New Hanover County Schools
Closed Circuit Cooler Addition

FOR

Emsley A. Laney High School

2700 North College Road
Wilmington, NC 28405

NHCS PROJECT NUMBER 20-9216-1

CBHF Engineers, PLLC
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NC# P-0506

NORTH CAROLINA PROFESSIONAL 23551 ENGINEER DAVID M. HAHN 11/21/19

SOUTH CAROLINA PROFESSIONAL 02331 ENGINEER W. ALLEN CATER 11/27/19

DRAWING INDEX

Project No: 19170

NAME OF PROJECT: LANEY HS CLOSED CIRCUIT COOLER ADDITION

ADDRESS: 2700 N COLLEGE ROAD, WILMINGTON, NC 28405

OWNER OR AUTHORIZED AGENT: CBHF ENGINEERS PHONE #: (910) 791-4000 E-Mail: dhahn@cbhfengineers.com

OWNED BY: ☐ City ■ County ☐ State ☐ Private

CODE ENFORCEMENT JURISDICTION: ☐ City ■ County ☐ State

CONTACT:

DESIGNER	FIRM	NAME	LICENSE #	TELEPHONE #	EMAIL ADDRESS
ARCHITECTURAL					
CIVIL					
ELECTRICAL	CBHF ENGINEERS, PLLC	W. ALLEN CRIBB	023311	(910) 791-4000	acribb@cbhfengineers.com
FIRE ALARM					
PLUMBING					
MECHANICAL	CBHF ENGINEERS, PLLC	DAVID M. HAHN	023551	(910) 791-4000	dhahn@cbhfengineers.com
SPRINKLER-STANDPIPE					
STRUCTURAL	ARDURRA GROUP	JEFFREY R. TROUTMAN	022657	(910) 397-2929	jtroutman@ardurra.com
RETAINING WALL >5' HIGH					
OTHER					

2018 NC BUILDING CODE:

☐ New Building ☐ Addition ☐ 1st Time Interior Completion

☐ Phased Construction - Shell/Core - Contact the local inspection jurisdiction for possible additional precedures and requirements ☐ Shell/Core - Contact the local inspection jurisdiction for possible additional precedures and requirements

2018 NC EXISTING BUILDING CODE:

☐ N/A	☐ Chapter 14	☐ Alteration Level I	☐ N/A	☐ N/A
☐ Prescriptive	☐ Historic Property	☐ Alteration Level II	☐ Repair	☐ Change of Use
☐ Repair	☐ Change of Use	☐ Alteration Level III		☐ Historic Property

CONSTRUCTED:
RENOVATED:
CURRENT OCCUPANCY(S) (Ch. 3)
PROPOSED OCCUPANCY(S) (Ch. 3)

OCCUPANCY CATEGORY (Table 1604.5):

CURRENT ☐ N/A ☐ I ☐ II ☐ III ☐ IV

PROPOSED ☐ N/A ☐ I ☐ II ☐ III ☐ IV

BASIC BUILDING DATA:

CONSTRUCTION TYPE: ☐ I-A ☐ I-B ■ II-A ☐ II-B ☐ III-A ☐ III-B ☐ IV ☐ V-A ☐ V-B

SPRINKLERS: ■ NO ☐ YES ☐ PARTIAL ☐ NFPA 13 ☐ NFPA 13R ☐ NFPA 13D

STANDPIPES: ■ NO ☐ YES ☐ CLASS I ☐ CLASS II ☐ CLASS III ☐ WET ☐ DRY

PRIMARY FIRE DISTRICT: ■ NO ☐ YES

FLOOD HAZARD AREA: ■ NO ☐ YES

SPECIAL INSPECTIONS: ■ NO ☐ YES (Contact the local inspection jurisdiction for additional procedures and requirements)

GROSS BUILDING AREA TABLE:

FLOOR	EXISTING (SQ. FT.)	NEW (SQ. FT.)	SUB-TOTAL
6TH FLOOR			
5TH FLOOR			
4TH FLOOR			
3RD FLOOR			
2ND FLOOR			
MEZZANINE			
1ST FLOOR	19,426		
BASEMENT			
TOTAL	19,426		

ALLOWABLE AREA:

PRIMARY OCCUPANCY CLASSIFICATION(S):

ACCESSORY OCCUPANCY CLASSIFICATION(S):

INCIDENTAL USES (Table 509):

SPECIAL USES (Chapter 4 - List Code Sections):

SPECIAL Provisions (Chapter 5 - List Code Sections):

MIXED OCCUPANCY: ☐ NO ☐ YES SEPARATION: ____ HR. EXCEPTION:

☐ Non-Separated Use (508.3)

☐ 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

$$\frac{\text{ACTUAL AREA OF OCCUPANCY A}}{\text{ALLOWABLE AREA OF OCCUPANCY A}} + \frac{\text{ACTUAL AREA OF OCCUPANCY B}}{\text{ALLOWABLE AREA OF OCCUPANCY B}} \leq 1$$

STORY NO.	DESCRIPTION AND USE	(A) BLDG AREA PER STORY (ACTUAL)	(B) TABLE 506.2[4] AREA		(C) AREA FOR FRONTAGE INCREASE[1,5]	(D) ALLOWABLE AREA PER STORY OR UNLIMITED
			UNSPRINKLERED	SPRINKLERED		

1. FRONTAGE AREA INCREASES FROM SECTION 506.2 ARE COMPUTED THUS:
   A. PERIMETER WHICH FRONTS A PUBLIC WAY OR OPEN SPACE HAVING 20 FT MINIMUM WIDTH ____ (F)
   B. TOTAL BUILDING PERIMETER = ____ (P)
   C. RATIO (F/P) = ____ (F/P)
   D. W = MINIMUM WIDTH OF PUBLIC WAY = ____ (W) (do not exceed 30)
   E. PERCENT OF FRONTAGE INCREASE I_f = 100 [F/P - 0.25] x W/30 = ____ (%)
2. UNLIMITED AREA APPLICABLE UNDER CONDITIONS OF SECTION 507.
3. MAXIMUM BUILDING AREA = TOTAL NUMBER OF STORIES IN THE BUILDING x D (MAXIMUM 3 STORIES) (506.2)
4. THE MAXIMUM AREA OF OPEN PARKING GARAGES MUST COMPLY WITH 406.5.4. THE MAXIMUM AREA OF AIR TRAFFIC CONTROL TOWERS MUST COMPLY WITH 412.3.1
5. FRONTAGE INCREASE IS BASED ON THE UNSPRINKLERED AREA VALUE IN TABLE 506.2

ALLOWABLE HEIGHT:

	ALLOWABLE (TABLES 504.3 & 504.4)	SHOWN ON PLANS	CODE REFERENCE
BUILDING HEIGHT IN FEET			
BUILDING HEIGHT IN STORIES			

Provide code reference if the "Shown on Plans" quantity is not based on Table 504.3 or 504.4.

FIRE PROTECTION REQUIREMENTS:

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							
Bearing Walls							
Exterior							
North							
East							
West							
South							
Interior							
Nonbearing Walls and Partitions							
Exterior							
North							
East							
West							
South							
Interior walls and partitions							
Floor Construction, including supporting beams and joists							
Floor Ceiling Assembly							
Columns Supporting Floors							
Roof Construction, including supporting beams and joists							
Roof Ceiling Assembly							
Columns Supporting Roof							
Shaft Enclosures - Exit							
Shaft Enclosures - Other							
Corridor Separation							
Occupancy / Fire Barrier Separation							
Party / Fire Wall Separation							
Smoke Barrier Separation							
Tenant / Dwelling Unit / Sleeping Separation							
Incidental Use Separation							

* Indicate section number permitting reduction

PERCENTAGE OF WALL OPENING CALCULATIONS:

FIRE SEPARATION DISTANCE (FEET) FROM PROPERTY LINES	DEGREE OF OPENINGS PROTECTION (TABLE 705.8)	ALLOWABLE AREA (%)	ACTUAL SHOWN ON PLANS (%)

LIFE SAFETY SYSTEM REQUIREMENTS:

EMERGENCY LIGHTING:	☐ NO	☐ YES
EXIT SIGNS:	☐ NO	☐ YES
FIRE ALARM:	☐ NO	☐ YES
SMOKE DETECTION SYSTEMS:	☐ NO	☐ YES ☐ PARTIAL
CARBON MONOXIDE DETECTION:	☐ NO	☐ YES

LIFE SAFETY PLAN REQUIREMENTS:

