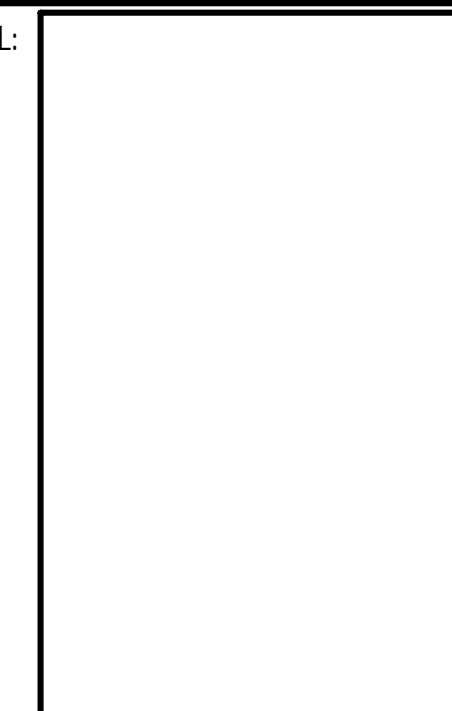


SEAL:



REVISIONS

PROGRESS REVIEW #1:	9-13-24
PROGRESS REVIEW #2:	
PROGRESS REVIEW #3:	
ISSUE FOR CONST.:	9-18-24
REVISION #1:	
REVISION #2:	
REVISION #3:	
REVISION #4:	

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**DUKE ENERGY**  
**NEW WELD SHOP**  
1269 JONESBORO RD  
DUNN, NORTH CAROLINA

PROJECT NAME:

SCALE: 1/4" = 1'-0"

FOUNDATION PLAN

MEPC PROJECT NO.: 115-24

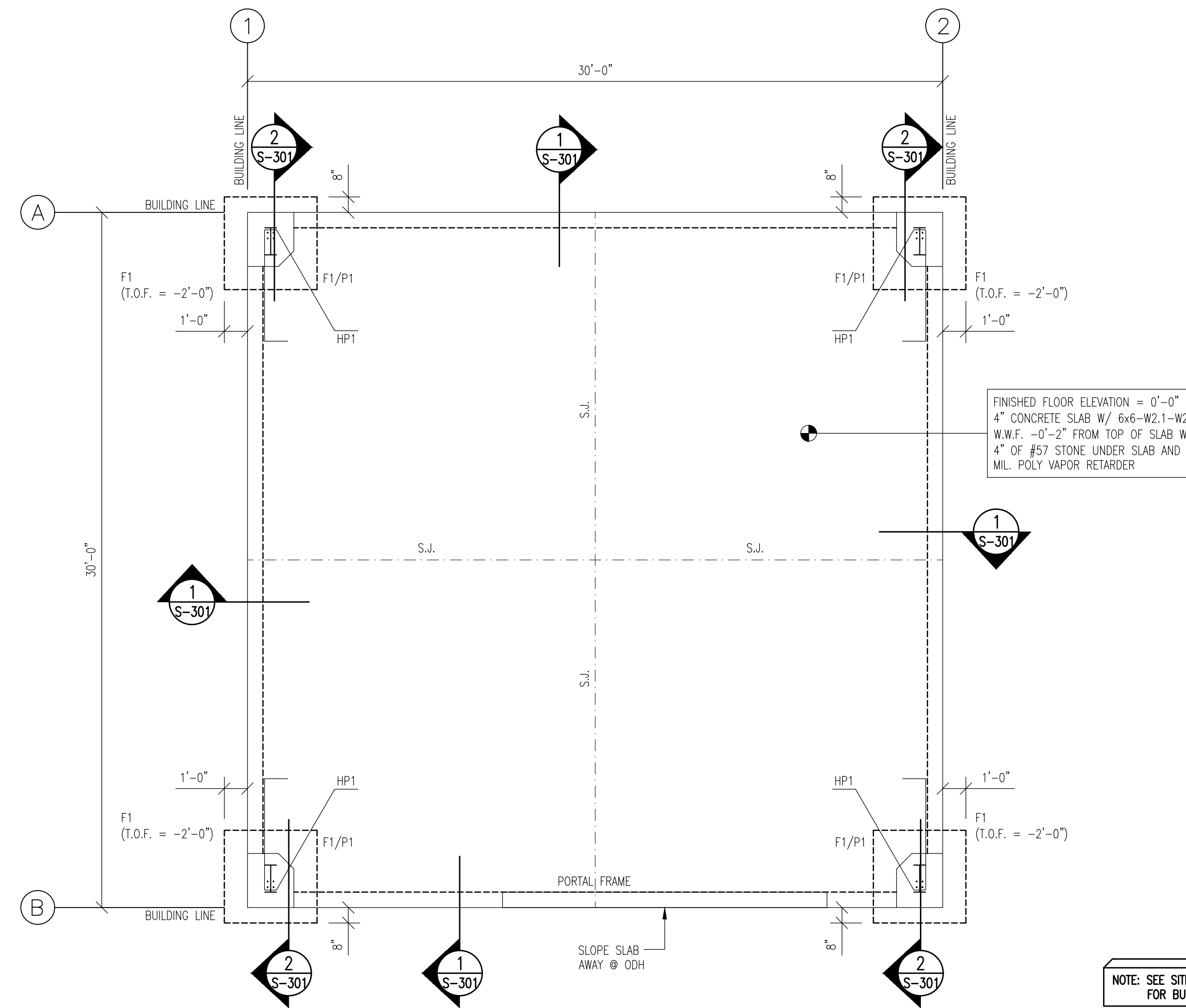
DATE: 9-18-24

DESIGN BY: JMM/PCC

DRAWN BY: JBL

CHECKED BY: JMM

**S-101**



**WELD SHOP FOUNDATION PLAN**

SCALE: 1/4" = 1'-0"

