

USC Greenhouse Construction

State Project No.: H27-Z090

Prepared For



UNIVERSITY OF SOUTH CAROLINA

October 23, 2013

THE UNIVERSITY OF SOUTH CAROLINA
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COLUMBIA, SC 29208
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PROJECT MANAGER
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CIVIL AND STRUCTURAL ENGINEERS
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DRAWING INDEX

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PLUMBING

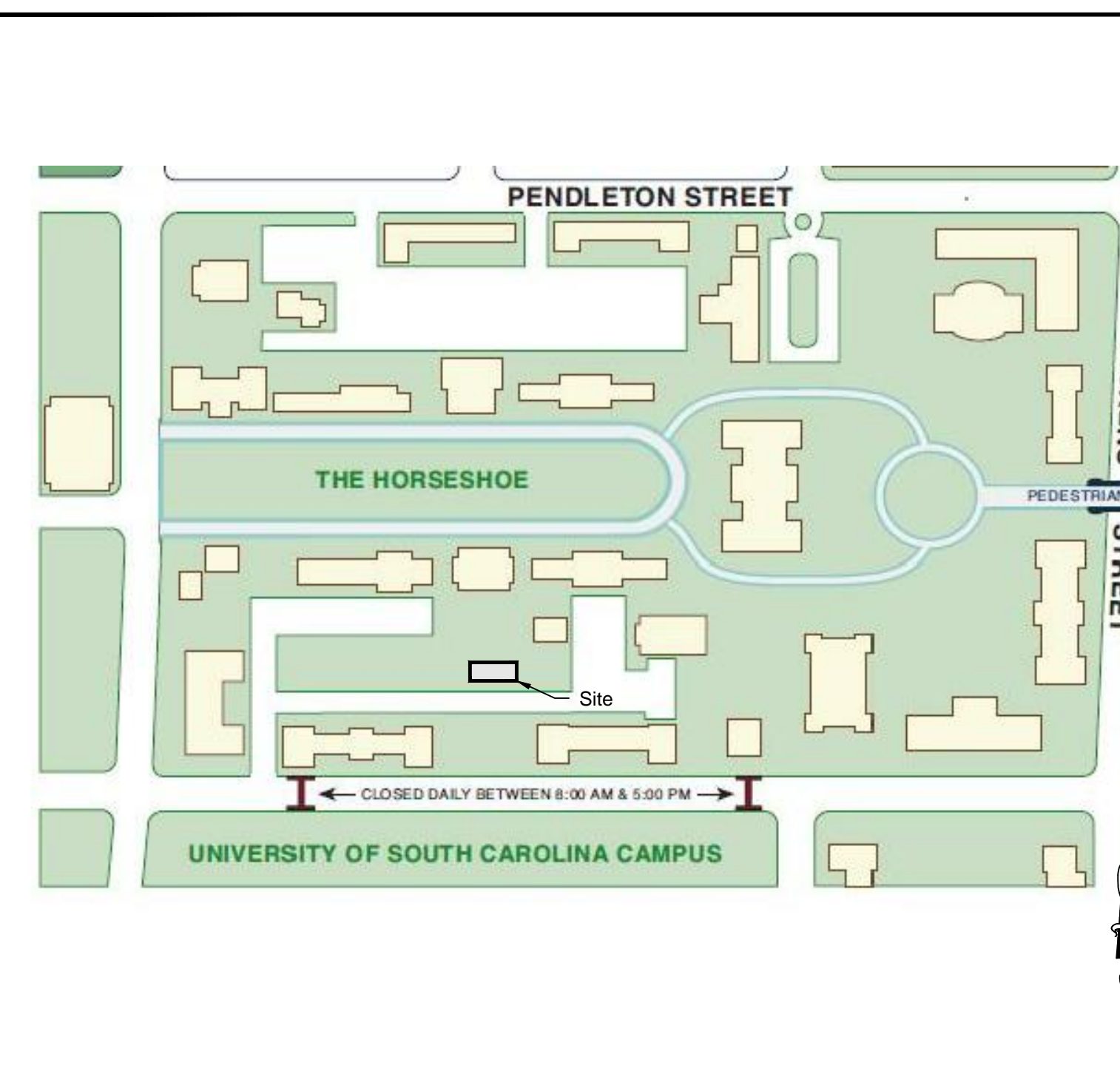
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ELECTRICAL

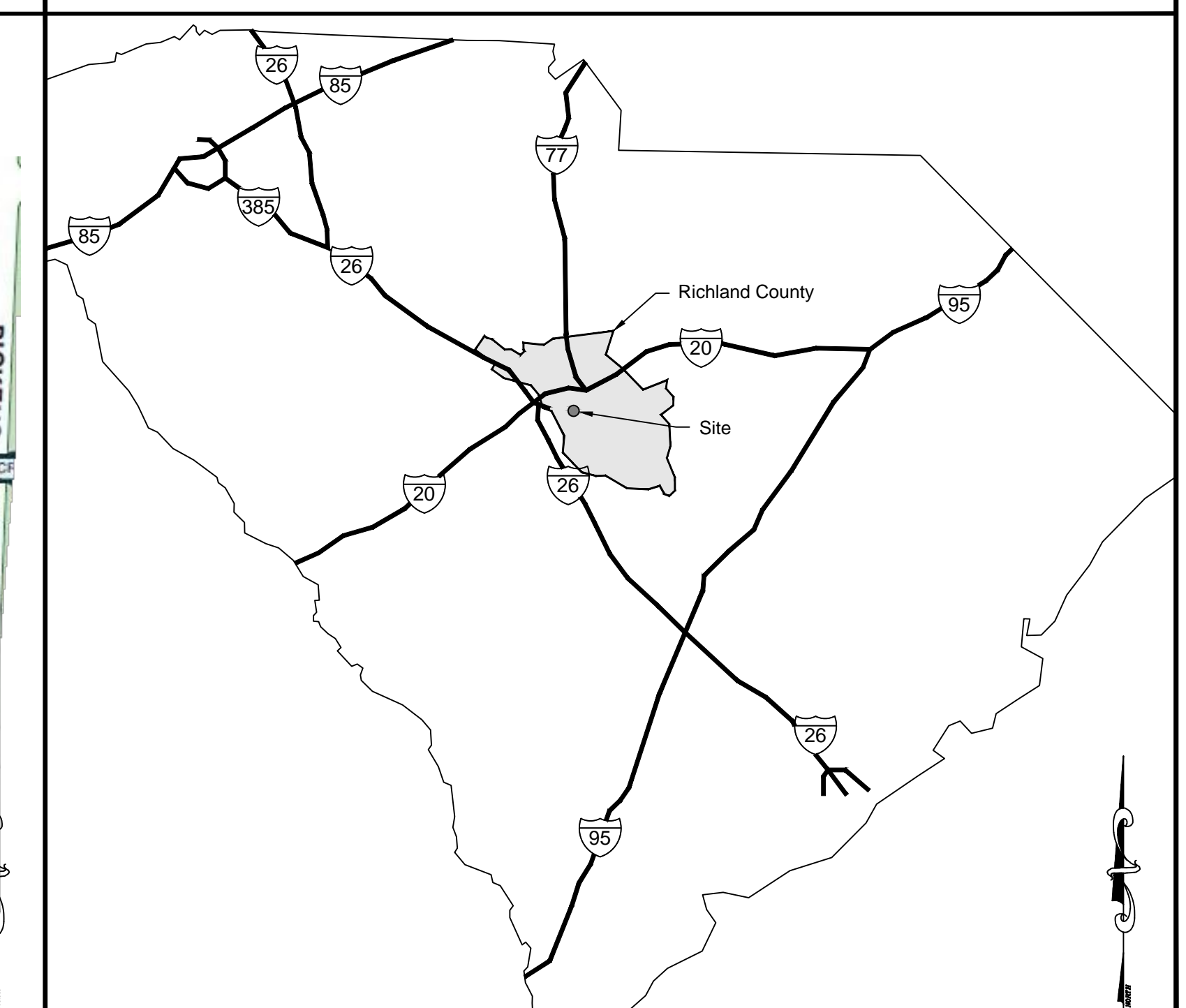
- E1.0 - ELECTRICAL PLAN

LOCATION MAP

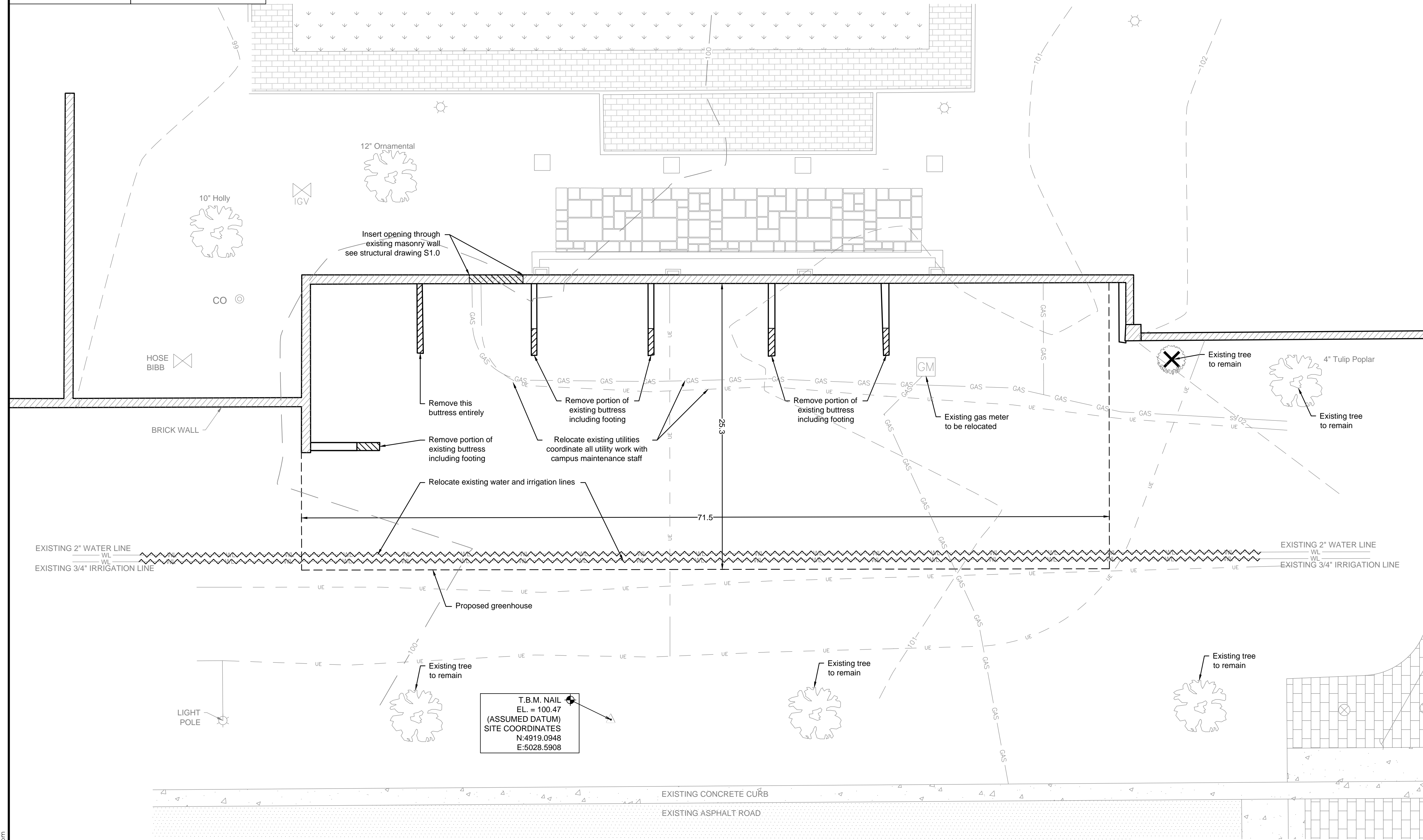
COUNTY OF RICHLAND
SCALE: NOT TO SCALE



STATE OF SOUTH CAROLINA
SCALE: 1" = 30 MILES



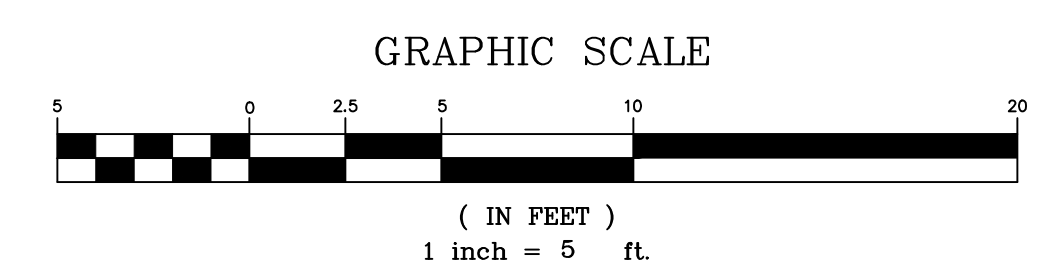
LEGEND	
	FIRE HYDRANT
	WATER VALVE
	WATER METER
	GAS VALVE
	SANITARY SEWER MANHOLE
	CLEANOUT (CO)
	NATURAL GAS LINE
	SANITARY SEWER LINE
	WATER LINE
	FENCELINE
	OVERHEAD ELECTRIC
	UNDERGROUND TELEPHONE
	UNDERGROUND FIBER OPTIC LINE
	UNDERGROUND CABLE TV
	CURB & GUTTER
	JUNCTION BOX (JB)
	DROP INLET (DI)
	HOOD & GRATE INLET (H&G)
	YARD INLET (YI)
	STORM DRAIN PIPE
	CONCRETE SIDEWALK
	POWER POLE & GUY
	LIGHT POLE
	ELEC BOX
	TELEPHONE PED
	HVAC CONCRETE PAD



- Construction Notes**
1. During construction and until turf is established, use the filter fabric inlet protection shown on detail sheet around all inlets and place and maintain the protection as required to prevent erosion and sedimentation runoff.
 2. Contractor shall verify all existing field conditions and utilities prior to beginning work.
 3. Provide silt fence and/or other erosion control devices, as may be required, to control soil erosion during construction. All disturbed areas shall be cleaned, graded and stabilized with grassing immediately after completion of construction in the area.
 4. Prior to any digging the contractor is required to contact 811 72 hrs prior to commencing construction.
 5. Contractor to repair any damage done to existing pavement, fencing, etc.. due to construction entirely at his/her expense.
 6. If necessary, slopes which exceed four vertical feet or 4:1 slopes should be stabilized with an approved turf reinforcing mat in addition to hydroseeding. It may be necessary to install temporary slope drains during construction. Temporary berms may be needed daily until slope is brought to grade.
 7. Contractor must take necessary action to minimize the tracking of mud onto the paved roadway from construction areas. Contractor to daily remove mud/soil from pavement as required.
 8. All erosion control devices shall be properly maintained during all phases of construction until the completion of all construction activities and all disturbed areas have been stabilized. Additional control devices may be required during construction in order to control erosion and/or offsite sedimentation. All temporary control devices shall be removed once construction is complete and the site is stabilized to the satisfaction of The City of Columbia and SCDHEC.
 9. All excavation is unclassified. Excess material is to be removed from the site and disposed of in a legal manner.

3 DAYS BEFORE DIGGING IN SOUTH CAROLINA CALL 811
Palmetto Utility Protection Service

- Notes:**
1. Boundary & topographic information furnished by Chao & Associates, INC.
 2. Benchmark is based on assumed datum.
 3. Proposed contours & proposed spot elevations represent finished grade.
 4. All pavement dimensions are referenced to the face of curb where applicable.



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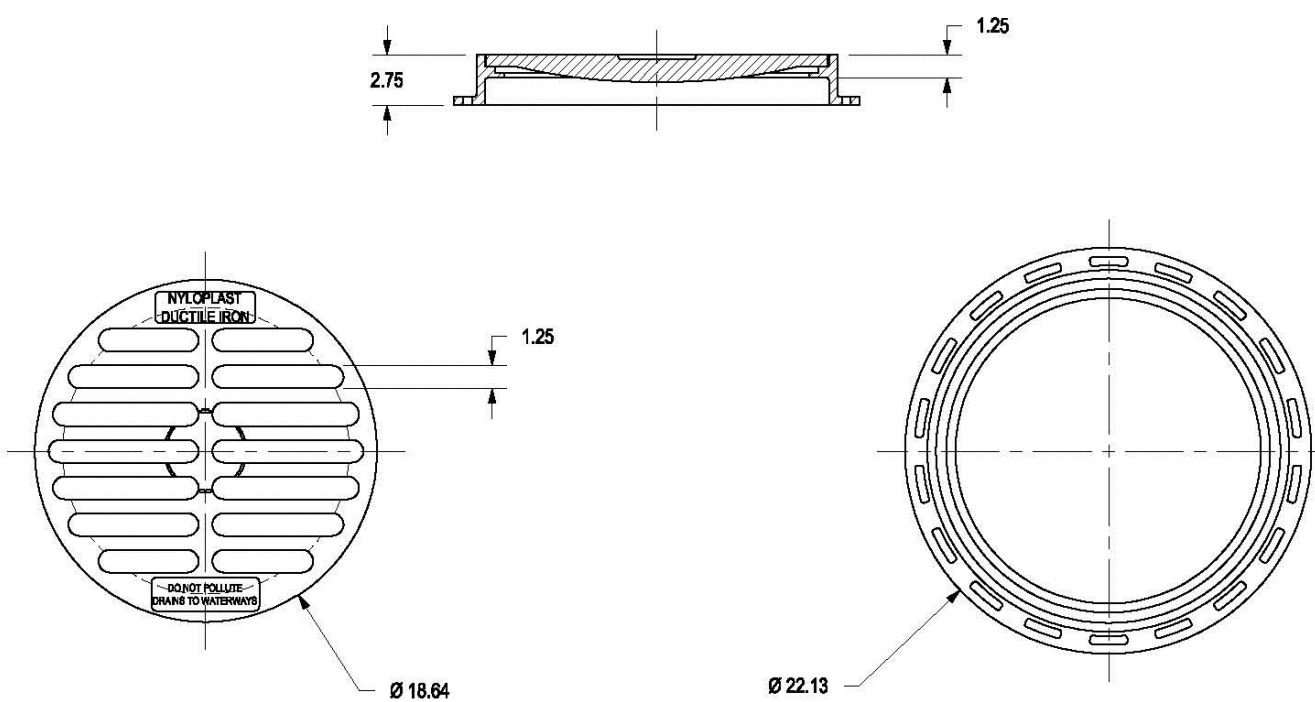
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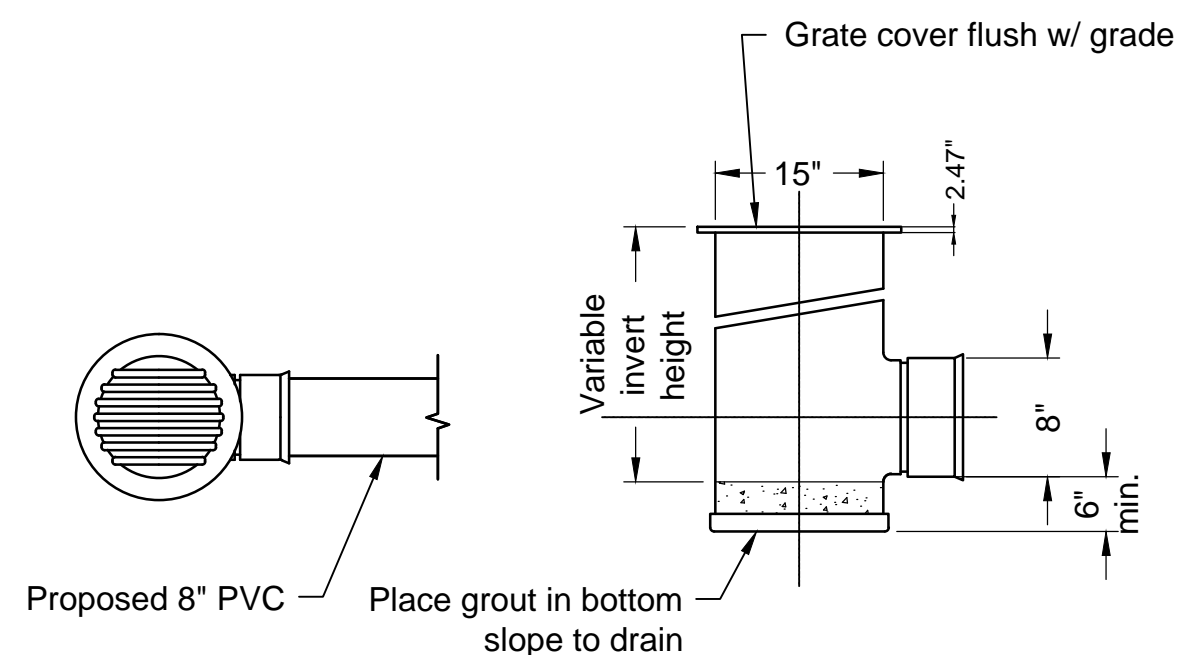
Existing Condition & Demolition Plan
USC Greenhouse - State Project No. H27-Z090
Prepared for:
The University of South Carolina
Columbia, South Carolina

