# PROJECT BENCHMARKS:

TEMPORARY BENCHMARK (TBM) #1 - CHISELED SQUARE IN NORTHEAST CORNER OF EXISTING PAVEMENT, LOCATED 26' EAST OF THE SOUTHEAST CORNER OF ANIMAL RESOURCE CENTER.

ELEVATION = 732.37'

MU CONTROL POINT #CP-018 - INLET - WEST OF ANIMAL RESOURCE CENTER N = 1130388.21 E = 1692930.16

# FLOOD PLAIN STATEMENT:

ELEV. = 736.15

NO PART OF THIS PROJECT IS LOCATED WITHIN THE 100-YEAR FLOODPLAIN AS PER THE BOONE COUNTY FIRM MAP #29019C0280E DATED APRIL 19, 2017.

# **DEFERRED SUBMITTALS:**

## **UTILITY COMPANIES:**

# LOCATES:

MISSOURI ONE CALL INC. 1022 B NORTHEAST DRIVE JEFFERSON CITY, MO 65109 1-800-344-7483

# WATER:

ENERGY MANAGEMENT 417 S. 5TH ST. COLUMBIA, MO 65211 573-882-3094

## MEDIUM VOLTAGE ELECTRIC:

ENERGY MANAGEMENT 417 S. 5TH ST. COLUMBIA, MO 65211 573-882-3094

## NATURAL GAS:

AMEREN MISSOURI 2001 MAGUIRE BLVD. COLUMBIA, MO 65201 573-876-3030

## TELECOM:

UNIVERSITY OF MISSOURI, DIVISION OF I.T. 615 LOCUST ST. COLUMBIA, MO 65211 573-882-5000

## SECONDARY ELECTRIC:

UNIVERSITY CAMPUS FACILITY OPERATIONS 180 GENERAL SERVICES BUILDING COLUMBIA, MO 65211 573-882-8211

# **GENERAL NOTES:**

CONTRACTOR WILL BE RESPONSIBLE FOR PLACEMENT AND MAINTENANCE OF TRAFFIC CONTROL DEVICES NECESSARY TO COMPLETE THEIR PORTION

EXISTING UTILITIES SHOWN FOR REFERENCE ONLY. CONTRACTOR SHALL COORDINATE LOCATES PRIOR TO ANY EXCAVATION

ALL EXCAVATION TO BE IN ACCORDANCE WITH SECTIONS 319.010-319.050, REVISED STATUTES OF THE STATE OF MISSOURI. SUCH COMPLIANCE SHALL NOT, HOWEVER, EXCUSE ANY PERSON MAKING ANY EXCAVATION FROM DOING SO IN A CAREFUL AND PRUDENT MANNER, NOR SHALL IT EXCUSE SUCH PERSON FROM LIABILITY FOR ANY DAMAGE OR INJURY TO UNDERGROUND UTILITIES RESULTING FROM THE EXCAVATION

IT IS THE INTENT OF THESE PLANS TO COMPLY WITH THE REQUIREMENTS OF THE MODNR CLEAN WATER COMMISSION

ALL PAVEMENTS, SIDEWALKS, ABANDONED SEWERS, PIPELINES, EXCESS EARTHWORK, OR OTHER OBSTRUCTIONS TO CONSTRUCTION THAT ARE ACCORDANCE WITH STATE REGULATION 10 CSR 80-2.010 (9)(A)1.

ALL SLOPES ARE 3:1 OR FLATTER UNLESS OTHERWISE NOTED

ALL DISTURBED AREAS WITHIN THE "LIMITS OF DISTURBANCE" THAT ARE NOT TO BE PAVED. SHALL BE FINE GRADED BY CONTRACTOR TO AN ELEVATION OF 6" BELOW FINISHED GRADE FOR TURF AREAS AND 24" BELOW FINISHED GRADE FOR PLANTER AREAS. TOP SOIL AND VEGETATION WILL BE REESTABLISHED BY OWNER.

TOTAL DISTURBED AREA = 0.4 AC.

MISSOURI DNR LAND DISTURBANCE PERMIT NOT NEEDED FOR THIS PROJECT.

ALL WORK SHALL BE SCHEDULED WITH THE OWNER'S REPRESENTATIVE AND BE SUBJECT TO THE OWNER'S APPROVAL PRIOR TO PROCEEDING

A GEOTECHNICAL EVALUATION HAS BEEN PERFORMED BY CROCKETT GEOTECHNICAL TESTING LAB (GTL). REFER TO REPORT NUMBER <u>G241079</u> DATED JULY 2, 2024 BY CROCKETT GTL.

# SPECIAL INSPECTIONS:

THE FOLLOWING ITEMS REQUIRE SPECIAL INSPECTION IN ACCORDANCE WITH CHAPTER 17 OF THE

- a. CONCRETE GROUT DESIGN MIX (PERIODIC)
- b. PLACING OF CONCRETE AND REINFORCING STEEL (CONTINUOUS OF CONCRETE SAMPLING / PERIODIC OF REINFORCING)
- c. BOLTS & ANCHORS EMBEDDED IN CONCRETE (PERIODIC)
- d. STRUCTURAL STEEL FABRICATIONS (UNLESS AISC APPROVED)
- e. STRUCTURAL STEEL BOLTING & WELDING (PERIODIC)
- f. POST INSTALLED ANCHORS IN CONCRETE (CONTINUOUS) q. IN-SITU SOILS, EXCAVATIONS, FILLING & COMPACTION (PERIODIC)
- h. WOOD FRAMING:
- h.a. SHEAR WALLS; WALL SIZE, CONFIGURATION, BLOCKING, PANEL GRADE, PANEL THICKNESS, AND FASTENING. (PERIODIC)
- h.b. DIAPHRAGMS (FLOOR AND ROOF SHEATHING); SIZE, CONFIGURATION, BLOCKING, PANEL GRADE, PANEL THICKNESS, AND FASTENING. (PERIODIC)
- h.c. FRAMING MEMBERS AND DETAILS (PERIODIC)
- h.d. MATERIAL GRADE (PERIODIC)
- h.e. CONNECTIONS; HANGERS, HOLD DOWNS, BUILT-UP COLUMNS, BUILT-UP BEAMS (PERIODIC)
- h.f. PRE-ENGINEERED TRUSSES; FRAMING, CONNECTIONS, BRIDGING (PERIODIC)

THE CONTRACTOR SHALL REQUEST SPECIAL INSPECTION OF THE ITEMS LISTED ABOVE PRIOR TO THOSE ITEMS BECOMING INACCESSIBLE AND UNOBSERVABLE DUE TO PROGRESSION OF THE WORK.

# UNIVERSITY OF MISSOURI ADOPTED BUILDING CODES:

INTERNATIONAL BUILDING CODE - 2021 INTERNATIONAL PLUMBING CODE - 2021 INTERNATIONAL MECHANICAL CODE -2021 INTERNATIONAL FIRE CODE - 2021 NATIONAL ELECTRIC CODE/NFPA 70 - 2020 NFPA 90A INSTALLATION OF AIR CONDITIONING AND VENTILATING SYSTEMS - 2018 NFPA 51B STANDARD FOR FIRE PREVENTION DURING WELDING, CUTTING, AND OTHER HOT WORK - 2019 NFPA 14 STANDARD FOR THE INSTALLATION OF STANDPIPE, PRIVATE HYDRANTS AND HOSE SYSTEMS - 2019 ASHRAE 90.1 - ENERGY STANDARD FOR BUILDINGS - 2019

# GENERALIZED BREAKDOWN OF CONTRACTOR VS. OWNER SCOPE OF WORK:

TREE CLEARING, EROSION CONTROL, GENERAL SITE PREP FOR ALL 4 BUILDINGS, GRADING, SALT BUILDING (INCLUDING FOUNDATIONS, ROCK BASE, STRUCTURE, ETC.), SOIL BUILDING (INCLUDING FOUNDATIONS, ROCK BASE, STRUCTURE, ETC.), EXTERNAL CONCRETE PADS, BOLLARDS, NEW SURFACE GRAVEL PLACEMENT, & PERMANENT NURSERY FENCING (BY SEPARATE

PAVEMENT PATCHES FOR UTILITY EXTENSIONS, REMOVAL OF OLD LIGHT POLES AND OUTLETS, NEW LIGHT POLES, INTERIOR AND EXTERIOR ELECTRIC/LIGHTING FOR BUILDINGS, MISCELLANEOUS PLUMPING, RELOCATION OF GREENHOUSE AND GARAGE BUILDINGS (INCLUDING FOUNDATIONS, ROCK BASE, ETC.), WATER HYDRANTS, & CONEX UNITS.

# SHEET INDEX:

CE 0 - COVER SHEET CE 1 - DEMOLITION PLAN

CE 2 - EROSION CONTROL PLAN CE 3 - GRADING PLAN

CE 4 - UTILITY PLAN CE 5 - UTILITY DETAILS

CE 6 - SITE PLAN

CE7-SITE DETAILS CE 8 - SITE CONSTRUCTION SPECIFICATIONS

CE 9 - WATER SPECIFICATIONS

ARCHITECTURAL (SALT SHED ONLY): A001 - COVER A100 - FLOOR PLAN

A200 - ELEVATIONS A300 - SECTIONS

# STRUCTURAL:

S100 - GENERAL STRUCTURAL DATA S200 - SALT SHED FOUNDATION PLAN S210 - SALT SHED FOUNDATION DETAILS

S211 - SALT SHED FOUNDATION DETAILS S300 - SOIL STORAGE FOUNDATION PLAN S310 - SOIL STORAGE FOUNDATION DETAILS

S400 - SOIL STORAGE ROOF PLAN S401 - SOIL STORAGE BUILDING ELEVATIONS S410 - SOIL STORAGE ROOF FRAMING DETAILS S411 - SOIL STORAGE ROOF FRAMING DETAILS

S500 - CAR PORT / GREENHOUSE FOUNDATION PLAN & DETAILS

MECHANICAL/ELECTRICAL/PLUMBING:

MEP101 - MECHANICAL ELECTRICAL PLUMBING SITE UTILITY PLAN MEP102 - MECHANICAL ELECTRICAL PLUMBING PLANS

MEP501 - MECHANICAL ELECTRICAL PLUMBING DETAILS & SCHEDULES

1000 W. Nifong Blvd., Bldg. 1 Columbia, Missouri 6520 www.crockettengineering.com

**ENGINEERING CONSULTANTS** 



GREGORY L. LINNEMAN - PE

MO LICENSE - 2005001013

# ¬ CIVIL

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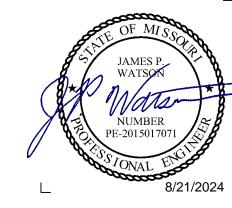
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ENGINEERING

2400 Bluff Creek Drive, Suite 101

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573 - 234 - 4492 phone

www.j-squaredeng.com

## PORTER, BERENDZEN & ASSOCIATES, P.C.



200 South Henry Clay Blvd. Ashland, Missouri 65010 573.657.2022 phone pba-architecture.com



JAY D. BERENDZEN, ARCHITECT

# **ARCHITECTURAL**

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DRAWN:

SHEET:

DESIGNED:

| REVISIONS:

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

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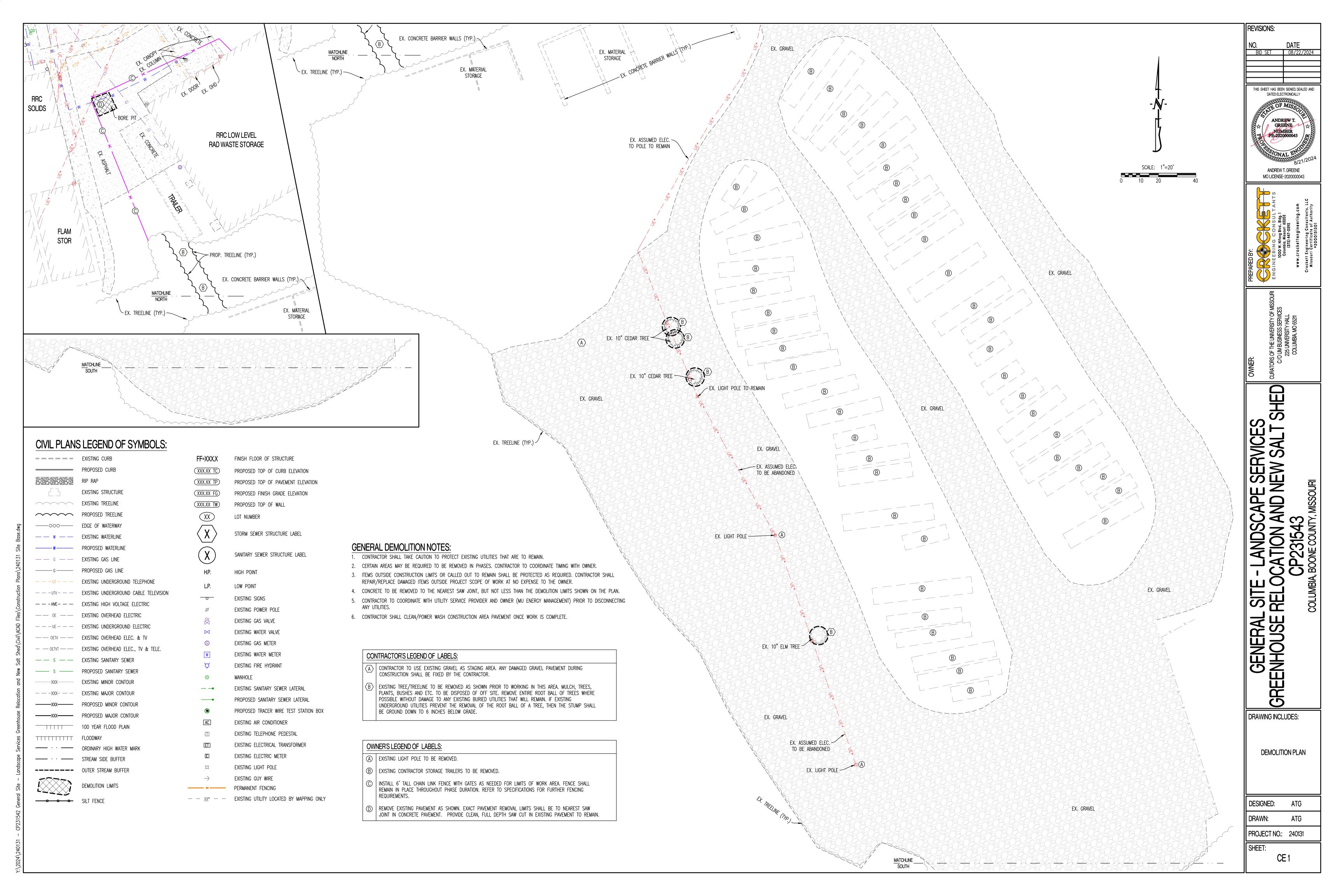
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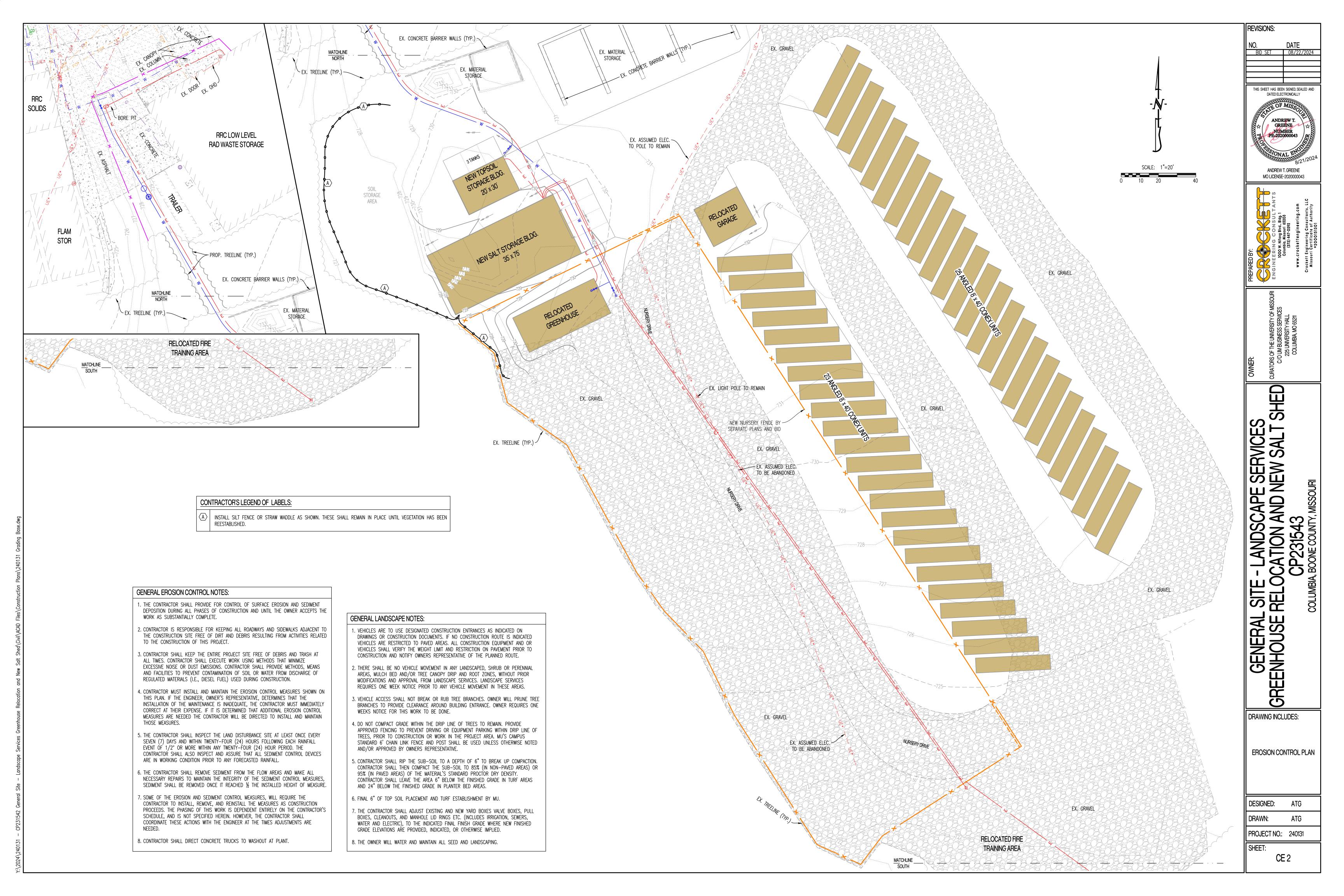
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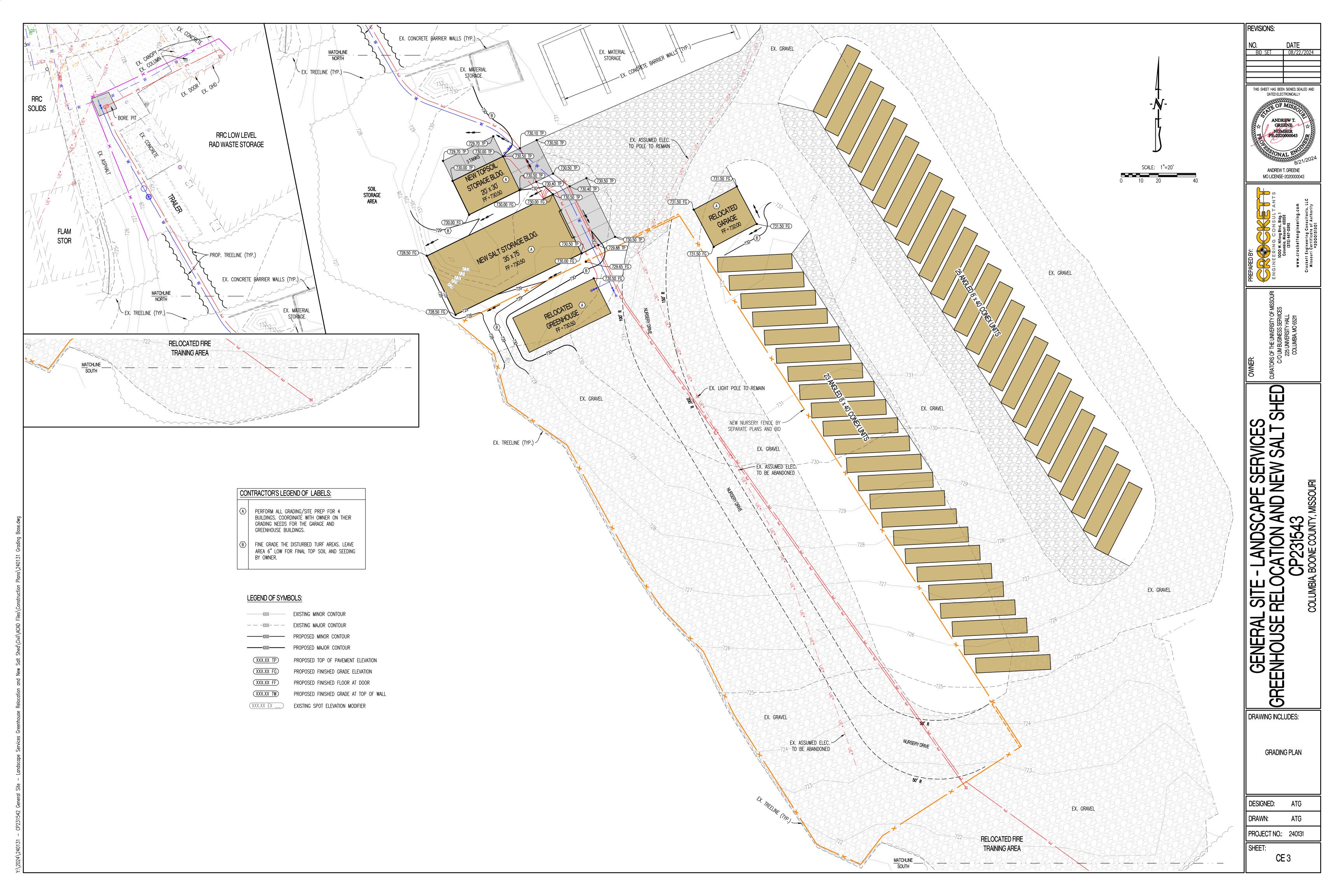
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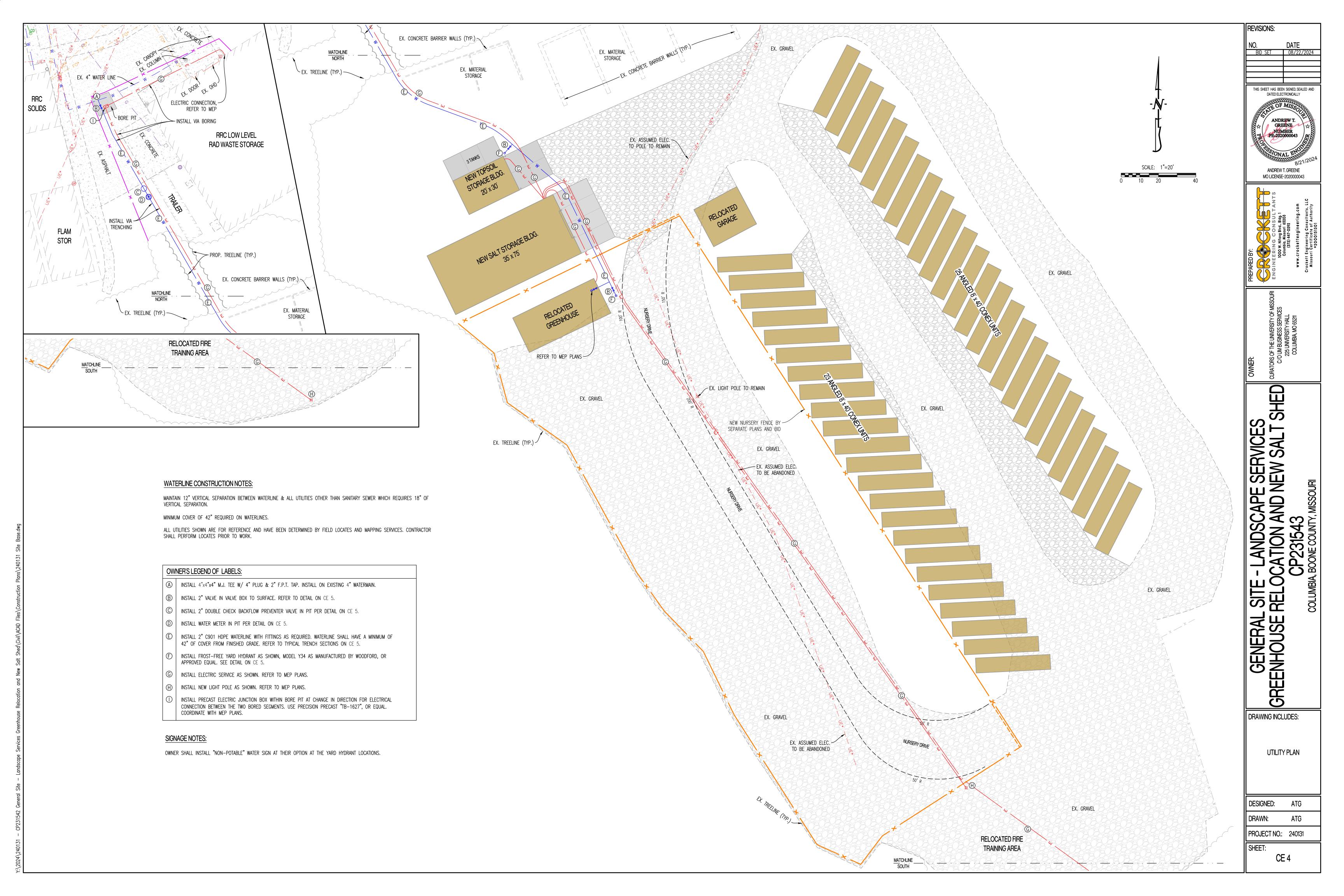
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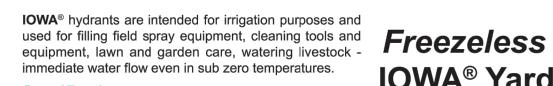
DRAWING INCLUDES:











**Specifications:** 

Female Inlet: Model Y34 - 3/4" NPT Model Y1 - 1" NPT

Casing: Model Y34 - 1" Galvanized Steel Pipe Model Y1 - 11/4" Galvanized Steel Pipe

Operating Rod: 3/8" Stainless Steel Pipe Drain Hole: Tapped - 1/8" N.P.T. Removable Nozzle: 3/4" Brass Male Hose Nozzle

**Optional At Additional Cost:** 1" Brass Pipe Outer Casing

> Y34 ONLY: 1" Stainless Steel Outer Casing 1" NPSH Hose Nozzle

¾" Brass Pipe Operating Pipe

 Adjustable Link - Provides easy and positive adjustment of the lever lock tension.

• Rod Guide - Eliminates side pull on rod, reduces wear on packing, packing nut & stem.

 Flow Finder and Lock - A simple cam that can be set to automatically obtain the same flow each time or lock against accidental opening.

 Long Life Packing - Graphite packing for lubricity and long life.

• One Piece Variable Flow Plunger - Large cushion type seal for longer life - is not easily damaged and assures shut-off even when foreign particles are present. Automatic drain feature - plunger opens drain to prevent freezing - closes at any flow to prevent wasting water.

• Maintenance & Repair - Woodford has manufactured Rough-In the IOWA® hydrant since 1929, and although many improvements have been made through the years, all parts are interchangeable. All repairs can be made from top of unit without removing hydrant from the ground.

 Maximum Working Pressure: 125 p.s.i. Maximum Temperature: 120° F

## **SHIPPING WEIGHT**

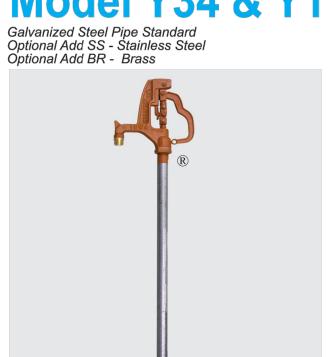
1 2 3 4 5 6\* 7\* Bury Depth (Ft) 15 17 19 22 24 26 28 Model Y34 (Lbs) 18 20 22 25 28 31 34 Model Y1 (Lbs)

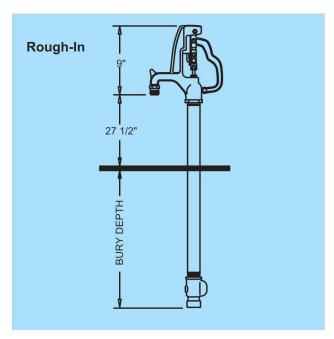
For Installation / Troubleshooting Instructions go to

\*Must ship by truck line due to length.

www.woodfordmfg.com or call 1-800-621-6032

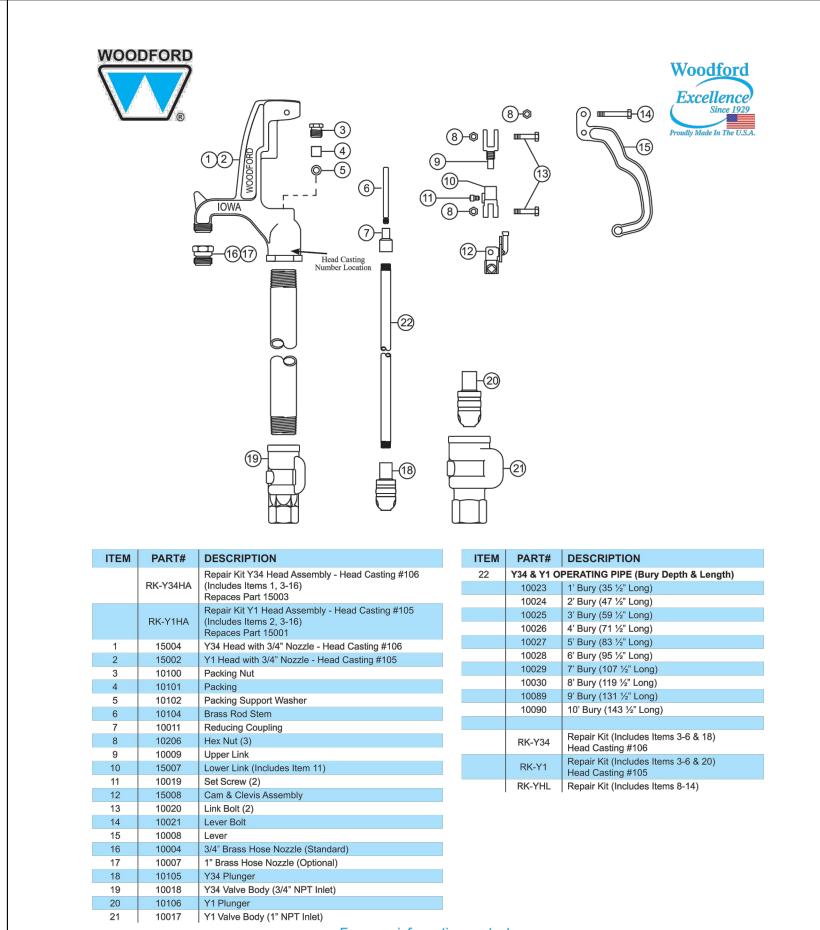






## When ordering, specify model and bury depth

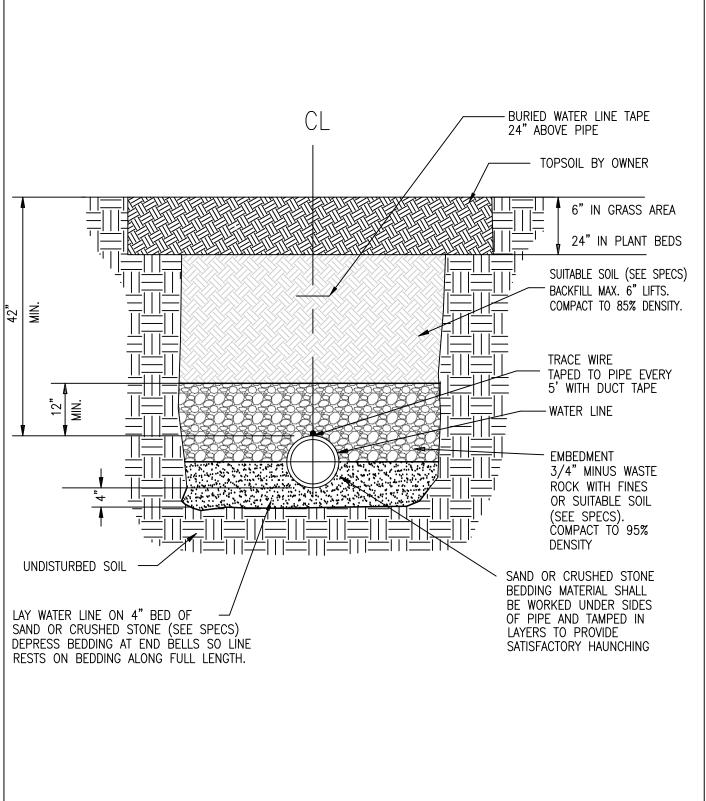
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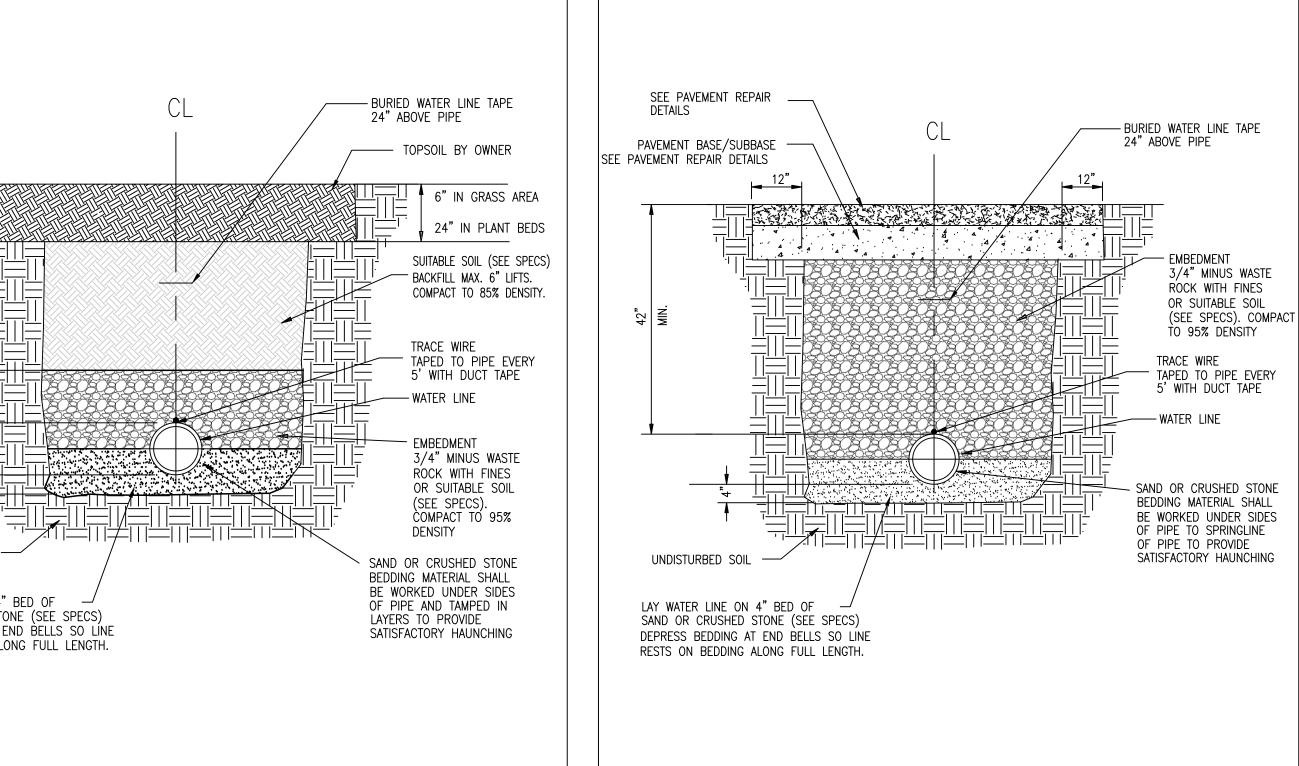
#### For more information contact. WOODFORD MANUFACTURING COMPANY, LLC

To view our complete product line visit: www.woodfordmfg.com or email: sales@woodfordmfg.com Rev. 12/21 Form No. Y34.110 ©2022 WOODFORD Mfg.

