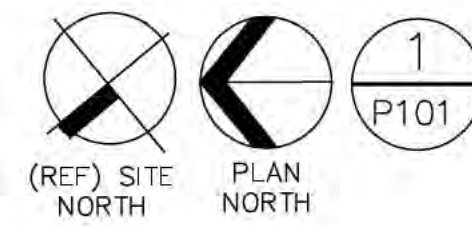
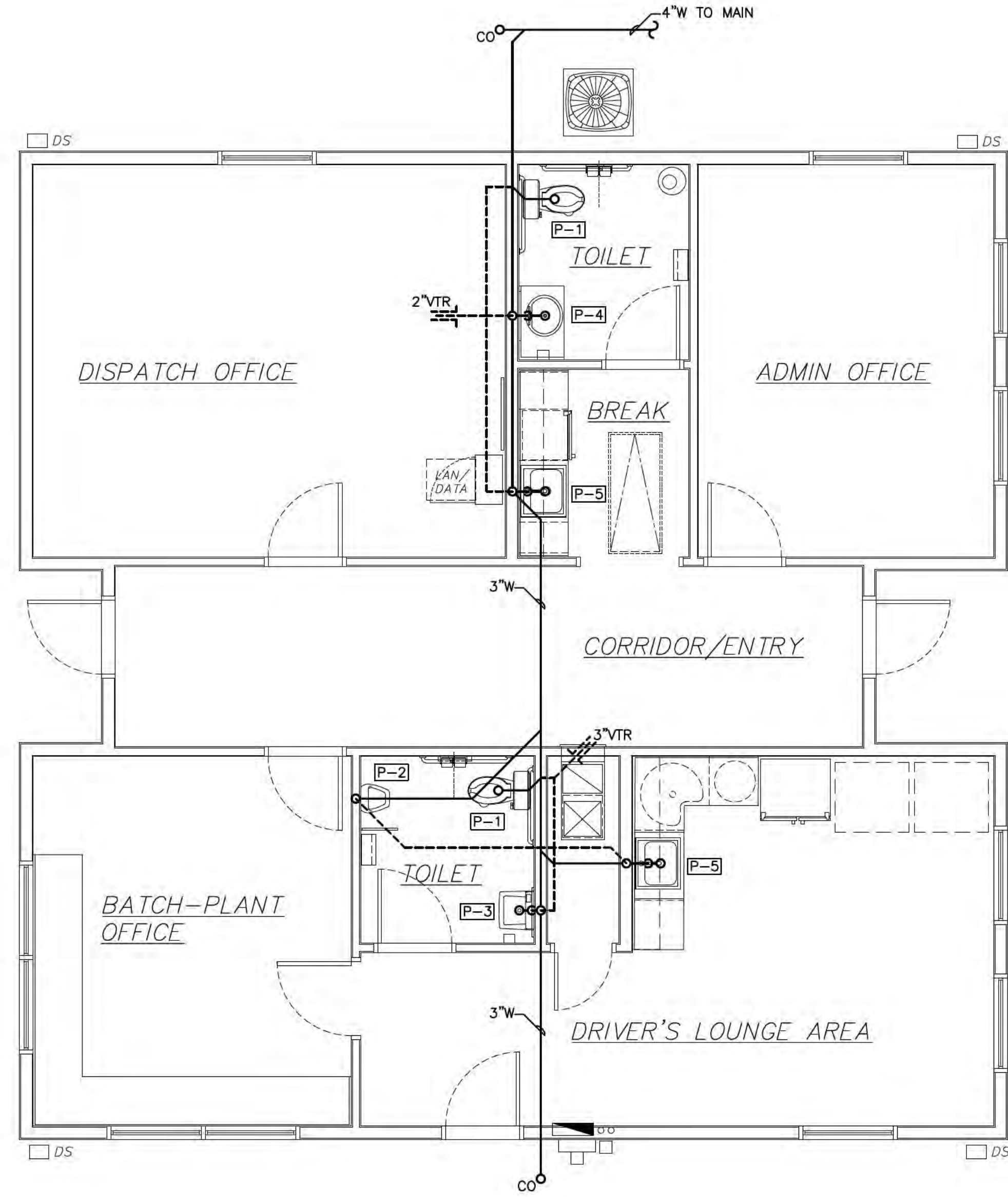
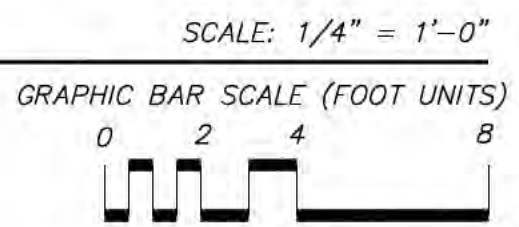




NO.	DATE	REVISION



1 PROPOSED FLOOR PLAN — PLUMBING — WASTE



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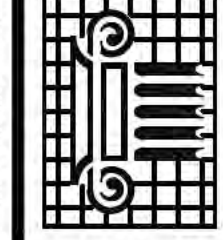
Proposed Dispatch Office Building for  
**Crete Solutions, LLC**  
 2520 US-401  
 Lillington, NC 27546

FLOOR PLAN — PLUMBING — WASTE  
 job status **Issued For Construction**

date 28 MAR, 2018  
 job no. CRETE/BUS  
 drawn by KGILBERT  
 checked by SEVERHART  
 drawing no.

**P101**  
 revision no.

THIS SHEET SHOWS BASIC DRAFTING STANDARDS. THE DRAWING WITHOUT THE WRITTEN PERMISSION IS PROHIBITED AND IMPROVEMENT WILL BE SUBJECT TO LEGAL ACTION.

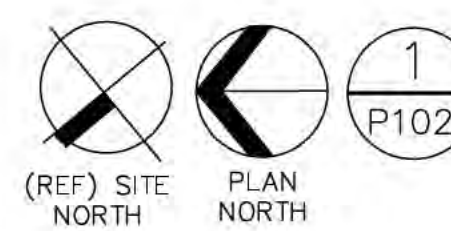
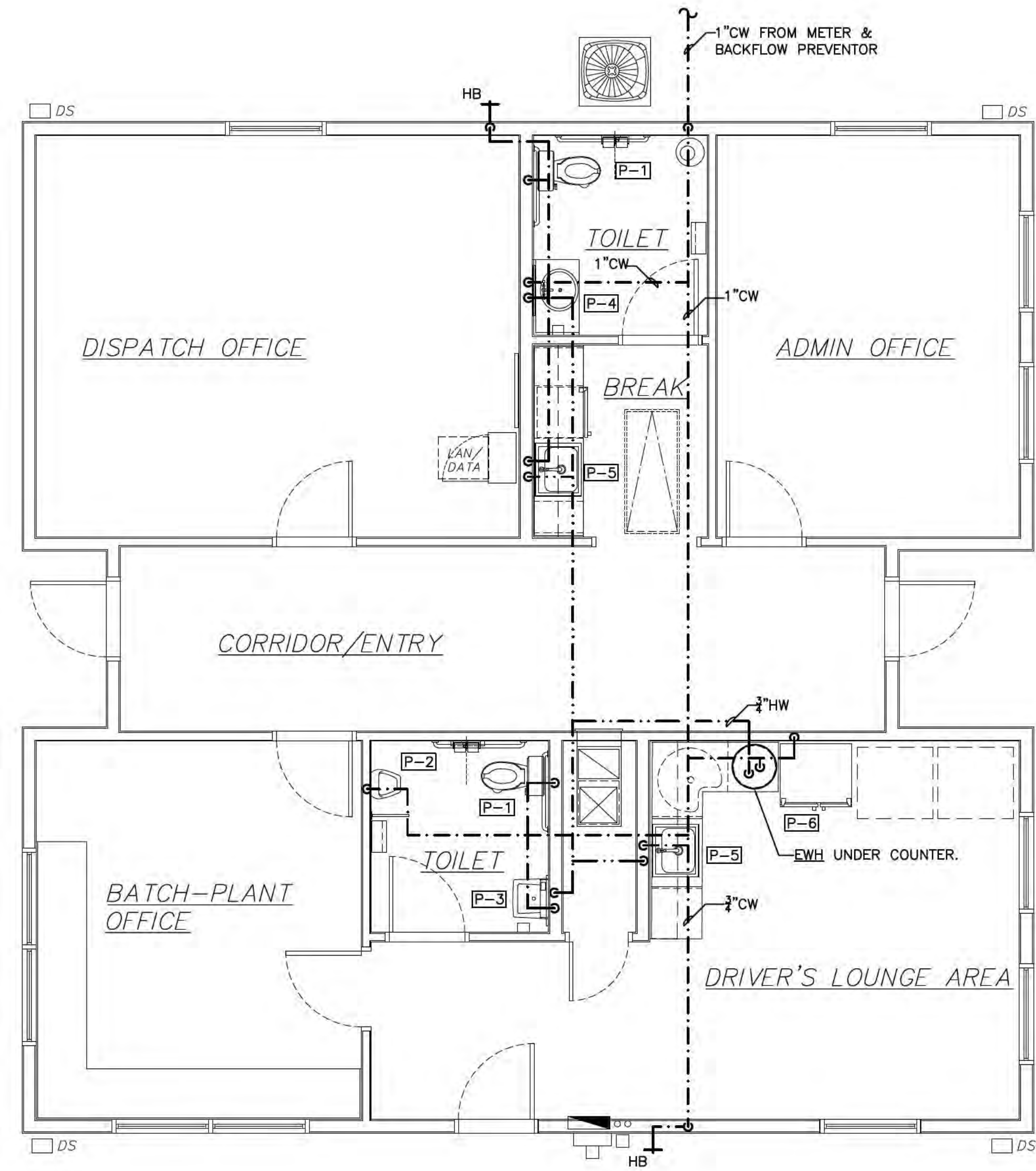


**Design Elements**  
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 Architect with Ode     Sole, LLC  
 Wilmington North Carolina, 28405  
 P.O. 599-1131

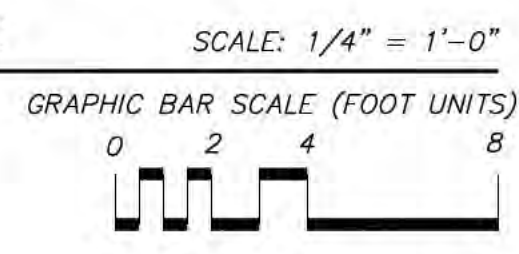


PROJECT NO. 10065  
 MCDOWELL CONSULTING  
 ENGINEERS, INC.  
 P.O. BOX 364  
 WILMINGTON, NC 28403  
 TEL (910) 270-3747 FAX 270-3779  
 NC LICENSE NO. C-2546

NO.	DATE	REVISION



PROPOSED FLOOR PLAN — PLUMBING — WATER



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**Proposed Dispatch Office Building for  
Crete Solutions, LLC**  
2520 US-401  
Lillington, NC 27546  
**FLOOR PLAN — PLUMBING — WATER**  
job status **Issued For Construction**

date 28 MAR, 2018  
job no. CRETE/BUS  
drawn by KGILBERT  
checked by SEVERHART  
drawing no.

