

01-09-17

Providence High School  
1800 Pineville-Matthews Rd.  
Charlotte, NC 28270

Training Facility

DRAWN BY:  
D. Howard, PE  
DATE:  
01-09-17

# NC Commercial Standard Notes

**STRUCTURAL DESIGN CRITERIA:**

1. STRUCTURAL DESIGN HAS BEEN PERFORMED ACCORDING TO THE 2012 NORTH CAROLINA STATE BUILDING CODE (2009 IBC with North Carolina Amendments) REFER TO THE RELEVANT PORTION OF NCSCC 2009 FOR ANY ADDITIONAL INFORMATION NOT COVERED IN THESE NOTES OR EXPLICITLY STATED ON THE DESIGN DRAWINGS.

2. DESIGN LOADS ARE ALL DEAD LOADS PLUS LIVE LOADS AS PRESCRIBED IN TABLE 1607.1 of the 2009 IBC.

**GENERAL NOTES:**

- THE GENERAL CONTRACTOR (CONTRACTOR) SHALL BE RESPONSIBLE TO:
  - OBTAIN ALL CONTRACT DOCUMENTS, ADDENDA, AND REVISIONS.
  - REVIEW AND COORDINATE STRUCTURAL WITH ARCHITECTURAL DRAWINGS AND ALL CONTRACT DOCUMENTS.
  - SUBMIT CONTRACT DOCUMENTS TO SUBCONTRACTORS AND MATERIAL SUPPLIERS PRIOR TO SUBMISSION OF SHOP DRAWINGS, OR FABRICATION OF ANY STRUCTURAL MEMBERS, OR ERECTION IN THE FIELD.
  - REVIEW STRUCTURAL DRAWINGS, OTHER CONTRACT DRAWINGS, AND DOCUMENTS. REPORT TO THE PROJECT ARCHITECT AND STRUCTURAL ENGINEER ANY DISCREPANCY BETWEEN AND WITHIN EACH SET OF DRAWINGS PRIOR TO THE FABRICATION OR INSTALLATION OF ANY STRUCTURAL MEMBERS.
  - VERIFY ALL EXISTING DIMENSIONS, ELEVATIONS, AND CONDITIONS. REPORT TO THE PROJECT ARCHITECT AND STRUCTURAL ENGINEER ANY DEVIATION FROM THE ASSUMED CONDITIONS INDICATED BY THE PLANS AND CONTRACT DOCUMENTS PRIOR TO THE FABRICATION OR INSTALLATION OF ANY STRUCTURAL MEMBERS.
  - PROVIDE BRACING AND TEMPORARY SHORING OF EXISTING AND NEW STRUCTURE AS REQUIRED TO MAINTAIN THE SAFETY OF WORKERS AND THE STRUCTURE(S) FOR THE DURATION OF CONSTRUCTION. THE CONTRACTOR SHALL RETAIN AN INDEPENDENT ENGINEER FOR ANY REQUIRED SHORING DESIGN. THE STRUCTURAL ENGINEER SHALL NOT BE RESPONSIBLE FOR THE METHODS, TECHNIQUES, OR SEQUENCES OF CONSTRUCTION. WORK SUPERVISION IS THE SOLE RESPONSIBILITY OF THE CONTRACTOR.
  - COMPLY WITH ALL SAFETY PRECAUTIONS AND REGULATIONS. THE ENGINEER WILL NEITHER ADVISE NOR ISSUE DIRECTION AS TO SAFETY PRECAUTIONS AND PROGRAMS.
- DRAWINGS SHOW GENERAL AND TYPICAL SECTIONS AND DETAILS OF CONSTRUCTION. WHERE CONDITIONS ARE NOT SPECIFICALLY SHOWN, SIMILAR SECTIONS AND CONSTRUCTION DETAILS SHALL BE USED, SUBJECT TO THE ENGINEERS APPROVAL, OR PER THE NORTH CAROLINA STATE BUILDING CODE.
- LOADS APPLIED TO THE STRUCTURE DURING CONSTRUCTION SHALL NOT EXCEED THE LIVE LOADS INDICATED IN THE STRUCTURAL CRITERIA SECTION OF THESE STANDARD NOTES. DO NOT APPLY ANY CONSTRUCTION LOADS UNTIL STRUCTURAL FRAMING IS PROPERLY INSTALLED AND ALL TEMPORARY BRACING IS IN PLACE.
- EQUIPMENT PADS SHALL BE PROVIDED BY THE MECHANICAL, ELECTRICAL, OR PLUMBING CONTRACTORS REQUIRING THE PAD. THE ENGINEER SHALL BE NOTIFIED OF LOCATIONS WHERE HEAVY EQUIPMENT IS TO BE SUPPORTED.
- COORDINATE THE EXACT SIZE AND LOCATION OF ALL SLEEVES AND OPENINGS THROUGH CONCRETE WALLS, CONCRETE SLABS, OR MASONRY WALLS WITH ARCHITECTURAL, MECHANICAL, PLUMBING, AND ELECTRICAL DRAWINGS. NOTIFY THE ENGINEER WHERE OPENINGS CONFLICT WITH PLACEMENT OF REINFORCING STEEL.
- ALL PENETRATIONS IN TIMBER OR STEEL FRAMING ARE TO BE MADE AS SPECIFIED BY THE ENGINEER OF RECORD OR AS SPECIFIED IN THE CODE.
- SHOP DRAWINGS SHALL BE SUBMITTED TO THE ENGINEER FOR REVIEW PRIOR TO FABRICATION. CONTRACTOR SHALL REVIEW, APPROVE, AND SIGN EACH SHEET PRIOR TO SUBMISSION. THE STRUCTURAL ENGINEER'S REVIEW SHALL BE FOR CONFORMANCE WITH THE DESIGN CONCEPT AND GENERAL COMPLIANCE WITH THE CONTRACT DOCUMENTS. THE ENGINEER'S REVIEW DOES NOT RELIEVE THE CONTRACTOR OF THE SOLE RESPONSIBILITY TO REVIEW, CHECK, AND COORDINATE THE SHOP DRAWINGS PRIOR TO SUBMISSION. THE CONTRACTOR REMAINS SOLELY RESPONSIBLE FOR ERRORS AND OMISSIONS ASSOCIATED WITH THE PREPARATION OF THE SHOP DRAWINGS AS THEY PERTAIN TO MEMBER SIZES, DETAILS, DIMENSIONS, ETC. SUBMIT ONE (1) REPRODUCIBLE AND TWO (2) PRINTS TO THE ENGINEER. ADDITIONAL COPIES WILL NOT BE RETURNED.
- WHERE THE GENERAL NOTES DIFFER FROM SPECIFICATIONS, THE MORE RESTRICTIVE OR HIGHER CAPACITY REQUIREMENT SHALL APPLY.

**FOUNDATIONS:**

- IF A GEOTECHNICAL ENGINEERING REPORT HAS BEEN INCLUDED IN THE CONTRACT DOCUMENTS, IT HAS BEEN USED TO DEVELOP DESIGN OF THE FOOTINGS, FOUNDATIONS, AND BEARING WALL SUPPORT. WHERE NO SOIL REPORT HAS BEEN PROVIDED THE PRESUMPTIVE SOIL CHARACTERISTICS PER NCSCC 2008 HAS BEEN USED.
- CONTRACTOR IS TO COORDINATE FOUNDATION WORK WITH ALL EXISTING UTILITIES - "CALL BEFORE YOU DIG" 1-800-632-4849 PRIOR TO ANY EXCAVATION WORK. FOUNDATIONS SHALL BE LOWERED WHERE REQUIRED TO AVOID CONFLICT WITH UTILITIES. NOTIFY PROJECT ARCHITECT AND STRUCTURAL ENGINEER OF CONFLICTS.
- COLUMN CENTERLINES SHALL BE PLACED AT THE CENTERLINES OF COLUMN FOOTINGS UNLESS OTHERWISE NOTED.