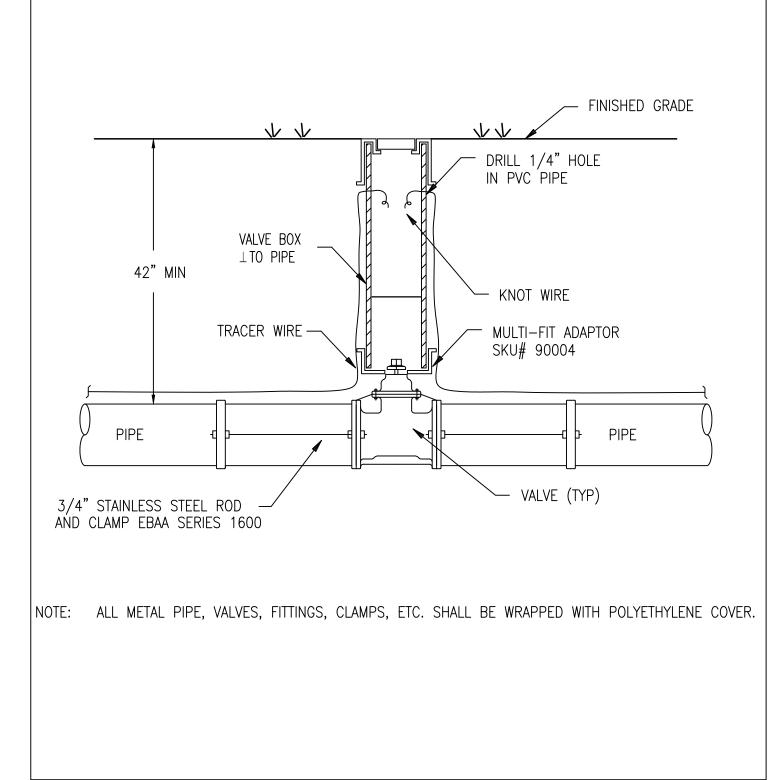
2121 Waynoka Road, Colorado Springs, Colorado 80915 • Phone: (800) 621-6032 • Fax: (800) 765-4115



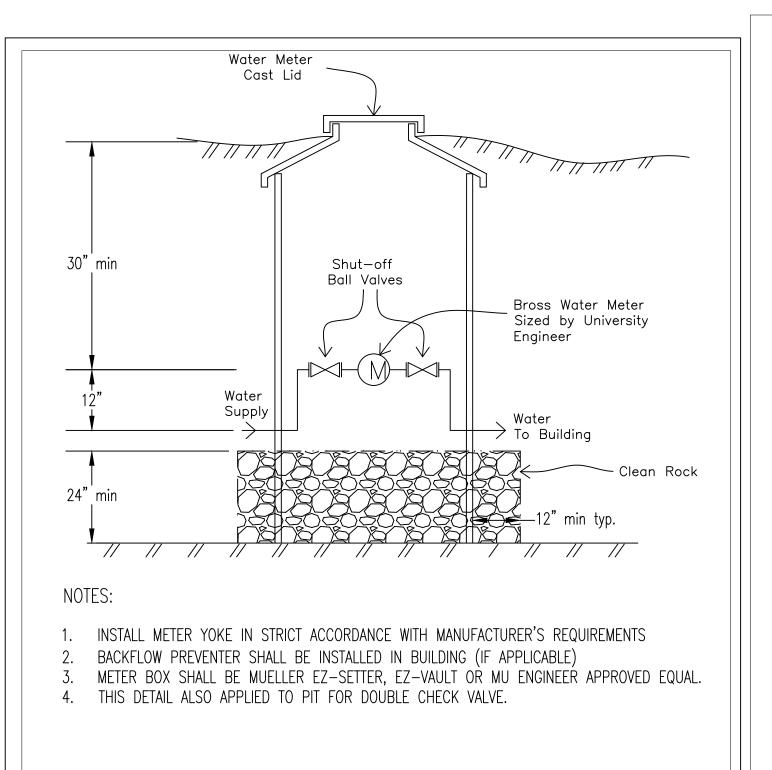
| REV DATE                     |  |   | REV DATE                     |  |
|------------------------------|--|---|------------------------------|--|
| 2 8/10/06                    | Construction Standard<br>Trench at Grass & Plantings |   | 1 8/10/06<br>2 1/6/14        | Construction Stand<br>Trench at Paving |
| 3 1/6/14<br>4 6/5/14         |  |   | 3 6/5/14                     |  |
| 5   11/05/15<br>DRAWN BY: BB |  | DRAWING<br>NOT TO SCALE<br>DATE: 12/22/02 | 4   11/05/15<br>DRAWN BY: BB | Energy Management<br>Campus Facilities |
| CHECKED BY: TG               | UNIVERSITY OF MISSOURI                               | DATE: 12/22/02                            | CHECKED BY: TG               | UNIVERSITY OF MISSOURI                 |



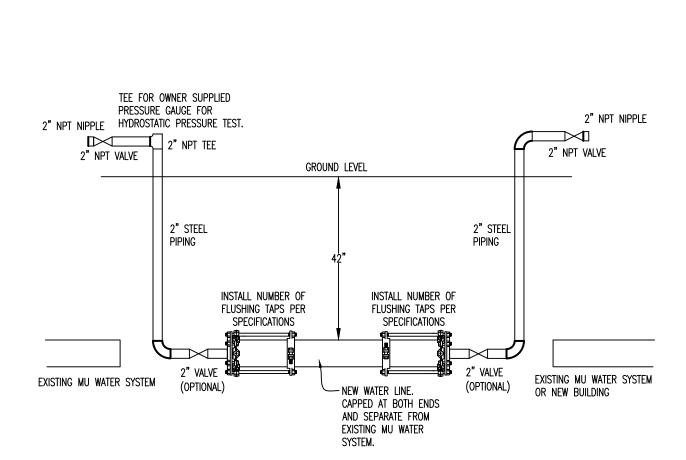
|   | REV DATE  1 8/10/06  2 1/6/14  3 6/5/14 | Construction Standard<br>Trench at Paving                        |   |
|---|---|--|---|
| 2 | 4 11/05/15 DRAWN BY: BB CHECKED BY: TG  | Energy Management<br>Campus Facilities<br>UNIVERSITY OF MISSOURI | DRAWING<br>NOT TO SCALE<br>DATE: 12/22/02 |



| REV DATE 0 10/26/06 1 07/17/09 2 06/05/14 | Construction Standard<br>Gate Valve | PROJECT NUMBER |
|---|-------------------------------------|----------------|
| 4 12/7/21                                 | Energy Management                   | DRAWING        |
| DRAWN BY: MD                              | Campus Facilities                   | NOT TO SCALE   |
| CHECKED BY: LL                            | UNIVERSITY OF MISSOURI-COLUMBIA     | DATE: 12/18/02 |



| REV DATE 0 5/2/02 1 11/05/15 | Meter Box Pit   | PROJECT NUMBER                          |
|------------------------------|---|---|
| DRAWN BY: AM CHECKED BY:     | Energy Management Campus Facilities UNIVERSITY OF MISSOURI-COLUMBIA | DRAWING<br>NOT TO SCALE<br>DATE: 5/2/02 |



| REV DATE 0               | Taps for Flushing and<br>Disinfection of Water Lines                |   |  |
|--------------------------|---|---|--|
| DRAWN BY:<br>CHECKED BY: | Energy Management Campus Facilities UNIVERSITY OF MISSOURI—COLUMBIA | DRAWING<br>NOT TO SCALE<br>DATE: 1/4/14 |  |

|| REVISIONS: BID SET 08/22/2024 THIS SHEET HAS BEEN SIGNED, SEALED AND

DATED ELECTRONICALLY ANDREW T. GREENE

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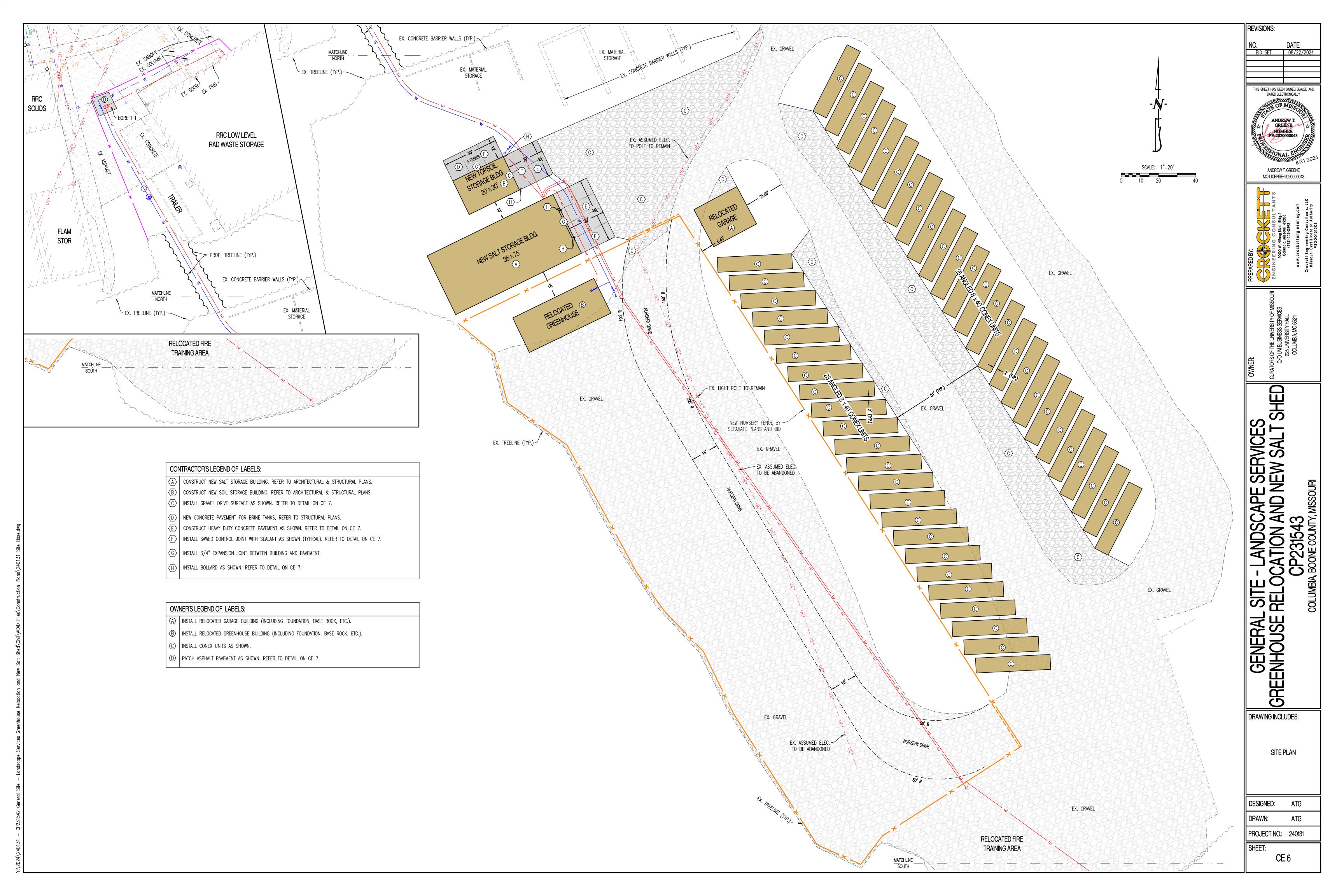
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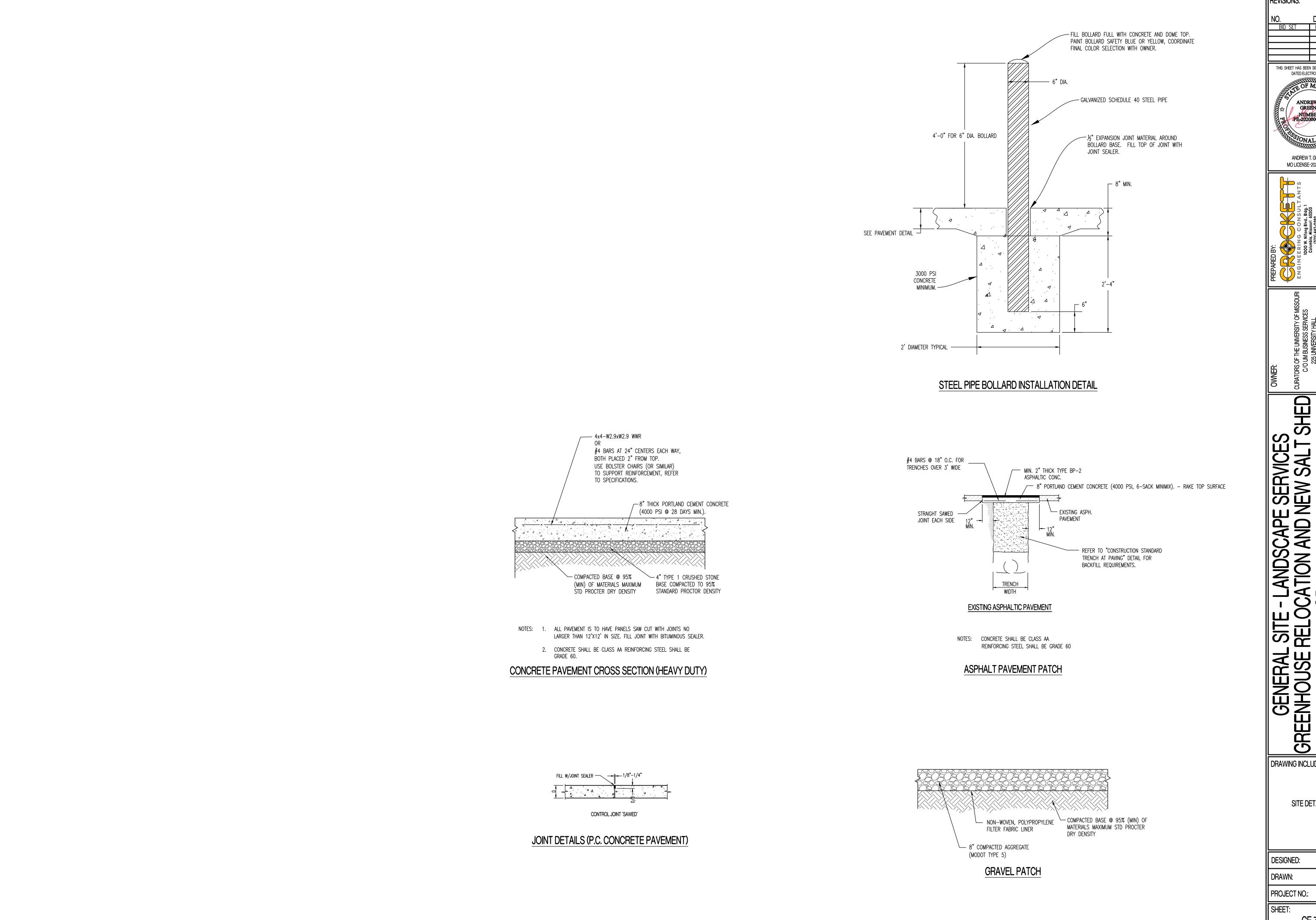
DRAWING INCLUDES:

UTILITY DETAILS

DESIGNED: DRAWN: ATG PROJECT NO.: 240131

SHEET: CE 5





REVISIONS:

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SHED

NDSCAPE SEF TON AND NEW 31543 ECOUNTY, MISSOURI

DRAWING INCLUDES:

SITE DETAILS

DESIGNED: ATG ATG

PROJECT NO.: 240131

SHEET: CE 7 MATERIALS AND COMPOSITION OF PLANT MIX BITUMINOUS BASE SHALL CONFORM TO MODOT 401.2 THROUGH 401.4.5 INCLUSIVE.

EQUIPMENT SHALL MEET THE REQUIREMENTS OF MODOT 403.7 THROUGH 403.9.

ASPHALT SHALL NOT BE PLACED WHEN EITHER THE AIR TEMPERATURE OR THE TEMPERATURE OF THE SURFACE ON WHICH THE MIXTURE IS TO BE PLACED IS BELOW 50 DEGREES FAHRENHEIT FOR THE SURFACE COURSE OR BELOW 40 DEGREES FAHRENHEIT FOR THE SUBSURFACE COURSES. IT SHALL NOT BE PLACED ON ANY WET OR FROZEN SURFACE. IT SHALL NOT BE PLACED WHEN WEATHER CONDITIONS PREVENT THE PROPER HANDLING OR FINISHING OF THE MIXTURE.

SPREADING AND FINISHING SHALL CONFORM TO MODOT 403.13 THROUGH 403.16.2

SPOT WEDGING AND SURFACE LEVELING SHALL CONFORM TO MODOT 402.10.4 THROUGH 402.10.9

THE SURFACE OF EACH LAYER SHALL BE SUBSTANTIALLY FREE FROM WAVES OR IRREGULARITIES

PRIME COAT SHALL CONFORM TO MODOT SECTION 408.

GEOTEXTILE FABRIC SHALL BE MIRAFI 600X OR APPROVED EQUAL.

SITE CLEARING & DEMOLITION:

IT IS THE INTENT THAT THE DEMOLITION BE COMPLETE AND ADEQUATE FOR THE INTENDED PURPOSE. THIS WORK SHALL INCLUDE THE REMOVAL OF ALL ITEMS, WHETHER IN VIEW OR HIDDEN UNDERNEATH THE SURFACE OF THE GROUND, REGARDLESS OF WHETHER SHOWN ON THE DRAWINGS OR ENCOUNTERED DURING

CONTRACTOR SHALL COMPLY WITH ALL APPLICABLE LOCAL, STATE, AND FEDERAL REQUIREMENTS REGARDING MATERIALS, METHODS OF WORK, AND DISPOSAL OF EXCESS WASTE MATERIALS.

ERECT BARRIERS TO PROTECT PERSONNEL, STRUCTURES AND UTILITIES REMAINING INTACT.

PROTECT ALL EXISTING OBJECTS INTENDED TO REMAIN. IN CASE OF DAMAGE, MAKE REPAIRS OR REPLACEMENTS NECESSARY AT NO ADDITIONAL COST TO THE

MINIMIZE INTERFERENCE WITH ROADS, STREETS, DRIVEWAYS, SIDEWALKS, AND ADJACENT FACILITIES.

DO NOT CLOSE OR OBSTRUCT STREETS, SIDEWALKS, ALLEYS OR PASSAGEWAYS WITHOUT PERMISSION FROM AUTHORITIES HAVING JURISDICTION.

IF CLOSURE IS PERMITTED, PROVIDE SIGNAGE INDICATING CLOSURE AND SIGNAGE TO DIRECT TRAFFIC TO ALTERNATE ROUTE.

MOISTEN SURFACES AS REQUIRED TO PREVENT DUST FROM BEING A NUISANCE TO THE PUBLIC, NEIGHBORS, AND CONCURRENT PERFORMANCE OF OTHER WORK ON

PROVIDE THE OWNER'S REPRESENTATIVE A MINIMUM OF TWO BUSINESS DAYS' NOTICE PRIOR TO COMMENCING WORK OF THIS SECTION.

THE CONTRACTOR SHALL LOCATE EXISTING UTILITY LINES AND SERVICES TRAVERSING THE SITE AND DETERMINE THE REQUIREMENTS FOR THEIR PROTECTION. THE CONTRACTOR SHALL PRESERVE ACTIVE UTILITIES ON THE SITE THAT ARE DESIGNATED TO REMAIN.

BEFORE STARTING SITE OPERATIONS. THE CONTRACTOR SHALL DISCONNECT OR ARRANGE FOR THE DISCONNECTION OF ALL UTILITY SERVICES DESIGNATED TO BE REMOVED. THE CONTRACTOR SHALL PERFORM ALL SUCH WORK IN ACCORDANCE WITH THE REQUIREMENTS OF THE UTILITY COMPANY OR AGENCY INVOLVED

IN REMOVING PAVEMENT, CURB AND GUTTER, SIDEWALKS, ETC., WHERE A PORTION IS LEFT IN PLACE, REMOVAL SHALL BE TO AN EXISTING JOINT OR TO A JOINT SAWED TO A MINIMUM DEPTH OF 2" WITH A TRUE SAW LINE AND A VERTICAL FACE. REMOVE SUFFICIENT PAVEMENT TO PROVIDE FOR PROPER GRADE AND CONNECTIONS IN THE NEW WORK REGARDLESS OF ANY LIMITS INDICATED ON THE DRAWING.

EXISTING CASTINGS AND CULVERTS, IF SALVAGEABLE AND REMOVED INTACT, REMAIN THE PROPERTY OF THE CONTRACTOR.

ALL SEWERS AND DRAINAGE PIPES, WHICH HAVE BEEN OR ARE TO BE ABANDONED, SHALL BE PERMANENTLY SEALED AT THE ENDS WITH BULKHEADS CONSTRUCTED OF CONCRETE, HAVING A MINIMUM THICKNESS OF 8".

ABANDON STORM OR SANITARY SEWER STRUCTURES BY BREAKING THE CONCRETE BOTTOM OF THE STRUCTURE INTO PIECES NO LARGER THAN 12" IN ANY DIRECTION AND REMOVING THE TOP OF THE STRUCTURE TO 3" BELOW FINISHED GRADE. PLUG ALL PIPES WITH CONCRETE AND FILL STRUCTURE WITH 1" CLEAN

ALL DEBRIS SHALL BE DISPOSED OF OFF-SITE

DO NOT STORE OR BURN MATERIALS ON-SITE UNLESS PERMITTED BY THE GOVERNING JURISDICTION.

ALL ASPHALT OR CONCRETE MATERIALS SHALL BE DISPOSED OF OFF-SITE.

MATERIAL ACQUIRED THROUGH DEMOLITION, OTHER THAN THOSE REQUIRED TO COMPLETE THE CONSTRUCTION PROJECT AND DESIGNATED FOR RETURN TO OWNER, WILL BECOME THE PROPERTY OF THE CONTRACTOR AND WILL BE REMOVED FROM THE SITE. THE MATERIAL WILL BE DISPOSED OF IN A LEGAL MANNER.

THE CONTRACTOR'S OPERATIONS SHALL BE RESTRICTED TO THOSE AREAS INSIDE THE CONSTRUCTION LIMITS INDICATED ON THE DRAWINGS. IF LIMITS ARE NOT INDICATED, RESTRICT WORK TO THE OWNER'S PROPERTY, EASEMENT, OR PUBLIC RIGHTS-OF-WAY.

COMPLETE WORK WITHIN PUBLIC RIGHTS-OF-WAY UNDER THE PERMISSION OF THE GOVERNING AGENCY.

IF ITEMS OUTSIDE THE LIMITS OF DISTURBANCE GET DAMAGED, OWNER COMPLETES THE REQUIRED REPAIRS AND CHARGES THE CONTRACTOR.

THE CONTRACTOR IS RESPONSIBLE FOR THE ADJUSTMENT OF ALL MANHOLES, CASTINGS, WATER VALVES IRRIGATION BOXES, CLEAN OUTS AND ETC. WITHIN THE GRADING LIMITS TO MATCH THE FINISHED SURFACE. ADJUSTMENTS SHALL BE COORDINATED WITH THE UTILITY COMPANIES AND THE COST FOR ALL ADJUSTMENTS SHALL BE INCIDENTAL TO CONSTRUCTION UNLESS NOTED AS A BID ITEM. THE CONTRACTOR SHALL REPAIR ANY DAMAGE TO UTILITY STRUCTURES AND APPURTENANCES THAT OCCURS DURING CONSTRUCTION AT NO ADDITIONAL COST TO THE OWNER.

## Earthmoving:

CONTRACTOR TO SUBMIT MANUFACTURER'S PRODUCT DATA AND INSTALLATION INSTRUCTIONS FOR EACH MATERIAL AND PRODUCT USED.

TEST REPORTS: SUBMIT FOR APPROVAL TEST REPORTS, LIST OF MATERIALS AND GRADATIONS PROPOSED FOR USE. OBTAIN SAMPLES OF ANY PROPOSED FILL MATERIAL AND CONTRACTOR TO PROVIDE STANDARD PROCTOR TEST REPORTS TO ENGINEER.

COMPACTION REQUIREMENTS ARE AS FOLLOWS:

1. UNDER STEPS, PAVEMENTS, AND WALKWAYS, 95 PERCENT STANDARD PROCTOR MINIMUM DENSITY, ASTM D 698. 2. UNDER LAWNS OR UNPAVED AREAS, 85 PERCENT, ASTM D 698.

GRADING TOLERANCES OUTSIDE BUILDING LINES ARE AS FOLLOWS: 1. LAWNS, UNPAVED AREAS, AND WALKS, PLUS OR MINUS 1 INCH.

PAVEMENTS, PLUS OR MINUS 1/2 INCH.

3. ALL ADA ROUTES AND PARKING ARE TO MEET ADA REQUIREMENTS AT ALL TIMES.

ALL ACTIVITIES WILL BE CONTAINED WITHIN CONSTRUCTION BOUNDARIES INDICATED ON SITE PLAN. SPECIFIED EXCAVATION REQUIREMENTS, PRECAUTIONS, AND PROTECTIVE SYSTEMS WILL BE OBSERVED AT ALL TIMES.

MOVEMENT OF TRUCKS AND EQUIPMENT ON OWNER'S PROPERTY WILL BE IN ACCORDANCE WITH OWNER'S INSTRUCTIONS.

TOPSOIL WILL BE STRIPPED FROM THE CONSTRUCTION SITE AND WILL BE DISPOSED OF LEGALLY OFF SITE.

TRENCHES WILL NOT BE BACKFILLED UNTIL ALL REQUIRED TESTS ARE COMPLETED AND THE UTILITY SYSTEMS. AS INSTALLED, CONFORM TO REQUIREMENTS SPECIFIED

EXCAVATION IS UNCLASSIFIED AND INCLUDES EXCAVATION TO SUBGRADE REGARDLESS OF MATERIALS ENCOUNTERED. REPAIR EXCAVATIONS BEYOND ELEVATIONS AND DIMENSIONS INDICATED AS FOLLOWS: AT STRUCTURE: CONCRETE OR COMPACTED STRUCTURAL FILL.

2. ELSEWHERE: BACKFILL AND COMPACT AS DIRECTED. MAINTAIN STABILITY OF EXCAVATIONS; CONTRACTOR TO BE RESPONSIBLE FOR DESIGN AND COORDINATION OF SHORING AND BRACING AS REQUIRED. PREVENT SURFACE AND SUBSURFACE WATER FROM ACCUMULATING IN EXCAVATIONS. STOCKPILE SATISFACTORY MATERIALS FOR REUSE, ALLOW FOR PROPER DRAINAGE AND DO NOT STOCKPILE MATERIALS WITHIN DRIP LINE OF TREES TO REMAIN.

COMPACT MATERIALS AT THE OPTIMUM MOISTURE CONTENT AS DETERMINED BY ASTM D 698 BY AERATION OR WETTING TO THE FOLLOWING PERCENTAGES OF

MAXIMUM DRY DENSITY: 1. STRUCTURE, PAVEMENT, WALKWAYS: SUBGRADE AND EACH FILL LAYER TO 95% (-2%+4%) OF STANDARD PROCTOR MAXIMUM DRY DENSITY TO SUITABLE DEPTH. COMPACTION TESTING SHALL BE PERFORMED IMMEDIATELY PRIOR TO THE PLACEMENT OF REINFORCING STEEL AND NEW PAVING MATERIALS.

CONTRACTOR SHALL BE RESPONSIBLE FOR SCHEDULING TESTING WITH OWNERS DESIGNATED TESTING AGENCY.

UNPAVED AREAS: TOP 6" OF SUBGRADE AND EACH FILL LAYER TO 90% MAXIMUM DRY DENSITY. 3. A PROOF-ROLL SHALL BE REQUIRED OF THE SUBGRADE PRIOR TO PLACEMENT OF THE BASE COURSE. PROOF ROLLING SHALL CONSIST OF PASSING A LOADED, 20-TON, TANDEM DUMP TRUCK OVER THE PREPARED SUBGRADE SOIL WITH A MAXIMUM ALLOWABLE DISPLACEMENT OF 1". ANY AREAS THAT

DISPLACE MORE THAN 1" SHALL BE COMPACTED UNTIL THIS CRITERION IS MET, OR THOSE AREAS MAY BE EXCAVATED AND BACKFILLED WITH COMPACTED TYPE 1 AGGREGATE USED FOR BASE MATERIAL. ALL PROOF ROLLING SHALL BE PERFORMED IN THE PRESENCE OF THE OWNER'S REPRESENTATIVE. 4. CUT AREAS UNDER PROPOSED ASPHALT OR CONCRETE PAVEMENTS SHALL BE CUT AND COMPACTED. AFTER GRADING TO SUBGRADE ELEVATION, SCARIFY THE TOP SIX INCHES OF THE SUB-BASE AND COMPACT AS OUTLINED ABOVE.

PLACE ACCEPTABLE MATERIALS IN LAYERS NOT MORE THAN 8" LOOSE DEPTH FOR MATERIALS COMPACTED BY HEAVY EQUIPMENT AND NOT MORE THAN 4" LOOSE DEPTH FOR MATERIALS COMPACTED BY HAND EQUIPMENT TO SUBGRADES INDICATED AS FOLLOWS:

STRUCTURAL FILL: USE UNDER FOUNDATIONS, SLABS ON GRADE IN LAYERS AS INDICATED. DRAINAGE FILL: USE UNDER DESIGNATED BUILDING SLABS, AT FOUNDATION DRAINAGE AND ELSEWHERE AS INDICATED.

LANDSCAPE AREA FILL:

ALL SUB-GRADE AREAS SHALL BE "RIPPED" TO A MINIMUM 6" DEEP AND A MAXIMUM OF 12" APART IN OPPOSITE DIRECTIONS WITH MINIMAL TIRE TRAFFIC TO FOLLOW.

CONTRACTOR TO LEAVE AREAS 6" OR 18" (PLANTER AREAS) BELOW FINISH GRADE. OWNER TO PLACE TOPSOIL AND ALL PLANTINGS.

ANY FILL SOIL WITHIN 36" OF FINISHED GRADE IN LAWN AND PLANTER AREAS SHALL BE COHESIVE SOILS IN SOIL CLASSIFICATIONS GROUPS ML, CL, CH OR A COMBINATION THEREOF, FREE OF ROCK OR GRAVEL LARGER THAN 1" IN ANY DIMENSION, DEBRIS, WASTE, FROZEN MATERIAL, VEGETATION

AND OTHER DELETERIOUS MATTER. 4. SUB-BASE MATERIAL: USE UNDER PAVEMENT, WALKS, STEPS, PIPING AND CONDUIT.

GRADE TO WITHIN 1/2" ABOVE OR BELOW REQUIRED SUBGRADE AND WITHIN A TOLERANCE OF 1/2" IN 10'.

PROTECT NEWLY GRADED AREAS FROM TRAFFIC AND EROSION. RECOMPACT AND REGRADE SETTLED, DISTURBED AND DAMAGED AREAS AS NECESSARY TO RESTORE QUALITY, APPEARANCE, AND CONDITION OF WORK

CONTROL EROSION TO PREVENT RUNOFF INTO SEWERS OR DAMAGE TO SLOPED OR SURFACED AREAS.

CONTROL DUST TO PREVENT HAZARDS TO ADJACENT PROPERTIES AND VEHICLES. IMMEDIATELY REPAIR OR REMEDY DAMAGE CAUSED BY DUST INCLUDING AIR FILTERS IN EQUIPMENT AND VEHICLES. CLEAN SOILED SURFACES.

DISPOSAL OF EXCAVATION WASTE AND UNSUITABLE MATERIALS SHALL BE THE RESPONSIBILITY OF THE SITE WORK CONTRACTOR. NO SPECIFIC OR PRE-APPROVED LOCATION IS BEING PROVIDED BY THE OWNER.

