BUILDING PLANS

FOR

Angus Strickland Building

NC 210 Highway

Harnett County, North Carolina

PREPARED FOR

Angus Strickland Building
210 Highway
Harnett County, North Carolina
TELEPHONE 910-814-0904

ENGINEER

C. GREGORY BAGLEY
805 COKESBURY ROAD
FUQUAY VARINA, NC 27526
PHONE: (919) 552-1600

SHEET INDEX

PLANNING DESIGN C.GREGORY BAGLEY ENGINEER MAPPING SURVEYING

NOTE:
ALL CONSTRUCTION TO BE IN ACCORDANCE
Harnett County NC.

2012 APPENDIX B
BUILDING CODE SUMMARY
FOR ALL COMMERCIAL PROJECTS
(EXCEPT 1 AND 2-FAMILY DWELLINGS AND TOWNHOUSES)
(Reproduce the following data on the building plans sheet 1 or 2)

Name of Project: Angus Strickland Building
Address: 3426 210 Highway Zip Code 28312
Proposed Use: Truck Repair
Owner/Authorized Agent: GREG BAGLEY Phone # (919) 609 - 0300 E-Mail GDB.GREG@GMAIL.COM
Owned By: [ ] City/County [x] Private [ ] State
Code Enforcement Jurisdiction: [x] City ____ [ ] County ____ [ ] State
Harnett County, NORTH CAROLINA

LEAD DESIGN PROFESSIONAL:

DESIGNER	FIRM	NAME	LICENSE #	TELEPHONE #	E-MAIL
Architectural				( )	
Civil	C. Gregory Bagley, Engineer	Greg Bagley	12276	(919) 609–0300	GDB.GREG@GMAIL.COM
Electrical	C. Gregory Bagley, Engineer	Greg Bagley	12276	(919) 609–0300	GDB.GREG@GMAIL.COM
Fire Alarm				( )	
Plumbing	C. Gregory Bagley, Engineer	Greg Bagley	12276	(919) 609–0300	GDB.GREG@GMAIL.COM
Mechanical	C. Gregory Bagley, Engineer	Greg Bagley	12276	(919) 609–0300	GDB.GREG@GMAIL.COM
Sprinkler-Standpipe				( )	
Structural	C. Gregory Bagley, Engineer	Greg Bagley	12276	(919) 609–0300	GDB.GREG@GMAIL.COM
Retaining Walls >5' High				( )	
Other				( )	

2012 EDITION OF NC CODE FOR: [x] New Construction [ ] Addition [ ] Upfit
EXISTING: [ ] Reconstruction [ ] Alteration [ ] Repair [ ] Renovation
CONSTRUCTED: (date) ____ **ORIGINAL USE(S)** (Ch. 3): Farm
RENOVATED: (date) ____ **CURRENT USE(S)** (Ch. 3): ____
PROPOSED USE(S) (Ch. 3): Truck Repair

BASIC BUILDING DATA
Construction Type: (check all that apply) [ ] I-A [ ] I-B [ ] II-A [x] II-B [ ] III-A [ ] III-B [ ] IV [ ] V-A [ ] V-B
Sprinklers: [ ] No [ ] Partial [ ] Yes [ ] NFPA 13 [ ] NFPA 13R [ ] NFPA 13D
Standpipes: [ ] No [ ] Yes Class [ ] I [ ] II [ ] III [ ] Wet [ ] Dry
Fire District: [ ] No [ ] Yes (Primary) **Flood Hazard Area:** [ ] No [ ] Yes
Building Height: (feet) ____
Gross Building Area:

FLOOR	EXISTING (SQ FT)	NEW (SQ FT)	SUB-TOTAL
6th Floor			
5th Floor			
4th Floor			
3rd Floor			
2nd Floor			
Mezzanine	Parts Storage and Office	405	405
1st Floor		7200	7200
Basement			
TOTAL			7605

ALLOWABLE AREA

Occupancy:
- Assembly [ ] A-1 [ ] A-2 [ ] A-3 [ ] A-4 [ ] A-5
- Business [ ]
- Educational [ ]
- Factory [ ] F-1 Moderate [ ] F-2 Low
- Hazardous [ ] H-1 Detonate [ ] H-2 Deflagrate [ ] H-3 Combust [ ] H-4 Health [ ] H-5 HPM
- Institutional [ ] I-1 [ ] I-2 [ ] I-3 [ ] I-4
  - I-3 Condition [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5
- Mercantile [ ]
- Residential [ ] R-1 [ ] R-2 [ ] R-3 [ ] R-4
- Storage [ ] S-1 Moderate [ ] S-2 Low [ ] High-piled
  [ ] Parking Garage [ ] Open [ ] Enclosed [x] Repair Garage
- Utility and Miscellaneous [ ]

Accessory Occupancies:
- Assembly [ ] A-1 [ ] A-2 [ ] A-3 [ ] A-4 [ ] A-5
- Business [ ]
- Educational [ ]
- Factory [ ] F-1 Moderate [ ] F-2 Low
- Hazardous [ ] H-1 Detonate [ ] H-2 Deflagrate [ ] H-3 Combust [ ] H-4 Health [ ] H-5 HPM
- Institutional [ ] I-1 [ ] I-2 [ ] I-3 [ ] I-4
  - I-3 Condition [ ] 1 [ ] 2 [ ] 3 [ ] 4 [ ] 5
- Mercantile [ ]
- Residential [ ] R-1 [ ] R-2 [ ] R-3 [ ] R-4
- Storage [ ] S-1 Moderate [ ] S-2 Low [ ] High-piled
  [ ] Parking Garage [ ] Open [ ] Enclosed [ ] Repair Garage
- Utility and Miscellaneous [ ]

Incidental Uses (Table 508.2.5):
- [ ] Furnace room where any piece of equipment is over 400,000 Btu per hour input
- [ ] Rooms with boilers where the largest piece of equipment is over 15 psi and 10 horsepower
- [ ] Refrigerant machine room
- [ ] Hydrogen cutoff rooms, not classified as Group H
- [ ] Incinerator rooms
- [ ] Paint shops, not classified as Group H, located in occupancies other than Group F
- [ ] Laboratories and vocational shops, not classified as Group H. located in a Group E or I-2 occupancy
- [ ] Laundry rooms over 100 square feet
- [ ] Group I-3 cells equipped with padded surfaces
- [ ] Group I-2 waste and linen collection rooms
- [ ] Waste and linen collection rooms over 100 square feet
- [ ] Stationary storage battery systems having a liquid electrolyte capacity of more than 50 gallons, or a lithium-ion capacity of 1,000 pounds used for facility standby power, emergency power or uninterrupted power supplies
- [ ] Rooms containing fire pumps
- [ ] Group I-2 storage rooms over 100 square feet
- [ ] Group I-2 commercial kitchens
- [ ] Group I-2 laundries equal to or less than 100 square feet
- [ ] Group I-2 rooms or spaces that contain fuel-fired heating equipment

Special Uses: [ ] 402 [ ] 403 [ ] 404 [ ] 405 [ ] 406 [ ] 407 [ ] 408 [ ] 409 [ ] 410 [ ] 411 [ ] 412 [ ] 413 [ ] 414 [ ] 415 [ ] 416 [ ] 417 [ ] 418 [ ] 419 [ ] 420 [ ] 421 [ ] 422 [ ] 423 [ ] 424 [ ] 425 [ ] 426 [ ] 427
Special Provisions: [ ] 509.2 [ ] 509.3 [ ] 509.4 [ ] 509.5 [ ] 509.6 [ ] 509.7 [ ] 509.8 [ ] 509.9
Mixed Occupancy: [x] No [ ] Yes Separation: ____ Hr. Exception: ____
[ ] Incidental Use Separation (508.2.5)
This separation is not exempt as a Non-Separated Use (see exceptions).

This separation is not exempt as a Non-Separated Use (see exceptions).
[x] Non-Separated Use (508.3)
The required type of construction for the building shall be determined by applying the height and area limitations for each of the applicable occupancies to the entire building. The most restrictive type of construction, so determined, shall apply to the entire building.
[ ] Separated Use (508.4) - See below for area calculations
For each story, the area of the occupancy shall be such that the sum of the ratios of the actual floor area of each use divided by the allowable floor area for each use shall not exceed 1.

$$\frac{\text{Actual Area of Occupancy A}}{\text{Allowable Area of Occupancy A}} + \frac{\text{Actual Area of Occupancy B}}{\text{Allowable Area of Occupancy B}} \leq 1$$

____ + ____ + …… = ____ ≤ 1.00

STORY NO.	DESCRIPTION AND USE	(A) BLDG AREA PER STORY (ACTUAL)	(B) TABLE 503[5] AREA	(C) AREA FOR FRONTAGE INCREASE[1]	(D) AREA FOR SPRINKLER INCREASE[2]	(E) ALLOWABLE AREA OR UNLIMITED[3]	(F) MAXIMUM BUILDING AREA[4]
1	STORAGE	2400	26000	0	0	0	26000
1	S–2	4800	26000	0	0	0	26000
1	MEZZANINE/OFFICE	405	26000	0	0	0	26000

1 Frontage area increases from Section 506.2 are computed thus:
a. Perimeter which fronts a public way or open space having 20 feet minimum width = ____ (F)
b. Total Building Perimeter = ____ (P)
c. Ratio (F/P) = ____ (F/P)
d. W = Minimum width of public way = ____ (W)
e. Percent of frontage increase $I_f = 100\,[F/P - 0.25] \times W/30$ = ____ (%)
2 The sprinkler increase per Section 506.3 is as follows:
a. Multi-story building I_s = 200 percent
b. Single story building I_s = 300 percent
3 Unlimited area applicable under conditions of Section 507.
4 Maximum Building Area = total number of stories in the building x E (506.4).
5 The maximum area of open parking garages must comply with Table 406.3.5. The maximum area of air traffic control towers must comply with Table 412.1.2.