Drawn: TKS
Checked: Lee
Revised:
Project No.: 577945

C1.0
Sheet Number
October 23, 2013
Date

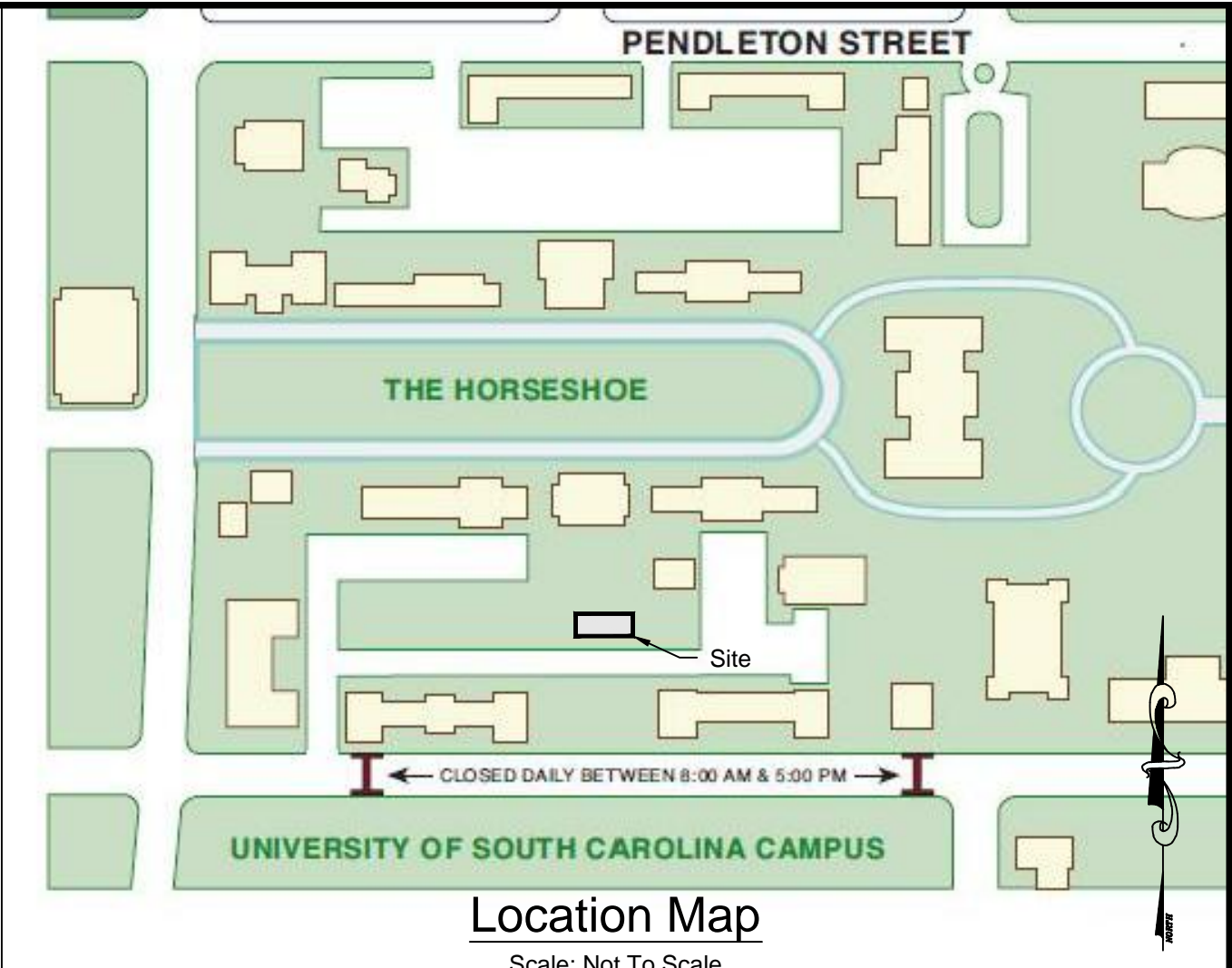


18" Standard Grate Assembly Detail
Not to Scale

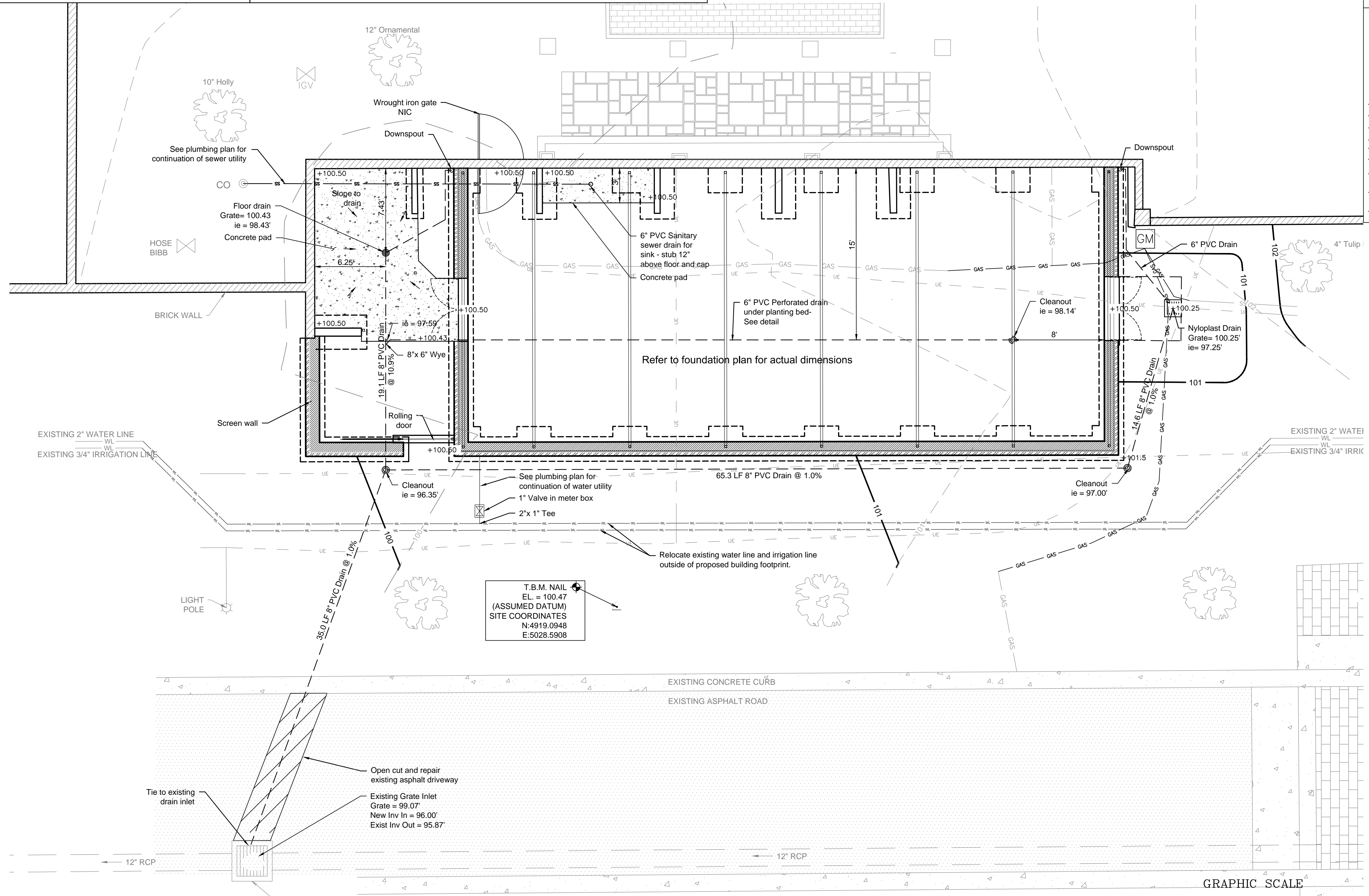


15" Nyloplast Drain Basin Detail
Not to Scale

Basis of design for this set of drawings is the 'American Classic Series' ACSE 2557 manufactured by Texas Greenhouse Company. Alternate pre-engineered greenhouses that meet the Owners requirements must be submitted for approval prior to bidding. Dimensions of alternate pre-engineered greenhouse may vary from what is shown on these drawings. It will be the responsibility of the greenhouse supplier to furnish signed and sealed drawings to adjust these plans to fit to their product. These drawings shall be furnished to the Owner for review and approval at no additional cost to the Owner.



Location Map
Scale: Not To Scale

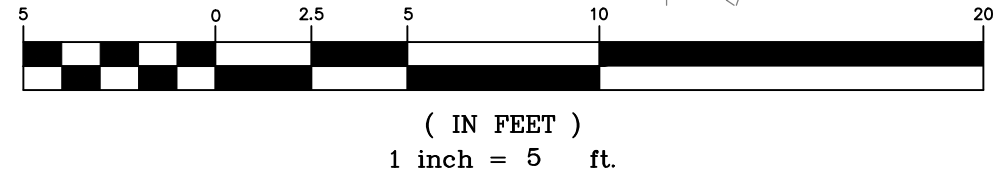


LEGEND

	FIRE HYDRANT		CURB & GUTTER
	WATER VALVE		JUNCTION BOX (JB)
	WATER METER		DROP INLET (DI)
	GAS VALVE		HOOD & GRATE INLET (H&G)
	SANITARY SEWER MANHOLE		YARD INLET (YI)
	CLEANOUT (CO)		STORM DRAIN PIPE
	NATURAL GAS LINE		CONCRETE SIDEWALK
	SANITARY SEWER LINE		POWER POLE & GUY
	WATER LINE		LIGHT POLE
	FENCELINE		ELEC BOX
	OVERHEAD ELECTRIC		TELEPHONE PED
	UNDERGROUND TELEPHONE		HVAC CONCRETE PAD
	UNDERGROUND FIBER OPTIC LINE		
	UNDERGROUND CABLE TV		

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Site Layout Plan
USC Greenhouse - State Project No. H27-Z090
Prepared for:
The University of South Carolina
Columbia, South Carolina

Drawn: TKS
Checked: Lee
Revised:
Project No.: 577945
File: 577945C R1.dwg

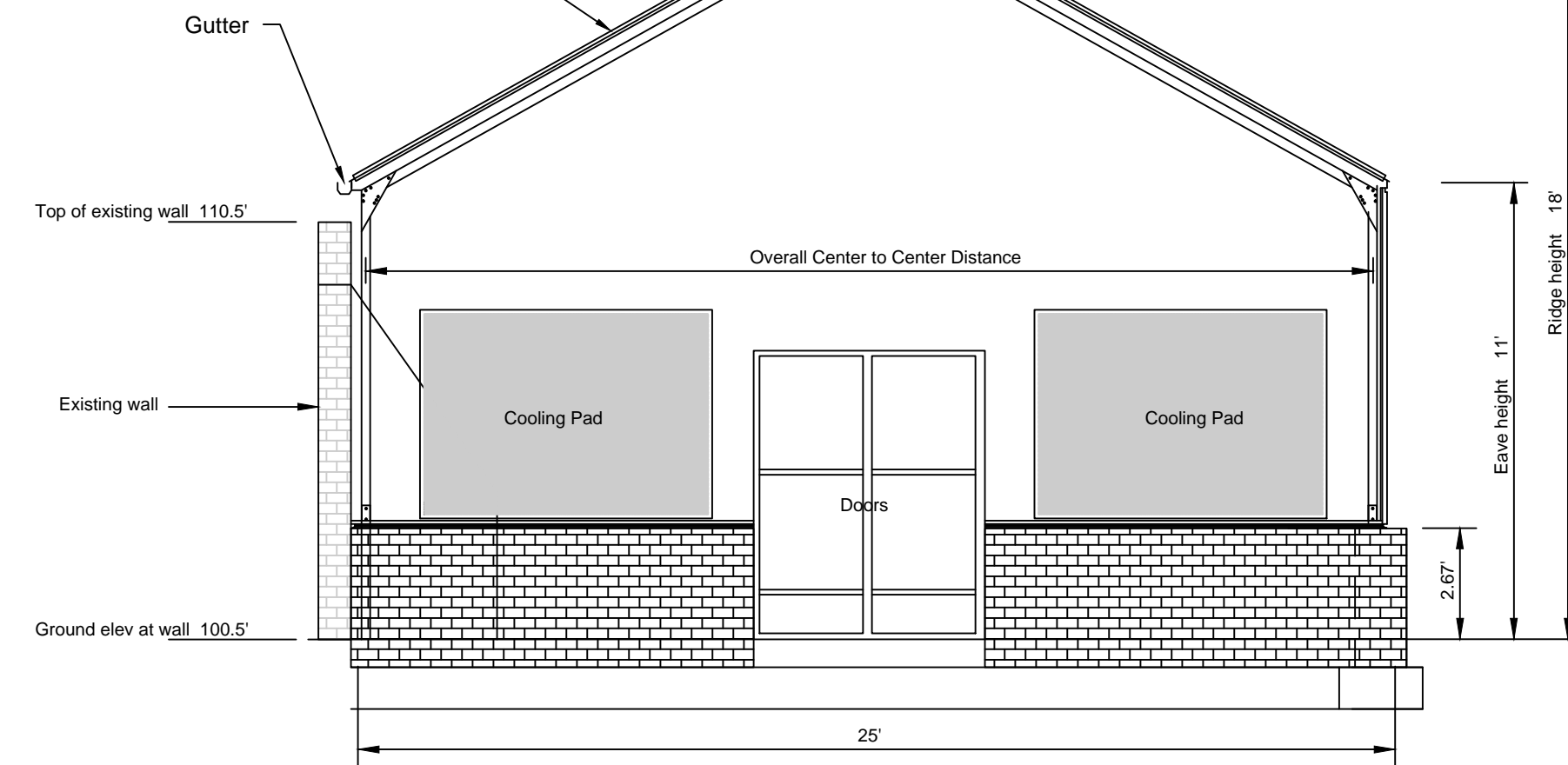
C2.0
Sheet Number
October 23, 2013
Date

Drawing file: 577945C_R1.dwg Plotfile: Oct. 28, 2013 - 6:20pm

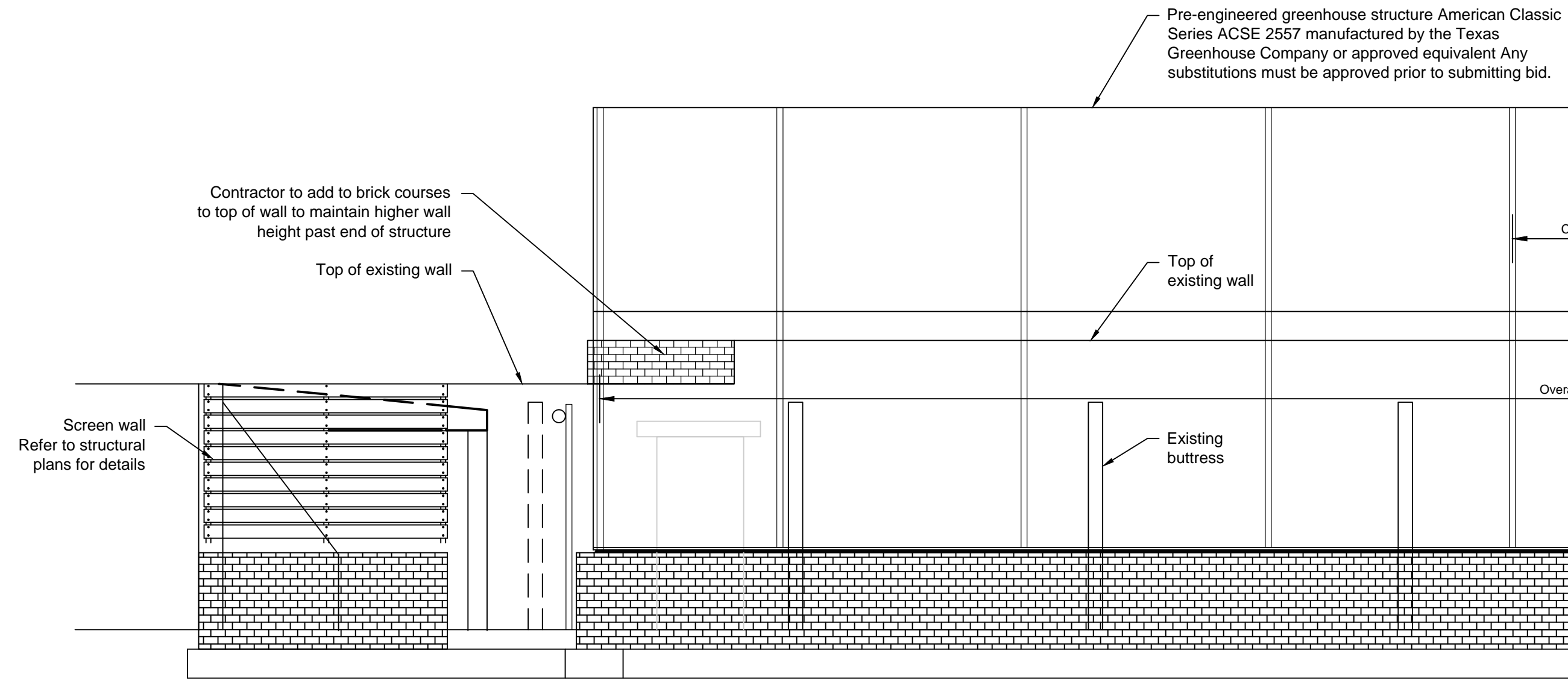
CHAO
CONSULTING ENGINEERS & LAND SURVEYORS
Chao & Associates, Inc.
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Voice: (803) 772-8420
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Pre-engineered greenhouse structure
American Classic Series ACSE 2557
manufactured by the Texas Greenhouse
Company or approved equivalent
Any substitutions must be approved
prior to submitting bid.

