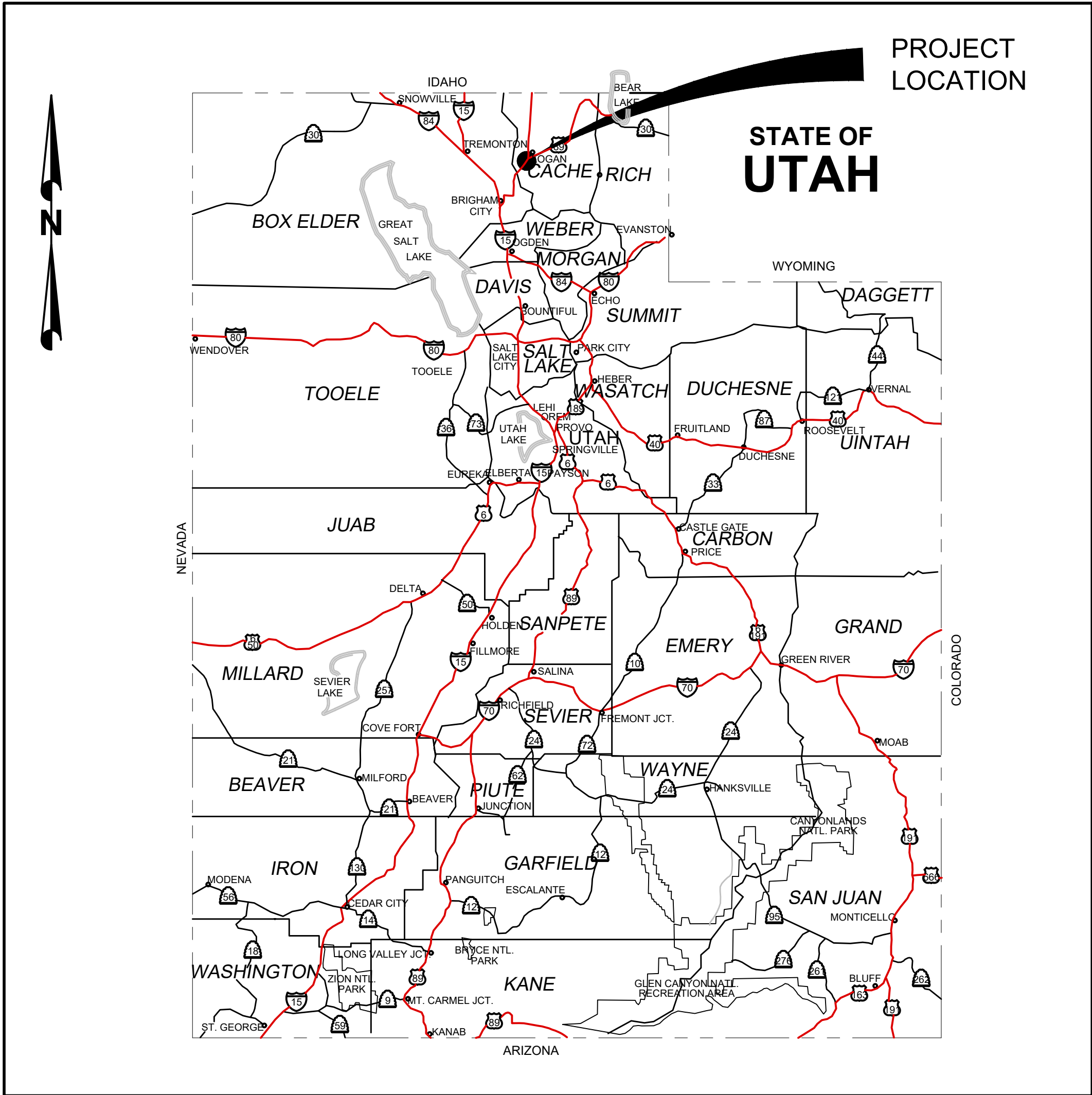


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USU BEEF TEACHING FACILITY

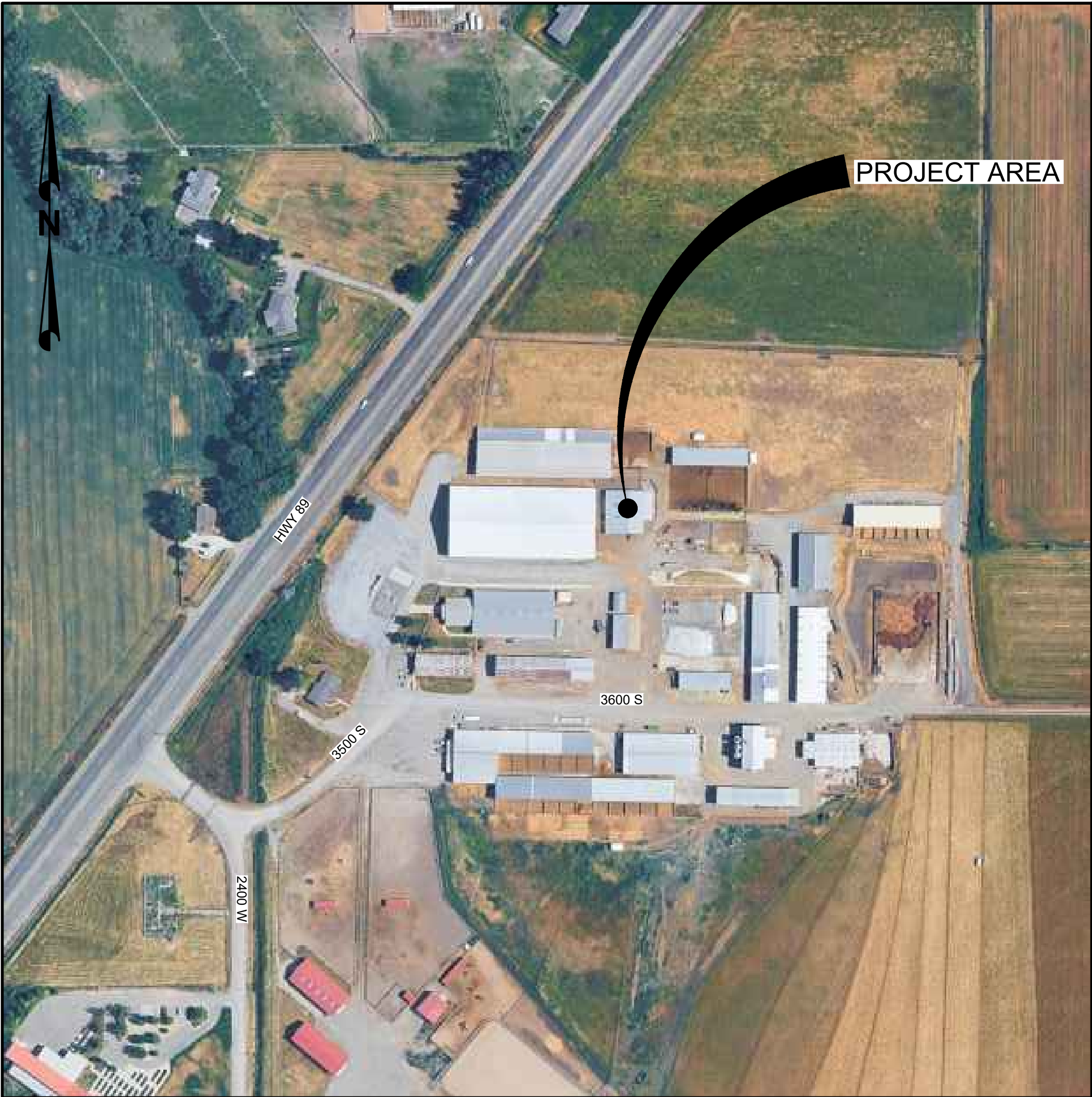
CATTLE PEN BUILDING

WELLSVILLE UTAH



PROJECT LOCATION MAP
N.T.S.

SHEET INDEX	
NO.	TITLE
S-000	COVER SHEET
C-100	SITE UTILITY AND GRADING
C-101	GENERAL DETAILS
S-001	STRUCTURAL NOTES
S-002	STRUCTURAL NOTES
S-100	DEMOLITION PLAN
S-101	STEEL BUILDING LAYOUT PLAN
S-102	FOUNDATION PLAN
S-103	PEN LAYOUT PLAN
S-500	STRUCTURAL DETAILS
E-001	ABBREVIATIONS G.P.N. LEGEND & SHEET INDEX
E-002	ELECTRICAL SPECIFICATIONS
ES-101	ELECTRICAL SITE PLAN
E-100	ELECTRICAL PLANS
E-601	ELECTRICAL ONE-LINE DIAGRAM



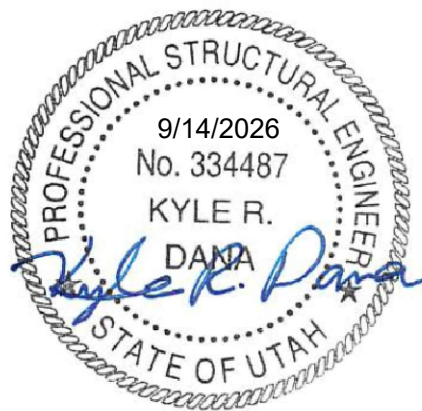
VICINITY MAP
N.T.S.

FA PROJECT NO. 14-26-0043
SEPTEMBER 2026



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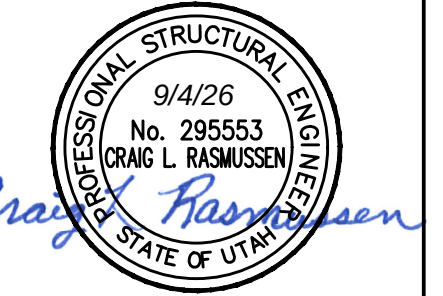
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BEEF TEACHING FACILITY

CAITILE PEN BUILDING

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TE: JULY 2026

PROJECT NO:	14-26-0043
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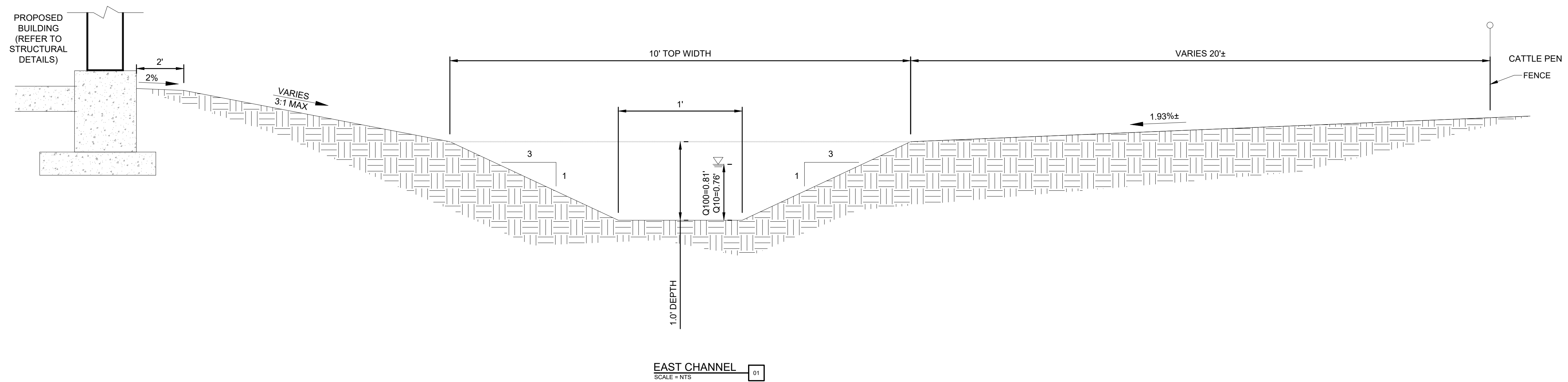
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HECKED BY: MM

C-101

GENERAL DETAILS



BID SET

REINFORCEMENT LAP LENGTHS				
CONCRETE DESIGN STRENGTH - 4000 PSI				
BAR SIZE	#3	#4	#5	#6
TOP BAR	1'-7"	2'-1"	2'-7"	3'-1"
OTHER BAR	1'-3"	1'-7"	2'-0"	2'-5"

NOTES:

1. ALL REINFORCEMENT LAPS, UNLESS OTHERWISE NOTED, SHALL SATISFY THE MINIMUM REQUIREMENTS SHOWN IN THE TABLE "REINFORCEMENT LAP LENGTHS."
2. TOP BARS SHALL BE DEFINED AS ANY HORIZONTAL BARS PLACED SUCH THAT MORE THAN 12" OF FRESH CONCRETE IS CAST IN THE MEMBER BELOW THE BAR, IN ANY SINGLE POUR. HORIZONTAL WALL BARS ARE CONSIDERED TOP BARS.

RECOMMENDED END HOOKS					
BAR SIZE	D	180° HOOKS		90° HOOKS	HOOK EMBED DEPTH
		A	B	A	
#3	2¼"	5"	3"	6"	7"
#4	3"	6"	4"	8"	9"
#5	3¾"	7"	5"	10"	12"
#6	4½"	8"	6"	1'-0"	14"

STD. CONCRETE HOOK SCHEDULE

NTS (IN ACCORDANCE WITH ACI 318-14)

NOTE: EMBED BARS WITH HOOKS TO THE DEPTH SHOWN.