ALLOWABLE HEIGHT

	ALLOWABLE (TABLE 503)	INCREASE FOR SPRINKLERS	SHOWN ON PLANS	CODE REFERENCE
Type of Construction	Type II–B		Type II–B	
Building Height in Feet	18'	Feet = H + 20' = 38'		
Building Height in Stories	1	Stories + 1 = 2		

FIRE PROTECTION REQUIREMENTS

NR = Not Required

BUILDING ELEMENT	FIRE SEPARATION DISTANCE (FEET)	RATING REQ'D	RATING PROVIDED (W/____* REDUCTION)	DETAIL # AND SHEET #	DESIGN # FOR RATED ASSEMBLY	DESIGN # FOR RATED PENETRATION	DESIGN # FOR RATED JOINTS
Structural Frame, including columns, girders, trusses	10	0		0002	NR		
Bearing Walls		0		0002	NR		
Exterior		0		0002	NR		
North		0		0002	NR		
East		0		0002	NR		
West		0		0002	NR		
South		0		0002	NR		
Interior							
Nonbearing Walls and Partitions		0		0002	NR		
Exterior walls		0		0002	NR		
North		0		0002	NR		
East		0		0002	NR		
West		0		0002	NR		
South		0		0002	NR		
Interior walls and partitions							
Floor Construction Including supporting beams and joists		0		0002	NR		
Roof Construction Including supporting beams and joists		0		0002	NR		
Shaft Enclosures - Exit							
Shaft Enclosures - Other							
Corridor Separation							
Occupancy Separation							
Party/Fire Wall Separation							
Smoke Barrier Separation							
Tenant Separation							
Incidental Use Separation							

* Indicate section number permitting reduction

LIFE SAFETY SYSTEM REQUIREMENTS

- Emergency Lighting: [ ] No [x] Yes
- Exit Signs: [ ] No [x] Yes
- Fire Alarm: [x] No [ ] Yes
- Smoke Detection Systems: [x] No [ ] Yes [ ] Partial ____
- Panic Hardware: [x] No [ ] Yes

LIFE SAFETY PLAN REQUIREMENTS

Life Safety Plan Sheet #: CODE SHEET
- [ ] Fire and/or smoke rated wall locations (Chapter 7)
- [ ] Assumed and real property line locations
- [x] Exterior wall opening area with respect to distance to assumed property lines (705.8)
- [ ] Existing structures within 30' of the proposed building
- [x] Occupancy types for each area as it relates to occupant load calculation (Table 1004.1.1)
- [x] Occupant loads for each area
- [ ] Exit access travel distances (1016)
- [x] Common path of travel distances (1014.3 & 1028.8)
- [ ] Dead end lengths (1018.4)
- [ ] Clear exit widths for each exit door
- [x] Maximum calculated occupant load capacity each exit door can accommodate based on egress width (1005.1)
- [x] Actual occupant load for each exit door
- [ ] A separate schematic plan indicating where fire rated floor/ceiling and/or roof structure is provided for purposes of occupancy separation
- [ ] Location of doors with panic hardware (1008.1.10)
- [ ] Location of doors with delayed egress locks and the amount of delay (1008.1.9.7)
- [ ] Location of doors with electromagnetic egress locks (1008.1.9.8)
- [ ] Location of doors equipped with hold-open devices
- [ ] Location of emergency escape windows (1029)
- [ ] The square footage of each fire area (902)
- [ ] The square footage of each smoke compartment (407.4)
- [ ] Note any code exceptions or table notes that may have been utilized regarding the items above

ACCESSIBLE DWELLING UNITS
(SECTION 1107)

TOTAL UNITS	ACCESSIBLE UNITS REQUIRED	ACCESSIBLE UNITS PROVIDED	TYPE A UNITS REQUIRED	TYPE A UNITS PROVIDED	TYPE B UNITS REQUIRED	TYPE B UNITS PROVIDED	TOTAL ACCESSIBLE UNITS PROVIDED
0							

ACCESSIBLE PARKING
(SECTION 1106)

LOT OR PARKING AREA	TOTAL # OF PARKING SPACES REQUIRED	TOTAL # OF PARKING SPACES PROVIDED	# OF ACCESSIBLE SPACES PROVIDED: REGULAR WITH 5' ACCESS AISLE	VAN SPACES WITH 132" ACCESS AISLE	VAN SPACES WITH 8' ACCESS AISLE	TOTAL # ACCESSIBLE PROVIDED
Main Parking	63	63	1		1	1
TOTAL						

STRUCTURAL DESIGN

DESIGN LOADS:

Importance Factors: Wind (I_W) .87; Snow (I_S) .8; Seismic (I_E) 1

Live Loads: Roof 20 psf; Mezzanine ____ psf; Floor 125 psf

Ground Snow Load: 10 psf

Wind Load: Basic Wind Speed 120 mph (ASCE-7); Exposure Category C; Wind Base Shears (for MWFRS) Vx = –8.77 Vy = –7.38

SEISMIC DESIGN CATEGORY: [x] A [ ] B [ ] C [ ] D
Provide the following Seismic Design Parameters:
Occupancy Category (Table 1604.5) [x] I [ ] II [ ] III [ ] IV
Spectral Response Acceleration S_S 2.7 %g S_1 3.7 %g
Site Classification (Table 1613.5.2) [ ] A [ ] B [ ] C [ ] D [x] E [ ] F
Data Source: [ ] Field Test [x] Presumptive [ ] Historical Data
Basic structural system (check one)
[ ] Bearing Wall [ ] Dual w/Special Moment Frame
[x] Building Frame [ ] Dual w/Intermediate R/C or Special Steel
[ ] Moment Frame [ ] Inverted Pendulum
Seismic base shear: V_X = ____ V_Y = ____
Analysis Procedure: [x] Simplified [ ] Equivalent Lateral Force [ ] Dynamic
Architectural, Mechanical, Components anchored? [x] Yes [ ] No

LATERAL DESIGN CONTROL: Earthquake [ ] Wind [x]

SOIL BEARING CAPACITIES:
Field Test (provide copy of test report) ____ psf
Presumptive Bearing capacity 2000 psf
Pile size, type, and capacity ____

SPECIAL INSPECTIONS REQUIRED: [ ] Yes [x] No

PLUMBING FIXTURE REQUIREMENTS
(TABLE 2902.1)

USE		WATERCLOSETS MALE	WATERCLOSETS FEMALE	URINALS	LAVATORIES MALE	LAVATORIES FEMALE	SHOWERS/ TUBS	DRINKING FOUNTAINS REGULAR	DRINKING FOUNTAINS ACCESSIBLE
SPACE	EXISTING								
	NEW	1	1	1	1	1		1	1
	REQUIRED	1	1		1	1		1	1

SPECIAL APPROVALS

Special approval: (Local Jurisdiction, Department of Insurance, OSC, DPI, DHHS, ICC, etc., describe below)

OCCUPANCY

S-2 = 500 GROSS = $\frac{7605}{500}$ = 15 OCCUPANTS

CODE SHEET
ENERGY SUMMARY

ENERGY REQUIREMENTS:
The following data shall be considered minimum and any special attribute required to meet the energy code shall also be provided. Each Designer shall furnish the required portions of the project information for the plan data sheet. If performance method, state the annual energy cost for the standard reference design vs annual energy cost for the proposed design.