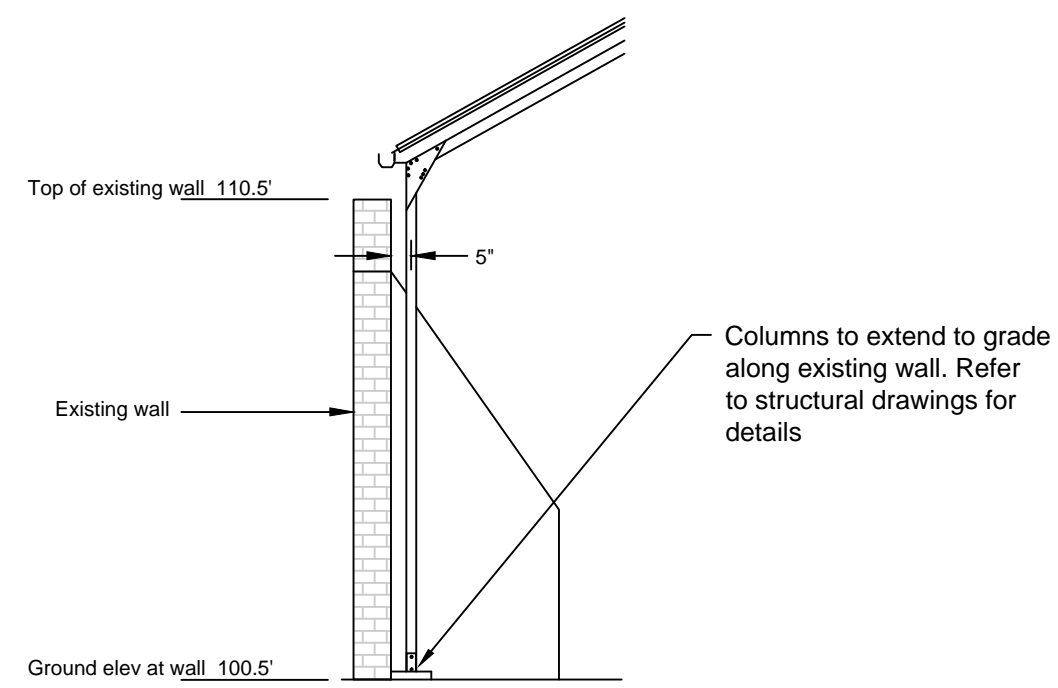


West Elevation

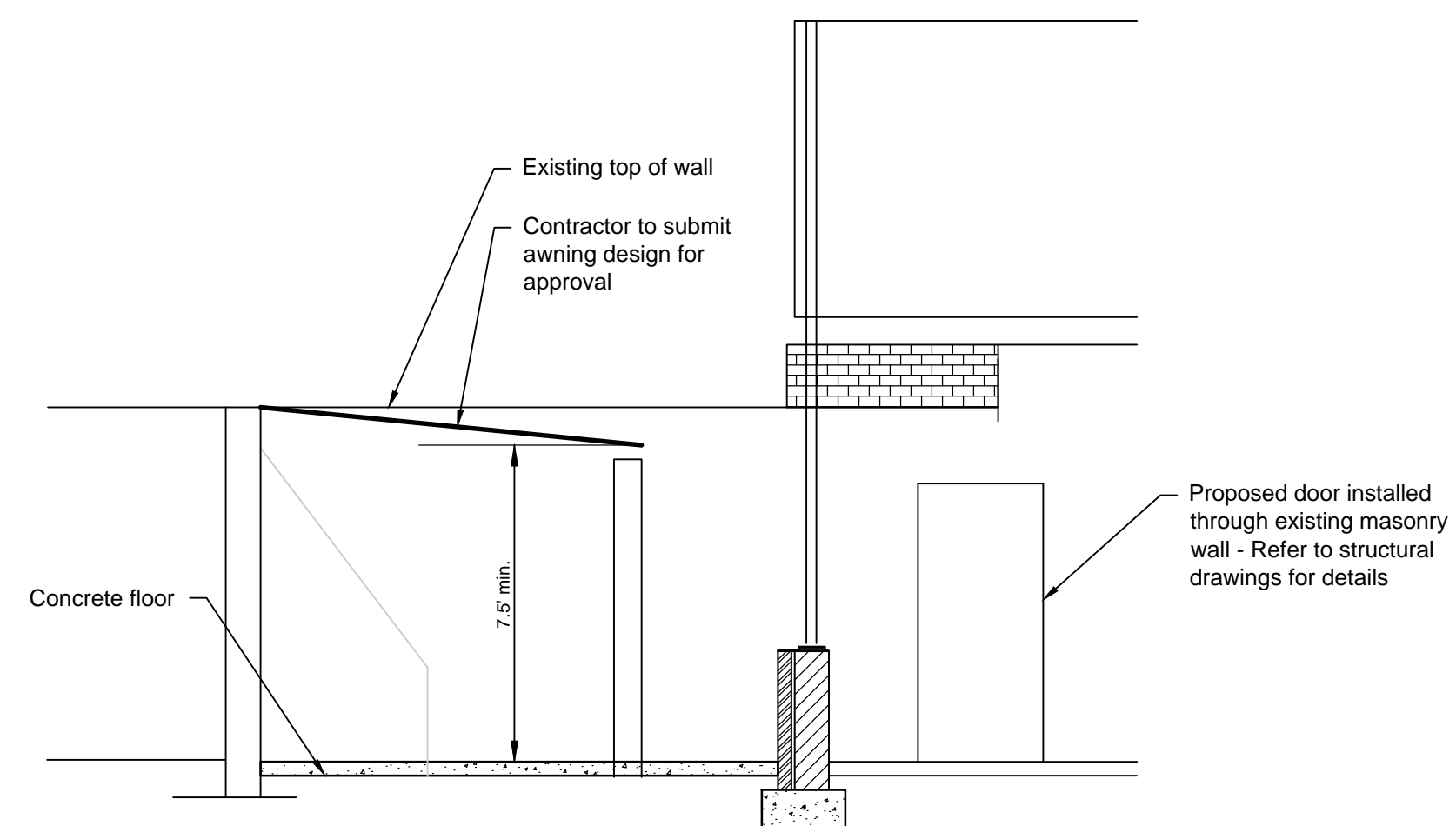


South Elevation

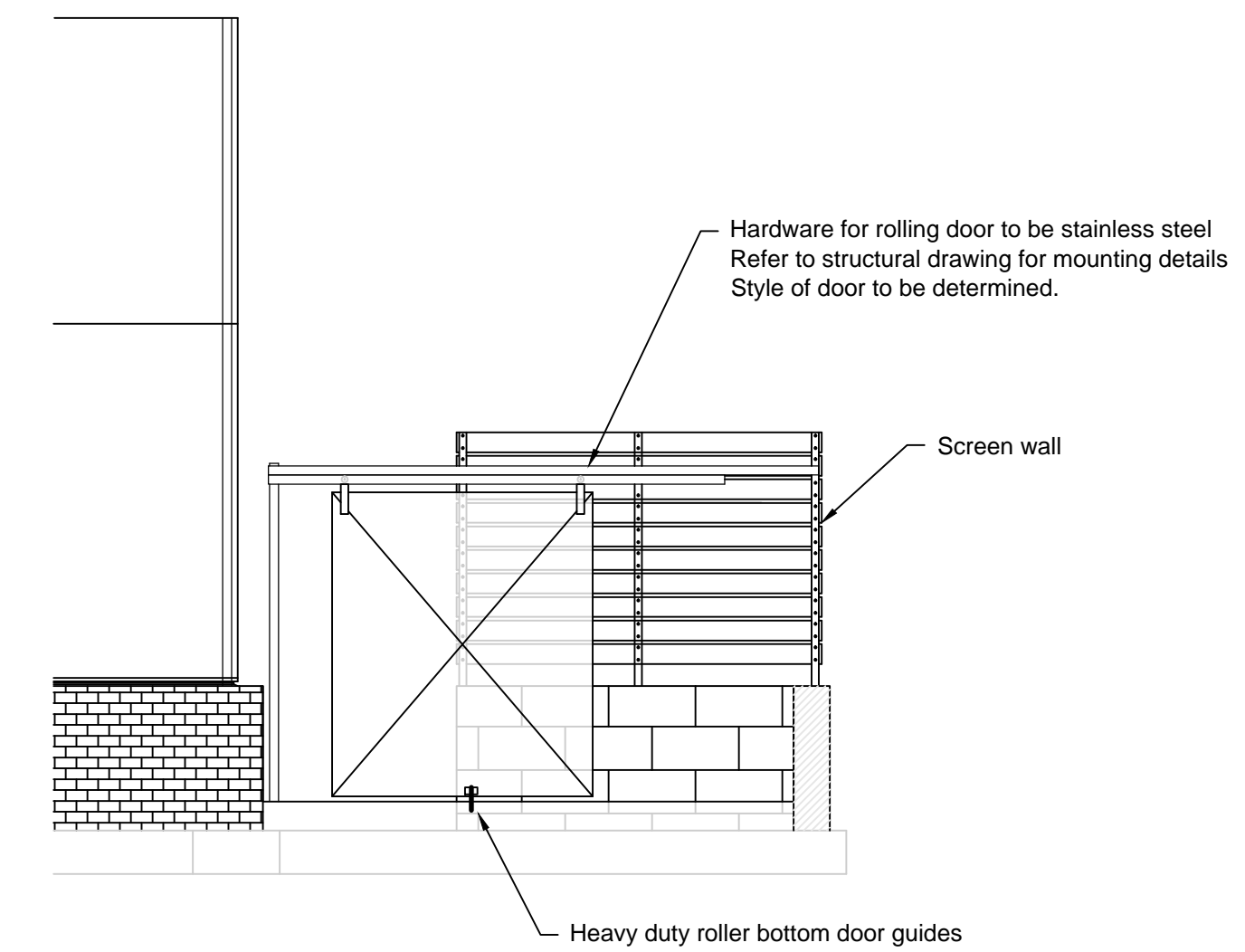
Owner will provide the bricks to be used in the construction of this project.



Section thru existing wall

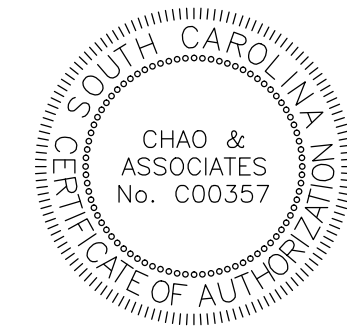


Section through work space



Elevation of storage area entrance

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Greenhouse Elevations
USC Greenhouse - State Project No. H27-Z090
Prepared for:
The University of South Carolina
Columbia, South Carolina

Drawn: TKS Checked: Lee

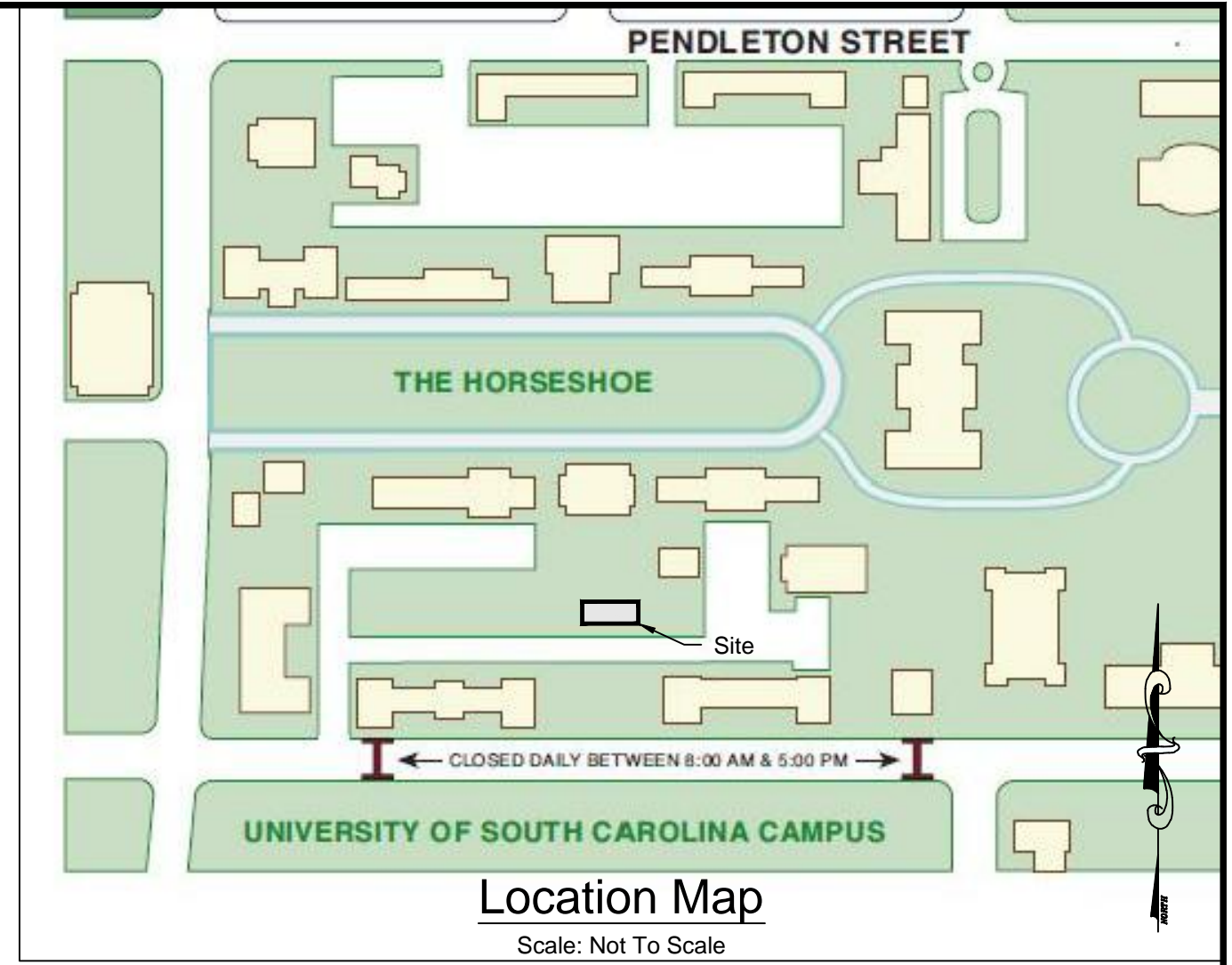
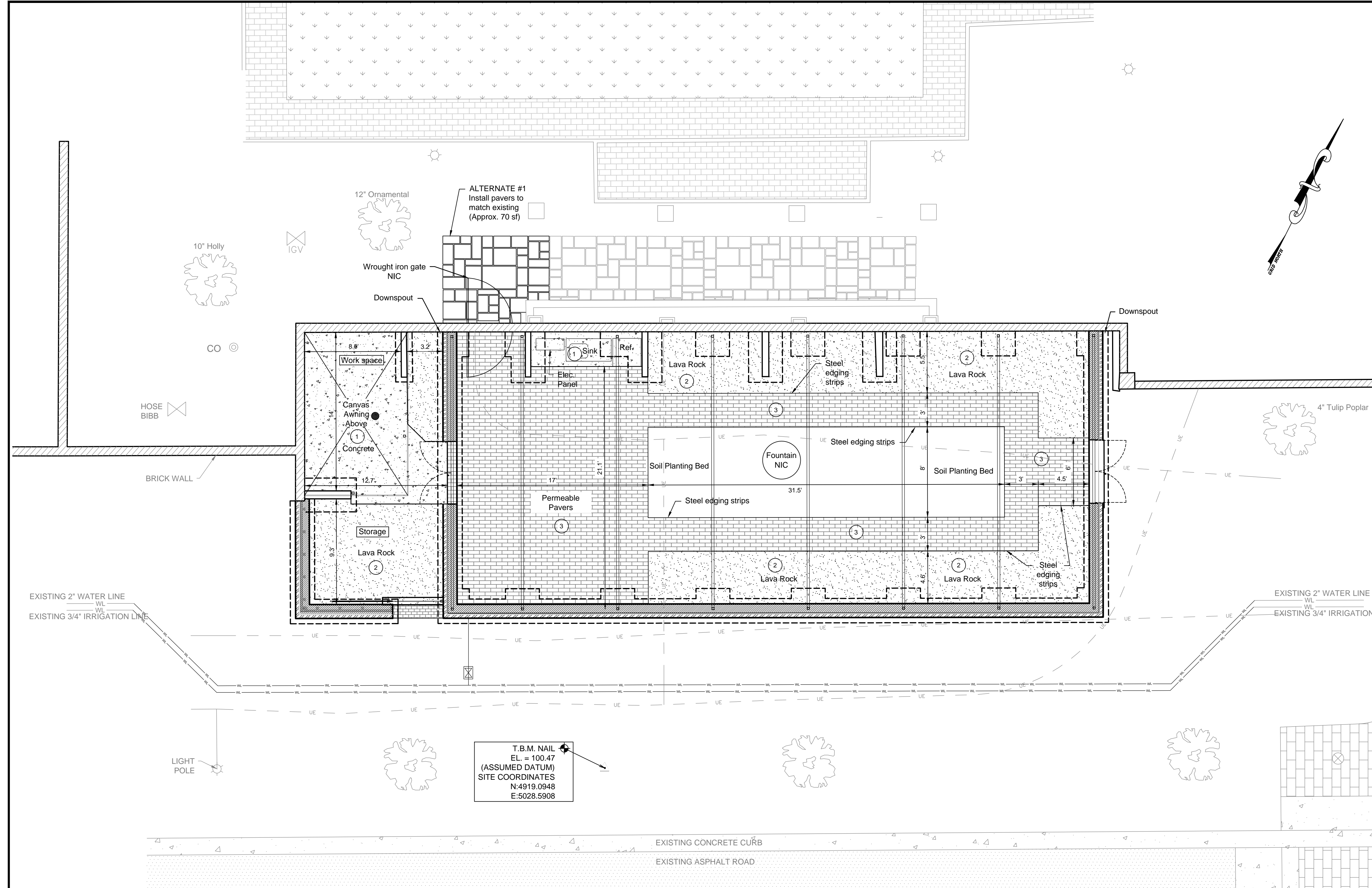
Revised:

Project No.: 577945
File: 577945C R1.dwg

Drawing file: 577945C_R1.dwg Plothead: Oct 28, 2013 - 6:21pm

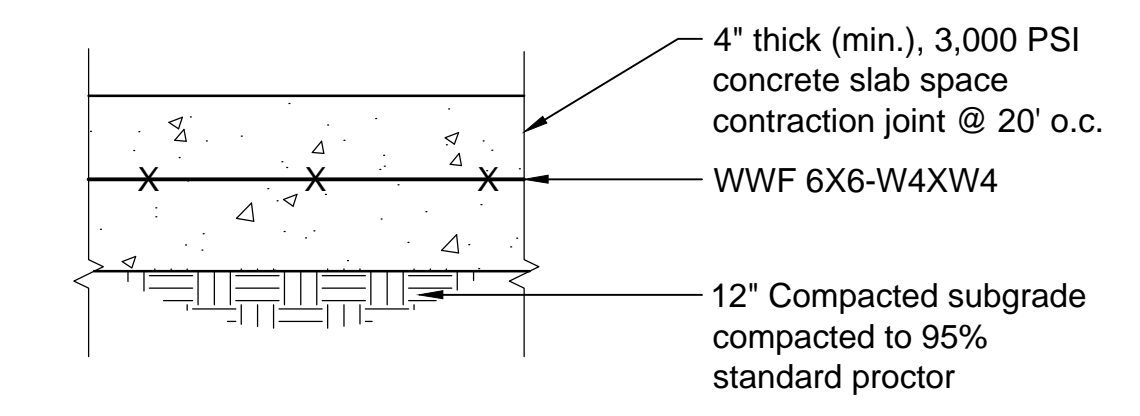
3 DAYS BEFORE DIGGING IN
SOUTH CAROLINA
CALL 811
Palmetto Utility Protection Service

C3.0
Sheet Number
October 23, 2013
Date

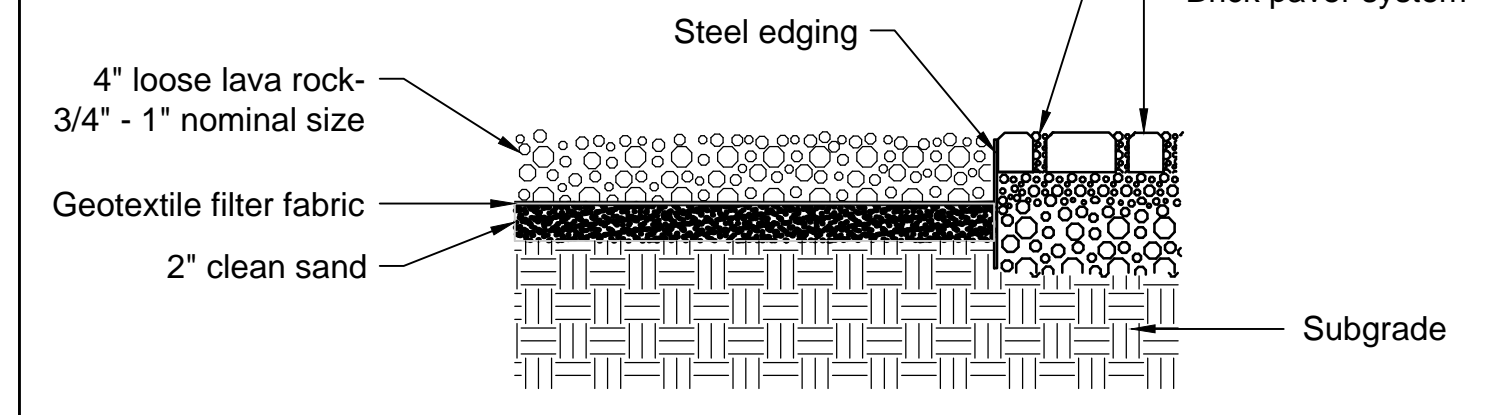


LEGEND	
	FIRE HYDRANT
	WATER VALVE
	WATER METER
	GAS VALVE
	SANITARY SEWER MANHOLE
	CLEANOUT (CO)
	GAS - NATURAL GAS LINE
	SS - SANITARY SEWER LINE
	WL - WATER LINE
	FENCELINE
	OE - OVERHEAD ELECTRIC
	UT - UNDERGROUND TELEPHONE
	FO - UNDERGROUND FIBER OPTIC LINE
	CTV - UNDERGROUND CABLE TV
	CURB & GUTTER
	JUNCTION BOX (JB)
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	HOOD & GRATE INLET (H&G)
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	HVAC CONCRETE PAD

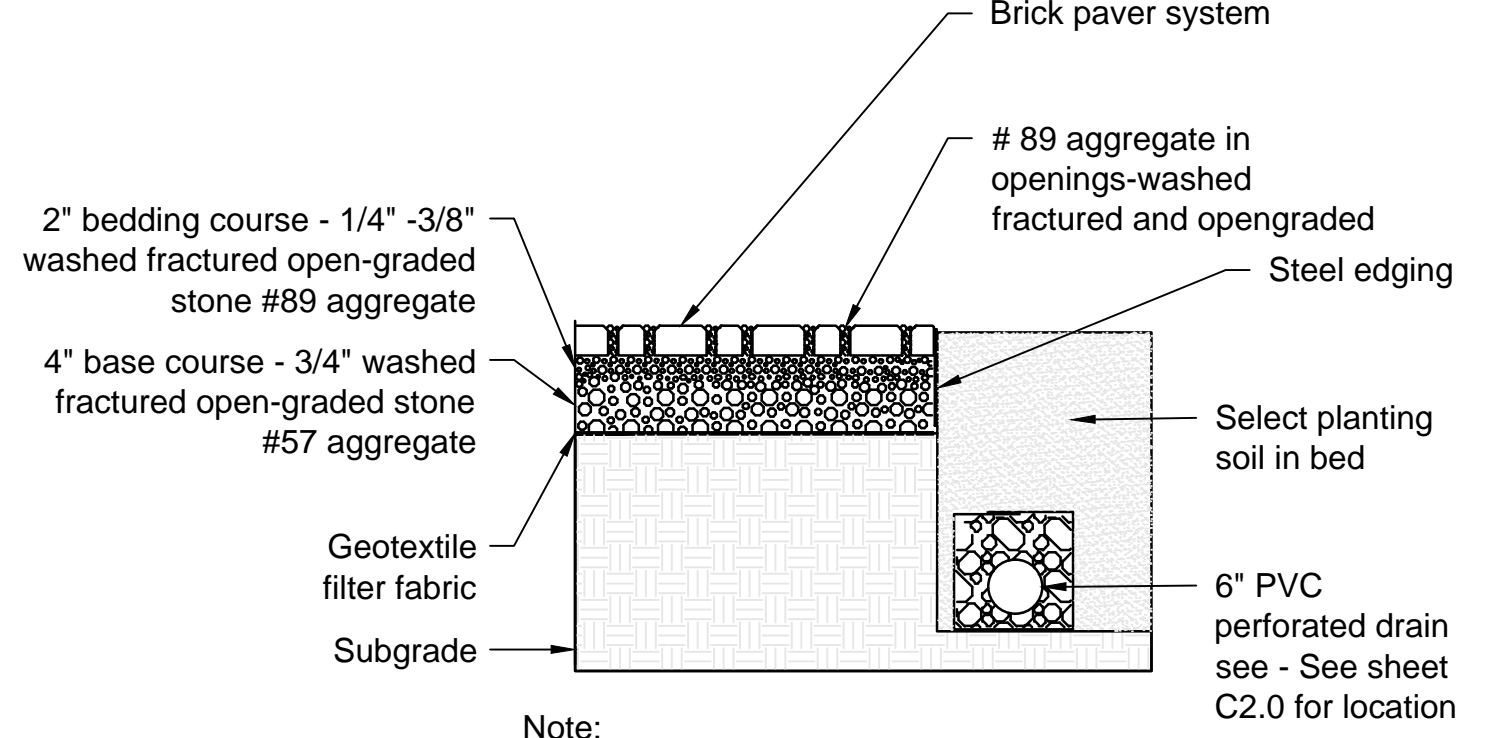
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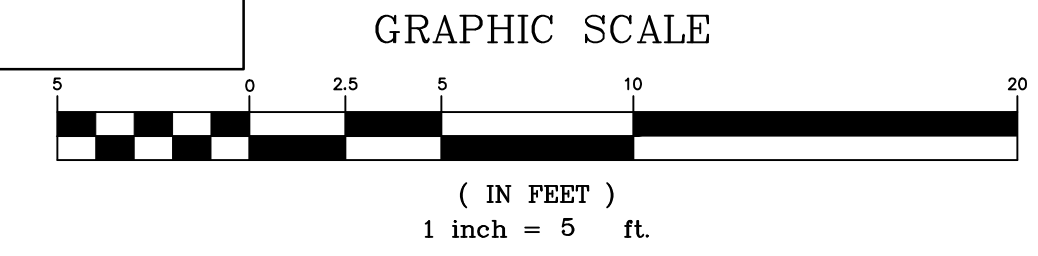
1 Poured Concrete Floor Detail
Not to Scale



2 Loose Lava Rock Installation Detail
Not to Scale



3 Pervious Brick Pavers Detail
Not to Scale



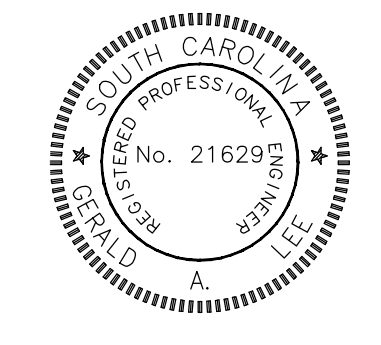
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Greenhouse Plan
USC Greenhouse - State Project No. H27-Z090
Prepared for:
The University of South Carolina
Columbia, South Carolina

Drawn: TKS
Checked: Lee
Revised:
Project No.: 577945
File: 577945C R1.dwg

C4.0
Sheet Number
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General Notes:

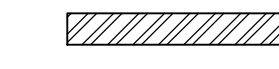
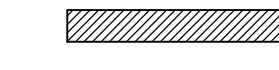

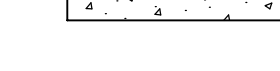
- Design Specifications: International Building Code (2012 Edition).
Design Loads:
Roof live load: 20 PSF flat (less than 4" per foot)
16 PSF pitched
Snow load: 10 PSF (Ground)
Dead load: Actual
Wind Velocity: 105 MPH
Exposure Category: B
Site Class: D
Risk Category I
Mapped Spectral Response Accelerations: $S_s=1.66$ g, $S_1=0.47$ g
Site coefficients: $F_a=1.0$, $F_v=1.53$
Seismic design category: D
Basic seismic resistance system: Moment resist frame systems (see Manufacture)
Response modification factor: (R): (see Manufacture)
Deflection amplification factor: (Cd): (see Manufacture)
Seismic Analysis Procedure: Equivalent lateral force procedure.
- The construction falsework design (if any) is the responsibility of the Contractor. The design shall be performed by a Registered Engineer and shall be submitted for approval before commencing of the work.
- Where a detail is shown on Structural Drawings for one condition, it shall apply to all similar or like conditions, unless noted or shown otherwise on plans.
- All items shall be tightly anchored or attached square, plumb, and true, or in other planes and shapes as shown on the drawings. Joints shall be tight, even, and free of offsets. No field altering of any members will be allowed that will cause them not to be in accordance with the drawings and specifications, without written approval of the Project Engineer.
- The dimensions shown with a suffix "±" are approximate and shall be verified by the Contractor before fabrication.
- If the Contractor finds a difference between these drawings & existing conditions, or finds any other conditions which prohibit execution of the work as directed in these drawings, the Contractor shall notify the Engineer immediately.
- The Owner shall employ a laboratory to perform the quality assurance, sampling, testing and/or inspection at his expense. Final selection of such laboratory shall be approved by the Engineer.
- The foundation is designed based on the allowable soil bearing pressure of 2 KSF. The foundation excavation shall be verified by a Geotechnical Engineer before the placement of foundation. Foundation construction shall be complied with the geotechnical report. All fill soil shall be compacted at 8" lift in loose thickness. All subgrade of foundation shall be compacted to 95% standard proctor density as a minimum or as directed by soil report.
- Any revision/modification to the original design during the shop drawing process, the Contractor shall clearly cloud line all the changes and shall receive approval from the Engineer in writing before fabrication. Any costs associated with correcting the unapproved change shall be at the Contractor's expense.
- The foundation is Based on the estimate force and size may be adjusted per Greenhouse manufacturer's Design reaction.
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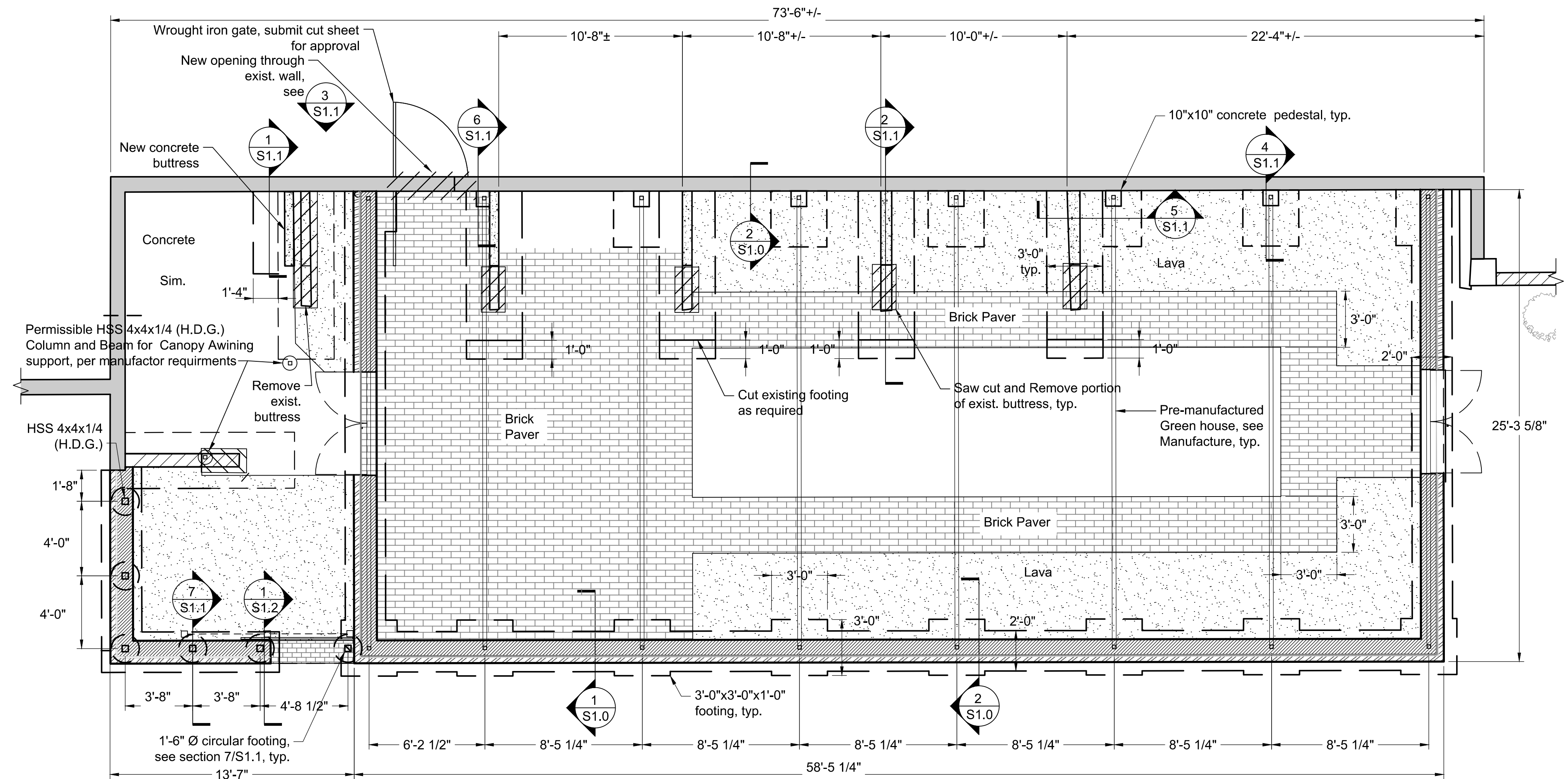
Concrete:

- Concrete: concrete minimum compressive strength at 28 days shall be 3,000 PSI.
- Reinforcement: all mild reinforcement bar shall be A615 grade 60 steel. All welded wire fabric shall conform to ASTM A185, grade 65. All welded wire fabric shall be in sheets and shall be supported on chairs.
- Bending dimensions & tolerances for reinforcing bar shall conform to current CRSI Manual of Standard Practice.
- Lap splices shall conform to the current CRSI Manual of Standard Practice unless otherwise noted.
- Horizontal construction joints to be scrubbed with a coarse wire brush at the approximate time of initial set to remove all laitance and to produce a roughened surface.
- Concrete work shall comply with ACI "Specifications for Structural Concrete" (ACI 301-05) and applicable provisions of ACI 318-05, keep a copy of ACI Field Reference Manual (ACI SP-15-05) Which includes ACI 301 and other ACI and ASTM references on the job.
- Detailing, fabricating, and placing of reinforcing steel and accessories shall be in accordance with ACI "Details and Detailing of Concrete Reinforcement" (ACI 315-99) and shall comply with (ACI 318-05) and with (ACI 301-05).
- The contractor shall select the testing laboratory & employ the laboratory at the contractor's expense to perform concrete strength testing per ACI 318-05. Final selection of testing laboratory shall be approved by engineer.