LIFE SAFETY PLAN SHEET #

- FIRE AND/OR SMOKE RATED WALL LOCATIONS (Chapter 7)
- ASSUMED AND REAL PROPERTY LINE LOCATIONS (if not on the site plan)
- EXTERIOR WALL OPENING AREA WITH RESPECT TO DISTANCE TO ASSUMED PROPERTY LINES (705.8)
- OCCUPANCY TYPES FOR EACH AREA AS IT RELATES TO OCCUPANT LOAD CALCULATION (TABLE 1004.1.2) OCCUPANT LOADS FOR EACH AREA
- EXIT ACCESS TRAVEL DISTANCES (1017)
- COMMON PATH OF TRAVEL DISTANCES (1006.2.1 & 1006.3.2(1))
- DEAD END LENGTHS (1020.4)
- CLEAR EXIT WIDTHS FOR EACH EXIT DOOR
- MAXIMUM CALCULATED OCCUPANT LOAD CAPACITY EACH EXIT DOOR CAN ACCOMMODATE BASED ON EGRESS WIDTH (1005.3)
- 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 (1010.1.9.7)
- LOCATION OF DOORS WITH ELECTROMAGNETIC EGRESS LOCKS (1010.1.9.9)
- LOCATION OF DOORS EQUIPPED WITH HOLD-OPEN DEVICES
- LOCATION OF EMERGENCY ESCAPE WINDOWS (1030)
- THE SQUARE FOOTAGE OF EACH FIRE AREA (202)
- THE SQUARE FOOTAGE OF EACH SMOKE COMPARTMENT FOR OCCUPANCY CLASSIFICATION I-2 (407.5)
- 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

ACCESSIBLE PARKING (SECTION 1106)

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

PLUMBING FIXTURE REQUIREMENTS (TABLE 2902.1)

USE		WATERCLOSETS MALE	WATERCLOSETS FEMALE	WATERCLOSETS UNISEX	URINALS	LAVATORIES MALE	LAVATORIES FEMALE	LAVATORIES UNISEX	SHOWERS / TUBS	DRINKING FOUNTAINS REGULAR	DRINKING FOUNTAINS ACCESSIBLE
SPACE	EXIST'G										
	NEW										
	REQ'D										

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

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.

EXISTING BUILDING ENVELOPE COMPLIES WITH CODE: ☐ YES (the remiander of this section is not applicable) ☐ NO

EXEMPT BUILDING: ☐ YES Provide code or statutory reference: ☐ NO

CLIMATE ZONE:

METHOD OF COMPLIANCE:

☐ PRESCRIPTIVE	(ENERGY CODE)
☐ PERFORMANCE	(ENERGY CODE)
☐ PRESCRIPTIVE	(ASHRAE 90.1)
☐ PERFORMANCE	(ASHRAE 90.1)
☐ PERFORMANCE	(OTHER)

If 'Other' specify source here:

THERMAL ENVELOPE (Prescriptive method only)

ROOF/CEILING ASSEMBLY (each assembly)
- DESCRIPTION OF ASSEMBLY
- U-VALUE OF TOTAL ASSEMBLY
- R-VALUE OF INSULATION
- SKYLIGHTS IN EACH ASSEMBLY
  - U-VALUE OF SKYLIGHT
- TOTAL SQUARE FOOTAGE OF SKYLIGHTS IN EACH ASSEMBLY

EXTERIOR WALLS (each assembly)
- DESCRIPTION OF ASSEMBLY
- U-VALUE OF TOTAL ASSEMBLY
- R-VALUE OF INSULATION
- **OPENINGS** (windows or doors with glazing)
  - U-VALUE OF ASSEMBLY
  - SOLAR HEAT GAIN COEFFICIENT
  - PROJECTION FACTOR
  - DOOR R-VALUES

WALLS BELOW GRADE (each assembly)
- DESCRIPTION OF ASSEMBLY
- U-VALUE OF TOTAL ASSEMBLY
- R-VALUE OF INSULATION

FLOORS OVER UNCONDITIONED SPACE (each assembly)
- DESCRIPTION OF ASSEMBLY
- U-VALUE OF TOTAL ASSEMBLY
- R-VALUE OF INSULATION

FLOORS SLAB ON GRADE (each assembly)
- DESCRIPTION OF ASSEMBLY
- U-VALUE OF TOTAL ASSEMBLY
- R-VALUE OF INSULATION
- HORIZONTAL / VERTICAL REQUIREMENT
- SLAB HEATED

STRUCTURAL DESIGN

DESIGN LOADS:

IMPORTANCE FACTORS: WIND (Iw) SNOW (Is) SEISMIC (Ie)

LIVE LOADS: ROOF PSF; MEZZANINE PSF; FLOOR PSF

GROUND SNOW LOAD: PSF

WIND LOAD: BASIC WIND SPEED MPH (ASCE-7-98); EXPOSURE CATEGORY

SEISMIC DESIGN CATEGORY:

PROVIDE THE FOLLOWING SEISMIC DESIGN PARAMETERS:

OCCUPANCY CATEGORY (TABLE 1604.5)

SPECTRAL RESPONSE ACCELERATION S_s %g S_1 %g

SITE CLASSIFICATION (ASCE 7)

DATA SOURCE:

BASIC STRUCTURAL SYSTEM

ANALYSIS PROCEDURE: ☐ N/A ☐ SIMPLIFIED ☐ EQUIVALENT LATERAL FORCE ☐ DYNAMIC

ARCHITECTURAL, MECHANICAL, COMPONENTS ANCHORED? ☐ YES ☐ NO

LATERAL DESIGN CONTROL: ☐ N/A ☐ EARTHQUAKE ☐ WIND

SOIL BEARING CAPACITIES:

☐ N/A

☐ FIELD TEST (PROVIDE COPY OF TEST REPORT) PSF

☐ PRESUMPTIVE BEARING CAPACITY PSF

PILE SIZE, TYPE AND CAPACITY PSF

MECHANICAL SUMMARY SEE MECHANICAL DRAWINGS

MECHANICAL SYSTEMS, SERVICE SYSTEMS AND EQUIPMENT

THERMAL ZONE
- WINTER DRY BULB
- SUMMER DRY BULB

INTERIOR DESIGN CONDITIONS
- WINTER DRY BULB
- SUMMER DRY BULB
- RELATIVE HUMIDITY

BUILDING HEATING LOAD

BUILDING COOLING LOAD

MECHANICAL SPACING CONDITIONING SYSTEM

UNITARY
- DESCRIPTION OF UNIT
- HEATING EFFICIENCY
- COOLING EFFICIENCY
- SIZE CATEGORY OF UNIT

BOILER
- SIZE CATEGORY, IF OVERSIZED, STATE REASON

CHILLER
- SIZE CATEGORY, IF OVERSIZED, STATE REASON

LIST EQUIPMENT EFFICIENCIES:

ELECTRICAL SUMMARY SEE ELECTRICAL DRAWINGS

ELECTRICAL SYSTEM AND EQUIPMENT

METHOD OF COMPLIANCE:

ENERGY CODE: ☐ PRESCRIPTIVE ☐ PERFORMANCE

ASHRAE 90.1: ☐ PRESCRIPTIVE ☐ PERFORMANCE

LIGHTING SCHEDULE
- LAMP TYPE REQUIRED IN FIXTURE
- NUMBER OF LAMPS IN FIXTURE
- BALLAST TYPE USED IN THE FIXTURE
- TOTAL WATTAGE PER FIXTURE TOTAL INTERIOR WATTAGE SPECIFIED VS ALLOWED (whole building or space by space)
- TOTAL EXTERIOR WATTAGE SPECIFIED VS ALLOWED

ADDITIONAL PRESCRIPTIVE COMPLIANCE
(When using the 2018 NCECC; not required for ASHRAE 90.1)
- C406.2 MORE EFFICIENT HVAC EQUIPMENT PERFORMANCE C406.3 REDUCED LIGHTING POWER DENSITY
- C406.4 ENHANCED DIGITAL LIGHTING CONTROLS
- C406.5 ON-SITE RENEWABLE ENERGY
- C406.6 DEDICATED OUTDOOR AIR SYSTEM
- C406.7 REDUCED ENERGY USE IN SERVICE WATER HEATING

REVISIONS			
Revision No:	DESCRIPTION:	Date:	
0	ISSUED FOR CONSTRUCTION	11.27.19	
1	ADDENDUM #1	12.13.19	

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NORTH CAROLINA REGISTERED SEAL 23551 ENGINEER DAVID M. HAHN 11/27/19

New Hanover County Schools
Emlsey A Laney High School
CLOSED CIRCUIT COOLER ADDITION
2700 NORTH COLLEGE ROAD, WILMINGTON, NORTH CAROLINA

GENERAL
BUILDING CODE SUMMARY

JOB NO.:	19170
DRAWN:	RWC
DESIGNED:	RWC
CHECKED:	DMH

DRAWING NO: G-001

REVISION: 0

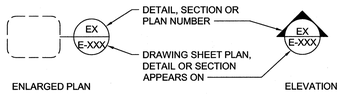
NHCS PROJECT NUMBER 20-9216-1

LOAD SUMMARY:
EXISTING 2000A SERVICE

Voltage	Phase	
480	3	
EXISTING DEMAND LOAD		
(DETERMINED BY 1 YEAR POWER BILLS)	696,000	Watts
ASSUMED POWER FACTOR OF .8	870,000	VA
Existing Demand AMPS	1,046	Amps
x 125% (PER NEC 220.87)	1,308	Amps
Largest Motor Approx. Amps	21	Amps
Largest Motor Approx. Amps x .25	5	Amps
HVAC		
CCC01 15HP FAN	17,460	VA
CCC01 7.5HP FAN	9,145	VA
CCC01 16KW BASIN HEATER	16,000	VA
CCC01 10HP SPRAY PUMP	11,640	VA
Sub-Total HVAC Demand	54,245	VA
Sub-Total HVAC Demand	65	Amps
EQUIPMENT		
HEAT TRACE	1,600	VA
CHEM FEED PUMP	500	VA
CHEM FEED CONTROLER	180	VA
Sub-Total Equipment Demand	2,280	VA
Sub-Total Equipment Demand	3	Amps
Add for Largest Motor	5	Amps
Total Equipment Demand	8	Amps
LIGHTING		
Lights (Exterior)	264	VA
Total Lighting Load	264	VA
LIGHTING LOAD x 1.25	330	VA
Total Demand for Lighting	0	Amps
Receptacles		
Receptacles	360	VA
Sub Total Receptacles	360	VA
Total Demand for Receptacle/Power Panels	360	VA
Total Demand for Receptacle/Power Panels	3	Amps
Total Additional Building Amps	77	Amps
Total Additional Building Load	63,714	VA
Total Additional Building Connected Load	57,149	VA