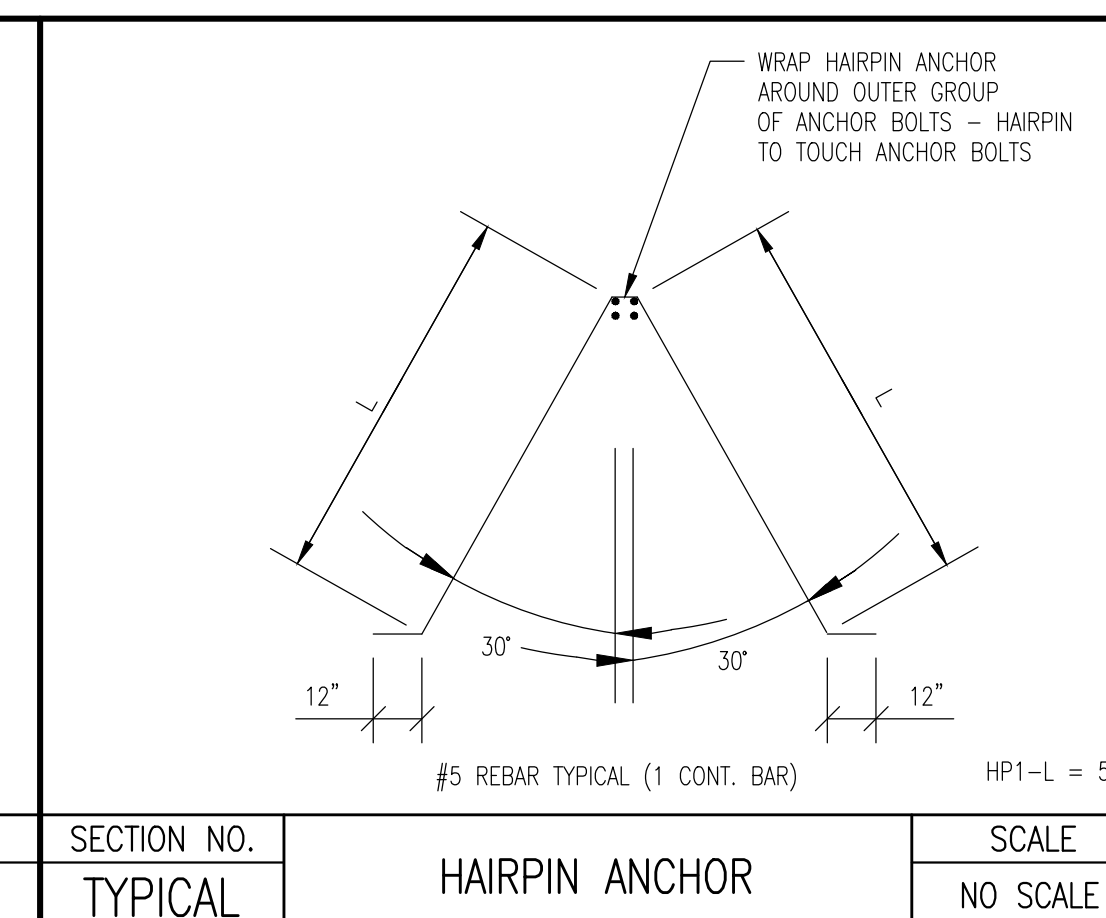
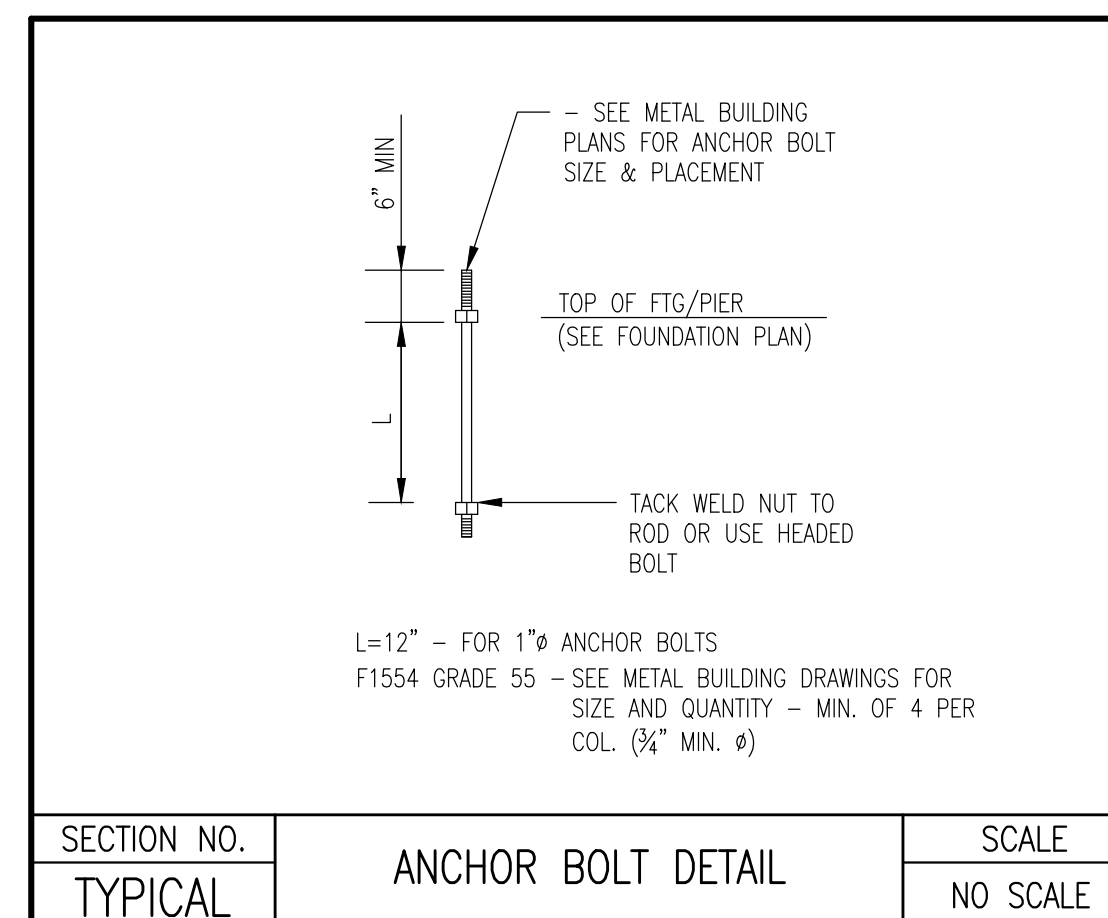
NOTE: SEE SITE PLAN BY MCADAMS FOR BUILDING LOCATIONS