Climate Zone: [x] 3 [ ] 4 [ ] 5

Method of Compliance:
- [x] Prescriptive (Energy Code)
- [ ] Performance (Energy Code)
- [ ] Prescriptive (ASHRAE 90.1)
- [ ] Performance (ASHRAE 90.1)

THERMAL ENVELOPE

Roof/ceiling Assembly (each assembly)
Description of assembly: METAL
U-Value of total assembly: ____
R-Value of insulation: R–30
Skylights in each assembly: ____
U-Value of skylight: ____
total square footage of skylights in each assembly: ____

Exterior Walls (each assembly)
Description of assembly: METAL
U-Value of total assembly: N/A
R-Value of insulation: R–15
Openings (windows or doors with glazing)
U-Value of assembly: N/A
Solar heat gain coefficient: ____
projection factor: ____
Door R-Values: N/A

Walls below grade (each assembly) N/A
Description of assembly: ____
U-Value of total assembly: ____
R-Value of insulation: ____

Floors over unconditioned space (each assembly)
Description of assembly: CONCRETE 3000 LB
U-Value of total assembly: ____
R-Value of insulation: ____

Floors slab on grade
Description of assembly: N/A
U-Value of total assembly: ____
R-Value of insulation: ____
Horizontal/vertical requirement: ____
slab heated: ____

MECHANICAL SUMMARY

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

Thermal Zone
winter dry bulb: 20 F
summer dry bulb: 95 F

Interior design conditions
winter dry bulb: 68 F
summer dry bulb: 74 F
relative humidity: 50%

Building heating load: 318,000 BTU

Building cooling load: 360,000 BTU

Mechanical Spacing Conditioning System
Unitary
description of unit: SPLIT SYSTEM
heating efficiency: 14 SEER
cooling efficiency: 14 SEER
size category of unit: 3.5 TON
Boiler
Size category. If oversized, state reason.: ____
Chiller
Size category. If oversized, state reason.: ____

List equipment efficiencies: 67%

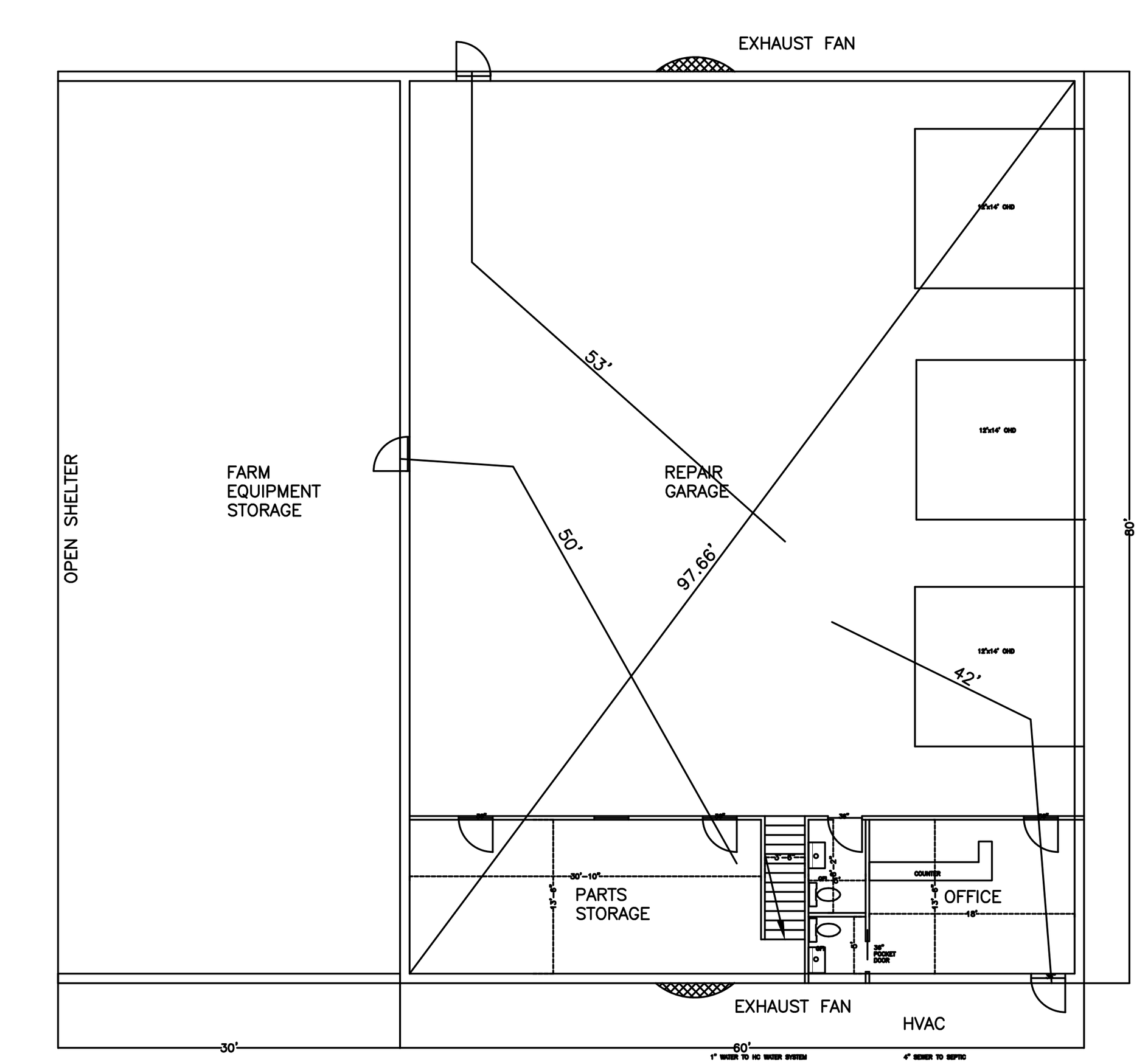
ELECTRICAL SUMMARY

ELECTRICAL SYSTEM AND EQUIPMENT

Method of Compliance:
Energy Code: [x] Prescriptive [ ] Performance
ASHRAE 90.1: [ ] Prescriptive [ ] Performance

Lighting schedule (each fixture type)
T–8 lamp type required in fixture
4 number of lamps in fixture
F96T8 ballast type used in the fixture
1 number of ballasts in fixture
40–60 total wattage per fixture
.48 vs. .40 total interior wattage specified vs. allowed (whole building or space by space)
250 total exterior wattage specified vs. allowed

Additional Prescriptive Compliance
- [ ] 506.2.1 More Efficient Mechanical Equipment
- [ ] 506.2.2 Reduced Lighting Power Density
- [ ] 506.2.3 Energy Recovery Ventilation Systems
- [ ] 506.2.4 Higher Efficiency Service Water Heating
- [ ] 506.2.5 On-Site Supply of Renewable Energy
- [x] 506.2.6 Automatic Daylighting Control Systems



LIFE SAFETY

REVISIONS	BY

NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 12276 C. GREGORY BAGLEY 6-6-19

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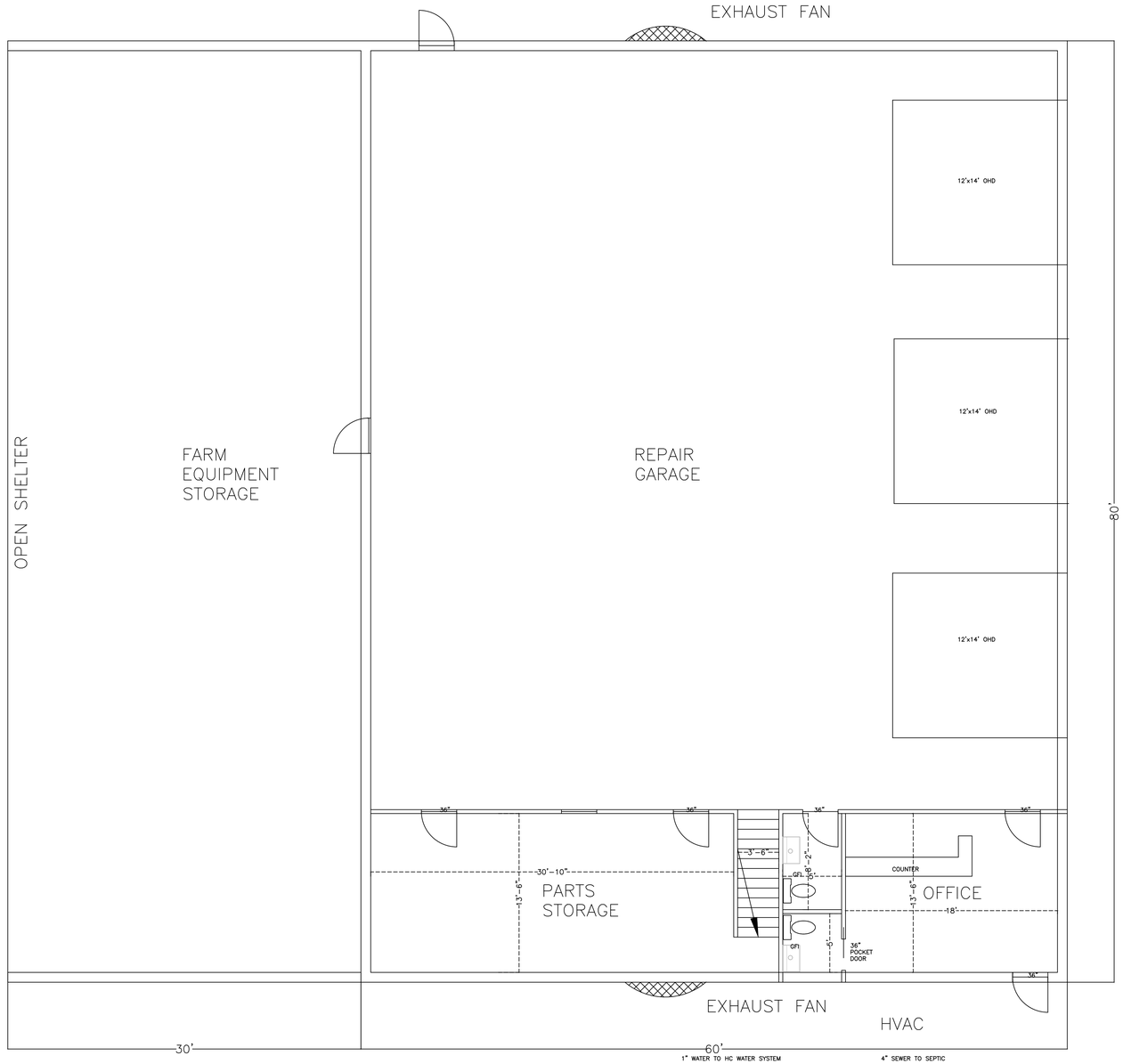
APPENDIX B