ALL GRADES OF STEEL (MIN. YIELD STRENGTHS)
D = FINISHED INSIDE BEND DIAMETER
d = BAR DIAMETER

D = 6d FOR #3 THROUGH #8
D = 8d FOR #9, #10 AND #11
D = 10d FOR #14 AND #18

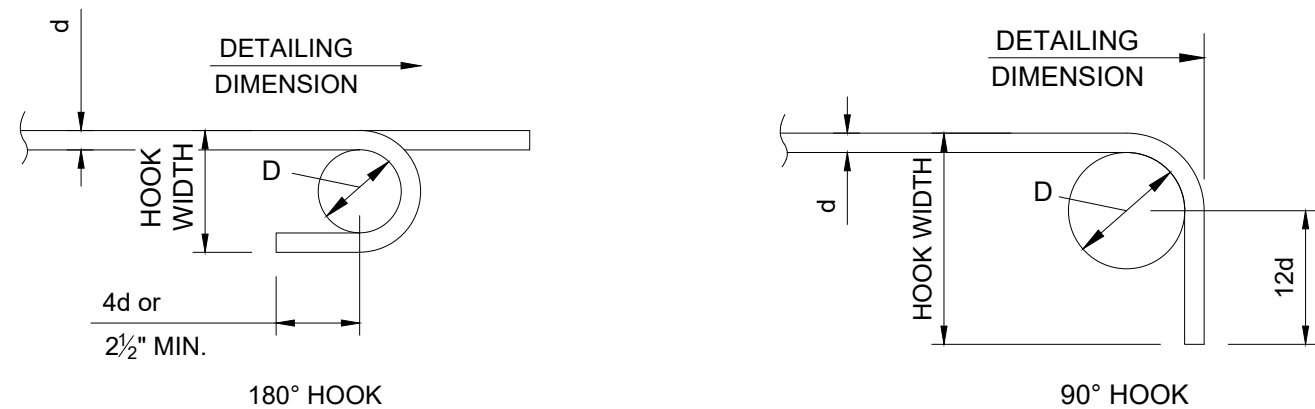


TABLE 1705.3 REQUIRED SPECIAL INSPECTIONS AND TESTS OF CONCRETE CONSTRUCTION

VERIFICATION AND INSPECTION	CONTINUOUS	PERIODIC	REFERENCED STANDARD	IBC REFERENCE
1. INSPECTION OF REINFORCING STEEL, INCLUDING PRESTRESSING TENDONS, AND VERIFY PLACEMENT.	--	X	ACI 318 CH. 20, 25.2, 25.3, 26.6.1-26.6.3	1908.4
2. INSPECT ANCHORS CAST IN CONCRETE.	--	X	ACI 318:17.8.2	--
3. INSPECT ANCHORS POST-INSTALLED IN HARDENED CONCRETE MEMBERS.				
a. ADHESIVE ANCHORS INSTALLED IN HORIZONTALLY OR UPWARDLY INCLINED ORIENTATIONS TO RESIST SUSTAINED TENSION LOADS.	X	--	ACI 318:17.8.2.4	--
b. MECHANICAL ANCHORS AND ADHESIVE ANCHORS NOT DEFINED IN 3.a.	--	X	ACI 318: 17.8.2	--
4. VERIFYING USE OF REQUIRED DESIGN MIX.	--	X	ACI 318: CH. 19, 26.4.3, 26.4.4	1904.1, 1904.2, 1908.2, 1908.3
5. PRIOR TO CONCRETE PLACEMENT, FABRICATE SPECIMENS FOR STRENGTH TESTS, PERFORM SLUMP AND AIR CONTENT TESTS, AND DETERMINE THE TEMPERATURE OF THE CONCRETE.	X	--	ASTM C172, ASTM C31, ACI 318: 26.4, 26.12	1908.10
6. INSPECT CONCRETE AND SHOTCRETE PLACEMENT FOR PROPER APPLICATION TECHNIQUES.	X	--	ACI 318: 26.5	1908.6, 1908.7, 1908.8
7. VERIFY MAINTENANCE OF SPECIFIED CURING TEMPERATURE AND TECHNIQUES.	--	X	ACI 318: 26.5.3-26.5.5	1908.9
8. INSPECT FORMWORK FOR SHAPE, LOCATION AND DIMENSIONS OF THE CONCRETE MEMBER BEING FORMED.	--	X	ACI 318: 26.11.1.2(b)	--

TABLE 1705.6 REQUIRED SPECIAL INSPECTIONS AND TESTS OF SOILS

VERIFICATION AND INSPECTION	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
1. VERIFY MATERIALS BELOW SHALLOW FOUNDATIONS ARE ADEQUATE TO ACHIEVE THE DESIGN BEARING CAPACITY.	--	X
2. VERIFY EXCAVATIONS ARE EXTENDED TO PROPER DEPTH AND HAVE REACHED PROPER MATERIAL.	--	X
3. PERFORM CLASSIFICATION AND TESTING OF COMPACTED FILL MATERIALS.	--	X
4. VERIFY USE OF PROPER MATERIALS, DENSITIES AND LIFT THICKNESSES DURING PLACEMENT AND COMPACTION OF COMPACTED FILL.	X	--
5. PRIOR TO PLACEMENT OF COMPACTED FILL, OBSERVE SUBGRADE AND VERIFY THAT SITE HAS BEEN PREPARED PROPERLY.	--	X

TABLE 1705.2.6 SPECIAL INSPECTIONS OF METAL BUILDING SYSTEMS

TYPE	CONTINUOUS SPECIAL INSPECTION	PERIODIC SPECIAL INSPECTION
1.INSTALLATION OF RAFTER/BEAM FLANGE BRACES AND COLUMN FLANGE BRACES.	–	X
2. INSTALLATION OF PURLINS AND GIRTS, INCLUDING SPECIFIED LAPPING.	–	X
3. PURLIN AND GIRT RESTRAINT/BRIDGING/BRACING.	–	X
4. INSTALLATION OF X-BRACING, TIGHTENED TO REMOVE ANY SAG.	–	X

NOTE:
SEE METAL BUILDING MANUFACTURER'S SPEC FOR ADDITIONAL SPECIAL INSPECTIONS OF BOLTING AND OTHER NECESSARY ITEMS

SECTION 1705.2.1 SPECIAL INSPECTIONS OF STRUCTURAL STEEL ELEMENTS

VERIFICATION AND INSPECTION	INSTRUCTION	CONTINUOUS DURING TASK LISTED	PERIODICALLY DURING TASK LISTED
PRIOR TO WELDING (TABLE N5.4-3, AISC 360-16): NOT REQUIRED IF ONLY SNUG-TIGHT JOINTS ARE SPECIFIED (PER SECTION N5.6(1) OF AISC 360-16)			
CERTIFICATIONS OF FASTENERS		X	-
FASTENERS MARKED	VERIFY THAT FASTENERS HAVE BEEN MARKED IN ACCORDANCE WITH ASTM REQUIREMENTS	-	X
PROPER FASTENERS FOR JOINT	VERIFY GRADE, TYPE, AND BOLT LENGTH IF THREADS ARE EXCLUDED FROM THE SHEAR PLANE	-	X
PROPER BOLTING PROCEDURE	VERIFY APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET REQUIREMENTS.	--	X
CONNECTING ELEMENTS	VERIFYING APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET REQUIREMENTS.	-	X
PRE-INSTALLATION VERIFICATION TESTING	VERIFYING APPROPRIATE FAYING SURFACE CONDITION AND HOLE PREPARATION, IF SPECIFIED, MEET REQUIREMENTS.	-	X
PROPER STORAGE	VERIFY PROPER STORAGE OF BOLTS, NUTS, WASHERS, AND OTHER FASTENER COMPONENTS	-	X
DURING BOLTING (TABLE N5.6-2, AISC 360-16): - NOT REQUIRED IF ONLY SNUG-TIGHT JOINTS ARE SPECIFIED (PER SECTION N5.6(1) OF AISC 360-16). - NOT REQUIRED FOR PRETENSIONED JOINTS USING TURN-OF-THE-NUT METHOD WITH MATCH-MARKING, DIRECT-TENSION-INDICATORS, OR TWIST-OFF TYPE TENSION CONTROL METHOD (PER SECTION N5.6(2) OF AISC 360-16).			
SNUG-TIGHT PRIOR TO PRETENSIONING	VERIFY THAT JOINTS ARE BROUGHT TO SNUG-TIGHT CONDITION PRIOR TO PRETENSIONING OPERATION	-	X
FASTENER COMPONENT	VERIFY THAT FASTENER COMPONENT IS NOT TURNED BY WRENCH PREVENTED FROM ROTATING	-	X
PRETENSION FASTENERS	VERIFY THAT FASTENERS ARE PRETENSIONED IN ACCORDANCE WITH RCSC SPECIFICATIONS, PROGRESSING SYSTEMATICALLY FROM THE MOST RIGID POINT TOWARD THE FREE EDGES	-	X
AFTER BOLTING (TABLE N5.6-3, AISC 360-16):			
DOCUMENT ACCEPTANCE OR REJECTION OF BOLTED CONNECTIONS		X	-

QUALITY ASSURANCE PLAN

1. SPECIAL INSPECTION SHALL BE PROVIDED ACCORDING TO IBC CHAPTER 17 FOR THE ITEMS IDENTIFIED IN THIS SECTION AND ON THE CONTRACT DOCUMENTS.
2. THE NAMES AND CREDENTIALS OF SPECIAL INSPECTORS TO BE USED SHALL BE SUBMITTED TO THE BUILDING DEPARTMENT WHEN APPLYING FOR A BUILDING PERMIT.
3. SPECIAL INSPECTION REPORTS SHALL BE DELIVERED TO THE OWNER BI-WEEKLY OR MORE FREQUENTLY AS REQUIRED BY THE INSPECTOR OR BUILDING OFFICIAL.
4. OFF-SITE FABRICATION: WHERE FABRICATION OF STRUCTURAL LOAD-BEARING MEMBERS AND ASSEMBLIES IS BEING PERFORMED ON THE PREMISES OF A FABRICATOR'S SHOP, SPECIAL INSPECTION OF THE FABRICATED ITEMS SHALL BE IN ACCORDANCE WITH IBC SECTION 1704.2.5 UNLESS THE FABRICATOR IS APPROVED ACCORDING TO IBC SECTION 1704.2.5.1.
5. CONCRETE CONSTRUCTION: SPECIAL INSPECTIONS AND VERIFICATIONS SHALL BE PROVIDED IN ACCORDANCE WITH TABLE 1705.3.
6. SOILS: SPECIAL INSPECTION SHALL BE PROVIDED FOR PLACEMENT OF FILL, 12 INCHES OR MORE DEEP IN ACCORDANCE WITH SECTION 1705.6.

QUALITY ASSURANCE CONTRACTOR RESPONSIBILITY

EACH CONTRACTOR RESPONSIBLE FOR THE CONSTRUCTION OF A SEISMIC-FORCE-RESISTING SYSTEM, DESIGNATED SEISMIC SYSTEM, OR COMPONENT LISTED IN THE QUALITY ASSURANCE PLAN SHALL SUBMIT A WRITTEN CONTRACTOR'S STATEMENT OF RESPONSIBILITY TO THE BUILDING OFFICIAL AND TO THE OWNER PRIOR TO THE COMMENCEMENT OF WORK ON THE SYSTEM OR COMPONENT IN ACCORDANCE WITH IBC SECTION 1704.4. THE CONTRACTOR'S STATEMENT OF RESPONSIBILITY SHALL CONTAIN THE FOLLOWING:

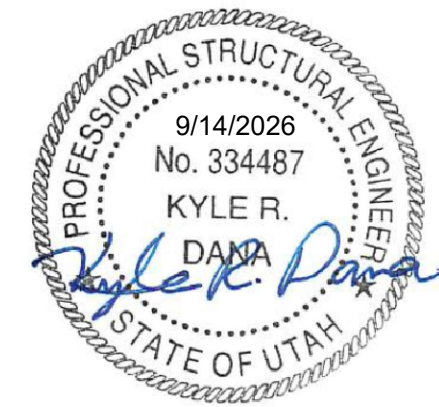
- A. ACKNOWLEDGMENT OF AWARENESS OF THE SPECIAL REQUIREMENTS CONTAINED IN THE QUALITY ASSURANCE PLAN.
- B. ACKNOWLEDGMENT THAT CONTROL WILL BE EXERCISED TO OBTAIN CONFORMANCE WITH THE CONSTRUCTION DOCUMENTS APPROVED BY THE BUILDING OFFICIAL.
- C. PROCEDURES FOR EXERCISING CONTROL WITHIN THE CONTRACTOR'S ORGANIZATION, THE METHOD AND FREQUENCY OF REPORTING, AND THE DISTRIBUTION OF REPORTS.
- D. IDENTIFICATION AND QUALIFICATIONS OF THE PERSON(S) EXERCISING SUCH CONTROL AND THE POSITION(S) IN THE ORGANIZATION.

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BEEF TEACHING FACILITY

CATTLE PEN BUILDING

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DATE: JULY 2020

PROJECT NO:	14-26-004:
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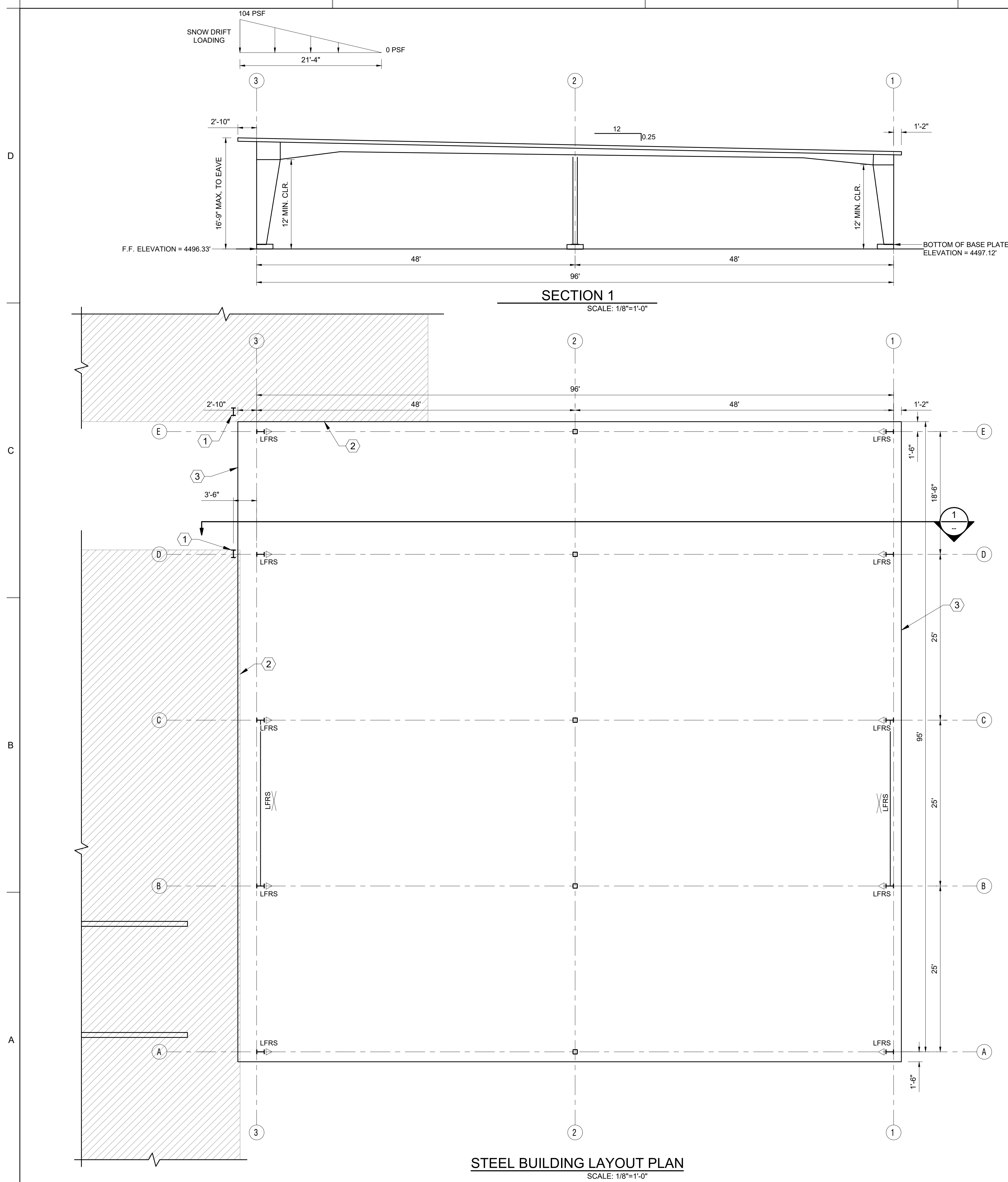
PROJECT NUMBER