ELECTRICAL LEGEND

SYMBOL	DESCRIPTION
	WALL MOUNTED LED WALL PACK EXTERIOR LIGHT FIXTURE SEE PLAN E-201 FOR FIXTURE TYPE
WP	EMERGENCY LIGHTING UNIT, 2-HEAD WITH BATTERY BACK-UP, WALL MOUNTED, "NOT SWITCHED", LETTER INDICATES WET LOCATION, SEE PLAN E-201 FOR FIXTURE TYPE
	(X)EXIT SIGN W/EMERGENCY LIGHTING UNIT, WALL/END MOUNTED
30A/3/3R, W/ 30AF	DISCONNECT SWITCH, FUSED, HEAVY DUTY, SIZE AS INDICATED ON DRAWINGS ##A = DISCONNECT SIZE / # = NUMBER OF POLES / # = NEMA RATING, /##AF = FUSE SIZE
"Equip" #AMP HMCP (##HP) NEMA #	COMBINATION STARTER WITH CIRCUIT BREAKER DISCONNECT, FULL VOLTAGE, NON-REVERSING, 600V, 3P, NEMA 3R, SIZE AS INDICATED ON DRAWINGS
	RECEPTACLE, DUPLEX, 120VAC, 20A, MOUNTED 24" AFF, UNLESS OTHERWISE NOTED. WP - LISTED WEATHER-RESISTANT TYPE DEVICE WITH WEATHERPROOF IN USE COVER GFI - GROUND FAULT CIRCUIT INTERRUPTER TYPE, 120VAC, 20A, MOUNTED 24" AFF LOCATE GFI TEST SWITCH IN A READILY ACCESSIBLE LOCATION
$WP	WEATHERPROOF SWITCH, SINGLE POLE 120/277 VAC, 20A, MOUNTED AT 46" AFF UNLESS OTHERWISE NOTED
	JUNCTION BOX - WALL MOUNTED +## - INDICATES MOUNTING HEIGHT OF DEVICE IN INCHES AFF (if given)
	POWER & SWITCH LEG
	UNSWITCHED LEG
	CONDUIT, HOME RUN TO PANEL BOARD
208/120V 480/277V	(X)PANELBOARD, SURFACE OR RECESSED MOUNTED AS SHOWN. SIZE, RATINGS, AND MOUNTING AS INDICATED ON PANEL SCHEDULE. CONTRACTOR IS RESPONSIBLE FOR REQUIRED CLEARANCE IN FRONT OF ELECTRICAL PANEL. SEE NEC TABLE 110.26 WORKING SPACES FOR ADDITIONAL CLEARANCE CONDITIONS.
	(X)TRANSFORMER, SIZE AS INDICATED ON DRAWING



TYPICAL ABBREVIATIONS:

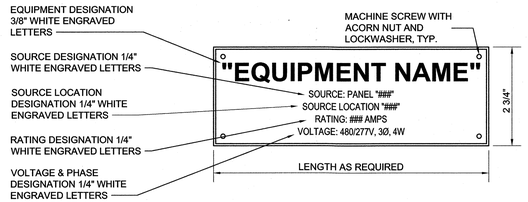
A, AMP	AMPERE
AFF	ABOVE FINISHED FLOOR
AFG	ABOVE FINISHED GRADE
AHU	AIR HANDLING UNIT
AIC	AMPERE INTERRUPTING CAPACITY
ATS	AUTOMATIC TRANSFER SWITCH
AWG	AMERICAN WIRE GAUGE
BOF	BOTTOM OF FIXTURE
BRKR	BREAKER
C, CND	CONDUIT
CAB	CABINET
CAT	CATALOG
CL	CHLORINE
CB	CIRCUIT BREAKER
CCTV	CLOSED CIRCUIT TELEVISION
CKT	CIRCUIT
CLG	CEILING
CP	CONTROL PANEL
CR	CONTROL RELAY, CORROSION RESISTANT
CS	CONTROL SWITCH
CV	CONTROL VALVE
CT	CURRENT TRANSFORMER
CU	COPPER
EF	EXHAUST FAN
EMER	EMERGENCY
EMT	ELECTRICAL METALLIC TUBING
ENCL	ENCLOSURE
EQUIP	EQUIPMENT
EWC	ELECTRIC WATER COOLER
EWH	ELECTRIC WATER HEATER
EPRF	EXPLOSION PROOF
FA	FIRE ALARM
FAAP	FIRE ALARM ANNUNCIATOR PANEL
FACP	FIRE ALARM CONTROL PANEL
FBO	FURNISHED BY OTHERS
FLA	FULL LOAD AMPS
FLUOR	FLUORESCENT
FLR	FLOOR
FWE	FURNISHED WITH EQUIPMENT
GEN	GENERATOR
G, GND	GROUND
GFCI	GROUND FAULT CIRCUIT INTERRUPTER
HH	HANDHOLE
HID	HIGH INTENSITY DISCHARGE
HOA	HAND-OFF-AUTO
HP	HORSE POWER
HPF	HIGH POWER FACTOR
HPS	HIGH PRESSURE SODIUM
HTR	HEATER
HV	HIGH VOLTAGE
Hz	HERTZ
IMC	INTERMEDIATE METALLIC CONDUIT
INCAND	INCANDESCENT
JB	JUNCTION BOX
K	THOUSAND
KCMIL	THOUSAND CIRCULAR MILLS
KVA	KILOVOLT AMPERE
KW	KILOWATTS
KWH	KILOWATT-HOURS
LP	LIGHTING PANEL, LIGHT POLE
LTG	LIGHTING
MCB	MAIN CIRCUIT BREAKER
MCC	MOTOR CONTROL CENTER
MCP	MOTOR CIRCUIT PROTECTOR
MDP	MAIN DISTRIBUTION PANEL
MFR	MANUFACTURER
MH	MANHOLE
MLO	MAIN LUGS ONLY
MTD	MOUNTED
MTG	MOUNTING
MTS	MANUAL TRANSFER SWITCH
MV	MEDIUM VOLTAGE
N, NEUT	NEUTRAL
NA	NOT APPLICABLE
NC	NORMALLY CLOSED
NEC	NATIONAL ELECTRIC CODE
NIC	NOT IN CONTRACT
NL	NIGHT LIGHT
NO	NORMALLY OPEN
NTS	NOT TO SCALE
P	POLE
PA	PUBLIC ADDRESS
PB	PULL BOX, PUSH-BUTTON
PF	POWER FACTOR
PH, ϕ	PHASE
PLC	PROGRAMMABLE LOGIC CONTROLLER
PNL	PANEL
PP	POWER PANEL, POWER POLE
PT	POTENTIAL TRANSFORMER
PWR	POWER
RECPT, RCP	RECEPTACLE
REQ'D	REQUIRED
RGS	RIGID GALVANIZED STEEL CONDUIT
RM	ROOM
RTU	REMOTE TELEMETRY UNIT
SCR	DC MOTOR DRIVE
SH	SHEET
SM	SURFACE MOUNTED
SPEC	SPECIFICATION
SS	SELECTOR SWITCH
SST	STAINLESS STEEL
SW	SWITCH
SWBD	SWITCHBOARD
SWGR	SWITCH GEAR
TEL	TELEPHONE
TPS	TWISTED PAIR SHIELDED
TVSS	TRANSIENT VOLTAGE SURGE SUPPRESSER
TYP	TYPICAL
UGND	UNDERGROUND
UH	UNIT HEATER
UON	UNLESS OTHERWISE NOTED
UTIL	UTILITY
V	VOLTS
VFD	VARIABLE FREQUENCY DRIVE
W	WIRE, WATT
WH	WATT-HOUR
WP	WEATHERPROOF
XFMR	TRANSFORMER
(X)	EXISTING

LIGHTING FIXTURE SCHEDULE

MARK	DESCRIPTION	MANUFACTURER/SERIES	NOM. SIZE	TEMP(oK)	LAMPS	VOLTS	DELIVERED LUMENS	WATTS	LENS	COLOR	MOUNTING HEIGHT	BALLAST/ DRIVER	REMARKS
A	SURFACE MOUNT LED WALL PACK	PHILLIPS-STONCO WP-50W-NW-G1--8-BZ	14.5"x9.5"x7"	4000	LED	MVOLT	5541	49	GLASS	BRONZE	SURFACE	LED DRIVER	1,6
B	SURFACE GASKETED LED VAPORPROOF FIXTURE	PHILLIPS-STONCO VCXL-14-NW-G1-8	4.5"x11"	4000	LED	MVOLT	1390	14	FROSTED GLASS	ALUMINUM	SURFACE CEILING	LED DRIVER	2,3,5
E	DUAL HEAD WET LOCATION EMERGENCY LIGHT	CHLORIDE BY SIGNIFY 65x-6-N-18-W-9	18"x6"x5"	N/A	LED	MVOLT	N/A	9	CLEAR LEXAN	WHITE	SURFACE SOFFIT	N/A	3,4