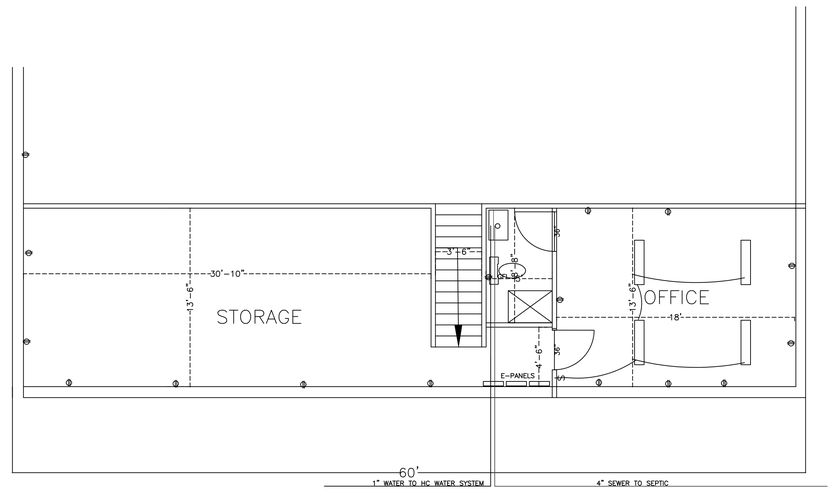
Angus Strickland Building
Prepared for
Angus Strickland
Harnett County North Carolina

DATE 6–6–19
SCALE 1/16" =1'–0"
Prepared for CGB
DRAWN BY
SHEET
CODE 1 OF 1
CODE SHEET

OCCUPANCY CALCULATIONS

S-2 = 500 GROSS = $\frac{7605}{500}$ = 15 OCCUPANTS





MEZZANINE

REVISIONS	BY

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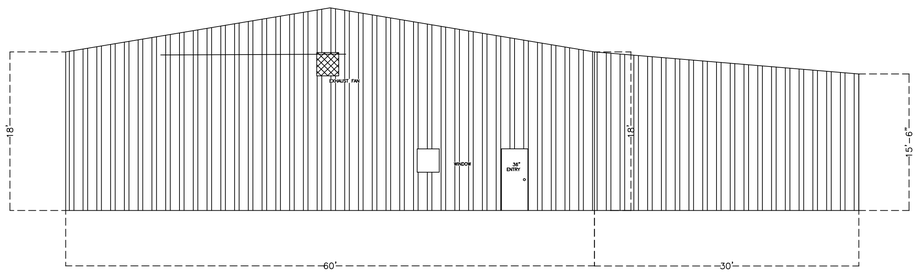
FLOOR PLAN

Angus Strickland Building
Prepared for
Angus Strickland
Harnett County North Carolina

DATE 6-6-19
SCALE 3/16" =1'-0"
Prepared for CGB
DRAWN BY
SHEET
FP 1 OF 1
FLOOR PLAN



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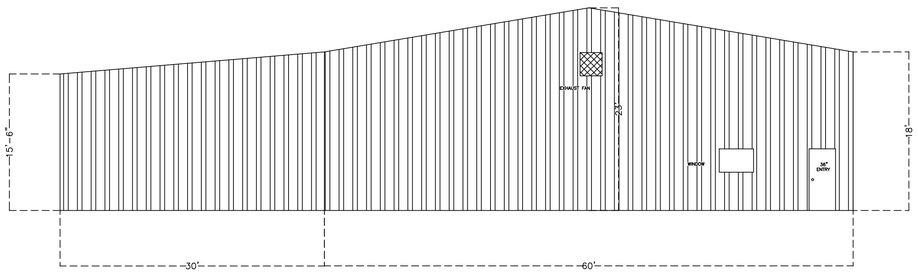

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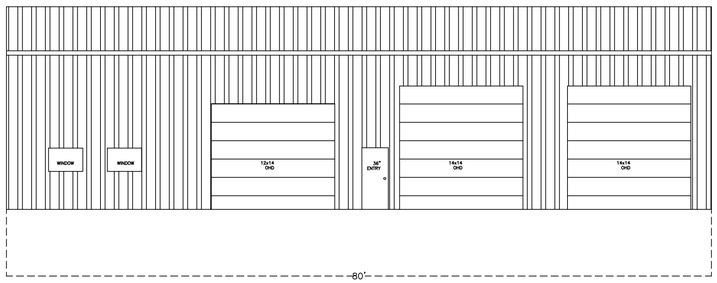
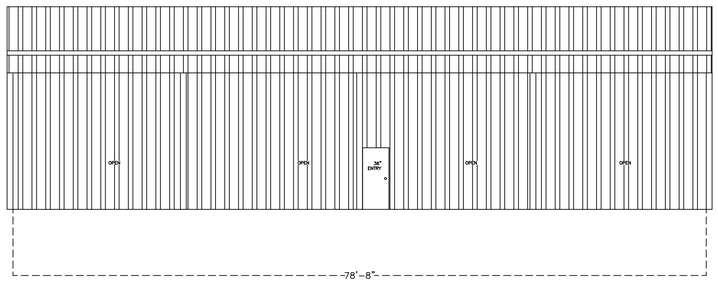


