:
1. DEPTH INCREASE AND DEEP BARS NOT REQUIRED IF PENETRATION OCCURS IN MIDDLE THIRD OF GRADE BEAM DEPTH

12 TYPICAL HORIZONTAL PENETRATION IN BEAM
NOT TO SCALE (© Dudley Engineering LLC)



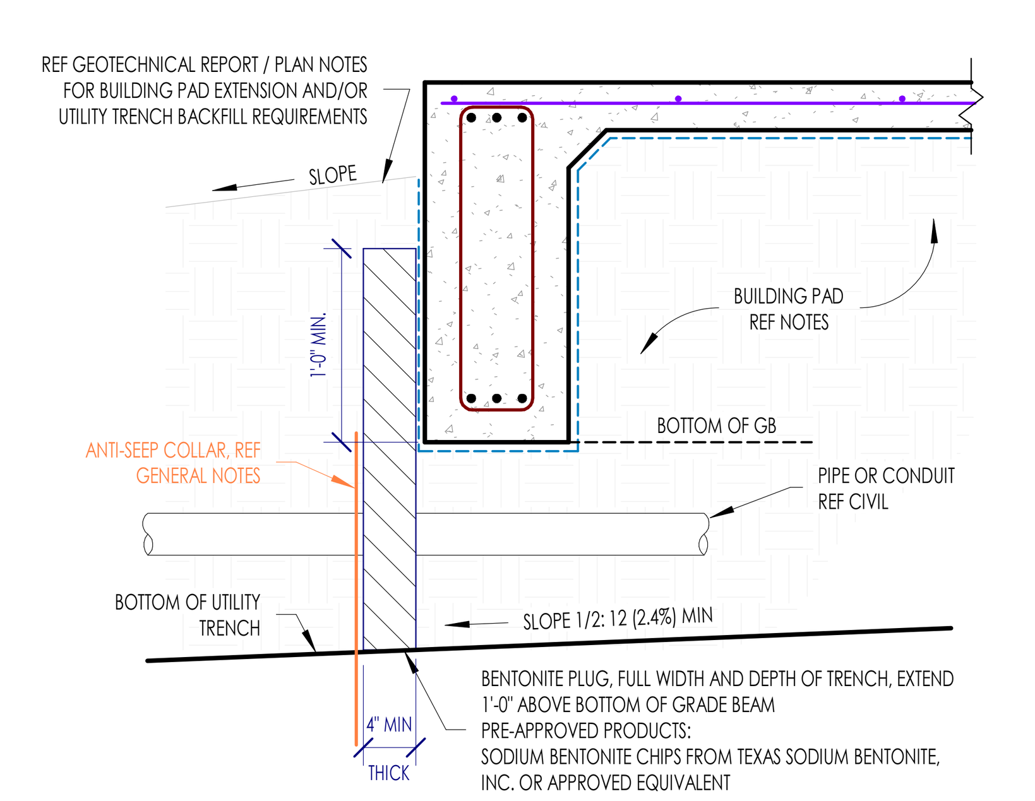
NOTES:
1. CONTRACTOR TO SUBMIT TO OWNER, ARCHITECT AND ENGINEER THE PRODUCT DATA FOR THE ELASTOMERIC JOINT SEALANT WHICH MUST INCLUDE A RECOMMENDED MAINTENANCE PROGRAM FOR THE SEALANT.
2. REFERENCE ARCHITECTURE / CIVIL FOR ADA REQUIREMENTS, TOP OF FLATWORK / PAVEMENT.
3. BUILDING PAD AND FLATWORK/PAVEMENT SUBGRADE IMPROVEMENT TO ADHERE TO THE REQUIREMENTS OF THE GEOTECHNICAL REPORT.
4. FLATWORK (SIDEWALK, PAVEMENT, STOOPS, ETC.) ADJACENT TO THE STRUCTURE IS NOT WITHIN THE SCOPE OF THE STRUCTURAL ENGINEER-OF-RECORD. THE CIVIL ENGINEER & CONTRACTOR SHALL FOLLOW ALL RECOMMENDATIONS FROM THE GEOTECHNICAL REPORT AND REQUIREMENTS OF THE BUILDING CODE (IMPERVIOUS SURFACE SHALL BE PERMITTED TO BE SLOPED LESS THAN 2% WHERE THE SURFACE IS A DOOR LANDING OR RAMP. THE PROCEDURE USED TO ESTABLISH THE FINAL GROUND LEVEL ADJACENT TO THE FOUNDATION SHALL ACCOUNT FOR ADDITIONAL SETTLEMENT OF BACKFILL, FREEZE/THAW DUE TO FROST, AND HEAVE/SUBSIDENCE DUE TO EXPANSIVE SOIL.)