S-002

STRUCTURAL NOTES

BID SET

S-100



- GENERAL NOTES:
1. THIS STEEL BUILDING PLAN IS PRELIMINARY, TO BE USED FOR BIDDING PURPOSES, AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL SUBMIT FINAL METAL BUILDING PLAN WITH COLUMN REACTIONS TO FORSGREN ASSOCIATES BEFORE CONSTRUCTION COMMENCES, INCLUDING SOIL IMPROVEMENTS. FORSGREN WILL PROVIDE A REVISED FOUNDATION PLAN WITH DETAILS TO MATCH THE FINAL METAL BUILDING PACKAGE. COORDINATE WITH METAL BUILDING MANUFACTURER TO DELIVER FINAL METAL BUILDING PACKAGE WITH ENOUGH TIME FOR THE REVISED FOUNDATION DESIGN TO BE FULLY COORDINATED BEFORE CONSTRUCTION COMMENCES.
 2. LFRS - LATERAL FORCE RESISTING SYSTEM BRACE LOCATION.
 3. OPEN BUILDING, BUILDING IS NOT ENCLOSED BY WIND GIRTS OR WALLS.
 4. MOMENT FRAME LOCATION, COLUMN LOCATIONS, BRACING LOCATIONS, DOOR LOCATIONS, AND BAY SPACING SHALL BE AS INDICATED ON DRAWINGS. THE METAL BUILDING DESIGNER SHALL NOT DEVIATE FROM THE LAYOUT OF BUILDING WITHOUT WRITTEN APPROVAL FROM THE STRUCTURAL ENGINEER OF RECORD.
 5. SNOW DRIFT LOADING FROM ADJACENT BUILDINGS IS SHOWN IN SECTION 1.

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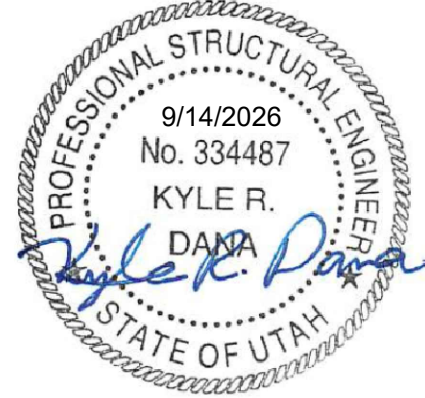
- # STRUCTURAL KEY NOTES
1. EXISTING COLUMN.
 2. EDGE OF EXISTING STEEL BUILDING EAVE.
 3. EDGE OF NEW STEEL BUILDING EAVE.

LEGEND

MOMENT FRAME	
BRACED FRAME	



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BEEF TEACHING FACILITY

CATTLE PEN BUILDING

MARK	DATE	DESCRIPTION

DATE: JULY 2026
PROJECT NO: 14-26-0043
CAD DWG FILE:
DRAWN BY: KB
CHECKED BY: MM
PROJECT NUMBER

S-101

STEEL BUILDING LAYOUT PLAN

BID SET

FOOTING SCHEDULE		
MARK	DIMENSIONS	REINFORCEMENT & OTHER INFORMATION
FS5.0	5'-0"x5'-0"x12"	(5) #5 BARS E.W., TOP AND BOTTOM
FS6.0	6'-0"x6'-0"x12"	(6) #5 BARS E.W., TOP AND BOTTOM
FS7.0	7'-0"x7'-0"x14"	(5) #6 BARS E.W., TOP AND BOTTOM
FS8.0	8'-0"x8'-0"x12"	(7) #6 BARS E.W., TOP AND BOTTOM

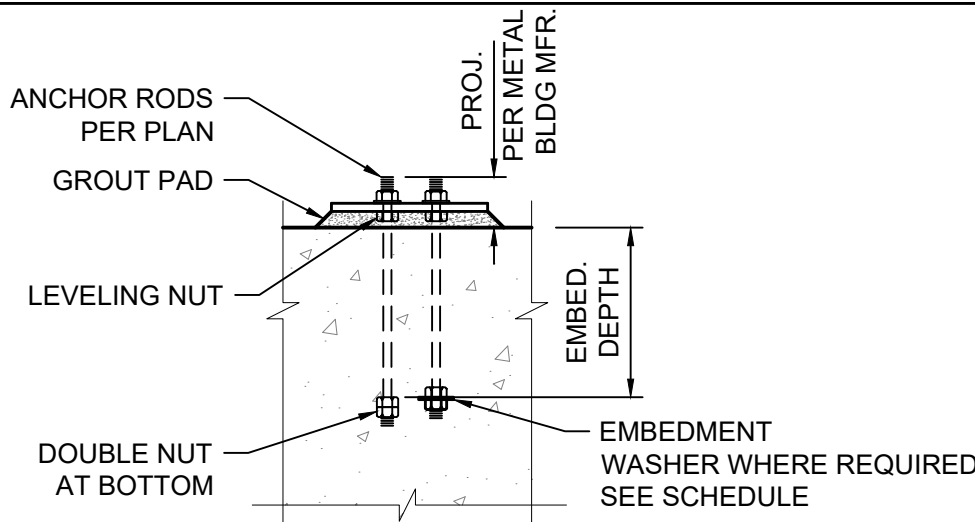
GRADE BEAM SCHEDULE		
GB1	16" WIDE x 16" TALL	(3) #5 BARS TOP & BOTTOM W/ #3 TIES AT 12" O.C.
GB2	16" WIDE x 20" +/- TALL	(4) #6 BARS TOP & BOTTOM W/ #3 TIES AT 12" O.C.

PIER SCHEDULE		
MARK	DIMENSIONS	REINFORCEMENT & OTHER INFORMATION
CP1	1'-6" x 1'-8" DETAIL 8/S500	(12) #5 BARS W/ #3 PIER TIES AT 6" O.C.
CP2	1'-4" x 1'-4" DETAIL 6/S500	(12) #5 BARS W/ #3 PIER TIES AT 6" O.C.

NOTES:
SEE PIER DETAILS FOR ADDITIONAL REQUIREMENTS ON TIE CONFIGURATIONS AND U-BAR LOCATIONS.

ANCHOR BOLT SCHEDULE				
MARK	ANCHOR BOLT AMOUNT / SIZE	ANCHOR GRADE	EMBEDMENT	NOTES
AB1	(6) 3/4" Ø ANCHORS	ASTM F1554 GRADE 36	16"	
AB2	(6) 1" Ø ANCHORS	ASTM F1554 GRADE 55	24"	
AB3	(4) 3/4" Ø ANCHORS	ASTM F1554 GRADE 36	12"	

NOTES:
SEE DETAIL BELOW FOR ANCHOR BOLT CONFIGURATIONS.
VERIFY ANCHOR BOLT PATTERNS & LOCATIONS WITH STEEL BUILDING MFR.



- FOUNDATION PLAN NOTES:
- THIS FOUNDATION PLAN IS PRELIMINARY, TO BE USED FOR BIDDING PURPOSES, AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL SUBMIT FINAL METAL BUILDING PLAN WITH COLUMN REACTIONS TO FORSGREN ASSOCIATES BEFORE CONSTRUCTION COMMENCES. FORSGREN WILL PROVIDE A REVISED FOUNDATION PLAN WITH DETAILS TO MATCH THE FINAL METAL BUILDING PACKAGE. COORDINATE WITH METAL BUILDING MANUFACTURER TO DELIVER FINAL METAL BUILDING PACKAGE WITH ENOUGH TIME FOR THE REVISED FOUNDATION DESIGN TO BE FULLY COORDINATED BEFORE CONSTRUCTION COMMENCES.
 - CENTER ALL FOOTINGS ON CONCRETE PIERS.
 - AT GRADE BEAMS, PLACE CONTROL JOINTS AT EDGE OF GRADE BEAM AS SHOWN IN DETAIL 3/S500.
 - FOR REINFORCING SPLICES PROVIDE LAP LENGTHS AS FOUND IN THE REINFORCING LAP LENGTHS SCHEDULE ON SHEET S002. WALL HORIZONTAL BARS AND GRADE BEAM BARS REQUIRE TOP BAR LAP LENGTHS, SEE SCHEDULE.
 - LFRS - LATERAL FORCE RESISTING SYSTEM BRACE LOCATION.
 - FINISHED FLOOR ELEVATION TO BE USED AS DATUM.
 - VERIFY ALL DIMENSIONS FOR CREATION OF METAL BUILDING SYSTEM PLAN.
 - DOWEL PLATE CONSTRUCTION JOINTS ARE TO BE PROVIDED AT COORDINATED EQUAL SPACING INCREMENTS AT THE END OF EACH SLAB PLACEMENT PERIOD AND SHALL BE ALIGNED WITH CONTROL JOINTS SHOWN ON THE PLAN. CONTRACTOR SHALL COORDINATE DOWEL PLATE CONSTRUCTION JOINT LOCATIONS BASED ON PRACTICAL WORK LOAD PLACEMENT REQUIREMENTS. IF CONTRACTOR HAS THE ABILITY TO PLACE ENTIRE BUILDING SLAB IN ONE PERIOD, DOWEL PLATE CONSTRUCTION JOINTS ARE NOT REQUIRED.
 - CONTRACTOR TO COORDINATE FLOOR SLAB FINISH WITH OWNER. (HEAVY GANDY ROLL)

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STRUCTURAL KEY NOTES

- GRADE BEAM, TYP.
- CONCRETE PIER, TYP. SEE PIER DETAILS ON S501
- SPOT FOOTING, TYP.
- EXISTING ALLEY WALL
- EXISTING PIER AND FOOTING.
- 6" SLAB ON GRADE W/ #4 BARS AT 16" O.C. E.W. AT CENTER OF SLAB. PLACE A MINIMUM OF 6" PIT RUN AND 4" CLEAN 3/4" ROCK BELOW SLAB. COMPACT SOIL UNDER SLAB TO AT LEAST 95% OF MAXIMUM DRY DENSITY AS DETERMINED BY (MODIFIED PROCTOR) ASTM D1557.
- SLAB CONTROL JOINT/CONSTRUCTION JOINT, SEE DETAILS 1 & 2 ON S500.
- DRILL AND EPOXY NEW FOOTING REBAR INTO EXISTING FOOTING WITH 6" MIN EMBEDMENT.
- EDGE OF CONCRETE SLAB
- PLACE 4" OF CLEAN 3/4" ROCK BELOW SLAB OVER PROPERLY PREPARED SUB-GRADE.
- FIELD FIT CONCRETE RAMP TO EXISTING SLAB

ELEVATIONS

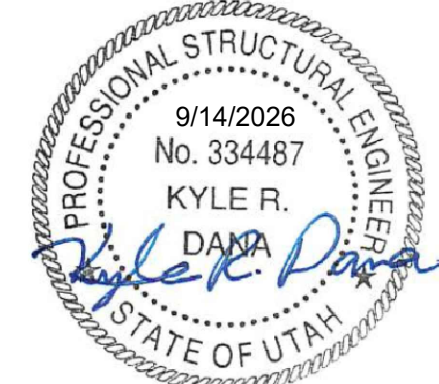
FINISHED FLOOR ELEVATION = 4496.32
TOP OF PIER ELEVATION = 4496.99
TOP OF FOOTING ELEVATION = 4494.82