REAR



FRONT

REVISIONS	BY

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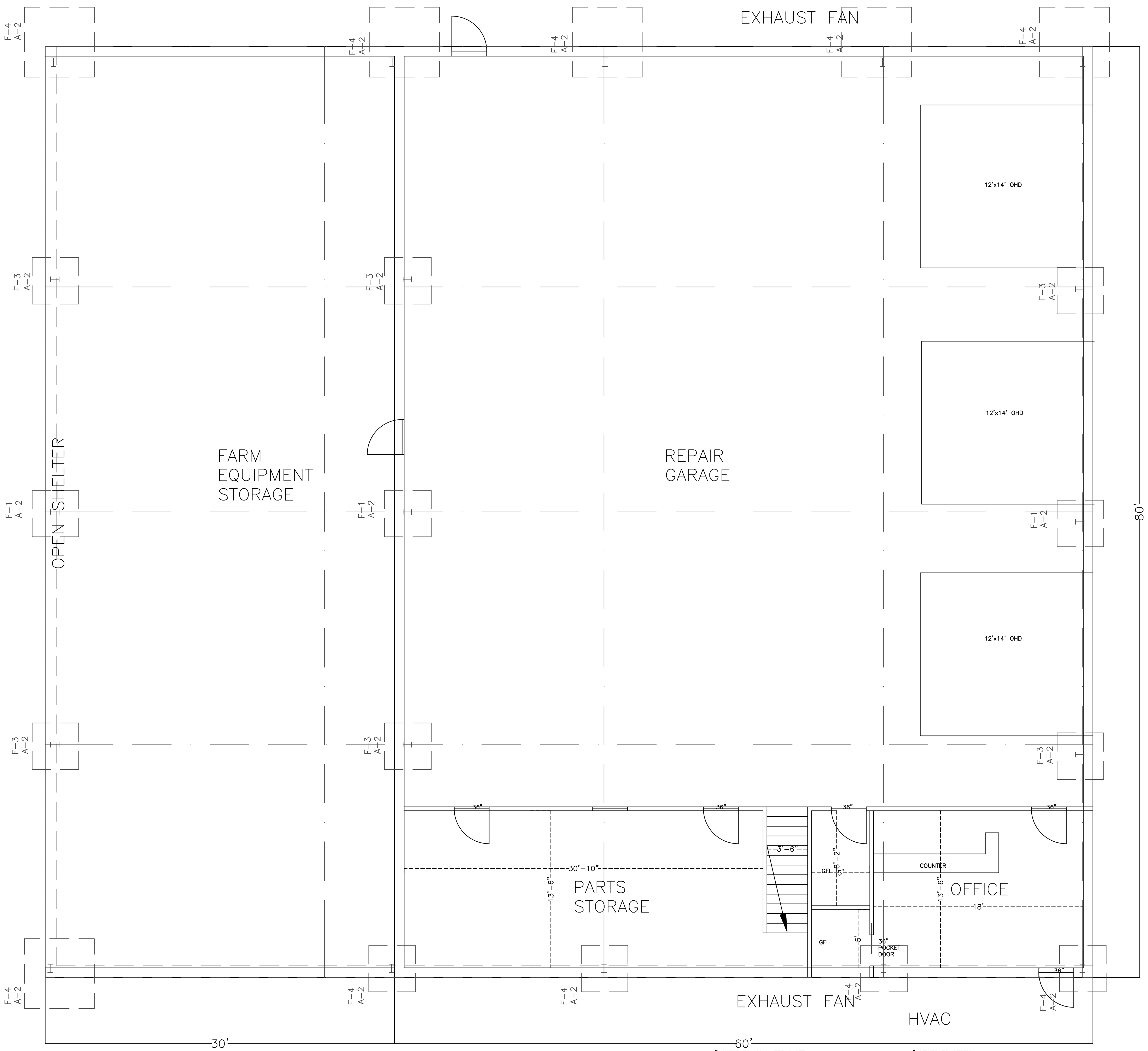
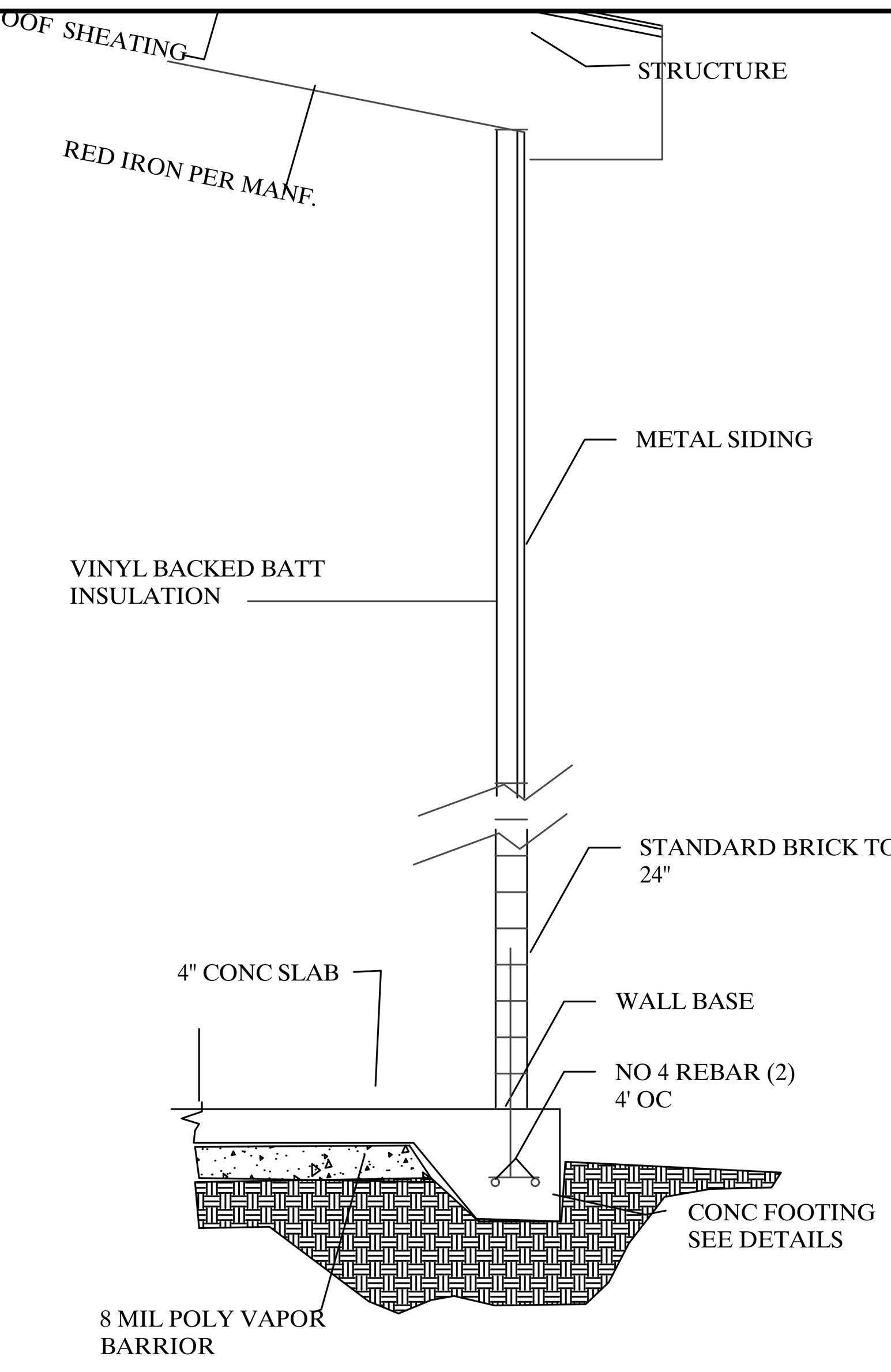
C. GREGORY EAGLEY
PLANNING DESIGN SURVEYING MAPPING

ELEVATIONS

Angus Strickland Building
Prepared for
Angus Strickland
Harnett County North Carolina

DATE	6-6-19
SCALE	1/8"=1'0"
Prepared for	CGB
DRAWN BY	
SHEET	ELV1 OF 1
	ELEVATIONS





SECTION

WALL DETAILS

FOUNDATION NOTES

1. REQUIRED CODE JURISDICTION
   NORTH CAROLINA BUILING CODE, 2012 EDITION
   ACI BUILDING CODE REQUIREMENT CONCRETE STRUCTURES (ACI 318–99)
   ASCE 7–98 MINIMUM DESIGN LOADS FOR BUILDINGS AND OTHER STRUCTURES.
2. ENGINEER'S SEAL APPLIES TO STRUCTURAL COMPONENTS ONLY.
3. REACTIONS PROVIDED BY DESIGN BUILD COMPANY.
4. SEE BUILDING DRAWINGS FOR COLUMN AND BASE PLATE SIZES.
5. ANCHOR BOLT DESIGN PROVIDED BY BUILDING DESIGNER.
6. UNLESS OTHERWISE NOTED, ALL CONCRETE SHALL HAVE THE FOLLOWING STRENGTH STRENGTH AND SLUMP REQUIREMENTS: 3000 PSI 28 DAY 6" SLUMP
7. REINFORCING STEEL SHALL BE PER ASTM A–615 GRADE 60

FOUNDATION REACTION SCHEDULE

PER METAL BUILDING MANUFACTURER

FOOTING SCHEDULE

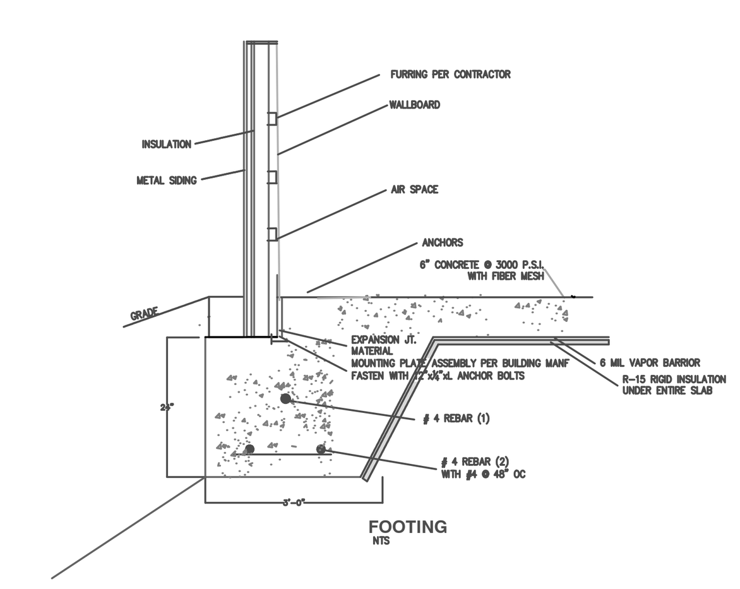
SYMBOL	SIZE	DEPTH	STEEL REINF.
F–1	2.5'x2.5'	24"	4 No. 5 E.W. BTM.
F–3	3'x3'	30"	5 No. 5 E.W. BTM.
F–4	4'x4'	36"	5 No. 5 E.W. BTM.
F–5	5'x5'	36"	6 No. 5 E.W. BTM.