13 TYPICAL FLATWORK/PAVEMENT DOWELS AT BUILDING
NOT TO SCALE (© Dudley Engineering LLC)

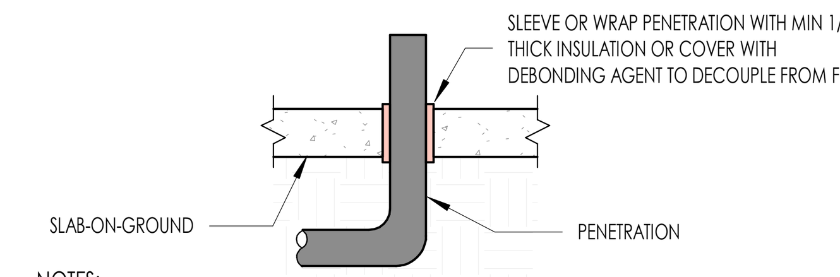


NOTES:
1. GENERAL CONTRACTOR SHALL SUBMIT PLAN SHOWING LAYOUT OF ALL SLEEVES WITH FORMWORK SHOP DRAWING SUBMITTAL.
2. SLEEVES SHALL BE LOCATED WITHIN THE MIDDLE THIRD OF THE SCHEDULED BEAM WIDTH.
3. GENERAL CONTRACTOR SHALL COORDINATE REQUIRED BEAM SLEEVES WITH MECHANICAL, ELECTRICAL, AND PLUMBING CONTRACTORS. REQUIRED SLEEVES MAY OR MAY NOT BE SHOWN ON THE STRUCTURAL DRAWINGS.
4. CONTINUOUS BEAM REINFORCEMENT MAY BE SLIGHTLY DISPLACED (3" MAXIMUM) OR ADJACENT BARS BUNDLED (2 BAR BUNDLES MAXIMUM) TO FACILITATE SLEEVE INSTALLATION. DO NOT CUT, OFFSET, OR BEND REINFORCEMENT.
5. SLEEVES OCCURRING ON OPPOSITE SIDES OF A COLUMN MUST BE IN LINE.
6. THE OUTSIDE DIAMETER OF A SLEEVE MAY NOT EXCEED 20% OF THE SCHEDULED WIDTH OF THE BEAM THROUGH WHICH IT MUST PASS.
7. THE CONTRACTOR SHALL CONTACT THE ENGINEER OF RECORD WHEN A SLEEVE SIZE OR LOCATION DOES NOT MEET THE ABOVE CONDITIONS.
8. SCHEDULED BEAM STIRRUPS NOT SHOWN FOR CLARITY.

14 TYPICAL VERTICAL PENETRATION IN GRADE BEAM
NOT TO SCALE (© Dudley Engineering LLC)

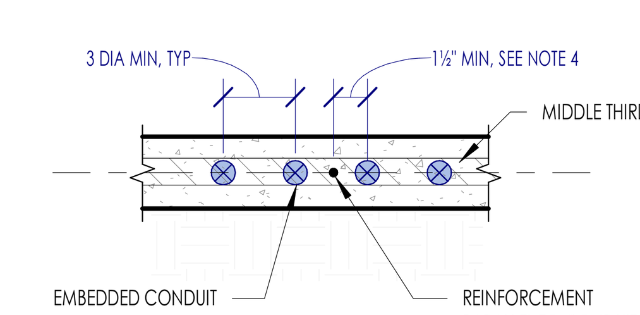


15 TYPICAL UTILITY TRENCH UNDER BLDG ANTI-SEEP COLLAR / PLUG AT EXTERIOR
NOT TO SCALE (© Dudley Engineering LLC)



NOTES:
1. DECOUPLING PENETRATIONS FROM THE SLAB IS CRITICAL AS THE FOUNDATION HAS NOT BEEN DESIGNED FOR SOIL MOVEMENT DUE TO PLUMBING LEAKS.

17 TYPICAL VERTICAL PENETRATION THOUGH FOUNDATION
NOT TO SCALE (© Dudley Engineering LLC)



NOTES:
1. EMBEDDED CONDUIT MUST BE PVC OR OTHER PRE-APPROVED PRODUCT THAT WILL NOT CHEMICALLY REACT WITH THE CONCRETE.
2. EMBEDDED CONDUIT MUST BE CHAIRED AND RESTRAINED @ 48" OC MAX IN ORDER TO PREVENT FLOATING OF THE CONDUIT DURING POURING.
3. PLACE ALL CONDUIT WITHIN THE MIDDLE THIRD OF THE OVERALL SLAB DEPTH.
4. DO NOT PLACE CONDUIT ADJACENT TO NOR TIE CONDUIT TO PARALLEL REINFORCEMENT.