**P102**  
revision no.

**Design Elements**  
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910.599.1131



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THIS SHEET SHOWS BASIC DRAFTING STANDARDS

## SPLIT SYSTEM HEAT PUMP SCHEDULE

UNIT NUMBER		AHU-1
AREA SERVED		
MANUFACTURER		TRANE
MODEL NUMBER		TAM7ADC48
UNIT WEIGHT (LBS)		163
FAN	TOTAL AIR CFM	1600
	OUTSIDE AIR CFM	160
	FAN H.P.	3/4
	EXT. S.P. (IN. H2O)	0.4
	POWER SUPPLY	208/230/60/1
COOLING CAPACITY	TOTAL CAPACITY COOLING (BTUH)	49,700
	SENSIBLE CAPACITY COOLING (BTUH)	36,700
	ENTERING AIR TEMP.	80/67
HEATING CAPACITY	ENTERING AIR TEMP.	70 °F
	HIGH TEMPERATURE (BTUH) 47°F DB	47,800
	LOW TEMPERATURE (BTUH) 17°F DB	31,000
	AUXILIARY COIL CAPACITY	7.21/9.6 KW @ 208/240
	POWER SUPPLY	208/230/60/1
AIR COOLED HEAT PUMP	UNIT NUMBER	HP-1
	MODEL NUMBER	4TWR5049
	UNIT WEIGHT	294
ENTERING AIR TEMP.		95°F
FAN TYPE		PROPELLER
FAN H.P.		1/3
COMPRESSOR		SCROLL
POWER SUPPLY		208/230/60/1
MINIMUM AMPACITY		30
MAX. OVERCURRENT PROTECTION		50
ACCESSORIES		(1), (2), (3)

- (1) PROVIDE WALL MOUNTED, PROGRAMMABLE ELECTRONIC THERMOSTAT WITH AUTO CHANGEOVER.
- (2) SYSTEMS SELECTED MEET REQUIREMENTS UNDER SECTION 506 OF THE NORTH CAROLINA STATE BUILDING CODE: ENERGY CONSERVATION CODE.
- (3) PROVIDE STRIP HEAT SHUTOFF PER 503.2.4.1.

## EXHAUST FAN SCHEDULE

TAG	CFM	RPM	S.P. IN.	W.G.	WATTS/HP	SONES	ELECTRIC	MANUFACTURER MODEL NUMBER	DESCRIPTION & ACCESSORIES
EF-1	75	700	.25		50 WATTS	3.0	120-1-60	GREENHECK SP-B90	1, 2, 3

- (1) CABINET CEILING FAN, DIRECT DRIVE, CENTRIFUGAL, SPRING LOADED ALUMINUM BACKDRAFT DAMPER.
- (2) ALUMINUM, WHITE ENAMEL CEILING GRILLE.
- (3) ALUMINUM HOODED WALL CAP WITH BUILT-IN BIRDSCREEN AND DAMPER.

## AIR DISTRIBUTION DEVICE SCHEDULE

TAG	SERVICE	NECK SIZE	OVERALL SIZE	MODEL NUMBER	DESCRIPTION & ACCESSORIES
A	SUPPLY	8"	12 X 12	ASCD	1, 2, 4, 7, 8
B	SUPPLY	10"	24 X 24	ASCD	1, 2, 3, 7, 8
C	RETURN	30 X 20	30 X 20	630	1, 2, 4, 5

- (1) PRICE AIR DISTRIBUTION; OR APPROVED EQUAL.
- (2) ALUMINUM CONSTRUCTION, STANDARD WHITE FINISH.
- (3) T-BAR LAY-IN PANEL.
- (4) SURFACE MOUNT BORDER.
- (5) CFM SHOWN IN GRILLE TAG IS MAXIMUM POSSIBLE WITH EXHAUST AND OUTSIDE AIR AT 0.
- (6) DOUBLE DEFLECTION GRILLE.
- (7) SQUARE FACE, ROUND NECK DIFFUSER
- (8) BUTTERFLY STYLE VOLUME CONTROL DAMPER.

NOTE: FLEXIBLE DUCTWORK SHALL MATCH DIFFUSER NECK SIZE UNLESS OTHERWISE NOTED.

### GENERAL MECHANICAL SPECIFICATIONS

ALL WORK SHALL COMPLY WITH THE REQUIREMENTS OF THE LATEST EDITION OF THE NC MECHANICAL CODE.

**SHEET METAL WORK:** THIS CONTRACTOR SHALL FURNISH ALL DUCTWORK AND ASSOCIATED SHEET METAL WORK AS CALLED FOR ON THE DRAWINGS AND REQUIRED FOR A COMPLETE DUCTED AIR DISTRIBUTION SYSTEM.

DUCTWORK SHALL BE FABRICATED AND INSTALLED IN ACCORDANCE WITH BEST PRACTICES OF SHEET METAL WORK AND SMACNA STANDARDS.

ALL DUCTWORK SHALL BE GALVANIZED SHEET IRON THROUGHOUT EXCEPT WHERE OTHERWISE SHOWN AND FABRICATED IN ACCORDANCE WITH THE FOLLOWING TABLE (ALL DUCT SIZES ON CONTRACT DRAWINGS ARE SHEET METAL FABRICATION SIZES):

MAXIMUM DIMENSION OF DUCT	GAUGE U.S. STD.	TRANSVERSE JOINT	BRACING
UP TO 12"	26	DRIVE SLIPS 7"-10" CENTERS	NONE
13" TO 30"	24	DRIVE SLIPS 7"-10" CENTERS	1"X1"X1/8" ANGLES 4 FEET FROM JOINT

DUCTS 25 INCHES OR SMALLER IN MAXIMUM DIMENSION SHALL BE SUPPORTED WITH 1 INCH FLAT BAND HANGERS; DUCTS 25 INCHES AND LARGER SHALL BE SUPPORTED BY 3/4 INCH X 1-1/2 INCH ANGLE IRON AND ROUND ROD. SUPPORTS SHALL BE NOT MORE THAN 8 FEET ON CENTERS, PROPERLY FASTENED AND PLACED TO BUILDING STRUCTURES AND SHALL EXTEND AND BE RIVETED TO THE BOTTOM OF DUCTS.

UNLESS OTHERWISE SPECIFIED, FURNISH AND INSTALL ALL NECESSARY LINTELS, PROPERLY SIZED, SHEET METAL SLEEVES AND ESCUTCHEON COLLARS WHERE DUCTWORK RISES THROUGH FLOORS OR PASSES THROUGH WALLS OR CEILINGS.

FURNISH AND INSTALL FLEXIBLE COLLARS IN THE DUCTWORK CONNECTIONS TO AIR HANDLING FANS TO PREVENT NOISE TRANSMISSION BETWEEN SECTIONS.

ALL CHANGES IN DUCT DIRECTION SHALL BE LONG RADIUS ELBOWS OR SHALL BE FITTED WITH TURNING VANES. IT IS ACCEPTABLE TO CHANGE RECTANGULAR DUCTWORK TO THE EQUIVALENT SIZE IN ROUND PROVIDED THE CONTRACTOR COORDINATES ALL CLEARANCE ISSUES.

**DUCT INSULATION:**  
ALL CONCEALED DUCTWORK SHALL BE INSULATED ON THE OUTSIDE WITH TWO INCH (2") THICK, 3/4 POUND DENSITY FIBERGLASS BLANKET INSULATION HAVING AN ALUMINUM FOIL-SCRIM VAPOR BARRIER JACKET.

EDGES OF INSULATION SHALL BE CUT STRAIGHT AND TRUE AND SHALL BE TIGHTLY BUTTED. THE VAPOR BARRIER JACKET SHALL OVERLAP THE BLANKET JOINT A MINIMUM OF THREE INCHES (3"). THE JACKET LAP SHALL BE FASTENED WITH MOISTURE RESISTANT ADHESIVE AND ALSO OUTWARD CLINCHING STAPLES SPACED TEN INCHES (10") C/C. THE VAPOR BARRIER EDGE AND STAPLES SHALL THEN BE COVERED WITH A THREE INCH (3") WIDE TAPE OF THE SAME MATERIAL AS THE JACKET AND SHALL BE FASTENED WITH MOISTURE RESISTANT ADHESIVE.

ALL CUTS, TEARS AND PENETRATIONS IN THE VAPOR BARRIER JACKET SHALL BE SEALED WITH JOINT TAPE. ALL EDGES OF INSULATING BLANKET SHALL BE SEALED FROM THE JACKET TO DUCT SURFACE WITH TAPE.