**CONCRETE:**

- CONCRETE MIXES SHALL BE DESIGNED IN ACCORDANCE WITH ACI 301 AND SHALL BE PROPORTIONED TO MEET THE FOLLOWING REQUIREMENTS:
 

ELEMENT	28-DAY STRENGTH (psi)	SUMP RANGE (in)	UNIT WEIGHT (pcf)
COLUMN FOOTINGS:	4000	3-6	150
WALL FOOTINGS:	3000	3-6	150
SLAB ON GRADE:	4000	3-6	150
EXTERIOR CONCRETE:	4000	3-6	150
- PORTLAND CEMENT SHALL BE ASTM C 150, TYPE I. FLY ASH SHALL BE ASTM C 618, CLASS F AND SHALL NOT EXCEED 25% OF CEMENT CONTENT BY WEIGHT. NORMAL WEIGHT AGGREGATE SHALL BE ASTM C 33.
- CONCRETE AGGREGATE GRADATION SHALL BE IN ACCORDANCE WITH ASTM C 33 SPECIFICATION. "SPECIFICATION FOR CONCRETE AGGREGATE" FINE AGGREGATE SHALL CONSIST OF NATURAL SAND OR A COMBINATION THEREOF, WITH A FINENESS MODULUS BETWEEN 2.3 AND 3.1. COARSE AGGREGATE CONTENT IS TO BE BETWEEN 35% AND 45% BY WEIGHT OR VOLUME OF THE TOTAL AGGREGATE CONTENT. LARGER COARSE AGGREGATE MIXES UP TO #467 ARE ACCEPTABLE FOR FLOOR SLAB CONCRETE TO MINIMIZE SHRINKAGE CRACKING.
- USE OF FLY ASH SHALL BE PROHIBITED WHERE CONCRETE TO BE PLACED IS SUBJECT TO COLD WEATHER PLACEMENT PROCEDURES PER ACI 308.
- ALL REINFORCING STEEL SHALL BE ASTM A615 GRADE 60 UNLESS NOTED OTHERWISE. ALL WELDED WIRE FABRIC (W.W.F.) SHALL BE ASTM A62 AND A185 COLD DRAWN STEEL. W.W.F. SHALL BE DELIVERED TO THE JOB SITE IN FLAT SHEETS (NO ROLLS). PLACE SHEETS ON BOLSTERS AT 48" MAXIMUM TO LOCATE IN UPPER THIRD OF SLAB.
- MINIMUM LAP LENGTH FOR CONTINUOUS STEEL SHALL BE 35 TIMES THE BAR DIAMETER UNLESS NOTED OTHERWISE. PROVIDE CORNER REINFORCING STEEL EQUIVALENT TO THE CONTINUOUS REINFORCING IN ALL WALLS AND FOOTINGS.
- BAR SUPPORT DESIGN, DETAILING, FABRICATION, AND PLACING OF REINFORCING BARS SHALL BE IN ACCORDANCE WITH THE ACI CODE AND DETAILING MANUAL AND CRSI MANUAL OF STANDARD PRACTICE.

**CONCRETE (CONTINUED):**

- MINIMUM CLEAR COVER FOR CONCRETE PROTECTION OF STEEL REINFORCEMENT SHALL BE:
 

CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH:	3"
CONCRETE EXPOSED TO WEATHER OR WEATHER:	2"
NO. 6 THROUGH NO. 18 BARS	
NO. 9 AND SMALLER	1 1/2"
CONCRETE NOT EXPOSED TO WEATHER OR IN CONTACT WITH GROUND:	
SLAB, WALLS AND JOISTS:	
NO. 14 AND NO. 18 BARS:	1 1/2"
NO. 11 AND SMALLER:	1"
BEAMS AND COLUMNS:	
PRIMARY REINFORCEMENT, TIRES, STIRRUPS AND SPIRALS:	1 1/2"
- ANCHOR RODS FOR COLUMNS SHALL BE POSITIONED WITH A TEMPLATE PRIOR TO PLACING CONCRETE IN PIER OR FOOTING. NUTS SHALL BE TIGHTENED ON EACH SIDE OF THE TEMPLATE TO HOLD THE ANCHOR BOLTS IN PLACE.
- CONCRETE DESIGN AND REINFORCEMENT SHALL BE IN ACCORDANCE WITH: ACI 318-05 - BUILDING CODE REQUIREMENTS FOR STRUCTURAL CONCRETE AND ACI 318-99 - DETAILS AND DETAILING OF CONCRETE REINFORCEMENT. CONCRETE PLACED DURING HOT WEATHER SHALL CONFORM TO ACI 308.1-08 AND CONCRETE PLACED DURING COLD WEATHER SHALL CONFORM TO ACI 308.1-06.
- PROVIDE A 1/4" CHAMFER WHERE THE CORNER OR EDGE OF ANY COLUMN, WALL, SLAB OR BEAM IS TO BE EXPOSED IN THE FINAL STRUCTURE, UNLESS NOTED OTHERWISE ON CONTRACT DRAWINGS.

**SLAB ON GRADE:**

- SIDEWALKS AND OTHER EXTERIOR SLABS ARE NOT SHOWN ON THE STRUCTURAL DRAWINGS. SEE ARCHITECTURAL, SITE AND CIVIL DRAWINGS FOR LOCATION, DIMENSIONS, AND ELEVATIONS.
- SEE ARCHITECTURAL DRAWINGS FOR EXACT LOCATION OF DEPRESSED SLAB AREAS AND DRAINS. SLOPE SLAB TO DRAINS WHERE INDICATED.
- ALL INTERIOR AND EXTERIOR FLOOR SLABS ARE TO RECEIVE ONE (1) COAT OF EVAPORATION REDUCER (CONSPEC AQUAFILM OR EQUIVALENT) APPLIED TO CONCRETE IMMEDIATELY AFTER SCREENING AND/OR AFTER THE FIRST FLOATING OPERATION. EVAPORATION REDUCER IS NOT RECOMMENDED FOR USE DURING COLD WEATHER PLACEMENT.
- FLOOR SLABS ARE TO RECEIVE TWO (2) COATS OF 25% MINIMUM SOLIDS ACRYLIC HARDENER AND SEAL (CONSPEC INTRASEAL OR EQUIVALENT). APPLICATION IS TO CONFORM TO MANUFACTURER'S SPECIFICATIONS. FIRST COAT IS FOR CURING, SECOND COAT IS FOR SEALING AND DUST PROOFING AFTER BUILDING CONSTRUCTION COMPLETION.
- FLOOR SLABS MAY RECEIVE DENSIFIER APPLICATION (NON-CRETE DUROXON, CONSPEC INTRASEAL, OR ASHFORD FORMULA, OR EQUIVALENT) IN PLACE OF ACRYLIC FLOOR SEALER. DENSIFIERS DO NOT CONFORM WITH ASTM C309 AND MAY REQUIRE A CURING COMPOUND PRIOR TO APPLICATION OF DENSIFIER. CURING COMPOUND REQUIREMENT IS TO BE BASED ON CLIMATE CONDITIONS DURING TIME OF CONCRETE PLACEMENT.
- SLAB ON GRADE SHALL HAVE SECONDARY REINFORCEMENT CONSISTING OF FIBERMESH SYNTHETIC FIBERS - FIBERATED POLYPROPYLENE FIBERS ENGINEERED AND DESIGNED FOR USE IN CONCRETE, COMPLYING WITH ASTM C 1116, TYPE 111. 3/8" LONG MAXIMUM UNIFORMLY DISTRIBUTED THROUGHOUT CONCRETE MIX AT MANUFACTURER'S RECOMMENDED RATE, BUT NOT LESS THAN 1.5 LB/CUBIC YARD.
- SEE GEOTECHNICAL REPORT / GEOTECHNICAL ENGINEER FOR VAPOR RETARDER AND/OR UNDERSLAB DRAINAGE FILL REQUIREMENTS WHERE APPLICABLE.

