STRUCTURAL NOTES

A. BUILDING CODE

1. THE STRUCTURE IS DESIGNED IN ACCORDANCE WITH THE 2012 VIRGINIA UNIFORM STATEWIDE BUILDING CODE WITH LOCAL AMENDMENTS.

B. GENERAL

1. FOR LOADING CRITERIA SEE ADJACENT TABLE.
2. THE STRUCTURE HAS BEEN DESIGNED TO WITHSTAND THE WIND PRESSURES SPECIFIED IN SECTION 1609.0 OF THE INTERNATIONAL BUILDING CODE. SEE THE ATTACHED LOAD TABLE.

3. THE STRUCTURE HAS BEEN DESIGNED TO WITHSTAND THE SNOW LOADS SPECIFIED IN SECTION 1608.0 OF THE INTERNATIONAL BUILDING CODE AND SECTION 7 OF ASCE 7. SEE THE ATTACHED DESIGN DATA TABLE ON THIS SHEET.
4. IN ADDITION TO THE FLAT ROOF SNOW LOAD STATED ABOVE, A SNOW LOAD PROVISION FOR DRIFTING SNOW HAS BEEN PROVIDED IN ACCORDANCE WITH THE REQUIREMENTS OF ASCE 7, SECTIONS 7.7 AND 7.8.

5. THE STRUCTURE HAS BEEN DESIGNED TO WITHSTAND THE SEISMIC FORCES SPECIFIED IN SECTION 1613.0 OF THE INTERNATIONAL BUILDING CODE. SEE THE SEISMIC DESIGN LOAD AND DATA TABLE ON THIS SHEET.

6. THE FLOOR SYSTEM HAS BEEN DESIGNED TO WITHSTAND A CONCENTRATED LOAD OF 2000 POUNDS IN AREA OF 2 ½ FEET SQUARE (6.25 SQUARE FEET), IN ACCORDANCE WITH SECTION 1607.4 OF THE INTERNATIONAL BUILDING CODE.
7. METHODS, PROCEDURES, AND SEQUENCES OF CONSTRUCTION ARE THE RESPONSIBILITY OF THE CONTRACTOR. THE CONTRACTOR SHALL TAKE ALL NECESSARY PRECAUTIONS TO MAINTAIN AND INSURE THE INTEGRITY OF THE STRUCTURE AT ALL STAGES OF CONSTRUCTION.
8. CONTRACTOR MUST FABRICATE AND ERECT STEEL IN ACCORDANCE WITH OSHA'S SAFETY REQUIREMENTS, 29 CFR PART 1926 SAFETY STANDARDS FOR STEEL ERECTION; FINAL RULE.
9. STRUCTURAL MEMBERS HAVE BEEN LOCATED AND DESIGNED TO ACCOMMODATE THE MECHANICAL EQUIPMENT AND OPENINGS SPECIFIED BY THE MECHANICAL CONSULTANT. ANY SUBSTITUTIONS RESULTING IN REVISIONS TO THE STRUCTURE SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR TO COORDINATE WITH THE STRUCTURAL ENGINEER.
10. THE GENERAL CONTRACTOR AND SUB-CONTRACTORS SHALL DETERMINE THE SCOPE OF THE STRUCTURAL WORK FROM THE CONTRACT DOCUMENTS TAKEN AS A WHOLE. THE STRUCTURAL DRAWINGS SHALL NOT BE CONSIDERED SEPARATELY FOR PURPOSES OF BIDDING THE STRUCTURAL WORK. DUE CONSIDERATION SHALL BE GIVEN TO OTHER STRUCTURAL WORK OR WORK RELATED TO THE STRUCTURE, INCLUDING NECESSARY COORDINATION DESCRIBED OR IMPLIED BY THE ARCHITECTURAL AND MECHANICAL DRAWINGS.
11. WRITTEN PERMISSION MUST BE OBTAINED FROM BEI STRUCTURAL ENGINEERS, INC., PRIOR TO THE REPRODUCTIVE USE OF THE STRUCTURAL CONTRACT DOCUMENTS IN ANY FASHION AS STRUCTURAL SHOP DRAWING DOCUMENTS.
12. SCALES NOTED ON THE DRAWINGS ARE FOR GENERAL INFORMATION ONLY. NO DIMENSIONAL INFORMATION SHALL BE OBTAINED BY DIRECT SCALING OF THE DRAWINGS.
13. THE GENERAL CONTRACTOR IS RESPONSIBLE FOR COORDINATION OF ALL RESULTING REVISIONS TO THE STRUCTURAL SYSTEM AS A RESULT OF ACCEPTANCE OF CONTRACTOR PROPOSED ALTERNATIVES OR SUBSTITUTIONS.

14. PRINCIPAL OPENINGS IN THE STRUCTURE ARE INDICATED ON THE CONTRACT DOCUMENTS. REFER TO THE ARCHITECTURAL, MECHANICAL, ELECTRICAL, AND PLUMBING DRAWINGS FOR SLEEVES, CURBS, INSERTS, ETC. NOT HEREIN INDICATED. OPENINGS IN SLABS WITH A MAXIMUM SIDE DIMENSION OR DIAMETER OF 12 INCHES OR LESS SHALL NOT REQUIRE ADDITIONAL FRAMING OR REINFORCEMENT, UNLESS NOTED OTHERWISE. THE LOCATION OF SLEEVES OR OPENINGS IN STRUCTURAL MEMBERS SHALL BE SUBMITTED TO THE STRUCTURAL ENGINEER FOR REVIEW.
15. ALL NON-PRIMARY STRUCTURAL ELEMENTS SUCH AS STAIRS, RAILINGS, METAL STUDS, STOREFRONTS, MULLIONS, ETC. SHALL BE DESIGNED BY A REGISTERED ENGINEER TO MEET THE MINIMUM REQUIREMENTS OF THE LOCAL BUILDING CODES. SUBMIT CALCULATIONS AND SHOP DRAWINGS WITH A SIGNED SEAL OF THE RESPONSIBLE REGISTERED ENGINEER FOR THE LOCAL JURISDICTION.

C. FOUNDATION AND SLAB ON GRADE

I. THE SUBSURFACE INFORMATION AND FOUNDATION DESIGN ARE BASED ON A REPORT PREPARED BY M.FARHANGI, P.E., REPORT NUMBER 072216, DATED 7/20/16. THE CONTRACTOR SHALL PERFORM EXCAVATIONS, FOOTING CONSTRUCTION, AND PREPARATION OF THE SUBGRADE UNDER THE SLAB ON GRADE IN ACCORDANCE WITH THE RECOMMENDATIONS CONTAINED IN THE GEOTECHNICAL REPORT AND THE PROJECT SPECIFICATIONS.

2. SOIL BEARING VALUE ASSUMED TO BE 3,000 PSF FOR FOOTINGS FOUNDED ON UNDISTURBED NATURAL SOIL OR CONTROLLED STRUCTURAL FILL IN ACCORDANCE WITH SUBSURFACE INVESTIGATION AND GEOTECHNICAL ENGINEERING REPORT. SOIL BEARING CAPACITY SHALL BE FIELD VERIFIED BY A SOILS ENGINEER REGISTERED IN THE STATE OF JURISDICTION.

3. BOTTOMS OF ALL FOOTINGS SHALL EXTEND A MINIMUM OF ONE FOOT INTO UNDISTURBED SOIL OR CONTROLLED COMPACTED FILL AND WHERE SUBJECT TO FROST ACTION, AT LEAST TWO FEET SIX INCHES BELOW FINISHED GRADE. ELEVATIONS SHOWN ARE TO TOPS OF FOOTINGS, AND ARE FOR ESTIMATING PURPOSES ONLY. FOOTING ELEVATIONS SHALL BE ADJUSTED AS REQUIRED TO SUIT FIELD CONDITIONS. BORING LOGS ARE ON FILE AT THE ARCHITECT'S OFFICE FOR REVIEW BY THE CONTRACTOR. ALL FOUNDATION WORK TO BE DONE IN STRICT ACCORDANCE WITH THE GEOTECHNICAL REPORT AND BE INSPECTED AND APPROVED BY A SOILS ENGINEER PRIOR TO POURING CONCRETE. ALL CONTROLLED COMPACTED FILL SHALL BE PLACED UNDER THE SUPERVISION OF A SOILS ENGINEER.

4. THE FOUNDATION FOR THE STRUCTURE HAS BEEN DESIGNED FOR THE FOLLOWING LATERAL EARTH PRESSURES:

CANTILEVER RETAINING WALLS	65 PCF
PASSIVE EARTH PRESSURE	300 PCF
COEFFICIENT OF FRICTION	0.200 PCF

6. EXCAVATIONS FOR SPREAD FOOTINGS, COMBINED FOOTINGS, CONTINUOUS FOOTINGS AND/OR MAT FOUNDATIONS SHALL BE CLEANED AND HAND TAMPED TO A UNIFORM SURFACE. FOOTING EXCAVATIONS SHALL HAVE THE SIDES AND BOTTOMS TEMPORARILY LINED WITH 6 MIL VISQUEEN IF PLACEMENT OF CONCRETE DOES NOT OCCUR WITHIN 24 HOURS OF THE EXCAVATION OF THE FOOTING.
7. FOUNDATION CONDITIONS NOTED DURING CONSTRUCTION, WHICH DIFFER FROM THOSE DESCRIBED IN THE GEOTECHNICAL REPORT SHALL BE REPORTED TO THE ARCHITECT, STRUCTURAL ENGINEER AND GEOTECHNICAL ENGINEER BEFORE FURTHER CONSTRUCTION IS ATTEMPTED.
8. REINFORCEMENT PLACEMENT SEQUENCE FOR FOOTINGS IS NOTED ONLY FOR MAJOR REINFORCEMENT BAR LAYERS. IN SPREAD FOOTINGS AND MATS THE CONTRACTOR SHALL SEQUENCE ALL OTHER BAR PLACEMENTS AS REQUIRED TO CONFORM TO THE CONTRACT DOCUMENTS.
9. WALLS RETAINING BACKFILL HAVE BEEN DESIGNED FOR IN SERVICE LOADS ONLY. THE CONTRACTOR SHALL PROVIDE TEMPORARY SHORING DURING CONSTRUCTION. THE SHORING SHALL NOT BE REMOVED UNTIL THE SUPPORTING ELEMENTS ARE IN PLACE, THE CONCRETE IN THE WALLS AND SUPPORTING ELEMENTS HAS ATTAINED THE SPECIFIED 28 DAY COMPRESSIVE STRENGTH (FC') AND COMPACTION OF THE BACKFILL HAS BEEN COMPLETED.
10. RETAINING WALLS AND/OR EXPOSED CONCRETE WALLS SHALL HAVE CONTROL JOINTS AT 10 FEET AND EXPANSION JOINTS AT 30 FEET MAXIMUM ON CENTERS UNLESS NOTED OTHERWISE. WALLS WITH INTEGRAL COLUMN PIERS OR PILASTERS SHALL HAVE A FORMED CONTROL JOINT ON ONE SIDE OF EACH PIER ON THE EXPOSED FACE OF THE WALL. JOINTS SHALL BE FILLED WITH AN APPROVED SEALANT.

11. EXCEPT WHERE OTHERWISE NOTED, SHALL BE 4" THICK CONCRETE REINFORCED WITH 6X6 W1.4XW1.4WELDED WIRE FABRIC. LAP MESH 6" IN EACH DIRECTION. PLACING, LAP, ETC. TO CONFORM TO WRI STANDARDS. SLAB ON GRADE SHALL BE UNDERLAID BY A MINIMUM OF 4 INCHES OF GRANULAR MATERIAL HAVING A MAXIMUM AGGREGATE SIZE OF 1.5 INCHES AND NOT MORE THAN 10% OF MATERIAL PASSING THROUGH A NO. 4 SIEVE. PRIOR TO PLACING THE GRANULAR MATERIAL, THE FLOOR SUBGRADE SHALL BE PROPERLY COMPACTED, PROOFROLLED, FREE OF STANDING WATER, MUD AND FROZEN SOIL. BEFORE PLACEMENT OF THE CONCRETE, A 10 MIL POLYETHYLENE VAPOR BARRIER SHALL BE PLACED ON TOP OF THE GRANULAR MATERIAL.
FOR ALL EXTERIOR SLABS ON GRADE, AIR ENTRAINED CEMENT WITH ENTRAINED AIR OF 6%±1.5% OR EQUIVALENT AIR ENTRAINING AGENT SHALL BE USED.
PROVIDE 1/2" PERIMETER EXPANSION JOINT FILLED WITH COMPRESSIVE MATERIAL WHERE SLABS ABUT VERTICAL SURFACES.

12. SLABS ON GRADE SHALL HAVE CONSTRUCTION JOINTS OR CRACK CONTROL JOINTS AT EACH COLUMN LINE IN EACH DIRECTION. PROVIDE ADDITIONAL JOINTS WITH A MAXIMUM SPACING NOT TO EXCEED 36 TIMES THE SLAB THICKNESS. ARRANGE JOINTS SUCH THAT PANEL LENGTH TO WIDTH RATIOS DOES NOT EXCEED 1.5. PROVIDE 3/4" DIAMETER X 1'-4" SMOOTH DOWELS AT 12 INCHES ON CENTER AT SLAB ON GRADE CONSTRUCTION JOINTS.
13. WHERE THE SLAB IS TO RECEIVE SENSITIVE ARCHITECTURAL FLOOR FINISHES, SUCH AS CERAMIC TILE, ALL JOINTS IN THE SLAB CONSTRUCTION SHALL BE PLACED TO ALIGN WITH JOINTS IN THE FINISHED MATERIAL.

D. CONCRETE

1. CONCRETE IN THE FOLLOWING AREAS SHALL HAVE NATURAL SAND FINE AGGREGATE AND NORMAL WEIGHT COARSE AGGREGATES CONFORMING TO ASTM C33, TYPE I PORTLAND CEMENT CONFORMING TO ASTM C150, AND SHALL HAVE THE FOLLOWING COMPRESSIVE STRENGTH (FC') AT 28 DAYS:

FOOTINGS AND MATS	3000 PSI
SLABS ON GRADE	3000 PSI
BASEMENT RETAINING WALLS AND FOOTINGS	3000 PSI

ALL CONCRETE EXPOSED TO WEATHER SHALL BE AIR ENTRAINED 6%±1.5%.

2. GROUND GRANULATED BLAST-FURNACE SLAG MAY BE USED AS A POZZOLAN TO REPLACE A PROTION OF THE PORTLAND CEMENT IN A CONCRETE MIX, SUBJECT TO THE APPROVAL OF THE STRUCTURAL ENGINEER. GROUND GRANULATED BLAST-FURNACE SLAG WHEN USED, SHALL CONFORM TO ASTM C989. CONCRETE MIXES USING GROUND GRANULATED BLAST-FURNACE SLAG SHALL BE PROPORTIONED TO ACCOUNT FOR THE PROPERTIES OF THE SPECIFIC GROUND GRANULATED BLAST-FURNACE SLAG USED. THE RATIO OF THE AMOUNT OF THE GROUND GRANULATED BLAST-FURNACE SLAG TO THE TOTAL AMOUNT OF GROUND GRANULATED BLAST-FURNACE SLAB AND CEMENT IN THE MIX SHALL NOT EXCEED 40 PERCENT.