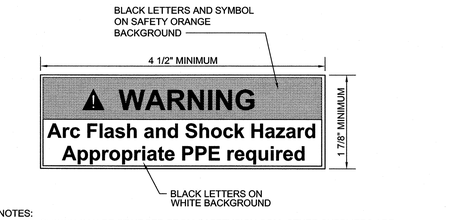
REMARKS:
1. IMPACT RESISTANT GLASSS LENS
2. COORDINATE LOCATION WITH MECH. EQUIPMENT
3. WET LOCATION
4. PROVIDE 90MIN BATTERY
5. DIE-CAST GUARD FOR GLOBE
6. MOUNT AS HIGH AS POSSIBLE ON WALL

GENERAL NOTES:
A. THE CONTRACTOR SHALL VERIFY THE LEAD TIME OF ALL PRODUCTS SPECIFIED IN THIS SCHEDULE AT THE TIME OF PACKAGE QUOTE.
B. DURING THE BID PROCESS, THE CONTRACTOR SHALL NOTIFY THE ENGINEER OF ANY DELIVERY/SCHEDULING ISSUES.
C. NO SUBSTITUTIONS WILL BE ALLOWED DUE TO THE LACK OF COORDINATION OF DELIVERY DATES AND CONSTRUCTION SCHEDULE AFTER BID.
D. ALL EXPEDITED EXPENSES SHALL BE THE RESPONSIBILITY OF THE CONTRACTORS.
E. LIGHTING FIXTURES SHALL MEET THE AESTHETICS, DESCRIPTION AND SPECIFICATIONS, SUBSTITUTIONS SHALL INCLUDE PT. BY PT. CALCULATIONS.
F. LIGHTING FIXTURES, AS SPECIFIED, HAVE BEEN SO SELECTED TO ACHIEVE REQUIRED/DESIRED FOOTCANDLE LEVELS IN THEIR RESPECTIVE AREA. HENCE SPECIFIC FIXTURE CHARACTERISTICS WHICH MAY CREATE PARTICULAR ILLUMINATION RESULTS ARE ESSENTIAL. ANY DEVIATIONS FROM SPECIFIED FIXTURES SHALL DEEM THE SUBMITTING AGENT AND CONTRACTORS RESPONSIBLE IN PROVIDINGSUCH DEVIATION FOR THE ENGINEER AND OWNER TO MAKE AN INFORMED DECISION.
G. SUBSTITUTIONS ARE ACCEPTABLE AS LONG AS THEY ARE EQUAL TO THE FIXTURE SPECIFIED, UNLESS OTHERWISE NOTED THIS INCLUDES LENS, COLORS, REFLECTORS, PHOTOMETRICS, HOUSING MATERIAL, FINISHES, ETC. ALL
H. ANY FIXTURE WITH THE TEXT "NL" ADJACENT TO IT SHALL INDICATE THAT THAT FIXTURE IS A NIGHT LIGHT (24HR LIGHT). THE FIXTURE SHALL BE CONNECTED TO THE UNSWITCHED HOT LEG OF THE INDICATED CIRCUIT.
I. ACRYLIC PRISMATIC LENSES SHALL BE 0.156" NOMINAL MINIMUM THICKNESS.
J. ALL EXIT AND EMERGENCY FIXTURES SHALL COMPLY WITH NCSBC STANDARDS AND HAVE AUTOMATIC TESTING DEVICES.
K. LED EMERGENCY BATTERY SHALL PROVIDE 1400 MINIMUM LUMENS OUTPUT FROM 1 LAMP FOR 90 MINUTES MINIMUM.
L. LED MODULES SHALL BE REPLACEABLE.
M. ELECTRICAL CONTRACTOR SHALL RECEIVE APPROVAL FOR ALL LIGHTING FIXTURES FROM OWNER PRIOR TO PURCHASE AND ROUGH-IN.
N. ALL LIGHTING FIXTURES PENETRATING RATED FLOOR/CEILING ASSEMBLY SHALL BE PROVIDED WITH ACCESSORIES TO MAINTAIN ASSEMBLY FIRE RATING.
O. THE ABOVE FIXTURE TYPES ARE LISTED AS THE DESIGN BASIS.
P. PROVIDE MANUFACTURER INSTALLED NEC 2014 ARTICLE 410.130 (G) COMPLIANT DISCONNECTING MEANS FOR ALL APPLICABLE FIXTURES.



NOTE: SEE SPECS. SECTION 260553 FOR NAMEPLATE MATERIAL AND ENGRAVING COLORS.

A3 **TYPICAL EQUIPMENT NAMEPLATE DETAIL**
NOT TO SCALE



NOTES:
1. LABEL SHOWN CAN BE SOURCED FROM SAFETYSIGN.COM, OTHER SUPPLIERS ARE COMPLIANTSIGNS.COM & SETON.COM

2. THIS WARNING LABEL MINIMALLY COMPLIES WITH NEC, HOWEVER IF ELECTRICAL EQUIPMENT IS LIKELY TO REQUIRE EXAMINATION OR MAINTENANCE WHILE ENERGIZED A DETAILED SHORT CIRCUIT AND ARC FLASH HAZARD ANALYSIS IS RECOMMENDED.

A4 **ELECTRICAL EQUIPMENT WARNING LABEL DETAIL**
NOT TO SCALE

Revision No:	DESCRIPTION:	Date:
	REVISIONS	
0	ISSUED FOR CONSTRUCTION	11.27.19
A	ISSUED FOR REVIEW	11.15.19

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 023311 ENGINEER W. ALLEN CREED
11/27/19

New Hanover County Schools
Emsley A Laney High School
CLOSED CIRCUIT COOLER ADDITION
2700 NORTH COLLEGE ROAD, WILMINGTON, NORTH CAROLINA

ELECTRICAL
LEGEND, ABBREVIATIONS, DETAILS
FIXTURE SCHEDULE AND LOAD SUMMARY

JOB NO.:	19170
DRAWN:	JLG
DESIGNED:	JLG
CHECKED:	WAC

DRAWING NO:
E-001

REVISION:
0

NHCS PROJECT NUMBER 20-9216-1

GENERAL NOTES

1. THE CONTRACTOR SHALL REVIEW ALL DRAWINGS AND SPECIFICATIONS FOR WORK REQUIREMENTS, THE AMOUNT OF SPACE AVAILABLE FOR ELECTRICAL EQUIPMENT, AND LAYOUT HIS WORK IN A COMPATIBLE AND COMPLEMENTARY MANNER.

2. THE CONTRACTOR SHALL ALSO BE RESPONSIBLE FOR THOROUGHLY FAMILIARIZING HIMSELF WITH ANY CONTRACTUAL REQUIREMENTS AS MAY BE SET FORTH IN THE OTHER DIVISIONS OF THE PROJECT SPECIFICATIONS.

3. UNLESS SPECIFICALLY NOTED OTHERWISE, SYSTEMS PROVIDED OR INSTALLED BY THE ELECTRICAL CONTRACTOR SHALL BE COMPLETE AND FULLY-FUNCTIONING AFTER INSTALLATION. INCIDENTAL COMPONENTS MAY NOT BE SHOWN, AND ALL WORK WHICH MAY BE REASONABLY IMPLIED AS BEING INCIDENTAL TO THIS WORK, BUT REQUIRED FOR THE PROPER OPERATION OF THE EQUIPMENT OR SYSTEM, SHALL BE PROVIDED BY THE CONTRACTOR AND INCLUDED IN THE BID. ADDITIONAL CIRCUITS SHALL BE INSTALLED WHEREVER NEEDED TO CONFORM TO THE SPECIFIC REQUIREMENTS OF EQUIPMENT.

4. TEMPORARY POWER CONNECTIONS AS REQUIRED SHALL BE PROVIDED BY THE CONTRACTOR AND INCLUDED IN THE BID. ALL TEMPORARY EQUIPMENT WIRING SHALL BE IN ACCORDANCE WITH THE NATIONAL ELECTRICAL CODE. THE CONTRACTOR SHALL PROVIDE DETAILS, METHODS, MATERIALS, ETC. FOR REVIEW PRIOR TO MAKING TEMPORARY CONNECTIONS. FURNISH AND INSTALL ALL EQUIPMENT AND MATERIALS INCLUDING CONTROL EQUIPMENT, MOTOR STARTERS, BRANCH AND FEEDER CIRCUIT BREAKERS, PANELBOARDS, TRANSFORMERS, ETC. FOR TEMPORARY POWER. COORDINATE WITH THE ELECTRICAL UTILITY COMPANY AS REQUIRED.