**MASONRY:**

- MASONRY CONSTRUCTION SHALL CONFORM TO ACI 530 - SPECIFICATION FOR MASONRY STRUCTURES.
- HOLLOW CONCRETE MASONRY UNITS SHALL CONFORM TO ASTM C-90 - LIGHTWEIGHT, MINIMUM NET COMPRESSIVE STRENGTH (FM) SHALL BE 1,500 PSI. WHERE BLOCK WALLS CONTAIN REINFORCING STEEL, THE CELLS SHALL BE FILLED SOLID WITH 3000 PSI GROUT. SUBMIT VERIFICATION OF ALL MATERIALS TO ARCHITECT FOR APPROVAL.
- ALL BRICK UNIT MASONRY SHALL CONFORM TO ASTM C-216, GRADE SW, TYPE FBS. MINIMUM NET COMPRESSIVE STRENGTH (FM) SHALL BE 3000 PSI. SUBMIT VERIFICATION OF ALL MATERIALS TO ARCHITECT FOR APPROVAL.
- MORTAR SHALL BE PORTLAND CEMENT-LIME MIX (PORTLAND CEMENT SHALL COMPLY WITH ASTM C150, TYPE I OR II, AND HYDRATED LIME COMPLYING WITH ASTM C207) OR MORTAR CEMENT ASTM C129 - TYPE S. THE USE OF MASONRY-CEMENT IS STRICTLY FORBIDDEN.
- GROUT FOR UNIT MASONRY SHALL COMPLY WITH ASTM C 478 (SLUMP 8 TO 11 INCHES). AGGREGATE FOR MORTAR SHALL COMPLY WITH ASTM C 144 AND AGGREGATE FOR GROUT SHALL COMPLY WITH ASTM C494. COMPRESSIVE STRENGTH SHALL BE GREATER THAN EQUAL TO 2,000 PSI OR FM, WHICHEVER IS GREATER. TESTING SHALL BE DONE IN AN ABSORBENT MOLD IN ACCORDANCE WITH ASTM C 1019.
- MASONRY JOINT REINFORCEMENT SHALL COMPLY WITH ASTM A-951 AND SHALL BE HOT DIPPED GALVANIZED, CARBON STEEL. BRICK TIES SHALL CONFORM TO SEISMIC DESIGN CATEGORY REQUIREMENTS (SUBMIT TO ENGINEER FOR APPROVAL). BRICK TIES USED IN SEISMIC DESIGN CATEGORIES D AND E SHALL HAVE A CONTINUOUS 3/8" DIAMETER GALVANIZED WIRE ROD EMBEDDED INTO THE BRICK MORTAR JOINT (HECKMAN SEISMIC JOBS-TIE OR EQUIVALENT). BRICK TIES USED IN SEISMIC DESIGN CATEGORY F SHALL HAVE A CONTINUOUS 7/8" DIAMETER GALVANIZED WIRE ROD EMBEDDED IN THE MORTAR JOINT. PROVIDE IN LENGTHS NOT LESS THAN 10 FEET IN LENGTH WITH PREFABRICATED CORNER AND TEE UNITS. FOR MULTIPLE MASONRY UNITS PROVIDE ADJUSTABLE TWO-PIECE UNITS. PROVIDE CONTINUITY AT CORNERS AND WALL INTERSECTIONS BY USING PREFABRICATED "Y" AND "T" SECTIONS. LAP REINFORCEMENT A MINIMUM OF SIX (6) INCHES SPACE REINFORCEMENT NOT MORE THAN 18" O.C. PROVIDE REINFORCEMENT NOT MORE THAN EIGHT (8) INCHES ABOVE OR BELOW WALL OPENINGS AND EXTENDING 24" BEYOND OPENINGS. CUT REINFORCEMENT AT CONTROL AND EXPANSION JOINTS UNLESS NOTED OTHERWISE.
- PROVIDE VERTICAL CONTROL JOINTS AT 16' TO 24' MAXIMUM. SEE ARCHITECTURAL DRAWINGS.
- THE MASONRY CONTRACTOR SHALL PROVIDE ALL REQUIRED TEMPORARY WALL BRACING DURING CONSTRUCTION.
- THE MINIMUM QUALITY ASSURANCE PROGRAM FOR NON-ESSENTIAL FACILITIES SHALL COMPLY WITH TABLE 1.14.2 OF ACI 530.2. THE MINIMUM QUALITY ASSURANCE PROGRAM FOR ESSENTIAL FACILITIES SHALL COMPLY WITH TABLE 1.14.3 OF ACI 530.2.

**STRUCTURAL STEEL:**

- ALL W-SHAPE STRUCTURAL STEEL SHALL BE ASTM A992. ALL OTHER STRUCTURAL SHAPES SHALL BE ASTM A-36. SQUARE OR RECTANGULAR TUBES SHALL CONFORM TO ASTM A-500, GRADE B. ROUND HESS SHAPES SHALL CONFORM TO ASTM A-500, GRADE B. STRUCTURAL STEEL PIPE COLUMNS SHALL CONFORM TO ASTM A-501 OR ASTM A-53, TYPE E OR S, GRADE B. DESIGN, DETAILING, FABRICATION, AND ERECTION SHALL BE IN ACCORDANCE WITH THE AISC CODE AND DETAILING MANUAL. NO STRUCTURAL MEMBERS SHALL BE SPICED EXCEPT AS SHOWN ON APPROVAL SHOP DRAWINGS.
- FABRICATOR IS RESPONSIBLE FOR THE DESIGN OF THE CONNECTIONS SHOWN ON THE STRUCTURAL DRAWINGS. GENERALLY CONNECTIONS SHOWN ON THE STRUCTURAL DRAWINGS ARE SCHEMATIC AND ARE INTENDED TO SHOW THE RELATIONSHIP OF THE MEMBERS. CONNECTIONS SHALL BE DESIGNED FOR ONE HALF (1/2) THE ALLOWABLE LOAD ON THE MEMBER, USING THE AISC ALLOWABLE UNIFORM LOAD TABLES WITH GIVEN BEAM SPAN, OR FOR THE REACTIONS SHOWN ON THE CONTRACT STRUCTURAL DRAWINGS OR A MINIMUM OF 10 KIPS, WHICHEVER IS GREATER. MEMBER FORCES AND REACTIONS HAVE BEEN REDUCED IN CONFORMANCE TO CODE PROVISIONS RELATED TO COMBINATIONS OF LOADINGS THAT INCLUDE WIND AND SEISMIC FORCES. NO FURTHER REDUCTIONS IN FORCES OR INCREASE IN ALLOWABLE STRESSES IS PERMITTED. CONNECTIONS MAY BE BOLTED OR WELDED UNLESS NOTED OTHERWISE.
- ALL SHOP AND FIELD WELDING SHALL BE PERFORMED BY A CERTIFIED WELDER AND SHALL CONFORM TO AWS STANDARDS.
- UNLESS OTHERWISE NOTED, ALL WELDS SHALL BE FILLET TYPE WITH A MINIMUM 3/16" LEG. WELDING ELECTRODES SHALL BE E70XX TYPE HAVING A MINIMUM YIELD STRENGTH OF 70,000 PSI. WELDING WORK AND MATERIALS SHALL CONFORM TO THE AMERICAN WELDING SOCIETY WELDING CODE (AWS D.1).
- BOLTED CONNECTIONS SHALL INCLUDE HIGH STRENGTH BOLTS CONFORMING TO ASTM A325. FOUNDATION ANCHOR BOLTS OR TIE RODS SHALL CONFORM TO ASTM A36 HAVING A MINIMUM YIELD STRENGTH OF 36,000 PSI.