16 TYPICAL CONDUITS EMBEDDED IN SLAB-ON-GRADE
NOT TO SCALE (© Dudley Engineering LLC)

Revision Schedule

Revision Number	Revision Description	Revision Date

THESE DOCUMENTS HAVE BEEN PREPARED SPECIFICALLY FOR THE FOLLOWING PROJECT:

CATTLEMEN LOT 112 RESIDENCE
3814 VAIL COURT
MONTGOMERY, TX 77356

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STATE OF TEXAS
DREW S DUDLEY
123798
LICENSED PROFESSIONAL ENGINEER
5/26/2023

CATTLEMEN LOT 112 RESIDENCE

3814 VAIL COURT
MONTGOMERY, TX 77356

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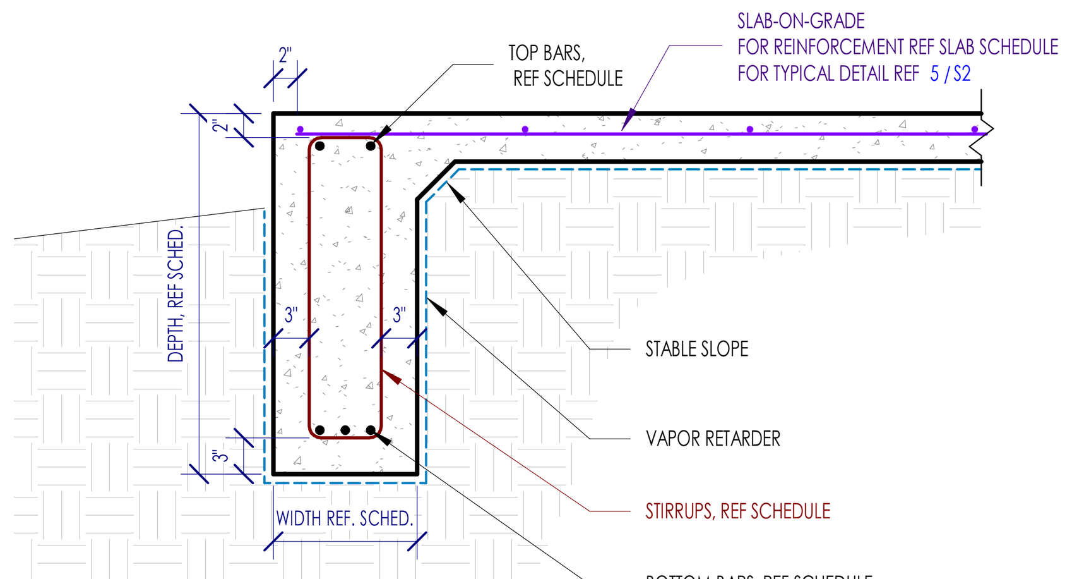
DETAILS

S2

Date: 5/26/2023

Project No: 23-00195



NOTES:

1. BEAM SCHEDULE IS ON SHEET S1

1 | 1 | S1

TYPICAL EXTERIOR GRADE BEAM

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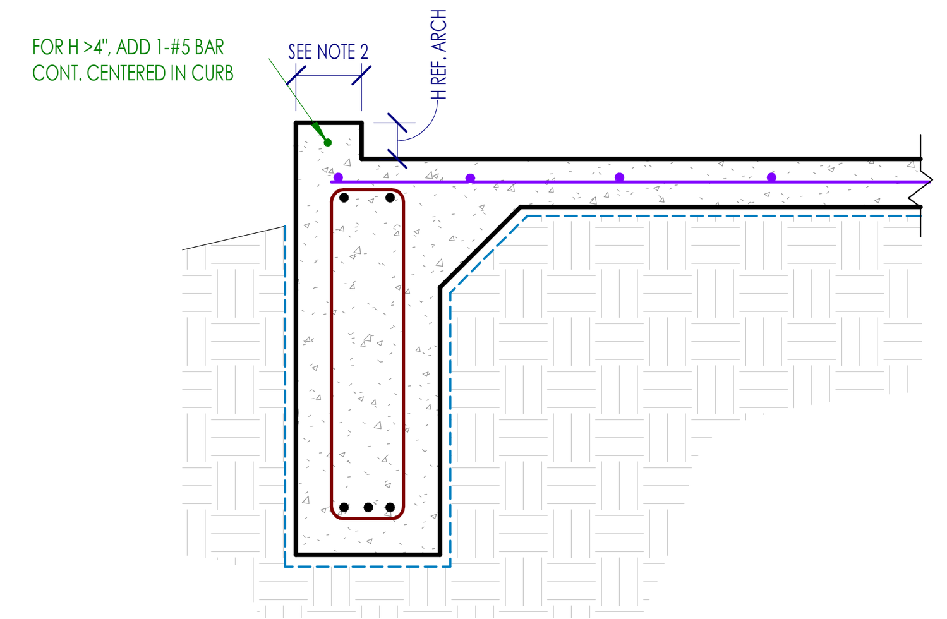