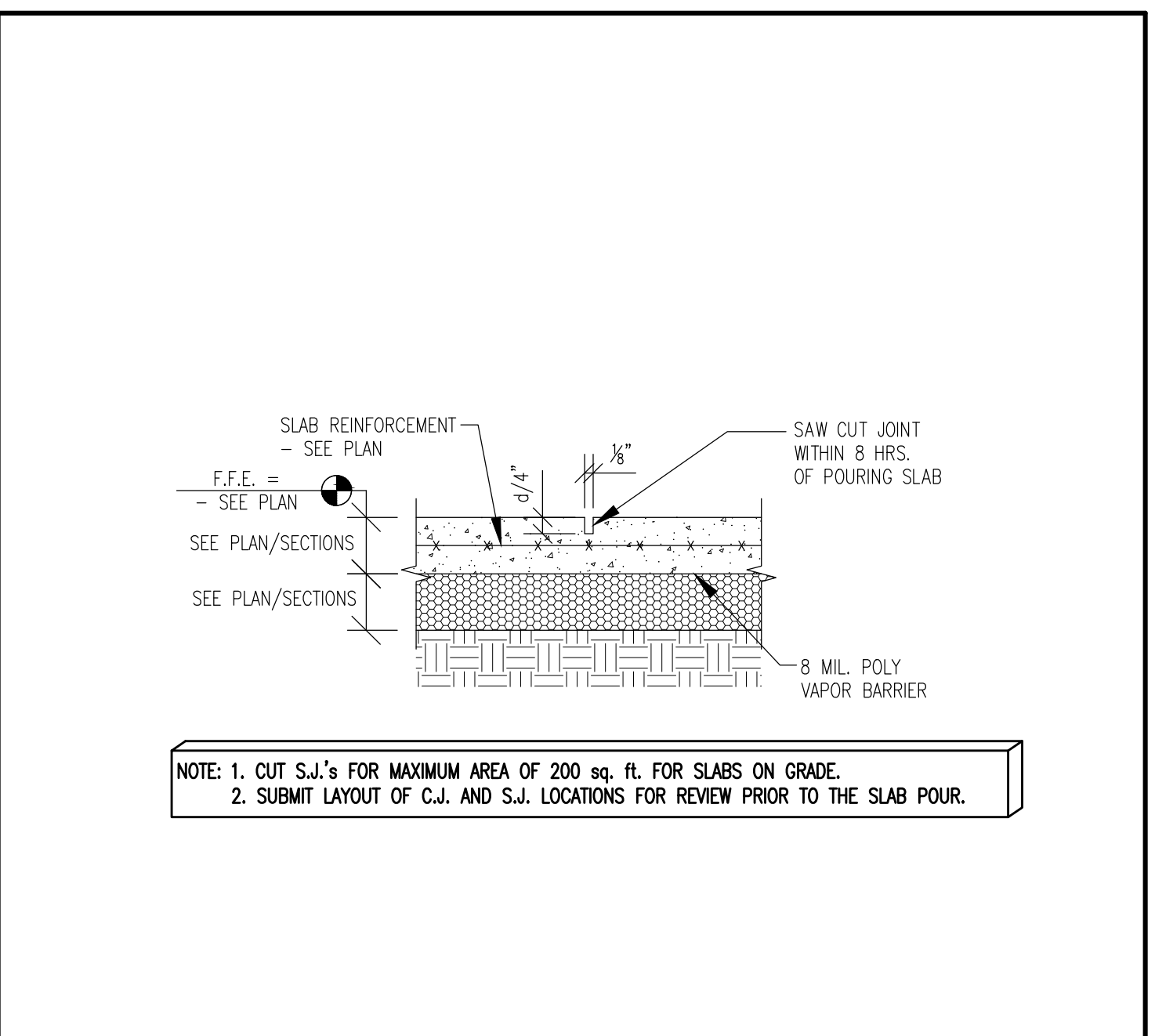
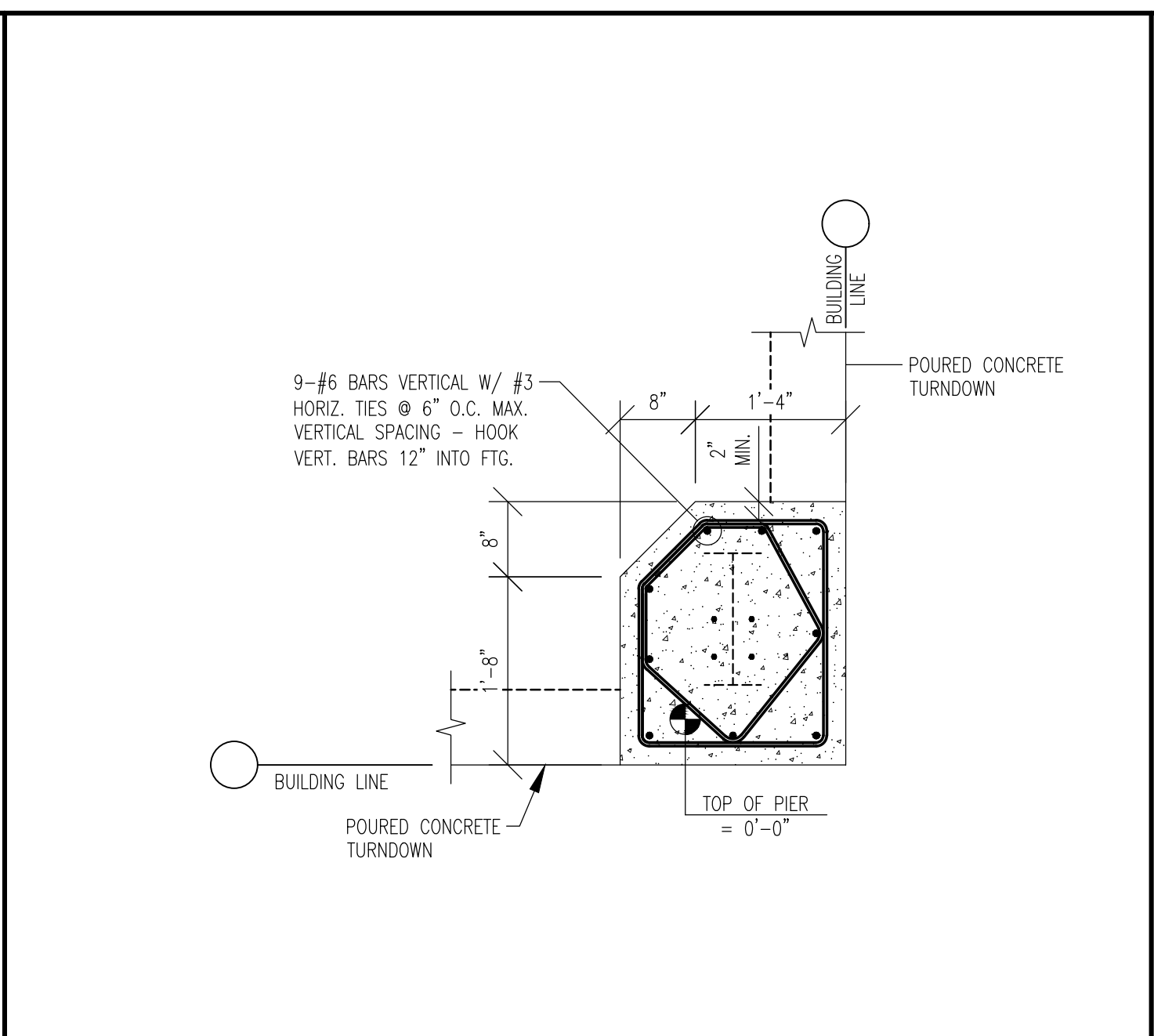
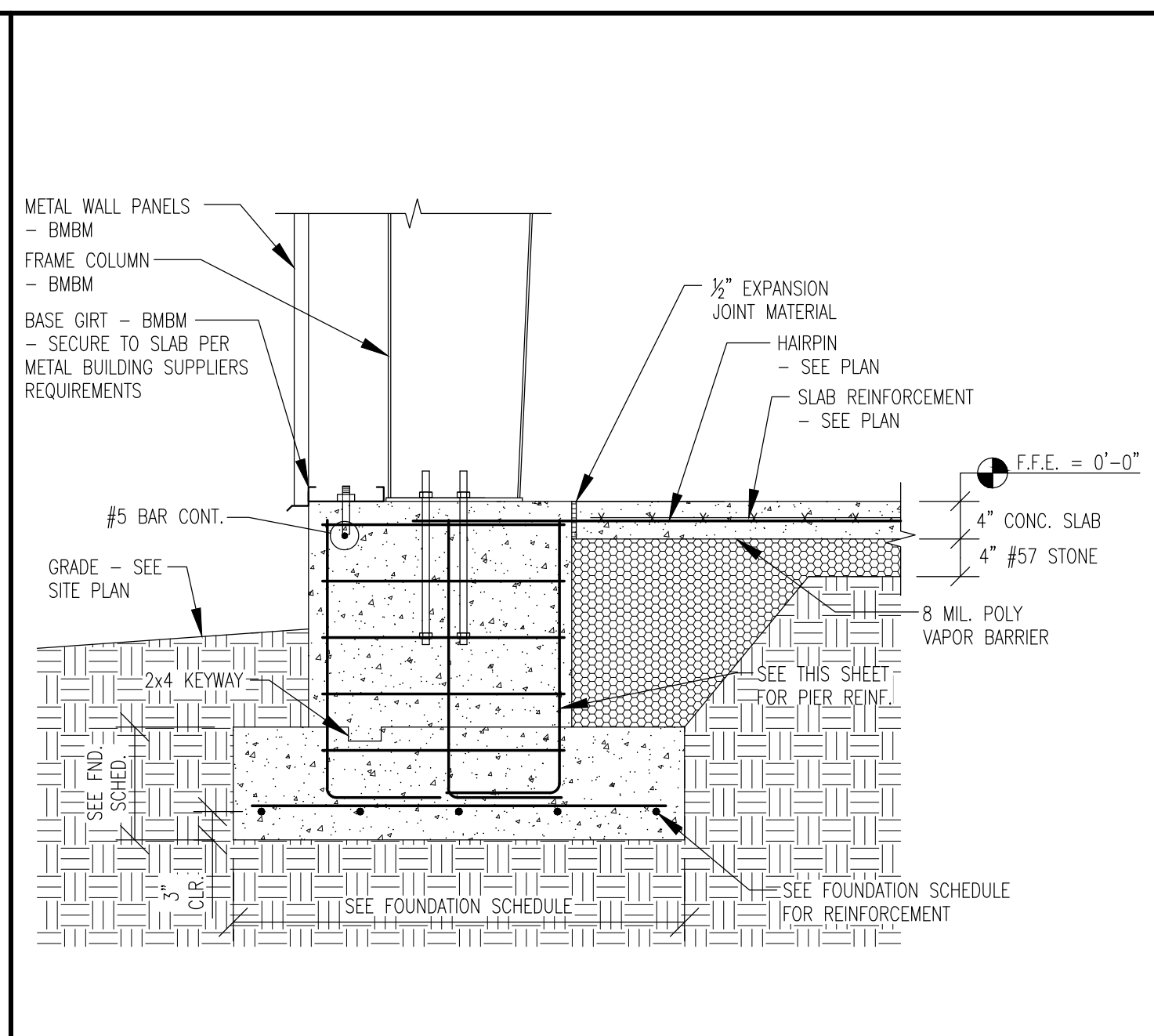