LEGEND

FOOTING
GRADE BEAM



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BEEF TEACHING FACILITY

CATTLE PEN BUILDING

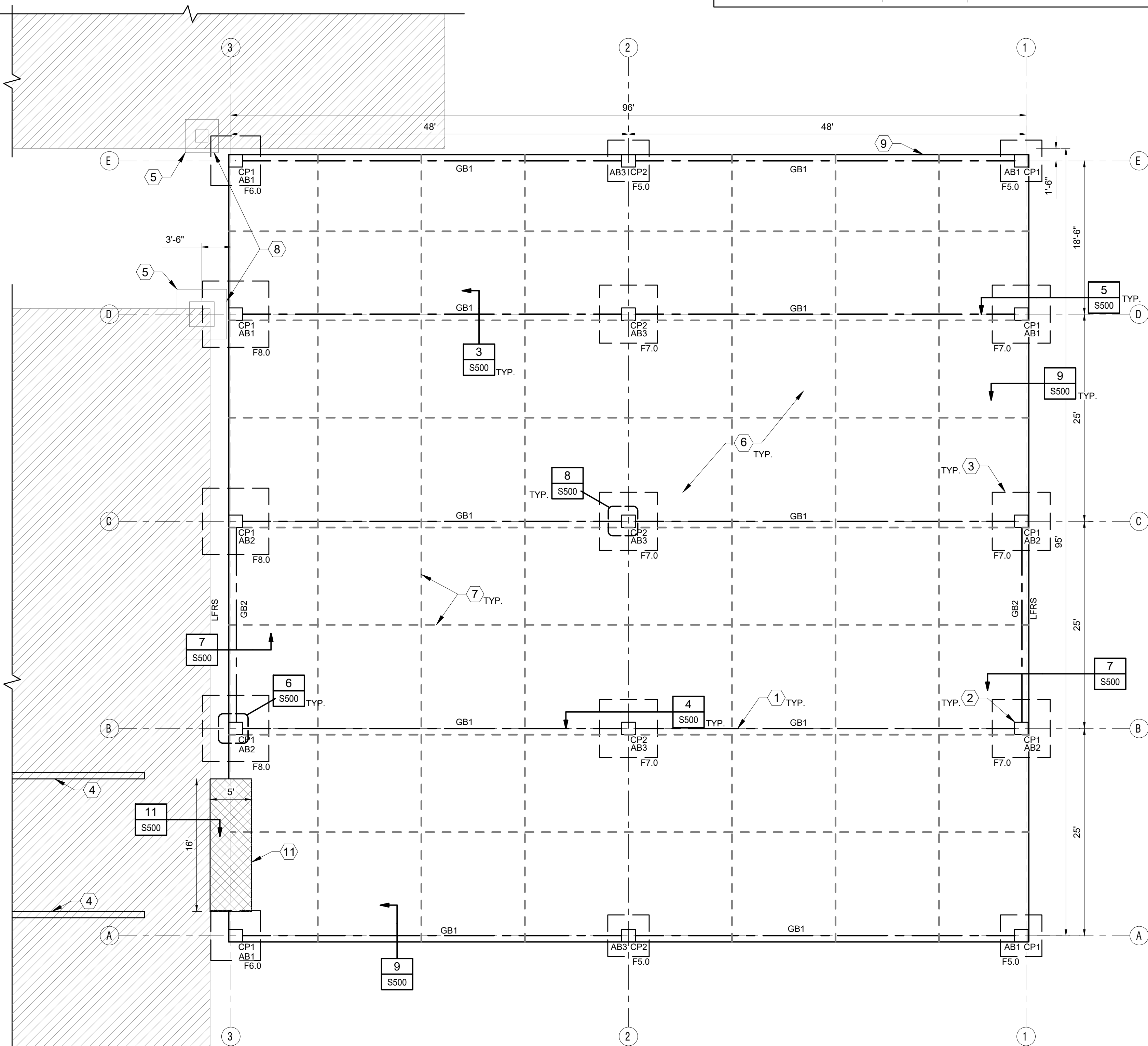
MARK	DATE	DESCRIPTION

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S-102

FOUNDATION
PLAN

BID SET



FOUNDATION PLAN

SCALE: 1/8"=1'-0"

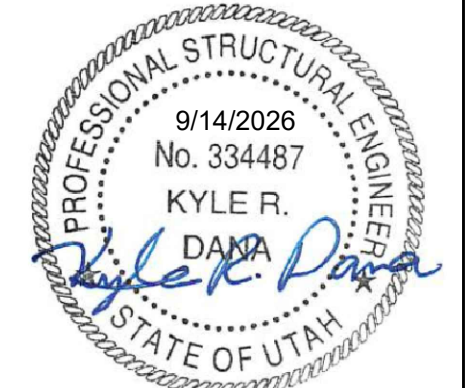
1. 8'-0" MAX POST SPACING.
2. FINAL PEN LAYOUT MAY VARY BASED ON FINAL METAL BUILDING LAYOUT AND MEMBER DIMENSIONS.

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1. PROVIDE 3" DIAMETER (O.D.) SCHEDULE 40 STEEL PIPE FENCE POST INSTALLED BY CONTRACTOR. CORE DRILL SLAB AND GROUT POSTS ACCORDING TO DETAIL 101/S500. COORDINATE LOCATIONS WITH OWNER. APPROXIMATE POST QUANTITY: 103
2. METAL PANEL GATE PROVIDED BY OWNER.
3. SQUEEZE CHUTE PROVIDED BY OWNER.
4. METAL ALLEYWAY PROVIDED BY OWNER.
5. CONTRACTOR TO PROVIDE (2) MARLEY ENGINEERED PRODUCTS BRM5881 INDUSTRIAL INFRARED HEATERS WITH PSD60050 FACTORY DISCONNECT AND M4500 FACTORY GROUND KIT, COORDINATE WITH ELECTRICAL DRWINGS. FINAL LOCATIONS TO BE COORDINATED WITH OWNER.
6. CONTRACTOR TO PROVIDE (2) DAYTON 30" MOUNTED FANS MODEL 20956, COORDINATE WITH ELECTRICAL DRAWINGS. FINAL LOCATIONS TO BE COORDINATED WITH OWNER.



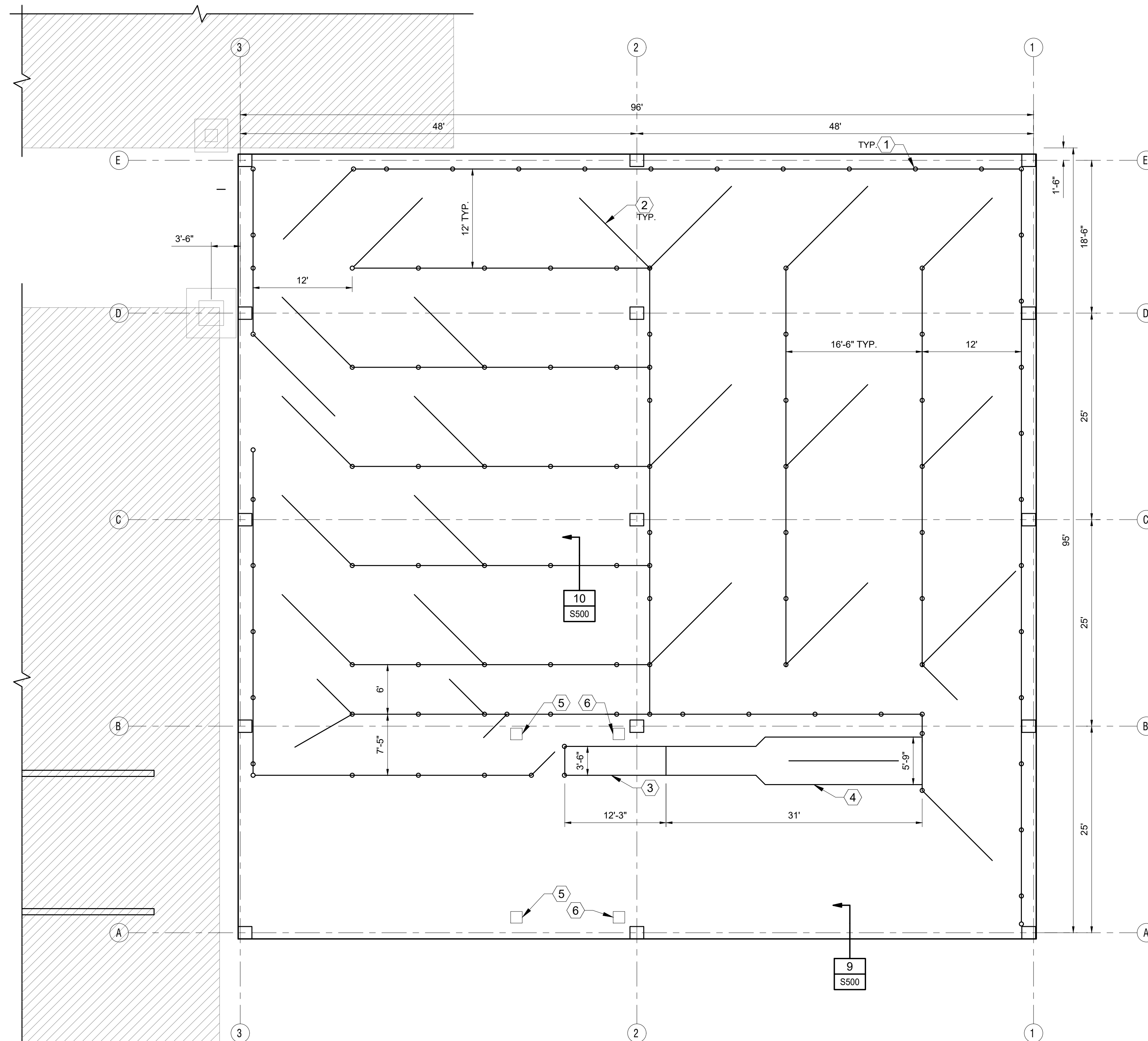
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CATTLE PEN BUILDING

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PROJECT NUMBER	

PEN LAYOUT
PLAN

PEN LAYOUT PLAN
SCALE: 1/8"=1'-0"