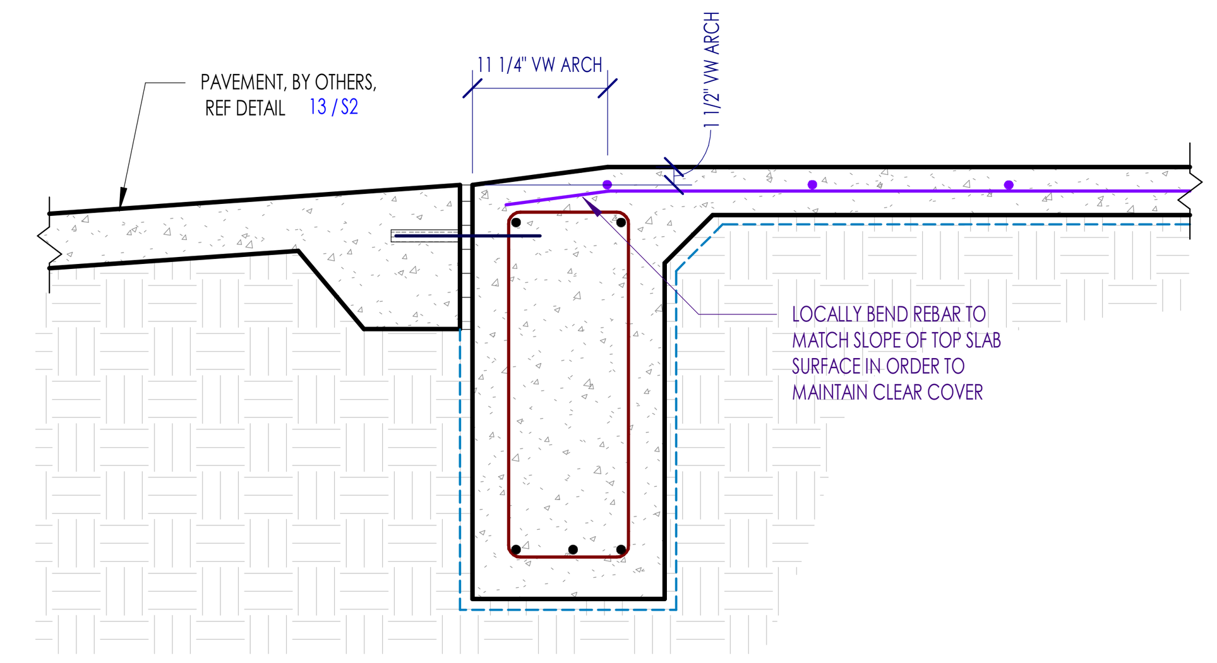
NOTES:

1. FOR INFORMATION NOT SHOWN, REFER TO DETAIL 49 / S2
2. WIDTH, REF ARCH, 3.5" MIN - 5.5" MAX. NOTIFY ENGINEER IF OUTSIDE OF THESE LIMITS

2 | 1 | S1

EXTERIOR GRADE BEAM W/ CURB

NOT TO SCALE (© Dudley Engineering LLC)



NOTES:

1. FOR INFORMATION NOT SHOWN, REFER TO DETAIL 1 / S3

3 | 1 | S1

TYPICAL EXTERIOR GRADE BEAM AT PAVEMENT AT OVERHEAD DOOR

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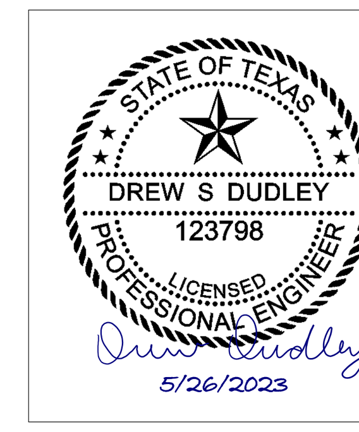
Revision Schedule

Revision Number	Revision Description	Revision Date



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DETAILS

S3

Date: 5/26/2023

Project No: 23-00195