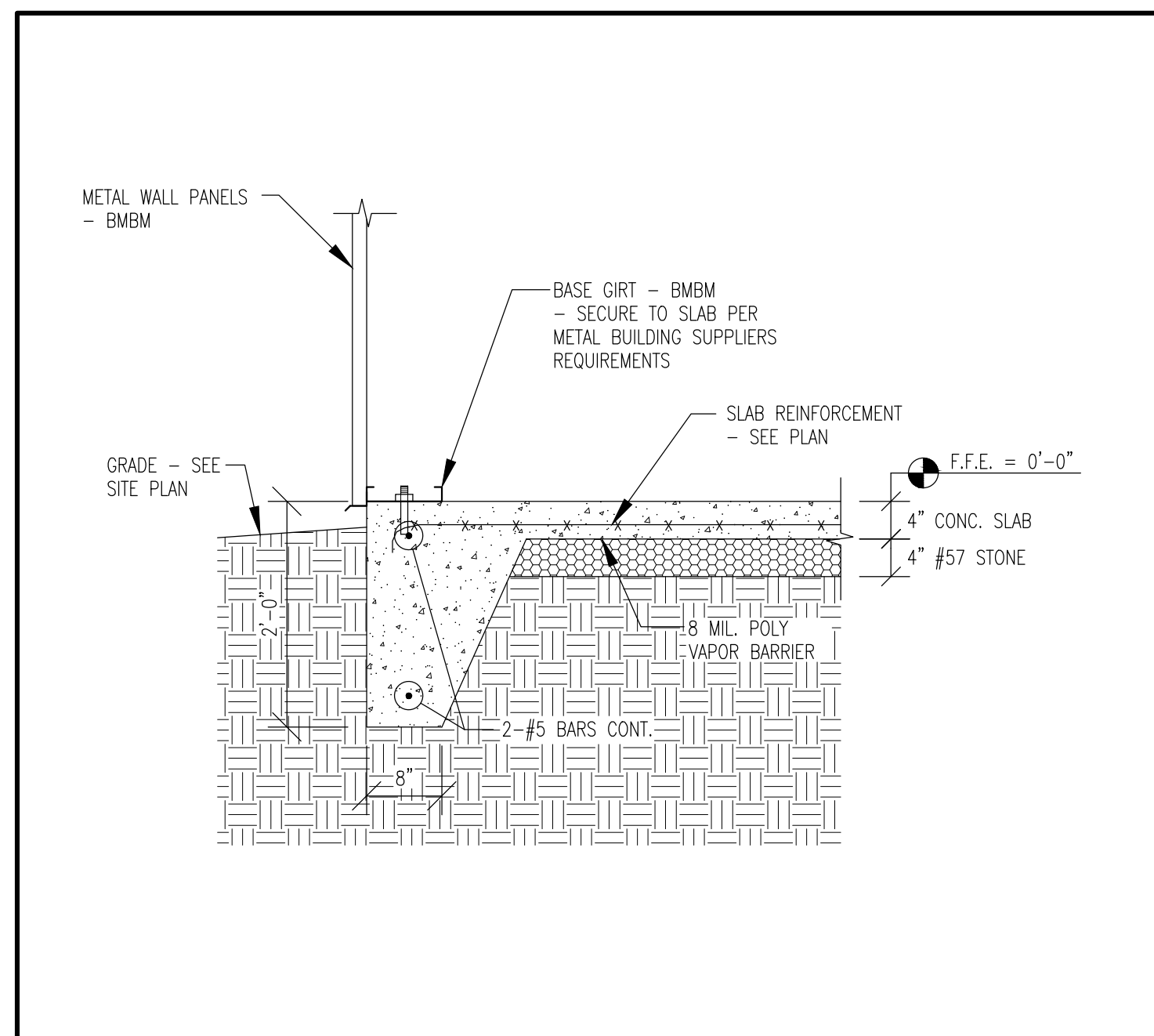
FOUNDATION SCHEDULE		
MARK	SIZE	REINFORCEMENT
F1	4'-0"x4'-0"x1'-0"	5-#5 BARS E.W.