#### **CONCRETE PAVEMENT JOINT SEALANTS:**

DELIVER MATERIALS TO PROJECT SITE IN ORIGINAL UNOPENED CONTAINERS OR BUNDLES WITH LABELS INDICATING MANUFACTURER, PRODUCT NAME AND DESIGNATION, COLOR, EXPIRATION DATE, POT LIFE, CURING TIME, AND MIXING INSTRUCTIONS FOR MULTICOMPONENT MATERIALS.

STORE AND HANDLE MATERIALS TO COMPLY WITH MANUFACTURER'S WRITTEN INSTRUCTIONS TO PREVENT THEIR DETERIORATION OR DAMAGE DUE TO MOISTURE, HIGH OR LOW TEMPERATURES, CONTAMINANTS, OR OTHER CAUSES.

DO NOT PROCEED WITH INSTALLATION OF JOINT SEALANTS UNDER THE FOLLOWING CONDITIONS:

1. WHEN AMBIENT AND SUBSTRATE TEMPERATURE CONDITIONS ARE OUTSIDE LIMITS PERMITTED BY JOINT SEALANT MANUFACTURER OR ARE BELOW 40 DEG F.

2. WHEN JOINT SUBSTRATES ARE WET OR COVERED WITH FROST.

3. WHERE JOINT WIDTHS ARE LESS THAN THOSE ALLOWED BY JOINT-SEALANT MANUFACTURER FOR APPLICATIONS INDICATED.

4. WHERE CONTAMINANTS CAPABLE OF INTERFERING WITH ADHESION HAVE NOT YET BEEN REMOVED FROM JOINT SUBSTRATES.

PROVIDE JOINT SEALANTS, BACKING MATERIALS, AND OTHER RELATED MATERIALS THAT ARE COMPATIBLE WITH ONE ANOTHER AND WITH JOINT SUBSTRATES UNDER CONDITIONS OF SERVICE AND APPLICATION, AS DEMONSTRATED BY JOINT-SEALANT MANUFACTURER BASED ON TESTING AND FIELD EXPERIENCE.

COLD-APPLIED JOINT SEALANTS ARE TO BE TYPE NS SILICONE SEALANT FOR CONCRETE: SINGLE-COMPONENT, LOW-MODULUS, NEUTRAL-CURING, NONSAG SILICONE SEALANT COMPLYING WITH ASTM D 5893 FOR TYPE NS. PRODUCTS ALLOWED ARE: CRAFCO INC.: ROADSAVER SILICONE, DOW CORNING CORPORATION; 888, PECORA NS 301, OR

CONTRACTOR TO PROVIDE JOINT-SEALANT BACKER MATERIALS THAT ARE NONSTAINING; ARE COMPATIBLE WITH JOINT SUBSTRATES, SEALANTS, PRIMERS, AND OTHER JOINT FILLERS; AND ARE APPROVED FOR APPLICATIONS INDICATED BY JOINT-SEALANT MANUFACTURER BASED ON FIELD EXPERIENCE AND LABORATORY TESTING. ROUND BACKER RODS FOR COLD-APPLIED SEALANTS: ASTM D 5249, TYPE 3, OF DIAMETER AND DENSITY REQUIRED TO CONTROL SEALANT DEPTHAND PREVENT BOTTOM-SIDE ADHESION OF SEALANT.

PRIOR TO JOINT INSTALLATION, CONTRACTOR IS TO EXAMINE JOINTS INDICATED TO RECEIVE JOINT SEALANTS, WITH INSTALLER PRESENT, FOR COMPLIANCE WITH REQUIREMENTS FOR JOINT CONFIGURATION, INSTALLATION TOLERANCES, AND OTHER CONDITIONS AFFECTING JOINT- SEALANT PERFORMANCE. PROCEED WITH INSTALLATION ONLY AFTER UNSATISFACTORY CONDITIONS HAVE BEEN CORRECTED.

CLEAN OUT JOINTS IMMEDIATELY BEFORE INSTALLING JOINT SEALANTS TO COMPLY WITH JOINT-SEALANT MANUFACTURER'S WRITTEN INSTRUCTIONS.

COMPLY WITH JOINT-SEALANT MANUFACTURER'S WRITTEN INSTALLATION INSTRUCTIONS FOR PRODUCTS AND APPLICATIONS INDICATED, UNLESS MORE STRINGENT REQUIREMENTS

COMPLY WITH RECOMMENDATIONS IN ASTM C 1193 FOR USE OF JOINT SEALANTS AS APPLICABLE TO MATERIALS, APPLICATIONS, AND CONDITIONS INDICATED.

INSTALL BACKER MATERIALS OF TYPE INDICATED TO SUPPORT SEALANTS DURING APPLICATION AND AT POSITION REQUIRED TO PRODUCE CROSS-SECTIONAL SHAPES AND DEPTHS OF INSTALLED SEALANTS RELATIVE TO JOINT WIDTHS THAT ALLOW OPTIMUM SEALANT MOVEMENT CAPABILITY. DO NOT LEAVE GAPS BETWEEN ENDS OF BACKER MATERIALS, DO NOT STRETCH, TWIST, PUNCTURE, OR TEAR BACKER MATERIALS. REMOVE ABSORBENT BACKER MATERIALS THAT HAVE BECOME WET BEFORE SEALANT APPLICATION AND REPLACE THEM WITH DRY MATERIALS.

NSTALL SEALANTS USING PROVEN TECHNIQUES THAT COMPLY WITH THE FOLLOWING AND AT THE SAME TIME BACKING ARE INSTALLED:

1. PLACE SEALANTS SO THEY DIRECTLY CONTACT AND FULLY WET JOINT SUBSTRATES.

2. COMPLETELY FILL RECESSES PROVIDED FOR EACH JOINT CONFIGURATION.

3. PRODUCE UNIFORM, CROSS-SECTIONAL SHAPES AND DEPTHS RELATIVE TO JOINT WIDTHS THAT ALLOW OPTIMUM SEALANT MOVEMENT CAPABILITY.

IMMEDIATELY AFTER SEALANT APPLICATION AND BEFORE SKINNING OR CURING BEGINS, TOOL SEALANTS ACCORDING TO REQUIREMENTS SPECIFIED BELOW TO FORM SMOOTH, UNIFORM BEADS OF CONFIGURATION INDICATED; TO ELIMINATE AIR POCKETS; AND TO ENSURE CONTACT AND ADHESION OF SEALANT WITH SIDES OF JOINT. REMOVE EXCESS SEALANTS FROM SURFACES ADJACENT TO JOINT.USE TOOLING AGENTS THAT ARE APPROVED IN WRITING BY JOINT-SEALANT MANUFACTURER AND THAT DO NOT DISCOLOR SEALANTS OR ADJACENT SURFACES.

PROVIDE JOINT CONFIGURATION TO COMPLY WITH JOINT-SEALANT MANUFACTURER'S WRITTEN INSTRUCTIONS, UNLESS OTHERWISE INDICATED.

PROVIDE RECESSED JOINT CONFIGURATION FOR SILICONE SEALANTS OF RECESS DEPTH AND AT LOCATIONS INDICATED.

CLEAN OFF EXCESS SEALANTS OR SEALANT SMEARS ADJACENT TO JOINTS AS THE WORK PROGRESSES BY METHODS AND WITH CLEANING MATERIALS APPROVED BY MANUFACTURERS OF JOINT SEALANTS AND OF PRODUCTS IN WHICH JOINTS OCCUR.

PROTECT JOINT SEALANTS DURING AND AFTER CURING PERIOD FROM CONTACT WITH CONTAMINATING SUBSTANCES AND FROM DAMAGE RESULTING FROM CONSTRUCTION OPERATIONS OR OTHER CAUSES SO SEALANTS ARE WITHOUT DETERIORATION OR DAMAGE AT TIME OF SUBSTANTIAL COMPLETION. IF, DESPITE SUCH PROTECTION, DAMAGE OR DETERIORATION OCCURS, CUT OUT AND REMOVE DAMAGED OR DETERIORATED JOINT SEALANTS IMMEDIATELY AND REPLACE WITH JOINT SEALANT SO INSTALLATIONS WITH REPAIRED AREAS ARE INDISTINGUISHABLE FROM THE ORIGINAL WORK.

# **CONCRETE PAVEMENT:**

CONCRETE WORK SHALL CONFORM TO ALL REQUIREMENTS OF THE CURRENT ACI 301. SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS. ACI 318 BUILDING CODE. REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI 305 SPECIFICATIONS FOR HOT WATER CONCRETE, AND ACI 306 SPECIFICATIONS FOR COLD WEATHER CONCRETE, WITH THE FOLLOWING

1. CONCRETE SHALL DEVELOP THE FOLLOWING 28-DAY MINIMUM COMPRESSIVE STRENGTH:

FOUNDATIONS 3.000 PSI CAST-IN-PLACE WALLS - 3,500 PSI

FLOOR SLAB 4.000 PSI EXTERIOR SLABS, WALLS AND CURBS 4,000 PSI

2. ALL FOOTINGS SHALL BEAR ON UNDISTURBED SOIL OR ENGINEERED FILL. 3. CHLORIDE— BASED ADMIXTURES ARE PROHIBITED IN ALL CONCRETE.

4. REINFORCING STEEL SHALL CONFORM TO ASTM A615, A616, OR A617, GRADE 60. 5. ALL CONTINUOUS REINFORCING STEEL THAT MEETS AT A CORNER SHALL BE TIED TOGETHER WITH A CORNER BAR THAT HAS SUFFICIENT LAP DISTANCE IN EACH DIRECTION

6. CONTINUOUS REINFORCING BARS LAP LENGTH SHALL BE A MINIMUM OF 48 BAR DIAMETERS UNLESS NOTED OTHERWISE 7. CONCRETE SLUMP SHALL BE A MAXIMUM OF 4" +/- 1" (ASTM C- 143) AS DELIVERED IN THE FIELD. CONTRACTOR MAY USE CHEMICAL ADMIXTURES TO ATTAIN A MAXIMUM SLUMP OF 8" FOR WORKABILITY. NO WATER MAY BE ADDED TO THE CONCRETE MIX ON SITE UNLESS WATER IS WITHHELD AT THE BATCHING FACILITY. IF WATER IS WITHHELD AT

MIXED. THIS SHALL BE NOTED IN THE SPECIAL INSPECTOR'S RECORDS. 8. CONCRETE EXPOSED TO WEATHER, VEHICLES, AND/OR DEICING CHEMICALS SHALL BE AIR-ENTRAINED WITH 6% (+/-) 1.5% ENTRAINED AIR BY VOLUME AT POINT OF DISCHARGE.

THE BATCHING FACILITY IT SHOULD BE REFLECTED ON THE LOAD TICKET. THE TOTAL AMOUNT OF WATER IN THE MIX SHALL NOT EXCEED WHAT IS NOTED ON THE APPROVED

DO NOT ALLOW AIR CONTENT OF TROWELED FINISHED FLOORS TO EXCEED 3%. 9. SUBMIT CONCRETE MIX PROPORTIONS PRIOR TO START OF WORK. DO NOT BEGIN CONCRETE PRODUCTION UNTIL MIXES HAVE BEEN REVIEWED AND ARE ACCEPTABLE TO THE

FNGINFFR 10. READY MIX CONCRETE SHALL COMPLY WITH REQUIREMENTS OF ASTM C94.

11. CONCRETE WORK EXECUTION A. CONSTRUCT FORMS TO CORRECT SIZE, SHAPE, ALIGNMENT, ELEVATION AND POSITION; AND TO SUPPORT VERTICAL AND LATERAL LOADS.

B. POSITION, SUPPORT, AND SECURE REINFORCEMENT AGAINST DISPLACEMENT. MINIMUM CONCRETE COVER FOR REINFORCEMENT SHALL BE, UNLESS NOTED OTHERWISE ON THE DRAWINGS: CAST AGAINST AND EXPOSED TO EARTH.......3 INCHES EXPOSED TO EARTH OR WEATHER......2 INCHES

NOT EXPOSED TO WEATHER OR IN CONTACT WITH EARTH......1 ½ INCHES

C. PROVIDE CONTROL JOINTS IN SLABS-ON-GRADE AT NOT GREATER THAN 15 FEET ON CENTER IN EACH DIRECTION. SAW CUT CONTROL JOINTS MINIMUM 1/4 OF SLAB DEPTH, AS SOON AFTER SLAB FINISHING WITHOUT DISLODGING AGGREGATE.

D. STEEL TROWEL FINISH ALL INTERIOR CONCRETE SLABS, BROOM FINISH ALL EXTERIOR CONCRETE SLABS. E. CURE ALL CONCRETE IN COMPLIANCE WITH ACI 301, USING A LIQUID TYPE MEMBRANE, NON-RESIDUAL, CURING COMPOUND COMPLYING WITH ASTM C309. ASSURE

COMPATIBILITY WITH FINISH FLOOR COVERING. 12. FLINT AND CHERT WILL BE LIMITED TO 1% MAXIMUM, BY WEIGHT OF THE COURSE AGGREGATE, IN ALL EXPOSED CONCRETE (CAST-IN-PLACE

PRECAST). LIGNITE WILL BE LIMITED TO 0.5%, BY WEIGHT OF THE FINE AGGREGATE IN ALL EXPOSED CONCRETE. SOME APPLICATIONS MAY BE REQUIRED TO BE LIGNITE 13. CONCRETE SHALL NOT BE PLACED UPON FROZEN SUBGRADE. ALL CONCRETE SHALL BE EFFECTIVELY PROTECTED FROM FREEZING UNTIL A MINIMUM COMPRESSIVE STRENGTH OF 3,500 PSI HAS BEEN ATTAINED. THE CONTRACTOR SHALL PROVIDE A METHOD, MEETING THE APPROVAL FROM THE ENGINEER, OF MONITORING THE CONCRETE THAT DEMONSTRATES THAT THE CONCRETE HAS BEEN PROTECTED FROM FREEZING. REGARDLESS OF PRECAUTIONS TAKEN, THE CONTRACTOR SHALL ASSUME ALL RISKS, AND ALL FROZEN CONCRETE SHALL BE REPLACED AT THE CONTRACTOR'S EXPENSE.

| REVISIONS:

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

ANDREW T. GREENE

MO LICENSE-2020000043

S M 

I DRAWING INCLUDES:

SITE CONSTRUCTION SPECIFICATIONS

DESIGNED:

ATG PROJECT NO.: 240131

SHEET:

PREPARATION FOR TRANSPORT, PREPARE VALVES, INCLUDING YARD HYDRANTS, ACCORDING TO THE FOLLOWING:

- 1. ENSURE THAT VALVES ARE DRY AND INTERNALLY PROTECTED AGAINST RUST AND CORROSION. 2. PROTECT VALVES AGAINST DAMAGE TO THREADED ENDS AND FLANGE FACES.
- 3. SET VALVES IN BEST POSITION FOR HANDLING. SET VALVES CLOSED TO PREVENT RATTLING.
- DURING STORAGE: USE PRECAUTIONS FOR VALVES, INCLUDING FIRE HYDRANTS, ACCORDING TO THE FOLLOWING
- 1. DO NOT REMOVE END PROTECTORS UNLESS NECESSARY FOR INSPECTION; THEN REINSTALL FOR STORAGE.
- 2. PROTECT FROM WEATHER. STORE INDOORS AND MAINTAIN TEMPERATURE HIGHER THAN AMBIENT DEW-POINT TEMPERATURE. SUPPORT OFF THE GROUND OR PAVEMENT IN WATERTIGHT ENCLOSURES WHEN OUTDOOR STORAGE IS

USE SLING TO HANDLE VALVES AND FIRE HYDRANT IF SIZE REQUIRES HANDLING BY CRANE OR LIFT. RIG VALVES TO AVOID DAMAGE TO EXPOSED PARTS. DO NOT USE HANDWHEELS OR STEMS AS LIFTING OR RIGGING POINTS.

DELIVER PIPING WITH FACTORY-APPLIED END CAPS. MAINTAIN END CAPS THROUGH SHIPPING, STORAGE, AND HANDLING TO PREVENT PIPE-END DAMAGE AND TO PREVENT ENTRANCE DIRT, DEBRIS, AND MOISTURE.

PROTECT STORED PIPING FROM MOISTURE AND DIRT. ELEVATE ABOVE GRADE. DO NOT EXCEED STRUCTURAL CAPACITY OF FLOOR WHEN STORING INSIDE. PROTECT FLANGES, FITTINGS, AND SPECIALTIES FROM MOISTURE AND DIRT. STORE PLASTIC PIPING PROTECTED FROM DIRECT SUNLIGHT. SUPPORT TO PREVENT SAGGING AND BENDING.

SYSTEM DESIGN, MATERIALS, AND INSTALLATION OF WATER SYSTEMS SHALL COMPLY WITH "MINIMUM DESIGN STANDARDS FOR MISSOURI COMMUNITY WATER SYSTEMS" (LATEST EDITION) AS PUBLISHED BY MISSOURI DNR.

SITE UTILITY TIE-INS SHALL BE COORDINATED WITH THE OWNER'S REPRESENTATIVE. CONTRACTOR SHALL NOTIFY OWNER'S REPRESENTATIVE TWO (2) WEEKS IN ADVANCE OF DESIRED TIE-IN TIME. OWNER'S REPRESENTATIVE WILL GIVE CONTRACTOR 72 HOURS ADVANCE NOTICE OF ACTUAL TIME FOR TIE-INS.

TIE-INS TO UTILITY SYSTEMS SHALL BE MADE ON WEEKENDS OR NIGHTS, AND WORK SHALL BE DONE AROUND-THE-CLOCK UNTIL THE TIE-IN IS COMPLETED. LINE OUTAGES ARE TO BE KEPT TO A MINIMUM.

#### UNIVERSITY OF MISSOURI WATER SPECIFICATIONS - METERING:

1.1. ALL EXTERNALLY INSTALLED WATER METERS SHALL BE BRONZE DISC AS MANUFACTURED BY BADGERMETER, MILWAUKEE, WI. SUBSTITUTES WILL NOT BE ACCEPTED.

- 1. CONSTRUCTION SHALL COMPLY WITH ANSI AND AWWA C700 STANDARDS AS REQUIRED FOR DOMESTIC WATER METERING APPLICATIONS.
- 2. METER HOUSING AND HOUSING TOP PLATE SHALL BE LEAD FREE CAST BRONZE CONSTRUCTION. THE MEASURING CHAMBER, DISC, STRAINER, AND GENERATOR HOUSING SHALL BE THERMOPLASTIC CONSTRUCTION. REGISTER LID AND BOX SHALL BE THERMOPLASTIC AND BRONZE AND TRIM SHALL BE STAINLESS STEEL OR BRONZE.
- 3. REGISTER SHALL BE A STRAIGHT-READING ODOMETER-TYPE TOTALIZATION DISPLAY (GALLONS), 360 DEGREE TEST CIRCLE WITH CENTER SWEEP HAND AND FLOW FINDER TO DETECT LEAKS. REGISTER SHALL BE INSTALLED USING TORX TAMPER RESISTANT SEAL SCREWS. METERS SHALL BE PROVIDED WITH AN INTEGRAL STRAINER. A TAMPER RESISTANT CALIBRATION PLUG SEAL SHALL ALSO BE PROVIDED TO PROTECT FROM UNAUTHORIZED PERSONNEL. 4. METERS SHALL BE RECORDALL DISC MODELS 35, 70, 120 AND 170.

- 2.1. INSTALLATION OF WATER METER, VALVING, BYPASS LOOP AND WATER SAMPLER/TEST OUTLET SHALL BE IN STRICT ACCORDANCE WITH MANUFACTURER'S PRINTED INSTRUCTIONS AND RECOMMENDATIONS, APPLICABLE ANSI AND AWWA REQUIREMENTS, AND AS DETAILED ON "WATER\_METER DETAIL."
- 2.2. WATER METERS SHALL BE INSTALLED WITH A THREE-VALVE BYPASS DESIGN USING BALL VALVES (2" OR LESS) OR OS&Y RISING STEM GATE VALVES (LARGER THAN 2"). THE BYPASS VALVE SHALL BE FULL-FLOW AND CAPABLE OF BEING LOCKED. ALL OTHER VALVES ASSOCIATED WITH THE METER INSTALLATION SHALL BE BALL VALVES. ELECTROMAGNETIC WATER METERS SHALL BE
- INSTALLED IN A STRAIGHT RUN WITH NO OBSTRUCTIONS A MINIMUM OF TEN DIAMETERS UPSTREAM AND FIVE DIAMETERS DOWNSTREAM. 2.3. WATER METER SHALL BE INSTALLED AFTER THE BACKFLOW PREVENTION DEVICE.

3.1. WATER SERVICE WILL NOT BE TURNED ON UNTIL THE WATER METER IS FULLY INSTALLED, POWERED AND OPERATING SATISFACTORILY, THE DOWNSTREAM WATER PIPING IS SUCCESSFULLY LEAK TESTED AND SECURE (INCLUDING FREEZE PROTECTION), AND THE NECESSARY BACKFLOW PREVENTER DEVICE IS INSTALLED AND SUCCESSFULLY TESTED WITH THE DELIVERY OF THE TEST REPORT TO THE OWNER'S REPRESENTATIVE.

3.2. MU ONLY: ONLY ENERGY MANAGEMENT STEAM AND WATER DISTRIBUTION PERSONNEL WILL BE AUTHORIZED TO TURN WATER SERVICE ON OR OFF.

## UNIVERSITY OF MISSOURI WATER SPECIFICATIONS - HORIZONTAL DIRECTIONAL DRILLING:

- MATERIALS, PIPE AND PIPE FITTINGS, GENERAL 1.1. ALL UNDERGROUND WATER PIPING SHALL BE PVC.
- 1.1.1. EXCEPTION: LINES PASSING DIRECTLY OVER STEAM TUNNELS OR DIRECT BURIED STEAM/CONDENSATE LINES MUST BE DUCTILE IRON WITH 4'R-5 EXTRUDED POLYSTYRENE INSULATION BOARD BETWEEN THE PIPE AND STEAM

# 1.2. PVC PIPE (TRENCHLESS CONSTRUCTION)

- 1.2.1. 4 INCHES TO 12 INCHES: AWWA C900; CLASS 235 (DR 18); CAST IRON O.D. EQUIVALENT; WITH GROOVED ENDS SUITABLE FOR RESTRAINED JOINT COUPLING.
- 1.2.2. COUPLINGS: NON-METALLIC RESTRAINED JOINT COUPLING WITH PVC PRECISION MACHINED HOUSING, NYLON JOINT RETAINING SPLINES, ELASTOMERIC O-RING SEALS, BEVELED LEADING EDGES, WITH PRESSURE RATING EQUAL TO

## 1.2.3. GASKETS: ASTM F477, ELASTOMERIC SEAL.

- 1.2.4. COUPLING LUBRICANT: COUPLING MANUFACTURER'S STANDARD FOR PERMANENT JOINTS.
- 1.2.5. COMPLIANCE: COMPLETE RESTRAINED JOINT PIPE AND COUPLING SYSTEM SHALL BE FACTORY MUTUAL APPROVED. UNDERWRITER'S LABORATORY LISTED. AND SHALL COMPLY WITH NATIONAL SANITATION FOUNDATION STANDARD NO. 61 AND UNIBELL UNI-B-13.
- 1.2.6. RESTRAINED JOINT PIPING SYSTEM SHALL BE CERTA-LOK C900/RJ SYSTEM, AS MANUFACTURED BY CERTAINTEED, VALLEY FORGE PA, OR APPROVED EQUAL.
- 1.2.7. LINK ASSEMBLY: SEAL ANNULAR SPACE FOR PIPING PASSING THROUGH WALLS WITH INTERLOCKING SYNTHETIC RUBBER LINK ASSEMBLY, LINK-SEAL® AS MANUFACTURED BY PSI-THUNDERLINE CORPORATION, HOUSTON TX, OR APPROVED EQUAL.

## TRENCHLESS PIPING INSTALLATION

- 2.1. IT IS THE DESIRE OF THE SYSTEM OWNER TO ASSURE THAT TRENCHLESS PIPING INSTALLATION BE
- COMPLETED IN A TIMELY, QUALITY AND ACCURATE MANNER UTILIZING GOOD, WELLMAINTAINED EQUIPMENT AND TRAINED COMPETENT PERSONNEL. TRENCHLESS PIPING MUST BE INSTALLED ON A ROUTE AS CLOSE TO THE DRAWINGS AS POSSIBLE TO PREVENT INTERFERENCE
- WITH BURIED UTILITIES AND OTHER OBSTRUCTIONS, AND TO PREVENT FUTURE ACCIDENTAL EXCAVATION DAMAGE.
- 2.2. TRENCHLESS PIPING INSTALLATION SHALL ONLY BE ALLOWED IF PREVIOUSLY APPROVED BY SYSTEM OWNER.
- 2.3. DIRECTIONAL DRILLING AND PIPE INSTALLATION SHALL BE DONE ONLY BY AN EXPERIENCED
- OPERATOR SPECIALIZING IN DIRECTIONAL DRILLING AND WHOSE KEY PERSONNEL HAVE AT LEAST
- FIVE (5) YEAR EXPERIENCE IN THIS WORK.
- 2.4. PIPE INSTALLED BY THE DIRECTIONAL DRILLED METHOD MUST BE LOCATED IN PLAN AS SHOWN ON THE DRAWINGS, AND MUST BE NO SHALLOWER THAN SHOWN ON THE DRAWINGS UNLESS OTHERWISE APPROVED. THE ACTUAL HORIZONTAL AND VERTICAL ALIGNMENT OF THE PILOT BORE SHALL BE PLOTTED AT INTERVALS NOT EXCEEDING TWENTY (20) FEET. THIS "AS BUILT" PLAN AND PROFILE SHALL BE UPDATED AS THE PILOT BORE IS ADVANCED. INSTRUMENTATION SHALL BE UTILIZED AT ALL TIMES THAT WILL ACCURATELY LOCATE THE PILOT HOLE AND MEASURE DRILLING FLUID FLOW AND PRESSURE.
- 2.5. PILOT HOLE SHALL BE DRILLED ON BORE PATH WITH NO DEVIATIONS GREATER THAN 5 FEET LEFT/RIGHT/DEPTH OVER A LENGTH OF 100 FEET. IN THE EVENT THAT PILOT DOES DEVIATE FROM BORE PATH MORE THAN THIS AMOUNT, THE ENGINEER SHALL BE NOTIFIED AND ENGINEER MAY REQUIRE THE PILOT DRILL TO BE PULLED BACK AND REDRILLED FROM THE LOCATION ALONG BORE
- PATH BEFORE THE DEVIATION. THE FINAL EXIT POINT OF PILOT HOLE SHALL BE WITHIN FIVE (5) FEET OF THE LOCATION SHOWN ON THE DRAWINGS 2.6. TRENCHLESS PIPING INSTALLED USING DIRECTIONAL DRILLING EQUIPMENT SHALL BE INSTALLED IN FULL COMPLIANCE WITH RESTRAINED JOINT PIPING SYSTEM MANUFACTURER'S INSTRUCTIONS.
- 2.7. FIELD GROOVING TOOLS, PULLING HEADS, SPLINE INSERTION TOOLS, ETC. SHALL BE PIPING SYSTEM MANUFACTURER'S STANDARD. 2.8. COMPLY WITH PIPING SYSTEM MANUFACTURER'S REQUIREMENTS ON MAXIMUM PULLING FORCE, MINIMUM BEND RADIUS, MAXIMUM DEFLECTION, ETC. DURING PULL—BACK OPERATIONS, NO MORE THAN THE MAXIMUM SAFE PIPE PULL
- PRESSURE SHALL BE APPLIED AT ANY TIME. MAXIMUM ALLOWABLE TENSILE FORCE IMPOSED ON THE PULL SECTION SHALL BE EQUAL TO, OR LESS THAN 80% OF THE PIPE MANUFACTURER'S SAFE PULL (TENSILE) STRENGTH.
- 2.9. PROVIDE PRESSURE RELIEF HOLES AT CLOSE ENOUGH INTERVALS TO PREVENT BUCKLING OF PAVEMENT/SIDEWALKS. IF DAMAGE DOES OCCUR, THE PAVEMENT SHALL BE REPAIRED IN ACCORDANCE WITH PAVEMENT DETAILS
- 2.10. TRACE WIRE SHALL BE PULLED WITH PIPE, WITHOUT SPLICES. UPON COMPLETION OF INSTALLATION, A CONTINUITY TEST ON THE WIRE SHALL BE PERFORMED AND ALL BREAKS SHALL BE REPAIRED.

## 2.11. FINISHED PIPING INSTALLATION SHALL HAVE A MINIMUM OF 42" COVER ON TOP OF PIPE.

- 3.1. FINISHED PIPE INSTALLATION SHALL HAVE MINIMUM 12" SEPARATION TO ALL OTHER UTILITIES.
- 3.2. MAINTAIN AT LEAST A TEN FOOT (10') HORIZONTAL SEPARATION OF WATER MAINS FROM ANY EXISTING OR PROPOSED SANITARY SEWER. THE DISTANCE MUST BE MEASURED EDGE TO EDGE. INSTALLATION OF THE WATER MAIN
- CLOSER TO A SANITARY SEWER IS ACCEPTABLE WHERE THE WATER MAIN IS LAID IN A SEPARATE TRENCH OR ON AN UNDISTURBED EARTH SHELF LOCATED ON ONE (1) SIDE OF THE SANITARY SEWER AT AN ELEVATION SO THE BOTTOM OF THE WATER MAIN IS AT LEAST EIGHTEEN INCHES (18") ABOVE THE TOP OF THE SANITARY SEWER.
- 3.3. PROVIDE A MINIMUM VERTICAL DISTANCE OF EIGHTEEN INCHES (18") BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SANITARY SEWER WHERE WATER MAINS CROSS THE SANITARY SEWER MAINS. THIS
- SHALL BE THE CASE WHERE THE WATER MAIN IS EITHER ABOVE OR BELOW THE SANITARY SEWER. AT CROSSINGS, ONE (1) FULL LENGTH OF WATER PIPE MUST BE LOCATED SO BOTH JOINTS WILL BE AS FAR FROM THE SANITARY SEWER LINE AS POSSIBLE. SPECIAL STRUCTURAL SUPPORT FOR THE WATER AND SANITARY SEWER PIPES MAY BE REQUIRED.
- 3.4. PROVIDE AT LEAST A TEN-FOOT (10') HORIZONTAL SEPARATION BETWEEN WATER MAINS AND SANITARY SEWER FORCE MAINS. THERE SHALL BE AN EIGHTEEN-INCH (18') VERTICAL SEPARATION AT CROSSINGS. 3.5. LOCATE WATER MAINS SO THAT THEY DO NOT PASS THROUGH OR COME IN CONTACT WITH ANY SANITARY SEWER MANHOLE
- 3.6. CONSULT THE SYSTEM OWNER WHERE ABOVE CONDITIONS CANNOT BE MET.

## 4.1. ROUGH FINAL GRADING OF SUBGRADE AND THE PLACEMENT OF FINAL TOPSOIL SHALL BE DETAILED ON THE DRAWINGS.

- 4.2. ALL SIDEWALKS, PAVING, ETC. WHICH ARE REMOVED OR DAMAGED DURING CONSTRUCTION SHALL BE REPLACED AND SHALL MATCH EXISTING.
- 5.1. SEE DISINFECTING SECTION FOR CLEANING, DISINFECTION AND PRESSURE TESTING REQUIREMENTS. 5.2. TEST REPORT: SUBMIT TEST REPORTS TO THE OWNER'S REPRESENTATIVE.
- 6.1. SEE DISINFECTING SECTION FOR CLEANING AND DISINFECTION REQUIREMENTS.
- 7.1. SYSTEM SHALL BE PLACED IN OPERATION ONLY AFTER TESTING SHOWS THE ABSENCE OF BACTERIOLOGICAL CONTAMINATION AND APPROVED BY SYSTEM OWNER.
- 7.2. MU: ONLY CAMPUS FACILITIES ENERGY MANAGEMENT STEAM AND WATER PERSONNEL WILL BE ALLOWED TO OPERATE VALVES ON NEW WATER SYSTEMS.

#### UNIVERSITY OF MISSOURI WATER SPECIFICATIONS - PIPING:

#### MATERIALS, PIPE AND PIPE FITTINGS

- 1.1. ALL UNDERGROUND WATER PIPING SHALL BE PVC.
- 1.1.1. EXCEPTION 1: DOMESTIC WATER SERVICE LINES 2" OR LESS SHALL BE TYPE K COPPER OR HIGH-DENSITY POLYETHYLENE (HDPE) PIPING. 1.1.2. EXCEPTION 2: LINES PASSING DIRECTLY OVER OR UNDER STEAM TUNNELS OR DIRECT BURIED STEAM/CONDENSATE LINES MUST BE DUCTILE IRON OR TYPE K COPPER (2" OR LESS) WITH 4" R-5 EXTRUDED POLYSTYRENE INSULATION BOARD BETWEEN THE PIPE AND STEAM LINES.
- 1.2. PVC PIPE (OPEN TRENCH CONSTRUCTION)
- 1.2.1. 4 INCHES TO 12 INCHES: AWWA C900; PRESSURE CLASS 235 (DR 18); CAST IRON O.D. EQUIVALENT; WITH BELL END AND ELASTOMERIC GASKET.
- 1.2.2. 14 INCHES TO 48 INCHES: AWWA C905; PRESSURE RATING 165 (DR 25); CAST IRON O.D. EQUIVALENT; WITH BELL END AND ELASTOMERIC GASKET. 1.2.3. GASKETS: ASTM F 477, ELASTOMERIC SEAL.

- 1.3.1. 4 INCHES TO 12 INCHES: AWWA C151; MECHANICAL JOINT PIPE; MINIMUM THICKNESS CLASS 52 OR PRESSURE CLASS 350; WITH INTEGRALLY CAST FLANGED BELL, CAST
- IRON GLAND, AND RUBBER GASKET. 1.3.2. LINING: STANDARD CEMENT LINING WITH ASPHALT COATING.