BID SET

BEEF TEACHING FACILITY

CATTLE PEN BUILDING

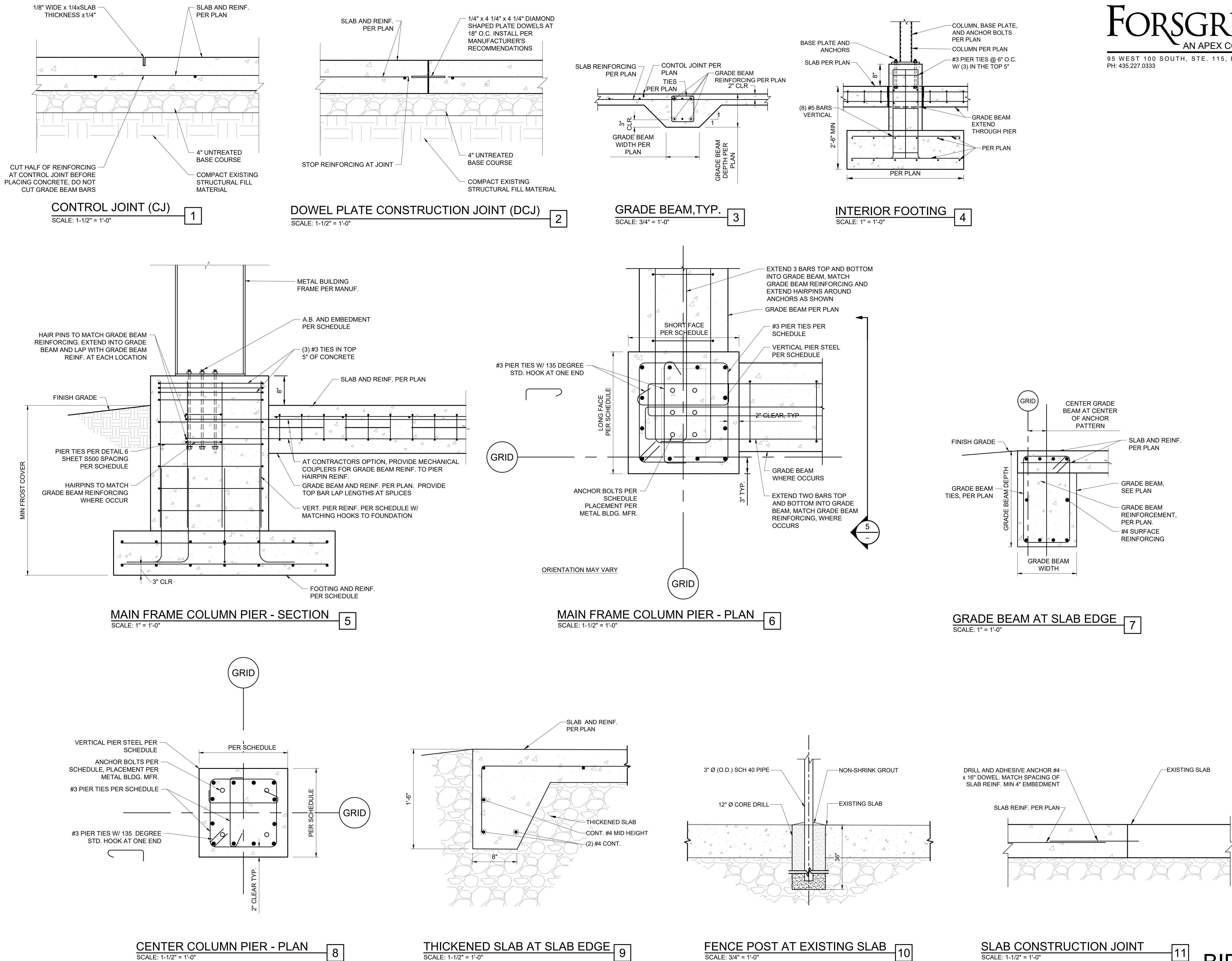
MARK	DATE	DESCRIPTION

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CAD DWG FILE:	
DRAWN BY:	KB
CHECKED BY:	MM
PROJECT NUMBER	

S-500

STRUCTURAL
DETAILS

BID SET



- MC CABLE IS NOT AN APPROVED ALTERNATE TO CONDUCTORS IN CONDUIT.
21. DO NOT INSTALL MORE THAN THREE PHASE CONDUCTORS IN ANY HOME-RUN CONDUITS UNLESS SPECIFICALLY INDICATED ON DRAWINGS.
22. IDENTIFY ALL OUTLET COVER PLATES WITH THE PANEL AND CIRCUIT NUMBER.
23. A GFI OUTLET SHALL BE INSTALLED AT EACH LOCATION DESIGNATED BY "GFI" ON THE DRAWINGS. DOWNSTREAM PROTECTION BY A GFI OUTLET UPSTREAM IS NOT ALLOWED.
24. ALL CONVENIENCE OUTLETS MUST BE MOUNTED FLUSH WITH THE COVER PLATE AND SECURED FIRMLY TO THE OUTLET BOX.
25. THE CONTRACTOR SHALL TAKE SPECIAL CARE TO MAKE SURE OUTLET BOXES ARE SET FLUSH WITH FINISH WALL SURFACES WHERE WALL PANELING OR ACOUSTICAL WALLS ARE INSTALLED OR WHERE OUTLETS ARE INSTALLED ON CARPETED RISERS.
26. REMOVE ALL OLD AND/OR UNUSED EXISTING CONDUIT AND ELECTRICAL APPARATUS FROM EXTERIOR OR INTERIOR EXPOSED SURFACES.
27. WHERE EXISTING ELECTRICAL EQUIPMENT IS TO REMAIN BUT THE SURFACE THAT IT IS MOUNTED ON IS TO BE REWORKED UNDER OTHER CONTRACTS, THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO REMOVE AND INSTALL OR MODIFY THE EXISTING EQUIPMENT AS REQUIRED TO MEET THE DESIGN INTENT. SEE ARCHITECTURAL DRAWINGS FOR ROOF, CEILINGS, WALLS, SOFFITS, FLOORS, ETC.
28. REMOVE ALL UNUSED CONDUITS AND CIRCUITS IN THE DEMOLITION AREA AS THEY ARE IDENTIFIED AS UNUSED OR ABANDONED.
29. REMOVE ALL EXISTING ELECTRICAL DEVICES, EQUIPMENT, AND APPARATUS AS THEY ARE IDENTIFIED AS UNUSED OR ABANDONED.
30. RELOCATE EXISTING CONDUITS AND CIRCUITS AS REQUIRED THAT ARE PRESENTLY SERVING EQUIPMENT THAT IS INTENDED TO REMAIN IN SERVICE BUT SAID CONDUITS ARE CURRENTLY RUNNING THROUGH AREAS TO BE DEMOLITIONED.
31. WHERE EXISTING CONDUIT RUNS ARE RE-USED BY SPECIAL PERMISSION FROM THE ARCHITECT, A SEPARATE GREEN INSULATED GROUND WIRE SHALL BE PULLED IN THE CONDUIT AND BONDED AT EACH END AS REQUIRED.
32. ALL PATCH, REPAIR, REPAINT AND COVER UP REQUIRED AS A RESULT OF ELECTRICAL REMODEL IS TO BE THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR, BUT ACTUAL WORK IS TO BE PERFORMED BY QUALIFIED PERSONNEL.
33. FIXTURE COUNTS SHOWN ON DRAWINGS ARE FOR REFERENCE ONLY. CONTRACTOR IS RESPONSIBLE TO VERIFY FIXTURE COUNTS AS PART OF BIDDING PROCESS.
34. THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE TO REVIEW ALL SWITCH LOCATIONS WITH THE GENERAL CONTRACTOR PRIOR TO ROUGH-IN TO PREVENT ANY SWITCHES FROM BEING BLOCKED.
35. BEFORE RUNNING CONDUITS, PLACING OUTLETS OR ORDERING EQUIPMENT, THE CONTRACTOR SHALL REVIEW THE SPECIFICATIONS AND DESIGN AND SHOP DRAWINGS OF THE OTHER TRADES SERVED BY THE CONDUIT, OUTLETS, AND/OR EQUIPMENT AND NOTIFY ENGINEER OF CONFLICTS. WHERE NO NOTIFICATION IS GIVEN, THE CONTRACTOR WILL BE RESPONSIBLE TO REVISE INSTALLATIONS WITHOUT COST TO THE OWNER.
36. PROVIDE NEUTRAL CONNECTION TO 208/240/480V. SINGLE-PHASE EQUIPMENT. RUN SEPARATE GROUND WIRE TO ALL OUTDOOR UNITS AND BOND TO THE EQUIPMENT GROUND LUG.
37. REVIEW THE STATE DESIGN REQUIREMENTS MANUAL PRIOR TO BID
38. REVIEW THE USU A&E DESIGN MANUAL PRIOR TO BID.
39. WHERE THERE ARE CONFLICTS IN THE DRAWINGS AND/OR SPECIFICATIONS THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER PRIOR TO BID. WHERE NO NOTIFICATION IS GIVEN THE MORE STRINGENT INTERPRETATION (GENERALLY INTERPRETED TO BE THE MORE COSTLY) WILL BE ENFORCED.

MECHANICAL EQUIPMENT SCHEDULE									
SYM	DESCRIPTION	LOAD	VOLTS	PHASE	FIRE ALARM SHUTDOWN	CONTROL CIRCUITS BY	* STARTER BY	SAFETY DISCONNECT BY	REMARKS
CLY. 1	CATTLE ALLEYWAY	8 FLA	208	1	NO	N/A	EQUIP	ELEC C&P	
IH- 1	INFRARED HEATER	4.5 KW	208	1	NO	ELEC	EQUIP	EQUIP	TYPICAL FOR MULTIPLE UNITS—SEE POWER PLAN FOR COUNTS AND LOCATIONS; INSTALL THERMOSTAT CONTROL AS DIRECTED BY OWNER; PROVIDE CONTROL WIRING FROM THERMOSTAT TO EQUIPMENT PER MANUFACTURER; INSTALL GROUND FAULT PROTECTION FURNISHED WITH EQUIPMENT
SC- 1R	SQUEEZE CHUTE	23.2 FLA	208	1	NO	N/A	EQUIP	ELEC C&P	RELOCATED EQUIPMENT. PROVIDE CORD AND PLUG TO MATCH EQUIPMENT NAMEPLATE RATING
VF- 1	VENTILATION FAN	1/3 HP	120	1	NO	N/A	EQUIP	EQUIP	TYPICAL FOR MULTIPLE UNITS—SEE POWER PLAN FOR COUNTS AND LOCATIONS;

* ELECTRICAL CONTRACTOR VERIFY SINGLE SPEED OR TWO SPEED STARTERS WITH MECHANICAL DRAWINGS.

[illegible]

REFER TO POWER, LIGHTING AND COMMUNICATIONS PLANS FOR SPECIFIC DIMENSIONS.
SEE GENERAL NOTES AND SPECIFICATIONS WHERE NO HEIGHTS ARE INDICATED.

CATTLE PEN BUILDING

SECTION 260500 - COMMON WORK RESULTS FOR ELECTRICAL

- ## 1. PERFORMANCE REQUIREMENTS
- A. Seismic Performance. Existing controllers shall withstand the effects of earthquake motions determined according to ASCE/EI 7.
1. The term "withstand" means "the unit will remain in place without separation of any parts from the device when subjected to the seismic forces specified."
- ## 2. ENCLOSURES
- A. Comply with environmental conditions at installed location.
 1. Indoor, Dry and Clean Locations: NEMA 250, Type 1.
 2. Outdoor Locations: NEMA 250, Type 3R.
 3. Wash-Down and Corrosive Areas: NEMA 250, Type 4X, stainless steel
 4. Other Wet or Damp, Indoor Locations: NEMA 250, Type 4.
 5. Animal containment areas: NEMA 250, Type 30* and below.
- ## 3. SLEEVES FOR RACEWAYS AND CABLES
- A. Steel Pipe Sleeves: ASTM A 53, Type E, Grade B, Schedule 40 galvanized steel, plain ends.
 1. Cast-Iron Pipe Sleeves: Cast or fabricated "wall pipe," equivalent to ductile-iron pressure pipe, with plain ends and integral watertight, unless otherwise indicated.
 - B. Sleeves for Rectangular Openings: Galvanized steel sheet.
 1. Minimum Metal Thickness:
 - a. For sleeve cross-section rectangular perimeter less than 50 inches and no side more than 16 inches, thickness shall be 0.052 inch.
 - b. For sleeve cross-section rectangular perimeter equal to, or more than, 50 inches and 1 or more sides equal to, or more than, 16 inches, thickness shall be 0.138 inch.

4. GROUT
- A. Nonmetallic, Shrinkage-Resistant Grout: ASTM C 1107, factory-packaged, nonmetallic aggregate grout, noncorrosive, nonstaining, mixed with water to consistency suitable for application and a 30-minute working time.
5. COMMON REQUIREMENTS FOR ELECTRICAL INSTALLATION
- A. Comply with NECA 1.
 - B. Measure indicated mounting heights to bottom of unit for suspended items and to center of unit for wall-mounting items.
 - C. Headroom Maintenance: If mounting heights or other location criteria are not indicated, arrange and install components and equipment to provide maximum possible headroom consistent with these requirements.
 - D. Equipment: Install to facilitate service, maintenance, and repair or replacement of components of both electrical equipment and other nearby installations. Connect in such a way as to facilitate future disconnecting with minimum interference with other items in the vicinity.
 - E. Right of Way: Give to piping systems installed at a required slope.
6. SLEEVE INSTALLATION FOR ELECTRICAL PENETRATIONS
- A. Electrical penetrations occur when raceways, cables, wireways, cable trays, or busways penetrate concrete slabs, concrete or masonry walls, or fire-rated floor and wall assemblies.
 - B. Concrete Slabs and Walls: Install sleeves for penetrations unless core-drilled holes or formed openings are used. Install sleeves for penetrations of cables and walls.
 - C. Fire-Rated Assemblies: Install sleeves for penetrations of fire-rated floor and wall assemblies unless openings compatible with firestop system are fabricated during construction of floor and walls.
 - D. Cut sleeves to length for mounting flush with both surfaces of walls.
 - E. Extnd sleeves installed in floors 2 inches above finished floor level.
- F. Seal space around of sleeves with grout for penetrations of concrete and masonry
- 1. Promptly pack grout solidly between sleeve and wall so no voids remain. Top exposed surfaces smooth; outerd grout wall while curing.

SECTION 260519 - LOW-VOLTAGE ELECTRICAL POWER CONDUCTORS AND CABLES

1. CONDUCTORS AND CABLES
 - A. Copper Conductors: Comply with NEMA WC 70.
 - B. Conductor Insulation: Comply with NEMA WC 70 for Types THHN-THWN.
2. CONNECTORS AND SPLICES
 - A. Descriptions: Factory-fabricated connectors and splices of size, ampacity rating, material, type, and class for application and service indicated.
3. CONDUCTOR MATERIAL APPLICATIONS
 - A. Branch Circuits: Copper. Solid or stranded for No. 10 AWG and smaller; stranded for No. 8 AWG and larger.
4. CONDUCTOR INSULATION AND MULTICONDUCTOR CABLE APPLICATIONS AND WIRING METHODS
 - A. Feeders: Type THHN-THWN, single conductors in raceway.
 - B. Branch Circuits, Including in Crawspaces: Type THHN-THWN, single conductors in raceway.
5. INSTALLATION OF CONDUCTORS AND CABLES
 - A. Conceal cables in finished walls, ceilings, and floors, unless otherwise indicated.
 - B. Use manufacturer-approved pulling compound or lubricant where necessary; compound used must not deteriorate conductor or insulation. Do not exceed manufacturer's recommended maximum pulling tension and sidewall pressure values.
 - C. Use pulling means, including fish tape, cable, rope, and basket-weave wire/cable grips, that will not damage cables or raceway.
 - D. Install exposed cables parallel and perpendicular to surfaces of exposed structural members, and follow surface contours where possible.
 - E. Support cables according to Division 26 Section "Hangers and Supports for Electrical Systems."
 - F. Identify color-code conductors and cables according to Division 26 Section "Identification for Electrical Systems."
6. CONNECTIONS
 - A. Tighten electrical connectors and terminals according to manufacturer's published torque-lightening values. If manufacturer's torque values are not indicated, use those specified in UL 485A and UL 486B.
 - B. Identify splices and taps that are compatible with conductor material and that possess equivalent or better mechanical strength and insulation ratings than unsplined conductors.
 - C. Wiring at Outlets: Install conductor at each outlet, with not less than 12 inches of slack.

SECTION 260526 - GROUNDING AND BONDING FOR ELECTRICAL SYSTEMS

- 1.1 QUALITY ASSURANCE**
- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, National Electrical Code, and approved by authority having jurisdiction, and marked by undersize use.
- B. Comply with UL 467 for grounding and bonding materials and equipment.
- 1.2 CONDUCTORS**
- A. Insulated Conductors: Copper wire or cable insulated for 600 V unless otherwise required by applicable Code or authorities having jurisdiction.
- B. Bare Copper Conductors:
- 1. Solid Conductors: ASTM B 3.
 - 2. Stranded Conductors: ASTM B 3.
 - 3. Bonding Cable: 28 kcmil, 14 strands of No. 17 AWG conductor, 1/4 inch in diameter.
 - 4. Bonding Conductor: No. 4 or No. 6 AWG, stranded conductor.
 - 5. Bonding Jumper: Copper wire, braided conductors, terminated with copper ferrules; 1-5/8 inches wide and 1/16 inch thick.

- 1.3 CONNECTORS
- A. Listed and labeled by a nationally recognized testing laboratory acceptable to authorities having jurisdiction for applications in which used, and for specific types, sizes, and combinations of conductors and other items connected.
- 1.4 GROUNDING ELECTRODES
- A. Ground Rods: Copper-clad steel, sectional type, 3/4 inch by 10 feet in diameter.
- 1.5 APPLICATIONS
- A. Conductors: Install solid or stranded conductor No. 8 AWG and smaller, and stranded conductors No. 6 AWG and larger, unless otherwise indicated.
- B. Conductor Terminations and Connections:
1. Pipe and Equipment Grounding Conductor Terminations: Bolted connectors.
2. Underground Connections: Welded connectors, except at ground rods and as otherwise indicated.
3. Connections to Ground Rods: Bolted connectors.
4. Connections to Structural Steel: Welded connectors.
- 1.6 EQUIPMENT GROUNDING
- A. Install insulated equipment grounding conductors all feeder and branch circuits, in addition to those required by NFPA 70.
- B. Metal Poles Supporting Outdoor Lighting Fixtures: Install grounding electrode and a separate insulated equipment grounding conductor in addition to grounding conductor installed with branch-circuit conductors.

- 1.7. INSTALLATION**
- A. **Grounding Conductors:** Route along shortest and straightest paths possible, unless otherwise indicated or required by Code. Avoid obstructing access or placing conductors where they may be subjected to strain, impact, or damage.
 - B. **Ground Rods:** Drive rods until tops are 2 inches below finished floor or final grade, unless otherwise indicated.
 - C. **Ground Rods:** Drive rods until tops are 2 inches below finished floor or final grade unless otherwise indicated.
 - 1. Interconnect ground rods with grounding electrode conductor below grade and as otherwise indicated. Make connections without exposing steel or damaging coating if any.
 - 2. For grounding electrode system, install at least three rods spaced at least one-rod length from each other and located at least 6 feet from any other grounded object, other grounding electrodes, and connect to the service grounding electrode conductor.