f'c = 3500psi

**GENERAL NOTES -- WELD SHOP FOUNDATION PLAN:**

- SEE PLAN FOR T.O.F. ELEVATIONS. MAINTAIN A 12" MINIMUM OF COVER OVER PERIMETER WALL T.O.F.'s TYPICAL. GC SHALL COORDINATE T.O.F. ELEVATIONS W/ SITE PLAN TO DETERMINE IF ADEQUATE FOOTING DEPTH WILL NEED TO BE PROVIDED.
- COORDINATE FLOOR DRAINS AND ANY SLOPED FLOOR AREA REQUIREMENTS WITH THE PLUMBING DRAWINGS.
- GC SHALL COORDINATE WITH THE PLUMBING CONTRACTOR FOR ANY STEP DOWNS IN THE T.O.F.'s IF REQUIRED TO ALLOW PLUMBING TO EXIT THE BUILDING.
- GC SHOULD AVOID LEAVING OPEN TRENCH EXCAVATIONS FOR THE FOOTINGS FOR LONG PERIODS WHEN INCLEMENT WEATHER IS ANTICIPATED. IN GENERAL ALL EXCAVATIONS MADE SHOULD BE POURED ON THE DAY OF THE EXCAVATION IF INCLEMENT WEATHER IS EXPECTED.
- CONTRACTOR SHALL COORDINATE FOR LOCAL INSPECTING AUTHORITY TO REVIEW AND APPROVE ALL FOOTING TRENCHES PRIOR TO THE PLACEMENT OF ANY FOOTING CONCRETE. IF FOOTINGS FAIL INSPECTION CONTRACTOR SHALL CONTACT THE ENGINEER FOR RECOMMENDATIONS.
- FOUNDATION DESIGN BASED ON A PRESUMPTIVE SOIL BEARING PRESSURE OF 2000 PSF. GC SHALL HAVE SOIL TESTING FIRM TO VERIFY PRESUMPTIVE BEARING PRESSURE PRIOR TO PLACEMENT OF THE CONCRETE FOOTINGS. ANY AREAS DETERMINED NOT TO PROVIDE THIS STATED SOIL BEARING PRESSURE SHALL BE BROUGHT TO THE ENGINEERS ATTENTION.
- FOUNDATION DESIGN BASED ON VARCO PRUDEN PRE-ENGINEERED METAL BUILDING DRAWINGS DATED 2-1-2024. IF REVISIONS ARE MADE TO THE REFERENCED PRE-ENGINEERED METAL BUILDING DRAWINGS, CONTACT ENGINEER FOR FOUNDATION DESIGN REVIEW.