#### 1.4. HIGH-DENSITY POLYETHYLENE (HDPE) PIPE AND FITTINGS

1.3.3. ENCASEMENT: AWWA C105, POLYETHYLENE FILM.

1.4.1. 2 INCHES AND LESS: SDR9 CTS PREMIUM GRADE PIPE, AWWA C901, ASTM D3035, NSF 14 AND 61, 200 PSI PRESSURE RATING. PIPE TO BE CENCORE HDPE AS MANUFACTURED BY CENTENNIAL PLASTICS OR APPROVED EQUAL. 1.4.2. FITTINGS AND JOINTS: ALL MOLDED FITTINGS AND FABRICATED FITTINGS SHALL BE FULLY PRESSURE RATED TO MATCH THE PIPE PRESSURE RATING. ALL FITTINGS SHALL BE MOLDED OR FABRICATED BY THE PIPE MANUFACTURER. CONNECTIONS MUST BE MADE BY EITHER THE USE OF BRASS/STAINLESS STEEL COMPRESSION COUPLINGS WITH INSERT RINGS OR BY CREATING A FUSION BUTT WELD ALL IN STRICT ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS. ALL BRASS FITTINGS SHALL BE LEAD FREE.

- 1.5. PIPE FITTINGS 1.5.1. 4 INCHES TO 24 INCHES: AWWA C153; 350-PSI PRESSURE RATING.
- 1.5.2. LINING: STANDARD CEMENT LINING WITH ASPHALT COATING.
- 1.5.3. ALL PIPE FITTINGS SHALL BE DUCTILE-IRON CONSTRUCTION, INSTALLED WRAPPED WITH AWWA C105 POLYETHYLENE FILM.
- 1.6.1. MECHANICAL JOINT: AWWA C111. PROVIDE RETAINER TYPE PACKING GLANDS WITH RUBBER GASKET, FOR USE WITH PVC PIPE AND CONFORMING TO UNI-B-13- 92. PIPE SIZES 4" TO 12" MUST ALSO BE FM APPROVED. MECHANICAL JOINT RESTRAINTS SHALL BE MEGALUG 2000 PV, AS MANUFACTURED BY EBAA IRON INC., EASTLAND TX, OR 1.6.2. JOINT RETAINERS: PROVIDE DUCTILE IRON SPLIT SERRATED RING HARNESSES AND ROD TYPE JOINT RETAINERS FOR PVC BELL AND SPIGOT JOINTS. CLAMPS SHALL BE
- DESIGNED FOR USE WITH PVC PIPE AND SHALL MEET UNI-B-13-92 STANDARDS AND BE FM APPROVED ON SIZES 4" TO 12". RESTRAINT HARNESSES SHALL BE SERIES 1500 FOR PIPE 4 INCHES TO 12 INCHES, AND SERIES 2800 FOR PIPE 14 INCHES AND LARGER, ALL AS MANUFACTURED BY EBAA IRON INC., EASTLAND TX OR APPROVED EQUAL. 1.6.3. RODS, NUTS AND WASHERS: 3/4" SS304 ALL THREAD RODS, NUTS AND WASHERS. 1.6.4. ALL PIPE RESTRAINTS AND DUCTILE IRON FITTINGS SHALL BE INSTALLED WRAPPED WITH AWWA C105 POLYETHYLENE FILM.
- 1.6.5. LINK ASSEMBLY: SEAL ANNULAR SPACE FOR PIPING PASSING THROUGH WALLS WITH INTERLOCKING SYNTHETIC RUBBER LINK ASSEMBLY, LINK—SEAL® AS MANUFACTURED BY PSI-THUNDERLINE CORPORATION, HOUSTON TX, OR APPROVED EQUAL. 1.6.6. PIPES, FITTINGS, VALVES, METERS, AND OTHER APPURTENANCES CONTAINING MORE THAN 0.25 PERCENT LEAD CALCULATED BY WEIGHTED AVERAGE SHALL NOT BE USED.
- 1.7.1 TRACER WIRE SHALL BE #14 AWG SOLID, STEEL CORE SOFT DRAWN HIGH STRENGTH TRACER WIRE, 250# AVERAGE TENSILE BREAK LOAD, 30 MIL HIGH MOLECULAR WEIGHT-HIGH DENSITY BLUE PÖLYETHYLENE JACKET COMPLYING WITH ASTM-D- 1248, 30 VOLT RATING. NO THHN INSULATED WIRE SHALL BE ALLOWED. TRACER WIRE SHALL BE COPPERHEAD INDUSTRIES HS-CCS OR APPROVED EQUAL. 1.7.2 TRACER WIRE SHALL HAVE MOISTURE RESISTANT SPLICES FOR DIRECT BURY APPLICATIONS. SPLICES SHALL BE COPPERHEAD INDUSTRIES SNAKEBITE OR 3M DBR OR
- 1.7.3 TRACER WIRE TEST STATIONS SHALL BE DESIGNED TO BE EASILY DETECTED BY MAGNETIC AND ELECTRONIC LOCATORS. A MAGNET SHALL BE SECURELY ATTACHED AT THE TOP OF THE UPPER TUBE OF THE BOX FOR LOCATING PURPOSES. LID SHALL BE BLUE AND HAVE A BRASS TERMINAL FOR ATTACHING LOCATING EQUIPMENT AND A BRASS 5 SIDED NUT FOR REMOVING CAP. TRACER WIRE TEST STATION SHALL BE COPPERHEAD INDUSTRIES SNAKE PIT OR APPROVED EQUAL.
- INSTALLATION
- 2.1.1. FINAL BURY DEPTH SHALL HAVE A MINIMUM OF 42" COVER TO THE TOP OF THE PIPE.
- 2.1.2. TRENCH BOTTOM SHALL BE GRADED TO PROVIDE A SMOOTH, FIRM, STABLE, AND ROCK-FREE FOUNDATION THROUGHOUT THE LENGTH OF THE PIPING. 2.1.3. ALL ROCK GREATER THAN ONE INCH IN DIAMETER FOUND IN THE TRENCH SHALL BE REMOVED FOR A DEPTH OF SIX INCHES BELOW THE BOTTOM OF THE PIPE AND REPLACED BY SUITABLE BEDDING MATERIAL.
- 2.1.4. UNSTABLE, SOFT, AND UNSUITABLE MATERIALS SHALL BE REMOVED AT THE SURFACE UPON WHICH PIPES ARE TO BE LAID AND BACKFILL WITH CRUSHED STONE AS
- 2.1.5. LAYERS OF CRUSHED STONE SHALL BE INSTALLED IN THE BOTTOM OF TRENCH AS INDICATED ON THE DRAWINGS. SHAPE STONE LAYER TO FIT BOTTOM OF PIPING. DIG BELL HOLES AT EACH PIPE JOINT TO RELIEVE THE BELLS OF ALL LOADS AND TO ENSURE CONTINUOUS BEARING OF THE PIPE BARREL ON THE FOUNDATION.

# 2.2.1. FINISHED PIPE INSTALLATION SHALL HAVE MINIMUM 12" SEPARATION TO ALL OTHER UTILITIES.

- 2.2.2. MAINTAIN AT LEAST A TEN FOOT (10') HORIZONTAL SEPARATION OF WATER MAINS FROM ANY EXISTING OR PROPOSED SANITARY SEWER. THE DISTANCE MUST BE MEASURED EDGE TO EDGE. INSTALLATION OF THE WATER MAIN CLOSER TO A SANITARY SEWER IS ACCEPTABLE WHERE THE WATER MAIN IS LAID IN A SEPARATE TRENCH OR ON AN UNDISTURBED EARTH SHELF LOCATED ON ONE (1) SIDE OF THE SANITARY SEWER AT AN ELEVATION SO THE BOTTOM OF THE WATER MAIN IS AT LEAST EIGHTEEN INCHES (18") ABOVE THE TOP OF THE SANITARY SEWER. 2.2.3. PROVIDE A MINIMUM VERTICAL DISTANCE OF EIGHTEEN INCHES (24") BETWEEN THE OUTSIDE OF THE WATER MAIN AND THE OUTSIDE OF THE SANITARY SEWER WHERE
- WATER MAINS CROSS THE SANITARY SEWER MAINS. THIS SHALL BE THE CASE WHERE THE WATER MAIN IS EITHER ABOVE OR BELOW THE SANITARY SEWER. AT CROSSINGS, ONE (1) FULL LENGTH OF WATER PIPE MUST BE LOCATED SO BOTH JOINTS WILL BE AS FAR FROM THE SANITARY SEWER LINE AS POSSIBLE. SPECIAL STRUCTURAL SUPPORT FOR THE WATER AND SANITARY SEWER PIPES MAY BE REQUIRED. 2.2.4. PROVIDE AT LEAST A TEN-FOOT (10') HORIZONTAL SEPARATION BETWEEN WATER MAINS AND SANITARY SEWER FORCE MAINS. THERE SHALL BE AN EIGHTEEN-INCH (24")
- VERTICAL SEPARATION AT CROSSINGS 2.2.5. LOCATE WATER MAINS SO THAT THEY DO NOT PASS THROUGH OR COME IN CONTACT WITH ANY SANITARY SEWER MANHOLE 2.2.6. CONSULT THE SYSTEM OWNER WHERE ABOVE CONDITIONS CANNOT BE MET.
- 2.3. INSTALLATION OF PIPE AND PIPE FITTINGS
- 2.3.1. PIPING 2" AND LESS: 2.3.1.1. ALL DOMESTIC WATER SERVICE PIPING FROM THE WATER MAIN TO THE BUILDING WITH A NOMINAL DIAMETER OF TWO INCHES AND LESS SHALL BE TYPE K COPPER 2.3.1.2. IN ALL INSTALLATIONS, TYPE K COPPER SHALL BE USED WHERE THE WATER LINE ENTERS THE BUILDING. IF THE WATER METER IS LOCATED IN A METER PIT, THE
- PIPING WITHIN THE METER PIT, AND STUBBED OUT ON EITHER SIDE SHALL ALSO BE TYPE K COPPER. 2.3.1.3. ALL BURIED COPPER PIPING SHALL BE WRAPPED. 2.3.1.4. FOR PULLED PIPE INSTALLATIONS, TRACER WIRE SHALL BE PULLED WITH PIPE, WITHOUT SPLICES. UPON COMPLETION OF INSTALLATION, A CONTINUITY TEST ON THE WIRE SHALL BE PERFORMED AND ALL BREAKS SHALL BE REPAIRED.
- 2.3.1.5. FOR TRENCHED PIPE INSTALLATION, TRACER WIRE SHALL BE TAPED TO THE PIPE AT THE THREE O'CLOCK POSITION EVERY 5 FEET. UPON COMPLETION OF INSTALLATION. A CONTINUITY TEST ON THE WIRE SHALL BE PERFORMED AND ALL BREAKS SHALL BE REPAIRED. 2.3.2. PVC (POLYVINYL CHLORIDE) PIPE: INSTALL IN ACCORDANCE WITH AWWA C605.
- 2.3.3. ALL JOINTS SHALL BE RESTRAINED WITH JOINT RETAINERS. ALL FITTINGS SHALL BE RESTRAINED WITH RETAINER TYPE PACKING GLANDS. 2.3.4. INSTALL STAINLESS STEEL RODS BETWEEN FITTINGS ON ALL OFFSETS AND BETWEEN FITTINGS, VALVES, AND BLIND FLANGES, IN ADDITION TO THE MEGALUGS. ON ISOLATED FITTINGS, VALVES, ETC., ATTACH RESTRAINT RINGS TO PVC PIPE AND INSTALL STAINLESS STEEL RODS BETWEEN FITTING AND RESTRAINT RINGS. RODS SHALL BE POSITIONED THROUGH THE BOLT HOLES IN FITTING AND MEGALUG, EACH ROD WILL REQUIRE FOUR NUTS AND WASHERS. DUCT LUGS ARE ACCEPTABLE. THE NUMBER OF
- PIPE DIAMETER NO. OF RODS 10" AND LESS

STAINLESS STEEL RODS REQUIRED PER FITTING FLANGE SHALL BE AS FOLLOWS:

- 2.3.5. ALL DUCTILE IRON PIPE, FITTINGS, VALVES, BELL END RESTRAINTS, ETC. SHALL BE WRAPPED WITH A POLYETHYLENE COVER CONFORMING TO AWWA C105, AND INSTALLED PER AWWA C600.
- 2.3.6. ALL DEAD END MAINS SHALL HAVE A DRY BARREL FIRE HYDRANT AT THE END TO FACILITATE FLUSHING OF THE MAIN. 2.3.7. PIPE SHALL BE INSTALLED IN CLEAN CONDITION, AND SHALL NEVER BE LAID IN TRENCHES WITH STANDING WATER. THE TRENCH SHALL BE DEWATERED DURING INSTALLATION OF THE WATER LINE. OPEN PIPE ENDS SHALL BE PROTECTED WITH A HARD CAP OR INFLATABLE PLUG AT THE END OF THE WORK DAY. NO PLYWOOD OR DUCTTAPE COVERINGS WILL BE ALLOWED.
- 2.4 BACKFILL 2.4.1 UNDER PIPE: ALL BACKFILL UNDER THE BARREL OF THE PIPE SHALL BE FREE FROM DEBRIS, ORGANIC MATTER, AND STONES LARGER THAN ONE INCH, AND SHALL BE TAMPED INTO PLACE. SAND OR CRUSHED STONE AGGREGATE (95% PASSING A ½" SCREEN BUT NOT MORE THAN 10% PASSING A #200 SIEVE) ARE ACCEPTABLE SUBSTITUTES
- 2.4.2 ADJACENT TO AND TOP OF PIPE: THE FIRST ONE FOOT OF BACKFILL OVER THE TOP OF PIPE SHALL BE "3/4 INCH MINUS WASTE ROCK WITH FINES" UNCLEANED CRUSHED STONE AGGREGATE OR SUITABLE SOIL. BACKFILL SHALL BE FREE OF DEBRIS, BRUSH, ROOTS AND STONES OR RUBBLE MORE THAN ONE INCH. 2.4.3A SUITABLE SOIL SHALL BE ASTM D 2487 SOIL CLASSIFICATION GROUPS ML, CH AND CL, OR A COMBINATION OF THESE GROUP SYMBOLS; FREE OF ROCK OR
- GRAVEL LARGER THAN 1 INCHES IN ANY DIMENSION, DEBRIS, WASTE, FROZEN MATERIALS, VEGETATION, AND OTHER DELETERIOUS MATTER. 2.4.4 ROUGH FINAL GRADING OF SUBGRADE AND THE PLACEMENT OF FINAL TOPSOIL SHALL BE DETAILED ON THE DRAWINGS 2.4.5 ALL SIDEWALKS, PAVING, ETC. WHICH ARE REMOVED OR DAMAGED DURING CONSTRUCTION SHALL BE REPLACED AND SHALL MATCH EXISTING.
- 2.5.1 INSTALL CONTINUOUS PLASTIC UNDERGROUND WARNING TAPE DURING BACK-FILLING OF TRENCH FOR UNDERGROUND WATER PIPING. TAPE SHALL BE LOCATED TWENTY-FOUR (24) INCHES ABOVE PIPE, DIRECTLY OVER EACH WATER LINE.

2.5.2 TAPE TRACE WIRE TO THE TOP OF EACH WATER LINE WITH DUCT TAPE EVERY FIVE (5) FEET. WIRE SPLICES SHALL BE MINIMIZED. TERMINATE TRACE WIRES INSIDE

BUILDING AND INSIDE VALVE BOXES. DRILL 1/4" HOLE IN PVC VALVE BOX ONE INCH BELOW CAST IRON COVER. ROUTE WIRE UP OUTSIDE OF VALVE BOX, THROUGH 1/4" HOLE AND KNOT. A TRACER WIRE TEST STATION SHALL BE INSTALLED AT ALL FIRE HYDRANTS AND AT ALL RUNS OF PIPING WITHOUT VALVES EVERY 400 FEET. UPON COMPLETION OF

INSTALLATION AND FINAL GRADING, A CONTINUITY TEST ON THE WIRE SHALL BE PERFORMED AND ALL BREAKS SHALL BE REPAIRED. TESTING

3.1 FIELD QUALITY CONTROL - SEE DISINFECTING SECTION FOR CLEANING AND DISINFECTION, AND PRESSURE TEST REQUIREMENTS.

4.1 SYSTEM SHALL BE PLACED IN OPERATION ONLY AFTER TESTING SHOWS THE ABSENCE OF BACTERIOLOGICAL CONTAMINATION AND APPROVED BY THE OWNERS REP. 4.2 AT MU: ONLY CAMPUS FACILITIES - ENERGY MANAGEMENT STEAM AND WATER PERSONNEL WILL BE ALLOWED TO OPERATE VALVES ON NEW WATER SYSTEMS.

### UNIVERSITY OF MISSOURI WATER SPECIFICATIONS - VALVES:

- 1.1. VALVES AND VALVES BOXES
- 1.1.1. NON-RISING STEM GATE VALVES: ANSI/AWWA C509, RESILIENT SEATED, LEAD FREE, BRONZE STEM, CAST-IRON OR DUCTILE-IRON BODY AND BONNET, EPOXY COATED DISC, STEM NUT, 250 PSIG WORKING PRESSURE, MECHANICAL JOINT ENDS. VALVES SHALL BE MODEL A-2360 AS MANUFACTURED BY MUELLER COMPANY, DECATUR IL, OR APPROVED EQUAL. VALVES SHALL TURN CLOCKWISE TO CLOSE. 1.1.2. BALL VALVES: THREADED LEAD FREE BRONZE, 125 LB., 2-PIECE DESIGN, FULL PORT. VALVES SHALL BE MODEL T-FP-600A-LF-LL
- AS MANUFACTURED BY NIBCO, ELKHART IL, OR APPROVED EQUAL. 1.1.3. VALVE BOXES: VALVE BOX SHALL BE 6" PVC C900 PIPE WITH CAST IRON COVER NO. 2195 AS MANUFACTURED BY CLAY AND BAILEY
- CONCRETE COLLAR IN PLANTED AND ASPHALT AREAS. 1.1.4. MULTI-FIT ADAPTOR: ALL VALVE BOXES SHALL BE INSTALLED UPON THE VALVE WITH THE USE OF A MULTI-FIT ADAPTOR (MFA) AS
- INSTALLATION
  - 2.1.1. USE THE FOLLOWING PRECAUTIONS FOR VALVES DURING STORAGE:
- 2.1.1.1. DO NOT REMOVE END PROTECTORS UNLESS NECESSARY FOR INSPECTION; THEN REINSTALL FOR STORAGE. 2.1.1.2. PROTECT VALVES FROM WEATHER - VALVES SHALL BE STORED INDOORS. MAINTAIN VALVE TEMPERATURE HIGHER THAN THE
- 2.2.1 USE A SLING TO HANDLE VALVES WHOSE SIZE REQUIRES HANDLING BY CRANE OR LIFT. VALVES SHALL BE RIGGED TO AVOID
- UP AND WITH VALVE BOX.
- 3.1. ALL VALVES SHALL BE PRESSURE TESTED IN ACCORDANCE WITH STANDARDS SET FORTH IN THE WATER PIPING CONSTRUCTION
- 4.1. MU ONLY: ALL VALVES UNDER PRESSURE IN THE MU WATER DISTRIBUTION MAINS WILL BE OPERATED ONLY BY CAMPUS FACILITIES -STEAM & WATER DISTRIBUTION PERSONNEL, EXCEPT IN CASES OF EXTREME EMERGENCY. ALL VALVES INSTALLED AS PART OF NEW CONSTRUCTION SHALL REMAIN FULLY CLOSED DURING CONSTRUCTION.

- 1.2. ALL DOMESTIC POTABLE WATER SYSTEMS WILL BE PRESSURE TESTED IN ACCORDANCE WITH AWWA M23. DISINFECTION SHALL BE PERFORMED AFTER LEAK AND PRESSURE TESTS ARE COMPLETED. 1.4. WATER LINE SHALL BE COMPLETELY SEPARATED FROM WATER SYSTEM FOR PRESSURE TEST AND DISINFECTION PURPOSES.
- PIPE DIAMETER (IN) 2" TAPS NEEDED

NEW WATER SYSTEMS.

"PREVENTION OF BACKFLOW" AS LAST REVISED.

- 1.6. OWNER SHALL INSTALL WATER LINE ENTRANCE AND EXIT PIPING WHICH ENTERS AND EXITS ABOVE GROUND. THE PURPOSE OF THIS PIPING IS TO PROVIDE A MEANS FOR FLUSHING. PRESSURE TESTING, AND DISINFECTING THE NEW WATER LINE. 1.7. MU ONLY: MU WILL PERFORM PRESSURE TESTING AND DISINFECTION OF NEW WATER LINES. OWNER SHALL PREPARE WATER LINE FOR TESTING AND DISINFECTION. NOTIFY OWNER'S REPRESENTATIVE AT LEAST 72 HOURS PRIOR TO REQUESTING DISINFECTION OF A NEW WATER LINE. OWNER WILL DRAW AND SEND SAMPLES FOR TESTING. ALLOW 24 HOURS FOR DISINFECTION OF THE WATER LINE AND AN ADDITIONAL 48 HOURS
- FOR RETURN OF TESTING PRIOR TO CONNECTING TO EXISTING SYSTEM. 1.8. FILL THE SYSTEM WITH A WATER-CHLORINE SOLUTION CONTAINING AT LEAST 50 PARTS PER MILLION OF CHLORINE, VALVE OFF, AND ALLOW TO STAND FOR AT LEAST TWENTY-FOUR (24) HOURS; OR FILL SYSTEM WITH A WATER-CHLORINE SOLUTION CONTAINING AT LEAST 200 PARTS PER
- 1.9. AFTER ALLOWED STANDING TIME, FLUSH THE SYSTEM WITH CLEAN POTABLE WATER UNTIL NO CHLORINE (IN EXCESS OF PUBLIC WATER SLIPPLY) REMAINS AT ANY POINT OF OUTLET 1.10. THE SYSTEM SHALL BE THOROUGHLY AND COMPLETELY FLUSHED AT MAXIMUM WATER PRESSURE, AND IF IT IS SHOWN BY A
- BACTERIOLOGICAL EXAMINATION MADE BY THE OWNER THAT CONTAMINATION STILL PERSISTS IN THE SYSTEM, THE ABOVE PROCEDURE SHALL BE 1.11. THE OWNER SHALL BE RESPONSIBLE FOR TAKING AND SENDING THE SAMPLE FOR TESTING
- 1.12. THE SYSTEM OWNER WILL BE FINANCIALLY RESPONSIBLE FOR FIRST BACTERIOLOGICAL TEST ON A SECTION OF LINE TO BE TESTED. THE CLEANING PROCEDURE SHALL REPEATED IF BIOLOGICAL EXAMINATION SHOWS EVIDENCE OF CONTAMINATION. COSTS INCURRED DUE TO SUBSEQUENT TESTING FROM AN INITIAL POSITIVE SAMPLE SHALL BE PAID FOR BY THE INSTALLERS.
- COMMISSIONING 2.1. SYSTEM SHALL BE PLACED IN OPERATION ONLY AFTER TESTING SHOWS THE ABSENCE OF BACTERIOLOGICAL CONTAMINATION AND APPROVED BY 2.2. MU ONLY: ONLY CAMPUS FACILITIES - ENERGY MANAGEMENT STEAM AND WATER PERSONNEL WILL BE ALLOWED TO OPERATE VALVES ON

# UNIVERSITY OF MISSOURI WATER SPECIFICATIONS - BACKFLOW PREVENTION:

ALL CONNECTIONS TO THE UNIVERSITY OF MISSOURI DOMESTIC WATER SYSTEM SHALL INCLUDE THE INSTALLATION OF A BACKFLOW PREVENTION ASSEMBLY IN STRICT ACCORDANCE WITH THE MISSOURI DEPARTMENT OF NATURAL RESOURCES RULE 10 CSR 60-11.010

ALL BUILDING DOMESTIC WATER MAIN CONNECTIONS SHALL BE CONSIDERED A CLASS I BACKFLOW HAZARD REQUIRING A REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLY. ALL FIRE WATER MAIN CONNECTIONS SHALL BE CONSIDERED A CLASS II BACKFLOW HAZARD REQUIRING A DOUBLE CHECK VALVE ASSEMBLY.

ONLY THOSE MODELS OF REDUCED PRESSURE PRINCIPLE BACKFLOW PREVENTION ASSEMBLIES AND DOUBLE CHECK VALVES ASSEMBLIES

BACKFLOW PREVENTION ASSEMBLY SHALL BE CONSTRUCTED WITH LEAD FREE BRONZE BODY OR FDA APPROVED EPOXY-COATED CAST IRON AND INCLUDE QUARTER-TURN, FULL PORT, RESILIENT SEATED BALL VALVE SHUTOFFS (2" AND UNDER) OR NON-RISING STREAM INCLUDE A STRAINER. BACKFLOW PREVENTION ASSEMBLIES SHALL BE LEAD FREE LF009, AND LF909 AS MANUFACTURED BY WATTS

INSTALLATION OF BACKFLOW PREVENTION ASSEMBLIES SHALL BE IN STRICT ACCORDANCE WITH 10 CSR 60-11.010 AND MANUFACTURER'S WRITTEN INSTRUCTIONS.

WATER SERVICE, BOTH PERMANENT AND TEMPORARY WILL NOT BE TURNED ON WITHOUT THE INSTALLATION OF A BACKFLOW PREVENTION ASSEMBLY. WITHIN TWENTY-FOUR (24) HOURS AFTER INSTALLATION AND PLACING INTO SERVICE, ALL BACKFLOW PREVENTION ASSEMBLIES SHALL BE INSPECTED, TESTED AND APPROVED BY A TESTER CERTIFIED IN ACCORDANCE WITH THE REQUIREMENTS AND PROCEDURES IN 10 CSR 60-11.030. A BACKFLOW PREVENTION

ALL PERMANENT AND TEMPORARY INSTALLED BACKFLOW PREVENTION ASSEMBLIES SHALL BE TESTED ANNUALLY AS REQUIRED BY 10 CSR

ASSEMBLY TEST DATA AND MAINTENANCE REPORT FORM (MO 780-0804) SHALL BE COMPLETED FOR EACH BACKFLOW PREVENTION

ASSEMBLY, AND THE WHITE COPY FORWARDED TO CAMPUS FACILITIES — ENERGY MANAGEMENT STEAM AND WATER DISTRIBUTION

- MANUFACTURING COMPANY, KANSAS CITY MO, OR APPROVED EQUAL. LID SHALL BE MARKED "WATER". PROVIDE BELOW GRADE
- MANUFACTURED BY ADAPTOR INC. OR AN APPROVED EQUAL. SKU # 90004.
- 2.1. VALVE STORAGE
- AMBIENT DEW POINT TEMPERATURE. IF OUTDOOR STORAGE IS NECESSARY, SUPPORT VALVES OFF THE GROUND OR PAVEMENT IN WATERTIGHT ENCLOSURES.
- DAMAGE TO EXPOSED VALVE PARTS. DO NOT USE HAND WHEELS OR STEMS AS LIFTING OR RIGGING POINTS.
- 2.2.2 DOMESTIC WATER SERVICE: AWWA-TYPE GATE VALVES: COMPLY WITH AWWA C600. INSTALL BURIED VALVES WITH STEM POINTING
- 2.2.3 VALVE BOXES SHALL BE INSTALLED VERTICALLY WITH TOP OF BOX EVEN WITH FINAL GRADE. 2.2.3 ALL VALVE BOXES SHALL BE INSTALLED UPON THE VALVE WITH THE USE OF A MULTI-FIT ADAPTOR (MFA). THE MFA SHALL BE INSTALLED IN LIEU OF HARDWOOD BLOCKING AND SHALL BE INCIDENTAL TO THE VALVE AND BOX INSTALLATION. INSTALL PER MANUFACTURER'S PUBLISHED INSTALLATION PROCEDURES
- 1.2. ALL VALVES SHALL BE DISINFECTED IN ACCORDANCE WITH STANDARDS SET FORTH IN THE WATER PIPING CONSTRUCTION STANDARD.

## UNIVERSITY OF MISSOURI WATER SPECIFICATIONS - DISINFECTION:

- 1.1. ALL DOMESTIC POTABLE WATER SYSTEMS SHALL BE CLEAN AND FREE OF FOREIGN MATTER AND SHALL BE DISINFECTED AND TESTED FOR BACTERIOLOGICAL CONTAMINATION BEFORE THE SYSTEM IS PUT INTO OPERATION, AS REQUIRED BY THE STATE DIVISION OF HEALTH AND IN ACCORDANCE WITH AWWA C651 OR C652.
- 1.5. OWNER SHALL INSTALL NUMBER AND SIZE OF TAPS BASED ON THE WATER LINE SIZE IN THE THE TABLE BELOW:
- MILLION OF CHLORINE, VALVE OFF, AND LET STAND FOR THREE (3) HOURS.
- 1.13. ALLOW FORTY-EIGHT (48) HOURS FOR RETURN OF TESTING BEFORE MAKING TIE-INS TO EXISTING SYSTEM.

APPROVED BY THE MISSOURI DEPARTMENT OF NATURAL RESOURCES PUBLIC DRINKING WATER PROGRAM ARE ACCEPTABLE.

RESILIENT SEATED GATE VALVES (OVER 2"), AND BRONZE STRAINER. FIRE PROTECTION BACKFLOW PREVENTION ASSEMBLIES SHALL NOT WATER TECHNOLOGIES, NORTH ANDOVER MA, OR APPROVED EQUAL BY OWNER.

60-11.010. THIS ANNUAL TESTING SHALL BE THE RESPONSIBILITY OF THE BUILDING MAINTENANCE OPERATION.

BID SET 08/22/2024

| REVISIONS:

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

ANDREW T. GREENE MO LICENSE-2020000043

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DRAWING INCLUDES:

WATER SPECIFICATIONS

DESIGNED: ATG

PROJECT NO.: 240131 SHEET:

ATG

NEW FACILITY OF APPROXIMATELY 2,625 SF CONSISTING OF A USE S-I (STORAGE) USE GROUP. THE BUILDING WILL BE A PRE-ENGINEERED STEEL STRUCTURE AND WILL BE TYPE IIB CONSTRUCTION. BUILDING CODES IN EFFECT: IBC/2021, NEC/2020, IPC/2021, IMC/2021, IFGC/2021, IFC/2021 NFPA 150 FOR ANIMAL FACILITIES

AS AMENDED AND ADOPTED BY THE UNIVERSITY OF MISSOURI

<u>ADMINISTRATION</u> (CHAPTER I) • DESIGN PROFESSIONAL IN RESPONSIBLE CHARGE JAY D. BERENDZEN, ARCHITECT PORTER, BERENDZEN & ASSOCIATES, P.C. 200 SOUTH HENRY CLAY BLVD. ASHLAND, MISSOURI 65010 573.657.2022 PHONE

USE \$ OCCUPANCY CLASSIFICATION (CHAPTER 3) • MIXED USE, NON-SEPARATED •• S-I - STORAGE

GENERAL BUILDING HEIGHTS & AREAS (CHAPTER 5) • (S-I STORAGE, CONSTRUCTION TYPE IIB - NON-SPRINKLERED)

• TABULAR ALLOWABLE BUILDING HEIGHT •• S-I USE GROUP: 2 STORY, 55 FEET • ACTUAL BUILDING HEIGHT: I STORY, 21 FEET • TABULAR ALLOWABLE BUILDING AREA PER FLOOR:

• STORAGE ( S-I USE ): 17,500 SF •• FRONTAGE INCREASE = 0% = 0 SF (0.00) = NOT USED •• TOTAL ALLOWABLE AREA = 17,500 SF ACTUAL BUILDING AREAS: •• TOTAL MAIN LEVEL BUILDING AREA: 2,625 SF

DEFERRED SUBMITTALS: I) PRE-ENGINEERED STEEL BUILDING

ALTERNATES:

SEE CIVIL COVER SHEET

USE GROUP S-I USE GROUP S-I • EXIT ENCLOSURES & EXIT PASSAGEWAYS: • CLASS B - (FLAME SPREAD 26-75, SMOKE DEVELOPED 0-450) CORRIDORS: •• CLASS B - (FLAME SPREAD 26-75, SMOKE DEVELOPED 0-450) • ROOMS & ENCLOSED SPACES: •• CLASS C - (FLAME SPREAD 76-200, SMOKE DEVELOPED 0-450) FIRE PROTECTION SYSTEM THIS BUILDING WILL NOT BE EQUIPPED WITH AN AUTOMATIC FIRE SPRINKLER SYSTEM. THRESHOLD: S-I = 12,000 S.F. OR 3 STORIES THIS BUILDING WILL NOT BE EQUIPPED WITH A FIRE ALARM SYSTEM. THRESHOLD: S-I = NONE THE GENERAL CONTRACTOR SHALL PROVIDE & INSTALL PORTABLE FIRE EXTINGUISHER(S) WITH NO MORE THAN 75 FEET OF TRAVEL DISTANCE BETWEEN FIRE EXTINGUISHERS LOCATED AS DIRECTED BY THE FIRE MARSHAL. (CHAPTER 10) SEE LIFE SAFETY / EGRESS PLAN ON FOLLOWING SHEET AIOO FOR DETAILS & INFORMATION. <u>ACCESSIBILITY</u> · ACCESSIBLE ROUTES WITHIN THE SITE SHALL BE PROVIDED FROM PUBLIC TRANSPORTATION STOPS; ACCESSIBLE PARKING; ACCESSIBLE PASSENGER LOADING ZONES; AND PUBLIC STREETS OR SIDEWALKS TO THE ACCESSIBLE BUILDING ENTRANCE SERVED (SECTION 1104.1) AT LEAST 60% OF ALL PUBLIC ENTRANCES SHALL BE MADE ACCESSIBLE. • AT LEAST 2 PERCENT, BUT NOT LESS THAN ONE, OF EACH TYPE OF PARKING SPACE PROVIDED SHALL BE AN ACCESSIBLE SPACE. • THIS BUILDING SHALL CONFORM TO: THE AMERICAN NATIONAL STANDARD FOR ACCESSIBLE AND USABLE BUILDINGS AND FACILITIES (ICC/ANSI AII7.1-2017) AND THE LATEST EDITION OF THE AMERICANS WITH DISABILITIES ACT.