5. THE WORK SHALL INCLUDE COMPLETE TESTING OF ALL EQUIPMENT AND WIRING AT THE COMPLETION OF WORK AND ANY MINOR CORRECTIONS, CHANGES OR ADJUSTMENTS NECESSARY FOR THE PROPER FUNCTIONING OF THE SYSTEM AND EQUIPMENT.

6. ALL EQUIPMENT SHOWN DOTTED OR DASHED IS BY OTHERS OR IS EXISTING, AS NOTED.

7. ALL ELECTRICAL EQUIPMENT SHALL, AT ALL TIMES DURING CONSTRUCTION, BE ADEQUATELY PROTECTED AGAINST MECHANICAL INJURY, OR DAMAGE BY WATER AND/OR THE ELEMENTS. ELECTRICAL EQUIPMENT SHALL NOT BE STORED OUT OF DOORS, BUT SHALL BE STORED IN DRY PERMANENT SHELTERS. IF AN APPARATUS HAS BEEN DAMAGED, OR HAS BEEN SUBJECT TO POSSIBLE INJURY BY WATER OR THE ELEMENTS, SUCH DAMAGE SHALL BE REPLACED AT NO ADDITIONAL COST.

8. DO NOT SCALE ELECTRICAL DRAWINGS. FIELD VERIFY ALL DIMENSIONS.

9. CIRCUIT LAYOUTS ARE NOT INTENDED TO SHOW THE NUMBER OF FITTINGS, OR OTHER INSTALLATION DETAILS. UNLESS NOTED OTHERWISE, THE EXACT ROUTING OF FEEDER AND BRANCH CIRCUIT RACEWAYS AND CABLES IS THE RESPONSIBILITY OF THE CONTRACTOR. RISER AND GENERAL CIRCUIT ARRANGEMENTS ARE SHOWN SCHEMATICALLY/DIAGRAMMATICALLY ONLY. THE CONTRACTOR SHALL ROUTE CONDUITS AS REQUIRED BY THE CONDITIONS OF THE INSTALLATION.

10. UNLESS DIMENSIONED, DEVICE LOCATIONS SHOWN ON THE DRAWINGS ARE APPROXIMATE. ADJUST EXACT LOCATIONS AS REQUIRED TO SERVE THE INTENDED PURPOSE AND TO AVOID CONFLICTS AND INTERFERENCES WITH OTHER TRADES. EXACT DEVICE LOCATIONS SHALL BE AS INDICATED ON THE ARCHITECTURAL DRAWINGS OR AS DIMENSIONED. IF NOT SHOWN OR DIMENSIONED ON THE ELECTRICAL DRAWINGS, VERIFY EXACT LOCATION WITH THE OWNER PRIOR TO ROUGH-IN.

11. CONDUIT TERMINATING IN PRESSED STEEL BOXES SHALL HAVE DOUBLE LOCKNUTS AND INSULATED BUSHINGS. CONDUITS TERMINATING IN GASKETED ENCLOSURES SHALL BE TERMINATED WITH GROUNDING TYPE CONDUIT HUBS.

12. BRANCH CIRCUIT HOMERUNS SHOWN ON DRAWINGS INDICATE PHASE CONDUCTORS, NEUTRAL, EQUIPMENT GROUND CONDUCTORS AS REQUIRED. ADDITIONAL CONDUCTORS REQUIRED FOR CONTROL SHALL BE INCLUDED EVEN IF NOT EXPLICITLY SHOWN.

13. SEAL ALL CONDUIT OPENINGS THROUGH EXTERIOR BUILDING WALLS WATERTIGHT.

14. IN WET LOCATIONS AND EXTERIOR, ALL WIRING DEVICES SHALL BE WEATHER-RESISTANT LISTED WITH WEATHERPROOF WHILE IN USE COVER. LIGHTING FIXTURES SHALL BE APPROPRIATELY RATED AND LISTED FOR THE ENVIRONMENT INCLUDING 0 DEGREE BALLASTS FOR FLUORESCENT.

15. RACEWAYS PENETRATING FLOORS, CEILINGS OR WALLS SHALL BE PROPERLY SEALED SMOKETIGHT.

16. RACEWAYS PENETRATING RATED FLOOR, CEILING OR WALL ASSEMBLIES SHALL BE PROPERLY SEALED IN ACCORDANCE WITH THE CORRESPONDING UNDERWRITERS LABORATORIES (OR OTHER APPROVED THIRD-PARTY TESTING AGENCY) APPROVED AND LISTED FIRESTOPPING MATERIALS AND MANUFACTURER APPROVED INSTALLATION TECHNIQUES COMPLYING WITH ALL APPLICABLE CODES. SEE ARCHITECTURAL DRAWINGS FOR IDENTIFICATION OF RATED WALLS AND CEILINGS.

17. ALL RACEWAYS SHALL BE CONCEALED WHERE POSSIBLE. IF APPLICABLE, MATCH EXISTING RACEWAY INSTALLATION METHODS AND ROUTINGS AT OR NEAR EXISTING FACILITIES.

18. INSTALL EXPOSED RACEWAYS PARALLEL TO OR AT RIGHT ANGLES TO NEARBY SURFACES OR STRUCTURAL MEMBERS, AND FOLLOW THE SURFACE CONTOURS AS MUCH AS POSSIBLE. NO DIAGONAL RUNS WILL BE ALLOWED. ALL CONDUITS SHALL BE RUN STRAIGHT AND TRUE. RUN PARALLEL OR BANKED RACEWAYS TOGETHER ON COMMON SUPPORTS WHERE PRACTICAL. MAKE BENDS IN PARALLEL OR BANKED RUNS FROM SAME CENTERLINE TO MAKE BENDS PARALLEL.

19. PROVIDE AND PLACE ALL SLEEVES FOR CONDUITS PENETRATING WALLS, FLOORS, PARTITIONS, ETC. LOCATE ALL NECESSARY SLOTS FOR ELECTRICAL WORK AND FORM BEFORE CONCRETE IS POURED.

20. PATCHING OF WATERPROOFED SURFACES SHALL RENDER THE AREA OF THE PATCHING COMPLETELY WATERPROOF.

21. ALL MOTORS AND OTHER VIBRATING EQUIPMENT SHALL BE CONNECTED TO THE CONDUIT SYSTEM BY MEANS OF A SHORT SECTION (18 INCH MINIMUM) OF FLEXIBLE CONDUIT UNLESS OTHERWISE INDICATED. AN EQUIPMENT GROUNDING CONDUCTOR SHALL BE INSTALLED INSIDE THE FLEXIBLE CONDUIT AND TERMINATE AT THE LOAD END WITH AN APPROVED GROUNDING CLAMP OR LUG.

22. SURFACE MOUNTED PANELBOARDS, JUNCTION, OUTLET AND PULL BOXES, RACEWAYS, ETC., INSTALLED ON EXTERIOR SURFACES OR INSIDE ON EXTERIOR WALLS SHALL BE SUPPORTED BY SPACERS TO PROVIDE A 1/4" MINIMUM CLEARANCE BETWEEN THE WALL AND EQUIPMENT.

23.

24. EXCAVATION AND TRENCHING REQUIRED FOR THE INSTALLATION OF ELECTRICAL POWER AND TELECOMMUNICATIONS RACEWAYS SHALL BE PROVIDED BY THE CONTRACTOR IN ACCORDANCE WITH THE REQUIREMENTS OF DIVISION 26 OF THE PROJECT SPECIFICATIONS.

25. PRIOR TO TRENCHING IN ANY AREA, THE CONTRACTOR SHALL CONTACT ELECTRICAL, COMMUNICATIONS/DATA/FIBER, CABLE TELEVISION, GAS AND WATER UTILITY PROVIDERS AND HAVE ALL UTILITIES IN THE AREA IDENTIFIED. DAMAGE TO ANY UNDERGROUND UTILITIES OR STRUCTURES SHALL BE REPAIRED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE PROJECT.

26. ALL UNDERGROUND RACEWAYS SHALL BE IDENTIFIED BY UNDERGROUND LINE MARKING TAPE LOCATED DIRECTLY ABOVE THE RACEWAY AT 6 TO 8 INCHES BELOW FINISHED GRADE. SEE SPECIFICATIONS SECTION 260553.

27. PROVIDE ADHESIVE BACKED RECEPTACLE DEVICE PLATE LABELS IDENTIFYING THE CIRCUIT FEEDING THE DEVICE. LABELS SHALL INDICATE PANEL AND CIRCUIT NUMBER. ALSO PROVIDE IDENTIFICATION FOR MULTIWIRE BRANCH CIRCUIT PHASE CONDUCTORS IN PANELBOARD. SEE SPECIFICATIONS SECTION 260553 FOR REQUIREMENTS.

28. FINAL TYPED PANELBOARD DIRECTORIES INSTALLED IN THE PANELBOARD DOOR POCKET SHALL INCLUDE FINAL ACTUAL ROOM NAMES AND NUMBERS IN ADDITION TO THE GENERAL DESCRIPTION SHOWN ON THE PANEL SCHEDULES ON THE DRAWINGS.