SECTION NO.	SECTION	SCALE	SECTION NO.	SECTION	SCALE	SECTION NO.	SECTION	SCALE	SECTION NO.	SECTION	SCALE
1	S-301	3/4" = 1'-0"	2	S-301	3/4" = 1'-0"	TYPICAL	P1 - PIER DETAIL	NO SCALE	TYPICAL	SLAB SAWED CUT JOINT (S.J.)	NO SCALE

**SPECIFICATIONS**

**DIVISION 1 - GENERAL REQUIREMENTS**

**I. GENERAL**

A. THE STRUCTURAL DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED STRUCTURE, AND, EXCEPT WHERE SPECIFICALLY SHOWN, DO NOT INDICATE THE METHOD OR MEANS OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE AND DIRECT THE WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, PROCEDURES, TECHNIQUES, AND SEQUENCES.

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

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

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

E. WHERE ANY DISCREPANCIES OCCUR BETWEEN PLANS, DETAILS, STRUCTURAL GENERAL NOTES, AND SPECIFICATIONS, THE MORE STRINGENT REQUIREMENTS SHALL GOVERN.

**II. CODES, SPECIFICATIONS AND STANDARDS**

A. APPLICABLE BUILDING CODE: THE CONTRACT DOCUMENTS ARE BASED ON THE REQUIREMENTS OF THE:

- 2018 NORTH CAROLINA BUILDING CODE
- BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE (ACI 318-14)
- 2010 SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS (ANSI/AISC 360-10)

**III. DESIGN LOADS (NBCB 2018):**

A. FLOOR LIVE LOAD: SECTION 1607.10

- SLAB ON GRADE = 100 PSF

B. ROOF LIVE LOAD: SECTION 1607.12

- ROOF = 20 PSF

C. ROOF SNOW LOAD DATA: SECTION 1608

- FLAT ROOF SNOW LOAD,  $P_s = 6.93$  PSF
- SNOW EXPOSURE FACTOR,  $C_e = 0.9$
- SNOW IMPORTANCE FACTOR,  $I_s = 1.0$
- ROOF THERMAL FACTOR,  $C_t = 1.1$

D. WIND DESIGN DATA: SECTION 1609

- ULTIMATE DESIGN WIND SPEED,  $V_{ult} = 119$  MPH
- RISK CATEGORY = II
- WIND EXPOSURE CATEGORY = C
- COMPONENTS & CLADDING DESIGN PRESSURES (ULTIMATE):
  - ROOF INTERIOR ZONES = 36 PSF
  - ROOF EDGE ZONES = 42 PSF
  - ROOF CORNER ZONES = 56 PSF
  - WALL INTERIOR ZONES = 33 PSF
  - WALL EDGE ZONES = 41 PSF

E. EARTHQUAKE DESIGN DATA: SECTION 1613

- RISK CATEGORY = II
- SEISMIC IMPORTANCE FACTOR,  $I_s = 1.0$
- MAPPED SPECTRAL RESPONSE ACCELERATION PARAMETERS:
  - SHORT PERIOD,  $S_s = 0.179$
  - 1 SECOND PERIOD,  $S_1 = 0.084$
- SITE CLASS = D
- DESIGN SPECTRAL RESPONSE ACCELERATION PARAMETERS:
  - SHORT PERIOD,  $S_{ms} = 0.1909$
  - 1 SECOND PERIOD,  $S_{m1} = 0.135$
- SEISMIC DESIGN CATEGORY = C
- BASIC SEISMIC FORCE-RESISTING SYSTEM: STEEL SYSTEMS NOT SPECIFICALLY DETAILED FOR SEISMIC RESISTANCE
- DESIGN BASE SHEAR
  - $V_u = \frac{F_a R}{R}$
  - $V_p = \frac{F_p R}{R}$
- SEISMIC RESPONSE COEFFICIENT,  $C_s = 0.064$
- RESPONSE MODIFICATION COEFFICIENT,  $R = 3.0$
- ANALYSIS PROCEDURE: EQUIVALENT LATERAL FORCE (1613)

**IV. SUBMITTALS**

A. SHOP DRAWINGS AND SUBMITTALS SHALL BE SUBMITTED TO THE ENGINEER BEFORE BEGINNING CONSTRUCTION.

B. CLEARLY SPECIFY AND DEVIATIONS FROM THE CONTRACT DOCUMENTS ON ALL SUBMITTALS.

C. THE CONTRACTOR SHALL REVIEW EACH SUBMITTAL BEFORE SUBMITTING TO THE ENGINEER.

D. THE FOLLOWING SUBMITTALS ARE RECOMMENDED FOR THIS PROJECT:

- CAST-IN-PLACE CONCRETE
  - COMPLY WITH SUBMITTAL REQUIREMENTS IN ACI 301/318
  - PRODUCT DATA
  - DESIGN MIXTURES (HISTORICAL DATA OR TRIAL BATCH)
  - REBAR SHOP DRAWING
- SHOP DRAWINGS FOR THE DESIGN, ERECTION, AND REMOVAL OF FORMWORK, SHORES, AND RESHORES APPROVED BY

A QUALIFIED PROFESSIONAL ENGINEER WHO APPROVED THE SHOP DRAWINGS.