**ROOF DECK:**

- FLAT ROOFS SHALL HAVE CONTROLLED DRAINAGE PROVISIONS AND SHALL BE EQUIPPED WITH A SECONDARY DRAINAGE SYSTEM AT A HIGHER ELEVATION, WHICH PREVENTS PONDING ON THE ROOF ABOVE THAT ELEVATION. THE SECONDARY DRAINAGE SYSTEM SHALL BE POSITIONED SO THAT A TWO (2) INCH MAXIMUM DEPTH OF WATER WILL POND ON THE ROOF DURING THE DESIGN RAINSTORM. THE DESIGN OF THE ROOF DRAINAGE, SECONDARY DRAINAGE, AND/OR OVERFLOW SCUPPERS IS BEYOND THE SCOPE OF THE STRUCTURAL ENGINEER'S SCOPE OF SERVICES.

**LUMBER:**

- LUMBER WALL STUDS SHALL BE SPRUCE PINE FIR #2 UNLESS NOTED OTHERWISE ON PLANS.
- LUMBER IN CONTACT WITH CONCRETE OR MASONRY SHALL BE TREATED AGAINST CORROSION AND DECAY.
- LUMBER CONNECTIONS SHALL BE THOSE SPECIFIED IN TABLE 2304.9.1 OF THE NORTH CAROLINA STATE BUILDING CODE UNLESS NOTED.
- PLYWOOD AND OSB PANELS SHALL HAVE 1/8" GAP AT ALL PANEL EDGES. PROVIDE SIMPSON PSCAL OR EQUIVALENT PLYWOOD CLIPS AT 24" O/C AT PANEL EDGES OF ALL ROOF PLYWOOD/OSB SHEATHING. NO GAP IS TO EXIST AT PANEL EDGES OF TONGUE AND GROOVE SHEATHING.
- TIMBER POSTS GREATER THAN FIVE (5) INCHES IN WIDTH SHALL BE SOUTHERN PINE, NO. 2 DENSE STR OR BETTER. TYPICAL UNLESS NOTED OTHERWISE.
- ROOF TRUSSES ARE TO BE DESIGNED BY THE MANUFACTURER AND INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. TRUSS SPACING MAY DIFFER FROM THAT SHOWN ON THE PLANS, PROVIDED THE DESIGN MEETS THE REQUIREMENTS OF ALL GOVERNING CODE REQUIREMENTS AND LOADING CONDITIONS AS NOTED IN THE DESIGN LOADS SECTION OF THESE GENERAL NOTES. CHANGES SHALL BE SUBMITTED TO THE ENGINEER FOR APPROVAL.

7. ALL COMMON FRAMING LUMBER IS TO MEET THE FOLLOWING MINIMUM SPECIFICATIONS AT 19% MOISTURE CONTENT:

MATERIAL	F <sub>b</sub> (psi)	F <sub>v</sub> (psi)	F <sub>c-L</sub> (psi)	E (psi)
#2 SPRUCE PINE FIR	875	450	425	1,400,000
#2 SOUTHERN YELLOW PINE	900 (2x10)	575	565	1,400,000

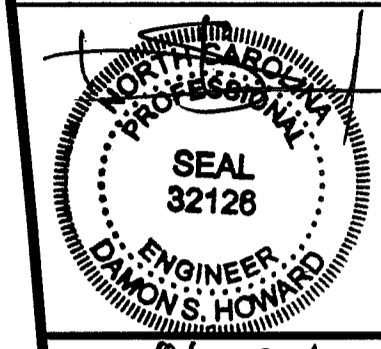
8. ALL STRUCTURAL COMPOSITE LUMBER (LVL, LSL, PSL) IS TO MEET THE FOLLOWING MINIMUM SPECIFICATIONS:

APPLICATION	F <sub>b</sub> (psi)	F <sub>c</sub> (psi)	F <sub>c-L</sub> (psi)	E (psi)
GIRDERS & BEAMS (LVL, PSL)	2,600	2,510	750	2,000,000
COLUMNS (LSL) & RIMBOARDS	1,700	1,400	400	1,300,000

9. ALL GLUED LAMINATED TIMBER (GLU-LAM) IS TO MEET THE FOLLOWING MINIMUM SPECIFICATIONS:

APPLICATION	F <sub>b</sub> (psi)	F <sub>c</sub> (psi)	F <sub>c-L</sub> (psi)	E (psi)
GIRDERS & BEAMS	2,400	1,700	740	1,700,000
COLUMNS	1,800	1,550	580	1,500,000

- WHERE THREE-PLY OR FOUR-PLY LVL BEAMS ARE SIDE-LOADED (JOISTS FRAME INTO THE SIDE AT THE OUTSIDE PLIES), FASTEN ALL PLIES TOGETHER WITH TWO ROWS OF 1/2" DIA. BOLTS AT 12" O.C. THE BOLTS SHALL BE LOCATED A MINIMUM OF 21/2" AND MAXIMUM OF 31/2" FROM THE TOP OR BOTTOM OF THE BEAM.
- BUILT-UP WOOD COLUMNS CONSISTING OF MULTIPLE STUDS SHALL HAVE EACH LAMINATION NAILED WITH 16D NAILS AT 9" O.C.