INSULATING BLANKET ON THE BOTTOM OF SURFACES IN EXCESS OF 24 INCHES WIDE SHALL BE SECURED AGAINST THE DUCT WITH ADHESIVE OVER THE ENTIRE AREA, MECHANICAL CLIPS ON 24 INCH CENTER OR BY WIRE TIES AROUND THE DUCT SPACED 24 INCHES C/C.

CONTRACTOR MAY USE FLEXIBLE DUCTWORK (MAXIMUM LENGTHS 15'-0") FOR FINAL CONNECTIONS TO DIFFUSERS/GRILLES. FLEXIBLE DUCTWORK SHALL BE CERTIFLEX 25 AS MANUFACTURED BY THE CERTAINTIED CORPORATION.

**REGISTERS AND GRILLES:** ALL REGISTERS AND GRILLES SHALL BE OF SIZE, STYLE AND CAPACITY CALLED FOR ON PLANS AND IN THE GRILLE SCHEDULE. PROVIDE RUBBER OR EXPANDED FOAM GASKETS COMPLETELY AROUND ALL REGISTER AND GRILLE FRAMES TO PREVENT AIR LEAKAGE BETWEEN GRILLE FRAME AND DUCT OR BETWEEN GRILLE FRAME AND SURROUNDING FINISHED SURFACE. ACCEPTABLE MFGS: PRICE, CARNES, METALAIR, KRUGER. REGISTERS AND GRILLES SHALL BE BALANCED TO CFM SHOWN AND RECORD MADE OF ACTUAL FLOW AND BALANCE METHOD.

**EQUIPMENT:** MECHANICAL AND ELECTRICAL CONTRACTORS SHALL COORDINATE PRIOR TO ORDERING EQUIPMENT TO VERIFY CONSISTANT VOLTAGES. PRIOR TO EQUIPMENT BEING ENERGIZED, VOLTAGE TO EQUIPMENT CIRCUITS SHALL BE VERIFIED AS INSTALLED TO MATCH EQUIPMENT NAMEPLATE.

**OPERATING INSTRUCTIONS, CERTIFICATES AND WARRANTIES:** THE ORIGINAL OF ALL INSPECTION CERTIFICATES SHALL BE DELIVERED TO THE OWNER AND ONE (1) COPY EACH TO THE ENGINEER PRIOR TO REQUEST FOR FINAL PAYMENT.

THREE (3) COPIES OF OPERATING AND MAINTENANCE INSTRUCTIONS AND MANUFACTURER'S WARRANTIES FOR ALL EQUIPMENT PROVIDED UNDER THIS CONTRACT SHALL BE PROVIDED TO THE OWNER PRIOR TO SUBMITTING REQUEST FOR FINAL PAYMENT.

PRIOR TO FINAL PAYMENT TO THE CONTRACT, THE CONTRACTOR SHALL BE RESPONSIBLE TO TRAIN THE AUTHORIZED PERSONNEL ON HOW TO SERVICE, START-UP AND SHUT-DOWN THE VARIOUS SECTIONS OF THE SYSTEM. UPON COMPLETION OF THIS PHASE OF THE CONTRACT, THE CONTRACTOR SHALL SECURE A LETTER OF ACCEPTANCE FROM THE OWNER THAT HE IS SATISFIED WITH THE CONDITIONS STIPULATED HEREIN. UPON ACCEPTANCE OF THIS LETTER AND AT THE DISCRETION OF THE ENGINEER, THE FINAL PAYMENT WILL BE MADE.

THE CONTRACTOR SHALL PROVIDE A WRITTEN GUARANTEE OF ALL MATERIALS AND WORKMANSHIP FOR A PERIOD OF ONE (1) YEAR FROM DATE OF SYSTEM ACCEPTANCE.

THE WORK UNDER THIS CONTRACT WILL BE ACCEPTED ONLY AS AN ENTIRE SYSTEM UPON SATISFACTORY COMPLETION OF THE REQUIRED TESTS. NO PARTIAL ACCEPTANCE OF ANY PART OR PORTION OF APPARATUS WILL BE MADE.

INSTALL AND CONNECT ALL EQUIPMENT IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS AND DO ALL WORK IN A NEAT AND WORKMANLIKE MANNER AND IN ACCORDANCE WITH ACCEPTED GOOD PRACTICE AS JUDGED BY THE ENGINEER.

ALL EQUIPMENT AND PIPING SHALL BE SO INSTALLED THAT NO OBJECTIONABLE NOISES FROM EQUIPMENT, PIPING OR AIR DISTRIBUTION ARE AUDIBLE IN THE FINISHED AREAS.

**GUARANTEE:** THIS CONTRACTOR SHALL GUARANTEE ALL MATERIALS, EQUIPMENT AND WORKMANSHIP FOR ONE (1) YEAR FOLLOWING FINAL INSPECTION AND ACCEPTANCE OF THE BUILDING BY THE ENGINEER AND OWNER. THIS APPLIES TO ALL MATERIALS AND EQUIPMENT INSTALLED UNDER THIS CONTRACT, REGARDLESS OF SOURCE.

THE ONE (1) YEAR GUARANTEE PERIOD WILL START ON THE DAY OF FINAL INSPECTION AND ACCEPTANCE BY THE OWNER. THE CONTRACTOR SHALL PROVIDE THE ENGINEER A LETTER WITH TWO (2) COPIES STATING THE BEGINNING AND ENDING DATES OF THE GUARANTEE BASED ON THE AFOREMENTIONED STARTING DATES.

**EXTENDED GUARANTEE:** PROVIDE AN ADDITIONAL FOUR (4) YEAR GUARANTEE ON ALL COMPRESSORS BEYOND THE ABOVE MENTIONED ONE (1) YEAR GUARANTEE PERIOD.

**AIR BALANCE:** ALL SYSTEMS SHALL BE BALANCED BY THE CONTRACTOR PER THE REQUIREMENTS OF SECTION 503.2.9 OF THE NORTH CAROLINA STATE BUILDING CODE: ENERGY CONSERVATION CODE.

**ENERGY CODE COMPLIANCE:** HVAC EQUIPMENT SELECTED MEETS PERFORMANCE REQUIREMENTS OF THE NORTH CAROLINA STATE BUILDING CODE: ENERGY CONSERVATION CODE SECTION 506.2.1. ANY SUBSTITUTIONS MUST MEET THIS STANDARD AS WELL. UPON FINAL INSPECTION THE CONTRACTOR SHALL PROVIDE TO OWNER MANUALS AND EVIDENCE OF AIR BALANCE. CONTRACTOR SHALL SCHEDULE DESIGN PROFESSIONAL AND ASSIST TO COMPLETE SYSTEM INSTALLATION STATEMENT IN ACCORDANCE WITH THE NORTH CAROLINA STATE BUILDING CODE: ENERGY CONSERVATION CODE SECTION 503.2.9.

### MECHANICAL LEGEND

- NEW DUCTWORK
- NEW SUPPLY GRILLE/DIFFUSER
- NEW RETURN GRILLE/DIFFUSER
- THERMOSTAT
- CFM TAG
- EXHAUST FAN
- CONDENSATE/REFRIGERANT PIPE

### MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

METHOD OF COMPLIANCE: ENERGY CODE  
Prescriptive  Energy Cost Budget

Thermal Zone 3H

Exterior design conditions 26° F  
 winter dry bulb 26° F  
 summer dry bulb 92° F DB/76° F WB

Interior design conditions 70° F  
 winter dry bulb 70° F  
 summer dry bulb 75° F  
 relative humidity 50%

Building heating load 18.5 MBTU/H  
 Building cooling load 3.5 TONS

Mechanical Spacing Conditioning System \_\_\_\_\_

Unitary description of unit \_\_\_\_\_  
 heating efficiency 9.0 HSPF MIN.  
 cooling efficiency 15.0 SEER MIN.  
 heat output of unit SEE SCHEDULES  
 cooling output of unit SEE SCHEDULES