Masonry:

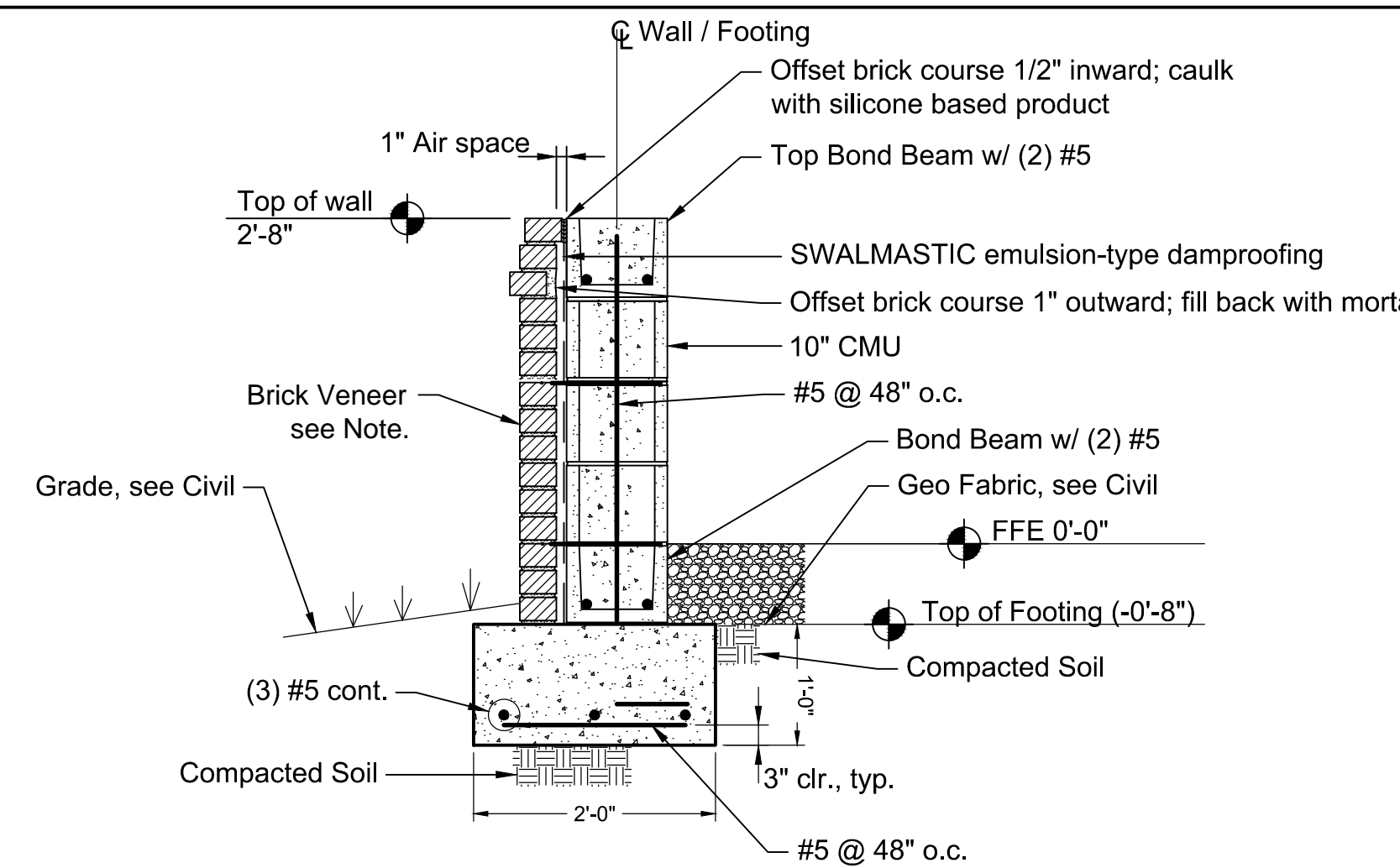
- Masonry materials and workmanship shall comply with "Building code requirements for masonry structures" (ACI 530-05/ASCE 5-05).
- Concrete masonry units shall be 8" nominal hollow core units with minimum net compressive strength of 1900 PSI, as determined by the manufacturer. $f'_m=1500$ PSI determined by unit strength method.
- Clay masonry units shall be 4" nominal solid units with minimum net compressive strength of 6000 PSI, as determined by the manufacturer.
- Vertical reinforcing shall be provided where shown or noted on plans/details, and shall be grouted with 3000 PSI coarse grout per ASTM C476.
- Place bar(s) in end cell of all jamb openings and corners. Space bar(s) as indicated on plans between jambs and corners.
- Reinforcing bars shall extend from footing dowels to top of wall continuous through all concrete, lintel, and bond beams.
- Accurately position and secure vertical reinforcing with #9 hard steel galvanized wire centering clips or spacers.
- Provide 2"x1/4"x32" strap anchors at 16" O.C. at wall intersections.
- Masonry mortar:
 - Concrete masonry mortar from foundation to roof shall be type S with full mortar bedding from foundation to roof.
 - Mortar types are as noted above and called for in the specifications. ASTM C-780. Copies of all reports shall be submitted to the owner or his representatives.
- Provide horizontal joint reinforcing at 16" vertical spacing unless notes otherwise. Provide ladder type horizontal reinforcing extending into 4" veneer at every concurrent course.
- Lap all masonry vertical wall steel 48 bar diameters unless noted otherwise on the drawings.
- University to provide Recycle Brick for use of this project.

-  Denotes Brick Veneer, see Note
-  Denotes 10" CMU wall
-  Denotes existing brick wall
-  Denotes existing concrete buttress U.N.O.



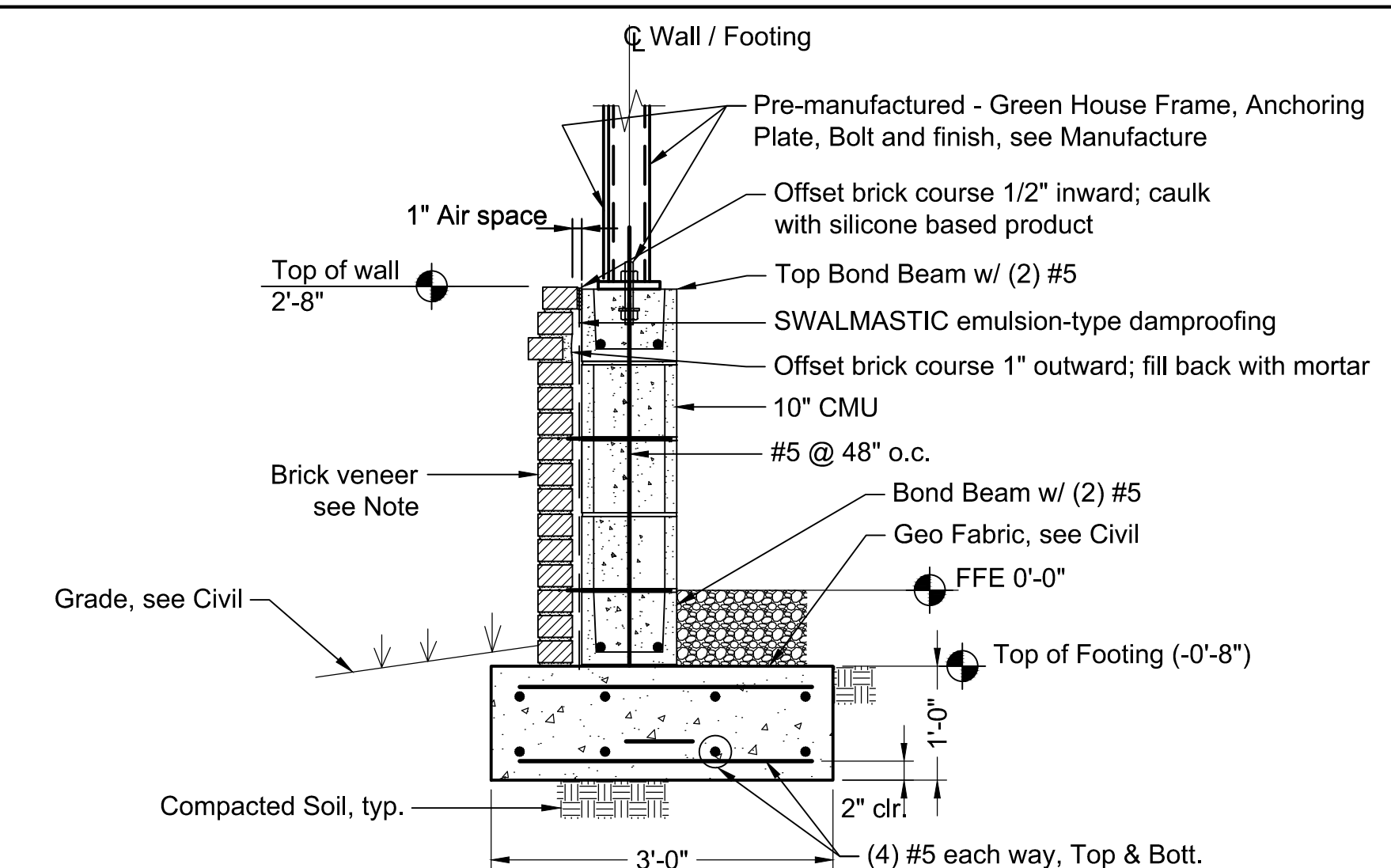
Greenhouse Foundation Plan

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



1 - Section

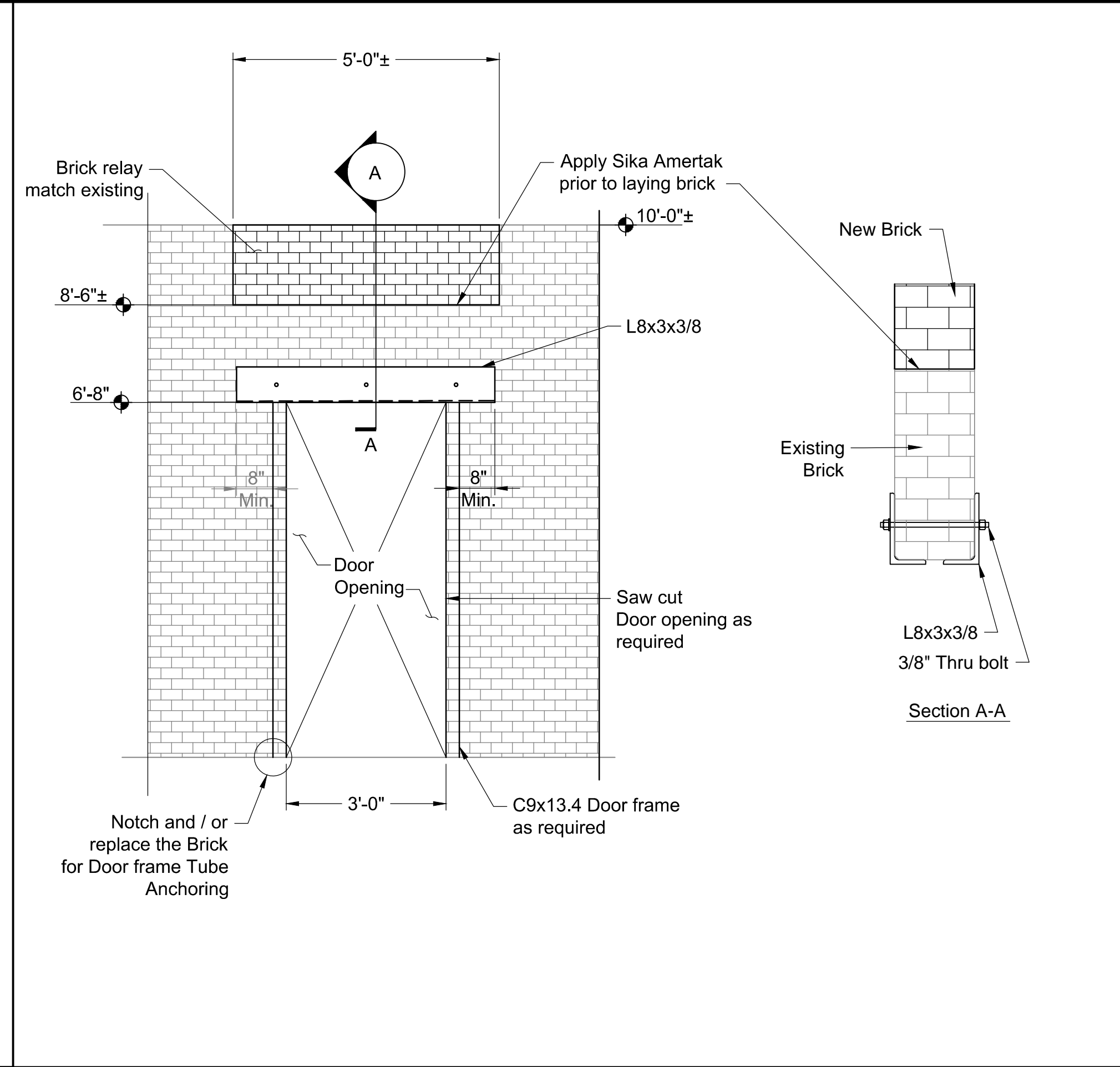
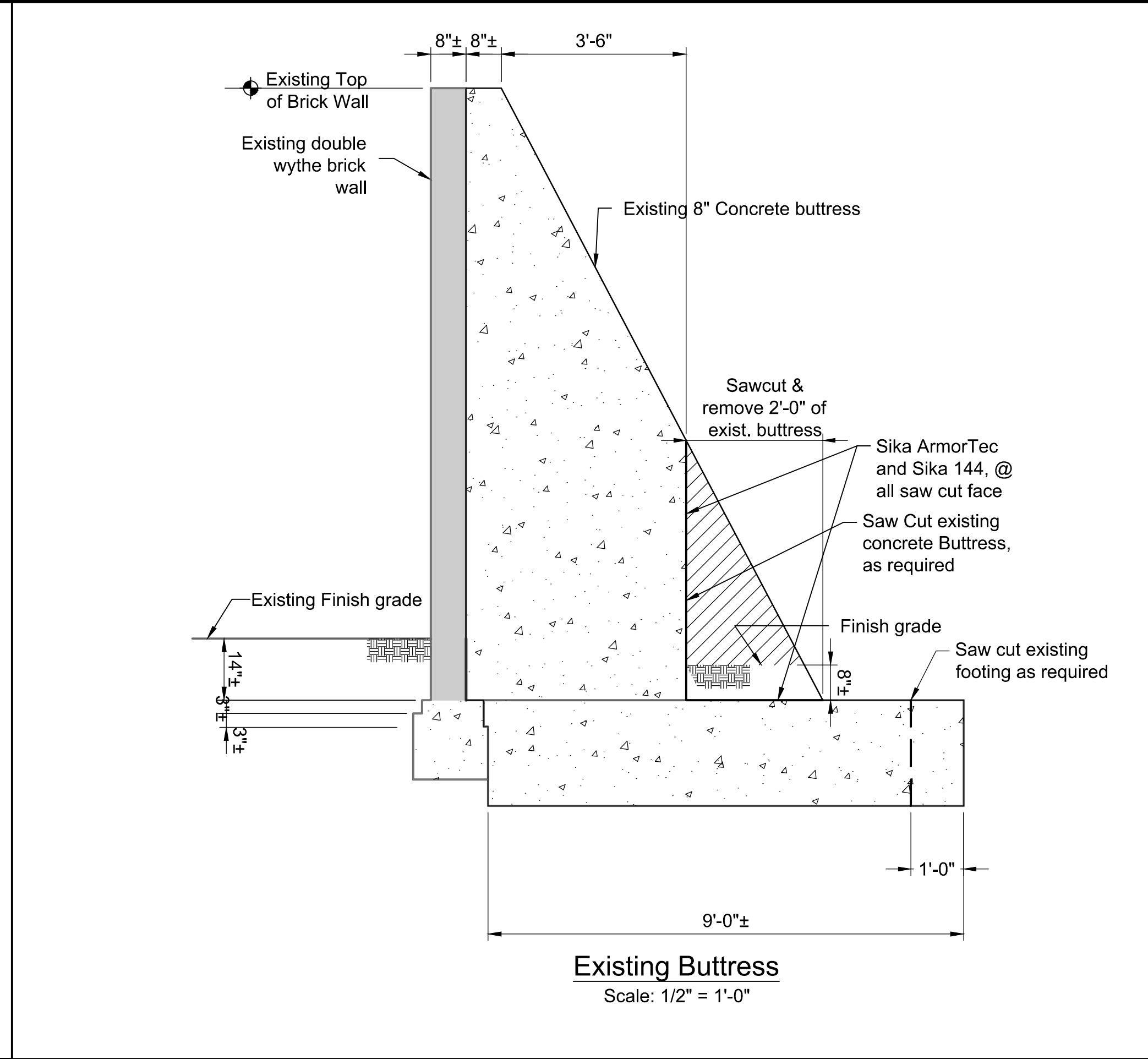
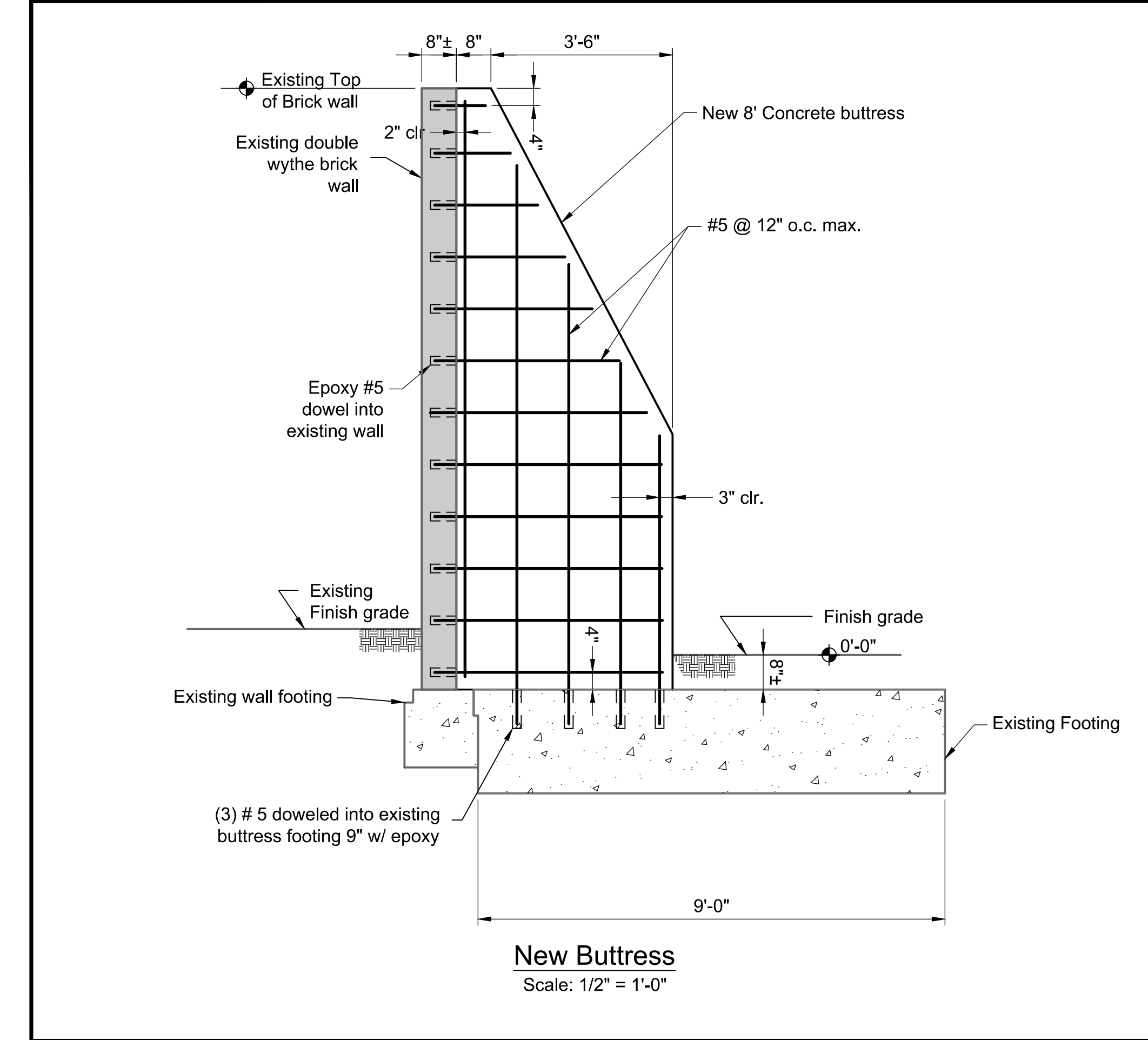
Scale: 3/4" = 1'-0"