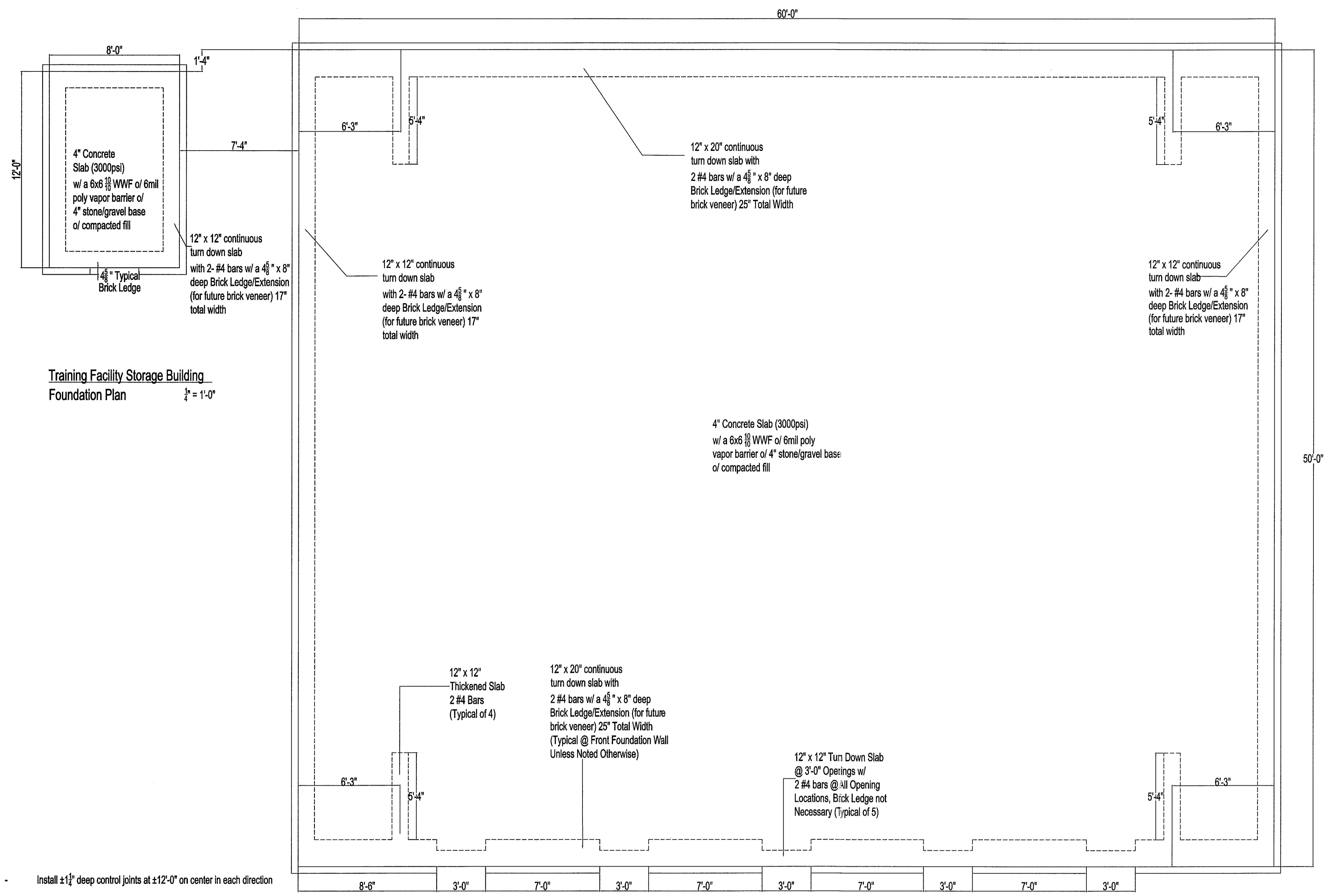
01-09-17

Providence High School  
1800 Pineville-Matthews Rd.  
Charlotte, NC 28270

Training Facility

DRAWN BY:  
D. Howard, PE  
DATE:  
01-09-17

**S1**  
SHEET

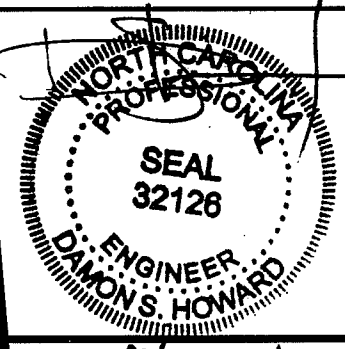


Training Facility Storage Building  
Foundation Plan 1/4" = 1'-0"

Foundation Plan 1/4" = 1'-0"

HOWARD VERNA ENGINEERING'S STANDARD NOTES ARE TO BE USED WITH THESE PLANS. THE ENGINEER OF RECORD DOES NOT ACCEPT RESPONSIBILITY FOR ANY PART OF THE PLAN NOT RELEVANT TO THE STRUCTURAL INFORMATION.

NOTE TO BUILDER &/OR LUMBER SUPPLIER: DO NOT ALTER THE FRAMING PLANS WITHOUT THE APPROVAL OF THE ENGINEER OF RECORD. ANY CHANGES MADE WITHOUT REVIEW AND APPROVAL BY THE ENGINEER OF RECORD SHALL ABSOLVE HIM OF ALL RESPONSIBILITY FOR ALL ASPECTS OF THE REENGINEERED DESIGN.



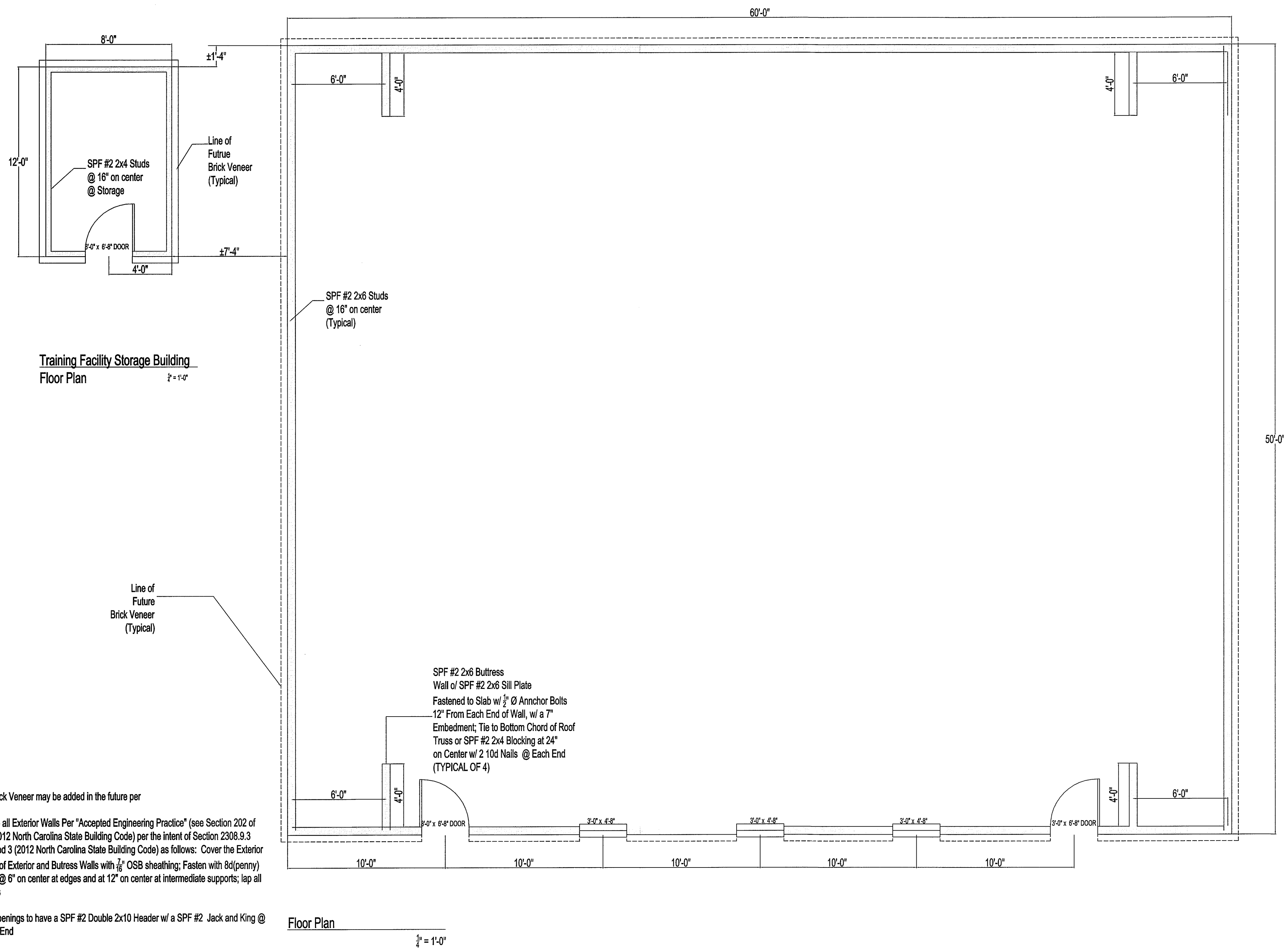
01-09-17

Providence High School  
1800 Pineville-Matthews Rd.  
Charlotte, NC 28270

Training Facility

DRAWN BY:  
D. Howard, PE  
DATE:  
01-09-17

**S2**  
SHEET



Training Facility Storage Building  
Floor Plan 1/4" = 1'-0"