29. CONDUCTOR SIZING IS BASED ON 75 DEGREE C. COPPER NEC RATINGS, UNLESS NOTED OTHERWISE. THE CONTRACTOR SHALL VERIFY, PRIOR TO INSTALLATION OF CONDUCTORS OR CONDUIT FEEDING ANY EQUIPMENT, THE ELECTRICAL EQUIPMENT IS RATED FOR USE WITH 75 DEGREE C. WIRING. IF ANY EQUIPMENT IS RATED FOR USE WITH LESS THAN 75 DEGREE C. CONDUCTORS, THE CONTRACTOR SHALL NOTIFY THE ARCHITECT/ENGINEER IMMEDIATELY FOR EVALUATION/CORRECTION.

30. DO NOT PULL CONDUCTORS UNTIL THE CONDUIT SYSTEM IS COMPLETE IN EVERY DETAIL. IN THE CASE OF CONCEALED WORK, "COMPLETE" MEANS UNTIL ALL ROUGH PLASTERING OR MASONRY HAS BEEN COMPLETED.

31. WHERE SIZE IS NOT SHOWN ON THE DRAWINGS, BRANCH CIRCUITS SHALL CONSIST OF #12 OR #10 AWG MINIMUM PHASE, NEUTRAL AND EQUIPMENT GROUND CONDUCTORS IN 3/4" MINIMUM RACEWAY.

32. USE #10 AWG CONDUCTORS FOR 20 AMPERE, 120 VOLT BRANCH CIRCUITS WITH A TOTAL INSTALLED LENGTH GREATER THAN 75 FEET AND/OR BRANCH CIRCUIT HOMERUNS LONGER THAN 50 FEET, I.E.; #12 AWG INCREASED TO #10 AWG FOR RECEPTACLE BRANCH CIRCUITS OVER 75 FEET TOTAL LENGTH (INCLUDING THE HOMERUN SEGMENT) AND HOMERUNS OVER 50 FEET.

33. COMMON NEUTRAL MULTIWIRE RECEPTACLE BRANCH CIRCUITS ARE NOT PERMITTED. PROVIDE SEPARATE, INDIVIDUAL NEUTRAL CONDUCTORS FOR MULTIWIRE BRANCH CIRCUITS.

34. KEEP CONDUCTOR SPLICES TO A MINIMUM. INSTALL SPLICES AND TAPES THAT POSSESS EQUIVALENT OR BETTER MECHANICAL STRENGTH AND INSULATION RATINGS THAN CONDUCTORS BEING SPLICED. USE SPLICE AND TAP CONNECTORS COMPATIBLE WITH CONDUCTOR MATERIAL. INSTALL CONDUCTORS AT EACH OUTLET WITH AT LEAST 6 INCHES OF SLACK. CONNECT OUTLETS AND COMPONENTS TO WIRING AND TO GROUND AS INDICATED AND INSTRUCTED BY THE MANUFACTURER.

35. DO NOT SPLICE BRANCH CIRCUIT HOMERUNS WITHOUT THE PERMISSION OF THE ENGINEER. HOMERUNS SHALL BE CONTINUOUS FROM THE LAST OUTLET BOX TO THE SERVING PANELBOARD.

36. DO NOT COMBINE BRANCH CIRCUIT HOMERUNS UNLESS SPECIFICALLY INDICATED ON THE DRAWINGS.

37. DO NOT CHANGE CIRCUITING SHOWN WITHOUT PERMISSION OF THE ENGINEER.

38. TROUGH TAPS SHALL BE AT SWITCH AMPACITY, UNLESS NOTED OTHERWISE.

39. PROVIDE GROUND FAULT CIRCUIT-INTERRUPTER PROTECTION FOR PERSONNEL IN ACCORDANCE WITH THE NEC INCLUDING ALL ELECTRIC WATER COOLERS; EXTERIOR RECEPTACLES AND RECEPTACLES IN AREAS SUBJECT TO POSSIBLE WET CONDITIONS. ALL RECEPTACLES INSTALLED WITHIN 6 FEET OF A SINK SHALL BE GFI PROTECTED.

40. COORDINATE LOCATIONS OF PLUMBING, MECHANICAL, EQUIPMENT WITH THE RESPECTIVE CONTRACTORS AND VENDORS AND THE OWNER BEFORE ROUGH-IN. ADJUST RECEPTACLES AND ELECTRICAL EQUIPMENT TO ACCOMMODATE THIS EQUIPMENT. ADVISE THE OWNER/ENGINEER OF CONFLICTS BEFORE ROUGH-IN.

41. THE MECHANICAL AND PLUMBING CONTRACTORS SHALL FURNISH ALL STARTERS AND CONTROLS FOR THEIR EQUIPMENT. THE ELECTRICAL CONTRACTOR SHALL PROVIDE SAFETY SWITCHES AND CIRCUIT BREAKERS AND PROVIDE WIRING AND CONNECTIONS TO THE LINE SIDE OF SAFETY SWITCHES AND/OR CIRCUIT BREAKERS. THE CONTRACTOR PROVIDING THE EQUIPMENT SHALL PROVIDE LOAD SIDE WIRING AND CONNECTIONS TO EQUIPMENT. THE MECHANICAL AND PLUMBING CONTRACTORS SHALL PROVIDE ALL CONTROL WIRING AND CONNECTIONS AND DEVICES FOR THEIR EQUIPMENT. [SCO PROJECTS ONLY]

42. ENERGIZE EQUIPMENT ONLY AFTER OBTAINING PERMISSION FROM THE CONTRACTOR PROVIDING THE EQUIPMENT.

43. UNLESS SPECIFICALLY NOTED OTHERWISE, THE ELECTRICAL CONTRACTOR SHALL MAKE FINAL CONNECTIONS TO ALL UTILIZATION EQUIPMENT SHOWN ON THE DRAWINGS. VERIFY THE TYPE OF FINAL CONNECTION AND PROVIDE APPROPRIATE WIRING METHOD. THE ELECTRICAL CONTRACTOR SHALL COORDINATE WITH THE MECHANICAL, PLUMBING AND GENERAL CONTRACTORS, PRIOR TO ORDERING OR INSTALLATION OF ANY EQUIPMENT, TO VERIFY MECHANICAL AND PLUMBING EQUIPMENT REQUIREMENTS ARE PROVIDED IN THE ELECTRICAL DESIGN. THE CONTRACTOR WILL NOT BE COMPENSATED FOR COSTS ASSOCIATED WITH CHANGING THE ELECTRICAL SYSTEMS TO MATCH UTILIZATION EQUIPMENT, EVEN IF THE ELECTRICAL WORK IS INSTALLED PER THE ELECTRICAL DRAWINGS.

44. THE MECHANICAL CONTRACTOR SHALL FURNISH ALL STARTERS AND VFDS AND CONTROLS FOR THEIR EQUIPMENT. THE ELECTRICAL CONTRACTOR SHALL MOUNT STARTERS AND VFDS FURNISHED BY THE MECHANICAL CONTRACTOR, THE ELECTRICAL CONTRACTOR PROVIDE ALL SAFETY SWITCHES, WIRING AND CONNECTIONS TO LINE SIDE AND LOAD SIDE OF STARTERS AND SAFETY SWITCHES COMPLETE TO MECHANICAL EQUIPMENT. FOR RESISTANCE TYPE LOADS WHERE STARTERS OR CONTACTORS ARE NOT REQUIRED, THE ELECTRICAL CONTRACTOR SHALL PROVIDE ALL POWER WIRING AND CONNECTIONS COMPLETE TO EQUIPMENT. THE MECHANICAL CONTRACTOR SHALL PROVIDE ALL CONTROL WIRING AND CONNECTIONS AND DEVICES FOR THEIR EQUIPMENT.

45. THE LAYOUT AND PLACEMENT OF ELECTRICAL EQUIPMENT IS BASED ON PUBLISHED EQUIPMENT SIZES AND SHALL BE FOLLOWED AS CLOSELY AS POSSIBLE. DEVIATIONS FROM CONFIGURATIONS SHOWN IS THE RESPONSIBILITY OF THE CONTRACTOR. PROVIDE NATIONAL ELECTRIC CODE REQUIRED CLEARANCES FOR ALL ELECTRICAL EQUIPMENT, SAFETY SWITCHES, SWITCHBOARDS, ETC. COORDINATE RESOLUTION OF CONFLICTS WITH OTHER TRADES. ADVISE THE OWNER/ENGINEER OF CONFLICTS BEFORE ROUGH-IN.

46. COORDINATION WITH THE UTILITY COMPANY FOR PLACEMENT OF EQUIPMENT OVER OR UNDER THE UTILITIES INFRASTRUCTURE IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.

47. COORDINATION WITH THE UTILITY COMPANY IS THE RESPONSIBILITY OF THE ELECTRICAL CONTRACTOR.

48. PROTECT ALL EXISTING POWER, COMMUNICATIONS, DATA, LIFE SAFETY SYSTEMS, FIRE ALARM AND PUBLIC ADDRESS SYSTEMS AND MAINTAIN THEM IN OPERATION THROUGHOUT THE PROGRESS OF THE WORK. NOTIFY THE OWNER AND ENGINEER IF SHUTDOWNS ARE REQUIRED PRIOR TO ANY OUTAGE OF SERVICE. WHERE THE DURATION OF A PROPOSED OUTAGE CANNOT BE TOLERATED BY THE OWNER, PROVIDE TEMPORARY CONNECTIONS AS REQUIRED TO MAINTAIN SERVICE.