TABLE 803.13 INTERIOR WALL & CEILING FINISH REQUIREMENTS, NON-SPRINKLERED)

TYPES OF CONSTRUCTION

INTERIOR FINISHES

VARIANCE REQUESTS:

As instructed a variance has been requested for the following:

1) Sprinkler System - Not practical and Not required by Building Code.

2) Fire Alarm System - Not practical and Not required by Building Code.

Also see formal variance request letter submitted and dated July 30, 2024

TYPE VB - NON-SPRINKLERED

FLOOR PLAN / LIFE SAFETY & EGRESS NOTES:

TYPE IIB - NON-SPRINKLERED CONSTRUCTION TYPE: BUILDING OCCUPANCY: S-I – STORAGE

GENERAL AREA CALCULATIONS

(CHAPTER 6)

(CHAPTER 8)

2,625 SQ.FT. (GROSS) ACTUAL FLOOR AREAS: MINIMUM OCCUPANT LOAD

S-I 2,625 SF / 500 GROSS = 6 OCCUPANTS

CORRIDOR FIRE-RESISTANCE RATING REQUIRED = O ( NO CORRIDORS ) MINIMUM CORRIDOR WIDTH = 44 INCHES

DEAD END CORRIDORS SHALL NOT EXCEED 20 FEET

MINIMUM NUMBER OF EXITS REQUIRED = | ( < 50 0CC. < 75') PROPOSED EXITS PROVIDED =

EXIT ACCESS TRAVEL DISTANCE: 100 FEET ( 75 FEET FOR SINGLE EXIT )

EGRESS WIDTH: REQUIRED =  $6 \times 0.2$ " = PROVIDED = (I) 34" =34"

EVERY EXIT DOOR SHALL BE OPERABLE FROM THE INSIDE WITHOUT THE USE OF A KEY OR ANY SPECIFIC KNOWLEDGE OR EFFORT.

PLUMBING FIXTURES, FAUCETS, & FIXTURE FITTINGS ~ (IPC 2021)

MINIMUM NUMBER OF PLUMBING FACILITIES (USE GROUP S-I)

OCCUPANT LOAD: (USE GROUP S-I) WORK AREA ~ 2,625 SF / 500 = 6 OCCUPANTS ACTUAL MAX. ANTICIPATED LOAD = I OCCUPANT

S-I OCCUPANCY - PROPOSE NO PLUMBING FIXTURES SINCE THIS BUILDING IS NOT INTENDED FOR HUMAN OCCUPANCY.

## GENERAL NOTES

IT IS THE RESPONSIBILITY OF THE GENERAL CONTRACTOR AND EACH OF HIS SUBCONTRACTORS TO REVIEW THE DRAWINGS TO ASSURE COORDINATION OF ALL WORK AFFECTING EACH TRADE. FAILURE TO REVIEW ALL CONTRACT DOCUMENTS FOR APPLICABLE ITEMS OF WORK SHALL NOT RELIEVE THE RESPONSIBLE PARTY FORM PERFORMING ALL WORK REOUIRED.

**SHEET INDEX** 

COVER / CODE PLAN

**ELEVATIONS** SECTIONS

FLOOR PLAN & SCHEDULES

Architectural

- CIVIL, STRUCTURAL, MECHANICAL, ELECTRICAL, PLUMBING NOTIFY THE DESIGN TEAM OF ALL CONFLICTS WITHIN THE WORK. DRAWINGS - THESE DRAWINGS SHALL NOT BE SCALED. REFER TO DIMENSIONS INDICATED, ACTUAL SIZES OF CONSTRUCTION ITEMS, OR OTHER METHODS OF LOCATING CONSTRUCTION. WHERE NO DIMENSION OR METHOD OF DETERMINING A LOCATION
- IS GIVEN, VERIFY CORRECT LOCATION WITH THE DESIGN TEAM PRIOR TO INSTALLATION. • DIMENSIONS - DIMENSIONS ON PLANS ARE FROM FACE OF CONCRETE, MASONRY, OR FRAMING UNLESS OTHERWISE NOTED.
- DIMENSIONS INDICATED AS "CLEAR" SHALL BE A MINIMUM DIMENSION, (FACE TO FACE) OF FINISH MATERIALS. • COORDINATION - GENERAL CONTRACTOR SHALL COORDINATE REQUIREMENTS OF ALL TRADES TO ALLOW FOR TIMELY
- INCLUSION IN THE WORK SO AS NOT TO DELAY THE WORK OR THE WORK OF ANY SUBCONTRACTOR. • EQUIPMENT - REFER TO EQUIPMENT SCHEDULE FOR ADDITIONAL INFORMATION. VERIFY ANY REQUIREMENTS FOR ROUGH-IN
- OR CONNECTION PRIOR TO CONSTRUCTION TO ASSURE CORRECT INSTALLATION, OPENINGS, ELECTRICAL, MECHANICAL, BLOCKING, ETC. • DUCTS, PIPE, CONDUIT, ETC. - ALL VERTICAL AND HORIZONTAL DUCTS, PIPES, CONDUIT, ETC. (WHETHER SHOWN OR NOT) IN
- FINISHED ROOMS SHALL BE LOCATED WITHIN WALLS OR ABOVE FINISHED CEILINGS. ITEMS THAT CANNOT BE LOCATED WITHIN WALLS OR CEILINGS SHALL BE FURRED IN AND FINISHED TO MATCH ADJACENT SURFACES AND ANY REQUIRED WALL OR CEILING RATINGS. VERIFY ACCEPTABILITY WITH THE DESIGN TEAM PRIOR TO ENCASEMENT. • FIXTURES - LAVATORIES AND SINKS SHALL BE INSTALLED A MINIMUM OF 4" FROM FINISHED SIDE WALLS. FAUCETS SHALL BE
- INSTALLED WITH A MINIMUM OF 5" FROM THE OUTLET TO THE FLOOD RIM OF SINKS, INCLUDING THOSE EQUIPPED WITH VACUUM BREAKERS. WATER CLOSETS SHALL BE INSTALLED A MINIMUM OF 16" FROM FINISHED SIDE WALLS TO CENTERLINE • BLOCKING - BLOCKING OUTSIDE THE BUILDING ENVELOPE OR SUBJECT TO MOIST OR HUMID CONDITIONS SHALL BE PRESSURE
- TREATED AND USE CORROSION RESISTANT FASTENERS. • ACCESS DOORS - FURNISH AND INSTALL ACCESS DOORS IN WALLS AND NON-ACCESSIBLE TYPE CEILINGS WHERE SERVICE OR
- ADJUSTMENT TO MECHANICAL, FIRE PROTECTION, PLUMBING, ELECTRICAL, OR OTHER EQUIPMENT IS REQUIRED. WHERE WALL OR CEILING IS REQUIRED TO BE RATED, PROVIDE ACCESS DOORS OF FIRE RATING EQUAL TO THE ASSEMBLY IN WHICH THEY EGRESS DOORS SHALL HAVE A MINIMUM CLEAR OPENING WIDTH OF NOT LESS THAN 32"
  - EXISTING CONDITIONS THE EXISTING CONDITIONS SHOWN ON THESE DRAWINGS ARE BASED ON INFORMATION PROVIDED TO THE DESIGN TEAM. THE CONTRACTOR SHALL VERIFY ALL EXISTING CONDITIONS ON THE JOB SITE, AND NOTIFY THE DESIGN TEAM & THE DISTRICT OF DEVIATIONS FROM THESE DRAWINGS PRIOR TO FABRICATION AND INSTALLATION OF THE WORK.
  - PRECAUTIONS IF UNFORESEEN CONDITIONS ARE DISCOVERED WHICH COULD RESULT IN DAMAGE TO THE STRUCTURE OR INJURY TO ITS OCCUPANTS, REPORT ANY SUCH CONDITION IMMEDIATELY TO THE DESIGN TEAM. TAKE PRECAUTIONS TO PROPERLY SUPPORT THE STRUCTURE.
  - HAZARDOUS MATERIALS CONTRACTOR SHALL IMMEDIATELY REPORT THE DISCOVERY OF ANY HAZARDOUS MATERIALS TO THE DESIGN TEAM.
  - SITE USAGE USE OF THE SITE FOR ANY CONSTRUCTION STAGING OR OTHER OPERATIONS SHALL BE COORDINATED WITH THE DESIGN TEAM & THE DISTRICT. TAKE CARE NOT TO BLOCK OR ADVERSELY AFFECT ANY PUBLIC OR ADJACENT OWNER AREAS. EXIT ACCESS - MAINTAIN FREE, SAFE, AND APPROVED MEANS OF EGRESS IN AND OUT OF PROJECT LOCATION IN ACCORDANCE
  - WITH REQUIREMENTS OF APPLICABLE REGULATORY AGENCIES. • THE CONTRACT DESIGN DRAWINGS AND SPECIFICATIONS REPRESENT THE FINISHED PROJECT, AND , EXCEPT WHERE SPECIFICALLY SHOWN, DO NOT INDICATE THE MEANS OR METHOD OF CONSTRUCTION. THE CONTRACTOR SHALL SUPERVISE
  - AND DIRECT ALL WORK AND SHALL BE SOLELY RESPONSIBLE FOR ALL CONSTRUCTION MEANS, METHODS, PROCEDURES, TECHNIQUES AND SEQUENCES. • THE ARCHITECT SHALL NOT HAVE CONTROL NOR CHARGE OF, AND SHALL NOT BE RESPONSIBLE FOR, CONSTRUCTION MEANS, METHODS, TECHNIQUES, SEQUENCES, FOR SAFETY PRECAUTIONS AND PROGRAMS IN CONNECTION WITH THE WORK, FOR THE
  - ACTS OR OMISSIONS OF THE CONTRACTOR, SUBCONTRACTOR, OR ANY OTHER PERSONS PERFORMING ANY OF THE WORK FOR FOR THE FAILURE OF ANY OF THEM TO CARRY OUT THE WORK IN ACCORDANCE WITH THE CONTRACT DESIGN DOCUMENTS. • THE DESIGN TEAM INCLUDING THE ARCHITECT SHALL NOT BE RESPONSIBLE FOR ANY CHANGES TO OR DEVIATIONS FROM THE CONTRACT DESIGN DOCUMENTS. ANY CHANGES OR DEVIATIONS MUST BE REVIEWED AND APPROVED BY THE ARCHITECT OF RECORD. WRITTEN APPROVAL MUST BE OBTAINED.
  - PERIODIC SITE OBSERVATION BY FIELD REPRESENTATIVES OF THE ARCHITECT IS SOLEY FOR THE PURPOSE OF DETERMINING IF THE WORK OF THE CONTRACTOR IS PROCEEDING IN ACCORDANCE WITH THE CONTRACT DESIGN DOCUMENTS. THIS LIMITED SITE OBSERVATION SHOULD NOT BE CONSTRUED AS EXHAUSTIVE OR CONTINUOUS TO CHECK THE QUALITY OR QUANTITY OF THE WORK, BUT RATHER PERIODIC IN AN EFFORT TO GUARD THE OWNER AGAINST DEFECTS OR DEFICIENCIES IN THE WORK OF THE CONTRACTOR.

BERENDZÆ N ON MIBER A 2.006034585

EXPIRATION DATE 12-31-24 JAY D. BERENDZEN. ARCHITEC ISSUE DATE: August 22, 2024

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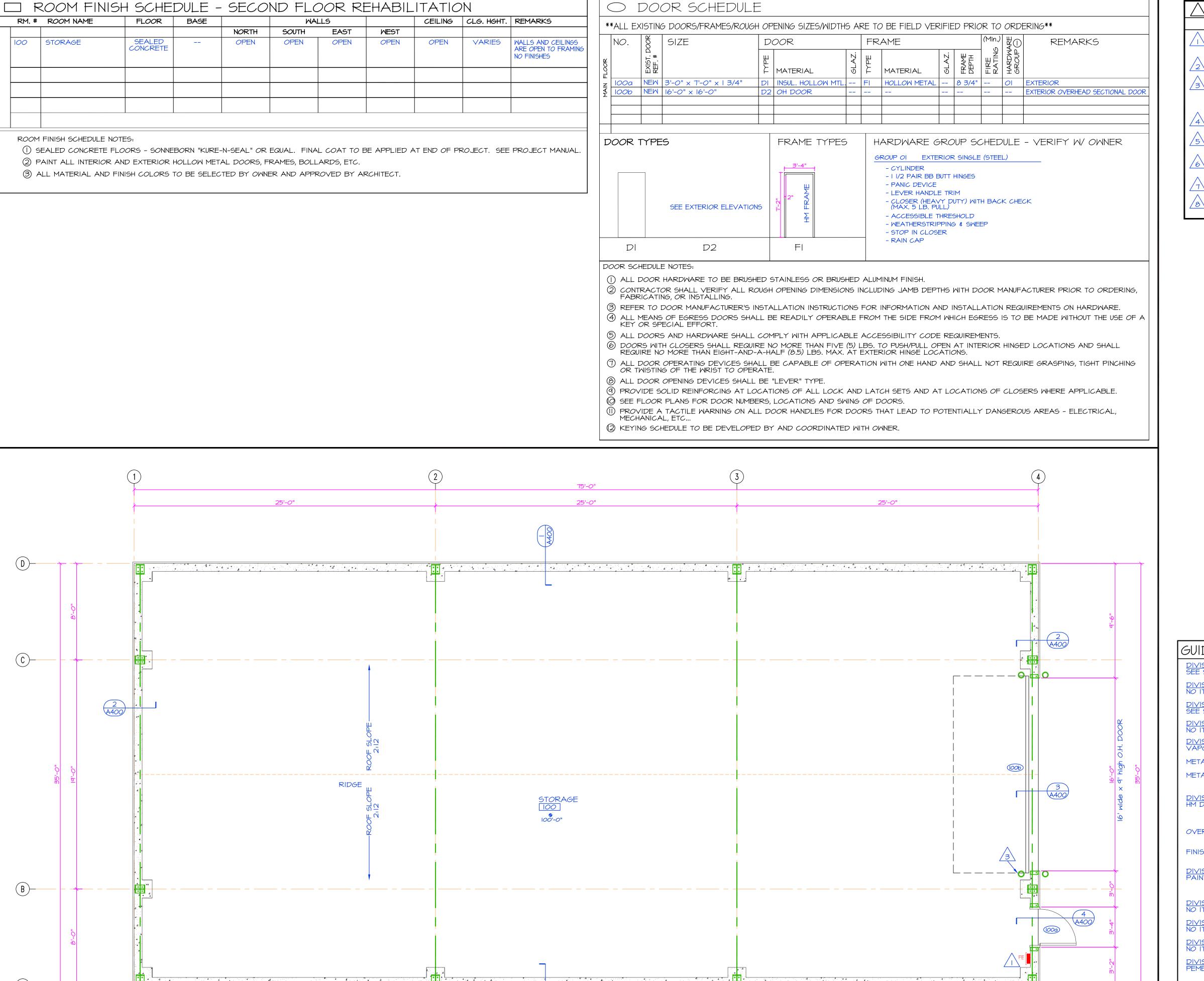
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PROJECT DATE **AUGUST 2024** 

COVER

SHEET NUMBER

SHEET TITLE



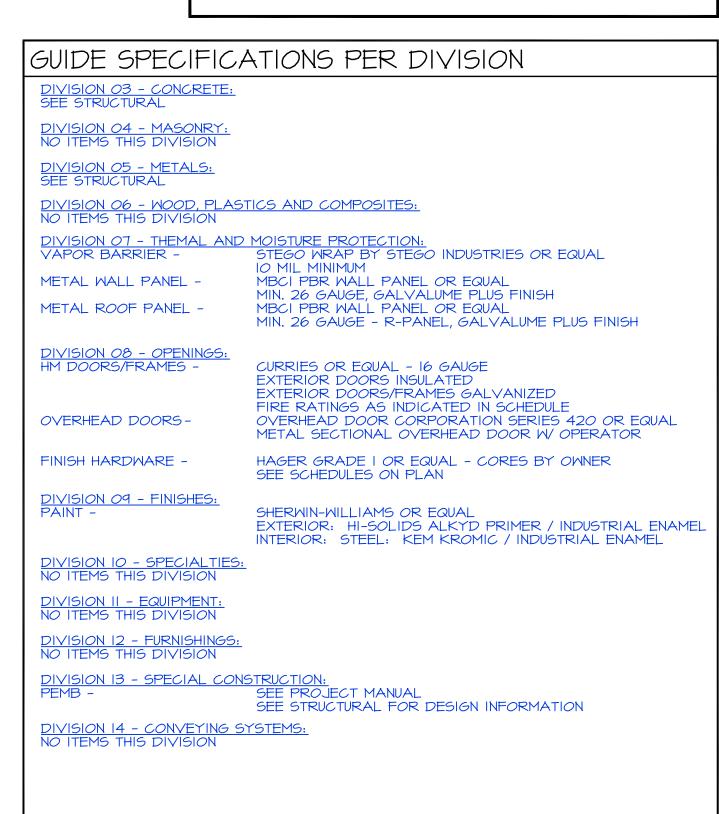
BUILDING FOOTPRINT = 2,625 S.F.

∧ NOTES /8\ ELECTRICAL SERVICE AND PANELS - SEE MEP PLANS FOR LOCATIONS.

GENERAL NOTES - FLOOR PLAN FIRE EXTINGUISHERS / CABINETS - LOCATIONS SHOWN ON FLOOR PLAN, THIS SHEET ' - MARKED FE. INSTALL CABINETS WITH TOP AT +(4'-8") AFF. DO NOT RECESS IN RATED WALLS. PROVIDE FIRE EXTINGUISHER. ALL INTERIOR DIMENSIONS ARE TO APPROXIMATE CLEAR FACE OF STEEL UNLESS NOTED OTHERWISE. STEEL BOLLARDS / GUARD POSTS - 6'-0" x 6" DIA. STEEL PIPE EMBEDDED IN CONCRETE W/ TOP @ +48" ABOVE FINISHED CONCRETE. FILL WITH CONCRETE AND PAINT BLUE OR COLOR AS INDICATED BY OWNER. SEE FLOOR PLAN THIS SHEET FOR LOCATIONS - 2 REQUIRED AT EXTERIOR AND INTERIOR OF EACH O.H. DOOR. /4\ BUILDING INSULATION: UNCONDITIONED BUILDING - NO INSULATION. FLOOR FINISH: UNDER THE BASE BID, THE FLOOR WILL BE SEALED CONCRETE. ALSO SEE STRUCTURAL NOTES. /6\ BUILDING ENVIRONMENT: THIS BUILDING IS NOT TO BE CONDITIONED. ALSO SEE MEP PLANS. 7\ PLUMBING FIXTURES - NONE.

| SYMBOL LEGEND  |                           |                         |                                     |  |  |  |  |  |
|----------------|---------------------------|-------------------------|-------------------------------------|--|--|--|--|--|
| SYMBOL         | DESCRIPTION               | REFERENCE               | REF. LOCATION                       |  |  |  |  |  |
| 8              | NOTE I.D.                 | NOTE LIST               | THIS SHEET                          |  |  |  |  |  |
| STORAGE<br>103 | ROOM I.D.                 | ROOM FINISH<br>SCHEDULE | SHEET A501                          |  |  |  |  |  |
| 103            | DOOR I.D.                 | DOOR<br>SCHEDULE        | SHEET A501                          |  |  |  |  |  |
| B              | MINDOM I.D.               | MINDOM<br>SCHEDULE      | SHEET A501                          |  |  |  |  |  |
| X<br>A-6       | SECTION I.D.              | SECTION<br>DETAIL       | SHEET INDICATED<br>BY BOTTOM FIGURE |  |  |  |  |  |
| (MI)           | WALL TYPE I.D.            | WALL TYPE<br>DETAILS    | SHEET A501                          |  |  |  |  |  |
| F.O.S.         | FACE OF STEEL             | DIMENSIONS              | FOUND., FRAMING,<br>\$ FLOOR PLANS  |  |  |  |  |  |
| F.O.B.         | FACE OF BRICK<br>OR BLOCK | DIMENSIONS              | FOUND., FRAMING,<br>\$ FLOOR PLANS  |  |  |  |  |  |
| F.O.C.         | FACE OF CONC.             | DIMENSIONS              | FOUND., FRAMING,<br>& FLOOR PLANS   |  |  |  |  |  |

| DRAWING                                 | DESCRIPTION                                       |
|---|---|
|   | EXISTING WALL                                     |
|   | CONCRETE  |
|   | CONCRETE MASONRY UNIT                             |
|   | STUD WALL   |
|   | HALF HIGH WALL                                    |
| 711111111111111111111111111111111111111 | MASONRY - BRICK/STONE                             |
|   | FIRE BARRIER / PARTITION<br>SEE WALL TYPE DETAILS |
|   | BULKHEAD / HEADER - SEE FLOOR PLAN                |
|   | FLOOR FINISH TRANSITION                           |
| FE                                      | RECESSED FIRE EXTINGUISHER CABINET                |
|   | FUTURE WALLS / LAYOUT                             |





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PROJECT NO.

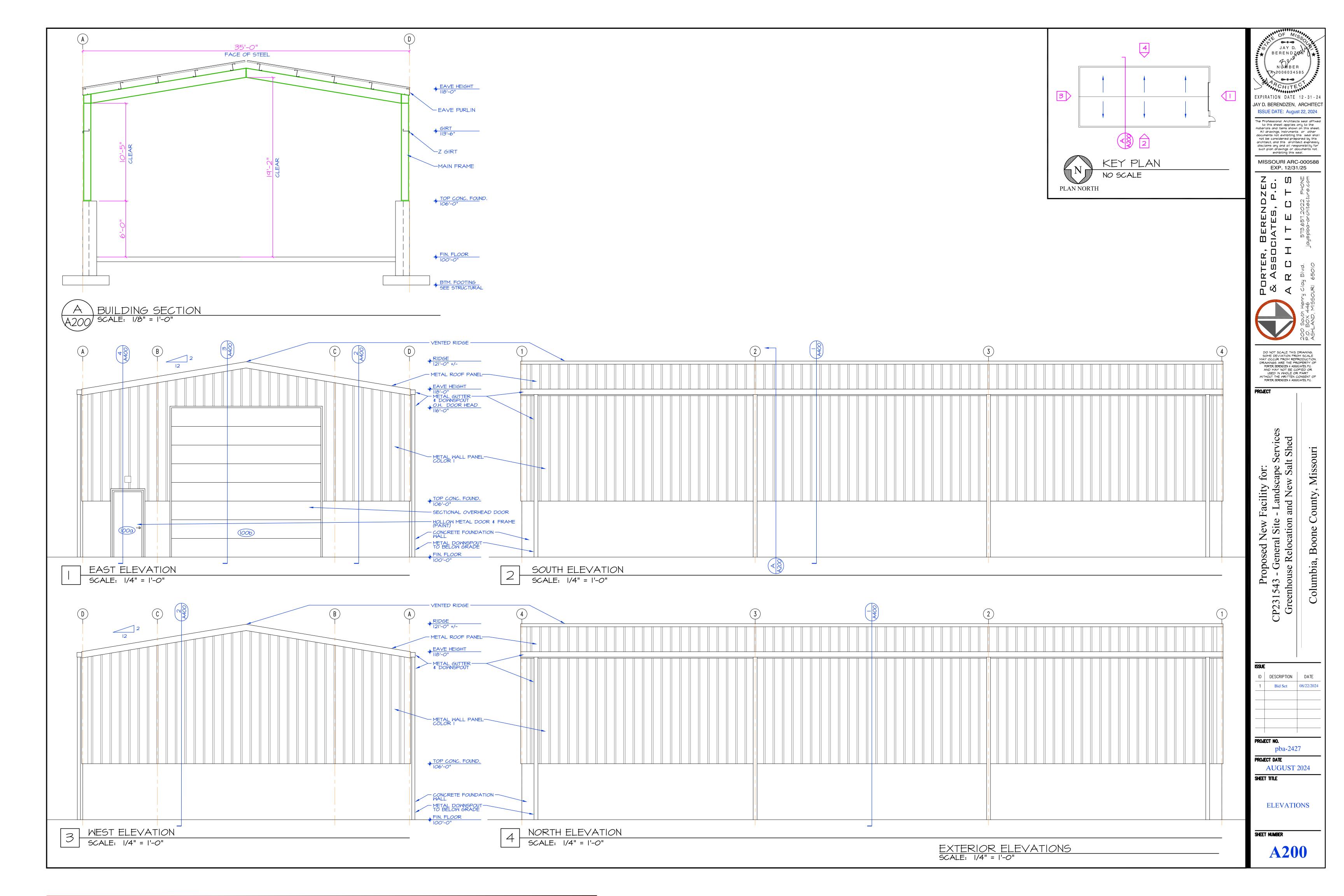
PROJECT DATE

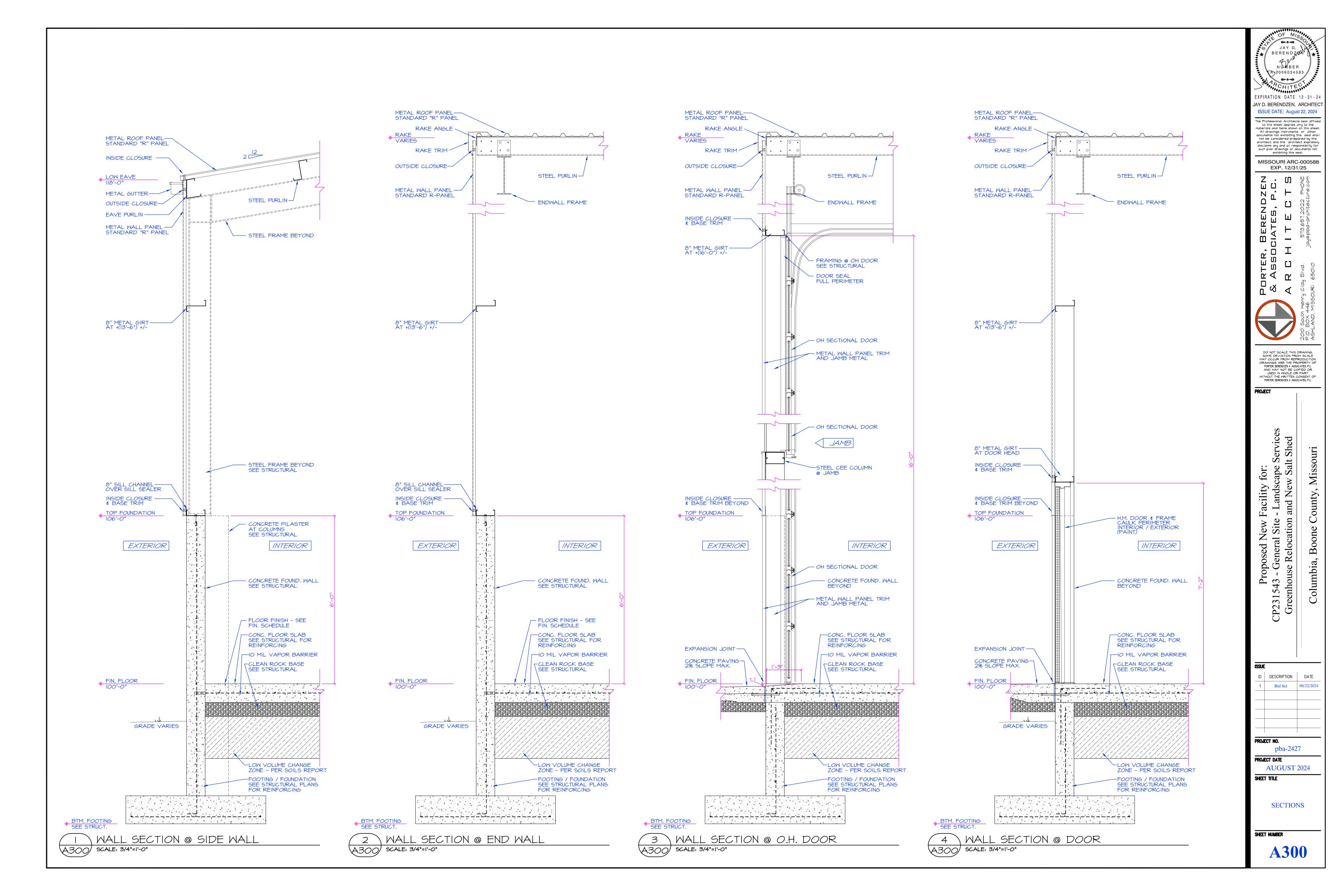
A\UGUST 2024

SHEET TITLE

**FLOOR PLAN** 

SHEET NUMBER **A100** 





#### GENERAL NOTES

ELEVATION DATUM

SEE ARCHITECTURAL DRAWINGS OR SITE PLAN FOR FINISH FLOOR ELEVATIONS

#### DESIGN SPECIFICATIONS

2021 INTERNATIONAL BUILDING CODE

EARTHWORK OPERATIONS SHALL BE PERFORMED UNDER THE DIRECTION OF A PROFESSIONAL TESTING AGENCY TO ASSURE COMPLIANCE WITH THE RECOMMENDATIONS OF THE SOILS REPORT. BY CROCKETT GTL DATED JULY 2, 2024.

#### CONCRETE

CONCRETE WORK SHALL CONFORM TO ALL REQUIREMENTS OF THE CURRENT ACI 301, SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS, ACI 318 BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE, ACI 305 SPECIFICATIONS FOR HOT WATER CONCRETE, AND ACI 306 SPECIFICATIONS FOR COLD WEATHER CONCRETE, WITH THE FOLLOWING ADDITIONAL REQUIREMENTS:

- 1. CONCRETE SHALL DEVELOP THE FOLLOWING 28-DAY MINIMUM COMPRESSIVE STRENGTH:
- FOUNDATIONS - 3.000 PSI CAST-IN-PLACE WALLS - 4,500 PSI
- FLOOR SLAB - 4,500 PSI
- EXTERIOR SLABS, WALLS AND CURBS 4,000 PSI 2. ALL FOOTINGS SHALL BEAR ON UNDISTURBED SOIL OR ENGINEERED FILL.
- 3. CHLORIDE- BASED ADMIXTURES ARE PROHIBITED IN ALL REINFORCED CONCRETE.
- 4. REINFORCING STEEL SHALL CONFORM TO ASTM A615, A616, OR A617, GRADE 60.
- 5. ALL CONTINUOUS REINFORCING STEEL THAT MEETS AT A CORNER SHALL BE TIED TOGETHER WITH A CORNER BAR THAT HAS SUFFICIENT LAP DISTANCE IN EACH DIRECTION
- 6. CONTINUOUS REINFORCING BARS LAP LENGTH SHALL BE A MINIMUM OF 48 BAR DIAMETERS UNLESS NOTED OTHERWISE
- 7. CONCRETE SLUMP SHALL BE A MAXIMUM OF 4" +/- 1" (ASTM C- 143) AS DELIVERED IN THE FIELD. CONTRACTOR MAY USE CHEMICAL ADMIXTURES TO ATTAIN A MAXIMUM SLUMP OF 8" FOR WORKABILITY. NO WATER MAY BE ADDED TO THE CONCRETE MIX ON SITE UNLESS WATER IS WITHHELD AT THE BATCHING FACILITY. IF WATER IS WITHHELD AT THE BATCHING FACILITY IT SHOULD BE REFLECTED ON THE LOAD TICKET. THE TOTAL AMOUNT OF WATER IN THE MIX SHALL NOT EXCEED WHAT IS NOTED ON
- THE APPROVED MIXED. THIS SHALL BE NOTED IN THE SPECIAL INSPECTOR'S RECORDS. 8. CONCRETE EXPOSED TO WEATHER, VEHICLES, AND/OR DEICING CHEMICALS SHALL BE AIR-ENTRAINED WITH 6% (+/-) 1.5% ENTRAINED AIR BY VOLUME AT POINT OF DISCHARGE. DO NOT ALLOW AIR
- CONTENT OF TROWELED FINISHED FLOORS TO EXCEED 3%. 9. SUBMIT CONCRETE MIX PROPORTIONS PRIOR TO START OF WORK. DO NOT BEGIN CONCRETE
- PRODUCTION UNTIL MIXES HAVE BEEN REVIEWED AND ARE ACCEPTABLE TO THE ENGINEER. 10.READY MIX CONCRETE SHALL COMPLY WITH REQUIREMENTS OF ASTM C94. 11.CONCRETE WORK EXECUTION
- A. CONSTRUCT FORMS TO CORRECT SIZE, SHAPE, ALIGNMENT, ELEVATION AND POSITION; AND TO SUPPORT VERTICAL AND LATERAL LOADS.
- B. POSITION, SUPPORT, AND SECURE REINFORCEMENT AGAINST DISPLACEMENT. MINIMUM CONCRETE COVER FOR REINFORCEMENT SHALL BE, UNLESS NOTED OTHERWISE ON THE DRAWINGS:
  - CAST AGAINST AND EXPOSED TO EARTH.......3 INCHES EXPOSED TO EARTH OR WEATHER......2 INCHES NOT EXPOSED TO WEATHER OR
  - IN CONTACT WITH EARTH....... 1 ½ INCHES
- C. PROVIDE CONTROL JOINTS IN SLABS-ON-GRADE AT NOT GREATER THAN 15 FEET ON CENTER IN EACH DIRECTION. SAW CUT CONTROL JOINTS MINIMUM 1/4 OF SLAB DEPTH, AS SOON AFTER SLAB FINISHING WITHOUT DISLODGING AGGREGATE.
- D. STEEL TROWEL FINISH ALL INTERIOR CONCRETE SLABS, BROOM FINISH ALL EXTERIOR CONCRETE
- E. CURE ALL CONCRETE IN COMPLIANCE WITH ACI 301, USING A LIQUID TYPE MEMBRANE, NON-RESIDUAL, CURING COMPOUND COMPLYING WITH ASTM C309. ASSURE COMPATIBILITY WITH
- STRUCTURAL STEEL

FINISH FLOOR COVERING.