2 - Section

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

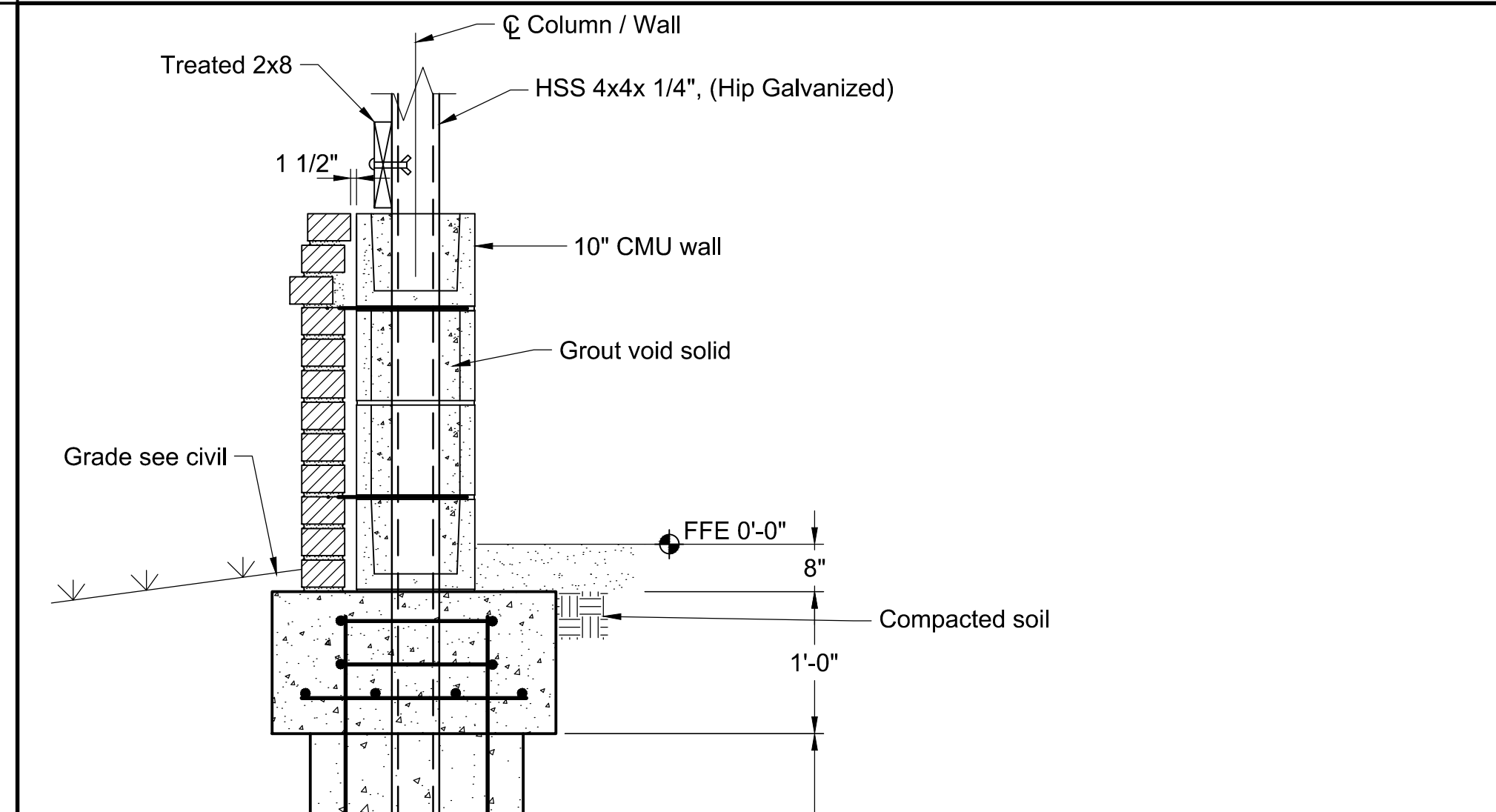
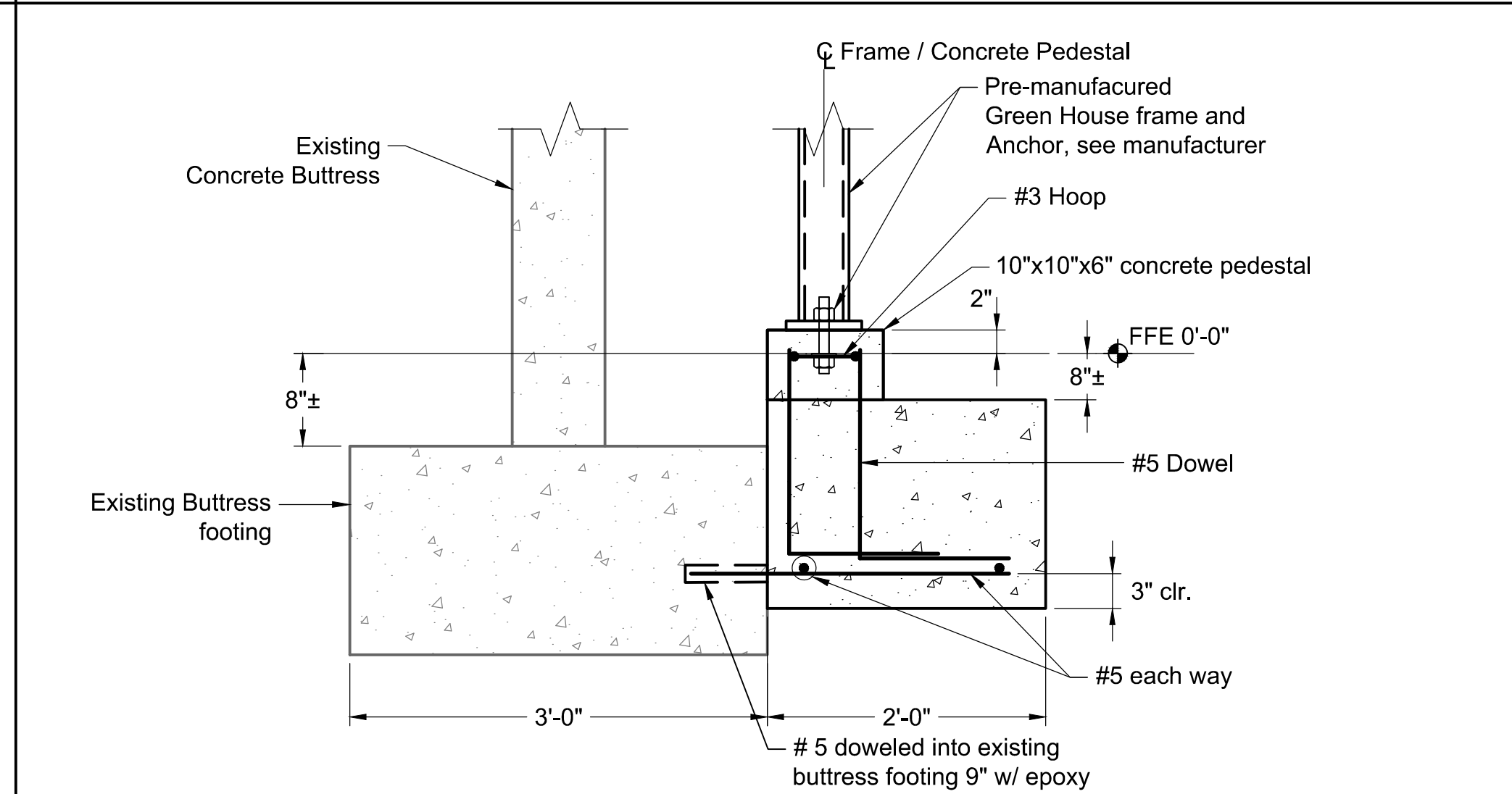
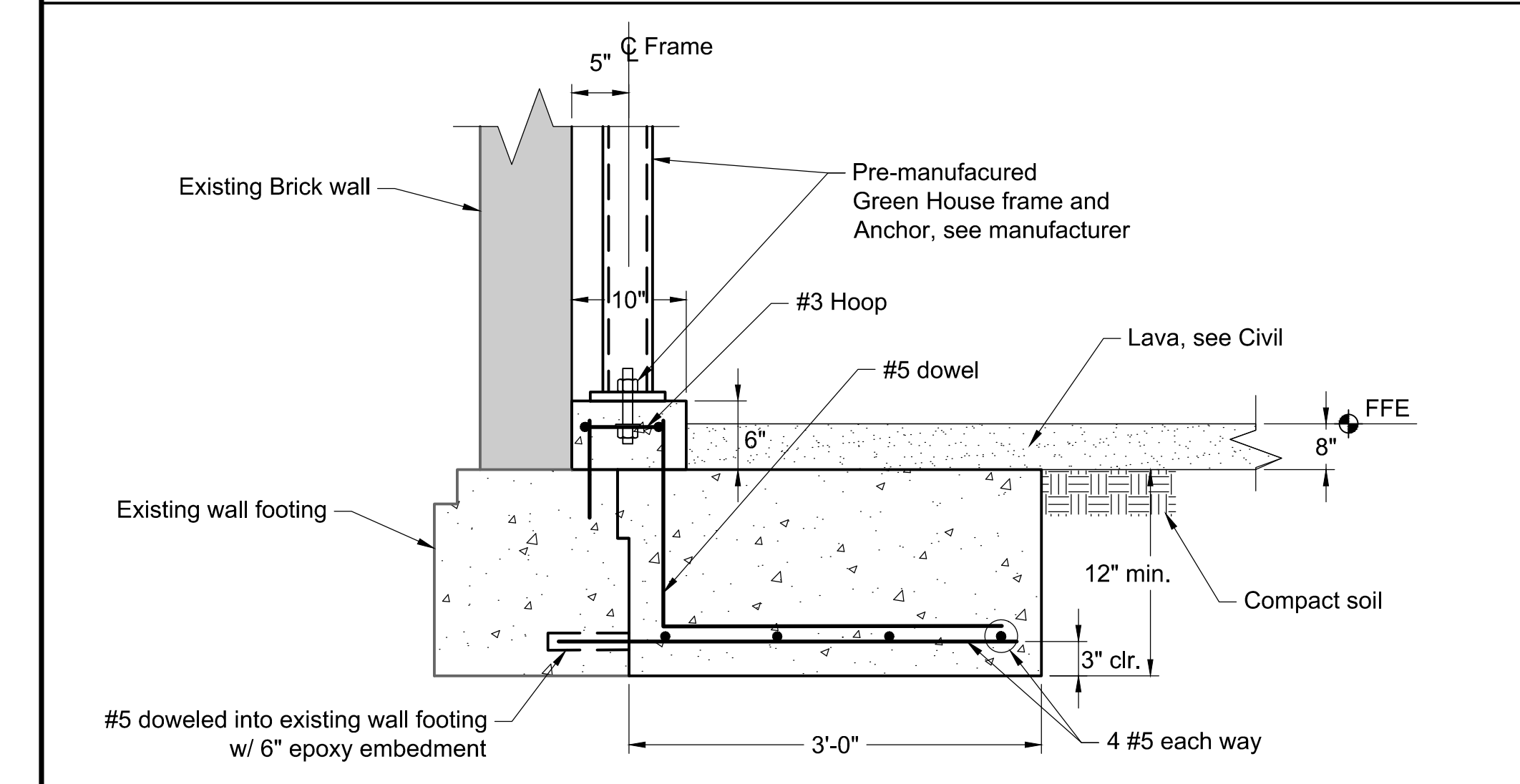
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4 - Section Scale: 1/2" = 1'-0"

2 - Section Scale: 1/2" = 1'-0"

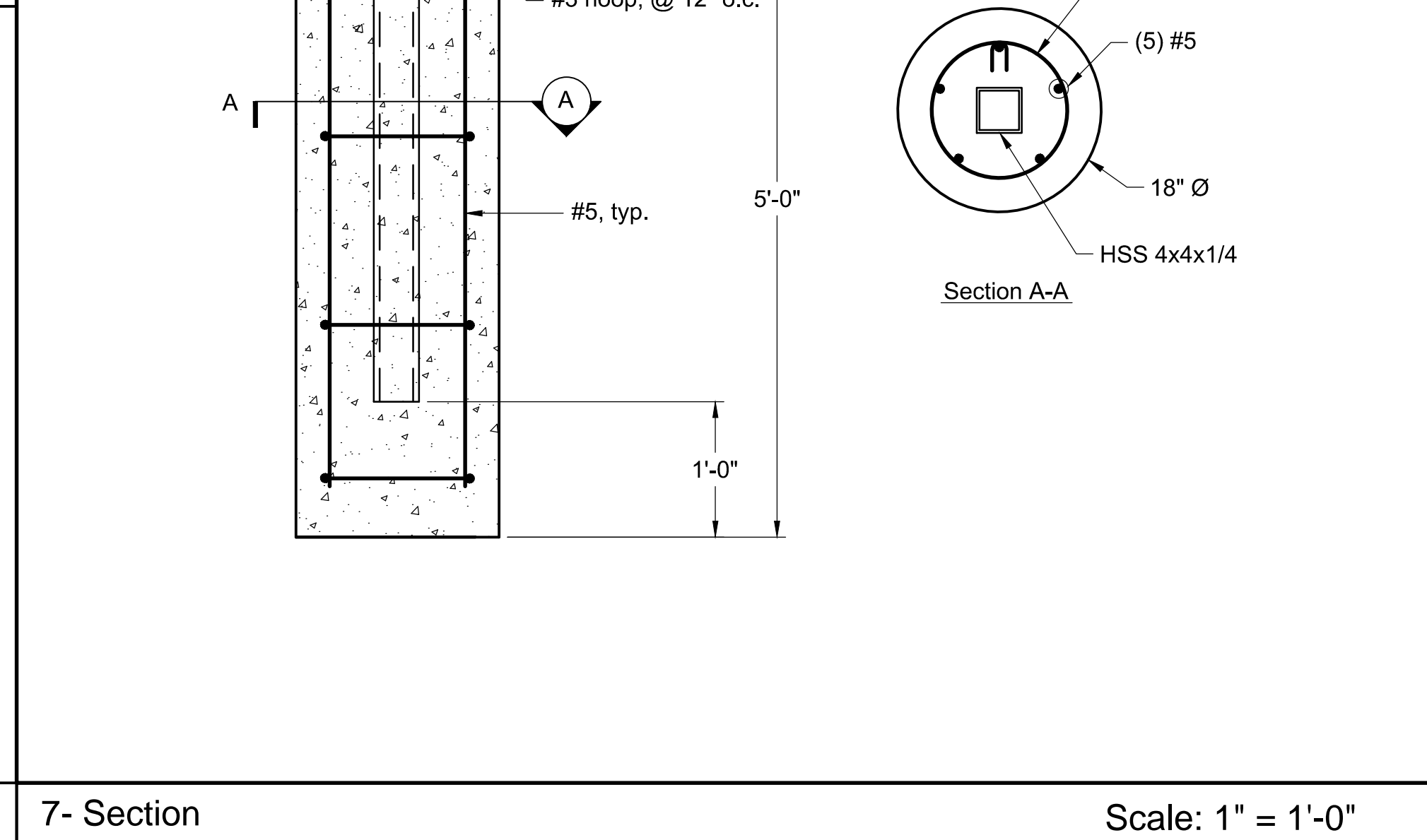
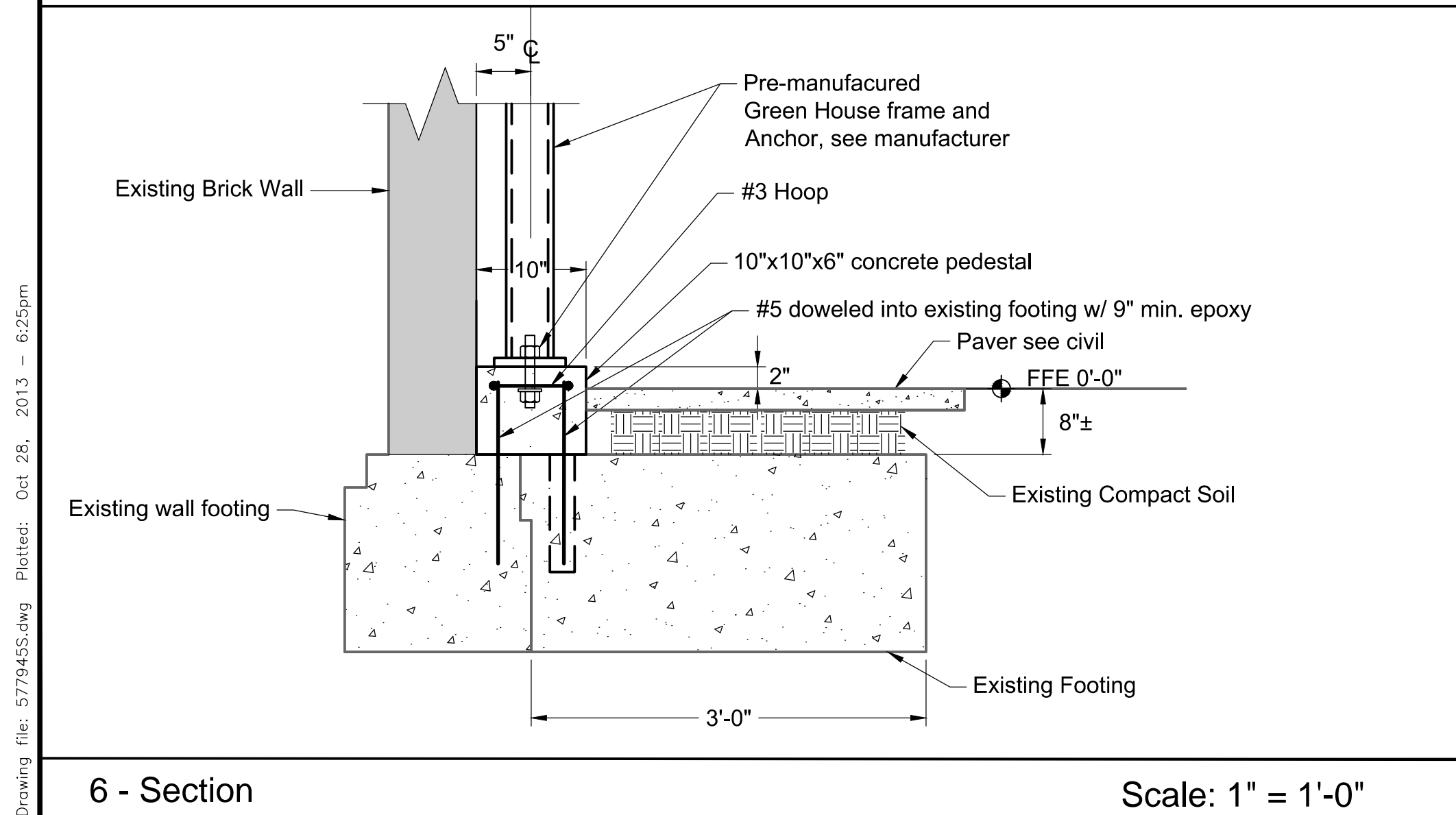
3 - Section Scale: 1/2" = 1'-0"