3. GROUT FOR BASE PLATES SHOULD BE NON-SHRINKABLE, NON-METALLIC CONFORMING TO ASTM C827 AND SHALL HAVE A SPECIFIED COMPRESSIVE STRENGTH AT 28 DAYS OF 5,000 PSI. PRE-GROUTING OF BASE PLATES WILL NOT BE PERMITTED.
4. ALL CONCRETE WORK AND SHALL COMPLY WITH THE REQUIREMENTS OF THE ACI BUILDING CODE (ACI 318), AND THE SPECIFICATIONS FOR STRUCTURAL CONCRETE FOR BUILDINGS (ACI 301).
5. DETAILING OF CONCRETE REINFORCEMENT BARS AND ACCESSORIES SHALL CONFORM TO THE RECOMMENDATIONS OF ACI 315 "DETAILS AND DETAILING OF CONCRETE REINFORCEMENT" AND ACI SP-66 "DETAILING MANUAL". PLACING OF REINFORCING BARS SHALL CONFORM TO THE RECOMMENDATIONS OF ACI 315R "MANUAL OF ENGINEERING AND PLACING DRAWINGS FOR REINFORCED CONCRETE STRUCTURES" AND CRSI "MANUAL OF STANDARD PRACTICE".
6. MIXING, TRANSPORTING, AND PLACING OF CONCRETE SHALL CONFORM TO ACI 301.
7. MINIMUM CONCRETE COVER PROTECTION FOR REINFORCEMENT BARS SHALL BE AS FOLLOWS: (SEE ACI 318 SECTION 7.7 FOR CONDITIONS NOT NOTED)

FOOTINGS……………………………………………3 INCHES
SLABS ON GRADE……………………………………2 INCHES (TOP)
WALLS BELOW GRADE (BACKFILLED SIDE)……2 INCHES
WALLS BELOW GRADE (NO BACKFILL)…………3/4 INCHES

8. PROVIDE STANDARD BAR CHAIRS AND SPACERS AS REQUIRED TO MAINTAIN CONCRETE PROTECTION SPECIFIED.

9. CONCRETE REINFORCEMENT BARS SHALL CONFORM TO ASTM A615, GRADE 60. REINFORCEMENT BARS SHALL NOT BE TACK WELDED, WELDED, HEATED OR CUT UNLESS INDICATED ON THE CONTRACT DOCUMENTS OR REVIEWED BY THE STRUCTURAL ENGINEER.
10. WELDED WIRE FABRIC SHALL CONFORM TO ATSM A185. FABRIC SHALL BE SUPPLIED IN FLAT SHEETS. FABRIC SHALL BE LAPPED A MINIMUM OF 6 INCHES.
11. WELDING OF REINFORCEMENT BARS, WHEN ACCEPTED BY THE STRUCTURAL ENGINEER, SHALL CONFORM TO THE AMERICAN WELDING SOCIETY STANDARD D1.4. ELECTRODES FOR SHOP AND FIELD WELDING OF REINFORCEMENT BARS SHALL CONFORM TO ASTM A233, CLASS E90XX.
12. REINFORCEMENT DESIGNATED AS "CONTINUOUS" SHALL LAP 48 BAR DIAMETERS AT SPLICES UNLESS NOTED OTHERWISE. REINFORCEMENT BAR SPLICES IN GRADE BEAMS SHALL BE LOCATED AT THE CENTERLINE OF SUPPORTS FOR BOTTOM BARS AND AT MIDSPAN FOR TOP BARS. PROVIDE STANDARD ACI HOOKS FOR TOP AND BOTTOM BARS AT DISCONTINUOUS ENDS OF ALL GRADE BEAMS.
13. HORIZONTAL FOOTING AND HORIZONTAL WALL REINFORCEMENT SHALL BE CONTINUOUS AND SHALL HAVE 90-DEGREE BENDS AND EXTENSIONS, OR CORNER BARS OF EQUIVALENT SIZE LAPPED 36 BAR DIAMETERS, AT CORNERS AND INTERSECTIONS.
14. HORIZONTAL JOINTS WILL NOT BE PERMITTED IN CONCRETE CONSTRUCTION EXCEPT AS SHOWN ON THE CONTRACT DOCUMENTS. VERTICAL JOINTS SHALL OCCUR AT CENTER OF SPANS AT LOCATIONS REVIEWED BY THE STRUCTURAL ENGINEER.
15. CONSTRUCTION JOINTS BETWEEN PIERS AND PIER CAPS, FOOTINGS AND WALLS OR COLUMNS, OR WALLS, COLUMNS, BEAMS AND THE FLOOR SYSTEM THEY SUPPORT SHALL BE PREPARED BY ROUGHENING THE CONTACT SURFACE TO A FULL AMPLITUDE OF APPROXIMATELY 1/4 INCH LEAVING THE CONTACT SURFACE CLEAN AND FREE OF LAITANCE.
16. CONCRETE STRENGTH, PROPORTIONS AND TESTING SHALL MEET THE FOLLOWING REQUIREMENTS:
a. CONCRETE STRENGTH SHALL NOT BE LESS THAN STRENGTHS LISTED ABOVE AT 28 DAYS.
b. THE MIX DESIGN SHALL BE PREPARED BY AN INDEPENDENT TESTING LABORATORY APPROVED BY THE OWNER USING MATERIALS TO BE USED ON THE JOB. THE LABORATORY MIX DESIGN SHALL EXCEED THE DESIRED JOB STRENGTH OF CONCRETE BY 1,200 PSI. FOUR COPIES OF MIX DESIGN SHALL BE SUBMITTED TO THE OWNER BEFORE CONCRETE WORK HAS BEGUN.
C. SLUMP SHALL NOT EXCEED 4 INCHES.
D. ALL COSTS OF CONCRETE TESTING SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR. TESTING OF CONCRETE SHALL BE ACCOMPLISHED BY TAKING FOUR STANDARD TEST CYLINDERS OF THE CONCRETE FOR EACH DAY CONCRETE IS POURED. ONE SET OF TEST CYLINDERS MAY REPRESENT NO MORE THAN 55 CUBIC YARDS OF CONCRETE NOR ONE DAY'S POUR. CYLINDERS SHALL BE BROKEN TWO AT 7 DAYS AND TWO AT 28 DAYS IN ACCORDANCE WITH ASTM SPECIFICATIONS. FOR ALL CONCRETE, SLUMP CONE TEST SHALL BE RUN AT THE JOB SITE ON EACH TRUCK DELIVERY. CONCRETE USED FOR SLUMP CONE TEST SHALL NOT BE TAKEN FROM FIRST OR LAST 15% OF EACH LOAD. ALL TEST CYLINDERS AND SLUMP CONE TESTS SHALL BE PERFORMED BY A QUALIFIED TECHNICIAN FROM AN APPROVED TESTING FIRM IF DIFFERENT FROM GEOTECHNICAL ENGINEERS USED TO MONITOR SITE GRADING.

31. THE FOLLOWING ENVIRONMENTAL REQUIREMENTS SHALL BE MET AND MAINTAINED:

A. PROVIDE COLD WEATHER AND/OR HOT WEATHER PROTECTION AS RECOMMENDED IN ACI 306 AND ACI 305.
B. UNLESS ADEQUATE PROTECTION IS PROVIDED, CONCRETE SHALL NOT BE PLACED DURING RAIN, SLEET OR SNOW. PROTECT CONCRETE FROM RAIN WATER, MAINTAIN CONCRETE WATER RATIO AND PROTECT CONCRETE SURFACE.
C. ALL CONCRETE SHALL BE ADEQUATELY PROTECTED AFTER POURING TO PREVENT DAMAGE FROM FREEZING, BY THE USE OF SUITABLE COVERS AND ADEQUATE HEATING EQUIPMENT. FROZEN AND DAMAGED CONCRETE MUST BE REMOVED AND REPLACED AT THE CONTRACTOR'S EXPENSE. DO NOT PLACE CONCRETE ON FROZEN EARTH.
D. ADMIXTURES TO RETARD OR ACCELERATE SETTING, REDUCE WATER RATIO OR PREVENT FREEZING SHALL NOT BE USED WITHOUT PRIOR APPROVAL FROM TENANT. NO ADMIXTURES CONTAINING CALCIUM CHLORIDE MAY BE USED.
E. DO NOT PLACE CONCRETE WHEN TEMPERATURE IS 40 DEGREES F. AND FALLING OR WHEN FREEZING WEATHER IS PREDICTED WITHIN 24 HOURS. "RECOMMENDED PRACTICE FOR WINTER CONCRETING", ACI 604, MAY BE FOLLOWED FOR PLACING CONCRETE IN COLD WEATHER.
F. NO CALCIUM CHLORIDE OR OTHER ACCELERATORS OR ANTI-FREEZES SHALL BE USED.

E. STRUCTURAL STEEL

1. ALL STRUCTURAL STEEL SHALL BE FABRICATED AND ERECTED IN ACCORDANCE WITH THE LATEST AISC CODE. ALL WIDE FLANGE SHAPES SHALL BE ASTM A992/A572 GRADE 50. ALL OTHER STRUCTURAL STEEL SHALL BE ASTM A36 UNO.

A. ALL STEEL RECTANGULAR/SQUARE HOLLOW STRUCTURAL SECTIONS SHALL BE ASTM A500 GRADE B, FY=46 KSI.
B. ALL STEEL SHALL HAVE A SHOP COAT OF RUST INHIBITIVE PAINT.
C. ALL STEEL SHALL BE THOROUGHLY CLEANED IN ACCORDANCE WITH SSPC- SP3 PRIOR TO PAINTING.

2. ANCHOR BOLTS SHALL CONFORM TO ASTM F1554, GRADE 36, UNLESS NOTED OTHERWISE.
3. CONNECTION BOLTS FOR STRUCTURAL STEEL MEMBERS SHALL BE HIGH STRENGTH BOLTS WHICH MEET OR EXCEED THE REQUIREMENTS OF ASTM A325, TYPE N, X, OR F. BOLTS SHALL BE DESIGNED AS BEARING TYPE BOLTS, EXCEPT AS NOTED. BOLTS SHALL BE INSTALLED IN ACCORDANCE WITH THE "SNUG TIGHT" CONDITION AS OUTLINED IN THE "SPECIFICATION FOR STRUCTURAL JOINTS USING ASTM A325 OR A490 BOLTS". BOLTS SHALL HAVE A HARDENED WASHER PLACED UNDER THE ELEMENT TO BE TIGHTENED. BOLTS IN BRACING CONNECTIONS, MOMENT CONNECTIONS OR OTHER CONNECTIONS NOTED ON THE DRAWINGS SHALL BE CONSIDERED TO BE "SLIP CRITICAL" BOLTS, AND SHALL BE DESIGNED AS FRICTION TYPE BOLTS. FRICTION TYPE CONNECTIONS SHALL BE TIGHTENED BY THE USE OF THE TURN-OF-THE-NUT METHOD OR THE USE OF LOAD INDICATING TYPE BOLTS, INSTALLED IN ACCORDANCE WITH THE MANUFACTURER'S RECOMMENDATIONS.
4. STRUCTURAL STEEL DETAILING, FABRICATION AND ERECTION SHALL CONFORM TO THE AISC "SPECIFICATION FOR STRUCTURAL STEEL BUILDINGS" AND THE AISC "CODE OF STANDARD PRACTICE FOR STEEL BUILDINGS AND BRIDGES".

5. TYPICAL CONNECTION DETAILS ARE INDICATED ON THE DRAWINGS. THE FABRICATOR SHALL PREPARE THE SHOP DRAWINGS FOR THE PROJECT BASED ON THIS CONNECTION DESIGN INFORMATION. IF ALTERNATE CONNECTION DESIGNS ARE USED, THE FABRICATOR SHALL HAVE A REGISTERED PROFESSIONAL ENGINEER PREPARE THE CONNECTION DESIGNS. SUCH DESIGNS SHALL BE SUBMITTED WITH THE SHOP DRAWINGS AND SHALL BEAR THE SEAL OF THIS RESPONSIBLE PROFESSIONAL ENGINEER. THE FABRICATOR IS RESPONSIBLE FOR THE SELECTION, DESIGN AND DETAILING OF ALL CONNECTIONS NOT FULLY DETAILED ON THE CONTRACT DRAWINGS. CONNECTIONS SHALL BE DESIGNED AND DETAILED IN ACCORDANCE WITH THE AISC "MANUAL OF STEEL CONSTRUCTION ", LATEST EDITION. TABLE II AND TABLE III OF PART 4 SHOULD BE USED. THE END REACTION OF THE CONNECTED BEAM SHALL BE DETERMINED FROM PART 2 "ALLOWABLE LOADS ON BEAMS" FOR THE MEMBER SIZE AND SPAN INDICATED, UNLESS A DESIGN REACTION IS INDICATED ON THE PLANS. IN NO CASE SHALL THE END REACTION BE TAKEN AS LESS THAN 12.0 KIPS.
6. STEEL FABRICATOR IS SOLELY RESPONSIBLE FOR SURVEYING AND VERIFICATION OF EXISTING CONDITIONS INCLUDING BUT NOT LIMITED TO THE LOCATION, ELEVATION, AND DIMENSIONS OF EXISTING WALLS AND FRAMING.
7. PRIOR TO DETAILING CONNECTIONS FOR STRUCTURAL STEEL, THE STEEL FABRICATOR SHALL SUBMIT FOR APPROVAL REPRESENTATIVE DETAILS AND CALCULATIONS FOR EACH TYPE OF STRUCTURAL STEEL CONNECTION TO BE UTILIZED. AFTER APPROVAL, THE CONNECTIONS MAY BE INCORPORATED INTO THE SHOP DRAWINGS, ALOONG WITH A TABLE OF DESIGN CAPACITIES FOR THE RANGE OF CONNECTIONS TO BE USED.

8. WELDING SHALL CONFORM TO THE AMERICAN WELDING SOCIETY STANDARD D1.1. ELECTRODES FOR SHOP AND FIELD WELDS SHALL CONFORM TO AWS A5.1 OR AWS A5.5, CLASS E70XX, LOW HYDROGEN.

9. ALL SHOP AND FIELD WELDING SHALL BE PERFORMED BY WELDERS CERTIFIED, AS DESCRIBED IN "AMERICAN WELDING SOCIETY'S STANDARD QUALIFICATION PROCEDURE", AWS D1.1, TO PERFORM THE TYPE OF WORK REQUIRED.
10. SPLICING OF STRUCTURAL STEEL MEMBERS WHERE NOT DETAILED ON THE CONTRACT DOCUMENTS IS PROHIBITED WITHOUT THE PRIOR APPROVAL OF THE STRUCTURAL ENGINEER AS TO LOCATION, TYPE OF SPLICE AND CONNECTION TO BE MADE.

11. THE CONTRACTOR SHALL NOTIFY THE STRUCTURAL ENGINEER OF ANY MISFABRICATED STRUCTURAL STEEL PRIOR TO ERECTION OF SAME.
12. PENETRATIONS SHALL NOT BE CUT IN STRUCTURAL STEEL MEMBERS UNLESS SO INDICATED IN THE DRAWINGS OR AS REVIEWED BY THE ENGINEER.
13. CAMBER BEAMS UPWARD AS SHOWN ON THE DRAWINGS WITHIN THE SPECIFIED AISC TOLERANCES FOR SHOP FABRICATION. IF BEAMS ARE RECEIVED FROM THE ROLLING MILL WITH CAMBER, THE STEEL FABRICATOR SHALL PROVIDE ADDITIONAL CAMBER AS REQUIRED TO SATISFY THE TOLERANCES SPECIFIED FOR SHOP FABRICATION. TESTING AGENCY SHALL MEASURE CAMBER ON BEAMS IN THE FABRICATOR'S SHOP IN THE UNSTRESSED CONDITION, AND SUBMIT REPORTS FOR REVIEW BY THE ENGINEER.

14. ALL LINTELS AND SHELF ANGLES SHALL BE PAINTED

F. MASONRY

1. MASONRY UNITS SHALL BE TYPE:
A. ASTM C90 SOLID OR ASTM C90 HOLLOW GROUTED SOLID BELOW GRADE.
B. ASTM C90 HOLLOW ABOVE GRADE
C. WITH MINIMUM COMPRESSIVE STRENGTH OF 1900 PSI
D. ALL CMU SHALL BE LAID IN A FULL BED OF MORTAR.

2. FOLLOWING ARE THE BLOCK STRENGTHS REQUIRED:

A. ASTM C90 SOLID 1900 PSI ON GROSS AREA OF INDIVIDUAL UNITS.
B. ASTM C90 HOLLOW 1900 PSI ON NET AREA OF INDIVIDUAL UNITS.

3. ALL MORTAR SHALL BE ASTM C270 TYPE S.

4. GROUT SHALL BE A HIGH SLUMP MIX

A. IN ACCORDANCE WITH ASTM SPECIFICATION C476
B. HAVING A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI.
C. FROM FIELD OBTAINED TEST CYLINDERS.

5. LAID UP MASONRY DESIGN F'M IS 1350 PSI FOR STANDARD CONCRETE MASONRY.

6. ALL CONCRETE MASONRY SHALL BE CONSTRUCTED IN ACCORDANCE WITH THE "BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES ACI 530/ASCE 5/TMS 402" AND "SPECIFICATIONS FOR MASONRY STRUCTURES ACI 530.1/ASCE 6/TMS 602.
A. AND INSPECTED BY A QUALIFIED ENGINEER.

7. ALL BRICK MASONRY UNITS SHALL BE GRADE SW IN ACCORDANCE WITH ASTM C216 WITH A MINIMUM COMPRESSIVE STRENGTH OF 3000 PSI AND BONDED TOGETHER WITH TYPE S MORTAR.

8. PROVIDE HOT-DIPPED GALVANIZED LADDER TYPE HORIZONTAL JOINT REINFORCEMENT, MIN. 9 GA, AT 16" ON CENTER VERTICAL IN ALL MASONRY WALLS. SPACE HORIZONTAL JOINT REINFORCEMENT AT 8 INCHES ON CENTER IN ALL PARAPETS. USE SHOP FABRICATED SPECIAL PIECES AT ALL CORNERS AND TEES.