- D. Bonding Straps and Jumpers: Install in locations accessible for inspection and maintenance except where routed through short lengths of conduit.
 - 1. Bonding to Structure: Bond straps directly to basic structure, taking care not to penetrate any adjacent parts.
 - 2. Bonding to Equipment Mounted on Vibration Isolation Hangers and Supports: Install bonding so vibration is not transmitted to rigidly mounted equipment.
 - 3. Use exothermic-welded connectors for outdoor locations; if a disconnect-type connection is required, use a bolted clamp.
- E. Grounding and Bonding for Piping:
 - 1. Metal Water Service Pipe: Install insulated copper grounding conductors, in conduit, from building's main service equipment, or grounding bus, to main metal water service entrances to building. Connect grounding conductors to main metal water service pipes; use a bolted clamp connector or bolt a lug-type connector to a pipe flange using one of the lug bolts of the flange. Where a dielectric main water fitting is installed, connect grounding conductor on street side of fitting. Bond metal grounding conductor or sleeve to conductor at each end.
 - 2. Water Meter Piping: Use braided-type bonding jumpers to electrically bypass water meters. Connect to pipe with a bolted connector.
 - 3. Bond each aboveground portion of gas piping system downstream from equipment shut-off valve.
- F. Bonding for Motor Equipment: Bond conductors to main metal water service pipes; use a bolted clamp connector, flange, blowers, electric heaters, and air cleaners. Install timed bonding jumper to bond across flexible duct connections to achieve continuity.
- G. Grounding for Steel Building Structure: Install a driven ground rod at base of each corner column and at intermediate exterior columns at distances not more than 80 feet (18 m) apart.
- H. Concrete-Encased Grounding Electrode (Ufer Ground):
 - 1. New Installations:
 - a. Fabricate according to NFPA 70, use a minimum of 20 foot (6 m) of bare copper conductor not smaller than No. 4 AWG.
 - b. If concrete foundation is less than 20 feet (6 m) long, coil excess conductor within base of foundation.
 - c. Bond grounding conductor to reinforcing steel in at least four locations and to anchor bolts. Extend grounding conductor below grade and connect to building's grounding grid or to grounding electrode external to concrete.
 - 2. Retrofit Installations:
 - a. Identify and expose existing foundation rebar and make suitable bonding connection using approved connector at one location.

SECTION 260533 - RACEWAY AND BOXES FOR ELECTRICAL SYSTEMS

- ## 1. METAL CONDUIT AND TUBING
- A. Rigid Steel Conduit: ANSI C80.1.
 - B. PVC-Coated Steel Conduit: PVC-coated rigid steel conduit.
 - 1. Comply with NEMA RM 1.
 - 2. Coating Thickness: 0.040 inch, minimum.
 - C. EMT: ANSI C80.3.
 - D. FMC: Zinc-coated steel or aluminum.
 - E. LFMC: Flexible steel conduit with PVC jacket.
 - F. Fittings for Conduit (including all Types and Flexible and Liquidtight), EMT, and Cable: NEMA FB 1; listed for type and size roadway with its own listing, and for application and environment in which installed.
- 1. Fittings for EMT, Rigid or die-cast, set-screw or compression type.
 - 2. Sleeves for Fittings for PVC-Coated Conduit: Minimum thickness, 0.040 inch, with overlapping sleeves protecting threaded joints.
- ## 2. JOINT COMPOUND FOR RIGID STEEL CONDUIT: Listed for use in cable connector assemblies, and compounded for use to lubricate and protect threaded raceway joints from corrosion and enhance their conductivity.
- ## 3. NONMETALLIC TUBING, TUBING, AND FITTINGS
- A. RNC: Type EPC-40-PVC, complying with NEMA TC 2 and UL 651 unless otherwise indicated.
 - B. Fittings for RNC: Comply with EMTA TC 3, match to conduit or tubing type and material.
- ## 3. BOXES, ENCLOSURES, AND CABINETS
- A. Sheet Metal Outlet and Device Boxes: NEMA OS 1.
 - B. Cast-Metal Outlet and Device Boxes: NEMA FB 1, ferrous alloy or aluminum. Type FD, with gasketed cover.
 - C. Small Sheet Metal Pull and Junction Boxes: NEMA OS 4.
 - D. Cast-Metal Access, Pull, and Junction Boxes: NEMA FB 1, cast aluminum or galvanized, cast iron with gasketed cover.
- ## 4. HANDHOLES AND BOXES FOR EXTERIOR UNDERGROUND WIRING
- A. Description: Comply with SCTE 77.
 - 1. Color of Frame and Cover: Gray.
 - 2. Configuration: Units shall be designed for flush burial and have open bottom, unless otherwise indicated.
 - 3. Cover: Weatherproof, secured by tamper-resistant locking devices and having structural load rating consistent with enclosure.
 - 4. Cover Finish: Nonskid finish shall have a minimum coefficient of friction of 0.50.
 - 5. Cover Legend: Molded lettering: "ELECTRIC".
 - 6. Handholes 12 inches wide by 24 inches long and larger shall have for cable racks and pulling-in irons installed before concrete is poured.
 - B. Polymer-Concrete Handholes and Boxes with Polymer-Concrete Cover: Molded of sand and aggregate, bound together with polymer resin, and reinforced with steel or fiberglass or a combination of the two.
- ## 5. RACEWAY APPLICATION
- A. Outdoors: Apply raceway products as specified below, unless otherwise indicated:
 - 1. Aboveground: Rigid steel conduit.
 - 2. Underground Conduit: RNC, Type EPC-80-PVC, direct buried.
 - 3. Connection to Vibrating Electric Equipment (including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): LFMC.
 - B. Boxes and Enclosures, Aboveground:
 - a. Animal containment areas: NEMA 250, Type 4
 - b. Other areas: NEMA 250, Type 3R.
 - 5. Application of Handholes and Boxes for Underground Wiring:
 - a. Handholes and Pull Boxes in Driveway, Parking Lot, and Off-Roadway Locations, Subject to Occasional, Nonloadbearing Loading by Heavy Vehicles: Polymer concrete, SCTE 77, Type 15 structural load rating.
 - b. Handholes and Pull Boxes in Sidewalk and Similar Applications with a Safety Factor for Nonloadbearing Loading by Vehicles: Polymer concrete, frame and cover, SCTE 77, Type 8 structural load rating.
 - c. Handholes and Pull Boxes Subject to Light-Duty Pedestrian Traffic Only: Polymer concrete, SCTE 77 with 3000-lbf vertical loading.

- B. Comply with the following indoor applications, unless otherwise indicated:
 - 1. Exposed, Not Subject to Physical Damage: EMT.
 - 2. Exposed and Subject to Physical Damage: Rigid steel conduit. Includes raceways in the following locations:
 - a. Concealed in Ceilings and Interior Walls and Partitions: EMT.
 - b. Connection to Vibrating Equipment (Including Transformers and Hydraulic, Pneumatic, Electric Solenoid, or Motor-Driven Equipment): FMC, except use ELMC in damp or wet locations.
 - 3. Damp or Wet Locations: Rigid steel conduit.
 - 4. Boxes and Enclosures: NEMA 250, Type 1, except use NEMA 250, Type 4, stainless steel in damp or wet locations.
 - C. Minimum Raceway Size: 3/4-inch trade size.
 - D. Raceway Fittings: Compatible with raceways and suitable for use and location.
 - 1. Rigid and Intermediate Steel Conduit. Use threaded rigid steel conduit fittings, unless otherwise indicated.
- 1.6. INSTALLATION**
- A. Comply with NECA 1 for installation requirements applicable to products specified in Part 2 except where requirements on Drawings or in this Article are stricter.
 - B. Keep raceways at least 6 inches away from parallel runs of flues and steam or hot-water pipes. Install horizontal raceway runs above water and steam piping.
 - C. Complete raceway installation before starting conductor installation.
 - D. Support raceways as specified in Division 26 Section "Hangers and Supports for Electrical Systems."
 - E. Arrange stub-ups so curved portions of bends are not visible above the finished slab.
 - F. Support no more than the equivalent of three 90-degree bends in any conduit run except for communications conduits, for which fewer bends are allowed.
 - G. Conceal conduit and EMT within finished walls, ceilings, and floors, unless otherwise indicated.
 - H. Raceways Embedded in Slabs:
 - 1. Run conduit larger than 1-inch trade size, parallel or at right angles to main reinforcement.
 - a. Where at right angles to reinforcement, place conduit close to slab support.
 - 2. Arrange raceways to cross building expansion joints at right angles with expansion fittings.
 - 3. Change from RNC, Type EPC-80/PVC to rigid steel conduit before rising above grade.
 - I. a. GRC, Stainless, PVC coated, or Red Brass rigid conduit in animal containment areas to a minimum height of 24".
 - I. Threaded Conduit Joints. Exposed to Wet, Damp, Corrosive, or Outdoor Conditions: Apply listed compound to threads of raceway and fittings before making pull-ups. Follow compound manufacturer's written instructions.
 - J. Raceway Terminations at Locations Subject to Moisture or Vibration: Use insulating bushings to protect conductors. Include conductors smaller than No. 4 AWG.
 - K. Install pull wires in empty raceways, using a guide or monofilament plastic line with not less than 200-lb tensile strength. Leave at least 12 inches of slack at each end of pull wire.
 - L. Install raceway sealing fittings at suitable, approved, and accessible locations and fill them with listed sealing compound. For concealed raceways, install each fitting in a flush steel bush with a blank cover.

plate having a finish similar to that of adjacent plates or surfaces. Install raceway sealing fittings at the following points:

1. Where conduits pass from underground to cold locations, such as boundaries of refrigerated spaces.
2. Where otherwise required by the manufacturer's instructions.

1.7. INSTALLATION OF UNDERGROUND CONDUIT

A. Direct-Buried Conduit:

1. Excavate trench bottom to provide firm and uniform support for conduit. Prepare trench bottom as specified in Division 31 Section "Earth Moving" for pipe less than 6 inches in nominal diameter.
2. Install bedfill per University requirements.
3. After installing conduit, bedfill and compact. Start at the tie-in point, and work toward end of conduit run, leaving conduit at end of run free to move with expansion and contraction as temperature changes during this process. Firmly hand tamp bedfill around conduit to provide maximum supporting strength. After placing conduit bedfill to within 12 inches of finished grade, make final conduit bedfill at end of run and complete bedfilling with compaction.
4. Install manufactured duct elbows for sub-up spots for equipment and at building entrances through the floor, unless otherwise indicated. Encase elbows for sub-up ducts throughout the length of the elbow.

1.8. INSTALLATION OF UNDERGROUND PUMPHOLES AND BOXES

- A. Install handholes and box level and grade with level and orientation and depth coordinated with connecting conduits to minimize bends and deflections required for proper entrances.
- B. Unless otherwise indicated, support units on a level bed of crushed stone or gravel, graded from 12-inch sieve to No. 4 sieve and compacted to same density as adjacent undisturbed earth.
- C. Elevation: In paved areas, set so to cover surface will be flush with finished grade. Set covers of other enclosures 18" above finished grade.
- D. Install removable handhole, including pulling eyes, cable stanchions, cable arms, and insulators, as required for installation and support of cables and conductors and as indicated. Select arm lengths to be long enough to provide spare space for future cables, but short enough to preserve adequate working clearances in the enclosure.
- E. Field-cut openings for conduits according to enclosure manufacturer's written instructions. Cut wall of enclosure with a tool designed for exterior cut. Cut sizes holes for terminating fittings to be used, and seal around penetrations after fittings are installed.

SECTION 260548 - VIBRATION AND SEISMIC CONTROLS FOR ELECTRICAL SYSTEMS

- ## 11 PERFORMANCE REQUIREMENTS
- A. Seismic-Restraint Loading:
1. Site Class as Defined in the IBC: D.
 2. Assigned Seismic Use Group or Building Category as defined in the IBC: III.
 - a. Component Importance Factor:
 - 1) General: 1.0
 - 2) Life Safety (EM): 1.5
 - b. Component Response Modification Factor:
 - 1) Fixtures: 1.0
 - 2) Equipment: 2.5
 - 3) Conduit and Cables: 5.0.
 - c. Component Amplification Factor: 2.5.
 3. Design Spectral Response Acceleration at Short Periods (0.2 Second): 173%.
 4. Design Spectral Response Acceleration at 1.0-Second Period: 76%.
- B. SEISMIC-RESTRAINT DEVICES
- A. General Requirements for Restraint Components: Rated strengths, features, and application requirements shall be as defined in reports by an agency acceptable to authorities having jurisdiction.
1. Structural Safety Factor: Allowable strength in tension, shear, and pullout force of components shall be at least four times the maximum seismic forces to which they will be subjected.
- B. Restraint Cables: ASTM A 603 galvanized steel cables with and connections made of steel assemblies with thimbles, shackles, turnbuckles, and bolts designed for restraining cable service, and with a minimum of two clamping bolts for cable engagement.
- C. Mechanical Anchor: Drilled-in and stud-wedge or female-wedge type in zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchors with strength required for anchor and as tested according to ASTM E 488. Minimum length of eight times diameter.
- D. Adhesive Anchor: Drilled-in and capsule anchor system containing polyvinyl or urethane methacrylate-based resin and accelerator, or injected polymer or hybrid mortar adhesive. Provide anchor bolts and hardware with zinc-coated steel for interior applications and stainless steel for exterior applications. Select anchor bolts with strength required for anchor and as tested according to ASTM E 488.
13. APPLICATIONS
- A. Strength of Support and Seismic-Restraint Assemblies: Where not indicated, select sizes of components so strength will be adequate to carry present and future static and seismic loads within specified loading limits.
14. SEISMIC-RESTRAINT DEVICE INSTALLATION
- A. Install bushing assemblies for mounting bolts for wall-mounted equipment, resistant to provide rigid support where equipment or equipment-mounting channels are attached to wall.
- B. Attachment to Structure: If specific attachment is not indicated, anchor bracing to structure at flanges of beams, at upper truss chords of bar joists, or at concrete members.
- C. Drilled-In Anchors:
1. Identify position of reinforcing steel and other embedded items prior to drilling holes for anchors. Do not damage existing reinforcing or embedded items during coring or drilling. Notify the structural engineer if reinforcing steel or other embedded items are encountered during drilling. Locate and avoid prestressed tendons, electrical and telecommunications conduit, and gas lines.
 2. Do not drill holes in concrete or masonry until concrete, mortar, or grout has achieved full design strength.
 3. Wedge Anchors: Protect threads from damage during anchor installation. Heavy-duty sleeve anchors shall be installed with sleeve fully engaged in the structural element to which anchor is to be fastened.
 4. Adhesive Anchors: Clean holes to remove loose material and drilling dust prior to installation of adhesive. Place adhesive in holes proceeding from the bottom of the hole and progressing toward the surface in such a manner as to avoid introduction of air pockets in the adhesive.
 5. Set anchors to manufacturer's recommended torque, using a torque wrench.
 6. Install zinc-coated steel anchors for interior and stainless-steel anchors for exterior applications.
15. ADJUSTING
- A. Adjust isolators after isolated equipment is at operating weight.
- B. Adjust limit stops on restrained spring isolators to mount equipment at normal operating height. After equipment installation is complete, adjust limit stops so they are out of contact during normal operation.
- C. Adjust active height of spring isolators.
- D. Adjust restraints to permit free movement of equipment within normal mode of operation.