boiler total boiler output. If oversized, state reason. N/A

chiller total chiller capacity. If oversized, state reason. N/A

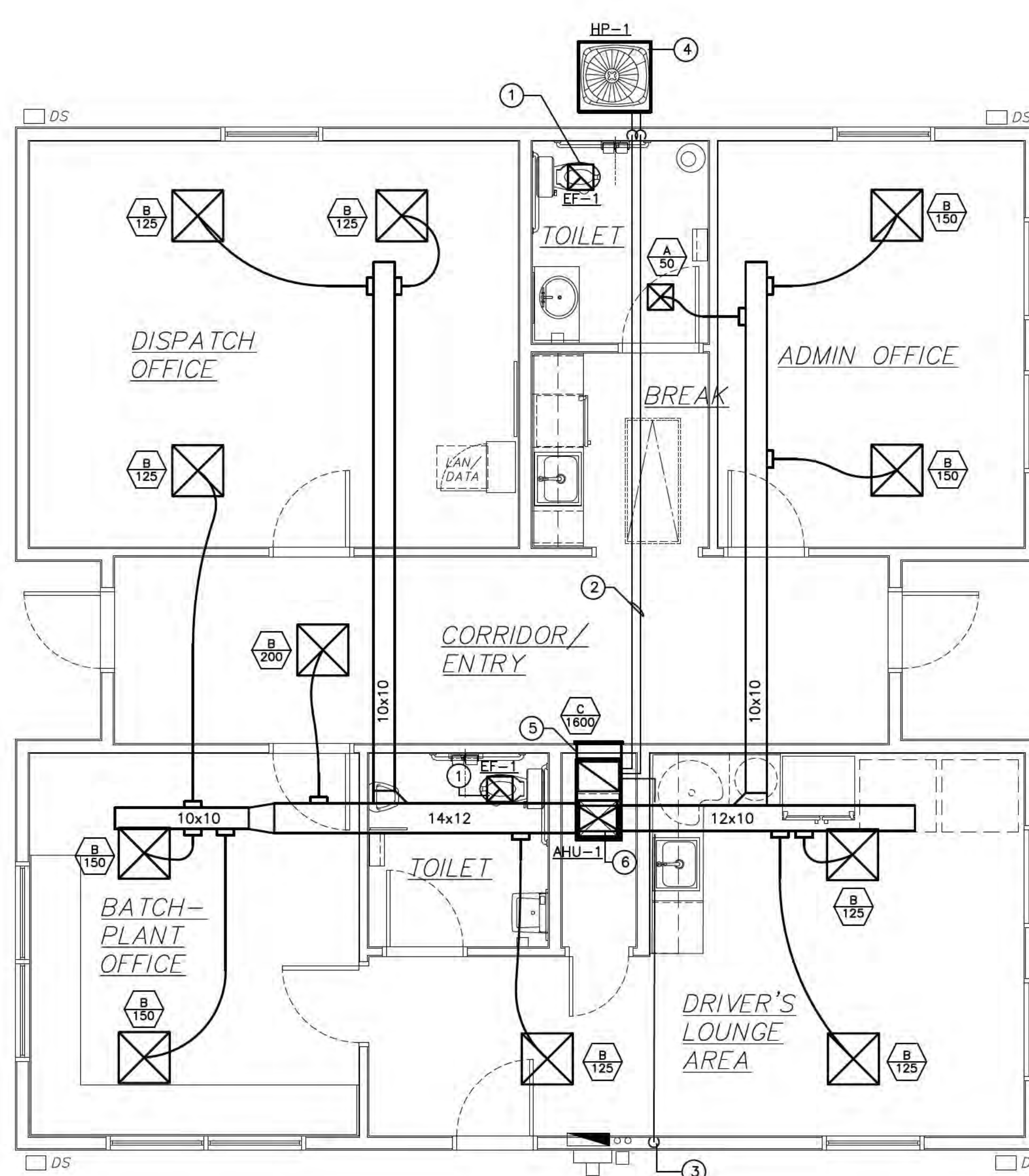
List equipment efficiencies N/A

Equipment schedules with motors (mechanical systems)  
 motor horsepower SEE SCHEDULES  
 number of phases SEE SCHEDULES  
 minimum efficiency SEE SCHEDULES  
 motor type ODP  
 # of poles 4

Additional prescriptive compliance method : 506.2.1 More Eff. Mech Equip.

DESIGNER STATEMENT:  
 To the best of my knowledge and belief, the design of this building complies with the mechanical systems, service systems and equipments of the 2012 North Carolina State Energy Code.  
 SIGNED: \_\_\_\_\_  
 NAME: STEVEN H. SEVERHART JR., P.E.  
 TITLE: PROFESSIONAL ENGINEER

no.	date	revision



- GENERAL NOTES:**
- ROUTE 6" EXHAUST TO WALL OR ROOF CAP AS CORRINATED IN FIELD.
  - REFRIGERANT PIPING CONCEALED ABOVE CEILING AND IN BUILDING CONSTRUCTION, SIZE AS RECOMMENDED BY UNIT MANUFACTURER. (TYP.)
  - 1"CONDENSATE DRAIN PIPING WITH PROPER PITCH. TERMINATE OUTSIDE BUILDING, MIN. 8" ABOVE GRADE WITH ELBOW LOOKING UP. (TYP.)
  - MOUNT UNIT ON 4" CONCRETE PAD OR PAVED SURFACE.
  - ROUTE 8"O.A. TO INTAKE VENT VIA BACKDRAFT DAMPER AND BALANCE DEVICE. MINIMUM 10' BETWEEN O.A. INTAKE AND EXHAUST FAN CAP.
  - 20 X 12 UP TO CEILING AREA.

(REF.) SITE NORTH PLAN NORTH

1 PROPOSED FLOOR PLAN — MECHANICAL

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

GRAPHIC BAR SCALE (FOOT UNITS)

0 2 4 8

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**Proposed Dispatch Office Building for Crete Solutions, LLC**  
2520 US-401  
Lillington, NC 27546

**FLOOR PLAN — MECHANICAL**  
job status  
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date 28 MAR, 2018  
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checked by SEVERHART  
drawing no. M101  
revision no.

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PROJECT NO. 10065  
MCDOWELL CONSULTING ENGINEERS, INC.  
HARRIS BLVD. #200  
HARRIS, NC 28443  
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NC LICENSE NO. C-2546

**DETAILED ELECTRICAL SPECIFICATIONS**  
 SCOPE: FURNISH ALL MATERIALS, LABOR, TOOLS, EQUIPMENT AND SUPERVISION NECESSARY TO INSTALL COMPLETE ELECTRICAL POWER AND LIGHTING SYSTEM IN THE BUILDING AS FURTHER DESCRIBED ON THE ELECTRICAL CONTRACT DRAWINGS.

SUPPLY ALL MATERIALS, FITTINGS AND HARDWARE NECESSARY FOR COMPLETE OPERATING SYSTEMS WITHIN THE OBVIOUS INTENT OF THE DRAWINGS. NO ATTEMPT HAS BEEN MADE TO DETAIL OR LIST EACH AND EVERY ITEM OF MATERIAL. THE ELECTRICAL CONTRACTOR IS CAUTIONED TO READ THE ENTIRE PROJECT DRAWINGS AND SPECIFICATIONS TO ASSURE HIMSELF OF A THOROUGH KNOWLEDGE OF BUILDING CONSTRUCTION, STRUCTURAL RESTRICTIONS TO ELECTRICAL CONTRACT WORK AND TO ASSURE THAT NO REFERENCE ANYWHERE IN THE PROJECT DRAWINGS AND SPECIFICATIONS TO WORK BY THE ELECTRICAL CONTRACTOR IS OVERLOOKED.

**CODES, PERMITS AND INSPECTIONS:** THE LATEST EDITION OF THE STATE BUILDING CODE WHICH INCLUDES THE 2014 EDITION OF THE NATIONAL ELECTRICAL CODE IS HEREBY MADE A PART OF THIS SPECIFICATION. CODE REQUIREMENTS SHALL TAKE PRECEDENCE OVER THESE SPECIFICATIONS WHERE THE CODE REQUIREMENTS EXCEED THAT OF THE SPECIFICATIONS. HOWEVER, THE SPECIFICATIONS SHALL BE FOLLOWED WHERE THEY EXCEED CODE REQUIREMENTS. THE ELECTRICAL CONTRACTOR SHALL, AT NO ADDITIONAL COST TO THE OWNER, OBTAIN THE SERVICES OF THE LOCAL ELECTRICAL INSPECTOR TO MAKE ALL REQUIRED DURING CONSTRUCTION AND COMPLETED ELECTRICAL SYSTEM INSPECTIONS.

**MATERIALS AND WORKMANSHIP:** ALL MATERIAL BUILT INTO THIS PROJECT SHALL BE NEW OF EQUIVALENT OR BETTER QUALITY THAN THAT SPECIFIED. SPECIFIC NAMES AND CATALOG NUMBERS USED HEREIN ARE TO ESTABLISH THE ITEM FUNCTION, ARRANGEMENT AND QUALITY REQUIRED AND ARE NOT INTENDED TO RESTRICT COMPETITION. ALL MATERIALS SHALL BE UL LISTED AND LABELED FOR THE PARTICULAR APPLICATION AS USED ON THIS PROJECT.

**CONDUCTORS:** ALL CONDUCTORS SHALL BE COPPER (#10 AWG AND SMALLER SHALL BE SOLID, AND #8 AWG AND LARGER STRANDED) WITH THHN/THWN INSULATION, INSTALLED IN CONDUIT OR APPROVED CABLE ASSEMBLY. NM CABLE SHALL NOT BE USED. CONDUCTORS SHALL BE #12 AWG MINIMUM EXCEPT WITHIN LIGHT FIXTURES, LOW VOLTAGE CONTROLS OR COMMUNICATION/FIRE ALARM EQUIPMENT. CONDUCTOR COLOR CODE SHALL CONFORM TO THE NEC. CONDUCTORS SHALL BE CONTINUOUS FROM TERMINAL TO TERMINAL OR PULL BOX TO PULL BOX. JOINTS SHALL BE MADE WITH IDEAL "WIRENUTS."

**RACEWAYS:** RACEWAYS SHALL BE ELECTRICAL METALLIC TUBING (EMT) WITH THREADED STEEL HEXAGONAL COMPRESSION FITTINGS - NEITHER INDENTOR TYPE OR DIE METAL FITTING WILL BE ACCEPTED. CONDUIT UNDER THE FLOOR SLAB AND UNDER GROUND OUTSIDE THE BUILDING MAY BE PVC. FITTINGS IN EMT SHALL BE WEATHER TIGHT (THOMAS AND BETTS SERIES #5123 WITH NYLON INSULATED THROATS), BENDS SHALL BE FACTORY FABRICATED OR MADE "COLD" WITH BENDING TOOL, FREE OF KINKS OR RESTRICTIONS. NO SINGLE BEND SHALL BE IN EXCESS OF 90 DEGREES. THERE SHALL BE NO MORE THAN THE EQUIVALENT OF THREE (3) 90 DEGREE BENDS IN A GIVEN RACEWAY FROM PULL BOX TO PULL BOX. RIGID RACEWAY THREADS SHALL BE CUT STRAIGHT AND TRUE - PIPE ENDS SHALL BE REAMED AND SMOOTHED INSIDE AND OUT.