**DIVISION 2 - FOUNDATIONS**

**I. GEOTECHNICAL REPORT - FOUNDATION DESIGN IS BASED ON A PRESUMPTIVE SOIL BEARING PRESSURE OF 2000 PSF (TO BE VERIFIED BY THE GENERAL CONTRACTOR AT THE TIME OF CONSTRUCTION).**

**II. SOIL EXCAVATION AND REPLACEMENT**

A. REMOVE ALL LOOSE FILL MATERIAL WITH DEBRIS EXTENDING 5 FOOT BEYOND BUILDING FOOTPRINT TO THE MORE CONSOLIDATED MATERIAL AS APPROVED BY THE GEOTECHNICAL ENGINEER. REPLACE WITH SELECT FILL MATERIAL IN 8" TO 10" LOOSE LIFTS AS DIRECTED BY GEOTECHNICAL ENGINEER. COMPACT SELECT FILL MATERIAL TO 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY ACCORDING TO ASTM D 698.

B. REVIEW SOIL REPORT BORING HOLES FOR INITIAL ESTIMATES OF EXCAVATION DEPTHS. THE GEOTECHNICAL ENGINEER SHALL APPROVE FINAL EXCAVATIONS OF FOOTING AND DRILLED PIER BEARING STRATA.

**III. SLAB-ON-GRADE CONSTRUCTION**

A. SUBGRADE PREPARATION

- IMMEDIATELY PRIOR TO PLACEMENT OF CRUSHED STONE BELOW SLAB, THE LAST ONE FOOT OF SUBGRADE SHOULD BE RECOMPACTED TO 95% OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY AS DETERMINED BY ASTM D698 TO DENSIFY ANY SOILS DISTURBED BY CONSTRUCTION OPERATIONS.
- PROVIDE A 4" MINIMUM LAYER OF CLEAN #4 CRUSHED STONE OR WASHED GRAVEL BELOW THE SLAB ON GRADE.
- PROVIDE VAPOR BARRIER OF 8 MIL. POLYETHYLENE SHEET OVER THE FINAL FILL BELOW THE CONCRETE SLABS. U.N.O.

B. CRANE LOADS - THE CONTRACTOR IS CAUTIONED AGAINST LOADING THE SLAB ON GRADE WITH CRANE LOADS. THE SLAB HAS NOT BEEN DESIGNED FOR CRANE LOADS AND MAY REQUIRE AN INCREASE IN SLAB THICKNESS AND/OR REINFORCEMENT. THE CONTRACTOR IS REQUIRED TO SUBMIT A PROPOSED PLAN IF CRANE SUPPORT IS REQUIRED ON SLABS-ON-GRADE TO THE ENGINEER FOR REVIEW PRIOR TO COMMENCING WORK.

**IV. SPREAD FOOTINGS**

A. FOOTING EXCAVATION - FOOTINGS SHALL BE NEAT EXCAVATED WHERE POSSIBLE WITH SIDES AND TOP EDGES FREE OF LOOSE OR WET MATERIALS. WHERE NEAT EXCAVATION IS NOT POSSIBLE, FOOTINGS EXCAVATION SHALL BE OPEN CUT WITH EDGES FORMED AND BRACED. ALL FOOTINGS WITH FORMED EDGES SHALL BE BACKFILLED WITH LEAN CONCRETE, CEMENT STABILIZED SAND OR SELECT FILL MATERIAL PLACED IN 8" LIFTS AND COMPACTED TO 95% OF MODIFIED STANDARD PROCTOR MAXIMUM DENSITY OF EACH LIFT. THE BOTTOM EXCAVATION SHALL BE CLEAN AND DRY WITH ALL LOOSE MATERIAL REMOVED FOR AN ESSENTIALLY FLAT BEARING SURFACE. EXCAVATIONS SHALL NOT BE LEFT OVERNIGHT UNLESS A 2" UNREINFORCED SEAL (MUD) SLAB IS PLACED AT THE BOTTOM OF THE FOOTING EXCAVATION.

**DIVISION 3**

**I. CAST-IN-PLACE CONCRETE**

**PART 1 - GENERAL**

**1.1 SECTION REQUIREMENTS**

A. SUBMIT CONCRETE MIX DESIGNS.

B. COMPLY WITH ASTM C 94; ACI 301, "SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS"; ACI 318, "BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE"; AND CRSI'S "MANUAL OF STANDARD PRACTICE."

**PART 2 - PRODUCTS**

**2.1 MATERIALS**

A. DEFORMED REINFORCING BARS: ASTM A 615, GRADE 60.

B. WELDED STEEL WIRE FABRIC: ASTM A 185, FLAT SHEETS, NOT ROLLS.

C. PORTLAND CEMENT: ASTM C 150, TYPE 1.

D. FLY ASH: ASTM C 618, TYPE F.

E. AGGREGATES: ASTM C 33, CLASS 4S.

F. FIBER REINFORCEMENT: NOT ALLOWED

G. AIR-ENTRAINING ADMIXTURE: ASTM C 260.

H. CHEMICAL ADMIXTURES: ASTM C 494, WATER REDUCING.

I. WATER STOPS: FLAT DUMBBELL OR CENTER-BULB TYPE, OF EITHER RUBBER (CRD C 513) OR PVC (CRD C 572).

J. VAPOR RETARDER: 8 MIL. POLY VAPOR BARRIER.

K. LIQUID MEMBRANE-FORMING CURING COMPOUND: ASTM C 309, CLEAR.

**2.2 MIXES**

A. PROPORTION NORMAL-WEIGHT CONCRETE MIXES TO PROVIDE THE FOLLOWING PROPERTIES:

- COMPRESSIVE STRENGTH: 3500 PSI (24.13 MPa) AT 28 DAYS.
- SLUMP LIMIT: 4 INCHES (100 MM) AT POINT OF PLACEMENT.
- WATER-CEMENT RATIO: 0.50 MAXIMUM AT POINT OF PLACEMENT.
- AIR CONTENT: 5.5 TO 7.0 PERCENT FOR CONCRETE EXPOSED TO FREEZING AND THAWING, 2 TO 4 PERCENT ELSEWHERE.

**PART 3 - EXECUTION**

**3.1 CONCRETING**

A. CONSTRUCT FORMWORK AND MAINTAIN TOLERANCES AND SURFACE IRREGULARITIES WITHIN ACI 117 LIMITS OF CLASS A FOR CONCRETE EXPOSED TO VIEW AND CLASS C FOR OTHER CONCRETE SURFACES.