SECTION 260553 - IDENTIFICATION FOR ELECTRICAL SYSTEMS

- ## 1.1 INSTALLATION
- 1.1.1. Verify identity of each item before installing identification products.
 - 1.1.2. Location: Install identification materials and devices at locations for most convenient viewing without interference with operations and without presence of equipment.
 - 1.1.3. Apply identification devices to surfaces that require finish after completing finish work.
 - 1.1.4. Self-Adhesive Identification Products: Clean surfaces before application, using materials and methods recommended by manufacturer of identification device.
 - 1.1.5. Attach signs and plastic labels that are not self-adhesive type with mechanical fasteners appropriate to the location and substrate.
 - 1.1.6. Underground-Line Warning Tape: During backfilling of trenches. Install continuous underground-line warning tape directly above line of 3 to 6 inches above lines. Use multiple tapes where width of multiple lines installed in a common trench exceeds 16 inches overall.
 - 1.1.7. Painted Identification: Comply with requirements in Division 09 painting Sections for surface preparation and paint application.
- ## 1.2 IDENTIFICATION SCHEDULE
- 1.2.1. Power-Covered Conductor Identification, 600V or Less: For conductors in vaults, pull and junction boxes, manholes, and inlets, use color-coding color codes to identify the phase.
 - 1.2.1.1. Color-Coding for Phase Identification, 600 V or Less: Use color-coding colors listed below for ungrounded branch-circuit conductors.
 - 1.2.1.1.1. Color shall be factory applied or field applied for sizes larger than No. 8 AWG, if authorities having jurisdiction permit.
 - 1.2.1.1.2. Colors for 120/240-V Circuits:
 - 1) Phase A: Black.
 - 2) Phase B: Red.
 - 3) Neutral: White with colored stripes to match associated phase
 - 4) Ground: Green.
 - 1.2.1.1.3. Field-Applied, Color-Coding Color Code Tape: Apply in half-lapped turns for a minimum distance of 6 inches from terminal points and in boxes where splices or taps are made.

Apply last two turns of tape with no tension to prevent possible unwinding. Label bands to avoid obscuring factory cable markings.
 - 1.2.1.2. Locations of Underground Lines: Identify with underground-line warning tape for power, lighting, communication, and control wiring and optical fiber cable.
 - 1.2.1.2.1. Install underground-line warning tape for both direct-buried cables and cables in raceway.

SECTION 262726 - WIRING DEVICES

- 1.1 QUALITY ASSURANCE
- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, Article 100, by a testing agency acceptable to authorities having jurisdiction, and marked for intended use.
- B. Comply with NFPA 70.

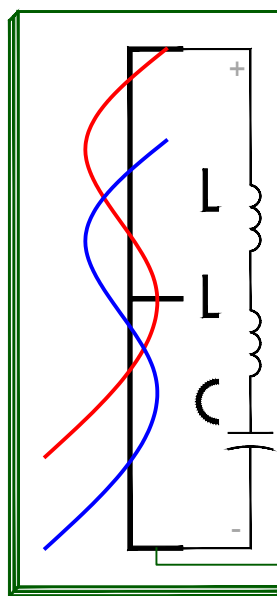
- ## 1.2 STRAIGHT BLADE RECEPTACLES
- A. General: 125V, 20A, NEMA 5-20R unless otherwise indicated. Comply with NEMA WD 1, NEMA WD 6, UL 498, and FSW W-C-596
 - B. Convenience Receptacles: 125 V, 20 A; configuration 5-20R.
 - C. GFCI Receptacles: Feed-through style with indicator light.
 - D. Twist-Lock, Single Receptacles: 125 V, 20 A; configuration 1-520R.
- ## 1.3 PENDANT CORD-CONNECTOR DEVICES
- A. Description: Matching, locking-type plug and receptacle body connector, heavy-duty grade.
 - B. Configuration: NEMA WD 6, Configurations 15-20P and 15-20R.
 - C. Body: Nylon, with screw-on, cable-gripping jaws and provision for attaching external cable grip.
 - D. External Cable Grip: Woven wire-mesh type made of high-strength, galvanized-steel wire strand, matched to cable diameter, and with attachment provision designed for corresponding connector.
 - E. Standards: Comply with FSW W-C-596
- ## 1.4 WALL PLATES
- A. Single and combination types to match corresponding wiring devices.
 - 1. Plate-Securing Screws: Metal with head color to match plate finish.
 - 2. Material for Unfinished Spaces: Galvanized steel.
 - 3. Material for Finished Spaces: Smooth, high-impact nylon or lexan.
- ## 1.5 FINISHES
- A. Color: Wiring device catalog numbers in Section Text do not designate device color.
 - 1. Wiring Devices Connected to Normal Power System: White, unless otherwise indicated or required by owner or NFPA 70 or device listing
 - 2. Wiring Devices Connected to Emergency Power System: Red.
 - 3. TVSS Devices: Blue.
- ## 1.6 INSTALLATION
- A. Comply with NECA 1, including the mounting heights listed in that standard, unless otherwise noted.
 - B. Coordinate with other trades:
 - 1. Install device boxes in brick or block walls so that the cover plate does not cross a joint unless the joint is traversed by the wall.
 - 2. Install wiring devices after all wall preparation, including painting, is complete.
 - C. Conductors:
 - 1. Do not strip insulation from conductors until just before they are spliced or terminated on devices.
 - D. Receptacle Orientation:
 - 1. Install ground pin of vertically mounted receptacles down, and on horizontally mounted receptacles to the left.
 - E. Arrangement of Devices: Unless otherwise indicated, mount flush, with long dimension vertical and with grounding terminal of receptacles on top. Group adjacent switches under single, multigang wall plates.

SECTION 265100 - INTERIOR LIGHTING

- ## 1. ACTION SUBMITTALS
- A. Product Data: For each type of lighting fixture, arranged in order of fixture designation. Include data on features, accessories, and finishes.
- ## 2. QUALITY ASSURANCE
- A. Electrical Components, Devices, and Accessories: Listed and labeled as defined in NFPA 70, by a qualified testing agency, and marked for intended location and application.
- B. Comply with NFPA 70.
- ## 3. GENERAL REQUIREMENTS FOR LIGHTING FIXTURES AND COMPONENTS
- A. Recessed Fixtures: Comply with NEMA LE 4 for ceiling compatibility for recessed fixtures.
- B. Metal Parts: Free of burrs and sharp corners and edges.
- ## 3. Diffusers and Globes:
- Acrylic Lighting Diffusers: 100 percent virgin acrylic plastic. High resistance to yellowing and other changes due to aging, exposure to heat, and UV radiation.
 - Lens Thickness: At least 0.125 inch minimum unless otherwise indicated.
 - UV stabilized.
- ## 4. LED LUMINAIRES
- A. Solid State Drivers and LED: Comply with DOE LM 79
- Total Harmonic Distortion Rating: Less than 10 percent
 - Transient Voltage protection
 - Power factor: 0.90 or higher
 - Temperatures: Minus 40 deg F (minus 40 deg C) and higher
 - Heat sink to remove heat from circuits
 - L70 compliant to 70,000 hours minimum
 - Color Rendering Index: 80 CRI minimum
 - Dimmable
 - Dimming Range: 100 to 1 percent of rated lamp lumens
 - Input watts: Can be reduced to 20 percent of normal
- ## 5. ELECTRICAL POWER UNIT
- A. Internal Type: Self-contained, modular, battery-inverter unit, factory mounted within lighting fixture body and compatible with ballast or driver. Comply with UL 924.
- Emergency Connection: Operate one lamp(s) continuously at an output of 1100 lumens each. Connect unswitched circuit to battery inverter unit and switched circuit to fixture ballast or driver
 - Nightlight Connection: Operate one lamp continuously.
 - Test Push Button and Indicator Light:
 - Fixture: Sealed, maintenance-free, nickel-cadmium type.
 - Charger:
 - Integral Self-Test:
- ## 6. EXIT SIGNS
- A. General Requirements for Exit Signs: Comply with UL 924; for sign colors, visibility, luminance, and lettering size, requirements for authorities having jurisdiction.
- B. Internally Lighted Signs:
- Lamps for AC Operation: LEDs, 50,000 hours minimum rated lamp life.
 - Self-Powered Exit Signs (Battery Type): Integral automatic charger in a self-contained power pack.
- ## 7. LIGHTING FIXTURE SUPPORT COMPONENTS
- A. Wires: ASTM A 641/A 641M, Class 3, soft temper, zinc-coated steel, 12 gage.
- B. Wires for Humid Spaces: ASTM A 580/A 580M, Composition 302 or 304, annealed stainless steel, 1/8 gage.
- ## 8. INSTALLATION
- A. Lighting fixtures: Set level, plumb, and square with ceilings and walls. Install lamps in each fixture.
- B. Comply with NFPA 70 for minimum fixture supports.
- ## 9. FIELD QUALITY CONTROL
- A. Test for Emergency Lighting: Interrupt power supply to demonstrate proper operation. Verify transfer from normal power to battery and retransfer to normal.



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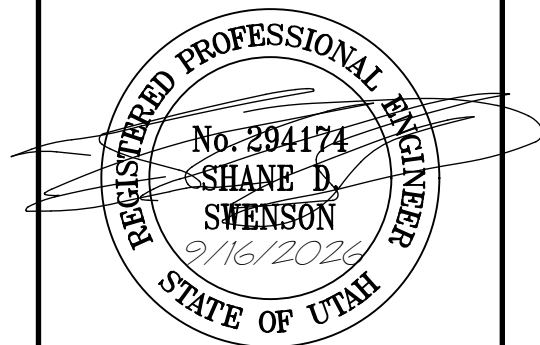
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BEEF TEACHING FACILITY

CATTLE PEN BUILDING

[illegible]

DATE: September 16, 2026

PROJECT NO:	SSE #2026028
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CAD DWG FILE:

DRAWN BY: D. RATTON

DRAWN BY:	BRAYTON
CHECKED BY:	S SWENSON

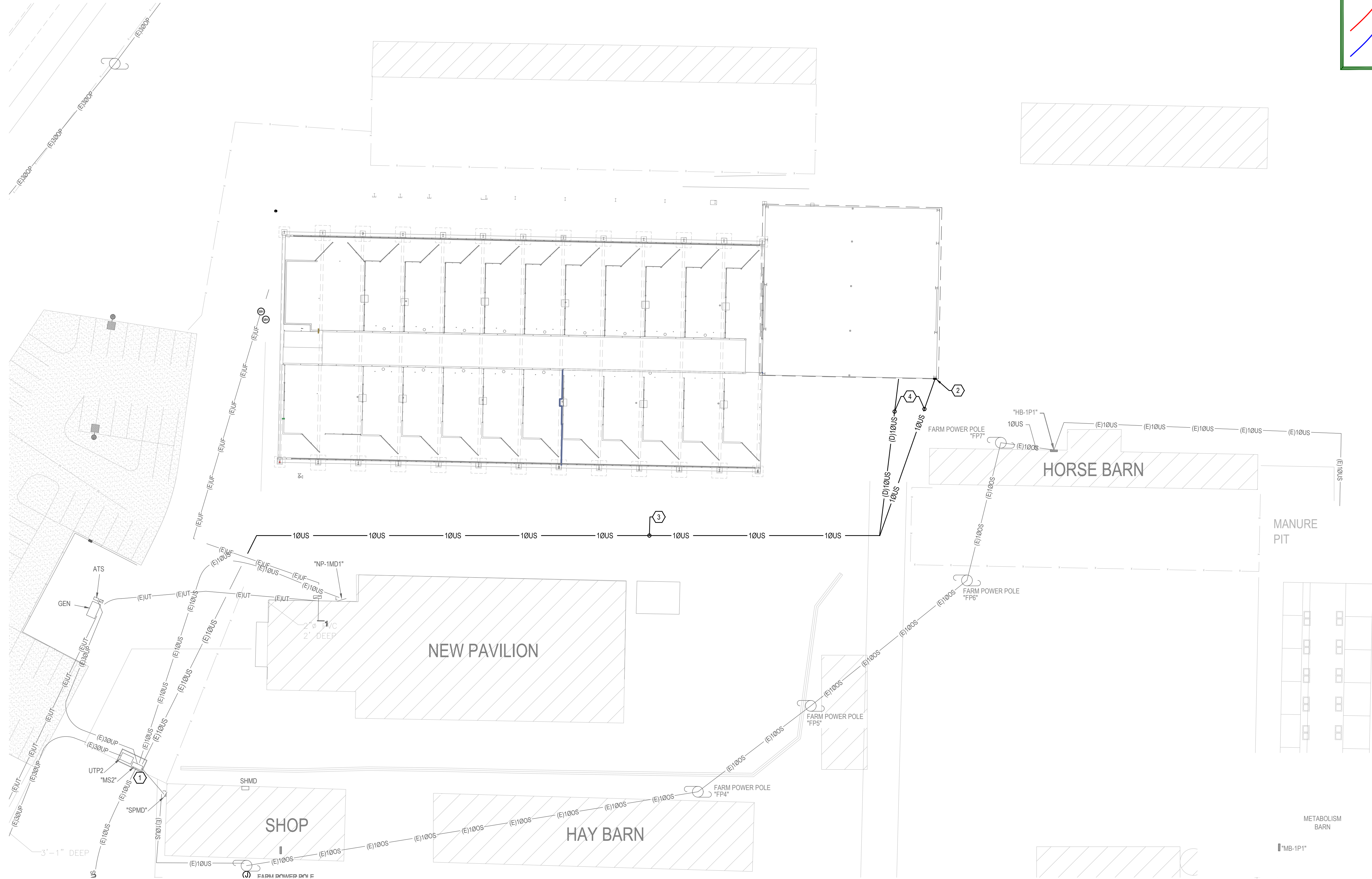
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E002

ELECTRICAL SPECIFICATIONS

OF

LAST SAVE: 01/16/2023 11:05:20 AM T:\JOBS\2026028 USU SOUTH FARM CATTLE PEN BUILDING ELECTRICALS\BUE ELECTRICALS\BUE ELECTRICAL SITE PLAN.DWG
LAST SAVE: 18 Sep 26



- GENERAL SHEET NOTES**
- EXISTING ITEMS TO BE REMOVED ARE INDICATED AS BOLD/DASHED. ITEMS TO REMAIN ARE SHOWN AS LIGHT/SOLID.
 - CIRCUIT ROUTING IS SCHEMATIC UNLESS OTHERWISE NOTED.