9. PROVIDE 1-#5 VERTICAL AT EACH END, CORNER AND INTERSECTION OF ALL WALLS.
10. PROVIDE MASONRY ACCESSORIES TO SECURE VERTICAL REINFORCEMENT IN PLACE AND CORRECTLY POSITIONED. VERTICAL REINFORCEMENT IS TO BE CENTERED IN THE MASONRY CELLS UNLESS INDICATED OTHERWISE.
11. CELLS TO BE GROUTED SHALL BE CLEAN AND FREE OF EXCESS MORTAR AND FOREIGN MATERIALS.
12. LINTELS SHALL BEAR ON MASONRY WALLS A MINIMUM OF 8" AT EACH END. FOR CMU WALLS, PROVIDE TWO GROUTED CORES EACH SIDE OF OPENING FULL HEIGHT OF WALL AND REINFORCE EACH OF THE TWO GROUTED CORES WITH 1-#5 VERTICAL EXTENDING FROM THE FOUNDATION TO THE POINT OF LATERAL SUPPORT FOR THE WALL ABOVE THE LINTEL LOCATION. UNLESS NOTED OTHERWISE, THE FOLLOWING LINTELS MAY BE USED WHEN THE HEAD OF THE MASONRY OPENING IS BELOW FLOOR OR ROOF BEARING ELEMENTS BY A MINIMUM DISTANCE OF 75% OF THE LINTEL SPAN:

Span	Galvanized Steel Angle Lintel per 4" Masonry wythe	CMU Lintel per 4" CMU wythe (fm'= 1500 psi)	Precast Concrete Lintel per 4" CMU Wythe (fc'= 3000 psi)
0 - 4'-0"	L3-1/2 x 3-1/2 x 1/4	8" Deep w/ (1) #4 Bottom	8" Deep w/ (1) #4 Top & Bottom
4'-1" - 6'-0"	L5 x 3-1/2 x 5/16	8" Deep w/ (1) #5 Bottom	8" Deep w/ (1) #4 Top & Bottom
6'-1" - 8'-0"	L5 x 3-1/2 x 3/8	16" Deep w/ (1) #4 Bottom	8" Deep w/ (1) #4 Top & Bottom
8'-1" - 12'-0"	L6 x 3-1/2 x 1/2	16" Deep w/ (1) #5 Bottom	8" Deep w/ (1)#5 Top & Bottom

13. TEMPORARY SHORING OF LINTELS MUST BE PROVIDED UNTIL MASONRY HAS CURED. CONTROL JOINTS IN MASONRY SHALL NOT BE LOCATED WITHIN A DISTANCE EQUAL TO 50% OF THE LINTEL SPAN ADJACENT TO EACH SIDE OF THE OPENING.
14. HORIZONTAL JOINT REINFORCEMENT SHALL BE USED IN THE MASONRY CONSTRUCTION. SUCH JOINT REINFORCEMENT SHALL BE PLACED AT 8 INCHES ON CENTER VERTICALLY IN WALLS BELOW GRADE AND AT 16 INCHES ON CENTER VERTICALLY IN WALLS THAT ARE ABOVE GRADE. HORIZONTAL JOINT REINFORCEMENT SHALL BE FABRICATED FROM GALVANIZED COLD-DRAWN STEEL WIRE CONFORMING TO ASTM A82. REINFORCEMENT SHALL CONSIST OF TWO OR MORE SMOOTH OR DEFORMED LONGITUDINAL WIRES NO. 9 GAGE OR LARGER, WELD CONNECTED WITH NO. 12 GAGE OR LARGER CROSS WIRES. GALVANIZE COATING SHALL CONFORM TO ASTM A116 AND SHALL BE APPLIED AT A WEIGHT OF NOT LESS THAN 1.5 OUNCES PER SQUARE FOOT OF UNCOATED WIRE SURFACE. THE OUT-TO-OUT SPACING OF THE LONGITUDINAL WIRES SHOULD BE 1-5/8 INCHES LESS THAN THE WIDTH OF THE MASONRY UNITS. THE DISTANCE BETWEEN THE WELDED CONTACTS OF THE CROSS WIRES WITH EACH LONGITUDINAL WIRE SHOULD NOT EXCEED 6 INCHES AND 16 INCHES FOR SMOOTH AND DEFORMED LONGITUDINAL WIRES RESPECTIVELY.
15. CONTROL JOINTS SHALL BE PLACED IN THE MASONRY CONSTRUCTION SUCH THAT THE PANEL LENGTH TO HEIGHT RATIO OF THE WALL DOES NOT EXCEED 2.5, AND THAT THE MAXIMUM PANEL LENGTH OF WALL DOES NOT EXCEED 25 FEET. ADDITIONAL JOINTS SHALL BE PLACE WHERE ABRUPT CHANGES IN WALL SECTIONS OCCUR.
16. MASONRY CONSTRUCTION SHALL BE INSPECTED DURING THE VARIOUS WORK STAGES BY A QUALIFIED INSPECTOR. INSPECTION SHALL INCLUDE CHECKING FOR COMPLIANCE WITH PROJECT DRAWINGS AND SPECIFICATIONS, INCLUDING RECORDING OF THE FOLLOWING:
I. QUALITY AND TESTING OF MASONRY UNITS AND MATERIALS FOR MORTAR, GROUT, AND MAKING OF PRISMS WHEN REQUIRED.
II. PROPORTIONING, MIXING, AND CONSISTENCY OF MORTAR AND GROUT.
III. LAYING, MORTARING, AND GROUTING OF MASONRY UNITS AND ELEMENTS.
IV. CONDITION, GRADE, SIZE, SPACING AND PLACEMENT OF REINFORCEMENT.
V. SIGNIFICANT OR UNUSUAL CONSTRUCTION LOADS ON MASONRY STRUCTURAL ELEMENTS.
VI. WHEN AMBIENT TEMPERATURE FALLS BELOW 40 DEGREES F OR RISES ABOVE 100 DEGREES F, A COMPLETE RECORD OF WEATHER CONDITIONS AND OF PRECONDITIONING AND PROTECTION GIVEN TO MASONRY MATERIALS, AND PROTECTION AND CURING OF COMPLETED WORK, SHALL BE MAINTAINED.
VII. GENERAL PROGRESS OF WORK.

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WARRENTON VIRGINIA
STRUCTURAL NOTES

DATE 4–3–17
FILE –
SHEET NO. S0

G. TIMBER FRAMING

1. ALL STRUCTURAL TIMBER SHALL

F. BE HEM FIR #2 MINIMUM, STRESS GRADE LUMBER OR APPROVED EQUAL.

G. THE MINIMUM ALLOWABLE PROPERTIES ARE AS FOLLOWS:

1. Fb = 850 PSI Fv = 75 PSI E = 1,300,000 PSI

C. ALL STRUCTURAL TIMBER TO BE STAMPED IN ACCORDANCE WITH THE AMERICAN INSTITUTE OF TIMBER CONSTRUCTIONS "CONSTRUCTION MANUAL".

2. ALL GLUED LAMINATED BEAMS SHALL BE SOUTHERN PINE, HEM FIR OR APPROVED EQUAL.

A. CONFORMING TO AITC 117-84 "STANDARD SPECIFICATION FOR STRUCTURAL GLUED LAMINATED TIMBER OF SOFTWOOD SPECIES".

B. THE MINIMUM ALLOWABLE PROPERTIES FOR GLUED LAMINATED BEAMS ARE AS FOLLOWS:

Fb = 2200 PSI Fv = 165 PSI E = 1,500,000 PSI.

3. ALL WOOD TRUSS MEMBERS SHALL BE FABRICATED FROM KILN DRIED SOUTHERN PINE STRESS GRADE LUMBER OR EQUAL.
4. ALL TIMBER AND TIMBER CONSTRUCTION SHALL COMPLY WITH SPECIFICATIONS AND CODES AS SPECIFIED BELOW:

A. AMERICAN INSTITUTE OF TIMBER CONSTRUCTION: TIMBER CONSTRUCTION MANUAL.

B. NATIONAL FOREST PRODUCTS ASSOCIATION: NATIONAL DESIGN SPECIFICATION FOR WOOD CONSTRUCTION.

C. AMERICAN PLYWOOD ASSOCIATION: PLYWOOD DESIGN SPECIFICATION.

D. AMERICAN WOOD-PRESERVERS ASSOCIATION STANDARDS.

E. NATIONAL LUMBER MANUFACTURERS ASSOCIATION: NATIONAL DESIGN SPECIFICATION FOR STRESS-GRADE LUMBER AND ITS FASTENINGS.

5. DESIGN, FABRICATION AND INSTALLATION OF WOOD TRUSSES AND SHEET METAL CONNECTORS SHALL BE IN ACCORDANCE WITH THE FOLLOWING TRUSS PLATE INSTITUTE STANDARDS:

A. DESIGN SPECIFICATION FOR METAL PLATE CONNECTED WOOD TRUSSES, TPI-85 FOR ROOFS.

B. DESIGN SPECIFICATION FOR METAL PLATE CONNECTED PARALLEL CHORD WOOD TRUSSES, PCT-80 FOR FLOORS.

C. RECOMMENDED DESIGN SPECIFICATION FOR TEMPORARY BRACING OF METAL PLATE CONNECTED WOOD TRUSSES, DSB-89.

D. HANDLING, INSTALLING AND BRACING METAL PLATE CONNECTED WOOD TRUSSES, HIB-91.

6. ALL TIMBER CONNECTIONS SHALL BE MADE USING PREFABRICATED CONNECTORS. TOE-NAILING IS NOT PERMITTED. SUBMIT MANUFACTURER'S DATA FOR REVIEW. FASTENERS SHALL BE AS MANUFACTURED BY HECKMANN, KANT SAG, SIMPSON OR APPROVED EQUAL.

7. HEADER AT NON-BEARNING CONDITIONS SHALL BE AS FOLLOWS:

i.	OPENING SIZE	HEADER
ii.	UP TO 4'-0	(2) 2" x 6"
iii.	4'-0 TO 6'-0	(2) 2 x 8"
iv.	6'-0 TO 9'-0	(2) 2" x 10"

8. PROVIDE MINIMUM CONTINUOUS SOLID BLOCKING OR CROSS BRIDGING LINES AT 8'-0" O/C MAX SPACING FOR ALL

A. ROOF TRUSSES
B. FLOOR TRUSSES
C. PROVIDE ADDITIONALLY X-BRIDGING AS REQUIRED BY FABRICATOR. PROVIDE A MINIMUM OF ONE LINE BLOCKING/CROSS BRIDGING FOR ALL SPANS.

9. PROVIDE STRUCTURAL PLYWOOD SHEATHING OR APPROVED EQUAL AT ALL SIDES OR CORNERS FOR WIND BRACING. CONNECTIONS OF PLYWOOD SHALL COMPLY WITH APA NAILING REQUIREMENTS FOR PLYWOOD SHEAR WALLS.

10. PROVIDE PRESSURE TREATED LUMBER WHERE LUMBER IS IN CONTACT WITH CONCRETE OR OUTSIDE OF BUILDING.

11.

A. SHEATHING FOR WALLS SHALL BE ½" THICK 32/16 SPAN RATING APA STRUCTURAL RATED PLYWOOD SHEATHING EXPOSURE 1.

B. SHEATHING FOR FLOORS SHALL ¾" THICK 20' SPAN RATING APA STURDI-I-FLOOR.

ALL JOINTS IN SHEATHING SHALL BE STAGGERED. ALL EDGES IN FLOOR SHEATHING SHALL BE TONGUE & GROOVE. COMPLY WITH APA REQUIREMENTS FOR PLYWOOD FLOOR/ROOF DIAGRAMS.

12. DESIGN AND DETAILING OF GLUE-LAMINATED MEMBERS AND ROUGH SAWN TIMBER MEMBERS, CONNECTIONS AND ACCESSORIES SHALL BE IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE AITC "TIMBER CONSTRUCTION MANUAL" AND THE NFPA "NATIONAL DESIGN SPECIFICATIONS FOR WOOD CONSTRUCTION".

13. ROUGH SAWN TIMBERS SHALL BE TREATED AND FINISHED AS REQUIRED BY THE ARCHITECTURAL SPECIFICATIONS. WEATHER EXPOSED ENDS SHALL BE TREATED WITH C.C.A.
14. PLYWOOD FOR ROOF SHALL BE 5/8" THICK AND SHALL CONFORM TO APA PS 1 RATED SHEATHING 48/24, EXTERIOR, 48" X 96". PLYWOOD SHALL BE TWO SPAN (MINIMUM) CONTINUOUS. FACE GRAIN SHALL BE PERPENDICULAR TO SUPPORTS WITH A STAGGERED LAY-UP. PROVIDE TWO PANEL EDGE CLIPS BETWEEN SUPPORTS. NAIL PLYWOOD TO SUPPORTING MEMBERS WITH 8D NAILS AT 6" O.C. AT PANEL EDGES AND 12 O.C. AT INTERMEDIATE SUPPORTS. MINIMUM MODULUS OF ELASTICITY SHALL BE 1800000 PSI.

15. WOOD TRUSSES SHALL BE DESIGNED TO CONFORM TO NATIONAL FOREST PRODUCTS ASSOCIATION "NATIONAL DESIGN SPECIFICATION FOR STRESS GRADED LUMBER AND ITS FASTENINGS" AND THE TRUSS PLATE INSTITUTE "DESIGN SPECIFICATIONS FOR LIGHT METAL PLATE CONNECTED WOOD TRUSSES". THE DESIGN CALCULATIONS AND DRAWINGS SHALL BEAR THE SEAL OF THE RESPONSIBLE REGISTERED PROFESSIONAL ENGINEER. ALL CHORDS MUST BE CUT FROM LUMBER BEARING THE PROPER GRADE MARK FOR THE MATERIAL SPECIFIED. CHORD LUMBER SHALL HAVE A COEFFICIENT OF VARIATION FOR THE MODULUS OF ELASTICITY OF 0.11 OR LESS. DESIGN DRAWINGS SHALL BE SUBMITTED FOR ALL TRUSSES INDICATING THE SPECIES, SIZES, AND STRESS GRADES OF LUMBER AND CONNECTOR PLATE SIZES TO BE USED IN THE FABRICATION OF THE TRUSSES. BEARING, ANCHORAGE AND BRACING DETAILS SHALL BE SHOWN. CONNECTOR PLATES SHALL BE MANUFACTURED FROM MATERIAL CONFORMING TO ASTM A446, GRADE A, AND SHALL GALVANIZED IN ACCORDANCE WITH ASTM A525, COATING DESIGNATION G60. IN HIGHLY CORROSIVE ENVIRONMENTS OR WHERE FIRE RETARDANT LUMBER IS SPECIFIED, STAINLESS STEEL CONNECTOR PLATES SHALL BE USED.

H. MASONRY VENEER ON WOOD STUDS

1. MASONRY SHALL CONFORM TO ASTM C-145. MORTAR SHALL CONFORM TO ASTM C270, TYPE S.
2. PROVIDE STUDS AS SHOWN ON THE DRAWING.
3. PROVIDE STUD LATERAL BRACING PER DRAWINGS OR AT 5'-0" O.C. MAXIMUM.
4. DOUBLE ALL STUDS AT JAMBS OF WINDOWS, DOORS, AND OTHER OPENINGS.
5. PROVIDE CORROSION RESISTANT 9 GAGE ADJUSTABLE WIRE TIES @ 16" O.C. EACH STUD. PROVIDE 1/2" GYPSUM WALL BOARD OR RIGID SHEATHING ON FACE OF STUDS. ATTACH WIRE TIES DIRECTLY TO STUDS AND NOT TO THE SHEATHING ALONE.

I. METAL STAIRS

1. STAIR ASSEMBLY SHALL BE DESIGNED TO SUPPORT A MINIMUM LIVE LOAD OF 100 PSF. STAIR TREADS SHALL BE DESIGNED TO SUPPORT A CONCENTRATED LOAD OF 300 POUNDS ON AN AREA OF 4 SQUARE INCHES APPLIED AT THE CENTER OF THE TREAD.
2. SHOP DRAWINGS SHALL BE SUBMITTED INDICATING LAYOUT OF STAIRS, PROFILES, ANCHORAGE AND CONNECTION DETAILS. DRAWINGS SHALL BEAR THE SEAL OF THE RESPONSIBLE REGISTERED PROFESSIONAL ENGINEER.
3. TREADS AND RISERS SHALL BE FORMED FROM STEEL THAT CONFORMS TO THE REQUIREMENTS OF ASTM A611, GRADE B, MINIMUM 12 GAGE THICKNESS. FABRICATE STAIRS WITH CLOSED RISERS AND TREADS OF PAN CONSTRUCTION TO RECEIVE CONCRETE FILL. ATTACH TREAD PANS TO STRINGERS WITH CLIP ANGLES WELDED IN PLACE.

DESIGN LOAD SCHEDULE
(POUNDS PER SQ. FT.)