- 1. FABRICATION AND ERECTION OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE AISC SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS, THE AISC CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES AND CURRENT OSHA STANDARDS.
- 2. WIDE FLANGE SHAPES SHALL CONFORM TO ASTM A992. STRUCTURAL TUBES SHALL CONFORM TO ASTM A500 GRADE B. ALL OTHER STRUCTURAL STEEL SHALL CONFORM TO ASTM A36.
- 3. BOLTS, UNLESS OTHERWISE SHOWN, SHALL CONFORM TO ASTM A325-N, SIZE AS PER PLAN.
- 4. ANCHOR BOLTS, UNLESS OTHERWISE SHOWN, SHALL CONFORM TO
- ASTM F1554 GRADE 36. 5. SPLICING OF STRUCTURAL STEEL IS PROHIBITED EXCEPT AS DETAILED.
- 6. ALL STRUCTURAL AND MISCELLANEOUS STEEL ITEMS SHALL RECEIVE ONE COAT OF "IRONCLAD RETARDO RUST INHIBITIVE PAINT 163" (BENJAMIN MOORE) OR APPROVED EQUAL UNLESS OTHERWISE INDICATED IN
- THE SPECIFICATIONS. ALL STEEL SURFACES EMBEDDED IN CONCRETE SHALL NOT BE PAINTED. PREPARATION OF STEEL SURFACES SHALL MEET THE REQUIREMENTS OF THE STEEL STRUCTURES PAINTING COUNCIL (SSPC-SP1) AND THE REMOVAL OF GREASE AND OIL BY SOLVENT CLEANING (SSPC-SP1) AND THE REMOVAL OF MILL SCALE, RUST, WELD FLUX AND SLAG BY HAND TOOL CLEANING
- (SSPC-SP2). PRIMER SHALL BE APPLIED AT THE MANUFACTURER'S RECOMMENDED RATE BUT NOT LESS THAN ONE GALLON PER 400 SQ.FT. THEREBY DEPOSITING A DRY FILM THICKNESS OF NOT LESS THAN 1.5 MILS. ANY SCARRED AREAS SHALL BE TOUCHED UP WITH THE SAME PAINT AFTER ERECTION. 7. ALL WELDING SHALL BE DONE BY QUALIFIED WELDERS IN ACCORDANCE WITH THE CURRENT EDITION OF

THE AWS STRUCTURAL WELDING CODE. WELDING ELECTRODES SHALL BE E70XX.

TIMBER WORK SHALL CONFORM TO ALL REQUIREMENTS OF THE CURRENT ANSI/AWC NATIONAL DESIGN SPECIFICATION (NDS) FOR WOOD CONSTRUCTION WITH 2018 NDS SUPPLEMENT FOR WOOD CONSTRUCTION, WITH THE FOLLOWING SUPPLEMENTAL REQUIREMENTS:

- 1. FOR COMMON MEMBER SIZES, THE SPECIES AND GRADES SHALL BE AS FOLLOWS, UNLESS NOTED OTHERWISE:
- A. 2X4 SPF No.1/No.2
- B. 2X6 SPF No.1/No.2
- C. 2X8 DF-L No.2
- D. 2X10 DF-L S.S.
- E. 2X12 DF-L S.S.
- EQUIVALENT (OR BETTER) GRADES & SPECIES MAY BE SUBMITTED FOR THE ENGINEER'S APPROVAL.
- 2. SIZES SHOWN FOR LUMBER ARE NOMINAL SIZES.
- 3. TIMBER EXPOSED TO WEATHER OR GROUND, OR IN CONTACT WITH CONCRETE OR MASONRY SHALL BE PRESSURE-IMPREGNATED BY AN APPROVED PROCESS AND PRESERVATIVE.
- 4. SPLICING OF JOISTS, STUDS, OR HEADERS IS PROHIBITED EXCEPT AS SHOWN.
- 5. BOLTS SHALL CONFORM TO ASTM A307. HOLES SHALL BE DRILLED PER SECTION 12.1.3 OF THE
- 2018 ANSI/AWC NDS FOR WOOD CONSTRUCTION NDS SUPPLEMENT.
- 6. LAG SCREWS AND WOOD SCREWS SHALL BE INSTALLED PER SECTIONS 12.1.4 & 12.1.5 RESPECTIVELY, OF THE 2018 ANSI/AWC NDS FOR WOOD CONSTRUCTION WITH 2018 NDS SUPPLEMENT.
- 7. COMMON NAILS SHALL BE USED, UNLESS NOTED OTHERWISE. IN ADDITION, NAILS SHALL BE GALVANIZED, IF EXPOSED TO WEATHER OR MOISTURE. TOE-NAILS SHALL BE DRIVEN PER SECTION 12.1.6.3 OF THE 2018 ANSI/AWC NDS FOR WOOD CONSTRUCTION WITH 2018 NDS SUPPLEMENT.
- 8. FASTENING SHALL BE PER THE IBC MINIMUM FASTENING SCHEDULE, TABLE 2304.10.1, UNLESS NOTED
- 9. CONNECTIONS/CONNECTORS SHALL BE INSTALLED PER MANUFACTURER'S SPECIFICATIONS.

#### PREFABRICATED WOOD TRUSSES

- 1. FLOOR & ROOF TRUSSES SHALL BE DESIGNED IN ACCORDANCE WITH THE TRUSS PLATE INSTITUTE (TPI) DESIGN SPECIFICATION FOR METAL PLATE CONNECTED WOOD TRUSSES, AND THE ANSI/NF&PA NATIONAL DESIGN SPECIFICATION (NDS) FOR WOOD CONSTRUCTION.
- 2. PROVIDE TEMPORARY AND PERMANENT BRACING ON ALL TRUSSES, AS REQUIRED TO PROVIDE MEMBER AND TRUSS STABILITY.
- 3. FLOOR & ROOF TRUSSES SHALL BE DESIGNED AND CONSTRUCTED FOR A MAXIMUM TOTAL LOAD DEFLECTION OF L/360 AND TO SAFELY SUPPORT THE FOLLOWING LOADS:
- A. DEAD, LIVE, SNOW, WIND, EARTHQUAKE: SEE PROJECT DESIGN DATA ON COVER SHEET. B. MECHANICAL PIPE LOAD: TRUSSES SHALL BE DESIGNED FOR A CONCENTRATED LOAD OF 250
- LBS HUNG ANYWHERE ALONG THE BOTTOM CHORD. C. OVER-FRAMING LOAD: TRUSSES SHALL ALSO BE DESIGNED TO SUPPORT ADDITIONAL OVERBUILD
- FRAMING, SUCH AS THAT WHICH FORMS VALLEYS AND HIPS ON ROOFS. D. DRIFTED SNOW LOAD: TRUSSES SHALL BE DESIGNED TO SUPPORT DRIFTED SNOW LOADS IN
- ACCORDANCE WITH THE APPROPRIATE BUILDING CODE. E. IN-PLANE LATERAL LOADS: TRUSSES SHALL BE DESIGNED TO SUPPORT ANY LATERAL LOADS
- CARRIED AXIALLY IN THE PLANE OF THE TRUSS, AS SHOWN ON THE PLANS.
- GABLED END TRUSSES SHALL HAVE VERTICAL MEMBERS SPACED AT 16" O.C. MAXIMUM.
- 5. SUBMITTALS SHALL INCLUDE THE FOLLOWING: A. SHOP DRAWINGS PREPARED UNDER THE SUPERVISION OF, AND SIGNED AND SEALED BY, A PROFESSIONAL ENGINEER REGISTERED IN THE STATE WHERE THE PROJECT IS BUILT. THESE DRAWINGS SHALL INDICATE SPECIES, GRADE, AND SIZES OF LUMBER TO BE USED; PITCH, SPAN, CAMBER, CONFIGURATION, AND SPACING FOR EACH TYPE OF TRUSS REQUIRED; TYPE, SIZE, MATERIAL, FINISH, AND LOCATION OF METAL CONNECTOR PLATES; AND BEARING DETAILS. SHOW

STRUCTURAL CAPACITY OF THE TRUSSES. PROVIDE COMPLETE ENGINEERING DESIGN CALCULATIONS THAT INCLUDE DESIGN VALUES, DESIGN ANALYSIS INDICATING LOADING, ASSUMED ALLOWABLE STRESSES, STRESS DIAGRAMS, AND CALCULATIONS, AND ANY OTHER INFORMATION NEEDED FOR REVIEW. THE CALCULATIONS SHALL HAVE BEEN SIGNED AND SEALED BY A QUALIFIED PROFESSIONAL ENGINEER WHO IS REGISTERED IN THE STATE WHERE THE PROJECT IS BUILT AND WHO IS RESPONSIBLE FOR PREPARATION OF THE CALCULATIONS.

TRUSS LAYOUT AND ALL REQUIRED TEMPORARY AND PERMANENT BRACING AFFECTING THE

#### SPECIAL INSPECTIONS

THE FOLLOWING ITEMS REQUIRE SPECIAL INSPECTION IN ACCORDANCE WITH CHAPTER 17 OF THE INTERNATIONAL BUILDING CODE.

- a. CONCRETE GROUT DESIGN MIX (PERIODIC)
- b. PLACING OF CONCRETE AND REINFORCING STEEL (CONTINUOUS OF CONCRETE SAMPLING / PERIODIC OF REINFORCING)
- c. BOLTS & ANCHORS EMBEDDED IN CONCRETE (PERIODIC)
- d. STRUCTURAL STEEL FABRICATIONS (UNLESS AISC APPROVED)
- (PERIODIC)
- e. STRUCTURAL STEEL BOLTING & WELDING (PERIODIC)
- f. POST INSTALLED ANCHORS IN CONCRETE (CONTINUOUS)
- h.a. SHEAR WALLS; WALL SIZE, CONFIGURATION, BLOCKING, PANEL GRADE, PANEL THICKNESS, AND FASTENING. (PERIODIC)
- h.b. DIAPHRAGMS (FLOOR AND ROOF SHEATHING); SIZE, CONFIGURATION, BLOCKING, PANEL
- h.c. FRAMING MEMBERS AND DETAILS (PERIODIC)

THE CONTRACTOR SHALL REQUEST SPECIAL INSPECTION OF THE ITEMS LISTED ABOVE PRIOR TO THOSE ITEMS BECOMING INACCESSIBLE AND UNOBSERVABLE DUE TO PROGRESSION OF THE WORK.

- 1. DESIGN, FABRICATION, AND ERECTION OF STRUCTURAL STEEL SHALL BE IN ACCORDANCE WITH THE CURRENT EDITION OF THE AISC SPECIFICATIONS FOR STRUCTURAL STEEL BUILDINGS, THE AISC STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES, AND CURRENT OSHA STANDARDS.
- 2. ALL STRUCTURAL AND MISCELLANEOUS STEEL ITEMS SHALL RECEIVE ONE COAT OF RUST INHIBITIVE
- 3. ALL WELDING SHALL BE DONE BY QUALIFIED WELDERS IN ACCORDANCE WITH THE CURRENT EDITION OF THE AWS STRUCTURAL WELDING CODE.
- 5. PER IBC TABLE 1604.3 ROOF MEMBERS SHALL BE DESIGNED AND CONSTRUCTED FOR A MAXIMUM TOTAL LOAD DEFLECTION OF L/120 AND L/180 LIVE LOAD, WALL GIRTS SHALL BE DESIGNED FOR A MAXIMUM TOTAL LOAD DEFLECTION OF L/120 WITHOUT BRICK AND TOTAL FRAME DEFLECTION SHALL BE
- 6. LOADING DESIGN DATA SHALL BE AS FOLLOWS:
- 6.1.1. LIVE LOAD
- 6.2.1. Pg= 20 PSF 6.2.2. ls= 1.0
- 6.3. SEISMIC DESIGN DATA:
- 6.3.3. le = 1.0
- 6.3.5. S1 =
- 109 MPH (3-SECOND GUST) 6.4.2. |w| =1.0
- PROFESSIONAL ENGINEER REGISTERED IN THE STATE OF MISSOURI INCLUDING ANCHOR PLAN AND
- b. DESIGN LOADS FOR FOUNDATION AND ANCHOR DESIGN INCLUDING VERTICAL, HORIZONTAL, AND
- LATERAL LOADS AT EACH COLUMN BASE.

- g. IN-SITU SOILS, EXCAVATIONS, FILLING & COMPACTION (PERIODIC)
- h. WOOD FRAMING:
- GRADE, PANEL THICKNESS, AND FASTENING. (PERIODIC)
- h.d. MATERIAL GRADE (PERIODIC)
- h.e. CONNECTIONS; HANGERS, HOLD DOWNS, BUILT-UP COLUMNS, BUILT-UP BEAMS (PERIODIC)
- h.f. PRE-ENGINEERED TRUSSES; FRAMING, CONNECTIONS, BRIDGING (PERIODIC)

#### PRE-ENGINEERED STEEL BUILDING STRUCTURE

- SPECIFICATIONS FOR THE DESIGN OF COLD FORMED STEEL STRUCTURAL MEMBERS, THE AISC CODE OF

- 4. THIS STEEL STRUCTURE SHALL BE DESIGNED IN ACCORDANCE WITH THE SPECIFIED CODE.
- LIMITED TO H/60. (ALL DEFLECTIONS BASED ON SERVICE WIND LOAD)
- 6.1. ROOF LOADINGS: 20 PSF
- 6.1.2. COLLATERAL LOAD 3 PSF STRUCTURE WEIGHT 6.1.3. DEAD LOAD
- 6.2. SNOW LOAD (DRIFTING AND SLIDING SNOW IN ADDITION TO UNIFORM LOAD):
- 6.3.1. OCCUPANCY CATEGORY 6.3.2. SITE CLASSIFICATION
- 6.3.4. Ss =
- 6.4. WIND LOADINGS: 6.4.1. V =

0.162

0.094

- 6.4.3. EXPOSURE =
- 7. SUBMITTALS SHALL INCLUDE THE FOLLOWING: a. SHOP DRAWINGS PREPARED UNDER THE SUPERVISION OF, AND SIGNED AND SEALED BY A
  - DETAILS.
- 8. NET ALLOWABLE SOIL BEARING 2,500 PSF PAD, 2,100 PSF STRIP.

BID SET | 08/22/2024 SEALED AND DATED ELECTRONICALLY GREGORY L LINNEMAN N

REVISIONS:

GREGORY L. LINNEMAN - PE MO LICENSE - 2005001013

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CATION AND N
CP231543
SOONE COUNTY, M

EEE. GREENHOUSE F

GENERAL

STRUCTURAL DATA

DRAWING INCLUDES:

DESIGNED: GLL TGS

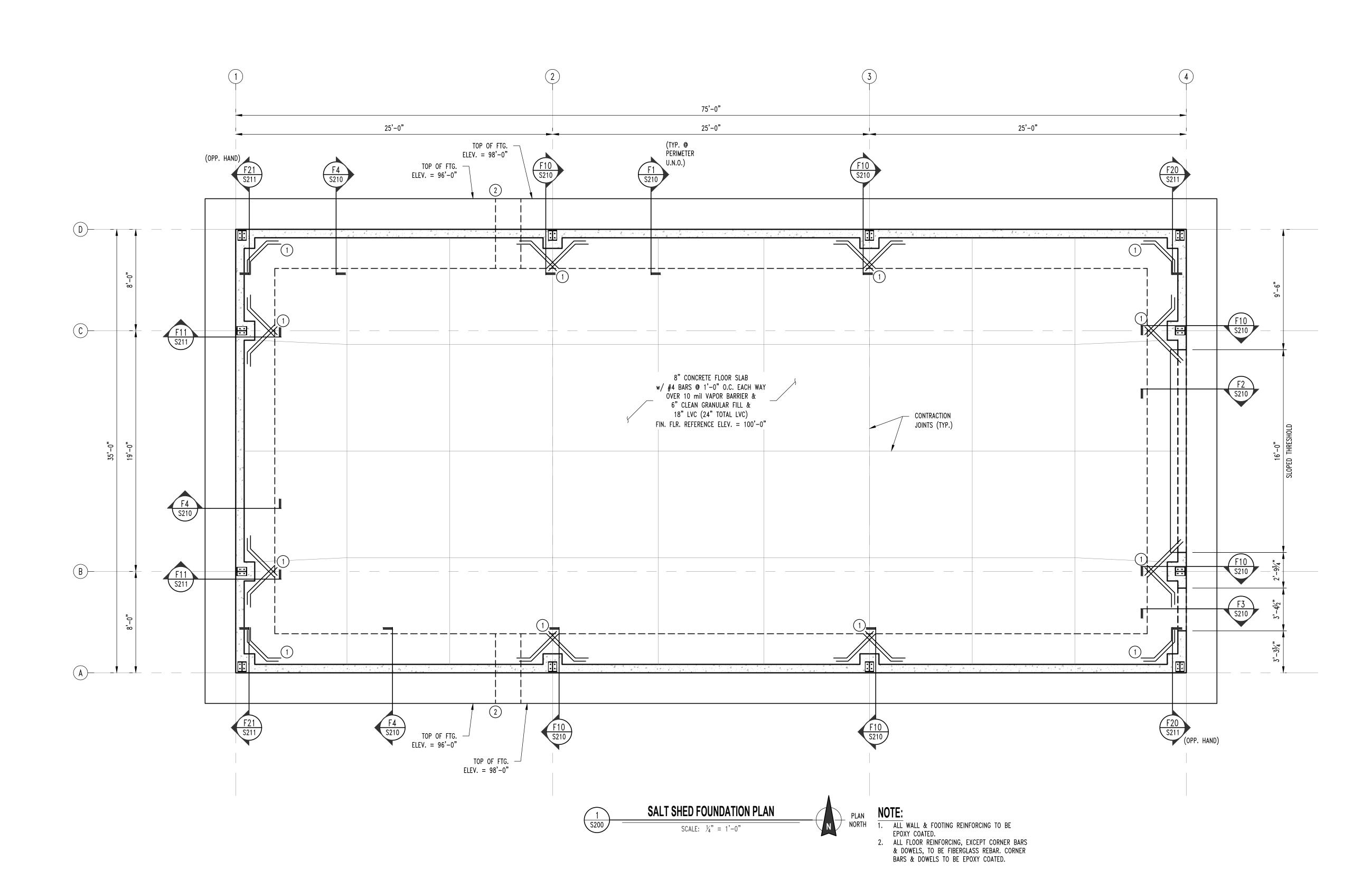
PROJECT NO.:

240131

ALL DIMENSIONS ARE FROM FACE OF FOUNDATION WALL OR FRAMING; EDGE OF SLAB OR TRUSS/RAFTER; OR CENTERLINE OF COLUMN, BEAM, OR JOIST UNLESS NOTED OTHERWISE.

# FOUNDATION NOTES

- 1 REENTRANT CORNER BARS, REFER TO TYPICAL CRACK CONTROL REINFORCING DETAIL ON SHEET S210.
- 2 FOOTING STEP, REFER TO DETAIL FS1/S211.



REVISIONS:

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

GREGORY L. LINNEMAN - PE MO LICENSE - 2005001013

ES TSHED E - LANDSCAPE SERVICE CATION AND NEW SALT CP231543

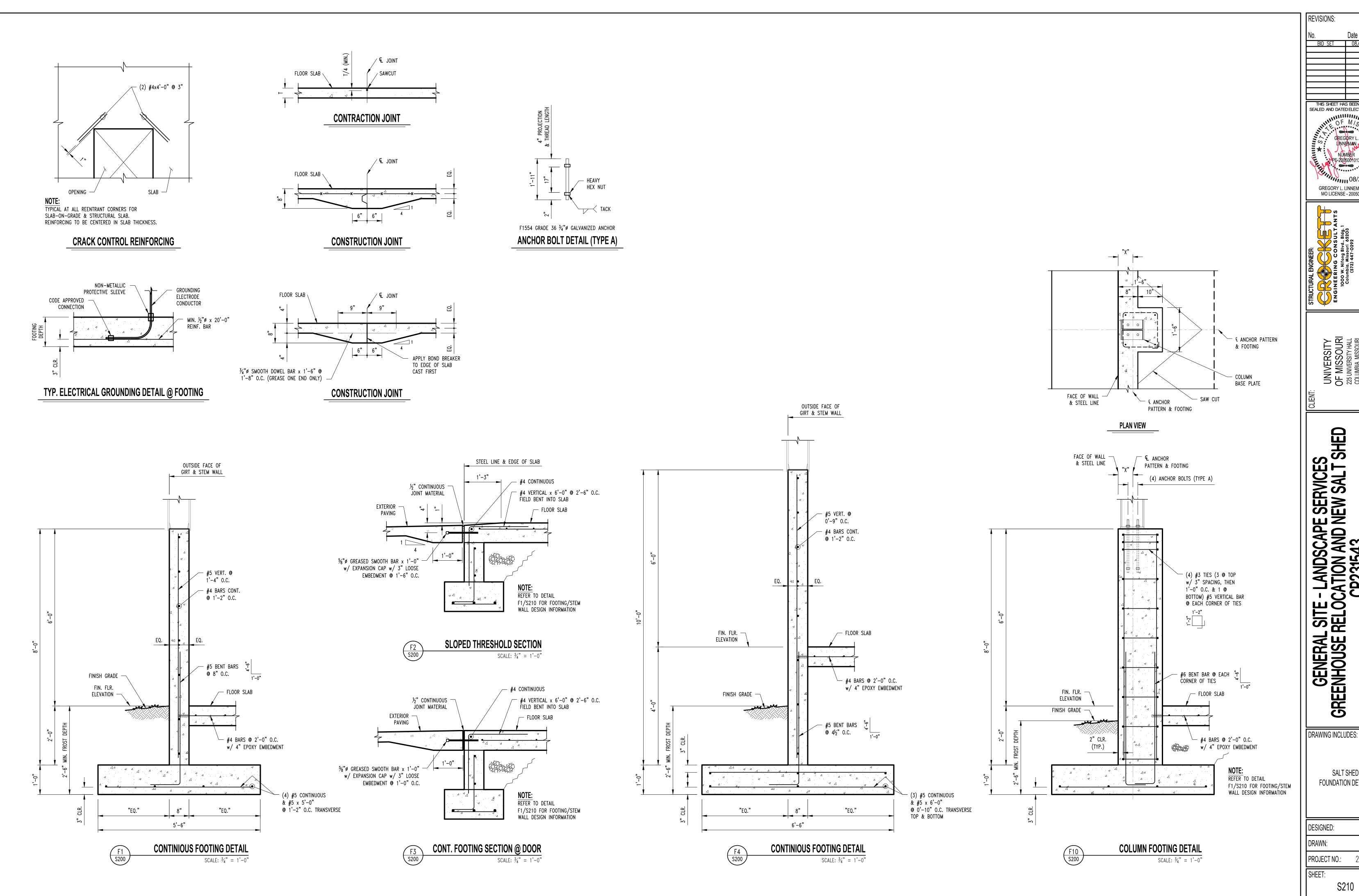
GENERAL SITE -GREENHOUSE RELOC

DRAWING INCLUDES:

SALT SHED FOUNDATION PLAN

DESIGNED: PROJECT NO.:

EXACT ANCHOR BOLT SIZE & VERIFICATION OF EXACT FOOTING SIZE TO BE DETERMINED ONCE FINAL PRE-ENGINEERED BUILDING REACTIONS ARE PROVIDED TO THE STRUCTURAL ENGINEER.



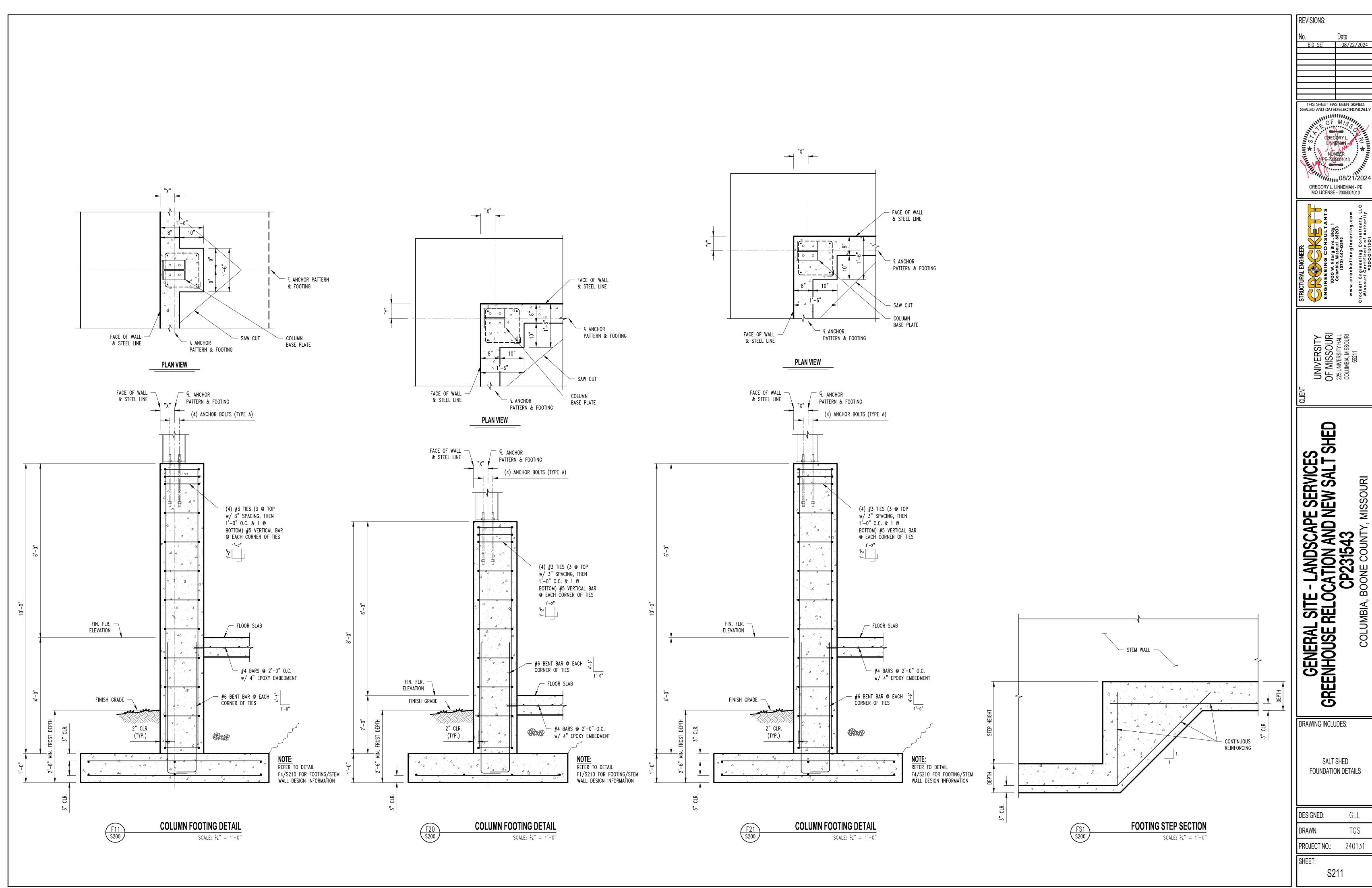




| F RFI OCATION AND NEW SAI T SHED | CP231543 | LUMBIA, BOONE COUNTY, MISSOURI |
|----------------------------------|----------|--------------------------------|
| F RFI O                          |          | LUMBIA, B                      |

SALT SHED FOUNDATION DETAILS

GLL TGS PROJECT NO.: 240131

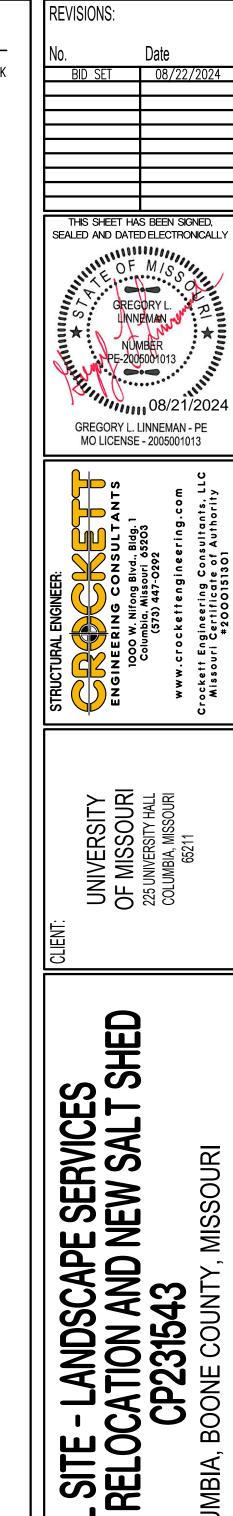


E - LANDSCAPE SERVICE CATION AND NEW SALT CP231543 BOONE COUNTY, MISSOURI SALT SHED FOUNDATION DETAILS GLL TGS 240131

ALL DIMENSIONS ARE FROM FACE OF FOUNDATION WALL OR FRAMING; EDGE OF SLAB OR TRUSS/RAFTER; OR CENTERLINE OF COLUMN, BEAM, OR JOIST UNLESS NOTED OTHERWISE.

# FOUNDATION NOTES

- 1 REENTRANT CORNER BARS, REFER TO TYPICAL CRACK CONTROL REINFORCING DETAIL ON SHEET S210.
- 2 FOOTING STEP, REFER TO DETAIL FS1/S210.