49. THE CONTRACT REQUIRES SEVERAL NEW CIRCUITS BE ADDED TO EXISTING PANELBOARDS. THE CONTRACTOR SHALL ENDEAVOR TO MAINTAIN PHASE BALANCE ON ALL PANELBOARDS AFFECTED BY THIS WORK. RECONNECT/MODIFY/EXTEND EXISTING CIRCUITING AS REQUIRED TO MAINTAIN SAFE CIRCUIT LOADING AND PHASE BALANCE. COORDINATE CONNECTIONS TO THE EXISTING ELECTRICAL DISTRIBUTION SYSTEM WITH THE OWNER AND ENGINEER. PROVIDE ACCURATE, UPDATED, TYPED PANEL SCHEDULES FOR ALL AFFECTED PANELS. NOTE ALL FINAL CIRCUIT CONFIGURATIONS ON AS-BUILT DRAWINGS.

50. THE CONTRACTOR SHALL PERFORM ALL CUTTING AND PATCHING NECESSARY TO INSTALL ALL EQUIPMENT AS REQUIRED AND SHALL REESTABLISH ALL FINISHES TO THEIR ORIGINAL CONDITION WHERE CUTTING AND PATCHING OCCUR. ALL CUTTING AND PATCHING SHALL BE DONE IN A THOROUGHLY WORKMANSHIP MANNER. SAW CUT CONCRETE AND MASONRY PRIOR TO BREAKING OUT SECTIONS. ALL PATCHING MATERIALS AND WORKMANSHIP SHALL BE PERFORMED BY TRADESMEN EXPERIENCED IN THAT WORK. ALL WORK SHALL BE SUBJECT TO THE APPROVAL OF THE OWNER.

51. CORE DRILL HOLES IN EXISTING CONCRETE WALLS AS REQUIRED.

52. INSTALL WORK AT SUCH TIME AS TO REQUIRE THE MINIMUM AMOUNT TO CUTTING AND PATCHING.

53. CUT OPENINGS ONLY LARGE ENOUGH TO ALLOW EASY INSTALLATION OF THE CONDUIT.

54. EXISTING CIRCUITING WHERE SHOWN IS FOR CONVENIENCE PURPOSES ONLY. VERIFICATION OF EXISTING WIRING DESTINATION, TERMINATION AND ADDITIONS OF NEW LOADS IS THE RESPONSIBILITY OF THE CONTRACTOR.

55. MAINTAIN CONTINUITY OF ALL EXISTING CIRCUITS TO REMAIN OR PORTIONS THEREOF AFFECTED BY THIS WORK.

56. INSOFAR AS POSSIBLE, MATCH EXISTING EXPOSED DEVICES IN FINISHED AREAS IN TYPE, COLOR AND FINISH.

57. THE EXISTING ELECTRICAL SYSTEMS DEPICTED ON THESE DRAWINGS HAVE BEEN COMPILED BY THE ENGINEER FROM THE OWNER'S RECORD DRAWINGS AND LIMITED FIELD VERIFICATION OF THE EXISTING CONDITIONS FOR THE PURPOSE OF INDICATING THE WORK REQUIRED AND ARE BELIEVED TO BE CORRECT. NOTWITHSTANDING, THE CONTRACTOR SHALL VERIFY ALL DIMENSIONS, POINTS OF ACCESS AND FIELD CONDITIONS AFFECTING HIS WORK.

58. THE CONTRACTOR SHALL VISIT THE SITE AND BECOME FAMILIAR WITH THE EXISTING ELECTRICAL SYSTEMS AND THE EXISTING BUILDING. THE SUBMISSION OF THE PROPOSAL BY THE CONTRACTOR SHALL BE CONSIDERED EVIDENCE THAT HE OR HIS REPRESENTATIVE HAS VISITED THE SITE AND BUILDINGS AND NOTED THE LOCATION AND CONDITIONS UNDER WHICH THE WORK WILL BE PERFORMED AND THAT HE TAKES FULL RESPONSIBILITY OF ALL FACTORS GOVERNING HIS WORK. NO EXTRAS WILL BE CONSIDERED BECAUSE OF ADDITIONAL WORK NECESSITATED BY EXISTING JOB CONDITIONS THAT ARE NOT INDICATED ON THE DRAWINGS.

59. THE EXISTING FACILITIES WILL REMAIN OCCUPIED BY STUDENTS AND THE STAFF THROUGHOUT THE PROJECT. AS SUCH, WORK WILL REQUIRE SPECIAL EFFORT BY THIS CONTRACTOR TO ALLOW THE WORK TO PROCEED IN A TIMELY MANNER. ALL ELECTRICAL WORK SHALL BE COORDINATED WITH THE OWNER AND GENERAL CONTRACTOR SO AS TO MINIMIZE DISRUPTION OF THE OWNER'S USE OF THE FACILITIES AND MAINTAIN THE CONSTRUCTION SEQUENCE OF THE GENERAL CONTRACTOR.

60. SAFETY:

    A. COMPLY WITH OSHA AND NEC ARC FLASH PROTECTION REQUIREMENTS.

    B. FOR EQUIPMENT BEING REMOVED AND REPLACED, THE CONTRACTOR SHALL DE-ENERGIZE THE EQUIPMENT AND MAKE IT SAFE PRIOR TO REMOVAL AND COMPLY WITH OSHA REQUIREMENTS FOR LOCKING-OUT AND TAGGING EQUIPMENT TO PREVENT INADVERTENT RE-ENERGIZING.

NHCS PROJECT NUMBER 20-9216-1

Revision No:	DESCRIPTION:	Date:
0	ISSUED FOR CONSTRUCTION	11.27.19
1	ADDENDUM #1	12.13.19

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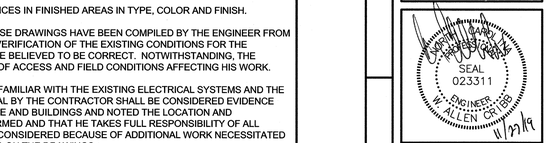


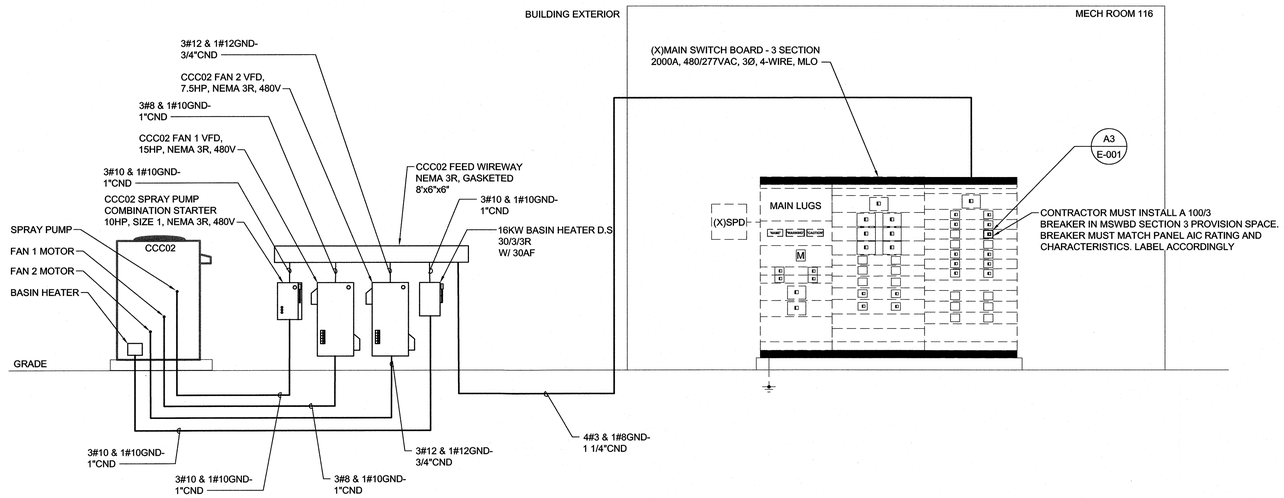
New Hanover County Schools
Emlsey A Laney High School
CLOSED CIRCUIT COOLER ADDITION
2700 NORTH COLLEGE ROAD, WILMINGTON, NORTH CAROLINA

ELECTRICAL
GENERAL NOTES

JOB NO.:	19170
DRAWN:	JLG
DESIGNED:	JLG
CHECKED:	WAC

DRAWING NO:
E-002

REVISION:
0



C4 **PARTIAL RISER DIAGRAM**
NOT TO SCALE

(X)PANEL H

TYPE: NEMA 1
BOLT-ON
SQUARE D

208 V, 3 PH, 4 WIRE
MOUNT: SURFACE
FEED:

PROVIDE IF CHECKED: EQUIP. GROUND BUS, NEUTRAL BUS, GUTTER TAPS, SUB-FEED LUGS

LOAD SERVED	LOAD VA	CKT BKR	CKT #	LOAD VA A	LOAD VA B	LOAD VA C	CKT #	CKT BKR	LOAD VA	LOAD SERVED
(X)HEAT TRACE	*2,000*	*30/1*	1	*2,000*			2			*SPACE*
(X)HET TRACE	*2,000*	*30/1*	3		*2,180*		4	*20/1*	*180*	*ROOFTOP GFI*
BOILER	*180*	*20/1*	5			*680*	6	*20/1*	*500*	*GAS WATER HEATER 3&4*
EXHAUST FAN	*180*	*15/1*	7	*180*			8	-		*SPACE*
SPARE		*20/1*	9		*750*		10	*20/1*	*750*	*GAS WATER HEATER 1,2&5*
SPACE		-	11				12	-		*SPACE*
SPACE		-	13				14	*20/1*		*SPACE*
SPACE		-	15				16	*20/1*		*SPACE*
SPACE		-	17				18	*20/1*		*SPACE*
SPACE		-	19				20	*20/1*		*SPACE*
SPACE		-	21				22	*20/1*		*SPACE*
SPACE		-	23				24	*20/1*		*SPACE*
SPACE		-	25				26	*20/1*		*SPACE*
SPACE		-	27				28	*20/1*		*SPACE*
SPACE		-	29				30	*20/1*		*SPACE*
				2,180	2,930	680				TOTAL VOLT AMPS
				18	24	6				CONN. AMPS