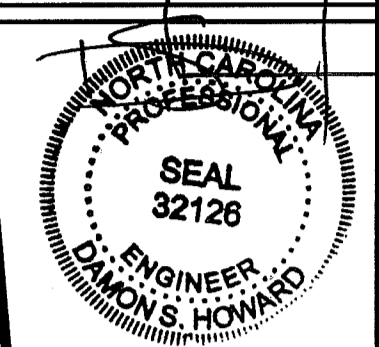
Floor Plan 1/4" = 1'-0"

- 4" Brick Veneer may be added in the future per
- Brace all Exterior Walls Per "Accepted Engineering Practice" (see Section 202 of the 2012 North Carolina State Building Code) per the intent of Section 2308.9.3 Method 3 (2012 North Carolina State Building Code) as follows: Cover the Exterior Face of Exterior and Butress Walls with 1/8" OSB sheathing; Fasten with 8d (penny) nails @ 6" on center at edges and at 12" on center at intermediate supports; lap all plates
- All Openings to have a SPF #2 Double 2x10 Header w/ a SPF #2 Jack and King @ Each End

SPF #2 2x6 Butress  
Wall of SPF #2 2x6 Sill Plate  
Fastened to Slab w/ 1/2" Ø Anchor Bolts  
12" From Each End of Wall, w/ a 7"  
Embedment; Tie to Bottom Chord of Roof  
Truss or SPF #2 2x4 Blocking at 24"  
on Center w/ 2 10d Nails @ Each End  
(TYPICAL OF 4)

HOWARD VERNA ENGINEERING'S  
STANDARD NOTES ARE TO BE USED  
WITH THESE PLANS. THE ENGINEER  
OF RECORD DOES NOT ACCEPT  
RESPONSIBILITY FOR ANY PART OF  
THE PLAN NOT RELEVANT TO THE  
STRUCTURAL INFORMATION.

NOTE TO BUILDER &/OR  
LUMBER SUPPLIER  
DO NOT ALTER THE FRAMING  
PLANS WITHOUT THE APPROVAL  
OF THE ENGINEER OF RECORD.  
ANY CHANGES MADE WITHOUT  
REVIEW AND APPROVAL BY THE  
ENGINEER OF RECORD SHALL  
ABSOLVE HIM OF ALL  
RESPONSIBILITY FOR ALL ASPECTS  
OF THE REENGINEERED DESIGN



01-09-17

Providence High School  
1800 Pineville-Matthews Rd.  
Charlotte, NC 28270

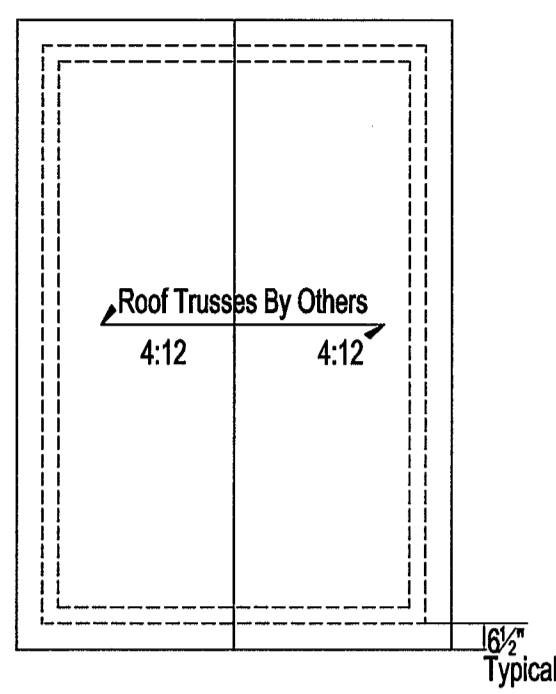
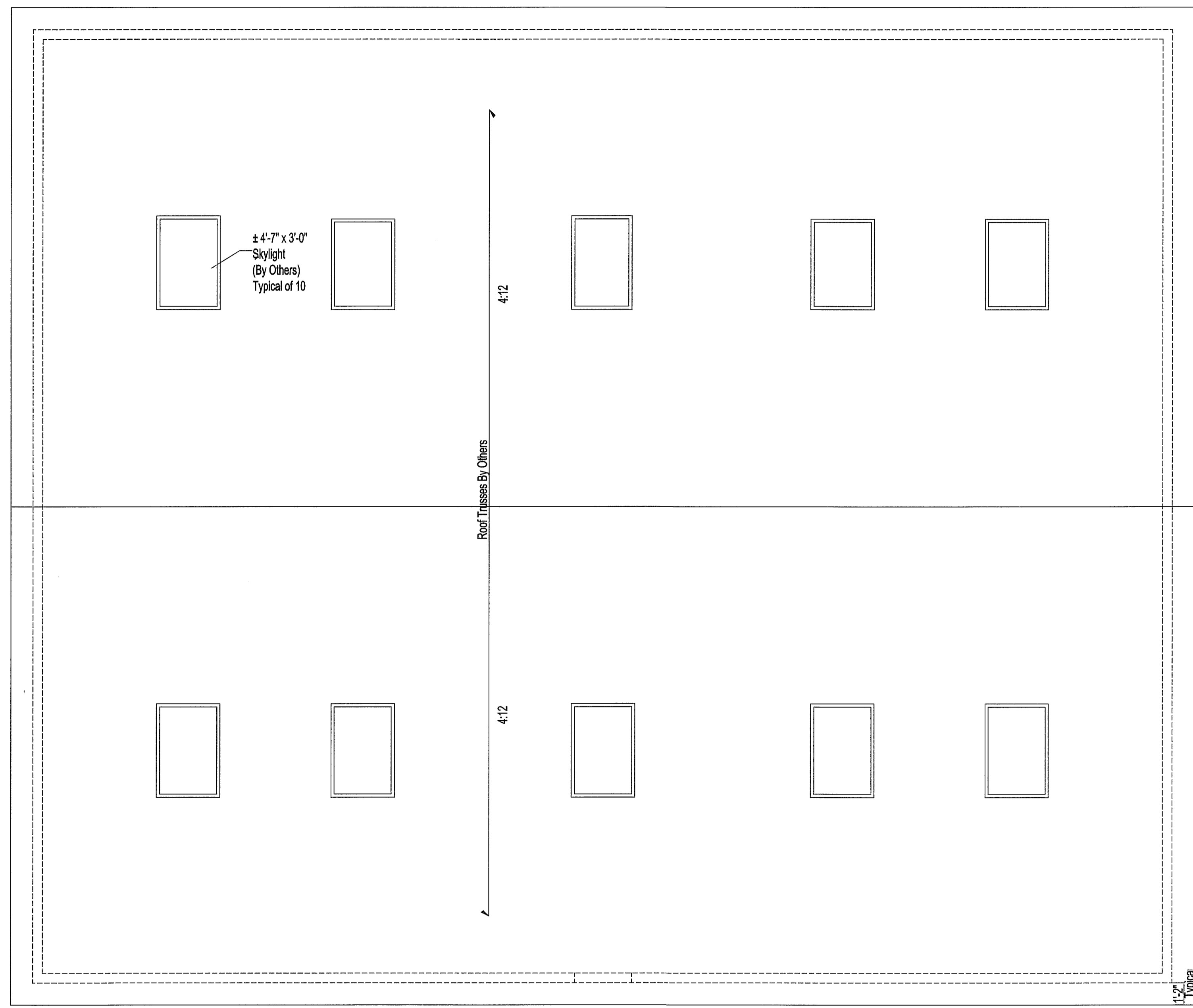
Training Facility