COMPONENT \ AREA	SLAB ON GRADE	SECOND FLOOR	ROOF			
CONCRETE SLAB	65	-	-			
ROOF & INSULATION	-	-	5			
WOOD FRAMING	-	5	5			
CEILING	-	5	5			
COLLATERAL	20	15	5			
RETAIL	-	100	-			
TOTAL DEAD LOAD	85	25	20			
TOTAL LIVE LOAD	100	100	30			
TOTAL LOAD	185	125	50			

SNOW DESIGN LOAD SCHEDULE
INTERNATIONAL BUILDING CODE (2009)

ITEM	SYMBOL	VALUE	REFERENCE
GROUND SNOW LOAD	Pg	30	FIGURE 7.1
SNOW EXPOSURE FACTOR	Ce	0.9	TABLE 7.2
SNOW LOAD IMPORTANCE FACTOR	Is	1.10	TABLE 15.2
THERMAL FACTOR	Ct	1.0	TABLE 7.3
FLAT-ROOF SNOW LOAD	Pf	23	SECTION 7.3
MINIMUM EQUIVALENT UNIFORM LOAD	-	30	RE: DESIGN LOAD SCHEDULE ABOVE
OCCUPANCY CATEGORY	-	II	TABLE 1.5-1

LATERAL LOAD DESIGN SCHEDULE
INTERNATIONAL BUILDING CODE (2009) ASCE 7-10

WIND LOAD

ITEM	SYMBOL	VALUE	REFERENCE
BASIC WIND SPEED (3 SEC. GUST)	V	90	FIGURE 26.5-1A
WIND EXPOSURE CATEGORY	-	B	SECTION 26.7.3
MINIMUM DESIGN VALUE (WW+LW)	-	20 PSF	SECTION 27.4
OCCUPANCY CATEGORY	-	II	TABLE 1.5-1
IMPORTANCE FACTOR	-	1.15	TABLE 1.5.2

SEISMIC LOAD

ITEM	SYMBOL	VALUE	REFERENCE
IMPORTANCE FACTOR	I_E	1.25	TABLE 1.5-2
SHORT PERIOD SPECTRAL ACCELERATION	S_{DS}	0.130g	SECTION 11.4.4
(1) SECOND PERIOD SPECTRAL ACCELERATION	S_{D1}	0.083g	SECTION 11.4.4
SEISMIC DESIGN CATEGORY	-	B	TABLE 11.6-1 & 11.6-2
SITE CLASSIFICATION	S	D	SECTION 20.3
BASIC STRUCTURAL SYSTEM	-	BEARING WALL SYSTEM	TABLE 12.2-1
BASIC SEISMIC-RESISTING SYSTEM	-	LIGHT FRAME WALLS	TABLE 12.2-1
RESPONSE MODIFICATION FACTOR	R	2	TABLE 12.2-1
DEFLECTION AMPLIFICATION FACTOR	Cd	2	TABLE 12.2-1
ANALYSIS PROCEDURE	EQUIVALENT LATERAL FORCE PROCEDURE		SECTION 12.8
MAPPED SHORT PERIOD SPECTRAL ACCELERATION	Ss	0.122g	FIGURE 22-1
MAPPED (1) SEC. PERIOD SPECTRAL ACCELERATION	S_1	0.052g	FIGURE 22-2
BASE SHEAR	V	16.4K	SECTION 12.8
OCCUPANCY CATEGORY	-	II	TABLE 1.5-1

WALL COMPONENTS & CLADDING: DESIGN WIND PRESSURES (LB/SQ. FT.)
(INTERNAL PRESSURE COEFFICIENTS, GCpi=±0.18)

TRIBUTARY AREA (SQ. FT.)	LESS THAN 10	10 TO 20	20 TO 50	50 TO 100	100 TO 500
MAIN FIELD (ZONE 4)	+14.6/-15.9	+14.0/-15.3	+13.4/-14.6	+12.8/-14.0	+10.9/-12.2
CORNER (ZONE 5)	+14.6/-19.6	+14.0/-19.0	+13.4/-17.1	+12.8/-15.9	+10.9/-12.2

POSITIVE PRESSURE: ACTING TOWARD SURFACE
NEGATIVE PRESSURE: ACTING AWAY FROM SURFACE
CORNER ZONE: WITHIN 5' FROM BUILDING CORNERS ALONG NORTH/SOUTH/EAST/WEST FACES.
NOTE: 1) ZONE DESIGNATIONS AS PER ASCE7.

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CHURCH ROAD ANIMAL HOSPITAL
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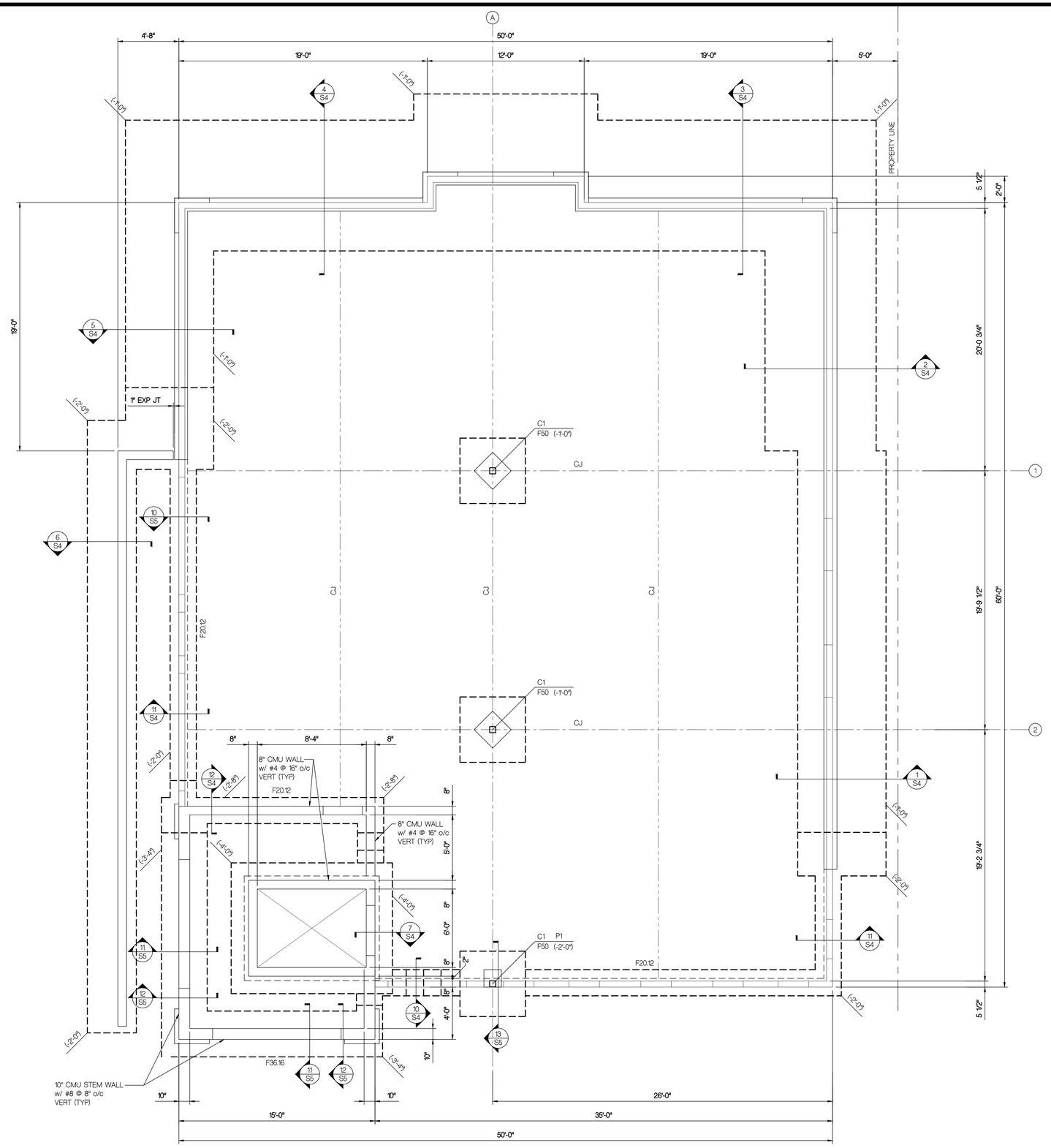
STRUCTURAL NOTES & DESIGN TABLES

DATE	SHEET NO.
4-3-17	S0.1
FILE –	



STEEL COLUMN SCHEDULE

MARK	SIZE	BASE PLATE	ANCHOR BOLTS (F1554)
C1	HSS5x5x1/2	3/4 x 12 x 1'-0"	(4) 3/4"ø

PIER SCHEDULE

MARK	SIZE	REINFORCING
P1	16" x 16" CONCRETE	(4) #6 VERT. w/#3 TIES @ 12"

FOOTING SCHEDULE

MARK	SIZE	DEPTH	REINFORCING (BOTTOM, UNO)
SOIL BEARING PRESSURE 1500 PSF			
F50	5'-0" x 5'-0"	12"	(6) #5 (B) EW
SOIL BEARING PRESSURE 1500 PSF			
F20.12	24" WIDE	12" DEEP	(3) #4 LW (B) CONT. & #4 @ 24" SW (B)
F36.16	42" WIDE	18" DEEP	(4) #5 LW (B) CONT. & #4 @ 24" SW (B)

NOTES:
1. ALL FOOTING REINFORCING IS BOTTOM STEEL/FOOTING, UNO.
2. CONCRETE COMPRESSIVE STRENGTH f'c = 3000 PSI, fy = 60 KSI.
3. SOIL BEARING PRESSURE = SEE ABOVE.
4. SHORT WAY BARS AND/OR BARS PERPENDICULAR TO WALLS SHALL BE PLACED AT THE BOTTOM LAYER.

1 FOUNDATION & FIRST FLOOR PLAN

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

NOTES:

1. FLOOR SHALL BE 4" SLAB ON GRADE REINFORCED w/ 6x6-W14xW14 OVER 10 MIL POLYETHYLENE VAPOR BARRIER AND MINIMUM 4" OF WASHED GRAVEL.
2. TOP OF SLAB SHALL BE AT ELEVATION 299.50' (+0'-0") UNLESS OTHERWISE NOTED.
3. TOP OF FOOTING ELEVATIONS ARE SHOWN THUS (000.00) ON PLAN.
4. DROP FOOTING ELEVATIONS AS REQUIRED TO OBTAIN DESIGN SOIL BEARING OR TO CLEAR UNDERGROUND PIPING. SEE PLUMBING DRAWINGS FOR INVERT ELEVATIONS.
5. SEE SITE PLAN FOR ALL EXTERIOR WORK SUCH AS SIDEWALKS, PAVING, CURBS AND GUTTERS, ETC.
6. C.J. DENOTES SLAB CONTROL JOINT. SEE TYPICAL DETAIL ON S2.0.
7. GENERAL CONTRACTOR TO COORDINATE ALL DIMENSIONS AND ELEVATIONS WITH THE ARCHITECTURAL DRAWINGS AND RESOLVE ALL DISCREPANCIES WITH THE ARCHITECT PRIOR TO POURING CONCRETE.

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WARRENTON VIRGINIA
FOUNDATION & FIRST FLOOR PLAN

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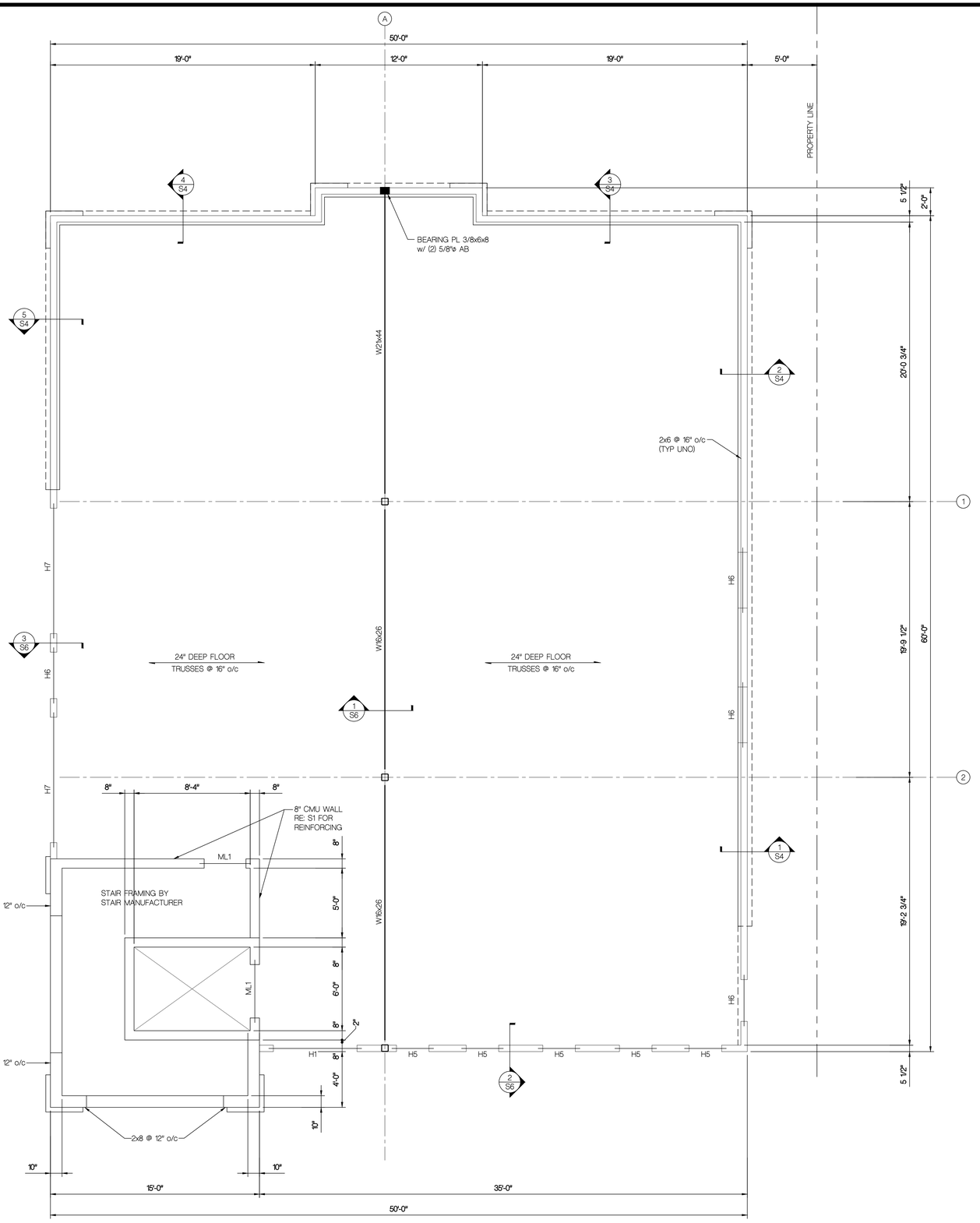

1 SECOND FLOOR FRAMING PLAN

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

NOTES:

1. FLOOR SHALL BE 5/8" T&G PLYWOOD NAILED & GLUED TO WOOD TRUSSES.
2. TOP OF FLOOR TO BE AT ELEVATION 311.50' (+12'-0") UNLESS NOTED OTHERWISE.
3. PROVIDE SOLID WOOD BLOCKING AT ALL FLOOR PENETRATIONS SMALLER THAN TRUSS SPACING.
4. FRAMING PLAN IS NOT TO BE USED TO QUANTIFY EXACT NUMBER OF TRUSSES OR FRAMING MEMBERS. TRUSS MANUFACTURER TO PROVIDE ADDITIONAL TRUSSES AS NECESSARY TO PROPERLY SUPPORT ALL CONDITIONS DESCRIBED IN THE CONTRACT DOCUMENTS. TRUSS MANUFACTURER TO VALUE ENGINEER TRUSSES FOR MOST ECONOMICAL SPACING.
5. DUCTWORK, WIRING & PLUMBING PASSING HORIZONTALLY OR VERTICALLY THRU FLOOR TRUSSES TO BE COORDINATED BY THE TRUSS SUPPLIER WITH THE MECHANICAL, ELECTRICAL AND PLUMBING DRAWINGS AND IS TO BE APPROVED BY THE CONTRACTOR.
6. LIVE LOAD DEFLECTION OF FLOOR TRUSSES TO BE LIMITED TO L/360 MAXIMUM. ADDITIONAL DESIGN DEAD LOAD OF 80 PLF FOR NON-LOAD BEARING PARTITIONS TO BE INCLUDED WHERE APPLICABLE.