ANCHOR BOLT SCHEDULE

SYMBOL	SIZE
A–1	3/4" x 12"
A–2	3/4" x 18"

LINTEL SCHEDULE

LOCATION	SIZE
STORE FRONT OPENING	4" x 6" x 5/16"



NOT FOR CONSTRUCTION

REVISIONS | BY

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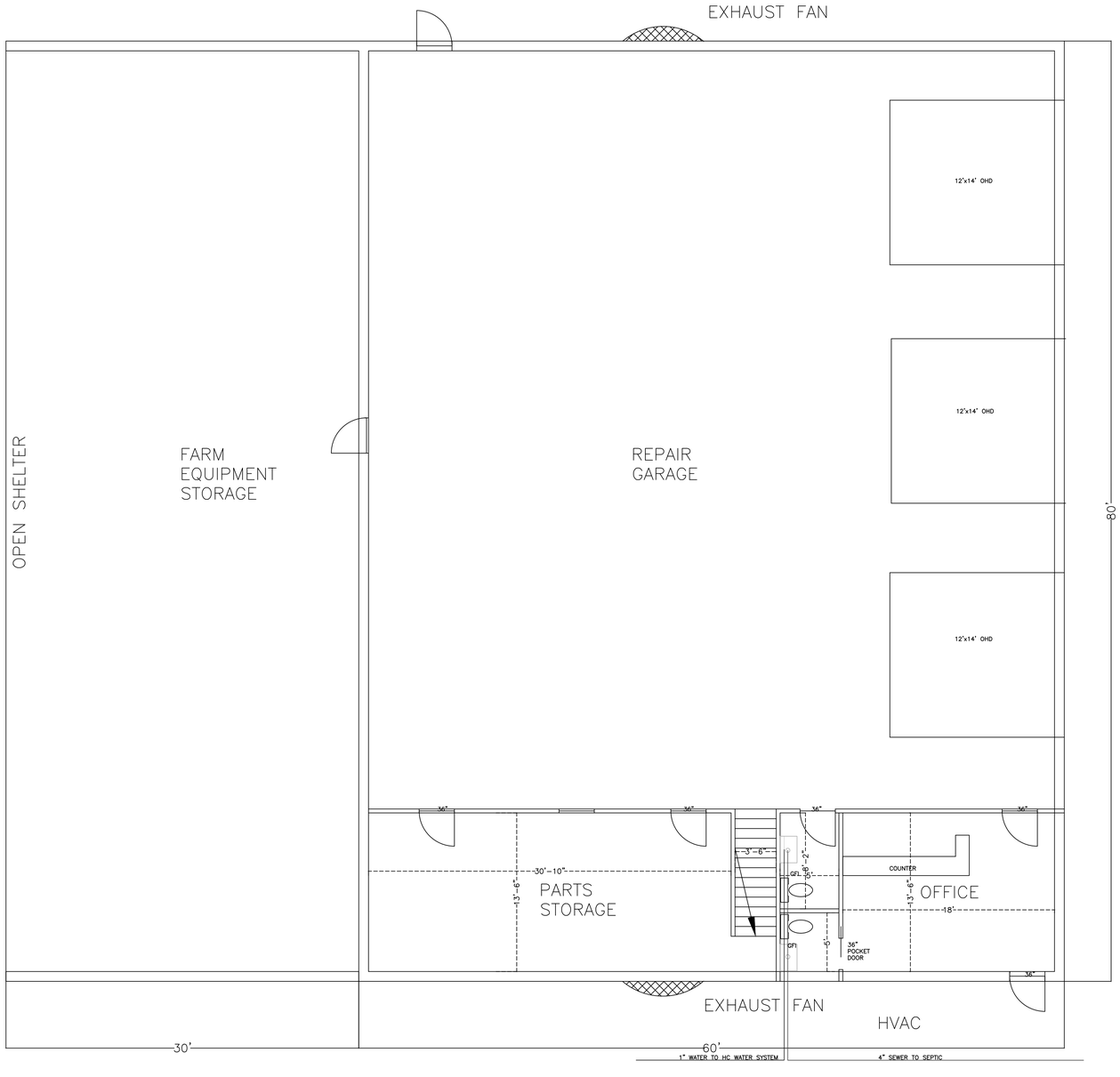
C. GREGORY BAGLEY ENGINEER
DESIGN · SURVEYING · PLANNING · MAPPING

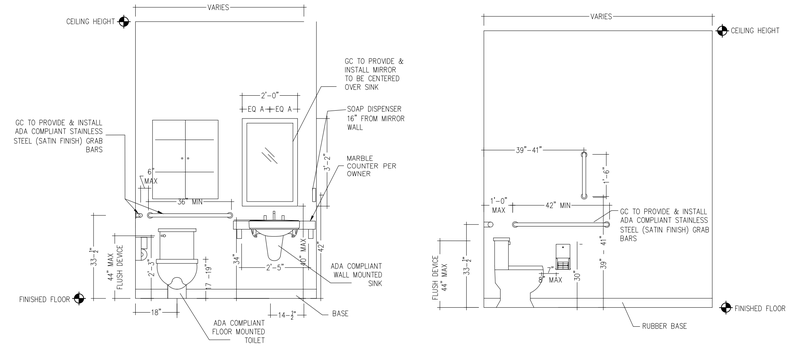
FOUNDATION PLAN

Angus Strickland Building
Prepared for Angus Strickland
Harnett County North Carolina

DATE	6–6–19
SCALE	3/16"=1'–0"
Prepared for	CGB
DRAWN BY	
SHEET	FND 1 OF 1
	FND

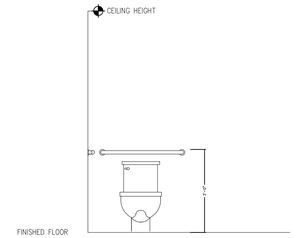


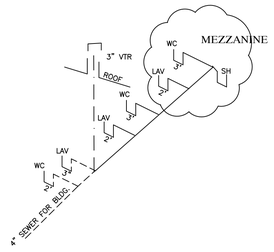
GRAB BARS SHALL:
- HAVE GRIPPING SURFACE OF 1 1/4" – 1 1/2" IN WIDTH OR OUTSIDE DIAMETER
- 1 1/2" HAND CLEARANCE BETWEEN THE FACE OF THE BAR & THE FINISHED SURFACE OF THE WALL/ PARTITION
- BE CAPABLE OF SUPPORTING A 250 LB. LOAD APPLIED IN ANY DIRECTION ANYWHERE ALONG ITS LENGTH
- NOT ROTATE W/ IN THEIR FITTINGS
- BE FREE OF ANY SHARP/ ABRASIVE ELEMENTS
- EDGES SHALL HAVE A 1/8" MIN. RADIUS



TYPICAL BATHROOM HANDICAP DETAILS

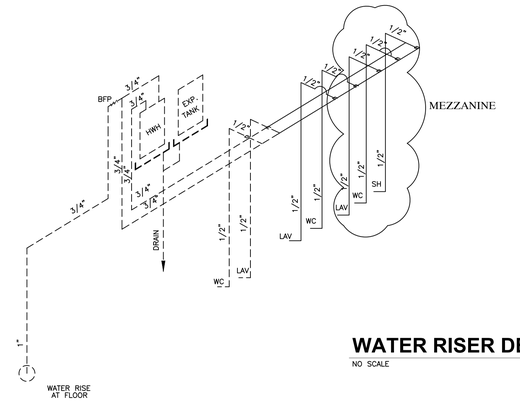
NO SCALE





SEWER RISER DETAIL

NO SCALE



WATER RISER DETAIL

NO SCALE

REVISIONS	BY

NORTH CAROLINA REGISTERED LANDSCAPE ARCHITECT SEAL 6519 C. GREGORY EAGLE

805 COKESBURY ROAD
FUQUAY VARINA, NC 27526
PHONE: (919) 552-1600
FAX: (919) 552-6325

PLANNING DESIGN C. GREGORY EAGLE LANDSCAPE ARCHITECT SURVEYING MAPPING

PLUMBING PLAN

Angus Strickland Building
Prepared for
Angus Strickland
Harnett County North Carolina

DATE 6-6-19
SCALE 3/16" =1-0"
Prepared for CGB
DRAWN BY
SHEET P1 OF 1 PLUMBING

HVAC

MECHANICAL SYSTEMS, SERVICE SYSTEMS, AND EQUIPMENT

METHOD OF COMPLIANCE	PRESCRIPTIVE
THERMAL ZONE	III
EXTERIOR DESIGN CONDITIONS	
winter dry bulb	16 F
summer dry bulb	92 F
INTERIOR DESIGN CONDITIONS	
winter dry bulb	70 F
summer dry bulb	74 F
relative humidity	50 %
BUILDING HEATING LOAD	43,300 BTU
BUILDING COOLING LOAD	44,009 BTU
MECHANICAL SPACE CONDITIONING SYSTEMS	
Unitary	
description of unit	DX COOLING/HEAT
heating efficiency	14 SEER
cooling efficiency	14 SEER
heating output of units	40,000 BTU
cooling output of units	44,000 BTU
LIST EQUIPMENT EFFICIENCIES	SEE SCHEDULE
EQUIPMENT SCHEDULES WITH MOTORS	SEE SCHEDULE

HVAC EQUIPMENT SCHEDULE

1-3.5 TON UNITS ON GROUND
WITH MANUAL AIR DAMPERS

HVAC EQUIPMENT NOTES

USE 14 SEER UNIT SPLIT SYSTEM
UNITS TO BE ON GRND OUTSIDE OF BUILDING.
3/4" CONDENSATE LINE WITH P-TRAP ROUTED TO OUTSIDE AND FASTENED TO WALL.
OUTSIDE AIR INTAKE TO BE ROUTED UP WALL FRAMING AND TERMINATED ABOVE ROOF.
INTAKE MUST BE A MINIMUM OF 10' FROM OUTLET OR EXHAUST.
MOUNT THERMOSTAT ON WALL 54" AFF. AS PER ADA REQUIREMENTS
BATHROOM FANS TO BE 125 CFM WITH 4" DUCT.
DISCHARGE EXHAUST OUTSIDE OF BUILDING.
USE 8" FLEX FOR OUTSIDE AIR INTAKE DUCT

GENERAL HVAC NOTES

PROVIDE PACKAGE UNITS
MIN REQUIREMENTS TO BE MET AS NOTED ABOVE MET FROM NOTES ABOVE
RELOCATE THERMOSTATS AS NEEDED FOR PROPER EFFECT
FANS SHALL RUN CONTINUOUSLY DURING OCCUPANCY TO PROVIDE OUTIDE AIR.
DUCT DETECTORS REQUIRED ON ALL UNITS
REMOTE ALARM INDICATOR DEVICES (RAIDS) REQUIRED FOR EACH UNIT AND TO BE INS
NEAR UNIT NO MORE THAN 72" AFF
DUCT SMOKE DETECTORS TO OPERATE GLOBALLY, ie WHEN ONE DETECTOR ACTIVATES, ALL AIR HANDLING UNITS SHUT DOWN.