DRAWN BY:  
D. Howard, PE  
DATE:  
01-09-17

**S3**  
SHEET

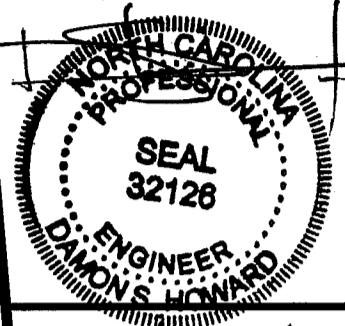
HOWARD VERNA ENGINEERING'S  
STANDARD NOTES ARE TO BE USED  
WITH THESE PLANS. THE ENGINEER  
OF RECORD DOES NOT ACCEPT  
RESPONSIBILITY FOR ANY PART OF  
THE PLAN NOT RELEVANT TO THE  
STRUCTURAL INFORMATION.

NOTE TO BUILDER &/OR  
LUMBER SUPPLIER  
DO NOT ALTER THE FRAMING  
PLANS WITHOUT THE APPROVAL  
OF THE ENGINEER OF RECORD.  
ANY CHANGES MADE WITHOUT  
REVIEW AND APPROVAL BY THE  
ENGINEER OF RECORD SHALL  
ABSOLVE HIM OF ALL  
RESPONSIBILITY FOR ALL ASPECTS  
OF THE REENGINEERED DESIGN



Training Facility Storage Building  
Roof Plan  
1/4" = 1'-0"

Roof Plan  
1/4" = 1'-0"



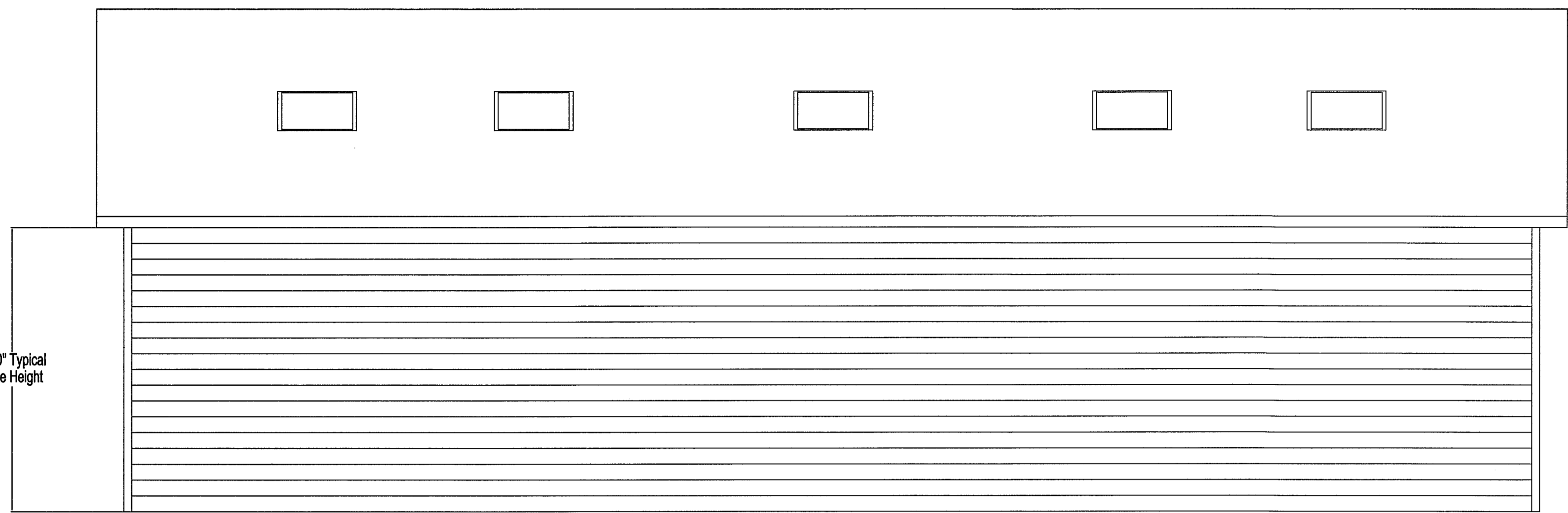
01-09-17

Providence High School  
1800 Pineville-Matthews Rd.  
Charlotte, NC 28270

Training Facility

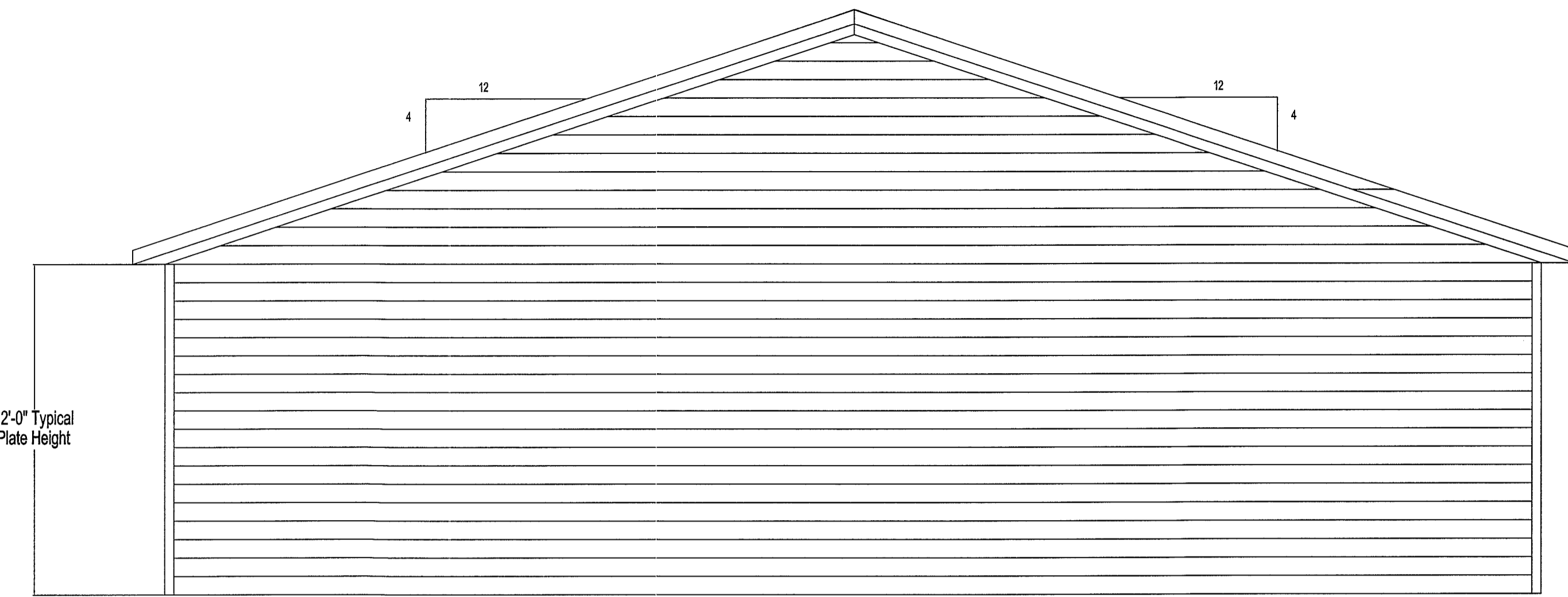
DRAWN BY:  
D. Howard, PE  
DATE:  
01-09-17