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SECOND FLOOR FRAMING PLAN

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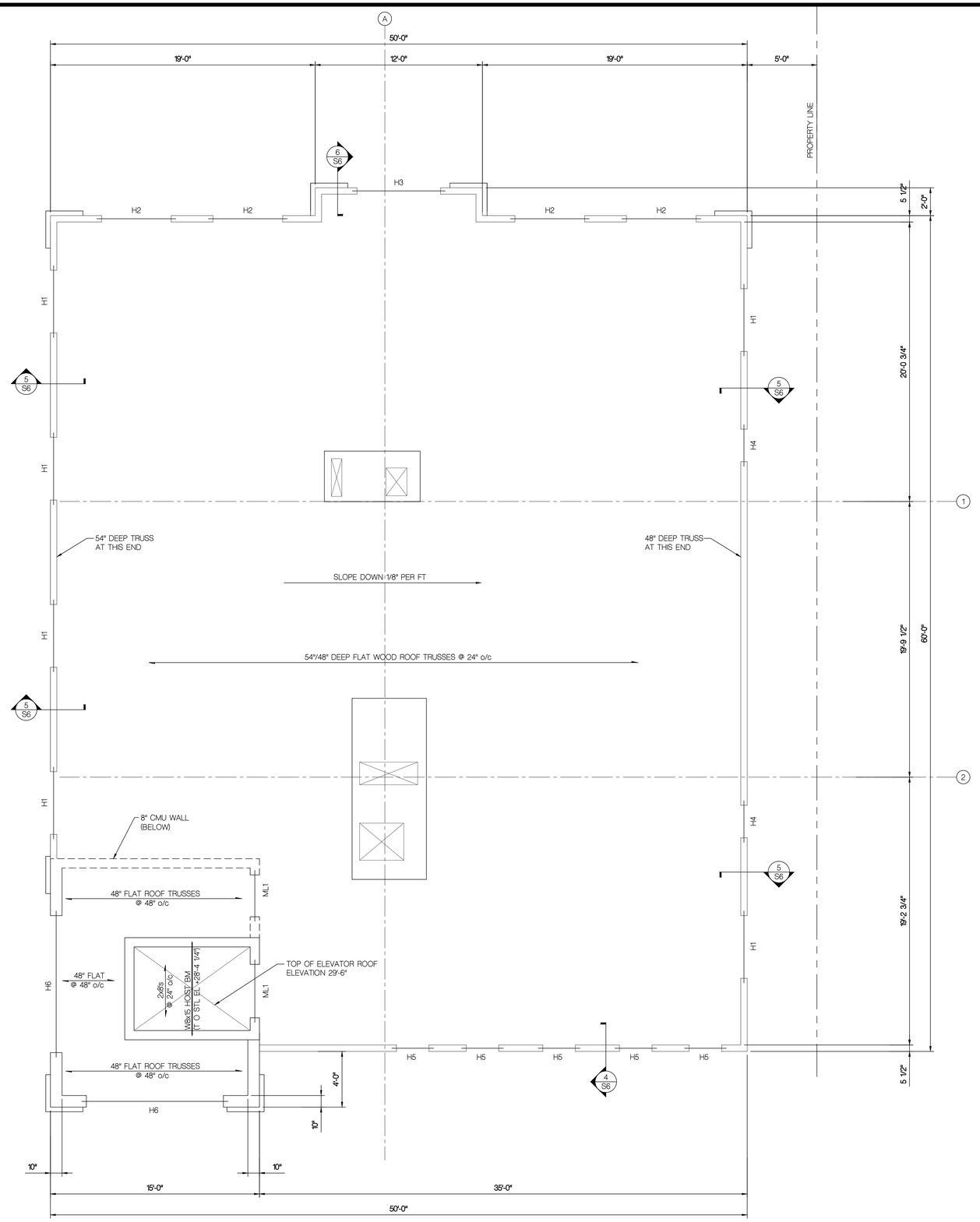

WOOD HEADER SCHEDULE

H1	(2) 2 x 12	
H2	(2) 2 x 6	
H3	(3) 2 x 6	
H4	(2) 2 x 8	
H5	(3) 2 x 4	
H6	(2) 2 x 12	
H7	(3) 1 3/4 x 16 LVL 1.8E	

1 ROOF FRAMING PLAN

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

NOTES:

1) ROOF TO BE 3/4" T&G PLYWOOD (GLUED AND NAILED) OVER WOOD ROOF TRUSSES @ 2'-0" o/c.
2) TRUSS BEARING TO BE AT ELEVATION +22'-0" UNLESS NOTED OTHERWISE.
3) TRUSS MANUFACTURER TO PROVIDE ALL TEMPORARY AND PERMANENT BRIDGING AS REQUIRED FOR STABILITY OF ROOF SYSTEM.
4) GENERAL CONTRACTOR TO SUBMIT DESIGN CALCULATIONS AND SHOP DRAWINGS OF WOOD TRUSSES, SIZE AND LOCATION OF THE PERMANENT BRIDGING, AND ALL ADDITIONAL FRAMING MEMBERS REQUIRED TO MATCH THE ROOF PROFILE SHOWN ON THE ARCHITECTURAL DRAWINGS. CALCULATIONS AND SHOP DRAWINGS TO BE SIGNED AND SEALED BY A REGISTERED ENGINEER IN THE STATE OF VIRGINIA.
5) PROVIDE DOUBLE STUDS AT EACH END OF OPENINGS UNLESS NOTED OTHERWISE.
6) SEE MECHANICAL DRAWINGS FOR LOCATION AND WEIGHT OF ALL MECHANICAL UNITS. TRUSS MANUFACTURER TO DESIGN TRUSSES FOR ADDITIONAL LOADS OF MECHANICAL UNITS.
7) OVERBUILT AREAS MAY BE CONSTRUCTED FROM TRUSSES OR 2x FRAMING AT 24" o/c.

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ROOF FRAMING PLAN

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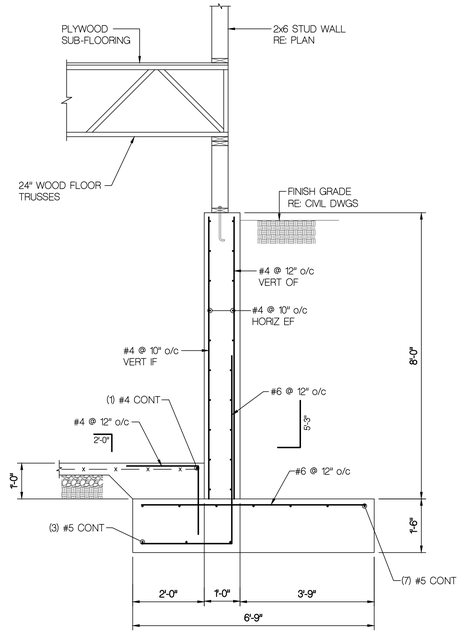
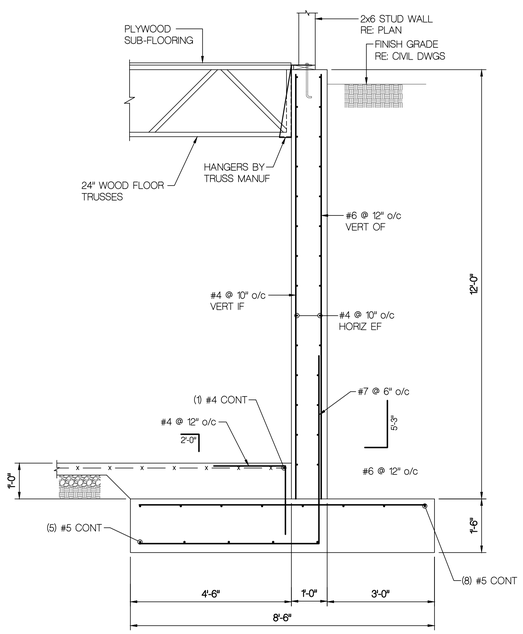
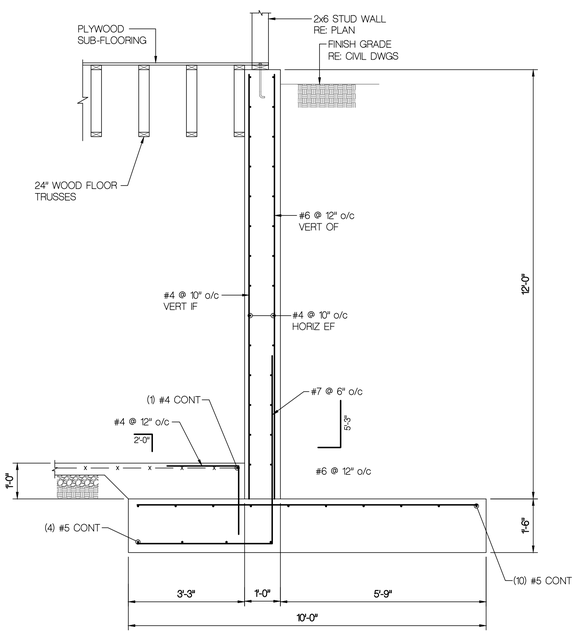


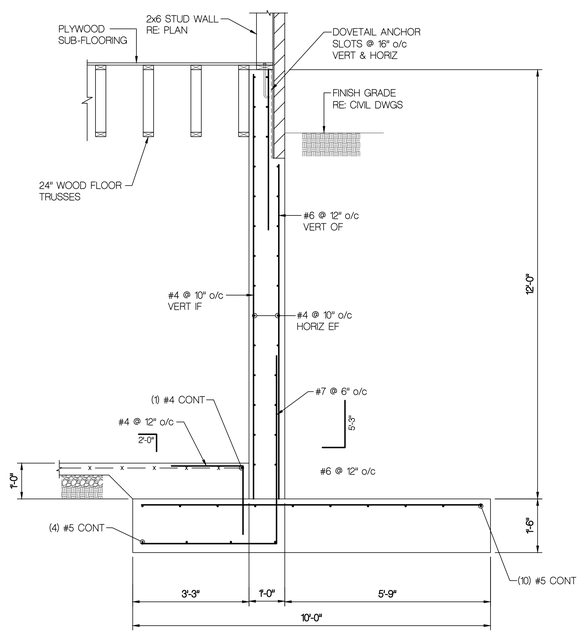
1 **SECTION**
SCALE : 1/2" = 1'-0"



2 **SECTION**
SCALE : 1/2" = 1'-0"



3 **SECTION**
SCALE : 1/2" = 1'-0"



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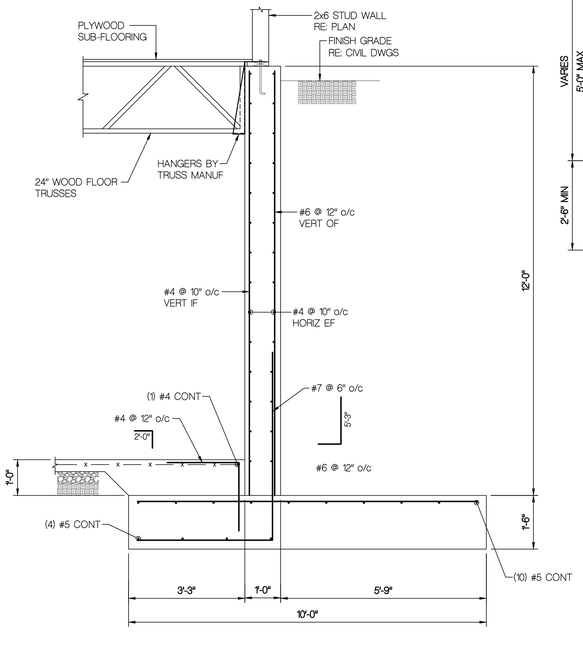
SCALE : 1/2" = 1'-0"



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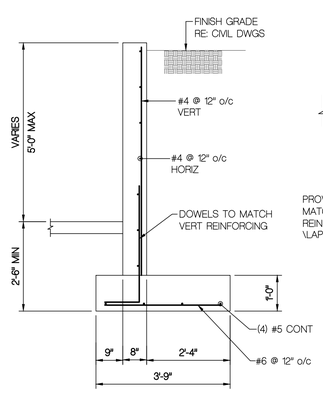
SCALE : 1/2" = 1'-0"



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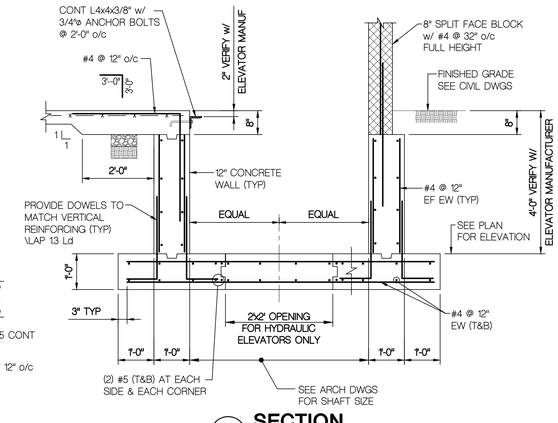

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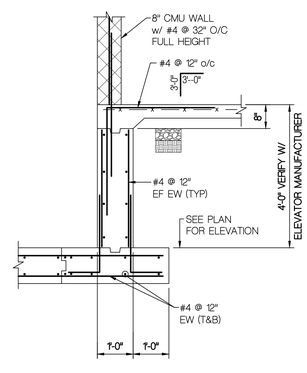

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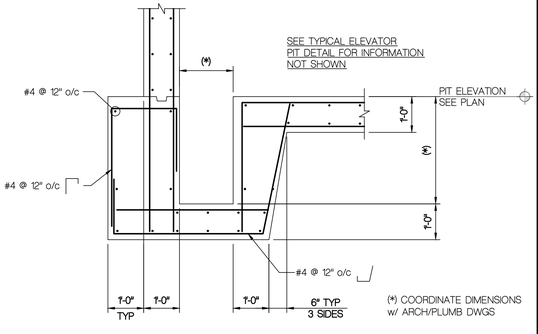
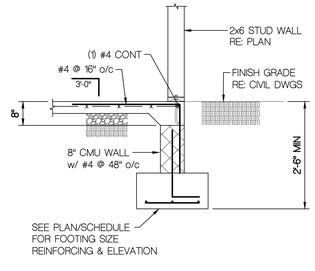
SCALE : 1/2" = 1'-0"



9 **TYPICAL SUMP DETAIL AT SIDE WALL**
SCALE : 1/2" = 1'-0"



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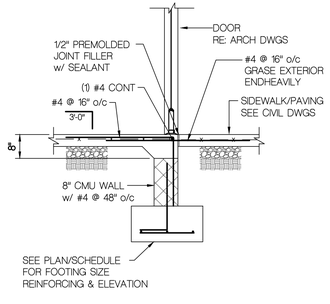
SCALE : 1/2" = 1'-0"



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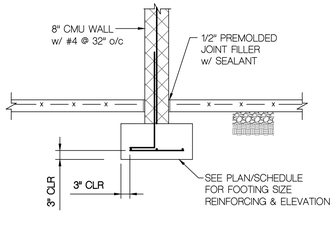

12 **SECTION**
SCALE : 1/2" = 1'-0"

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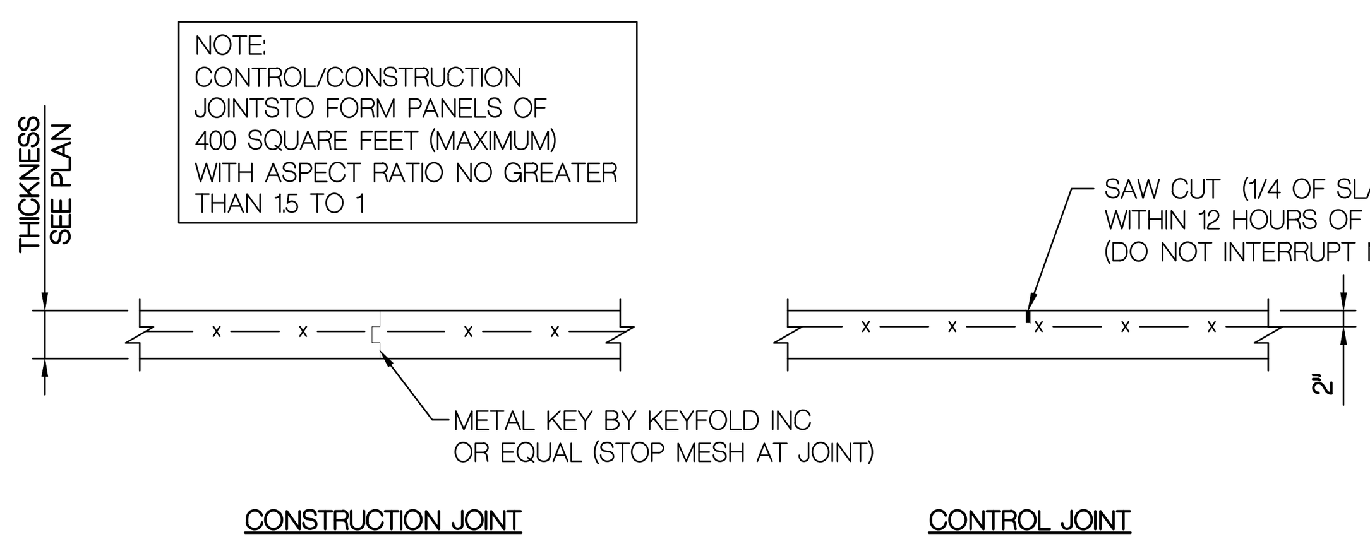
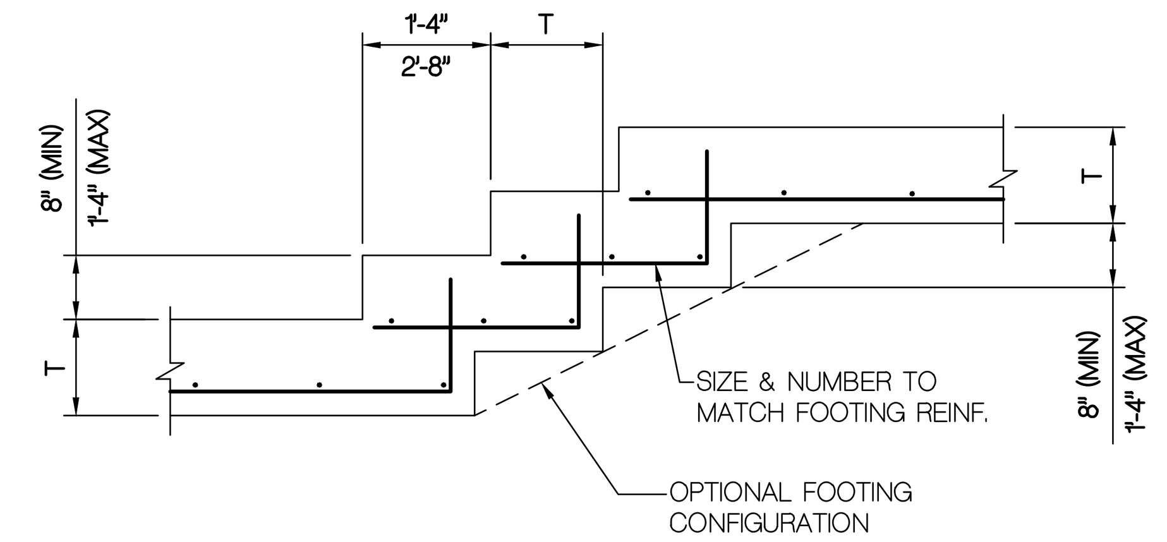
CHURCH ROAD ANIMAL HOSPITAL
WARRENTON VIRGINIA
FOUNDATION SECTIONS