VENTILATION CALCULATIONS

$V_{bz}=R_pP_z+R_aA_z$ (Equation4-1)

Az = Zonefloorarea:thenetoccupiablefloorareaof the space or spaces in the zone.
Pz = Zone population: the number of people in the space or spaces in the zone.
Rp = People outdoor air rate: the outdoor airflow rate required per person from Table 403.3.
Ra = Area outdoor air rate: the outdoor airflow rate required per unit area from Table 403.3

REFRIGERANT NCMC 1103

VARIOUS REFRIGERANTS USED PER NCMC 1103 AND ARE SHOWN WITH TECHNICAL CUT SHEETS ATTACHED.

TESTING PROCEDURES

SECTION 1108 FIELD TEST

1108.1 General.
Every refrigerant-containing part of every system that is erected on the premises, except compressors, condensers, vessels, evaporators, safety devices, pressure gauges and control mechanisms that are listed and factory tested,shallbetestedandprovedtightaftercompleteinstallation, and before operation. Tests shall include both the high and low-pressure sides of each system at not less than the lower of the design pressures or the setting of the pressure relief device(s). The design pressures for testing shall be those listed on the condensing unit, compressor or compressor unit name plate, as required by ASHRAE15.

Exceptions: 1. Gas bulk storage tanks that are not permanently connected to a refrigeration system.
2. Systems erected on the premises with copper tubing not exceeding 5/8-inch (15.8 mm) OD, with wall thickness as required by ASHRAE15, shall be tested in accordance with Section 1108.1, or by means of refrigerant charged into the system at the saturated vapor pressure of the refrigerant at 70°F (21°C) or higher.
3. Limited-charge systems equipped with a pressure relief device, erected on the premises, shall be tested at a pressure not less than one and one-half times the pressure setting of the relief device. If the equipment or appliance has been tested by the manufacturer at one and one-half times the design pressure, the test after erection on the premises shall be conducted at the design pressure.

1108.1.1 Booster compressor.
Where a compressor is used as a booster to obtain an intermediate pressure and discharges into the suction side of another compressor, the booster compressor shall be considered a part of the low side, provided that it is protected by a pressure relief device.

1108.1.2 Centrifugal/nonpositive displacement compressors.
Infield-testing systems using centrifugal or other non-positive displacement compressors, the entire system shall be considered as the low-side pressure for field test purposes.

1108.2 Test gases.
Tests shall be performed with an inert dried gas including, but not limited to, nitrogen and carbon dioxide. Oxygen, air, combustible gases and mixtures containing such gases shall not be used.
Exception: The use of air is allowed to test R-717, ammonia, systems provided that they are subsequently evacuated before charging with refrigerant.

1108.3 Test apparatus.
The means used to build up the test pressure shall have either a pressure-limiting device or a pressure-reducing device and a gauge on the outlet side.

1108.4 Declaration.
A certificate of test shall be provided for all systems containing 55 pounds (25kg) or more of refrigerant. The certificate shall give the name of the refrigerant and the field test pressure applied to the high side and the low side of the system. The certification of test shall be signed by the installer and shall be made part of the public record.

PIPE INSULATION REQUIREMENTS

503.2.8 Piping insulation.
All piping serving as part of a heating or cooling system shall be thermally insulated in accordance with Table 503.2.8.
Exceptions:
1. Factory-installed piping within HVAC equipment tested and rated in accordance with a test procedure referenced by this code.
2. Factory-installed piping within room fan-coils and unit ventilators tested and rated according to AHRI 440 (except that the sampling and variation provisions of Section 6.5 shall not apply) and 840, respectively.
3. Piping that conveys fluids that have a design operating temperature range between 55°F (13°C)and 105°F (41°C).
4. Piping that conveys fluids that have not been heated or cooled through the use of fossil fuels or electric power.
5. Run out piping not exceeding 4 feet (1219mm) in length and 1 inch (25mm) in diameter between the control valve and HVAC coil.
6. Refrigerant suction piping located in conditioned space is not required to be insulated other than as may be necessary for preventing the formation of condensation.

TABLE 503.2.8
MINIMUM PIPE INSULATION
(thickness in inches)

FLUID	NOMINAL PIPE DIAMETER < 1.5"	NOMINAL PIPE DIAMETER > 1.5"
Steam	1½	3
Hot water	1½	2
Chilled water, brine or refrigerant	1½	1½

For SI: 1 inch = 25.4 mm.
a. Based on insulation having a conductivity (k) not exceeding 0.27 Btu per inch/h ·ft2 ·°F.
b. For Insulation with a thermal conductivity not equal to 0.27Btu·inch/h·ft2·°F at a mean temperature of 75°F ,the minimum required pipe thickness is adjusted using the following equation;
$T=r[(1+t/r)K/k-1]$
where:
T = Adjusted insulation thickness (in).+
r = Actual pipe radius (in).
t = Insulation thickness from applicable cell in table (in).
K = New thermal conductivity at 75°F (Btu ·in/hr ·ft 2 ·°F).
k = 0.27 Btu ·in/hr ·ft 2 ·°F.

MECHANICAL SCHEDULE

CONDENSER AND AIR HANDLER

TYPE	RATING	TON	MODEL NO	MCA	MOCP
TRANE	14 SEER	3.33	4TWR4024G100AB	27.6	30 AMPS
TRANE		10 KW	TAM4AOA24521EDA	57.5	40 AMPS

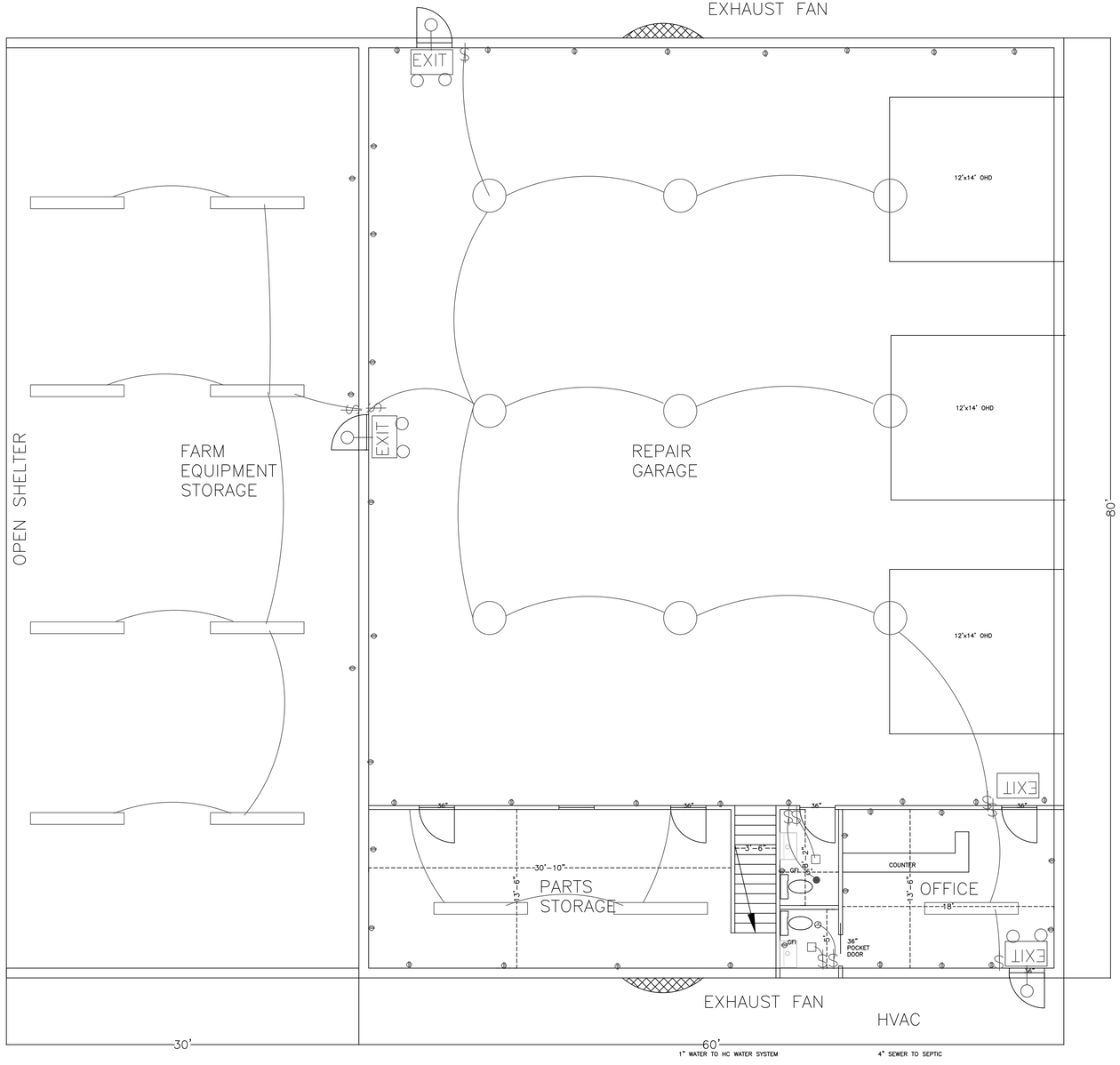
REVISIONS BY

C. GREGORY BAGLEY ENGINEER
DESIGN PLANNING SURVEYING MAPPING
805 COKESBURY ROAD
FUQUAY VARINA, NC 27526
PHONE: (919) 552-1600
FAX: (919) 552-6325