**S4**  
SHEET



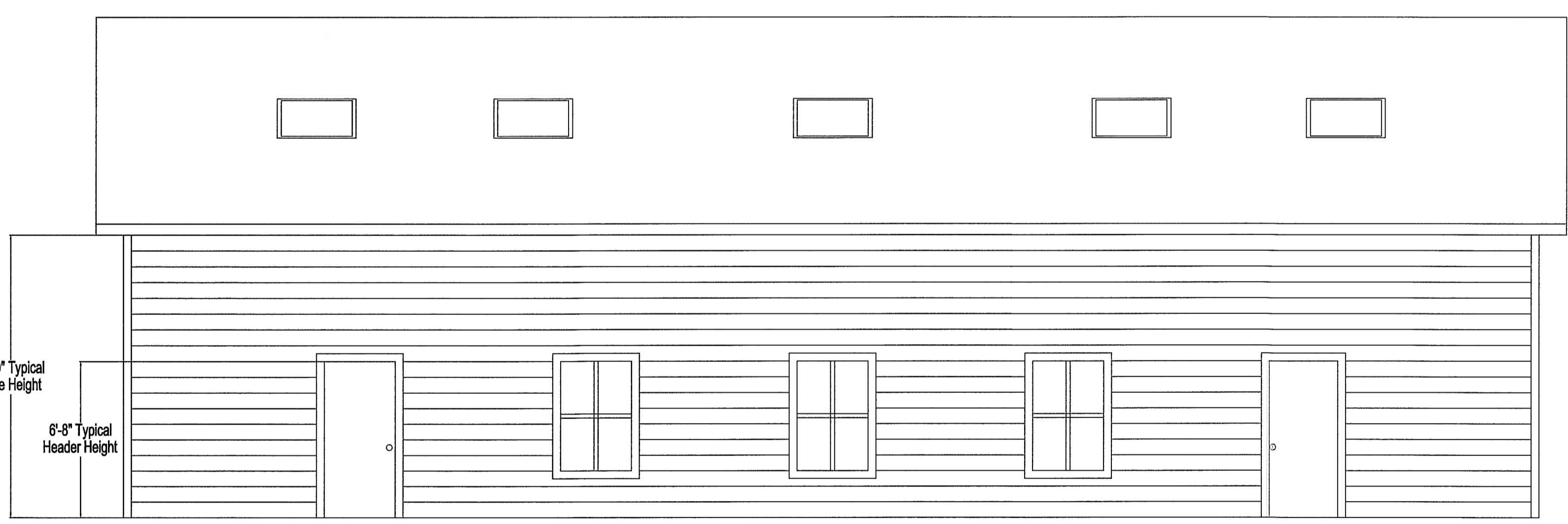
12'-0" Typical Plate Height

Rear Elevation  
 $\frac{1}{4}'' = 1'-0''$



12'-0" Typical Plate Height

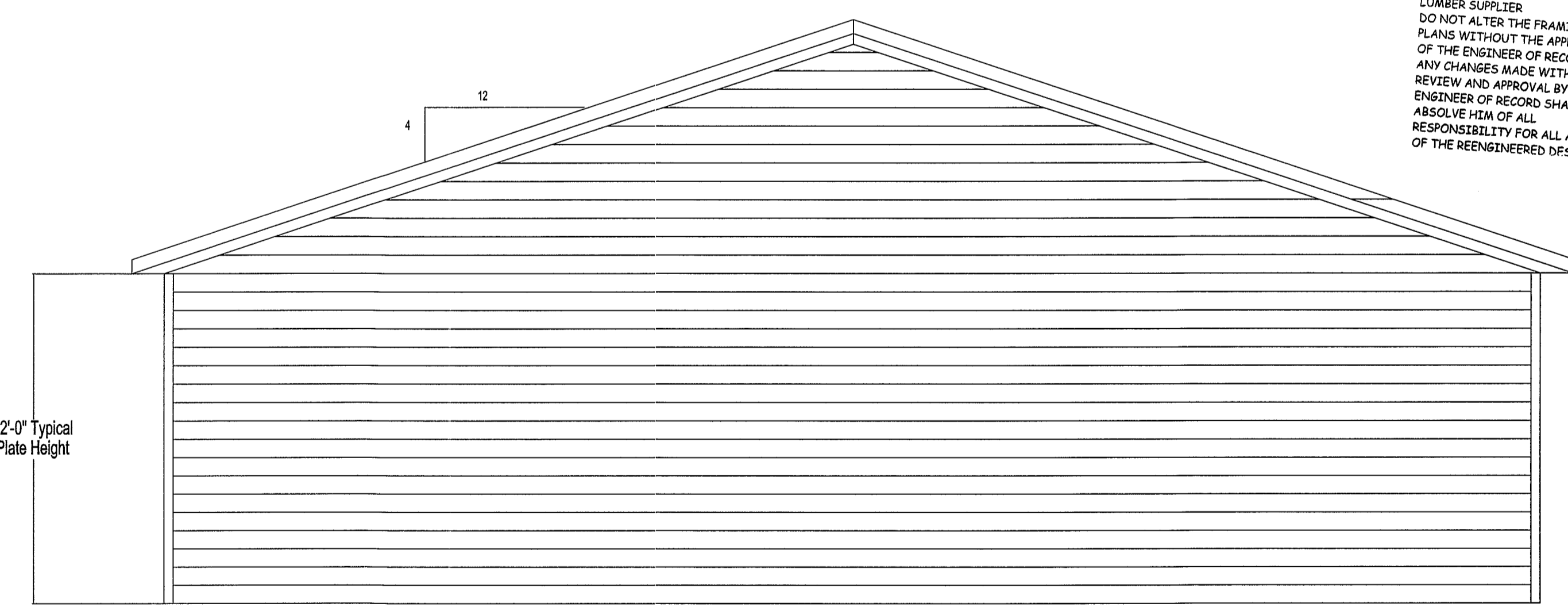
Left Elevation  
 $\frac{1}{4}'' = 1'-0''$



12'-0" Typical Plate Height

6'-8" Typical Header Height

Front Elevation  
 $\frac{1}{4}'' = 1'-0''$



12'-0" Typical Plate Height

Right Elevation  
 $\frac{1}{4}'' = 1'-0''$

HOWARD VERNA ENGINEERING'S STANDARD NOTES ARE TO BE USED WITH THESE PLANS. THE ENGINEER OF RECORD DOES NOT ACCEPT RESPONSIBILITY FOR ANY PART OF THE PLAN NOT RELEVANT TO THE STRUCTURAL INFORMATION.

NOTE TO BUILDER &/OR LUMBER SUPPLIER DO NOT ALTER THE FRAMING PLANS WITHOUT THE APPROVAL OF THE ENGINEER OF RECORD. ANY CHANGES MADE WITHOUT REVIEW AND APPROVAL BY THE ENGINEER OF RECORD SHALL ABSOLVE HIM OF ALL RESPONSIBILITY FOR ALL ASPECTS OF THE REENGINEERED DESIGN.