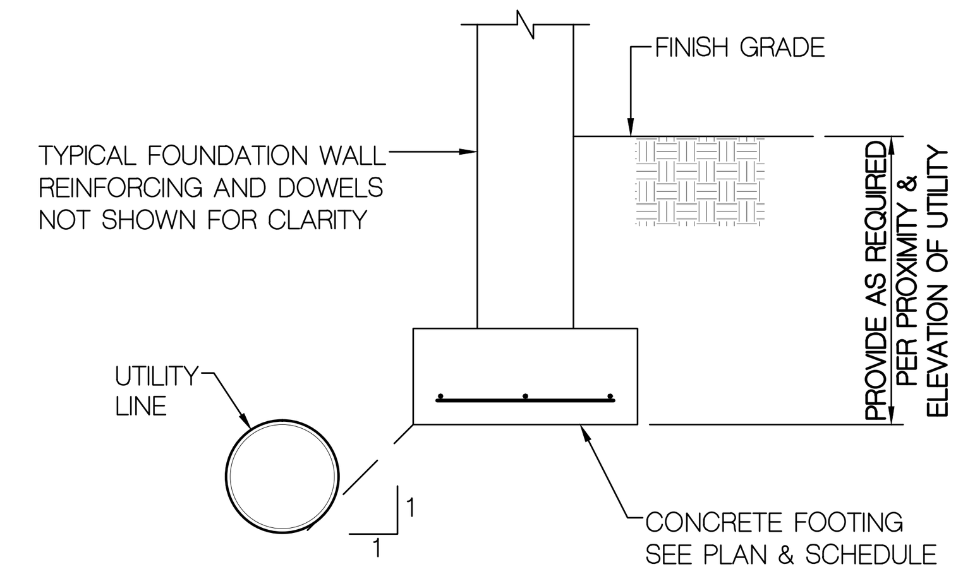
DATE	SHEET NO.
4-3-17	S4
FILE –	


NOTE:
CONTROL/CONSTRUCTION JOINTSTO FORM PANELS OF 400 SQUARE FEET (MAXIMUM) WITH ASPECT RATIO NO GREATER THAN 1.5 TO 1
THICKNESS SEE PLAN
SAW CUT (1/4 OF SLAB DEPTH) WITHIN 12 HOURS OF POUR (DO NOT INTERRUPT MESH)
2"
METAL KEY BY KEYFOLD INC OR EQUAL (STOP MESH AT JOINT)
CONSTRUCTION JOINT
CONTROL JOINT

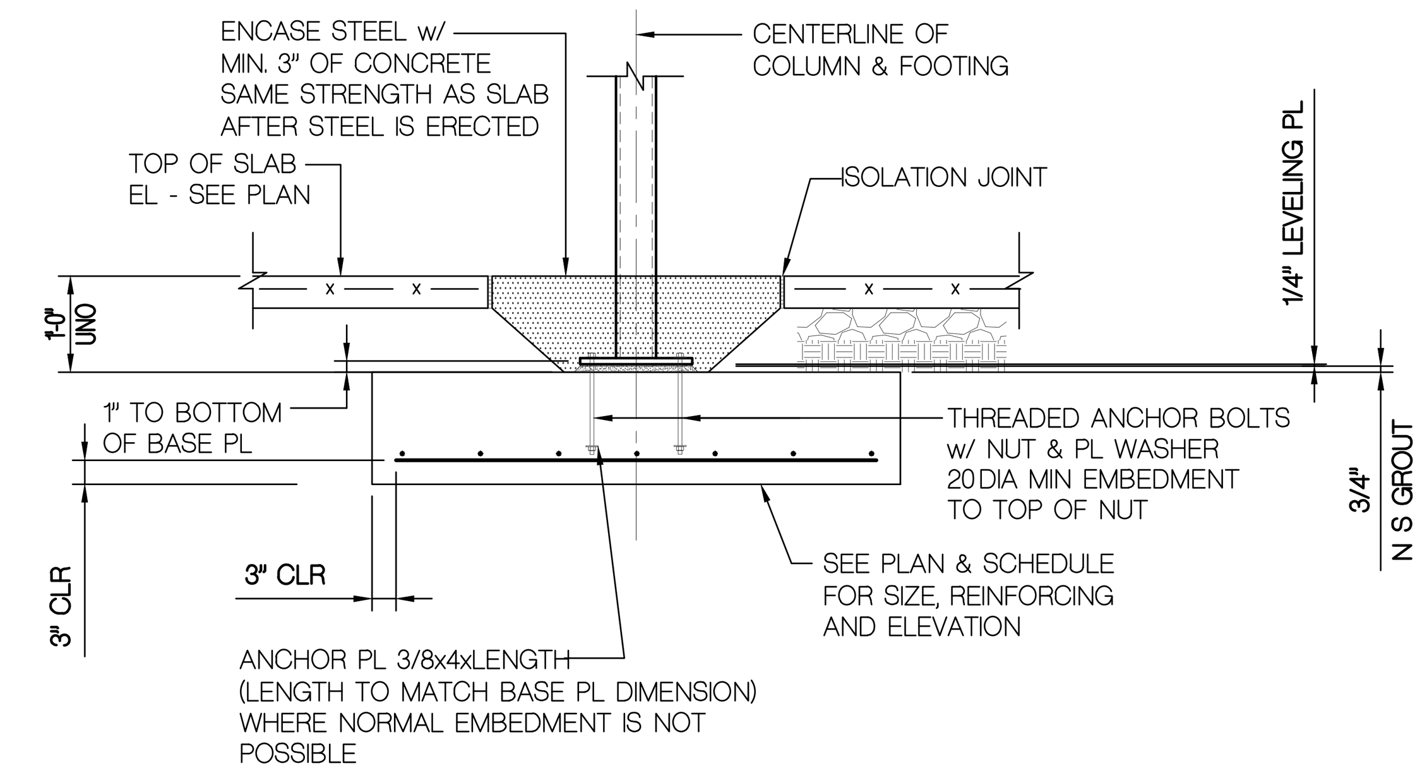
1 TYPICAL SLAB ON GRADE DETAILS
SCALE : 1/2" = 1'-0"



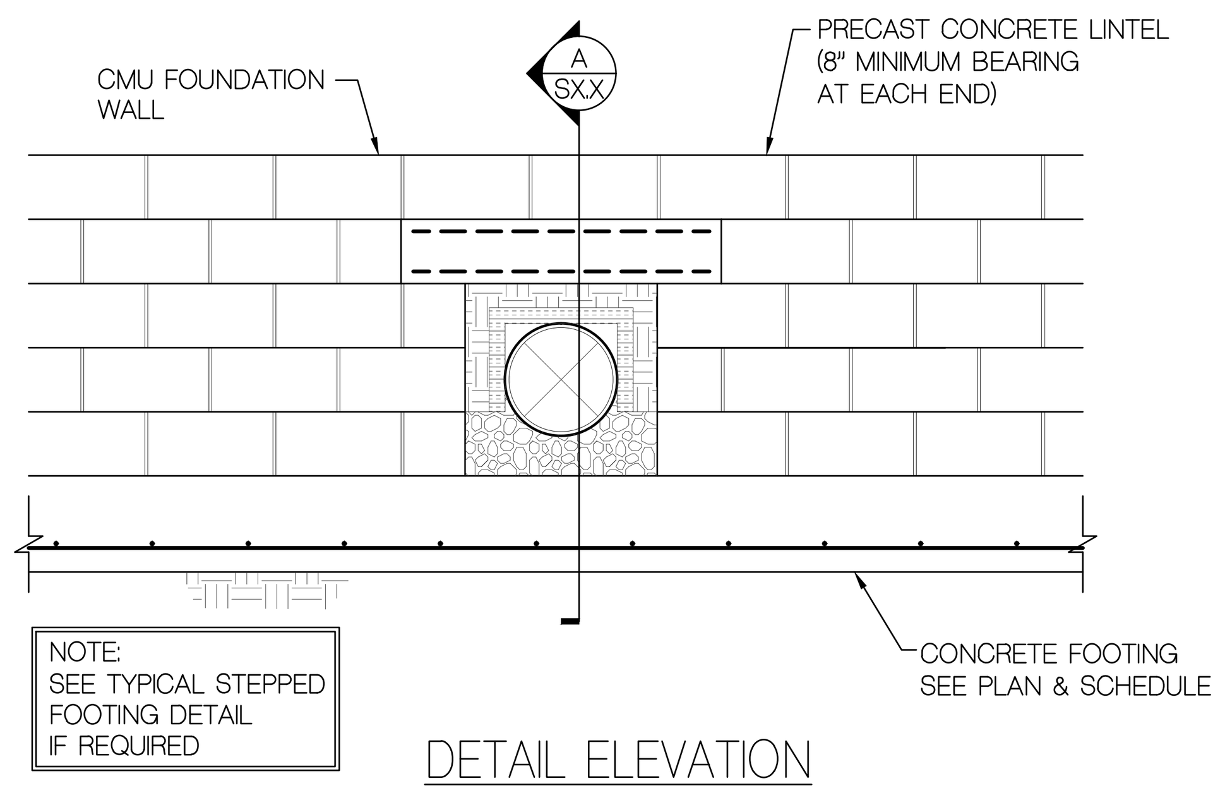
2 TYPICAL STEPPED FOOTING DETAIL
SCALE : 1/2" = 1'-0"

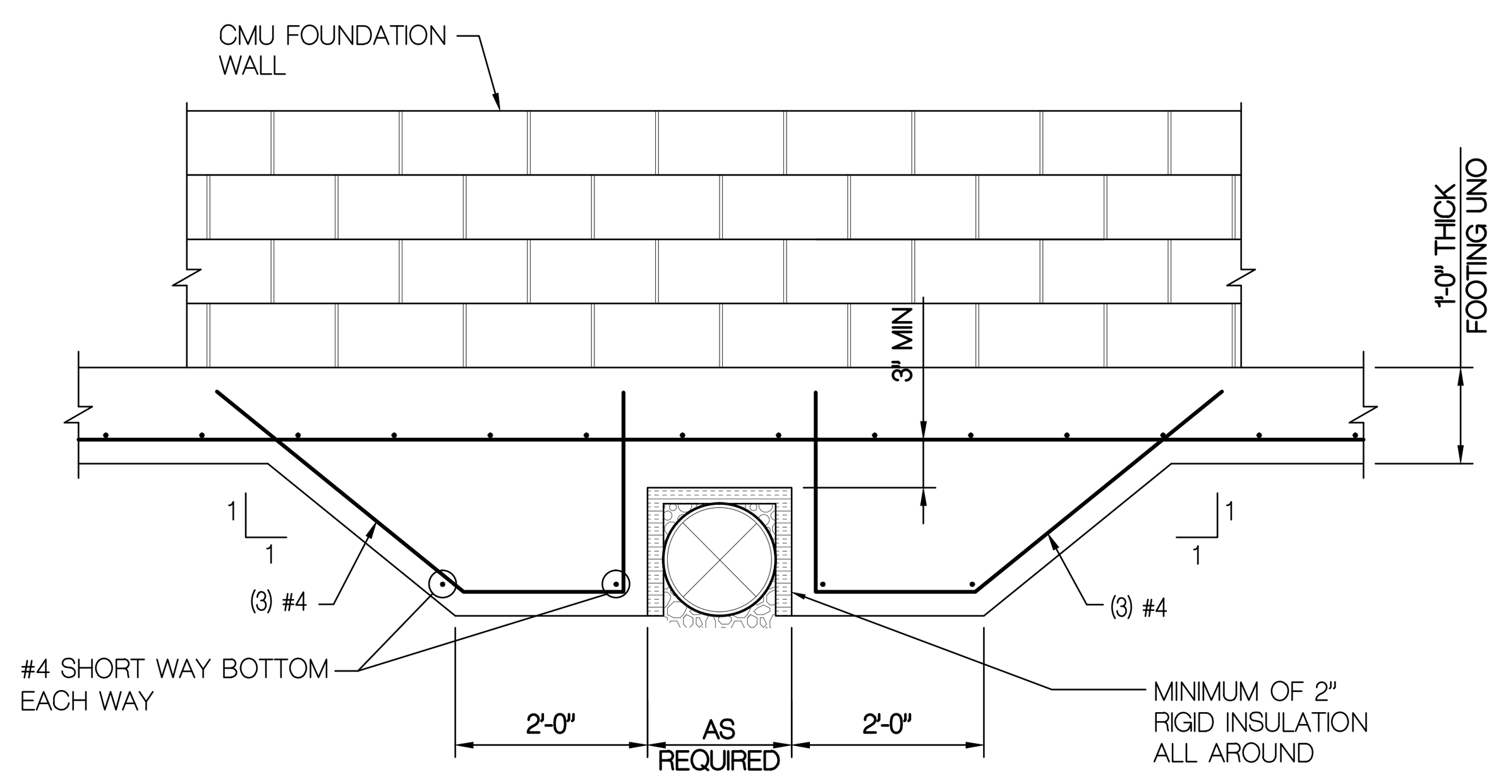


3 TYPICAL DETAIL FOR UTILITIES ADJACENT TO FOOTINGS
SCALE : 1/2" = 1'-0"

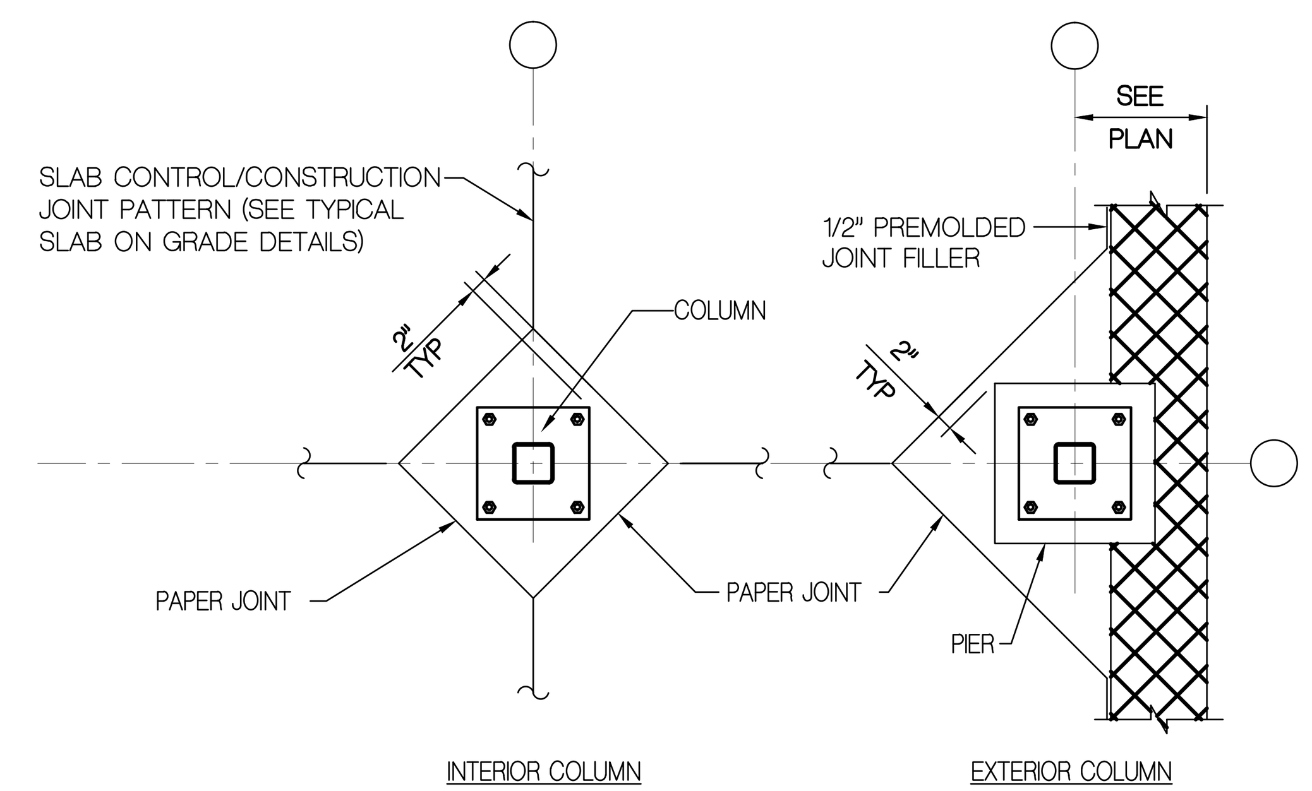

ENCASE STEEL w/ MIN. 3" OF CONCRETE SAME STRENGTH AS SLAB AFTER STEEL IS ERECTED
CENTERLINE OF COLUMN & FOOTING
TOP OF SLAB EL - SEE PLAN
ISOLATION JOINT
1/4" LEVELING PL
1'-0" UNO
1" TO BOTTOM OF BASE PL
THREADED ANCHOR BOLTS w/ NUT & PL WASHER 20DIA MIN EMBEDMENT TO TOP OF NUT
3/4" N S GROUT
3" CLR
3" CLR
SEE PLAN & SCHEDULE FOR SIZE, REINFORCING AND ELEVATION
ANCHOR PL 3/8x4xLENGTH (LENGTH TO MATCH BASE PL DIMENSION) WHERE NORMAL EMBEDMENT IS NOT POSSIBLE