SUPPORT 1-1/2 INCH AND LARGER CONDUIT 10 FEET O/C OR LESS, AND 1 INCH AND SMALLER 6 FEET O/C MAXIMUM. RACEWAYS SHALL BE SUPPORTED DIRECTLY FROM BUILDING STRUCTURE WITH BOLTS, SCREWS, STRAPS, HANGER RODS AND BRACKETS. ALL METALLIC HARDWARE SHALL BE GALVANIZED OR CADMIUM PLATED. NAILS, WIRE AND/OR PERFORATED STRAPS WILL NOT BE ACCEPTED.

USE THREADED LOCKNUTS OUTSIDE AND THREADED LOCKNUT AND BUSHING INSIDE ALL RACEWAY CONNECTIONS TO BOXES, DEVICES, PANELS AND GUTTERS. USE NON-METALLIC BUSHINGS ON ALL 1-1/4 INCH AND LARGER CONDUIT. EXPOSED CONDUIT SHALL BE RUN STRAIGHT AND TRUE PARALLEL AND PERPENDICULAR TO PRIMARY BUILDING LINES.

**BOXES AND DEVICES:** ALL BOXES, PANELS AND EQUIPMENT SHALL BE SUPPORTED DIRECTLY FROM THE BUILDING STRUCTURE AND SHALL NOT DEPEND ON THE FEEDER RACEWAYS FOR SUPPORT. ALL ITEMS SHALL BE CAREFULLY ALIGNED SO THAT COVERS WILL FINISH FLUSH AND STRAIGHT. ALL UNUSED KNOCKOUTS SHALL BE CLOSED WITH BLANKING DEVICES. BOXES IN CONCRETE OR MASONRY SHALL BE 3-1/2 INCH DEEP (MINIMUM) SQUARE 16 GAUGE GALVANIZED STEEL - STEEL CITY SERIES GW. BOXES INSTALLED IN WOOD PARTITIONS SHALL BE STEEL CITY 3-1/2 INCH DEEP GANGABLE SQUARE CORNER TYPE. RECEPTACLES SHALL BE HUBBELL 5362 OR EQUAL SWITCHES SHALL BE HUBBELL 1120 SERIES OR EQUAL. COVER PLATES SHALL BE IMPACT RESISTANT.

PULL BOXES SHALL BE 14 GAUGE GALVANIZED STEEL WITH BLANK COVER SIZED AS REQUIRED BY NATIONAL ELECTRICAL CODE. LOCATE DEVICES AND EQUIPMENT ABOVE FINISHED FLOOR AS FOLLOWS UNLESS OTHERWISE SPECIFICALLY NOTED ON PLANS:

- WALL SWITCHES - 4'-0" OR TO NEAREST MASONRY COURSE JOINT.
- RECEPTACLES - 1'-6" OR TO NEAREST MASONRY COURSE JOINT.
- LIGHT FIXTURES - AS NOTED ON FIXTURE SCHEDULE.

**GROUNDING:** THE ELECTRICAL SYSTEM AND ALL ELECTRICAL EQUIPMENT SHALL BE GROUNDED IN ACCORDANCE WITH ARTICLE 250 OF THE LATEST EDITION OF THE NATIONAL ELECTRICAL CODE. GREEN EQUIPMENT GROUND WIRE SHALL BE USED WITH ALL FEEDERS AND BRANCH CIRCUITS.

**LIGHTING FIXTURES:** LIGHTING FIXTURES AND LAMPS SHALL BE PROVIDED AND INSTALLED AS PER SCHEDULE. ALL FIXTURES SHALL BE CLEANED ON COMPLETION OF INSTALLATION.

**TESTS:** THE CONTRACTOR SHALL MEGGER ALL BUSWAYS, CABLES AND CONTROL CONNECTIONS TO PROVE INSULATION RESISTANCE IS OF ACCEPTABLE VALUE.

**PANELBOARDS:** PROVIDE PANELBOARDS RATED AND SIZED AS INDICATED IN THE SCHEDULE AND SHOWN ON THE PLANS EQUAL TO SQUARE D COMPANY MODEL QO LOAD CENTER.

**ACCEPTABLE MANUFACTURERS:** SQUARE D, GENERAL ELECTRIC, SIEMENS, CUTLER-HAMMER

**SAFETY SWITCHES:** SWITCHES SHALL BE EQUAL TO SQUARE D TYPE GD WITH RATINGS AND FUSING PROVISIONS AS INDICATED.

**IDENTIFICATION AND NAMEPLATES:** PROVIDE ENGRAVED, LAMINATED BAKELITE (WHITE LETTERS ON BLACK SURFACE) NAMEPLATES SCREWED TO EACH PIECE OF ELECTRICAL DISTRIBUTION EQUIPMENT AS FOLLOWS:

A. PANELBOARDS, SWITCHBOARDS - DESIGNATION L1, P1, ETC., VOLTAGE, PHASE NUMBER OF WIRES, ETC.; WORDING EXAMPLE: PANEL L1-208V-3 PHASE, 4 WIRE.

B. MOTOR STARTERS, DISCONNECT SWITCHES - UNLESS MOUNTED DIRECTLY ON OR ADJACENT TO IDENTIFY EQUIPMENT; WORDING EXAMPLE: EXHAUST FAN 1, MAKE-UP AIR UNIT.

PROVIDE TYPED DIRECTORIES FOR PANELBOARD BRANCH CIRCUIT IDENTIFICATION. IDENTIFY EACH CIRCUIT BREAKER AS TO THE EXACT ROOM NUMBERS OR AREA SERVED AND THE TYPE OF CIRCUIT, I.E. "ROOMS 101-104 LIGHTS" OR "CAFETERIA EXHAUST FAN".

**EQUIPMENT CONNECTIONS:** THIS CONTRACTOR SHALL BRING ALL REQUIRED ELECTRICAL SERVICE TO ALL EQUIPMENT ITEMS FURNISHED UNDER OTHER SECTIONS OF THESE SPECIFICATIONS OR BY THE OWNER, MAKE FINAL CONNECTIONS, AND LEAVE EQUIPMENT READY FOR OPERATION. THIS CONTRACTOR SHALL COORDINATE WITH ANY AFFECTED TRADE TO ASSURE CORRECT OPERATION OF THE EQUIPMENT ITEM.

**CONTROL AND INTERLOCK WIRING:** EXCEPT AS OTHERWISE INDICATED ON THE DRAWINGS, ALL CONTROL AND INTERLOCK WIRING SHALL BE PERFORMED BY THE RESPECTIVE CONTRACTORS.

THE ELECTRICAL SUBCONTRACTOR SHALL INSTALL ALL STARTERS, PILOT SWITCHES, CONTROL DEVICES AND MISCELLANEOUS ITEMS OF ELECTRICAL EQUIPMENT FURNISHED UNDER OTHER SECTIONS OF THESE SPECIFICATIONS THAT ARE NOT INTEGRALLY MOUNTED WITH THEIR ASSOCIATED EQUIPMENT.

**SERVICE:** THE ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR COORDINATING SERVICE WITH THE UTILITY COMPANY. PROVIDE UTILITY REQUIRED METERING PROVISIONS. PROVIDE CT CAN OR CONCRETE PAD FOR TRANSFORMER AS REQUIRED. PROVIDE CONDUIT FOR UTILITY IF REQUIRED. EC SHALL WORK DIRECTLY WITH THE UTILITY AND SHALL COMPLETE AND SUBMIT ALL LOAD DATA SHEETS REQUIRED FOR SERVICE APPLICATION.