B. SET WATER STOPS WHERE INDICATED TO ENSURE JOINT WATER TIGHTNESS.

C. PLACE VAPOR RETARDER ON PREPARED SUBGRADE, WITH JOINTS LAPPED 6 INCHES (150 MM) AND SEALED.

D. ACCURATELY POSITION, SUPPORT, AND SECURE REINFORCEMENT.

E. INSTALL CONSTRUCTION, ISOLATION, AND CONTROL JOINTS.

F. PLACE CONCRETE IN A CONTINUOUS OPERATION AND CONSOLIDATE USING MECHANICAL VIBRATING EQUIPMENT.

G. PROTECT CONCRETE FROM PHYSICAL DAMAGE OR REDUCED STRENGTH DUE TO WEATHER EXTREMES DURING MIXING, PLACING, AND CURING.

H. FORMED SURFACE FINISH: SMOOTH-FORMED FINISH FOR CONCRETE EXPOSED TO VIEW, COATED, OR COVERED BY WATERPROOFING OR OTHER DIRECT-APPLIED MATERIAL; ROUGH-FORMED FINISH ELSEWHERE.

I. UNFORMED SLAB FINISHES: SCRATCH FINISH FOR SURFACES TO RECEIVE MORTAR SETTING BEDS FLOAT FINISH SURFACES FOR INTERIOR STEPS AND RAMPS AND SURFACES TO RECEIVE WATERPROOFING, ROOFING, OR OTHER DIRECT-APPLIED MATERIAL TROWELED FINISH FOR FLOOR SURFACES AND FLOORS TO RECEIVE FLOOR COVERINGS, PAINT, OR OTHER THIN FILM-FINISH COATINGS TROWEL AND FINE BROOM FINISH FOR SURFACES TO RECEIVE THIN-SET TILE NONSLIP BROOM FINISH TO EXTERIOR CONCRETE PLATFORMS, STEPS, AND RAMPS.

J. CURE FORMED SURFACES BY MOIST CURING UNTIL FORMS ARE REMOVED.

K. BEGIN CURING UNFORMED CONCRETE AFTER FINISHING. APPLY MEMBRANE-FORMING CURING COMPOUND TO CONCRETE.

L. PROTECT CONCRETE FROM DAMAGE. REPAIR SURFACE DEFECTS IN CONCRETE.

**STRUCTURAL ABBREVIATIONS**

Ø = AT

A.B. = ANCHOR BOLTS

ABC = AGGREGATE BASE COARSE

A.E.F.F.E. = ABOVE EXISTING FINISHED FLOOR ELEVATION

A.F.F.E. = ABOVE FINISHED FLOOR ELEVATION

A.R.F.F.E. = ABOVE REFERENCED FINISHED FLOOR ELEVATION

ALT. = ALTERNATE

ARCH. = ARCHITECTURAL

B.F.F.E. = BELOW FINISHED FLOOR ELEVATION

B.M.B.M. = BY METAL BUILDING MANUFACTURE

B.R.F.F.E. = BELOW REFERENCED FINISHED FLOOR ELEVATION

B.L.D.G. = BUILDING

BOT. = BOTTOM

B.O.W. = BOTTOM OF WALL

BRG. = BEARING

C.J. = CONSTRUCTION/CONTROL JOINT

CL. = CENTER LINE

CLR. = CLEAR

CMU = CONCRETE MASONRY UNIT

COL. = COLUMN

CONC. = CONCRETE

CONN. = CONNECTION

CONST. = CONSTRUCTION

CONT. = CONTINUOUS

COORD. = COORDINATE

DET. = DETAIL

DIA. = DIAMETER

DIM. = DIMENSION

DWS. = DRAWINGS

DWL. = DOWEL

E.A. = EACH

E.F.F.E. = EXISTING FINISHED FLOOR ELEVATION

E.J. = EXPANSION JOINT

ELEV. = ELEVATION

E.W. = EACH WAY

EXP. = EXPANSION

EXIST. = EXISTING

EXT. = EXTENSION

FLR. = FLOOR

FD - FLOOR DRAIN

FND. = FOUNDATION

FP = FULL PENETRATION

FTG. = FOOTING

HK. = HOOK

HORIZ. = HORIZONTAL

HSS = HOLLOW STRUCTURAL SECTION (TUBE OR PIPE)

INT. = INTERIOR

JT. = JOINT

K = KIP (1000 lbs)

LLH = LONG LEG HORIZONTAL

LLV = LONG LEG VERTICAL

MANUF. = MANUFACTURER

MAS. = MASONRY

MAX. = MAXIMUM

MECH. = MECHANICAL

MIN. = MINIMUM

NOM. = NOMINAL

O.C. = ON CENTER SPACING

OPNG. = OPENING

PC. = PRECAST

PL. = PLATE

REINF. = REINFORCEMENT

REQD. = REQUIRED

R.F.F.E. = REFERENCED FINISHED FLOOR ELEVATION

SC. = SLIP CRITICAL

SCHD. = SCHEDULE

SECT. = SECTION

T&B = TOP AND BOTTOM

T.O.F. = TOP OF FOOTING

T.O.P. = TOP OF PIER

T.O.S. = TOP OF STEEL

T.O.W. = TOP OF WALL

TYP. = TYPICAL

U.N.O. = UNLESS NOTED OTHERWISE

VERT. = VERTICAL

W = WIDE FLANGE MEMBER

W/ = WITH

WNF = WELDED WIRE FABRIC

\* = COORD. WITH SITE PLAN

**MOOREFIELD ENGINEERING, P.C.**

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**REVISIONS**

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PROJECT NAME:

SCALE: 3/4" = 1'-0"

**SECTIONS, DETAILS & SPECIFICATIONS**

MEPC PROJECT NO.: 115-24

DATE: 9-18-24

DESIGN BY: JMM/PCC

DRAWN BY: JBL

CHECKED BY: JMM

**S-301**