4 TYPICAL COLUMN FOOTING WITHOUT PIER DETAIL
SCALE : 1/2" = 1'-0"

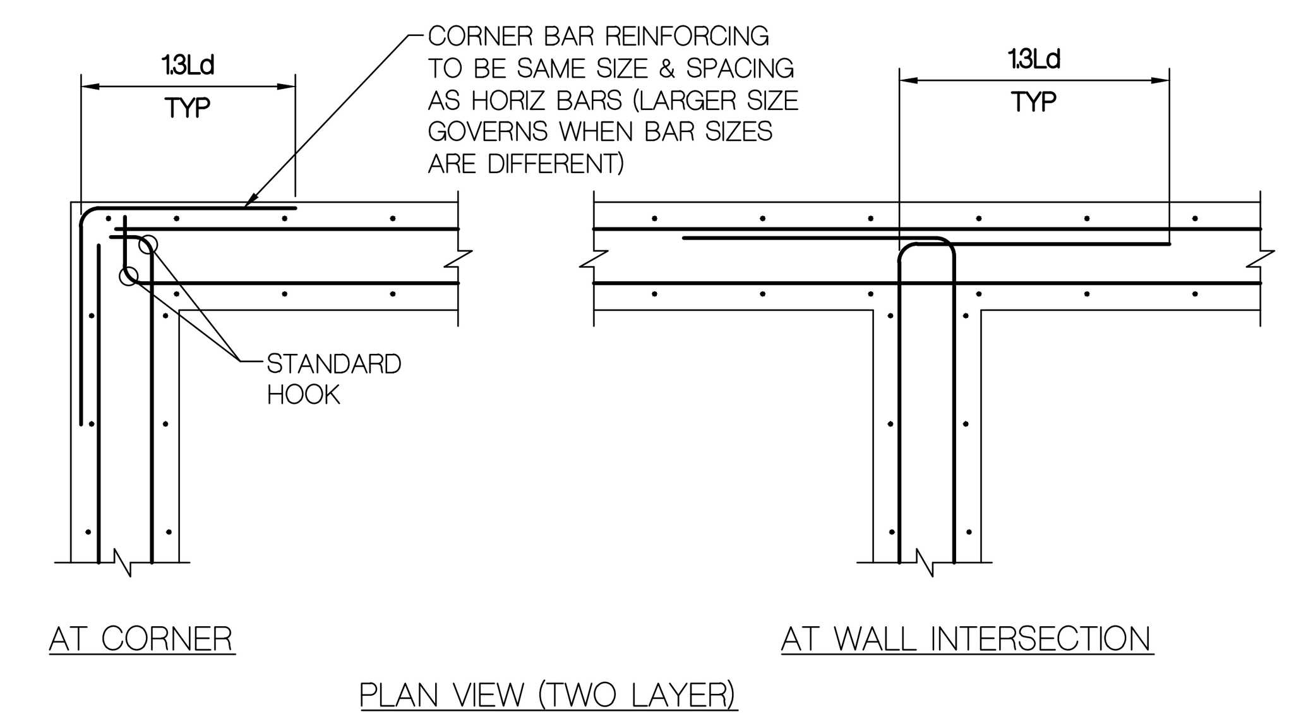




6 TYPICAL DETAIL FOR UTILITIES RUNNING BELOW FOOTINGS (ELEVATION)
SCALE : NTS



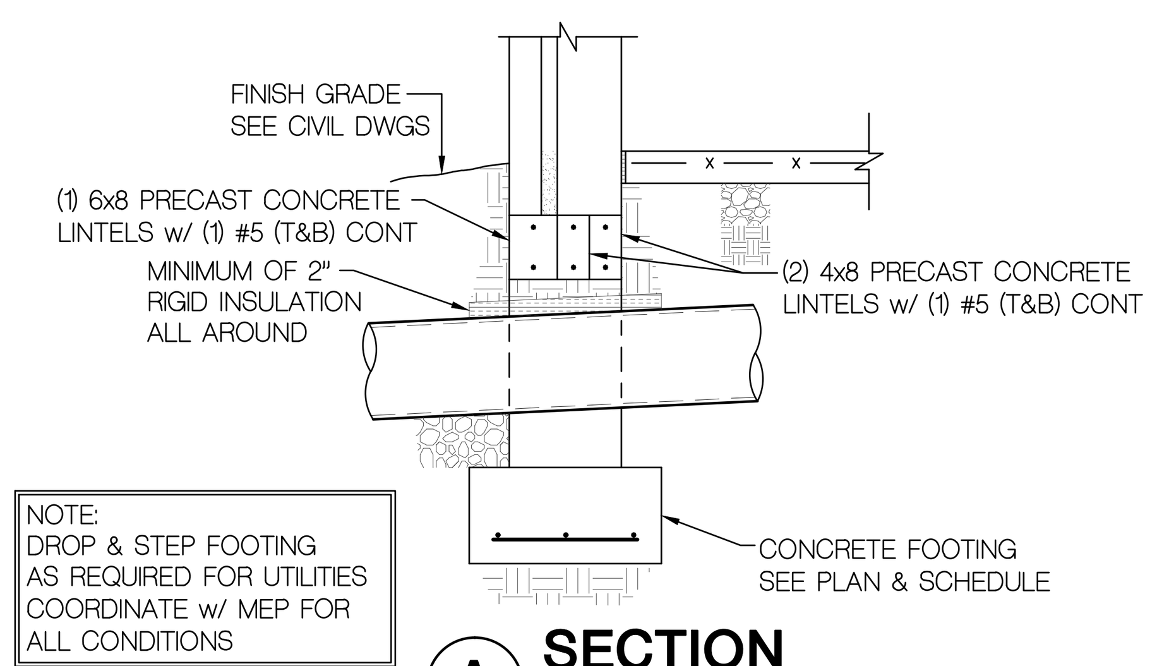
7 TYPICAL ISOLATION JOINT DETAILS
SCALE : 1/2" = 1'-0"



NOTES:

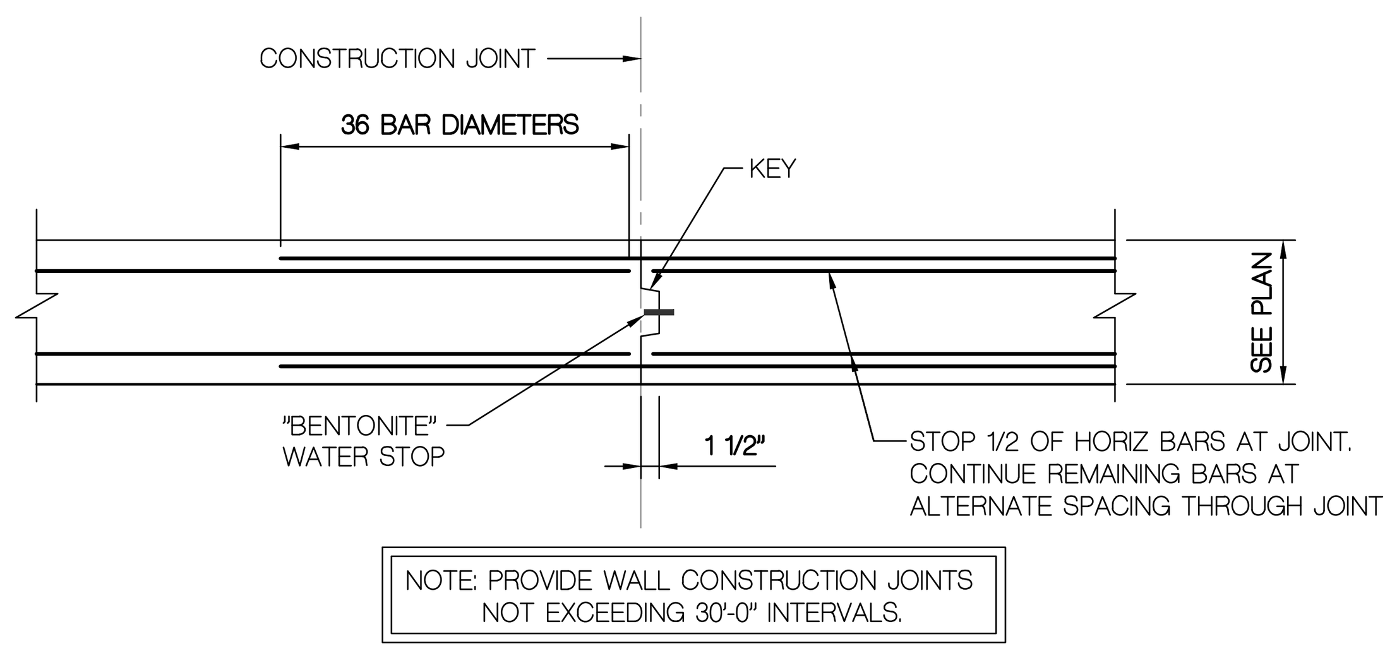
1) Ld PER TABLES FOR DEVELOPMENT LENGTH.
2) SEE PLANS AND SECTIONS FOR SIZE AND SPACING OF REINFORCEMENT AND WALL THICKNESS.

8 TYPICAL CONCRETE WALL REINFORCING DETAIL
SCALE : 1/2" = 1'-0"


FINISH GRADE SEE CIVIL DWGS
(1) 6x8 PRECAST CONCRETE LINTELS w/ (1) #5 (T&B) CONT
MINIMUM OF 2" RIGID INSULATION ALL AROUND
(2) 4x8 PRECAST CONCRETE LINTELS w/ (1) #5 (T&B) CONT
NOTE: DROP & STEP FOOTING AS REQUIRED FOR UTILITIES COORDINATE w/ MEP FOR ALL CONDITIONS
CONCRETE FOOTING SEE PLAN & SCHEDULE

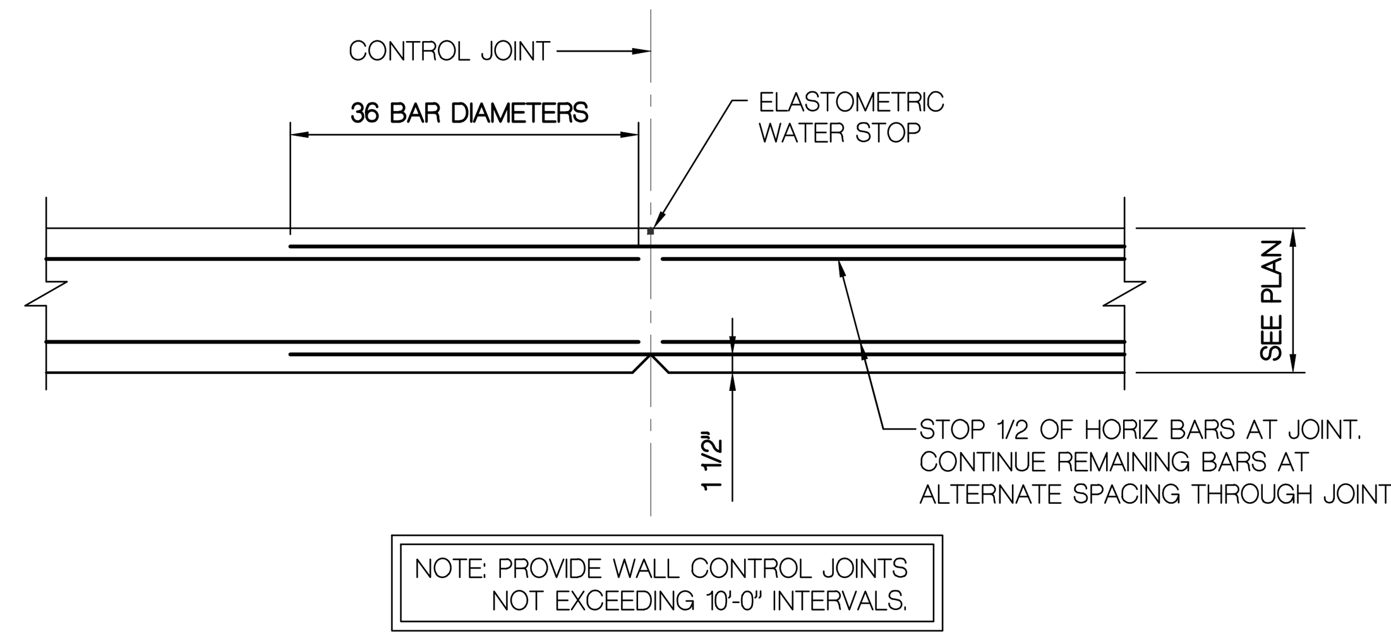
A SECTION
SCALE : NTS

5 TYPICAL DETAIL FOR UTILITIES RUNNING THRU FOUNDATION WALL
SCALE : NTS



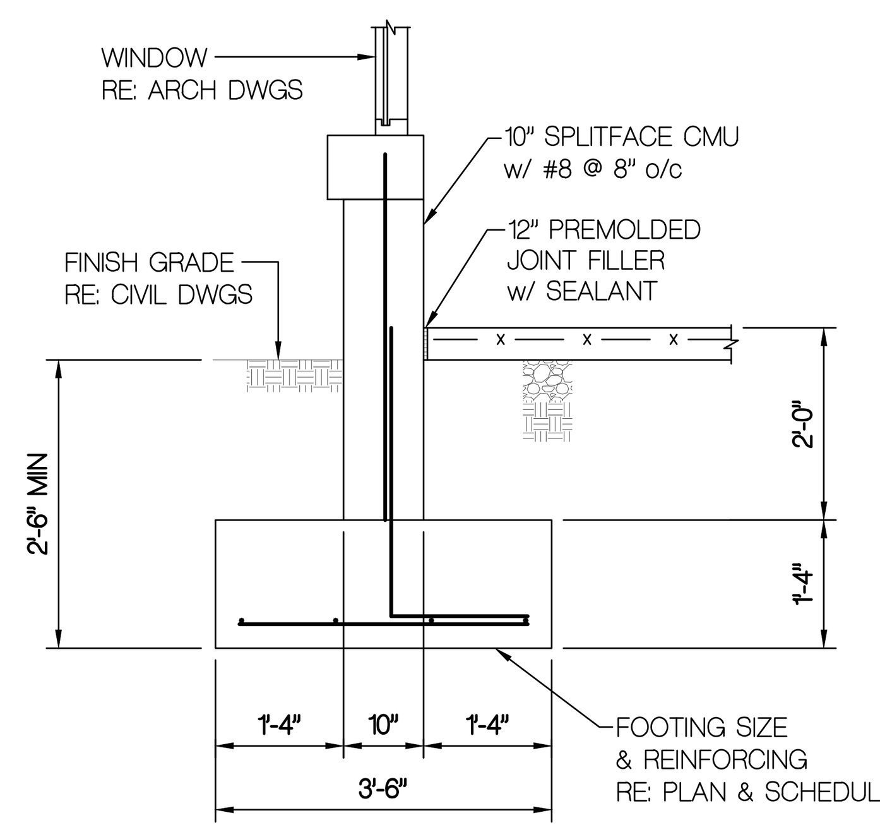
NOTE: PROVIDE WALL CONSTRUCTION JOINTS NOT EXCEEDING 30'-0" INTERVALS.