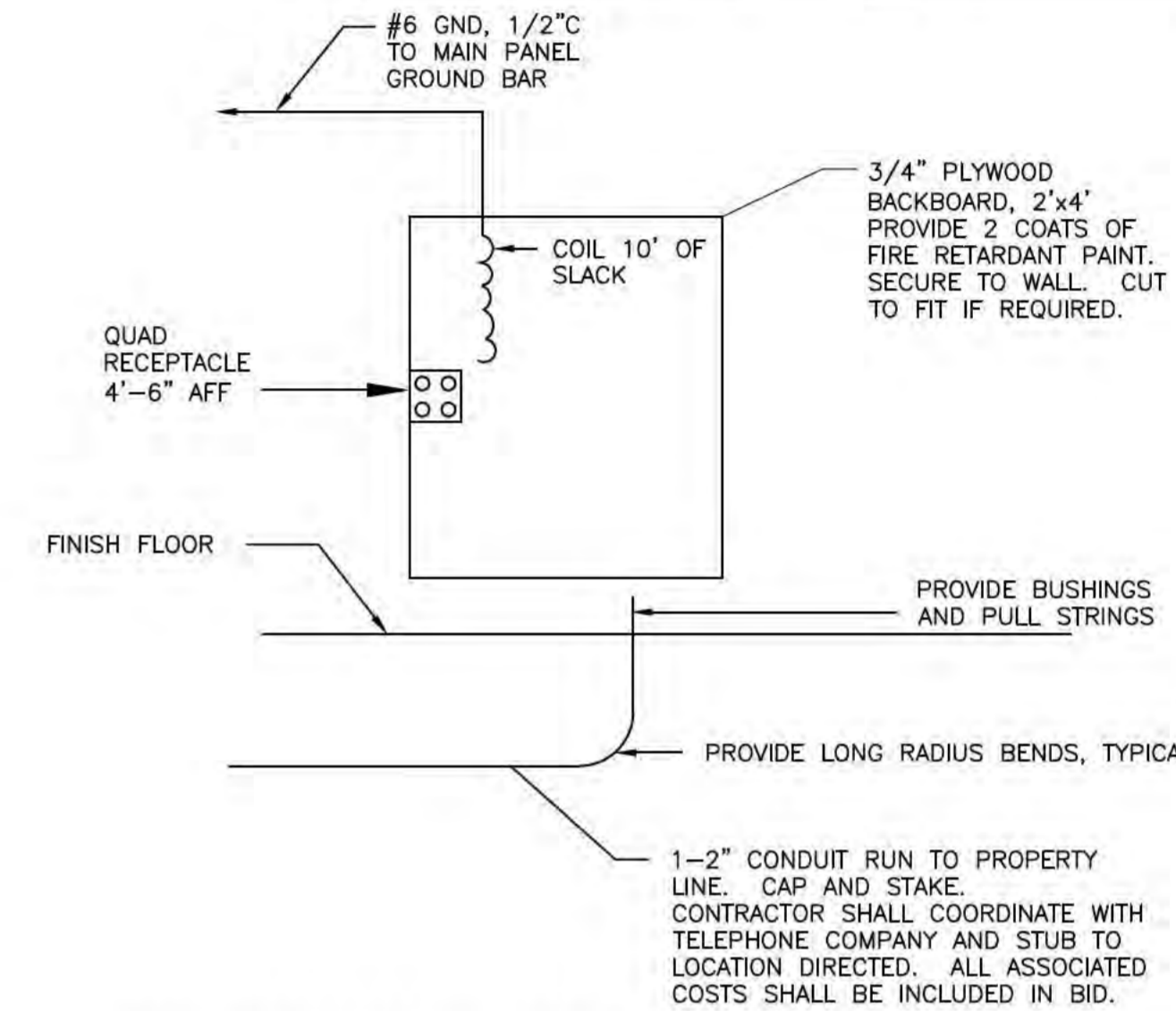
### EQUIPMENT CONNECTION SCHEDULE

CALLOUT	SYMBOL	VOLTS	AMPS	KVA	CIRCUIT	WIRE CALLOUT	MCA	MOCP	DISCONNECT	DISCONNECT DESCRIPTION
AHU		240V 2P 2W	45	10.8	A-1,3	2 #6, #10 GND	55	60	FUSED	240/60/2
HP		240V 2P 2W	24.2	5.8	A-2,4	2 #8, #10 GND	30	50	FUSED	240/60/2/3R
WH		120V 1P 2W	12.5	1.5	A-5	2 #12, #12 GND	16	20	TOGGLE SWITCH	

A		MOUNTING FLUSH FED FROM UTILITY NOTE		VOLTS 240/120V 2P 3W BUS AMPS 200 NEUTRAL 100%		AIC 22,000 MAIN BRKR 200 LUGS STANDARD			
CKT #	CKT BKR	CIRCUIT DESCRIPTION	LOAD KVA		CKT #	CKT BKR	CIRCUIT DESCRIPTION	LOAD KVA	
			A	B				A	B
1	60/2	AHU	5.4	5.4	2	50/2	HP	2.9	2.9
3					4				
5	20/1	WATER HEATER	1.5	0	6	20/1	LIGHTING	0.621	0.627
7	20/1	SPARE			8	20/1	LIGHTING		
9	20/1	REFRIGERATOR	1.2	0	10	20/1	EXTERIOR LIGHTING	0.128	0.36
11	20/1	VENDING	1.2	1.2	12	20/1	LAN		
13	20/1	VENDING	1.2	1.2	14	20/1	TEL BOARD	0.36	0.6
15	20/1	ADMIN RECEPTACLE		0.9	16	20/1	UC REFRIGERATOR		
17	20/1	DISPATCH RECEPTACLE	0.54		18	20/1	BREAK RECEPTACLE	0.18	0.18
19	20/1	DISPATCH RECEPTACLE		0.54	20	20/1	BREAK RECEPTACLE		
21	20/1	TLTS, HALL, OUTSIDE RECEPTACLE	0.9		22	20/1	LOUNGE RECEPTACLE	0.18	0.36
23	20/1	BATCH RECEPTACLE		0.54	24	20/1	LOUNGE RECEPTACLE		
25	20/1	BATCH RECEPTACLE	0.54		26	20/1	SPARE	0	0
27	20/1	LOUNGE RECEPTACLE		0.54	28	20/1	SPARE	0	0
29	20/1	SPARE	0	0	30	20/1	SPARE	0	0
31	20/1	SPARE	0	0	32	20/1	SPARE	0	0
33	20/1	SPARE	0	0	34	20/1	SPARE	0	0
35	-/1	SPACE	0	0	36	-/1	SPACE	0	0
37	-/1	SPACE	0	0	38	-/1	SPACE	0	0
39	-/1	SPACE	0	0	40	-/1	SPACE	0	0
			TOTAL CONNECTED KVA BY PHASE					15.6	14.1
		CONN KVA	CALC KVA		CONN KVA	CALC KVA			
LIGHTING	1.38	1.72	(125%)	CONTINUOUS	1.5	1.88	(125%)		
LARGEST MOTOR	5.8	1.45	(25%)	HEATING	10.8	10.8	(100%)		
OTHER MOTORS	0	0	(100%)	COOLING	5.8	0	(0%)		
RECEPTACLES	6.12	6.12	(50%>10)	NONCONTINUOUS	0	0	(100%)		
KITCHEN EQUIP	4.2	3.36	(80%)	DIVERSE	0	0	(N/A)		
				METERED DEMAND	0	0	(125%)		
				TOTAL KVA	29.8	25.3			
				BALANCED AMPS		106			

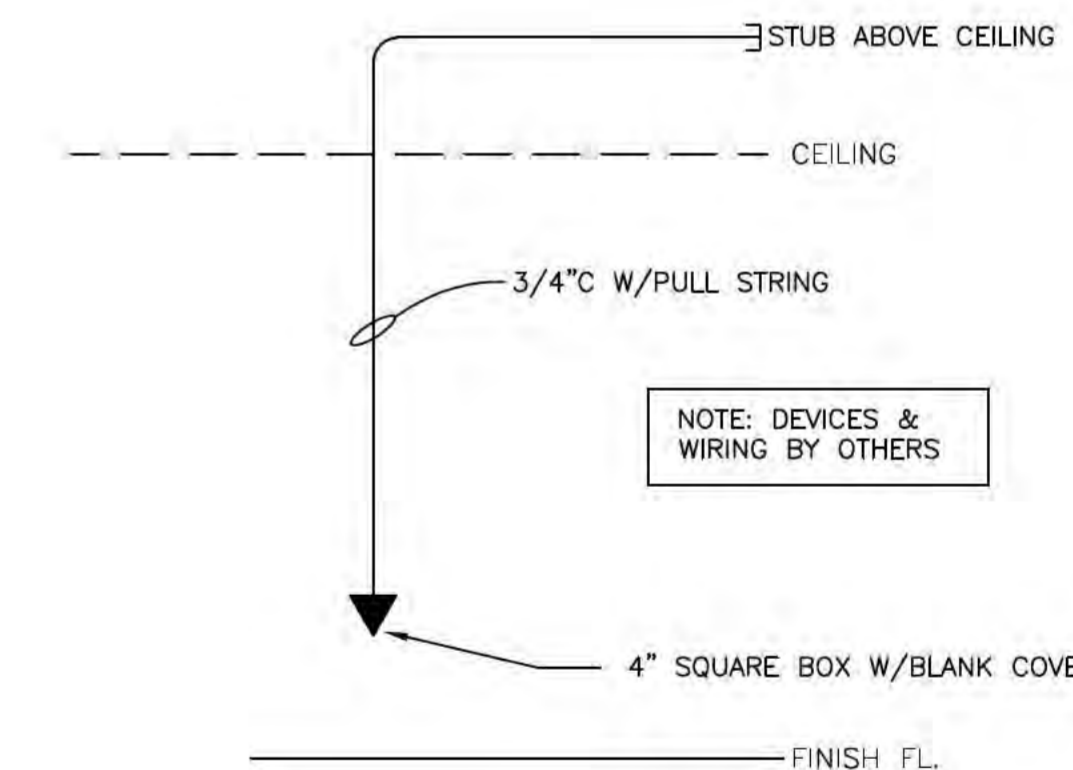
### ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
	CONDUIT
	CONDUIT UNDERFLOOR OR UNDERGROUND
	ARROW INDICATES HOMERUN, TICKMARKS: NEUTRAL, PHASE, GND.
	POWER PANEL
	DATA/COMM OUTLET
	JUNCTION BOX
	DISCONNECT SWITCH; FUSED; NONFUSED
	FUSE PER NAMEPLATE
	MOTOR TOGGLE SWITCH
	MOTOR
	EXISTING OR BY OTHERS
	LIGHT FIXTURE
	SINGLE POLE SWITCH, 3 WAY, 4 WAY
	DIMMER SWITCH, 3-WAY DIMMER SWITCH
	ABOVE FINISHED FLOOR
	DUPLEX RECEPT, ABOVE COUNTER
	WEATHERPROOF, GROUND FAULT
	QUAD-PLEX RECEPTACLE