4 - Section Scale: 1" = 1'-0"

5 - Section Scale: 1" = 1'-0"

7 - Section Scale: 1" = 1'-0"



6 - Section Scale: 1" = 1'-0"

5 - Section Scale: 1" = 1'-0"

7 - Section Scale: 1" = 1'-0"

Drawing file: 577945S.dwg, Plotted: Oct. 28, 2013 - 6:25pm

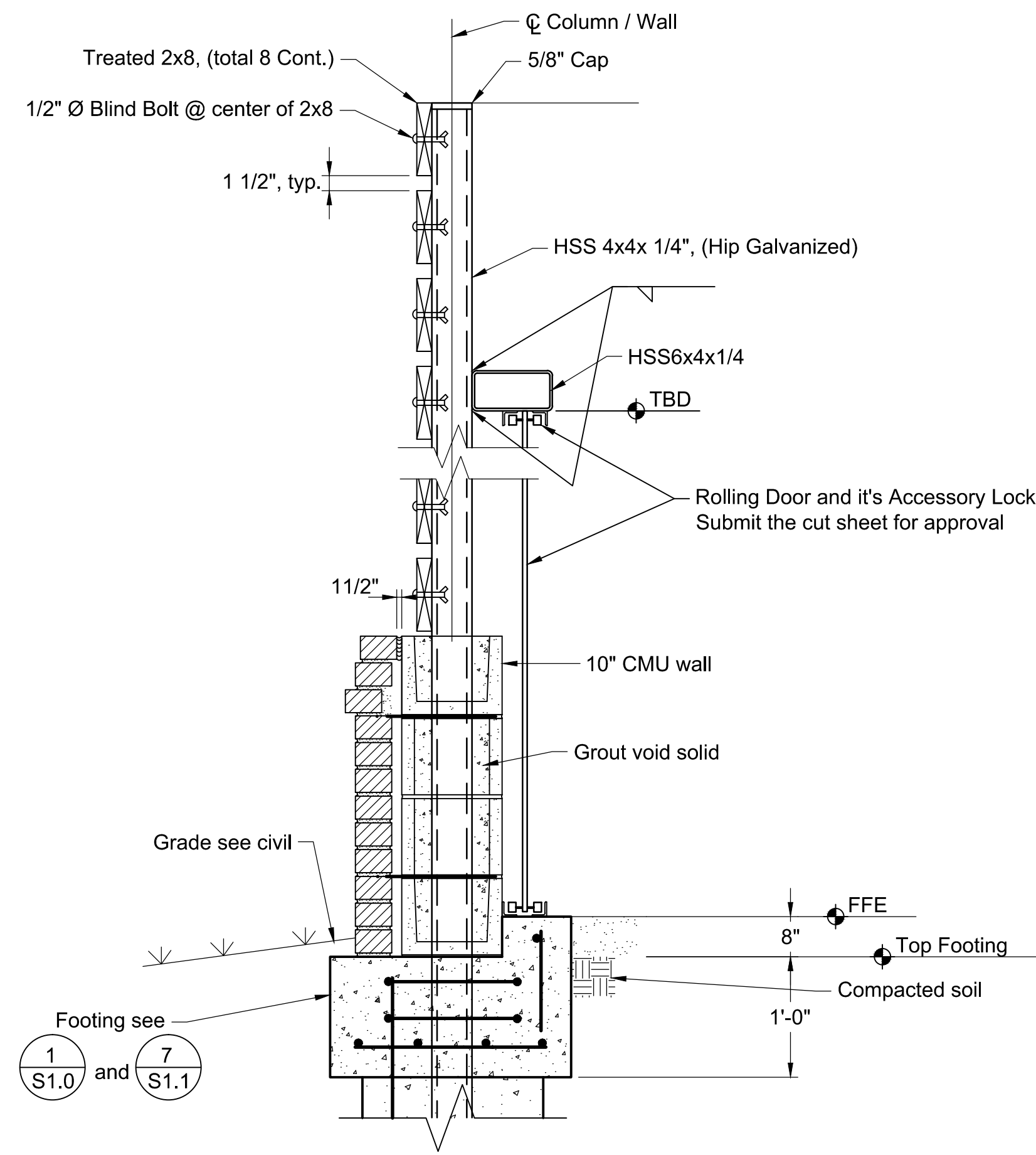


Chao & Associates, Inc.
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 7 Clusters Court
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 Fax: (803) 772-9120
 Email: consult@chaoinc.com

Sections and Details
 USC Greenhouse - State Project No. H27-Z090
 Prepared for:
 The University of South Carolina
 Columbia, South Carolina

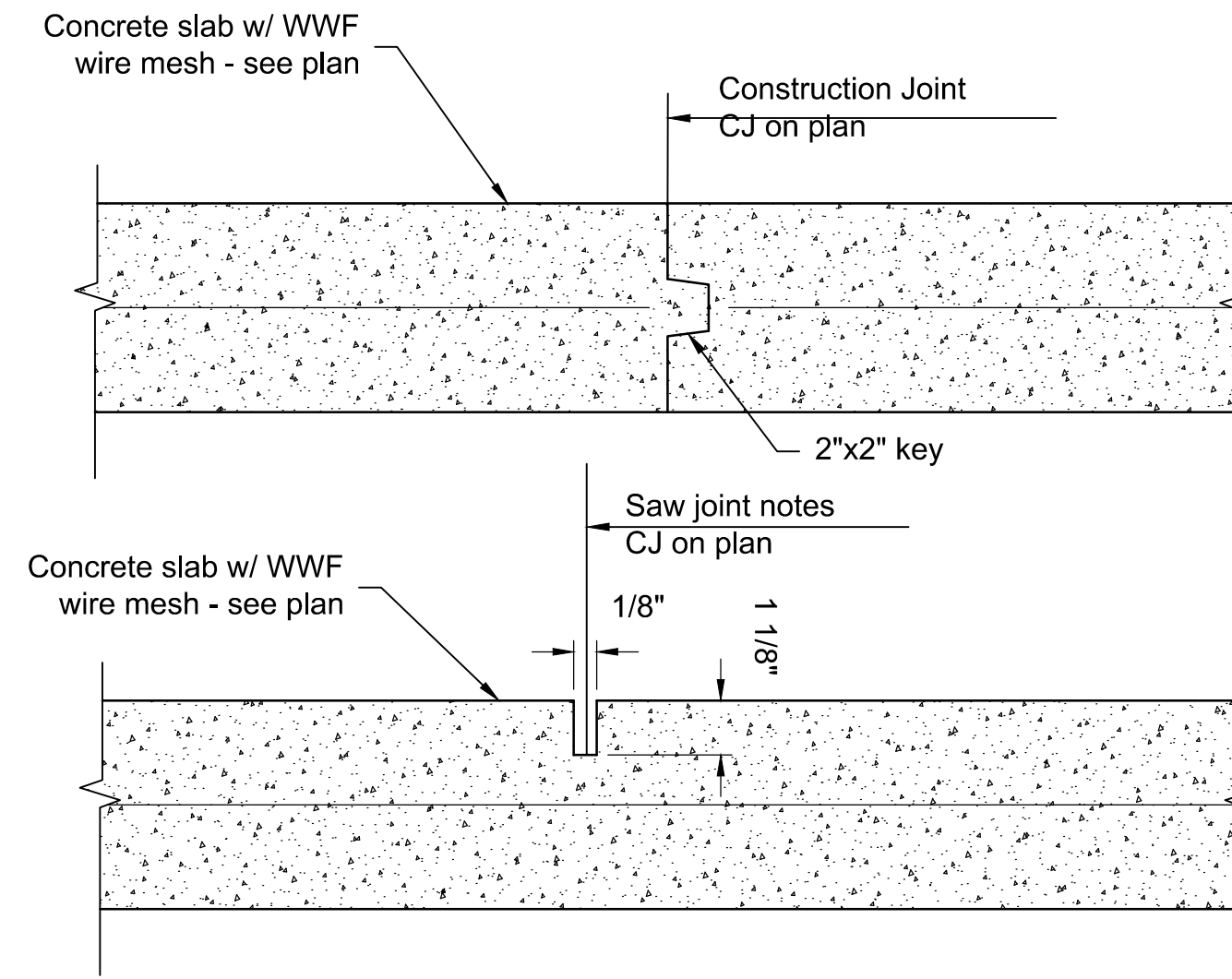
Drawn: TKS
 Revised:
 Checked: Lee
 Project No.: 577945
 File: 577945S.dwg

S1.1
 Sheet Number
 Oct. 25, 2013
 Date

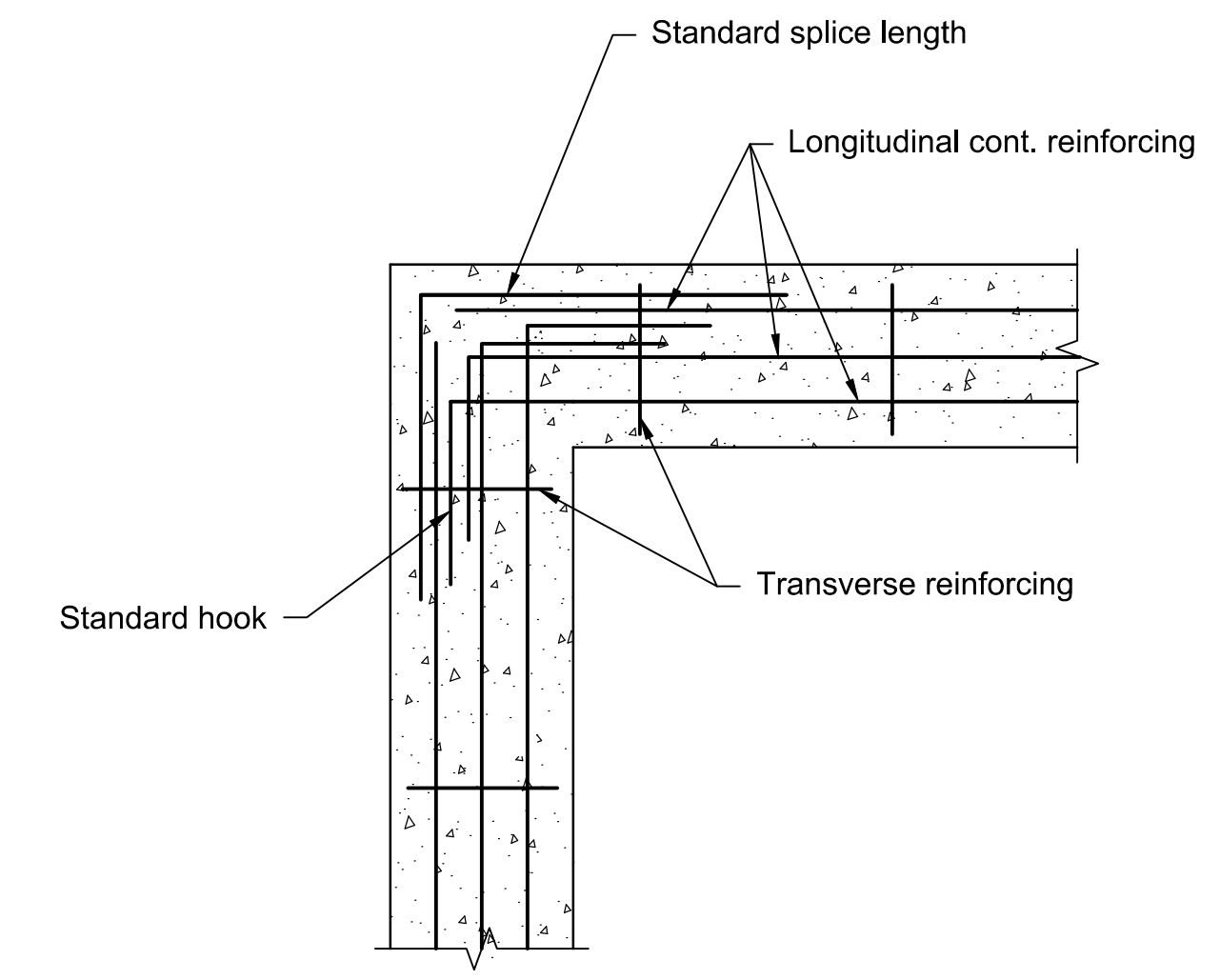


1 - Section

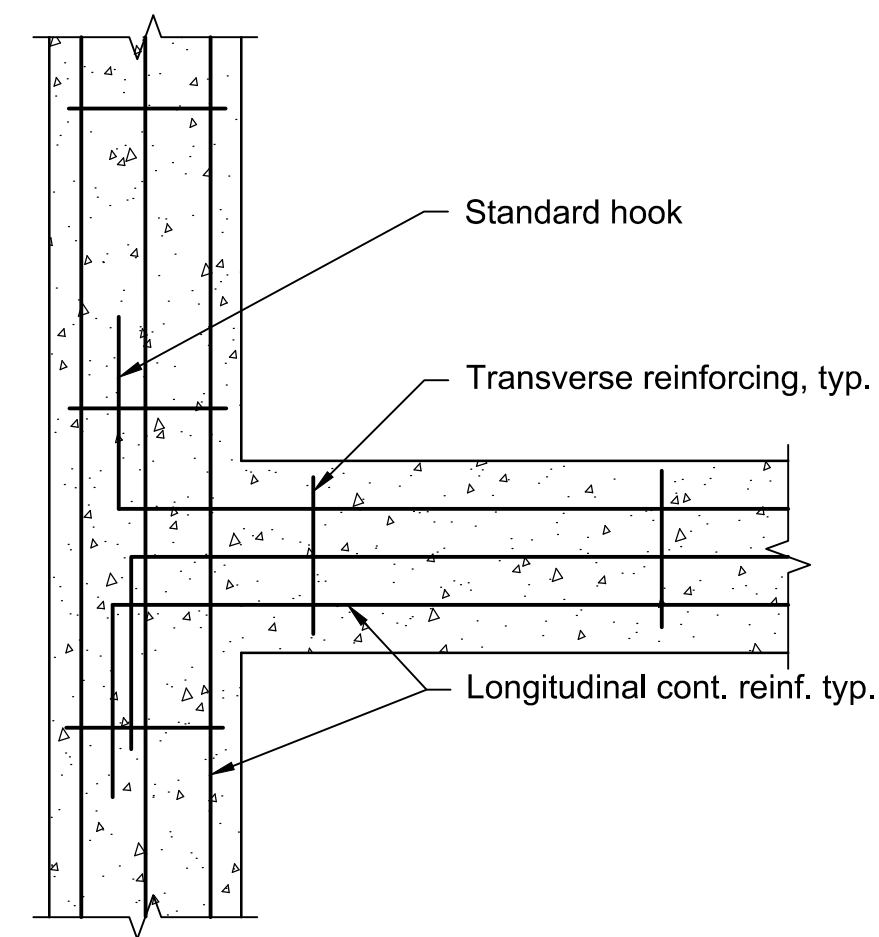
Scale: 1" = 1'-0"



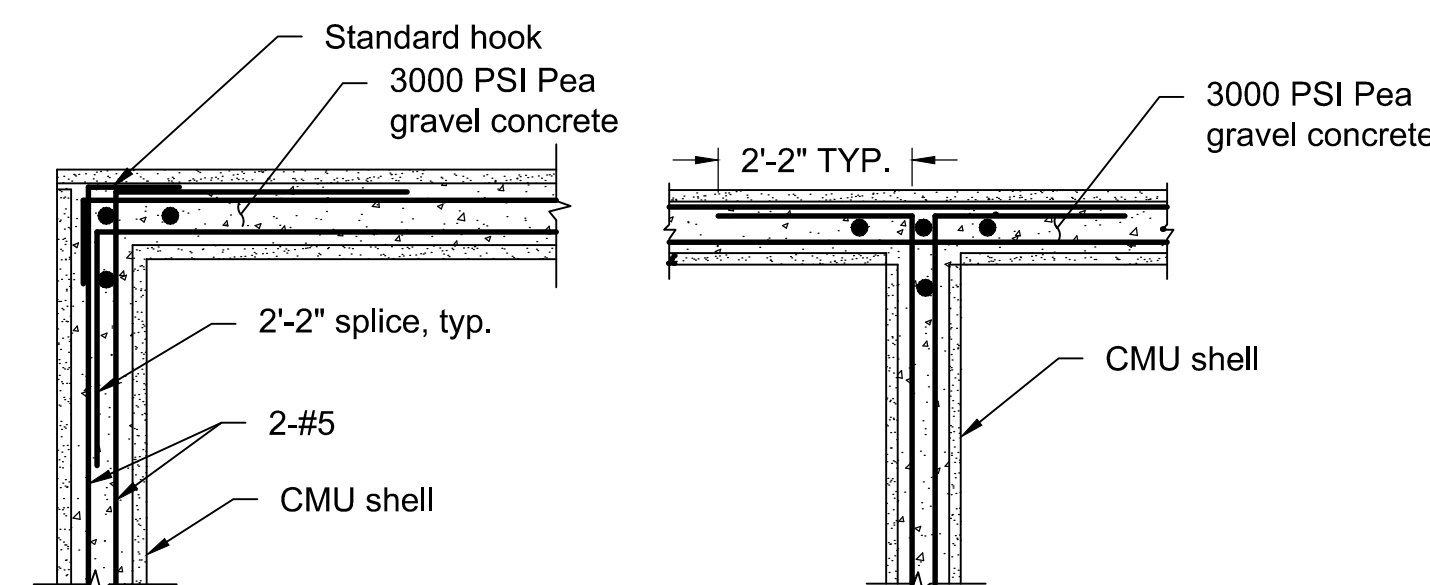
Control Joint Details
Not to scale
(MAX. 12' on center)