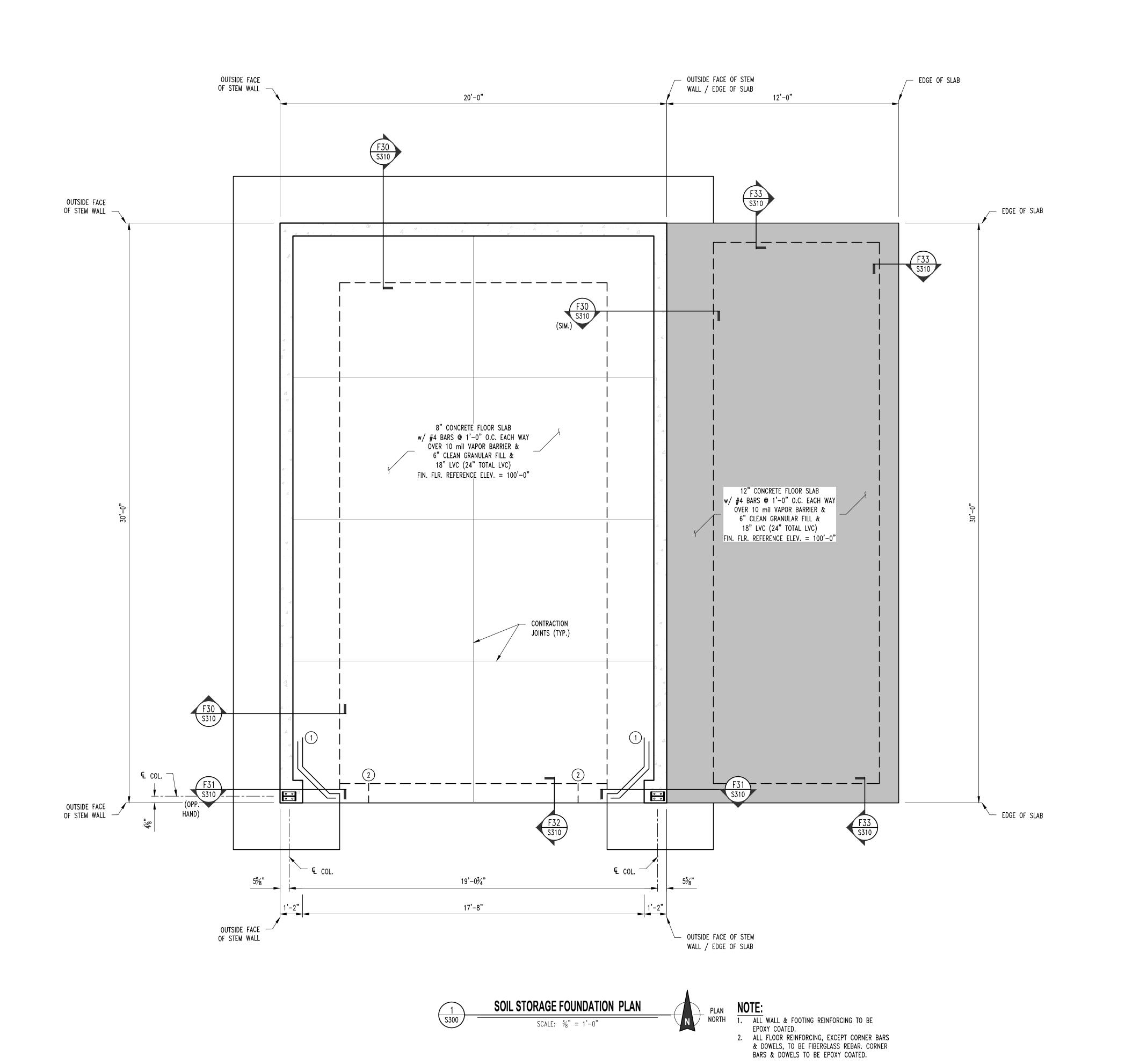


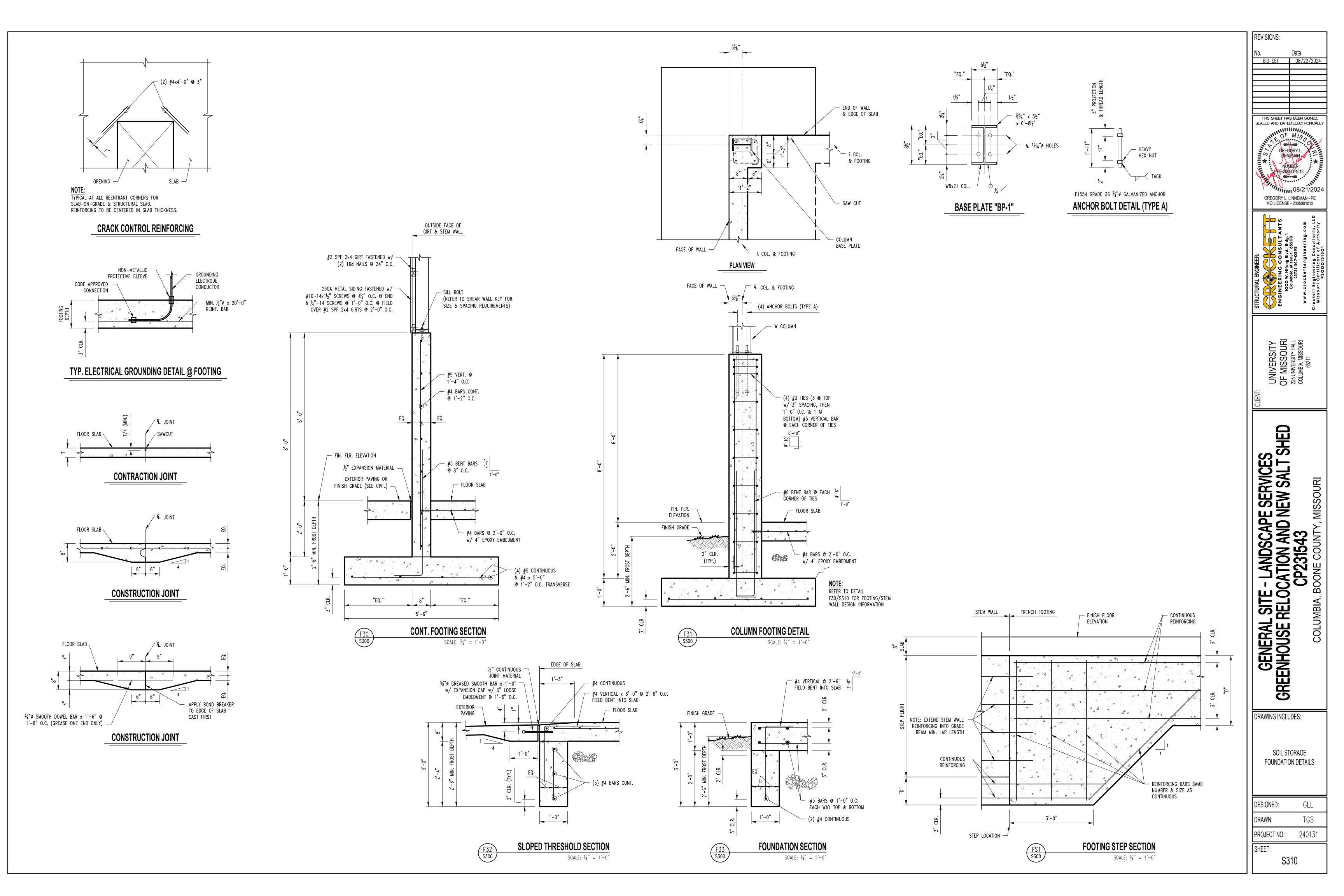


DESIGNED: GLL

SOIL STORAGE FOUNDATION PLAN

TGS PROJECT NO.:





ALL DIMENSIONS ARE FROM FACE OF FOUNDATION WALL OR FRAMING; EDGE OF SLAB OR TRUSS/RAFTER; OR CENTERLINE OF COLUMN, BEAM, OR JOIST UNLESS NOTED OTHERWISE. OUTSIDE FACE OUTSIDE FACE
OF GIRT OF GIRT — 20'-0" S11 S410 OUTSIDE FACE OF GIRT 29GA METAL SIDING FASTENED w/ #10x1½" SCREWS @ 4½" O.C. @ END & ½"-14 SCREWS @ 1'-0" O.C. @ FIELD OVER #2 SYP 2x4 PURLINS @ 2'-0" O.C. FASTEND w/ (3) 16d NAILS OVER PRE-ENGINEERED ROOF TRUSSES @ 4'-0" O.C. TO COL.)
S20
S411 OUTSIDE FACE OF GIRT -S12 S410 KNEE BRACE (TYP.) 19'-03/4" 55/8" OUTSIDE FACE — • COL. OUTSIDE FACE
OF GIRT SOIL STORAGE ROOF PLAN 1 S400 PLAN NORTH SCALE:  $\frac{3}{8}$ " = 1'-0"

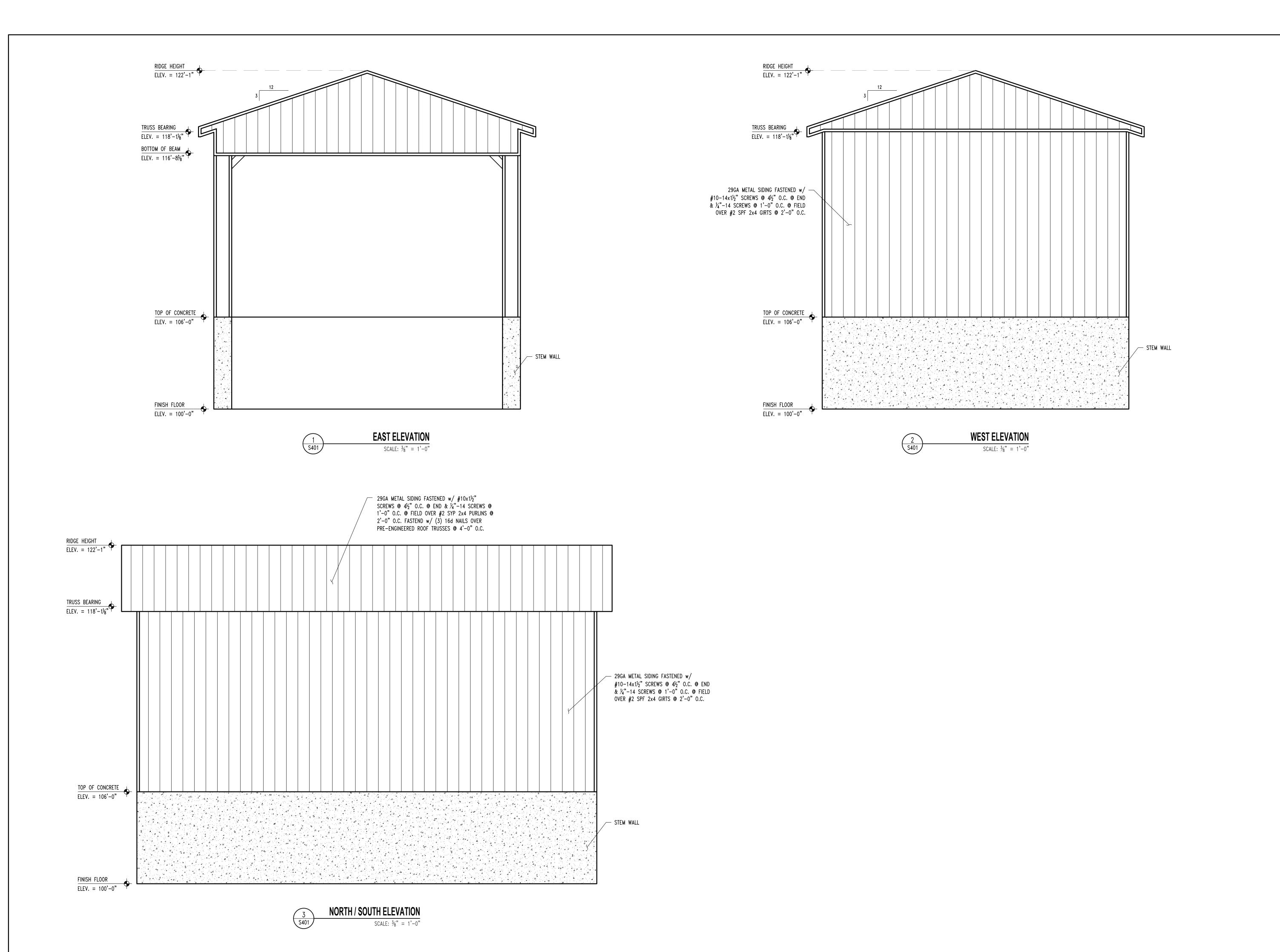
REVISIONS: THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY GREGORY L. LINNEMAN - PE MO LICENSE - 2005001013

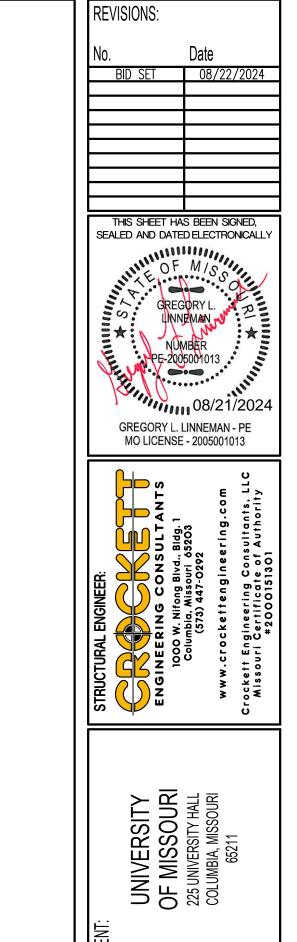
ES TSHED GREENHOUSE RELOCATION AND NEW SAL CP231543 COLUMBIA, BOONE COUNTY, MISSOURI

DRAWING INCLUDES:

SOIL STORAGE **ROOF PLAN** 

DESIGNED: GLL TGS DRAWN: PROJECT NO.:





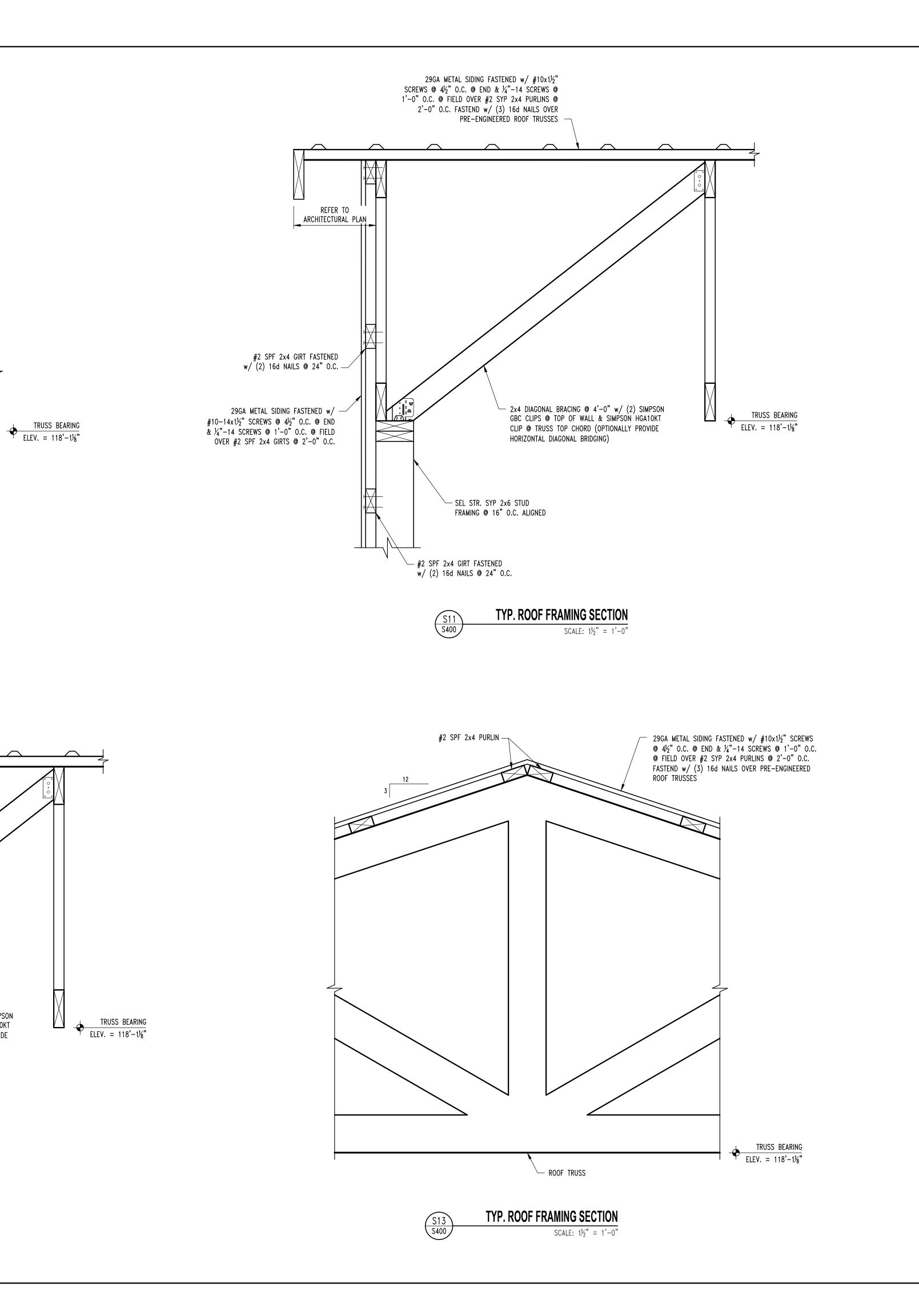
GENERAL SITE - LANDSCAPE SERVICES
GREENHOUSE RELOCATION AND NEW SALT S
CP231543
COLUMBIA, BOONE COUNTY, MISSOURI

DRAWING INCLUDES:

SOIL STORAGE BUILDING ELEVATIONS

DESIGNED: GLL
DRAWN: TGS
PROJECT NO.: 240131

SHEET:



\_\_\_ ALTERNATE 2x4 FLAT BLOCKING

w/ FULL HEIGHT BLOCKING

w/ 10d NAILS @ 6" O.C.

AND FASTEN PURLIN TO BLOCK

- ROOF TRUSS

TRUSS CLIP BY TRUSS MANUFACTURER

- #2 SPF 2x4 GIRT FASTENED

TYP. ROOF FRAMING SECTION

29GA METAL SIDING FASTENED w/ #10x1/2"

2'-0" O.C. FASTEND w/ (3) 16d NAILS OVER PRE-ENGINEERED ROOF TRUSSES

SCREWS @  $4\frac{1}{2}$ " O.C. @ END &  $\frac{1}{4}$ "-14 SCREWS @ 1'-0" O.C. @ FIELD OVER #2 SYP 2x4 PURLINS @

w/ (2) 16d NAILS @ 24" O.C.

SEL. STR. SYP 2x6 STUD FRAMING @ 16" O.C. ALIGNED w/ TRUSS

SCALE:  $1\frac{1}{2}$ " = 1'-0"

2x4 DIAGONAL BRACING @ 4'-0" w/ (2) SIMPSON GBC CLIPS @ TOP OF WALL & SIMPSON HGA10KT

CLIP @ TRUSS TOP CHORD (OPTIONALLY PROVIDE

HORIZONTAL DIAGONAL BRIDGING)

TYP. ROOF FRAMING SECTION

SCALE:  $1\frac{1}{2}$ " = 1'-0"

— 2 PLY NAILER FASTENED TO BEAM w/ ½"ø A307 @ 2'-0" O.C. STAGGERED EA. SIDE OF WEB

- NAILER FASTENED TO BEAM

w/½"ø A307 @ 2'-0" O.C. STAGGERED EA. SIDE OF WEB

29GA METAL SIDING FASTENED w/ #10x1/2"

SCREWS @ 4\2" O.C. @ END & 1/4"-14 SCREWS @

2'-0" O.C. FASTEND w/ (3) 16d NAILS OVER

29GA METAL SIDING FASTENED w/ —

#10-14x1½" SCREWS @ 4½" O.C. @ END & ½"-14 SCREWS @ 1'-0" O.C. @ FIELD

OVER #2 SPF 2x4 GIRTS @ 2'-0" O.C.

REFER TO ARCHITECTURAL PLAN

#2 SPF 2x4 GIRT FASTENED — w/ (2) 16d NAILS @ 24" O.C.

29GA METAL SIDING FASTENED w/ -#10-14x1½" SCREWS @ 4½" O.C. @ END & ¼"-14 SCREWS @ 1'-0" O.C. @ FIELD OVER #2 SPF 2x4 GIRTS @ 2'-0" O.C.

PRE-ENGINEÈRED ROOF TRUSSES —

12d NAILS @ 6" O.C.

REFER TO ARCHITECTURAL PLAN

1'-0" O.C. @ FIELD OVER #2 SYP 2x4 PURLINS @

FULL HEIGHT BLOCKING BETWEEN EVERY OTHER TRUSS FASTEN ROOF SHEATHING TO BLOCKING w/ 10D NAILS @ 6" O.C. & TOENAIL BLCKING TO TOP NAILER w/ REVISIONS: BID SET 08/22/2024 THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY GREGORY L. LINNEMAN - PE MO LICENSE - 2005001013

SHED SI E-LANDSCAPE SERVICE CATION AND NEW SALT CP231543 BOONE COUNTY, MISSOURI

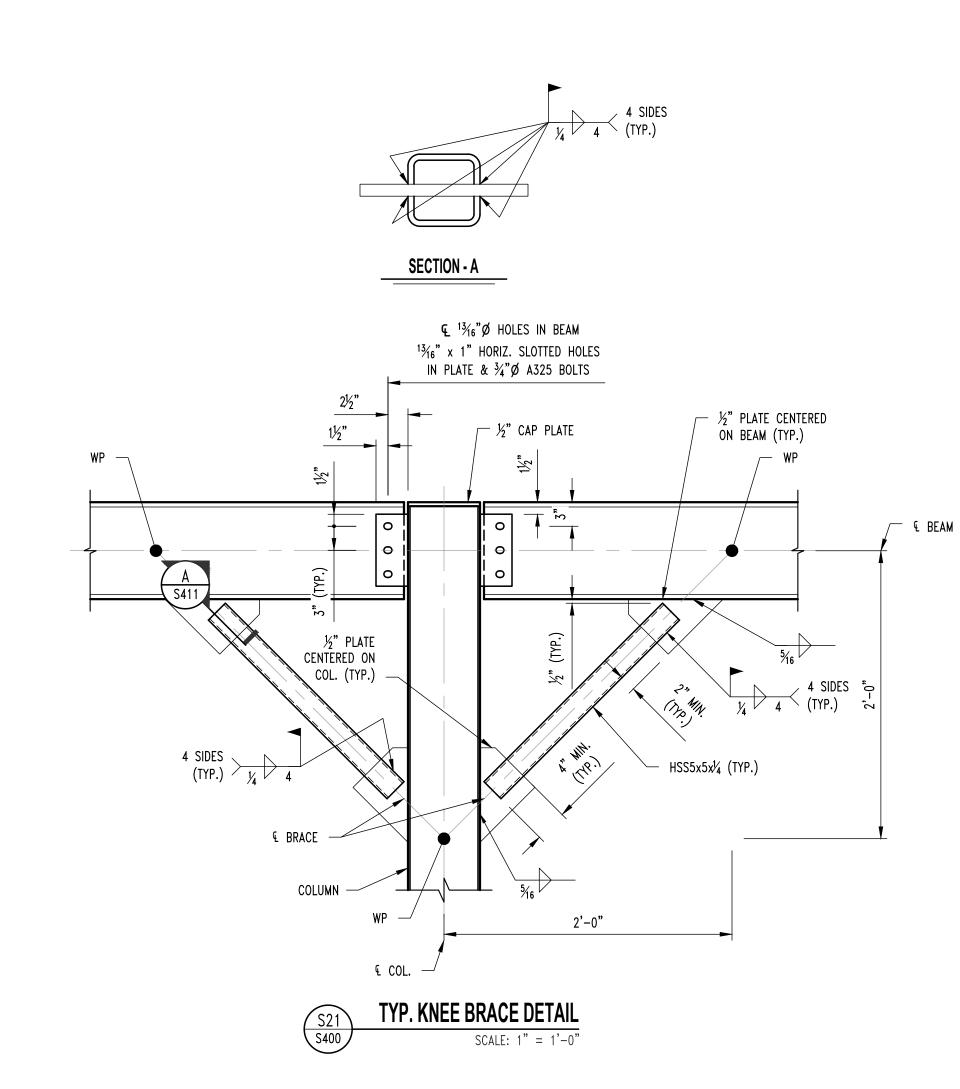
SITE RELO GREENHOUSE R

DRAWING INCLUDES:

SOIL STORAGE ROOF FRAMING DETAILS

DESIGNED: GLL TGS PROJECT NO.:

SHEET:



€ <sup>13</sup>/<sub>16</sub>"ø HOLES IN BEAM

<sup>13</sup>/<sub>16</sub>" x 1" HORIZ. SLOTTED HOLES

IN PLATE & 3/4" Ø A325 BOLTS

— ½" CAP PLATE

-6-

├ -�-

No. OF BOLTS "N" | PLATE SIZE | WELD SIZE "D"

½16x4x0'−9"

TYP. BEAM TO COLUMN SECTION

└─ BEAM (SEE TABLE)

└─ P (SEE TABLE)

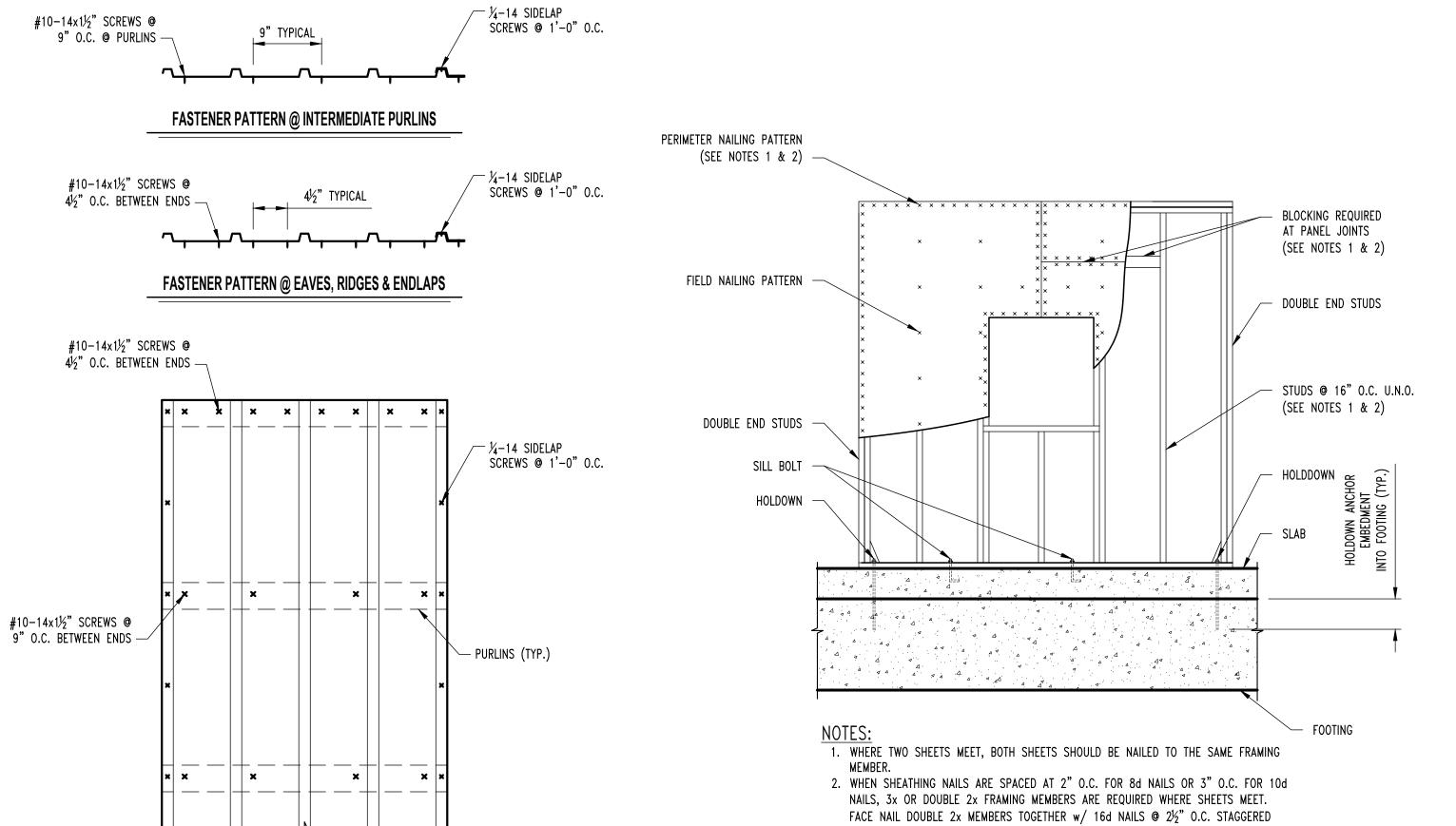
- COLUMN

SCALE:  $1\frac{1}{2}$ " = 1'-0"

NO RETURN >

W14

S20 S400



TYP. SHEATHING FASTENING PATTERN

EACH FACE OF STUD.

3. SEE WALL SECTIONS FOR ADDITIONAL INFORMATION.

TYP. SHEAR WALL DETAIL

ES TSHED CP231543
C - LANDSCAPE SERVICE
COCATION AND NEW SALT
CP231543
A, BOONE COUNTY, MISSOURI

REVISIONS:

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GREGORY L. LINNEMAN - PE MO LICENSE - 2005001013

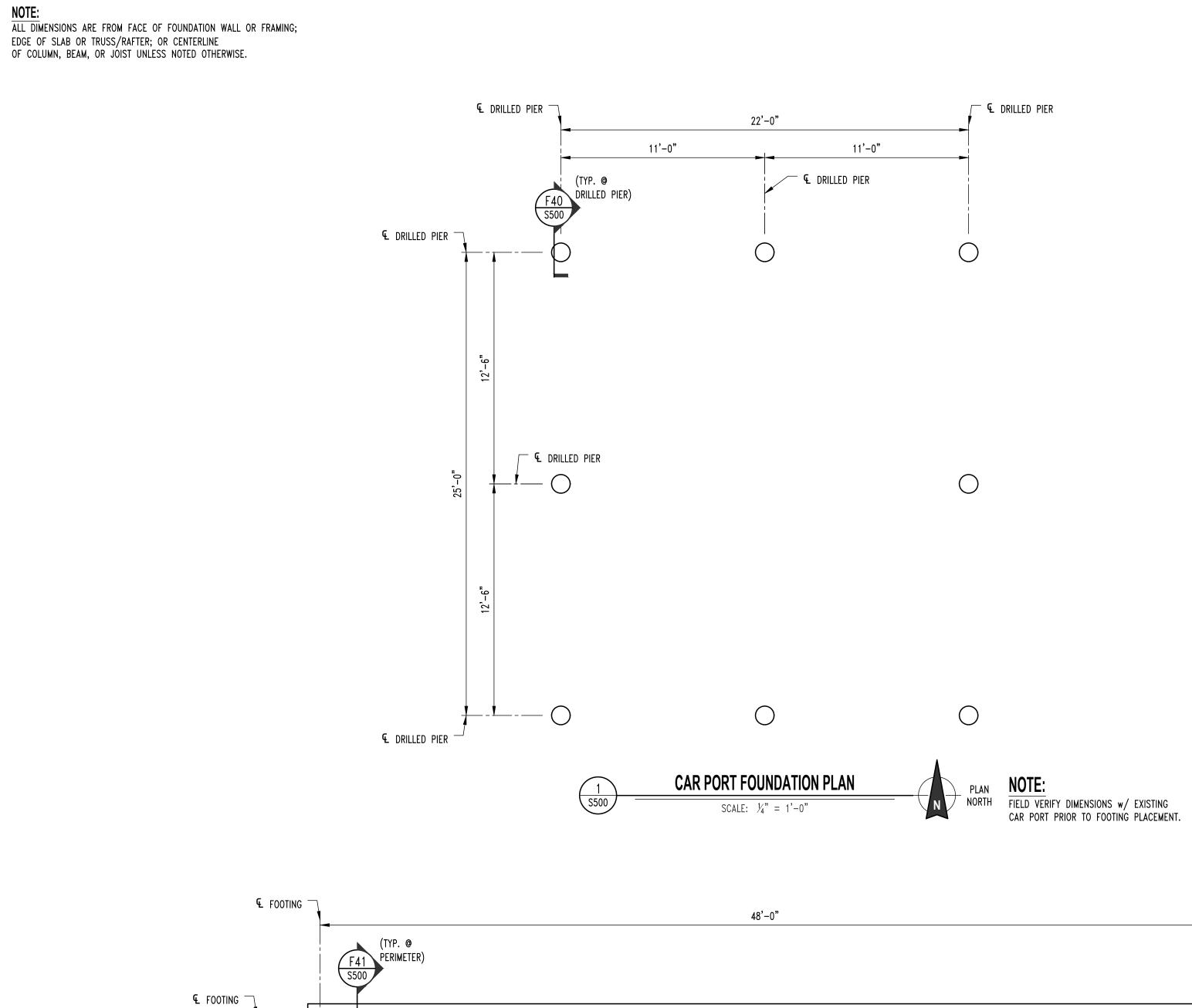
GENERAL SITE -GREENHOUSE RELOC

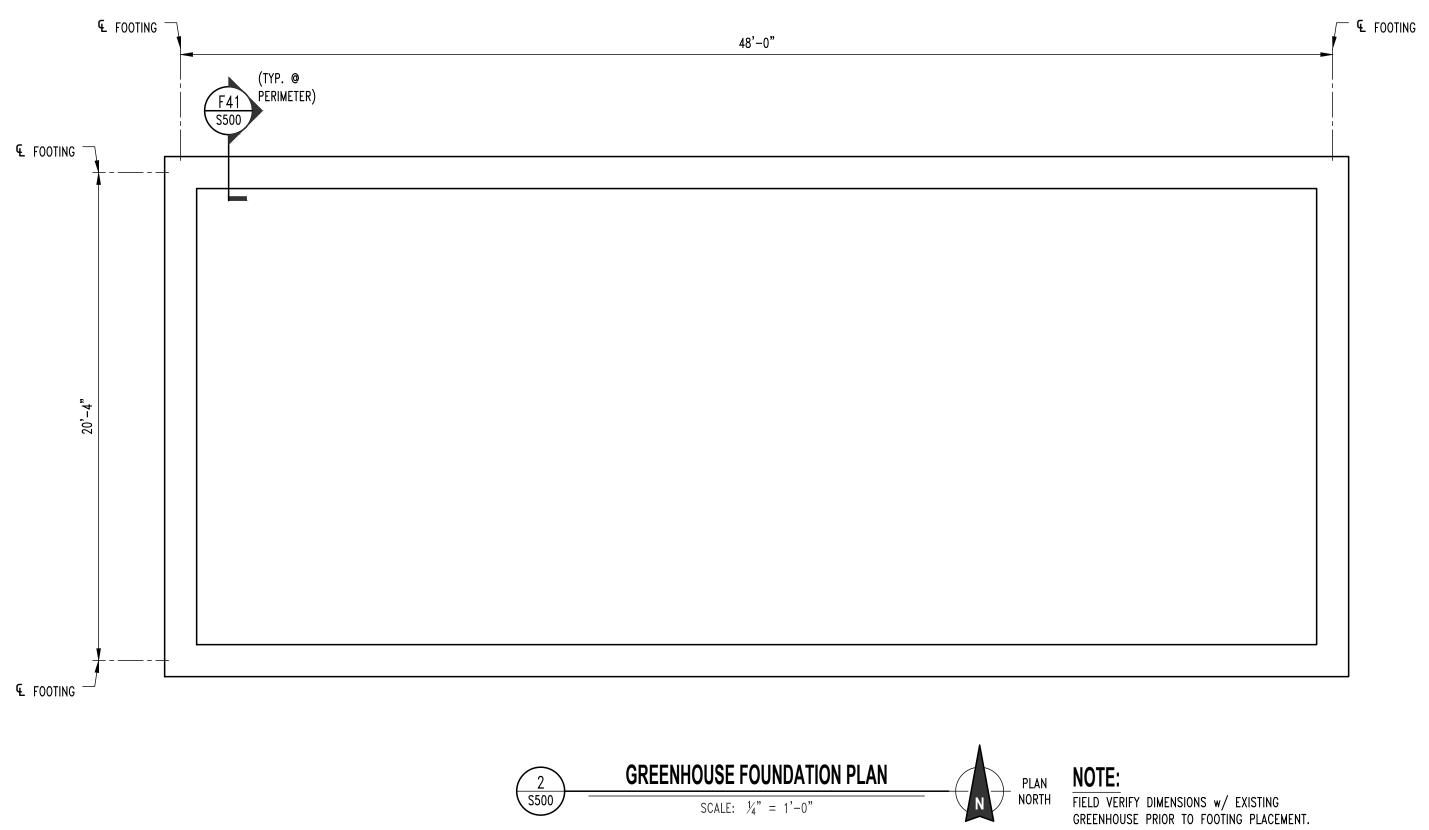
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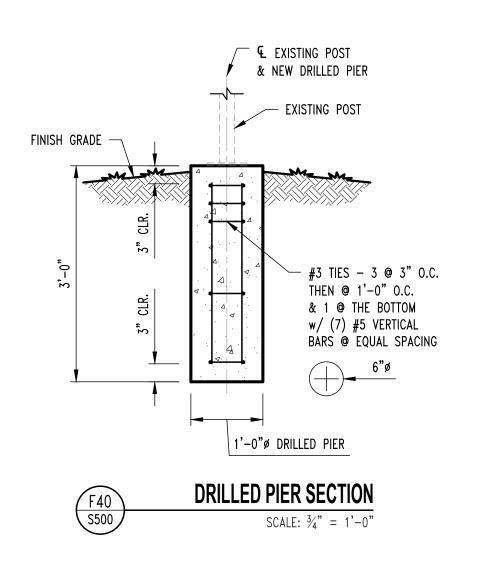
SOIL STORAGE ROOF FRAMING DETAILS

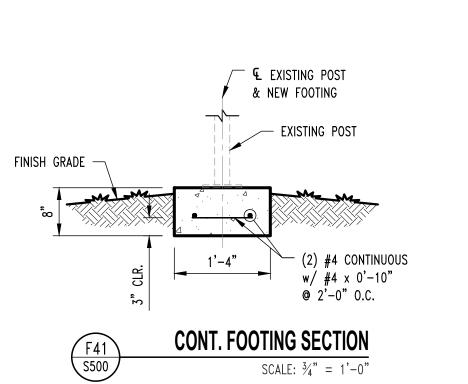
DESIGNED: GLL TGS PROJECT NO.:

SHEET:









REVISIONS:

No. Date

BID SET 08/22/2024

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

THIS SHEET HAS BEEN SIGNED, SEALED AND DATED ELECTRONICALLY

OF M/SS

GREGORY L. LINNEMAN

NUMBER
PE-2005001013

O8/21/2024

GREGORY L. LINNEMAN - PE
MO LICENSE - 2005001013

STRUCTURAL ENGINEER:

ENGINEERING CONSULTANTS
1000 W. Nifong Bivd.. Bidg. 1
Columbia, Missouri 65203
(573) 447-0292

www.crockettengineering.com
Crockett Engineering Consultants, LLC

UNIVERSITY
OF MISSOURI
225 UNIVERSITY HALL
COLUMBIA, MISSOURI
65211

VICES CLIENT: UNSALT SHED OF 225 COL

GENERAL SITE - LANDSCAPE SERVICE
GREENHOUSE RELOCATION AND NEW SALT
CP231543
COLUMBIA, BOONE COUNTY, MISSOURI

DRAWING INCLUDES:

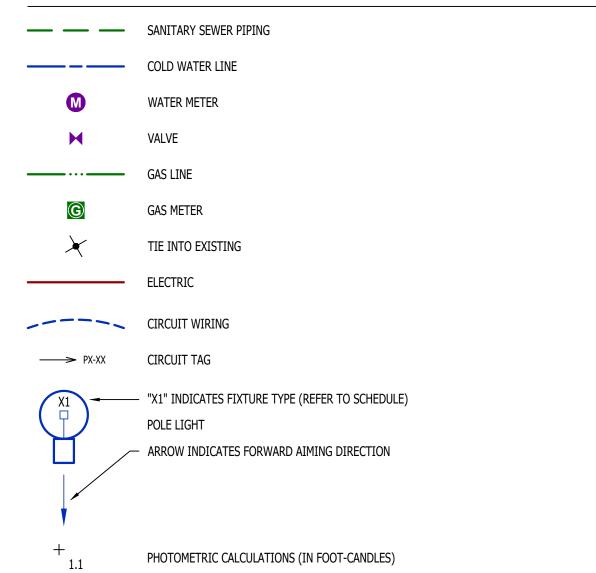
CAR PORT / GREENHOUSE FOUNDATION PLAN & DETAILS

DESIGNED: GLL
DRAWN: TGS
PROJECT NO.: 240131
SHEET:

S500

NOTE:
FOOTINGS THIS SHEET TO BE PROVIDED BY MU CONSTRUCTION SERVICES.