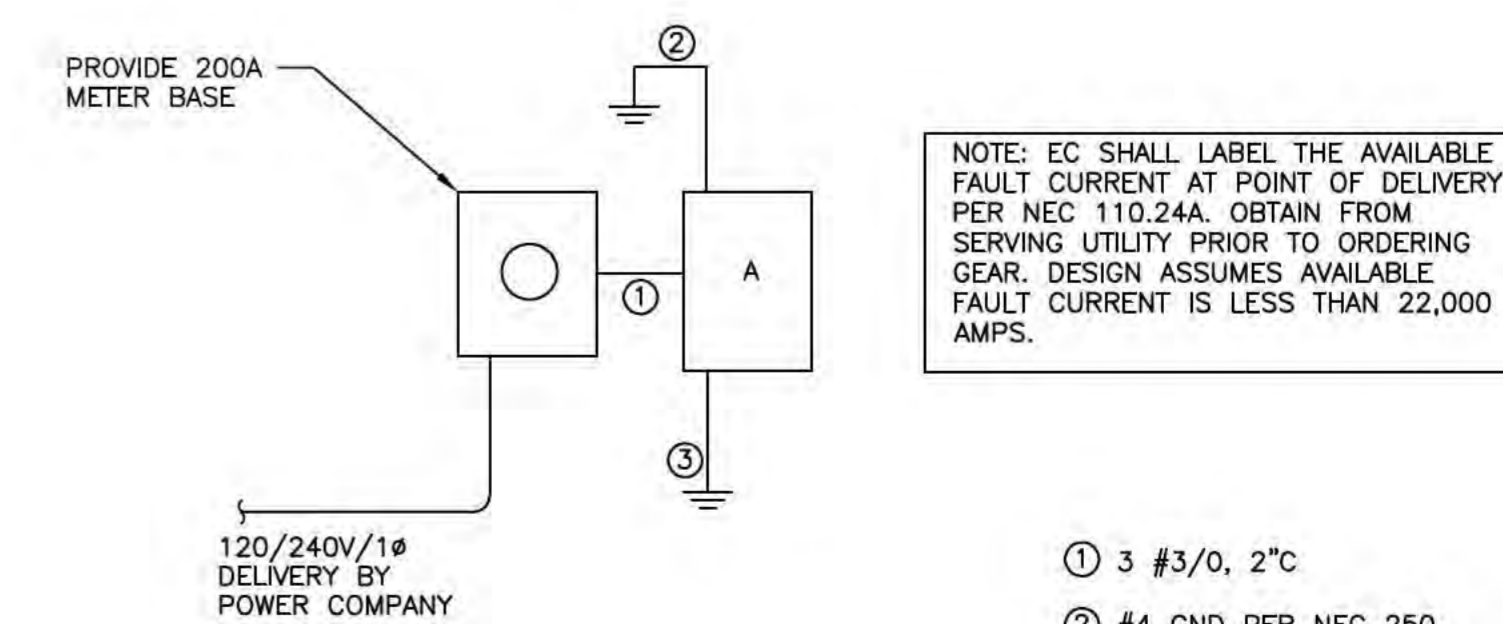
### TELEPHONE SERVICE DETAIL

NTS



### TYPICAL DATA/COMM OUTLET

NTS



### POWER RISER

NTS

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PROJECT NO. 10065  
 McDowell Consulting Engineers, Inc.  
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 NC LICENSE NO. C-2546



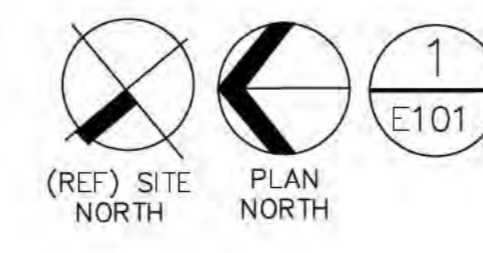
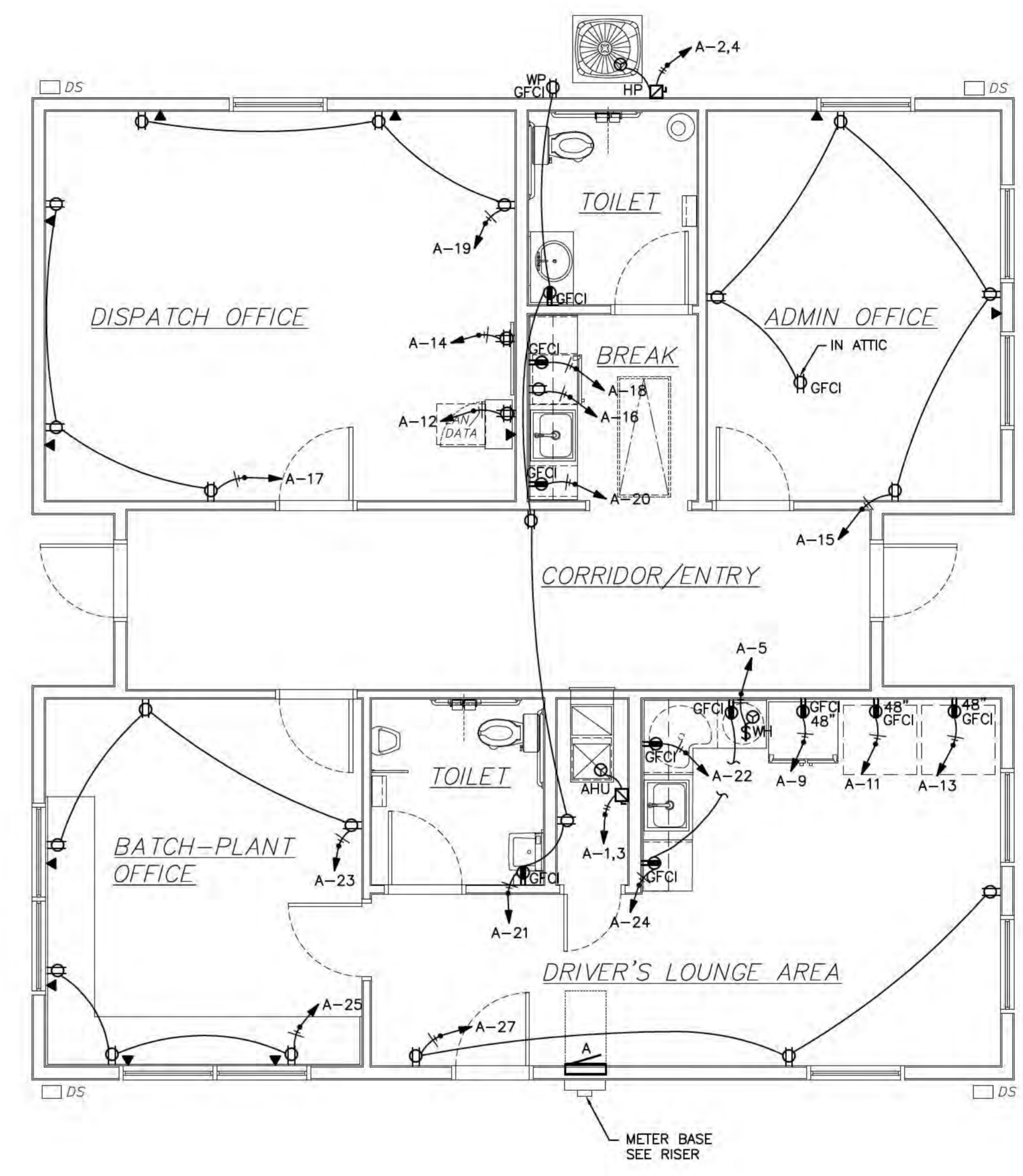
**Design Elements**  
 Michael L. Saized, Jr., AIA, AIBD  
 1913 Calabash Drive, Suite 143  
 Wilmington, North Carolina 28403  
 P.O. Box 3131

**Proposed Dispatch Office Building for Crete Solutions, LLC**  
 2520 US-401  
 Lillington, NC 27546  
**ELECTRICAL SCHEDULES, NOTES & DETAILS**  
 Issued For Construction

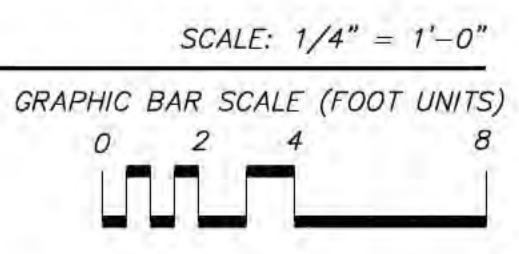
date 28 MAR, 2018  
 job no. CRETE/BUS  
 drawn by. R. GILBERT  
 checked by. GMC DOWELL  
 drawing no. E100  
 revision no.

NO.	DATE	REVISION

no.	date	revision



1 PROPOSED FLOOR PLAN — POWER



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**Proposed Dispatch Office Building for**  
**Crete Solutions, LLC**  
 2520 US-401  
 Lillington, NC 27546  
 job status **FLOOR PLAN — ELECTRICAL — POWER**  
**Issued For Construction**

date	28 MAR, 2018
job no.	CRETE/BUS
drawn by	RGILBERT
checked by	GMCOWELL
drawing no.	E101
revision no.	

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 P.O. 509, 3131

**McDowell Consulting Engineers, Inc.**  
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 1100 W. WILMINGTON BLVD.  
 WILMINGTON, NC 28403  
 TEL (910) 270-3747 FAX 270-3779  
 NC LICENSE NO. C-2546

LUMINAIRE SCHEDULE								
CALLOUT	LAMP	DESCRIPTION	MOUNTING	MODEL	INPUT WATTS	NOTE 1	QUANTITY	VOLTS
A	LED	2x4 BASKET TROFFER	CEILING	DAY-BRITE 2EVG38L850UNVDIM	37		22	120
B	LED	WRAPAROUND	SURFACE	DAY-BRITE OWL44.0L835UNVDIM	37		1	120
C	LED	2' STRIP	WALL	DAY-BRITE FSS220L840UNVDIM	17		1	120
D	LED	DOWNLIGHT	RECESSED	LIGHTOLIER P6RD10N210UVB P6RD835VB P6RDCC	10		2	120
E	INCLUDED	EMERGENCY	WALL	CHLORIDE CFX6			3	120
ER	INCLUDED	REMOTE HEAD	WALL	CHLORIDE VLL2R			3	120
EX	LED (EXIT) INCLUDED (EM)	EXIT/EM COMBO	WALL/CEILING	CHLORIDE VCRW			3	120
F	AS REQUIRED	VANITY	WALL	SELECTED BY OWNER	100	100W MAX	2	120
G	LED	KEYLESS FIXTURE	SURFACE	SELECTED BY CONTRACTOR	60		1	120
OA	LED	EXTERIOR SCONCE	WALL	STONCO LPWZ-8BZ	14	UL DAMP LABEL	2	120
OB	LED	EXTERIOR SCONCE	WALL	LIGHTOLIER P6RD15N210UVB P6RD840VB P6RDCC	100	UL WET LABEL	1	120