Typical Continuous Footing Corner
Not to scale



Typical Continuous Footing Intersection
Not to scale



TYP. Bond Beam Intersection
Not to scale

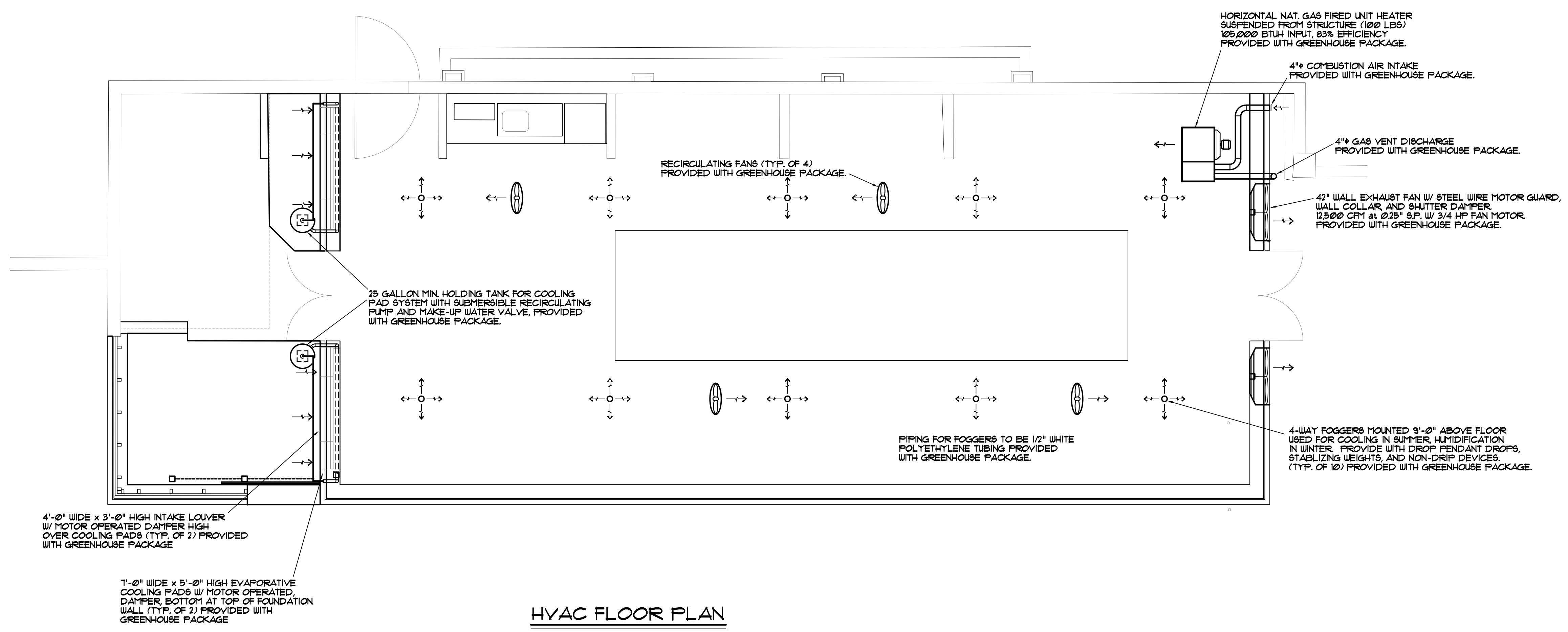
6 - Section

Scale: 1" = 1'-0"

7- Section

Scale: 1" = 1'-0"

Drawing file: 577945S.dwg, Plotted: Oct. 28, 2013 - 6:27pm



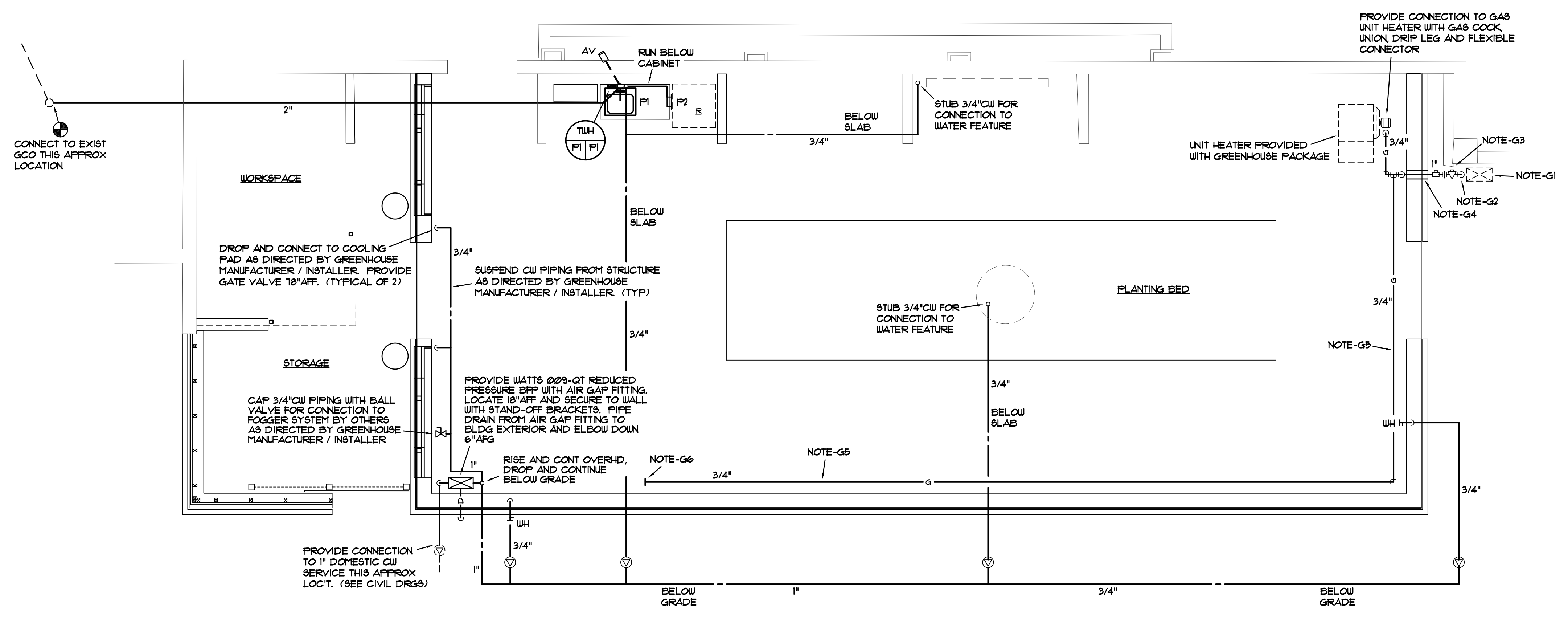
100% SUBMITTAL DRAWING

MECHANICAL DESIGN, INC.
4403 Broad River Road
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CONTACT: Danny Wilds
DATE: 10/23/13 COMM. NO. 133017

MECHANICAL DESIGN, INC.
No. C00096

SOUTH CAROLINA
CERTIFICATE OF AUTHORIZATION

M1.0
Sheet Number
October 23, 2013
Date



PLUMBING FLOOR PLAN
 SCALE: 1/4" = 1'-0"

PLUMBING FIXTURE SCHEDULE						
SYMBOL	DESCRIPTION	CW	HW	WASTE	VENT	MOUNTING HEIGHT
P1	1-COMP SINK	1/2"	1/2"	2"	1-1/2"	SEE ARCH
P2	ICE MAKER BOX	1/2"	---	---	---	24"
WH	WALL HYDRANT	3/4"	---	---	---	18"

- PLUMBING NOTES**
- DO NOT SCALE DRAWINGS. ROUGH FROM ARCHITECTURAL AND EQUIPMENT MANUFACTURER'S DRAWINGS.
 - COORDINATE PLUMBING SYSTEMS WITH ALL TRADES TO AVOID INTERFERENCE AND CONFLICTS PRIOR TO INSTALLATION OF PIPING, FIXTURES, AND EQUIPMENT.
 - ALL WORK AND MATERIALS SHALL BE IN ACCORDANCE WITH THE (IBC) BUILDING, (IPC) PLUMBING AND (IFGC) FUEL GAS CODES, 2012 EDITIONS OF THE (ICC) INTERNATIONAL CODE COUNCIL AND ALL LOCAL CODES AND ORDINANCES.
 - WHENEVER THE WORD "PROVIDE" IS USED, IT SHALL MEAN FURNISH AND INSTALL COMPLETE AND READY FOR USE.
 - UNLESS OTHERWISE SHOWN OR NOTED, ALL PIPING SHALL BE RUN CONCEALED IN WALLS, CHASES AND/OR ABOVE CEILING.
 - PROVIDE AIR CHAMBERS ON HOT AND COLD WATER SUPPLY AS REQUIRED. SIZE ONE PIPE SIZE LARGER THAN SUPPLY. (SEE DETAIL)

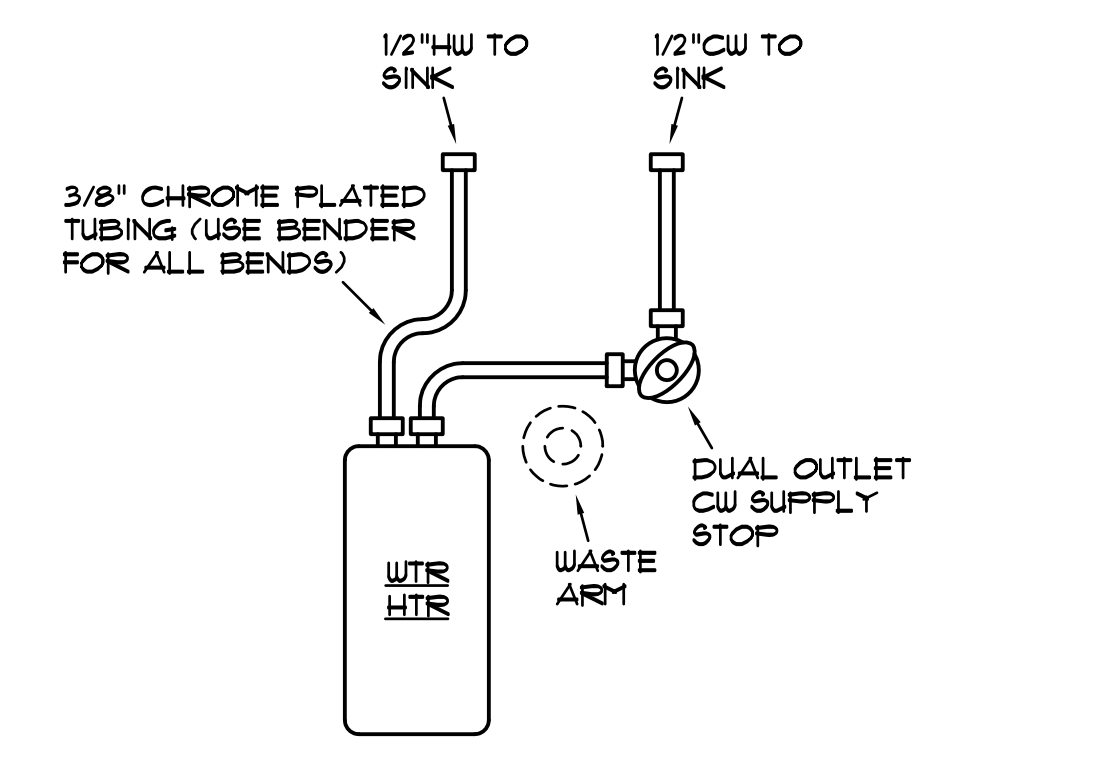
PLUMBING SYMBOLS	
SYMBOL	DESCRIPTION
---	SANITARY WASTE PIPING
- - - -	SANITARY VENT PIPING
---	COLD WATER PIPING
---	HOT WATER PIPING (120°F)
-G-	GAS PIPING (14" W.C.)
⊕	GATE VALVE IN CAST IRON BOX
⊙	GAS COCK
∩	UNION
⊕	GAS REGULATOR (5 PSI TO 14" W.C.)
-H-WH	WALL HYDRANT
CW, HW	COLD WATER, HOT WATER
AFG	ABOVE FINISHED GRADE
AFB	ABOVE FINISHED FLOOR
AV	AUTOMATIC AIR VENT

- GAS PIPING NOTES**
- EXIST GAS METER AND REGULATOR TO BE RELOCATED BY OTHERS. (SEE CIVIL DRGS)
 - PROVIDE CONNECTION TO GAS PIPING AT RELOCATED METER AS REQUIRED. SECURE PIPING TO GREENHOUSE WITH STAND-OFF BRACKETS AS DIRECTED.
 - PROVIDE GAS COCK, UNION AND REGULATOR ON GAS PIPING SERVING GREENHOUSE. FIELD VERIFY OUTLET PRESSURE AT METER. SET PRESSURE DOWNSTREAM OF GAS REGULATOR TO 14" W.C. DELIVERY.
 - CORE BRICK WALL FROM THE OUTSIDE. PROVIDE SLEEVE FOR 1" GAS PIPING AND SEAL OPENING WATERTIGHT. (18" AFF)
 - SUSPEND GAS PIPING FROM STRUCTURE AS DIRECTED BY GREENHOUSE MANUFACTURER / INSTALLER.
 - CAP 3/4" GAS PIPING FOR FUTURE UNIT HEATER AS DIRECTED.

PLUMBING SPECIFICATIONS

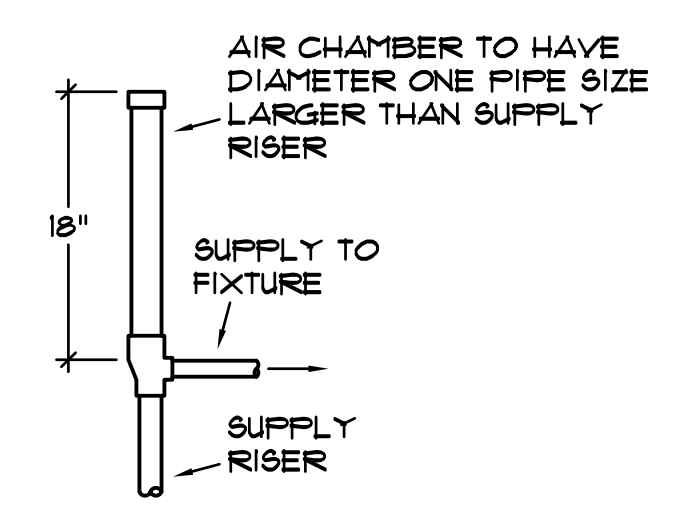
- | | |
|---|--|
| <p>1.0 SCOPE:</p> <p>A. Provide all related equipment, labor, materials, excavation and backfill, operations and accessories required for the installation of complete and quietly operating plumbing systems, in accordance with the plans and specifications.</p> <p>2.0 SOIL, WASTE, DRAIN, SEWER AND VENT PIPING:</p> <p>A. Soil, waste, drain and vent piping shall be sch 40 PVC plastic pipe with solvent cement drainage pattern and fittings.</p> <p>3.0 HOT AND COLD WATER PIPING:</p> <p>A. Hot and cold water piping to be hard drawn copper, Type K with soldered wrought copper fittings. Use lead-free hard solder (95-5) for all joints.</p> <p>4.0 GAS PIPING:</p> <p>A. Gas piping shall be sch 40 black steel pipe with threaded iron fittings. Provide dielectric unions where pipes of dissimilar materials meet.</p> <p>B. All gas valves, regulators, cocks and flexible connectors shall be CGA rated for gas service. Provide lockable 1/4 turn ball valves or gas cocks for gas service to each mechanical unit.</p> <p>C. Provide painting of exposed gas piping and regulator. Painting shall be completed in a neat and workmanlike fashion. Piping shall be cleaned, primed and painted prior to final acceptance. Painting shall consist of (2) coats red primer with (2) coats enamel applied to all exposed piping. Color shall be as selected by the Owner.</p> <p>5.0 PIPE INSULATION:</p> <p>A. Water piping shall be insulated with 1" thick 25/50 rated fiberglass with ASJ jacket and all seams sealed with mastic. Install in accordance with manufacturers requirements.</p> <p>B. Water piping shall be insulated with 1/2" thick 25/50 rated Armaflex flexible unicellular insulation in all interior walls. Install in accordance with manufacturers requirements.</p> <p>6.0 PIPE SUPPORTS:</p> <p>A. Support copper pipe with copper or copper plated hangers, spaced not over 6 feet apart for 1/2" pipe and 8 feet apart for larger pipes.</p> <p>B. Support waste and vent piping with hangers spaced in accordance with all local codes and ordinances.</p> | <p>7.0 FIXTURES:</p> <p>A. Plumbing fixtures shall be as selected by the Contractor and approved by the Owner.</p> <p>B. Provide stop valves for all fixtures.</p> <p>8.0 WALL HYDRANT:</p> <p>A. Provide Woodford 67 3/4" self-draining anti-freeze wall hydrant with integral vacuum breaker and loose key operator.</p> <p>B. Equal wall hydrant by Zurn or Josam will be accepted.</p> <p>9.0 AUTOMATIC AIR VENT:</p> <p>A. Automatic air vent shall be tec-vent as manufactured by Studor Inc. made of polycarbonate (Lexan) suitable for installation in return air plenums.</p> <p>10.0 ELECTRICAL:</p> <p>A. Coordinate electrical requirements with electrical Contractor as required.</p> <p>11.0 STERILIZATION OF HOT AND COLD WATER SYSTEMS:</p> <p>A. Sterilize all water piping in accordance with local codes and building officials prior to final acceptance by the Owner.</p> <p>12.0 TESTS:</p> <p>A. Pressure and leak test all water piping at minimum 150 PSI for 4 hours and in accordance with local requirements.</p> <p>B. Test entire waste, sanitary drainage and venting pipe systems by plugging all necessary openings and filling systems with minimum 10'-0" water column, or to the top of highest vent stack.</p> <p>C. Test gas piping in accordance with local building officials and in accordance with all applicable codes and ordinances.</p> <p>13.0 GUARANTEE:</p> <p>A. Contractor shall guarantee all equipment, piping and any other materials specified under this Division of the contract for a period of one (1) year from the date of project acceptance unless otherwise indicated. Upon failure of any part(s) of the system during the guarantee period, the affected part(s) shall be repaired or replaced promptly be and at the of the Contractor.</p> <p>B. If any component fails during the regular one (1) year period, then the replacement part(s) shall be given an additional one (1) year guarantee from the time of replacement. This shall continue until the items have given one (1) year satisfactory service.</p> |
|---|--|

END OF SPECIFICATIONS



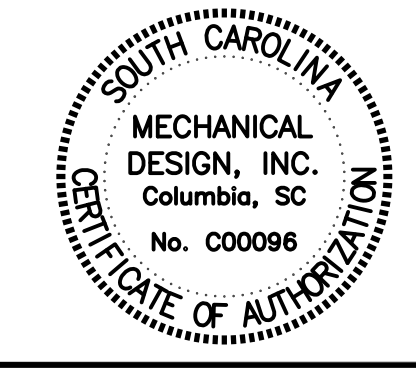
TANKLESS WATER HEATER DETAIL
 NO SCALE

- NOTES:**
- EEMAX SP55SL "FLOW CONTROLLED" TANKLESS WATER HEATER, 5.5 KW INPUT, 0.5 GPM AT 15" TEMPERATURE RISE. SEE ELECTRICAL DRAWINGS FOR VOLTAGE REQUIREMENTS.
 - SECURE HEATER TO CABINET / EXIST WALL AS DIRECTED.
 - ALL PIPING SHALL BE 3/8" CHROME PLATED COMPRESSION TUBING.
 - PROVIDE 0.5 GPM FLOW CONTROL AERATOR AT SINK FAUCET IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS.



AIR CHAMBER DETAIL
 NO SCALE

- SPECIAL NOTES:**
- (IPC) PLUMBING CODE PARAGRAPH 604.9 APPLIES TO QUICK-CLOSING VALVES ONLY.
 - THIS PROJECT DOES NOT CONTAIN QUICK-CLOSING VALVES.



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