#### SITE PLAN SYMBOL LEGEND

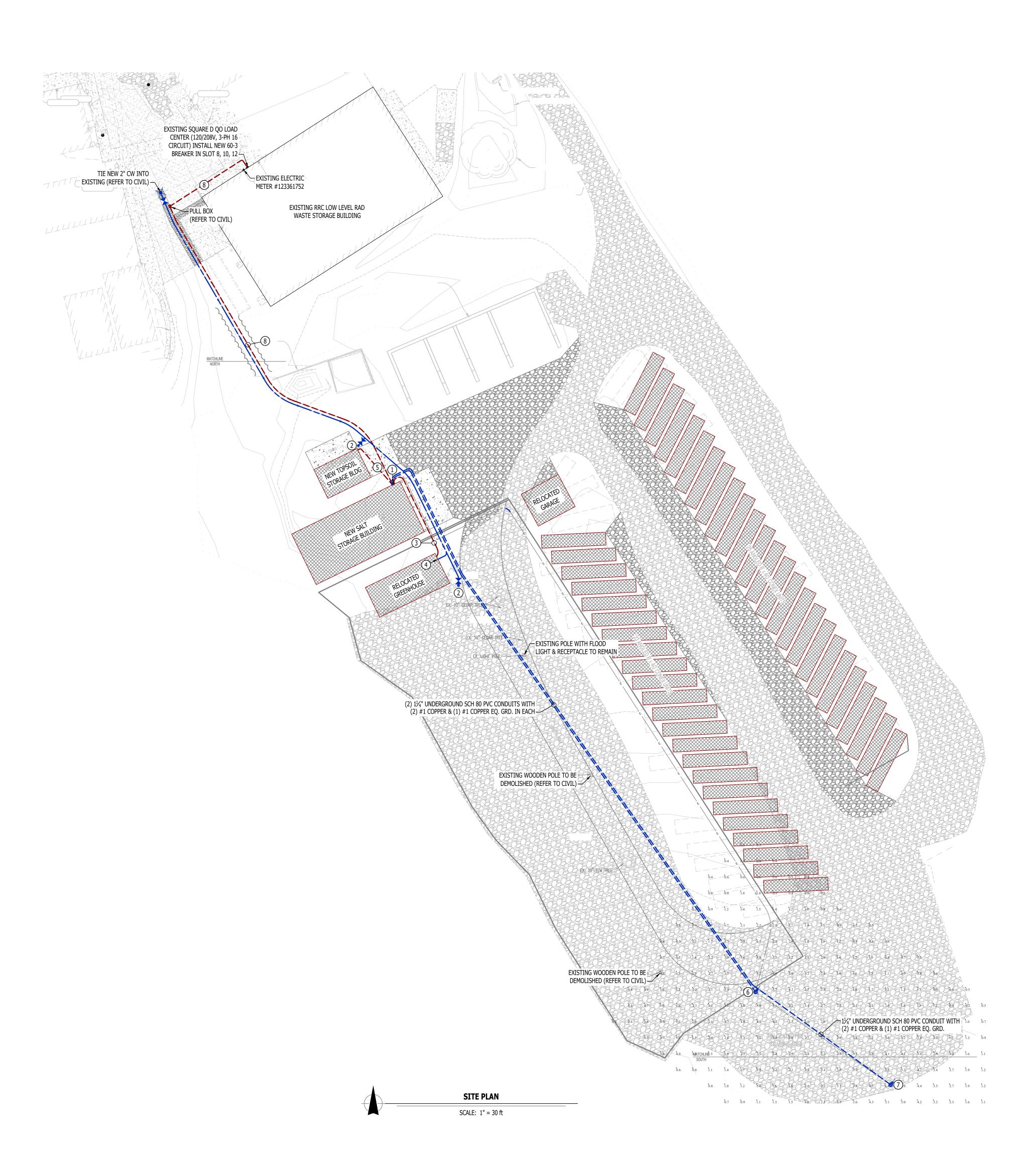


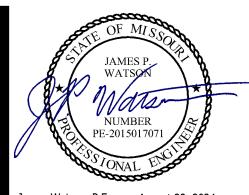
# SITE UTILITIES PLAN GENERAL NOTES:

1. REFER TO CIVIL PLANS FOR EXACT UTILITY LOCATIONS, CONNECTIONS, DETAILS, ETC.

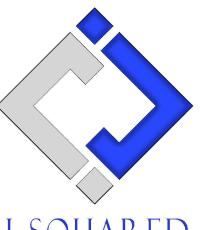
#### SITE UTILITIES PLAN KEY NOTES:

- 1) NEW PANEL 'P1' SEE SHEET ME102 FOR DETAILS.
- 2) NEW EXTERIOR YARD HYDRANT REFER TO CIVIL FOR DETAILS.
- (3) NEW 3/4" UNDERGROUND SCH 80 PVC CONDUIT WITH CONDUCTORS FROM PANEL 'P1' TO OUTLETS IN RELOCATED GREENHOUSE.
- (4) NEW 2" CW (UNDERGROUND) TO RELOCATED GREENHOUSE (SEE GREENHOUSE PLAN ON ME102 FOR CONTINUATION).
- (5) NEW 3/4" UNDERGROUND CONDUIT WITH CONDUCTORS FROM PANEL 'P1' TO NEW TOPSOIL STORAGE BUILDING (SEE SHEET ME102 FOR DETAILS).
- (6) INSTALL NEW POLE LIGHT FIXTURE (MARK 'SL') & RECEPTACLE ON OWNER-FURNISHED 20' TALL 4"x4" STRAIGHT SQUARE POLE. CONTRACTOR TO PROVIDE NEW CONCRETE BASE & POLE ANCHOR BOLTS. CIRCUIT NEW LIGHT FIXTURE & RECEPTACLE TO P1-8.
- 7 INSTALL NEW POLE LIGHT FIXTURE (MARK 'SL') & RECEPTACLE ON OWNER-FURNISHED 20' TALL 4"x4" STRAIGHT SQUARE POLE. CONTRACTOR TO PROVIDE NEW CONCRETE BASE & POLE ANCHOR BOLTS. CIRCUIT NEW LIGHT FIXTURE & RECEPTACLE TO P1-10.
- 8) 1½" UNDERGROUND CONDUIT WITH (4) #3 COPPER & (1) #8 COPPER EQ. GRD.





James Watson, P.E. August 22, 2024 PE-2015017071 MO Certificate of Authority # 2018029680



# J-SQUARED ENGINEERING

2400 Bluff Creek Drive, Suite 101 Columbia, Missouri 65201 573 - 234 - 4492 phone www.j-squaredeng.com

| J2 PROJECT No: | J21270         |
|----------------|----------------|
| J2 DESIGN:     | JAP            |
|                | _              |
| ISSUE TITLE    | DATE           |
| BID SET        | 08 - 22 - 2024 |

# It Shed

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- GENERAL SITI reenhouse Relo

AHJ APPROVAL STAMP

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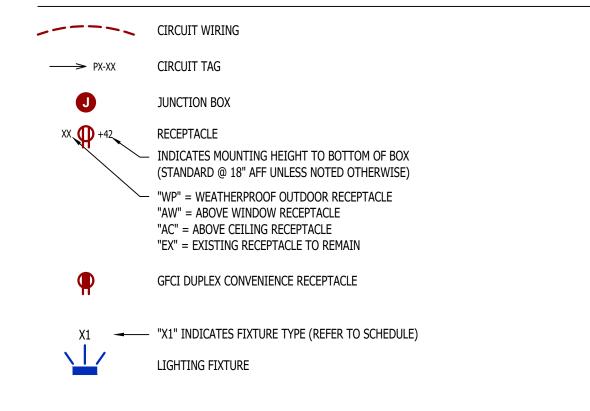
SHEET TITLE

MECHANICAL
ELECTRICAL PLUMBING
SITE UTILITY PLAN

SHEET NUMI

**MEP101** 

#### **ELECTRICAL PLAN SYMBOL LEGEND**

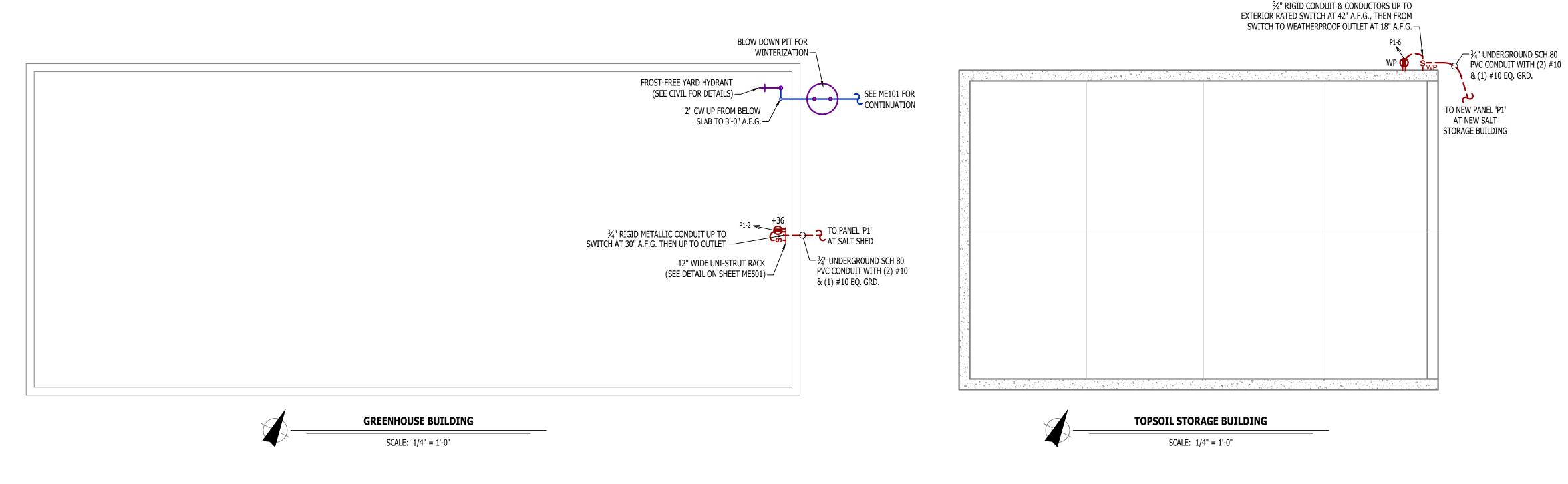


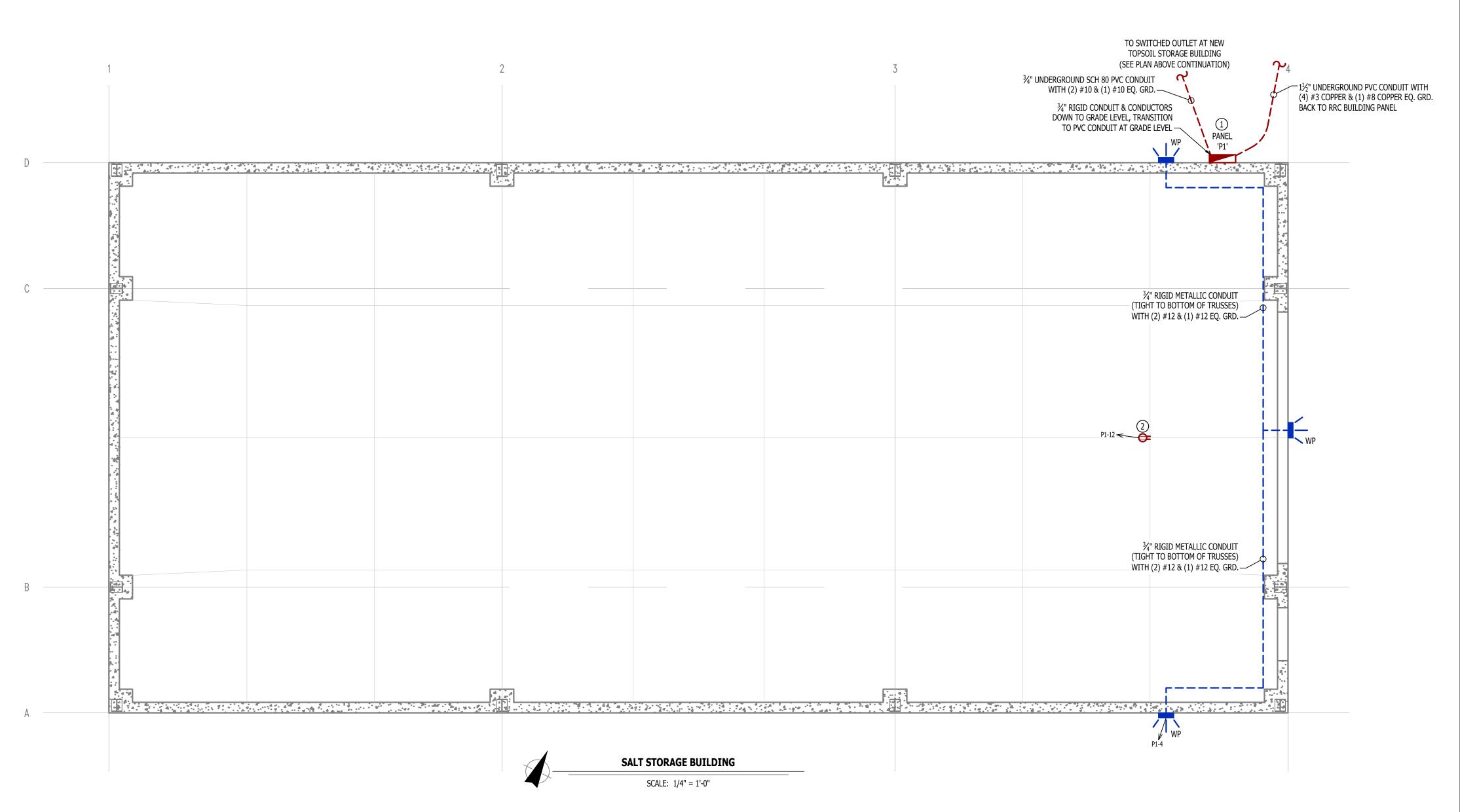
#### **ELECTRICAL PLAN GENERAL NOTES:**

- 1. REFER TO E500 AND/OR E600 SERIES SHEETS FOR ADDITIONAL ELECTRICAL NOTES, DETAILS, REQUIREMENTS, AND SCHEDULES.
- 2. ELECTRICAL CONTRACTOR SHALL REVIEW ALL PROJECT DOCUMENTS AND COORDINATE LOCATION OF ALL ELECTRICAL EQUIPMENT, WIRING, HANGERS / SUPPORTS, ETC. WITH HVAC AND PLUMBING TRADES BEFORE INSTALLATION OF ANY MATERIAL. ADDITIONAL COSTS ASSOCIATED WITH LACK OF COORDINATION WILL NOT BE
- 3. ANY EXISTING ELECTRICAL EQUIPMENT, CIRCUITS, ETC. SHOWN IS FOR REFERENCE ONLY. ELECTRICAL CONTRACTOR TO FIELD VERIFY EXACT EQUIPMENT LOCATIONS, CONDITIONS, ETC. PRIOR TO BEGINNING WORK AND NOTIFY ENGINEER OF ANY DISCREPANCIES.

#### **ELECTRICAL PLAN KEY NOTES:**

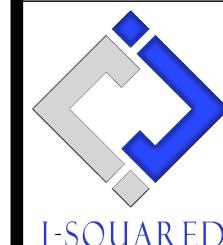
- 1) NEW NEMA 3R 120/208V, 3-PH 16 CIRCUIT 100 AMP MLO WITH 60-3 BREAKER INSTALLED IN SLOT 1,3,5 USED AS MAIN CIRCUIT BREAKER. INSTALL PERMANENT PLACARD ABOVE PANEL STATING THE FOLLOWING: PANEL 'P1' -(120/208V, 3-PH) DISCONNECT FOR PANEL IS LOCATED ON NORTH SIDE OF RRC BUILDING IN PANEL ADJACENT
- (2) POWER FOR OVERHEAD DOOR OPERATOR. COORDINATE EXACT LOCATION WITH OVERHEAD DOOR INSTALLER.







James Watson, P.E. August 22, 2024 PE-2015017071 MO Certificate of Authority # 2018029680



2400 Bluff Creek Drive, Suite 101 Columbia, Missouri 65201 573 - 234 - 4492 phone www.j-squaredeng.com

J2 PROJECT No: J21270 J2 DESIGN:

ISSUE TITLE 08 - 22 - 2024

Shed Salt ation

CP2

AHJ APPROVAL STAMP

**MECHANICAL ELECTRICAL PLUMBING PLANS** 

#### MECHANICAL SPECIFICATIONS

#### 1. GENERAL

- 1.1. PLUMBING CONTRACTOR IS RESPONSIBLE TO PROVIDE ALL ESCUTCHEONS, ½ TURN STOPS, P-TRAPS, AND SUPPLY LINES TO PROVIDE A COMPLETE SYSTEM AT EACH FIXTURE INDICATED ON PLANS UNLESS
- ALL PLUMBING SYSTEMS SHALL BE INSTALLED LEVEL, PLUMB, AND PARALLEL/PERPENDICULAR TO BUILDING ORIENTATION WHERE POSSIBLE.
- COORDINATE ALL PIPING INSTALLATIONS WITH STRUCTURAL GRADE BEAMS, FOOTINGS, COLUMN PIERS, ETC. SLEEVE PIPING THRU STRUCTURAL ELEMENTS AS NECESSARY, VERIFY WITH STRUCTURAL
- VERIFY ALL UTILITY CONNECTION POINTS WITH PROPOSED PLUMBING LAYOUTS PRIOR TO BEGINNING
- CLEAN ALL PLUMBING FIXTURES AND CHANGE FAUCET AERATORS AND SINK STRAINERS AT PROJECT COMPLETION PRIOR TO TURNING OVER TO OWNERSHIP.

#### 2. **EQUIPMENT / FIXTURES**

- 2.1. ALL EQUIPMENT AND/OR FIXTURES MUST MEET OR EXCEED THE PERFORMANCE, FUNCTIONAL INTENT, AND AESTHETICS AS MODELS SPECIFIED ON PLANS. WHERE SPECIFIC MANUFACTURERS AND/OR MODELS ARE INDICATED ON PLANS OR WITHIN SCHEDULES, CONTRACTOR TO PROVIDE MODEL INDICATED OR APPROVED EQUAL. VERIFY SUBSTITUTION APPROVAL PRIOR TO PURCHASE OR
- INSTALLATION OF EQUIPMENT. 2.2. CONTRACTOR TO SUPPLY SUBMITTALS FOR ALL EQUIPMENT FOR REVIEW BY ARCHITECT AND ENGINEER.
- FORMAL APPROVAL SHALL BE RECEIVED BY CONTRACTOR PRIOR TO EQUIPMENT PURCHASE. CONTRACTOR TO SHARE APPROVED EQUIPMENT SUBMITTALS WITH ANY PERTINENT ELECTRICAL REQUIREMENTS WITH ELECTRICAL CONTRACTORS WITHIN TWO WEEKS OF RECEIVING APPROVED SUBMITTALS FROM ARCHITECT/ENGINEER.

#### 3. DOMESTIC WATER

## 3.1. ALL DOMESTIC WATER PIPING TO BE AS FOLLOWS:

- 3.1.1. WATER PIPING BELOW GRADE SHALL BE SDR 9. THERE SHALL BE NO JOINTS IN WATER PIPING LOCATED BENEATH BUILDING SLAB.
- WATER PIPING ABOVE GRADE SHALL BE TYPE "L" COPPER.
- 3.2. ALL DOMESTIC WATER PIPING SHALL BE ROUTED WITHIN BUILDING THERMAL ENVELOPE AND WITHIN WALL CAVITIES, ABOVE FINISHED CEILINGS, OR BELOW SLAB TO REMAIN CONCEALED UNLESS OTHERWISE NOTED. NOTIFY ENGINEER OF ANY NECESSARY ADJUSTMENTS THAT REQUIRE PIPING TO BE
- 3.3. DOMESTIC WATER PIPING INSULATION
- 3.3.1. CW COPPER PIPING TO INSULATED WITH ½" PLENUM RATED CLOSED CELL ELASTOMERIC INSULATION.

#### **ELECTRICAL SPECIFICATIONS**

- 1.1. THE ENTIRE ELECTRICAL SYSTEM SHALL BE CONTINUOUSLY GROUNDED. EVERY BRANCH CONDUIT SHALL INCLUDE A GREEN GROUND CONDUCTOR SIZED PER NEC.
- ARC-FAULT CIRCUITS SHALL BE RUN WITH A DEDICATED NEUTRAL AS REQUIRED BY MANUFACTURER. 1.3.
- PROVIDE PERMANENT ARC-FLASH LABEL AFFIXED TO EVERY DISCONNECT AND PANEL. 1.4. PROVIDE TYPE WRITTEN PANEL SCHEDULE FOR EACH PANEL.

## 2. MATERIALS

- 2.1. CONDUIT & CONDUCTORS ALL CONDUCTORS SIZES INDICATED ON PLANS ARE COPPER UNLESS NOTED OTHERWISE.
- ABOVE GRADE CONDUCTORS SHALL BE THHN COPPER. BELOW GRADE CONDUCTORS SHALL BE
- 2.1.3. MINIMUM CONDUCTOR SIZE SHALL BE #12 UNLESS NOTED OTHERWISE. 120V, 20 AMP CIRCUITS WITH CONDUCTOR LENGTH GREATER THAN 100' SHALL BE MINIMUM #10. ELECTRICAL CONTRACTOR IS RESPONSIBLE FOR MEASURING ACTUAL CONDUCTOR LENGTH AND INCREASING
- CONDUCTOR SIZE TO COMPENSATE FOR VOLTAGE DROP AS REQUIRED BY NEC. RIGID GALVANIZED OR SCHEDULE 80 PVC CONDUIT SHALL BE USED FOR SERVICE WIRING, BELOW GRADE INSTALLATIONS, OR WHERE EXPOSED TO WEATHER.
- 2.2. DEVICES CONTRACTOR TO PROVIDE J-BOXES, COVER PLATES, AND ANY ACCESSORIES REQUIRED TO
- PROVIDE A COMPLETE SYSTEM. SEE ARCHITECTURAL PLANS FOR DEVICE COLORS. DUPLEX RECEPTACLES SHALL BE TAMPER RESISTANT, 20 AMP, EOUAL TO LEVITON CR20.

| ۷.۷.۱. | DUPLEX RECEPTACLES SHALL BE TAMPER RESISTANT, 20 AMP, EQUAL TO LEVITON CR20. |
|--------|--|
| 2.2.2. | TOGGLE WALL SWITCHES SHALL BE EQUAL TO LEVITON CS120-2                       |
| 2.2.3. | DIMMER SWITCHES SHALL BE TESTED WITH FIXTURES AND LAMPS FOR COMPATIBILITY.   |

|                   | PA NEL S                     | SPECIFICATIONS |                 |      | <u> </u> |      |                 |                                   | TOTAL CONNECT        | ED LO | AD             |
|-------------------|------------------------------|----------------|-----------------|------|----------|------|-----------------|-----------------------------------|----------------------|-------|----------------|
| V                 | <b>OLTAGE:</b> 120/208V 3-PH | NEMA RATIN     | <b>3:</b> 3R    |      |          |      |                 |                                   | PHASE "A" LOAD:      | 17.5  | AMF            |
| AM                | PACITY: 100A MLO             | PANEL MOUNTING | 3: SURFACE      |      |          |      |                 |                                   | PHA SE "B" LOA D:    | 17.5  | AMF            |
| AIC-              | RATING: 10kA                 |                |                 |      |          |      |                 |                                   | PHASE "C" LOAD:      |       | AMF            |
| CIRCUIT<br>NUMBER | DESCRI                       | IPTION         | BREAKER<br>SIZE | AMPS | PHASE    | AMPS | BREAKER<br>SIZE | DESCRIPTION                       |                      |       | CIRCU<br>NUMBI |
| 1                 | MAIN BR                      | ₹EAKER         | 60-3            | 17.5 | Α        | 1.5  | 20-1            | GREENHOUSE RECEPTACLE             |                      |       | 2              |
| 3                 | -                            |                | -               | 17.5 | В        | 1.5  | 20-1            | SALT STORAGE EXTERIOR LTG         |                      |       | 4              |
| 5                 | -                            | i              | -               | 9    | С        | 7.5  | 20-1            | TOPSOIL STORAGE RECEPTACLE        |                      |       | 6              |
| 7                 | SPA                          | RE             | 20-1            |      | Α        | 16   | 20-1            | RELOCATED POLE LIGHT & RECEPTACLE |                      |       | 8              |
| 9                 | SPA                          | RE             | 20-1            |      | В        | 16   | 20-1            | RELOCATED POLE LIGHT & RECEPTACLE |                      |       | 1              |
| 11                | SPA                          | RE             | 20-1            |      | С        | 1.5  | 20-1            | SALT STORAGE                      | OVERHEAD DOOR OPERAT | OR    | 1              |
| 13                | SPA                          | RE             | 20-1            |      | Α        |      | 20-1            |                                   | SPARE                |       | 1              |
| 15                | SPA                          | RF             | 20-1            |      | В        |      | 20-1            |                                   | SPARE                |       | 1              |

A: PANEL SHALL BE EQUAL TO SQUARE D MODEL "QO"

B: ELECTRICIAN SHALL VERIFY EXACT EQUIPMENT OVERCURRENT PROTECTION REQUIREMENTS PRIOR TO PURCHASE & INSTALLATION OF EQUIPMENT.

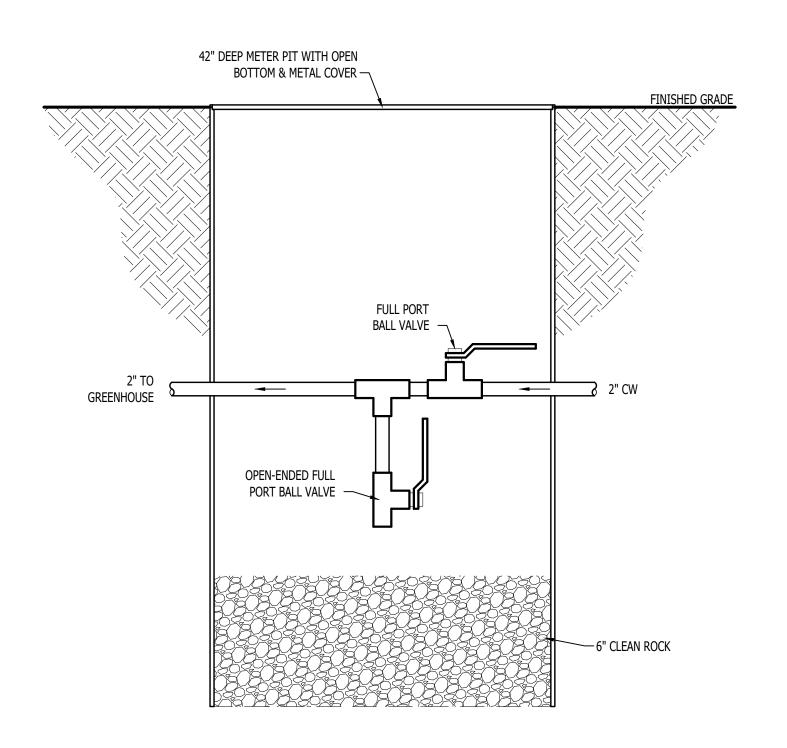
C: AFTER COMPLETION OF WORK, ELECTRICAN SHALL PROVIDE A TYPE WRITTEN PANEL DIRECTORY IN NEW PANEL.

|        | SITE LIGHTING FIXTURE SCHEDULE |                                  |                    |                              |                 |          |     |       |       |  |
|--------|--------------------------------|----------------------------------|--------------------|------------------------------|-----------------|----------|-----|-------|-------|--|
| TAG    | MANUFACTURER<br>(OR EQUAL)     | MODEL NUMBER<br>(OR EQUAL)       | DESCRIPTION        | MOUNTING                     | LUMEN<br>OUTPUT | сст (°К) | CRI | VOLTS | WATTS | NOTES  |
| SL     | LUMARK                         | PRV-XL-PA4B-740-U-5WQ-MS/DIM-L20 | LED POLE LIGHT     | 20' POLE ON 24" BASE         | 40,868          | 4000     | 70  | 120   | 303   | PROVIDE (1) FSIR-100 FOR FIELD CONFIGURATION |
| WP     | LUMARK                         | AXCL6A-MSP/DIM-L30               | EXTERIOR WALL PACK | WALL MOUNTED @ 16'-0" A.F.G. | 7,594           | 4000     | 70  | 120   | 50    | 1 thru 3                                     |
| NOTES: |                                |                                  |                    |                              |                 |          |     |       |       |  |

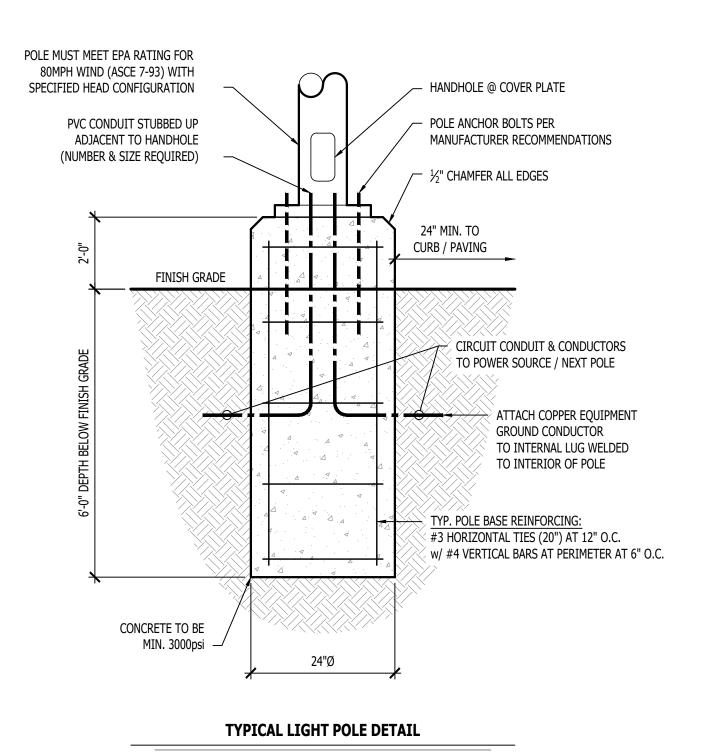
1. VERIFY LIGHT FIXTURE FINISHES WITH OWNER / ARCHITECT PRIOR TO ORDERING.

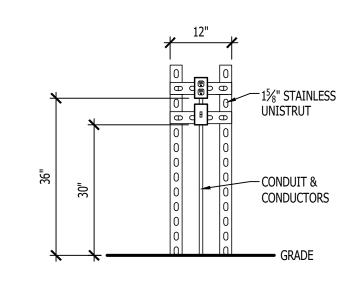
2. EACH FIXTURE SHALL BE PROVIDE WITH DEEP BACK BOX (PAINTED TO MATCH FIXTURE).

3. PROVIDE (1) INTEGRATED SENSOR PROGRAMMING REMOTE (LUMARK #ISHH-01) FOR JOB.



**BLOW DOWN PIT DETAIL** 

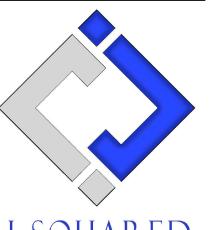




**UNISTRUT PANEL MOUNTED DETAIL** 

James Watson, P.E. August 22, 2024

PE-2015017071 MO Certificate of Authority # 2018029680



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Columbia, Missouri 65201

573 - 234 - 4492 phone

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J2 PROJECT No: J21270 J2 DESIGN: ISSUE TITLE 08 - 22 - 2024

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CP

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AHJ APPROVAL STAMP

**MECHANICAL ELECTRICAL PLUMBING DETAILS & SCHEDULES**