ELECTRICAL SUMMARY

ELECTRICAL SYSTEM AND EQUIPMENT

METHOD OF COMPLIANCE:

Energy Code:  Prescriptive  Performance  
 ASHRAE 90.1:  Prescriptive  Performance

Lighting schedule

lamp type required in fixture See Fixture Schedule  
 number of lamps in fixture See Fixture Schedule  
 ballast type used in the fixture See Fixture Schedule  
 number of ballasts in fixture See Fixture Schedule  
 total wattage per fixture See Fixture Schedule

Building Area      Space by Space       
 total interior wattage specified vs allowed 1088/1312  
 total exterior wattage specified vs allowed 48/780

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
- 506.2.6 Automatic Daylighting Control System
- N/A EXISTING/RENOVATION

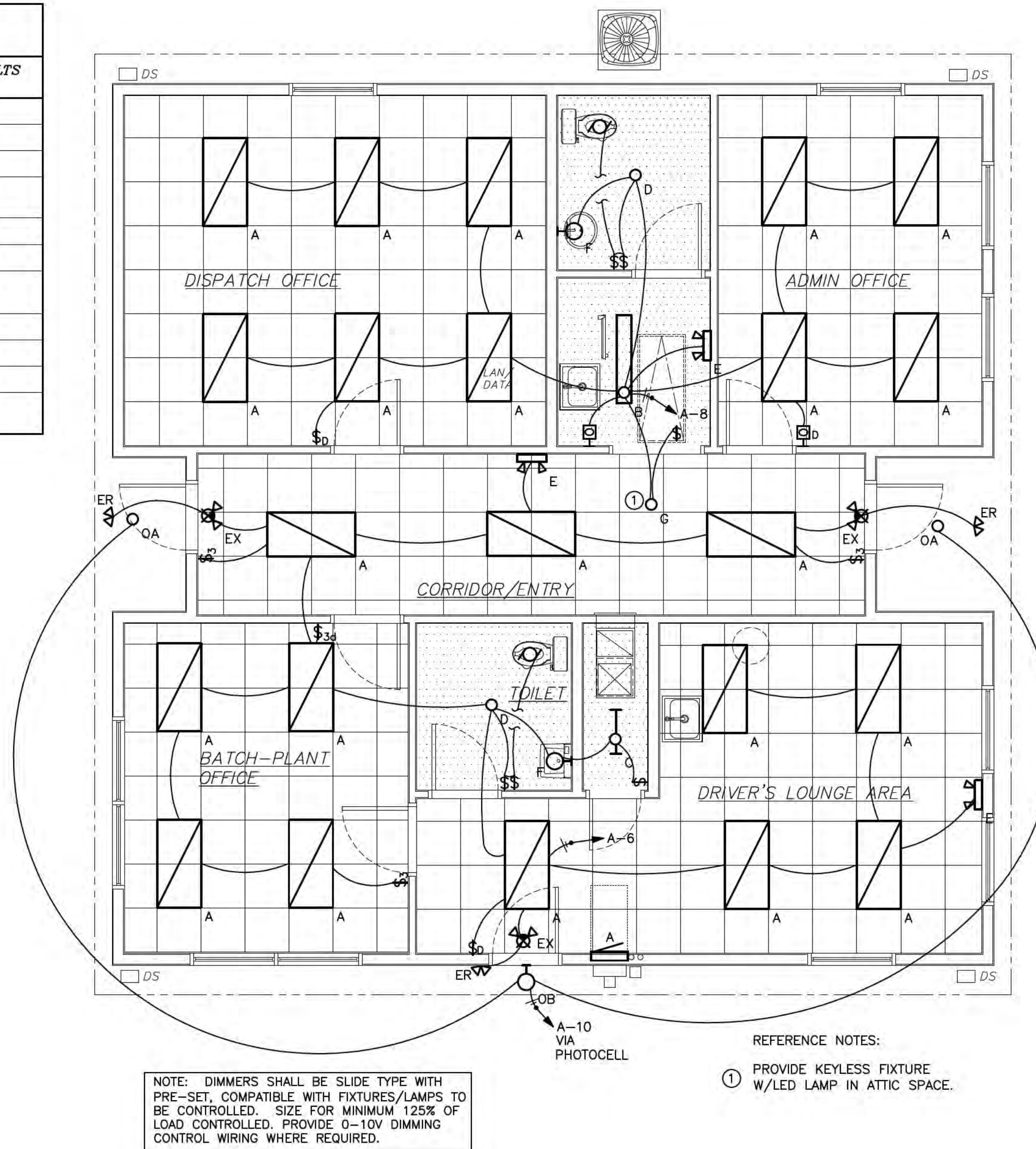
DESIGNER STATEMENT:

To the best of my knowledge and belief, the design of this building complies with the requirements of Chapter 5 of the 2012 North Carolina State Energy Code.

SIGNED: Gregory McDowell  
 NAME: Gregory McDowell  
 TITLE: Professional Engineer

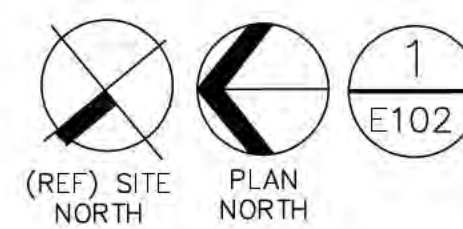
SWITCH SCHEDULE

SYMBOL	NOTE 1
\$ <sub>D</sub>	DIMMER SWITCH
\$	Single Pole Switch
\$ <sub>D</sub>	0-10V LOCAL WALL MOUNT DIMMER / SENSOR WATTSTOPPER PW-311
\$ <sub>3</sub>	WALL BOX OCCUPANCY SENSOR GREENGATE ONW-P-1001-MV-W
\$ <sub>3</sub>	3-WAY SWITCH
\$ <sub>3d</sub>	3-Way Dimmer



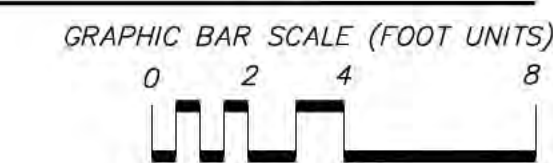
NOTE: DIMMERS SHALL BE SLIDE TYPE WITH PRE-SET, COMPATIBLE WITH FIXTURES/LAMPS TO BE CONTROLLED. SIZE FOR MINIMUM 125% OF LOAD CONTROLLED. PROVIDE 0-10V DIMMING CONTROL WIRING WHERE REQUIRED.

REFERENCE NOTES:  
 ① PROVIDE KEYLESS FIXTURE W/LED LAMP IN ATTIC SPACE.



1 PROPOSED FLOOR PLAN - LIGHTING

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



NO.	DATE	REVISION

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Professional Engineer Seal  
 MICHAEL L. SAEED  
 018518  
 3/29/18  
 GREGORY L. McDowell

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**Proposed Dispatch Office Building for Crete Solutions, LLC**  
 2520 US-401  
 Lillington, NC 27546  
 FLOOR PLAN - ELECTRICAL - LIGHTING  
 Issued For Construction

date 28 MAR, 2018  
 job no. CRETE/BUS  
 drawn by RGILBERT  
 checked by GMCOWELL  
 drawing no. E102  
 revision no.



1/2" PLYWOOD. ATTACH TO STUDS W/ 10d NAILS @ 4" O.C. AT PANEL EDGES AND 12" O.C. IN FIELD OF THE PANEL. REF. ARCH. FOR WALL FINISH.

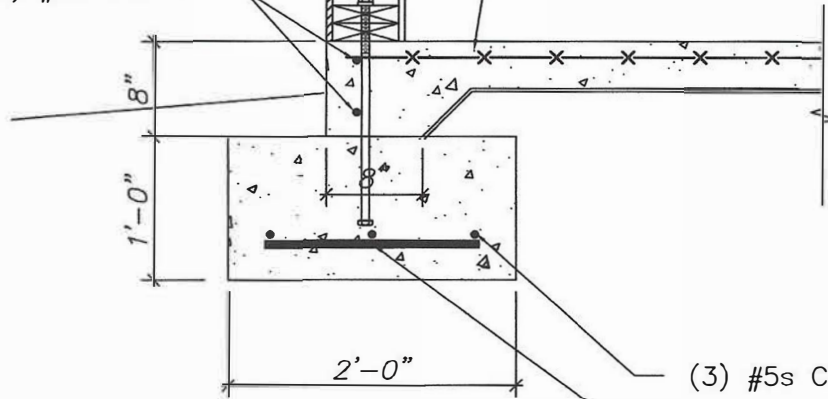
2X6 STUD

SHEETROCK, REF. ARCH.

5/8"  $\phi$  X 1'-8" HEADED ANCHOR BOLT WITH 2" SQ. X 3/8" PLATE WASHER & NUT @ 4'-0" O.C.

4" CONCRETE SLAB W/ 6X6-W2.9XW2.9 WWF OVER 15 MIL. MIN. POLYETHYLENE SHEET, 4" GRANULAR FILL AND COMPACTED SUBGRADE.

(2) #5s CONT.



(3) #5s CONT.

#5 @ 24" O.C.

1 ALT. FOOTING SECTION  
BD1 SCALE: 3/4" = 1'-0"



OFFICE BUILDING  
CONCRETE BATCHING PLANT

2520 US-401  
Lillington, NC 27546

DAVID TERKELTOUB AND ASSOCIATES  
CONSULTING ENGINEERS

902 PINE GROVE DRIVE  
WILMINGTON, NC 28409  
PHONE: (910) 794-3070 FAX: (910) 794-3090  
DT PROJECT NO.: 18011

CADD FILE: BD1.0  
PROJECT NUMBER: 18011  
DRAWN BY: DT

BD1

1 OF 1

DATE: 17 MAY 2018