- SHEET KEYED NOTES**
- EXISTING SWITCHBOARD LOCATION.
 - APPROXIMATE LOCATION OF "CB-1P1".
 - ANTICIPATED ROUTING OF EXISTING FEEDER. CONTRACTOR VERIFY WITH FIELD CONDITIONS. UPGRADE AS INDICATED. SEE ONE-LINE DIAGRAM FOR ADDITIONAL INFORMATION.
 - REROUTE FEEDER TO NEW PANEL LOCATION PER FIELD CONDITIONS.

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Utah State University
FACILITIES PLANNING, DESIGN & CONSTRUCTION

REGISTERED PROFESSIONAL ENGINEER
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SHANE D. SWENSON
9/16/2022
STATE OF UTAH

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BEEF TEACHING FACILITY

CATTLE PEN BUILDING

DATE:	September 16, 2026
PROJECT NO:	SSE #2026028
CAD DWG FILE:	
DRAWN BY:	D.PATTON
CHECKED BY:	S.SWENSON
PROJECT NUMBER	ES101
ELECTRICAL SITE PLAN	
OF	

A

1. DEMOLITION PLAN IS ENGINEER'S ATTEMPT TO ASSIST BIDDER IN ESTIMATING REMOVAL COSTS OF EXISTING EQUIPMENT. PLAN IS NOT INTENDED TO BE ALL-INCLUSIVE, AND IT IS THE BIDDER'S RESPONSIBILITY TO VERIFY ALL EXISTING EQUIPMENT AND DEVICES TO BE REMOVED PRIOR TO BIDDING.
2. EXISTING ITEMS TO BE REMOVED ARE INDICATED AS BOLD/DASHED. ITEMS TO REMAIN ARE SHOWN AS LIGHT/SOLID.
3. CIRCUIT ROUTING IS SCHEMATIC UNLESS OTHERWISE NOTED.
4. EXISTING LIGHTING, ELECTRICAL AND ELECTRONIC DEVICES SHOWN LIGHT. NEW DEVICES SHOWN DARK.
5. ALL UNDERGROUND EQUIPMENT GROUNDING OR GROUNDING ELECTRODE CONDUCTORS SHALL BE INSULATED (THIN/THIN) PER NEC REQUIREMENTS FOR AGRICULTURAL INSTALLATIONS.
6. ALL INSTALLATIONS BELOW 6" SHALL BE PVC COATED RIGID AND NEMA 4X CIRCULATING DUST AND CORROSIVE ENVIRONMENT. ALL INSTALLATIONS ABOVE 6" SHALL BE RIGID OR EMT WITH DUST TIGHT FITTINGS AND NEMA 12 ENCLOSURES. SEE NEC TABLE 110.28 AND NEC 547 FOR ADDITIONAL INFORMATION.

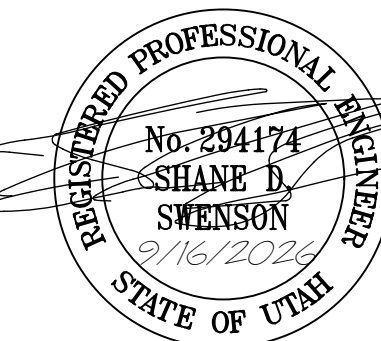
1. REMOVE EXISTING PANEL TO ALLOW FOR CONSTRUCTION. UPGRADE PANEL. UPGRADE AND RE-ROUTE FEEDER TO NEW PANEL LOCATION. SEE E601 - ELECTRICAL ONE-LINE DIAGRAM AND SITE PLAN FOR ADDITIONAL INFORMATION.
2. REMOVE EXISTING FIXTURES AND/OR LIGHTING CONTROL AS INDICATED.
3. REMOVE EXISTING OUTLETS AS INDICATED.
4. VERIFY LOCATION WITH OWNER PRIOR TO ROUGH-IN.

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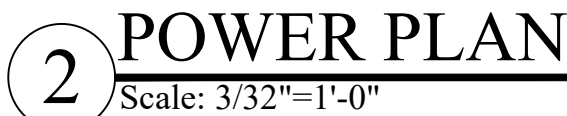
CATTLE PEN BUILDING

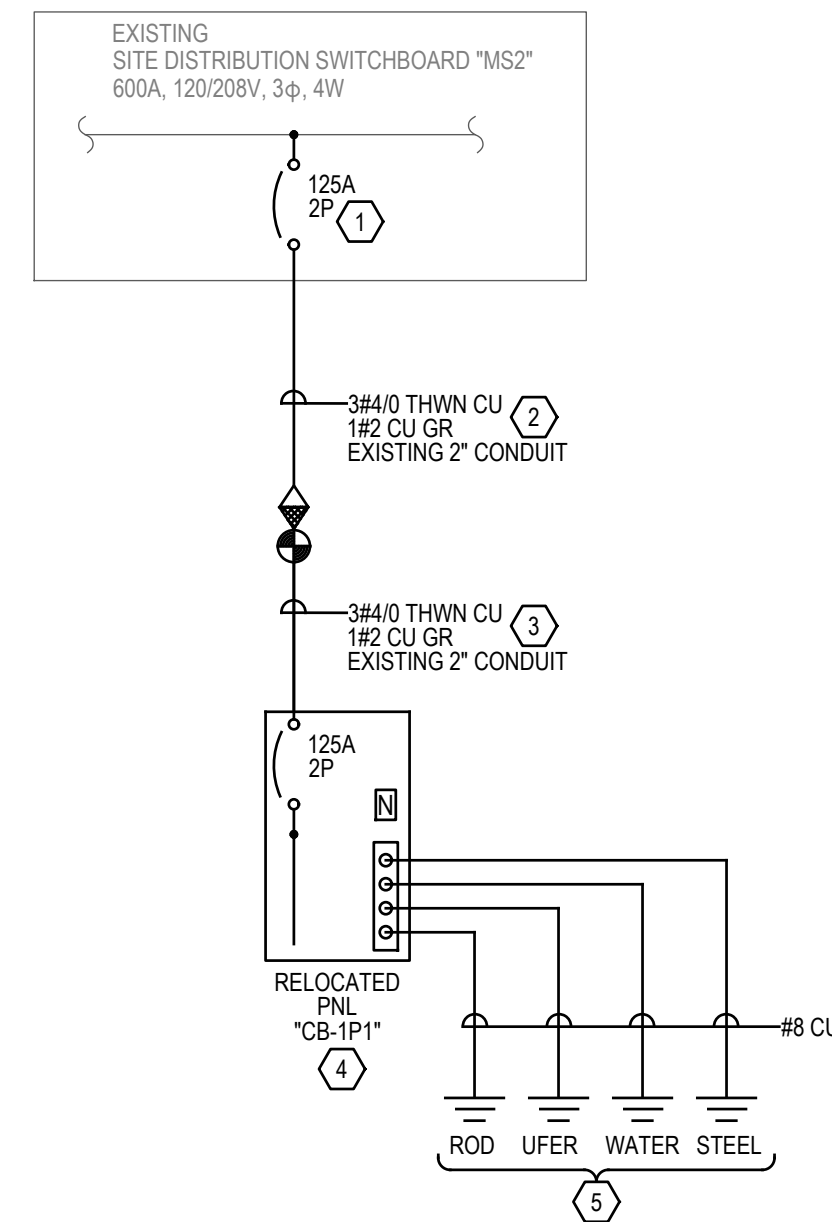
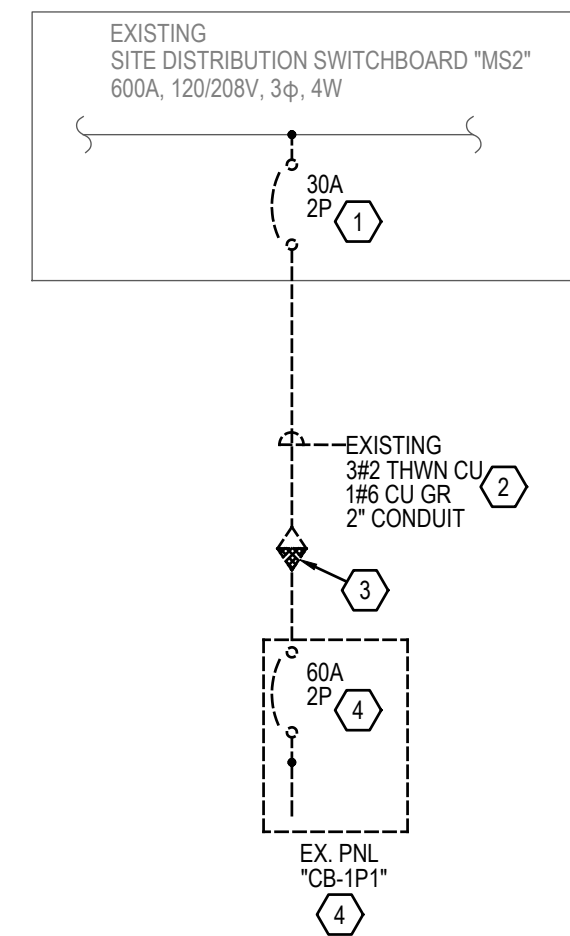
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ELECTRICAL PLANS

OF



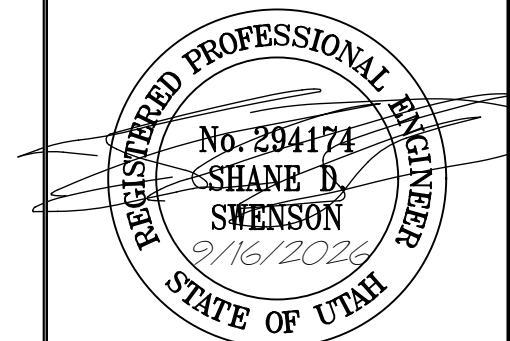
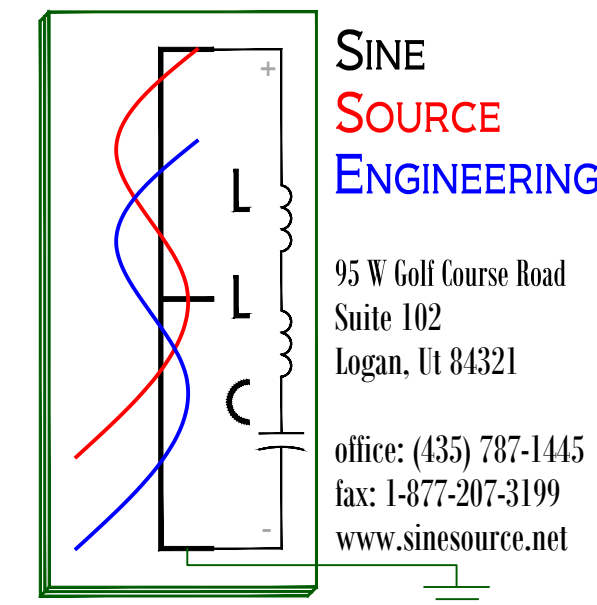


- | <i>SHEET KEYED NOTES</i> | |
|---------------------------------|---|
| 1. | REPLACE EXISTING SWITCHBOARD BREAKER WITH NEW. |
| 2. | REMOVE EXISTING CONDUCTORS FROM CONDUIT AND UPSIZE AS INDICATED. SEE ES101 - ELECTRICAL SITE PLAN FOR ADDITIONAL INFORMATION. |
| 3. | REROUTE FEEDER TO NEW PANEL LOCATION. |
| 4. | REMOVE AND UPGRADE PANEL. INSTALL IN NEW LOCATION. SEE POWER PLAN FOR ADDITIONAL INFORMATION. |
| 5. | PROVIDE GROUNDING AND BONDING AT SEPARATE STRUCTURE PER NEC 250.32(B)(1). DO NOT BOND NEUTRAL TO GROUND AT THIS LOCATION. |

- ## **GENERAL SHEET NOTES**
1. DEMOLITION PLAN IS ENGINEER'S ATTEMPT TO ASSIST BIDDERS IN ESTIMATING REMOVAL COSTS OF EXISTING EQUIPMENT. PLAN IS NOT INTENDED TO BE ALL-INCLUSIVE, AND IT IS THE BIDDERS RESPONSIBILITY TO VERIFY ALL EXISTING EQUIPMENT AND DEVICES TO BE REMOVED PRIOR TO BIDDING.
 2. EXISTING ITEMS TO BE REMOVED ARE INDICATED AS BOLD/DASHED. ITEMS TO REMAIN ARE SHOWN AS LIGHT/SOLID.
 3. MAINTAIN CIRCUIT CONTINUITY FOR DEVICES DOWNSTREAM OF ITEMS TO BE REMOVED.
 4. WHERE DEVICES ARE SHOWN TO BE REMOVED, COMPLETELY REMOVE ALL RACEWAYS, BOXES AND CONDUCTORS TO PANEL OR TO FIRST J-BOX TO REMAIN ACTIVE IN CIRCUIT PATH.
 5. INSTALL GROUNDING ELECTRODE CONDUCTORS IN CONDUIT WHERE CONDUCTOR IS NOT ABLE TO BE CONCEALED IN BUILDING FINISHES.
 6. CONTRACTOR SHALL DOCUMENT FEEDER CONDUCTOR LENGTH ON FIELD REDLINE SET.

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BEEF TEACHING FACILITY

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PROJECT NUMBER	

E601
ELECTRICAL ONE-LINE DIAGRAM OF