9 TYPICAL CONCRETE WALL CONSTRUCTION JOINT
SCALE : 3/4" = 1'-0"

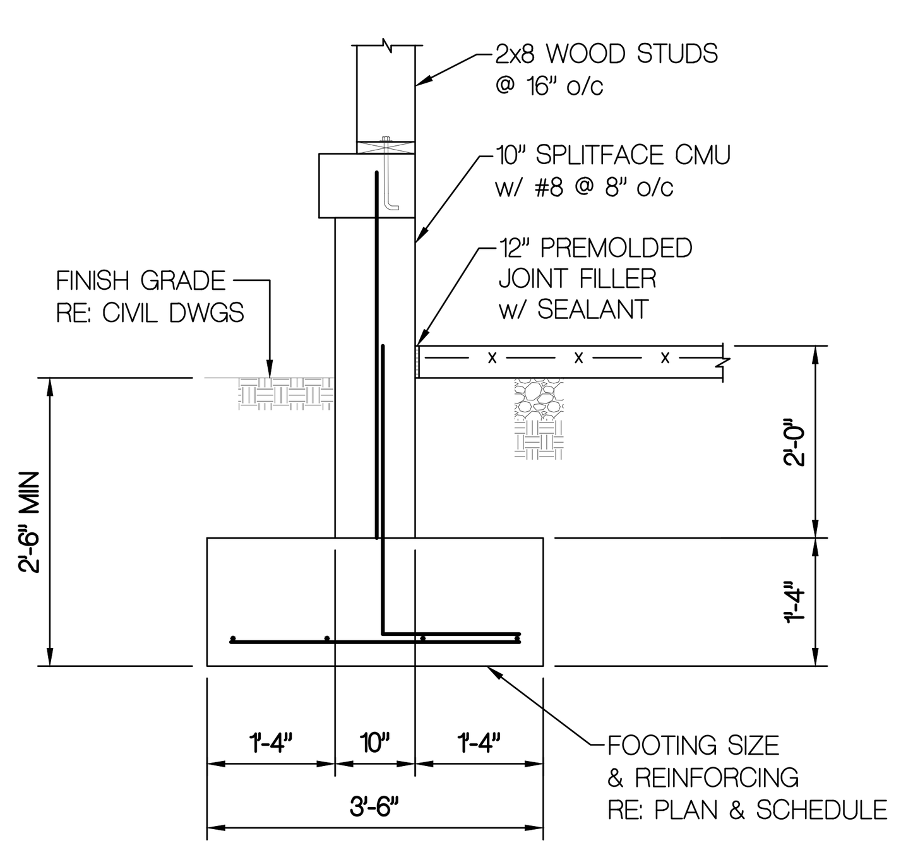


NOTE: PROVIDE WALL CONTROL JOINTS NOT EXCEEDING 10'-0" INTERVALS.

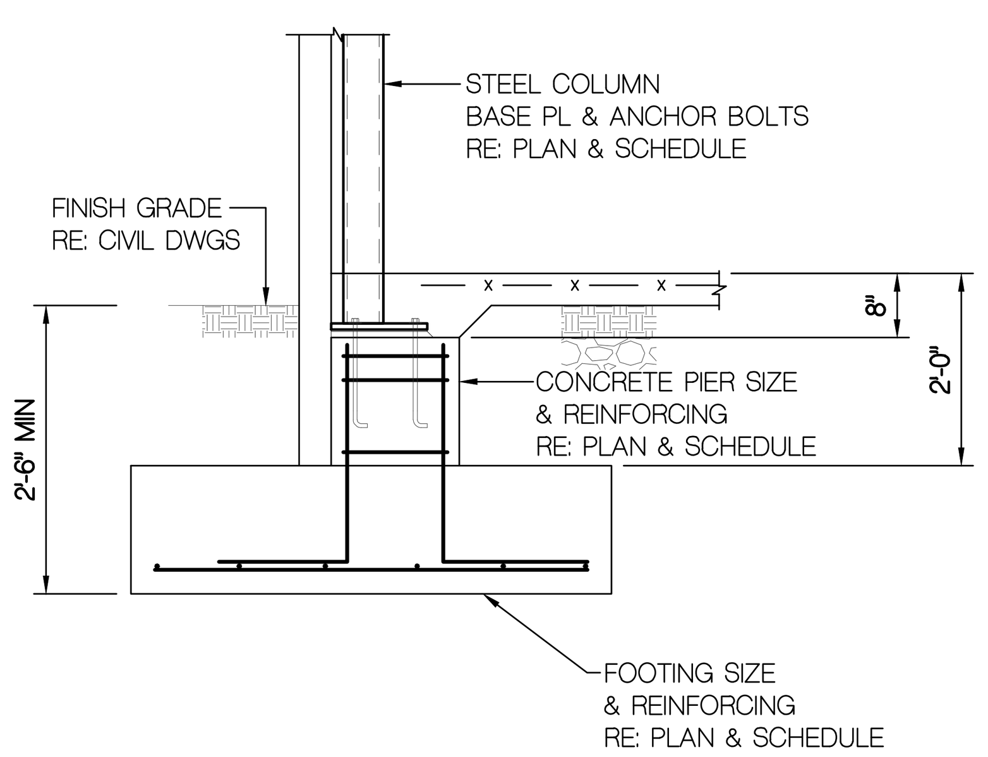
10 TYPICAL CONCRETE WALL CONTROL JOINT
SCALE : 3/4" = 1'-0"



11 SECTION
SCALE : 1/2" = 1'-0"



12 SECTION
SCALE : 1/2" = 1'-0"



13 SECTION
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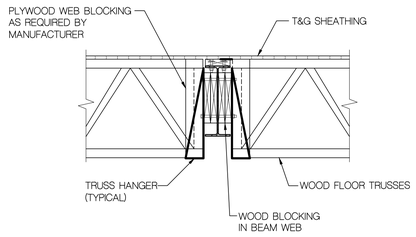
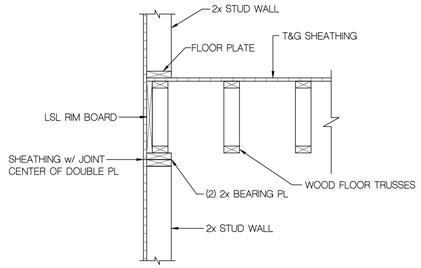
WARRENTON VIRGINIA

FOUNDATION SECTIONS & TYPICAL DETAILS

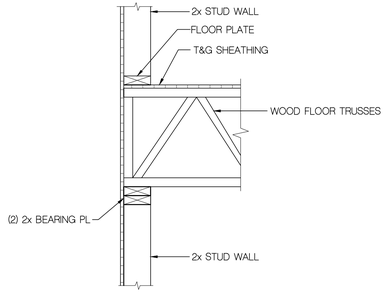
DATE 4-3-17	SHEET NO.
FILE –	S5



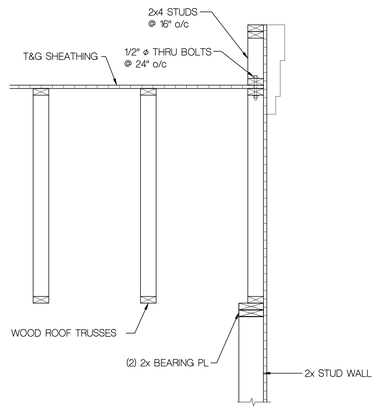
1 **SECTION**
SCALE : 3/4" = 1'-0"



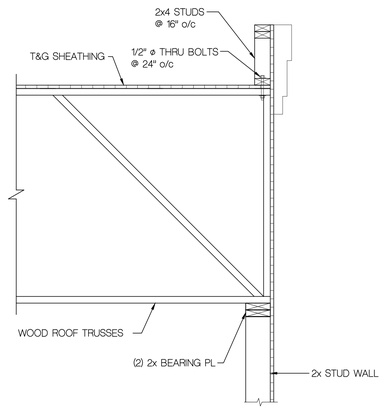
2 **SECTION**
SCALE : 3/4" = 1'-0"



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



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



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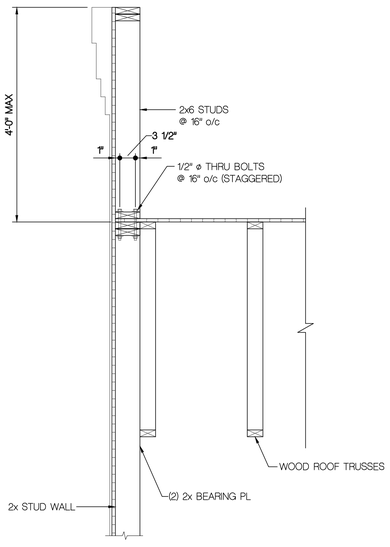
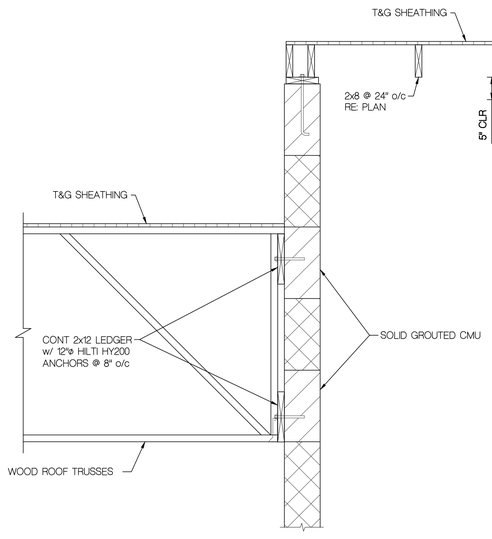
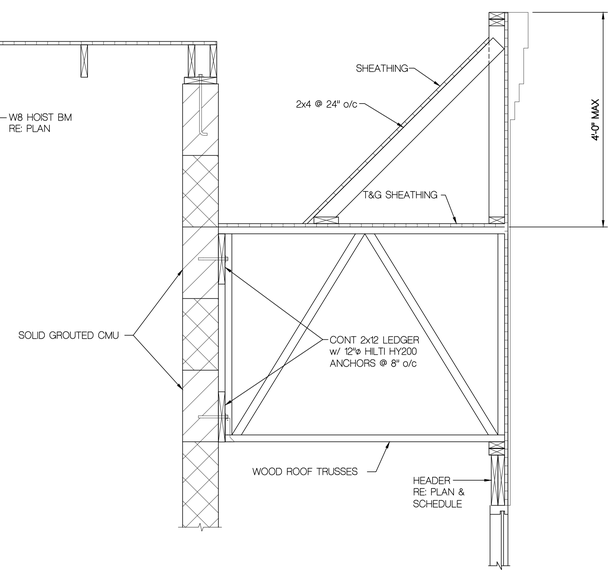
SCALE : 3/4" = 1'-0"



6 **SECTION**
SCALE : 3/4" = 1'-0"



7 **SECTION**
SCALE : 3/4" = 1'-0"



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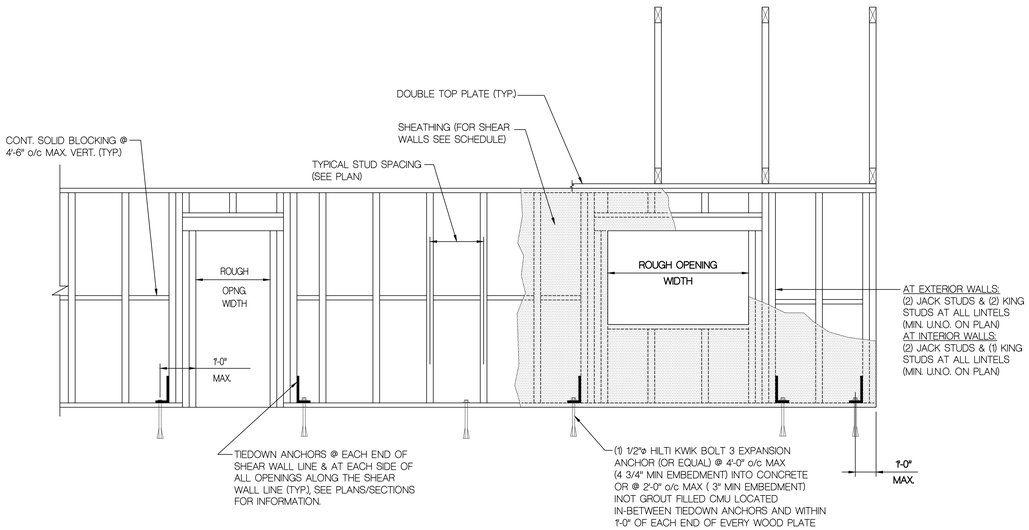
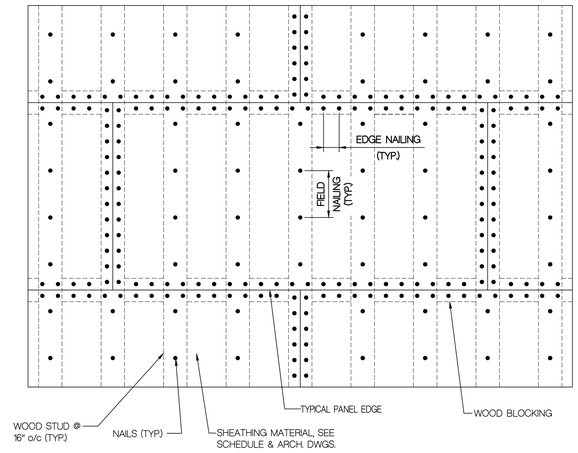
DATE 4-3-17
SHEET NO. S6
FILE –



1 TYPICAL WOOD STUD BEARING AND/OR SHEAR WALL ELEVATION

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

FOR SHEAR WALL NAILING REQUIREMENTS, SEE SCHEDULE

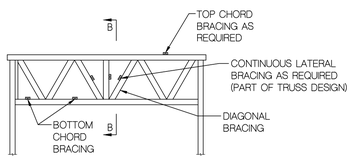


2 TYPICAL SHEAR WALL PANEL ELEVATION

SCALE : 1/2" = 1'-0"

WOOD SHEAR WALL SCHEDULE FOR STUDS AT 16" SPACING

SW MARK	SHEATHING MATERIAL (ONE SIDE ONLY)	BLOCKED/ UNBLOCKED	EDGE NAILING INCLUDING EDGES OF OPENINGS)	FIELD NAILING	SIMPSON TIEDOWN ANCHOR	MAXIMUM FORCE (PLF)	ALLOWABLE FORCE (PLF)
SW1	15/32" STRUCTURAL I SHEATHING	BLOCKED	6d @ 6"	10d @ 12"	HDU8-SDS2.5	210	870
SW2	15/32" STRUCTURAL I SHEATHING	BLOCKED	6d @ 3"	10d @ 12"	HDU8-SDS2.5	535	640

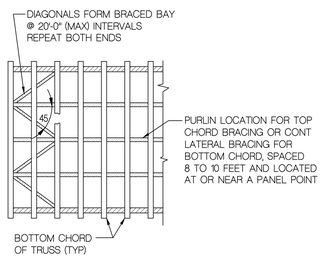


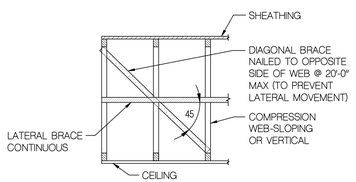
3C TYPICAL TRUSS ELEVATION

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

GENERAL NOTES:

1) WOOD TRUSSES SHALL BE BRACED AND ERECTED IN ACCORDANCE WITH THE "TRUSS PLATE INSTITUTE" STANDARDS. SEE STRUCTURAL NOTES.
2) BRACING IN THE PLANE OF WEB MEMBERS:
   a) THE TRUSS FABRICATOR SHALL PROVIDE AND LOCATE CONTINUOUS LATERAL BRACING FOR EACH TRUSS WEB MEMBER AS REQUIRED.
   b) LATERAL BRACING SHALL BE RESTRAINED BY DIAGONAL BRACING (MIN 2" THICK NOMINAL LUMBER). THIS BRACING SHALL BE CONTINUOUS.
   c) A MINIMUM OF TWO ROWS OF DIAGONAL BRACING IS REQUIRED. ONE AT EACH VERTICAL WEB MEMBER CLOSEST TO BEARING LOCATIONS.
3) THE BOTTOM CHORDS SHALL BE BRACED BY CONTINUOUS LATERAL BRACING SPACED AT 8 TO 10 FEET NAILED TO TOP OF BOTTOM CHORD DIAGONALS PLACED AT 45 DEGREES TO THE LATERAL BRACES SHALL BE LOCATED AT EACH END, IF BUILDING EXCEEDS 60 FEET IN LENGTH, DIAGONAL BRACING SHOULD BE REPEATED AT 20 FOOT INTERVALS.
4) TOP CHORD BRACING:
   a) IF PLYWOOD DECKING IS APPLIED DIRECTLY TO THE TOP CHORD, PROPERLY LAPPED AND NAILED TO DEVELOP DIAPHRAGM ACTION, BRACING IS NOT REQUIRED.
   b) IF PURLINS ARE USED, DIAGONAL TOP CHORD BRACING IS REQUIREED AT EACH END. IF BUILDING EXCEEDS 60 FEET IN LENGTH, DIAGONAL BRACING SHOULD BE REPEATED AT 20 FOOT INTERVALS.
5) WOOD ROOF TRUSSES ARE TO BE DESIGNED FOR THE WOOD FABRICATOR BY A PROFESSIONAL ENGINEER AND SEALED CALCULATIONS AND DRAWINGS ARE TO BE SUBMITTED FOR REVIEW.





3B SECTION B-B

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

3 TOP/BOTTOM CHORD BRACING

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

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TYPICAL WOOD DETAILS

DATE	SHEET NO.
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