MECHANICAL PLAN

Angus Strickland Building
Prepared for Angus Strickland
Harnett County North Carolina

DATE 9-12-17
SCALE 1/4" =1'-0"
Prepared for CGB
DRAWN BY
SHEET M1 OF 1
MECHANICAL



PANEL A

100 AMP SERVICE PANEL
VOLTAGE 208/120V 3 PHASE : 4 WIRE

DEVICE SIZE	DEVICE AMPS TRIP	DEVICE POLES	BRANCH CIRCUIT DESCRIPTION	CK	PH A	PH B	PH C	PH A	PH B	PH C	CKT	BRANCH CIRCUIT DESCRIPTION	DEVICE POLES	DEVICE AMPS TRIP	DEVICE SIZE
12	20	1	RECEPT	1				11			2	RECPT.	1	20	12
12	20	1	RECEPT	3	11				11		4	RECPT.	1	20	12
14	20	1	RECEPT	5			11			11	6	RECPT.	1	20	12
12	20	1	RECEPT OFFICE	7	11				11		8	RECEPT	1	20	10
12	20	1	RECPT.BRK. RM .GFI	9			11			11	10	RECEPT	1	20	14
10	20	1	REGISTER	11	11					22	12	RECEPT	1	20	10
10	20	2	RECEPT	13		20		22			14	RECEPT	1	20	10
10	20	2	RECEPT	15		18			22		16	RECEPT	1	20	12
14	20	1	LIGHTING	17			7	7			18	BATH FAN (WOMEN)	1	20	12
14	20	1	LIGHTING	19	7					7	20	LIGHTING	1	14	12
14	20	1	LIGHTING	21		32			32		22	LIGHTING	2	20	14
14	20		LIGHTING	23				32		32	24	LIGHTING	2	20	14
14	20	1	BATH FAN (MEN)	25			32	22			26	LIGHTING	1	20	14
14	20	1		27	32						28	LIGHTING			
				29						7	30				
14	20	1	SIGN	31			7		7		32	EXIT	1	20	14
				33		16									

PANEL B

200 AMP SERVICE PANEL
VOLTAGE 277/480V 3 PHASE : 4 WIRE

DEVICE SIZE	DEVICE AMPS TRIP	DEVICE POLES	BRANCH CIRCUIT DESCRIPTION	CK	PH A	PH B	PH C	PH A	PH B	PH C	CKT	BRANCH CIRCUIT DESCRIPTION	DEVICE POLES	DEVICE AMPS TRIP	DEVICE SIZE
10	20	1		1				11			2		1	20	12
10	20	1		3	11				11		4		1	20	12
10	20	1	AIR COMPRESSOR	5		11				11	6	AIR COMPRESSOR	1	20	12
10	20	1		7	11					11	8		1	20	10
10	40	2	HVAC 1	9			11				10		1	20	14
10	40	1		11	15					15	12		2	40	10
10	40	2		13		11		22			14		2	40	10
10	40	2		15		11			22		16		1	20	12
10	40	1		17			7	7			18		1	20	14
10	40	1		19	7					7	20		1	20	14
14	20	1		21		7			32		22		2	40	10
10	40	2		23		32				32	24		2	40	10
10	40	2		25			32	22			26		1	30	12
10	40	2		27	32						28				
				29							30				
14	20	1		31	7				7		32		1	20	14
	60	2													

PANEL C

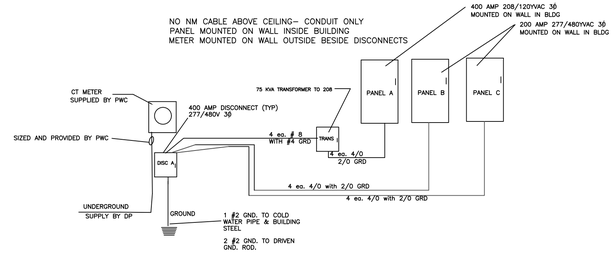
200 AMP SERVICE PANEL
VOLTAGE 277/480V 3 PHASE : 4 WIRE

DEVICE SIZE	DEVICE AMPS TRIP	DEVICE POLES	BRANCH CIRCUIT DESCRIPTION	CK	PH A	PH B	PH C	PH A	PH B	PH C	CKT	BRANCH CIRCUIT DESCRIPTION	DEVICE POLES	DEVICE AMPS TRIP	DEVICE SIZE
10	20	1	RECEPT	1				11			2	RECPT.	2	40	10
10	20	1		3	11				11		4		2	40	10
10	20	1		5		11				11	6		2	40	10
10	20	1		7	11				11		8		2	40	10
10	40	2		9		11				11	10		2	40	10
10	20	2		11	11					22	12		1	20	10
10	20	1	RECEPT	13		11		22	32		14	RECPT.	1	20	10
10	20	1	RECEPT	15		11		32			16	RECPT.	1	20	12
14	20	1	RECEPT	17			7	7			18	RECPT.	1	20	14
14	20	1	RECEPT	19	7					7	20	RECPT.	1	20	14
14	20	1	RECEPT	21		32			32		22	RECPT.	2	20	10
10	40	2	RECEPT	23						32	24	RECPT.	2	20	10
10	40	2		25			32	22			26		1	30	12
10	40	2		27	32						28				
				29						7	30				
14	20	1		31	7				7		32		1	20	14
															14
															10
															10

NOTE: ELECTRICAL CONTRACTOR TO PROVIDE AIC RATING PER 2014 FAULT CURRENT IS 10236

LOAD CALCS.			
LOAD	CONN (KVA)	DEMAND FACTOR	DEMAND LOAD
LIGHTING	10.1	125% ****	12.63
RECEPT.	14.2	1ST 10 KV – 100% REM –50%	12.1
HVAC	269.7	100%	269.7
SIGN	1.2	125% ****	1.5
WH	25	125%	31.25
EQUIPMENT	82.5	125%	103.12
TOTAL	402.5	TOTAL	430.25

NO NM CABLE ABOVE CEILING– CONDUIT ONLY
PANEL MOUNTED ON WALL INSIDE BUILDING
METER MOUNTED ON WALL OUTSIDE BESIDE DISCONNECTS



ELECTRICAL DIAGRAM

NOTE: ELECTRICAL CONTRACTOR TO PROVIDE AIC RATING PER 2014 NEC

Project: Angus Strickland Building
OFFICE, BUILDING
WAKE FOREST, NORTH CAROLINA

Designers of Record

Designer	Name	License #	Telephone #
A. Architectural			
B. Structural			
C. Plumbing			
D. Sprinkler–Standpipe			
E. Mechanical			
F. Electrical	C. GREGORY BAGLEY	12276	919–609–0300
G. Fire Alarm			

1. Occupancy
2. Construction Type
3. Area (SI.ft)
4. Occupant Load
5. Number of Exits
6. Travel Distance to Ext

DESIGNER STATEMENT
I hereby certify that the design of this building complies with the electrical systems, service systems and equipment requirements of the 2011 NEC and the 2002 North Carolina State Electrical Code Volume IV

Signed C Gregory Bagley

MECHANICAL SCHEDULE

CONDENSER AND AIR HANDLER					
TYPE	RATING	TON	MODEL NO	MCA	MOCP
TRANE	14 SEER	3.33	4TWR4024S10DAB	27.6	30 AMPS
TRANE		10 KW	AMHA/AD424S21EDA	57.5	40 AMPS

805 COKESBURY ROAD
FUQUAY VARINA, NC 27526
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REVISIONS	BY

CAROLINA — C. GREGORY BAGLEY — SEAL 12276 — ENGINEER — 6-6-19

C. GREGORY EAGLEY ENGINEERING — PLANNING — DESIGN — SURVEYING — MAPPING

ELECTRICAL PLAN

Angus Strickland Building
Prepared for Angus Strickland
Harnett County North Carolina

DATE 6-6-19
SCALE 3/16" = 1–0"
Prepared for CGB
DRAWN BY
SHEET E-1 OF 1 ELECTRICAL