NOTES:

100 A. BUS (COPPER)
100 A. MAIN LUGS

(X)PANEL H REVISED

TYPE: NEMA 1
BOLT-ON
SQUARE D

208 V, 3 PH, 4 WIRE
MOUNT: SURFACE
FEED:

PROVIDE IF CHECKED: EQUIP. GROUND BUS, NEUTRAL BUS, GUTTER TAPS, SUB-FEED LUGS

LOAD SERVED	LOAD VA	CKT BKR	CKT #	LOAD VA A	LOAD VA B	LOAD VA C	CKT #	CKT BKR	LOAD VA	LOAD SERVED
(X)HEAT TRACE	*2,000*	*30/1*	1	2,000			2	-		*SPACE*
(X)HET TRACE	*2,000*	*30/1*	3		2,180		4	*20/1*	*180*	*ROOFTOP GFI*
BOILER	*180*	*20/1*	5			680	6	*20/1*	*500*	*GAS WATER HEATER 3&4*
EXHAUST FAN	*180*	*15/1*	7	180			8	-		*SPACE*
SPARE		*20/1*	9		750		10	*20/1*	*750*	*GAS WATER HEATER 1,2&5*
CCC02 HEAT TRACE (NOTE 2 & NOTE 3)	**1,600**	**20/1**	11			1,600	12	-		*SPACE*
RECEPT: CCC02 GFI (NOTE 3)	**360**	**20/1**	13	860			14	**20/1**	**500**	**CCC02 CHEM FEED PUMP (NOTE 3)**
SPACE		-	15		180		16	**20/1**	**180**	**CCC02 GFI AND CONTROL POWER (NOTE 3)**
SPACE		-	17			264	18	**20/1**	**264**	**LIGHTS: CCC02 CTYD & CHEM FEED SHED (NOTE 3)**
SPACE		-	19				20	-		*SPACE*
SPACE		-	21				22	-		*SPACE*
SPACE		-	23				24	-		*SPACE*
SPACE		-	25				26	-		*SPACE*
SPACE		-	27				28	-		*SPACE*
SPACE		-	29				30	-		*SPACE*
				3,040	3,110	2,544				TOTAL VOLT AMPS
				25	26	21				CONN. AMPS

NOTES:
1. HVAC & REFRIGERATION EQUIPMENT SHALL USE TYPE HACR BREAKERS.
2. PROVIDE GFI BREAKER (HEAT TRACE)
3. CONTRACTOR MUST PROVIDE BREAKER MATCHING PANEL AIC RATING AND CHARACTERISTICS

100 A. BUS (COPPER)
100 A. MAIN LUGS

NHCS PROJECT NUMBER 20-9216-1

Revision No	DESCRIPTION: REVISIONS	Date:
0	ISSUED FOR CONSTRUCTION	11.27.19
A	ISSUED FOR REVIEW	11.15.19

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NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 023311 ENGINEER W. ALLEN CRUMPLER 11/27/19

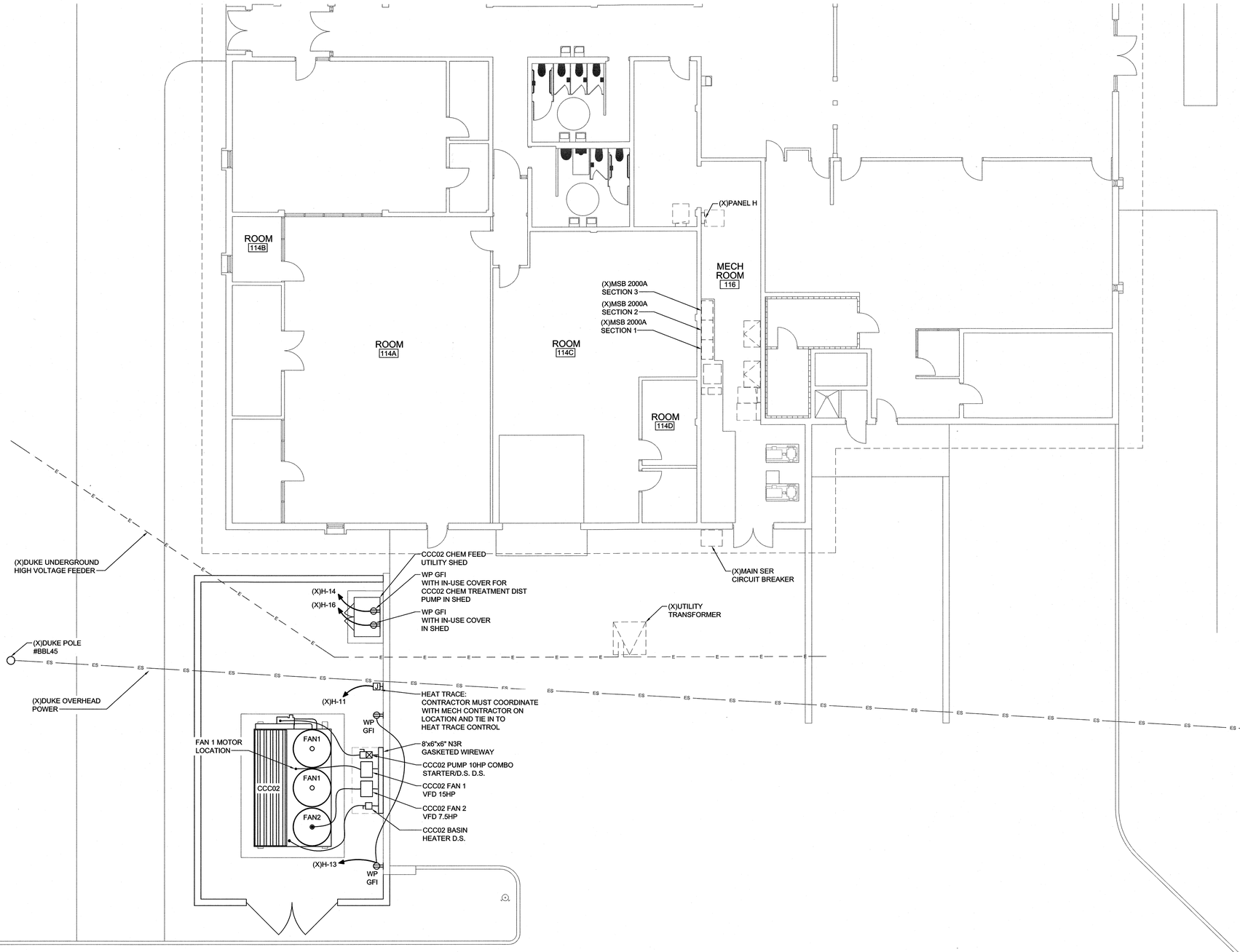
New Hanover County Schools
Emsley A Laney High School
CLOSED CIRCUIT COOLER ADDITION
2700 NORTH COLLEGE ROAD, WILMINGTON, NORTH CAROLINA

ELECTRICAL
PANEL SCHEDULES AND RISER

JOB NO.:	19170
DRAWN:	JLG
DESIGNED:	JLG
CHECKED:	WAC

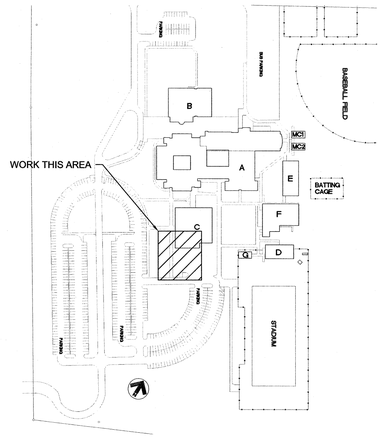
DRAWING NO:
E-003

REVISION:
0



A1 **PARTIAL FLOOR PLAN**
1/8" = 1'-0"
0 4' 8' 16'

PLAN NORTH



A5 **KEYPLAN**
NOT TO SCALE

Revision No:	DESCRIPTION:	Date:
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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 023311 ENGINEER W. ALLEN CRITES 11/27/19

New Hanover County Schools
Emlsey A Laney High School
CLOSED CIRCUIT COOLER ADDITION
2700 NORTH COLLEGE ROAD, WILMINGTON, NORTH CAROLINA

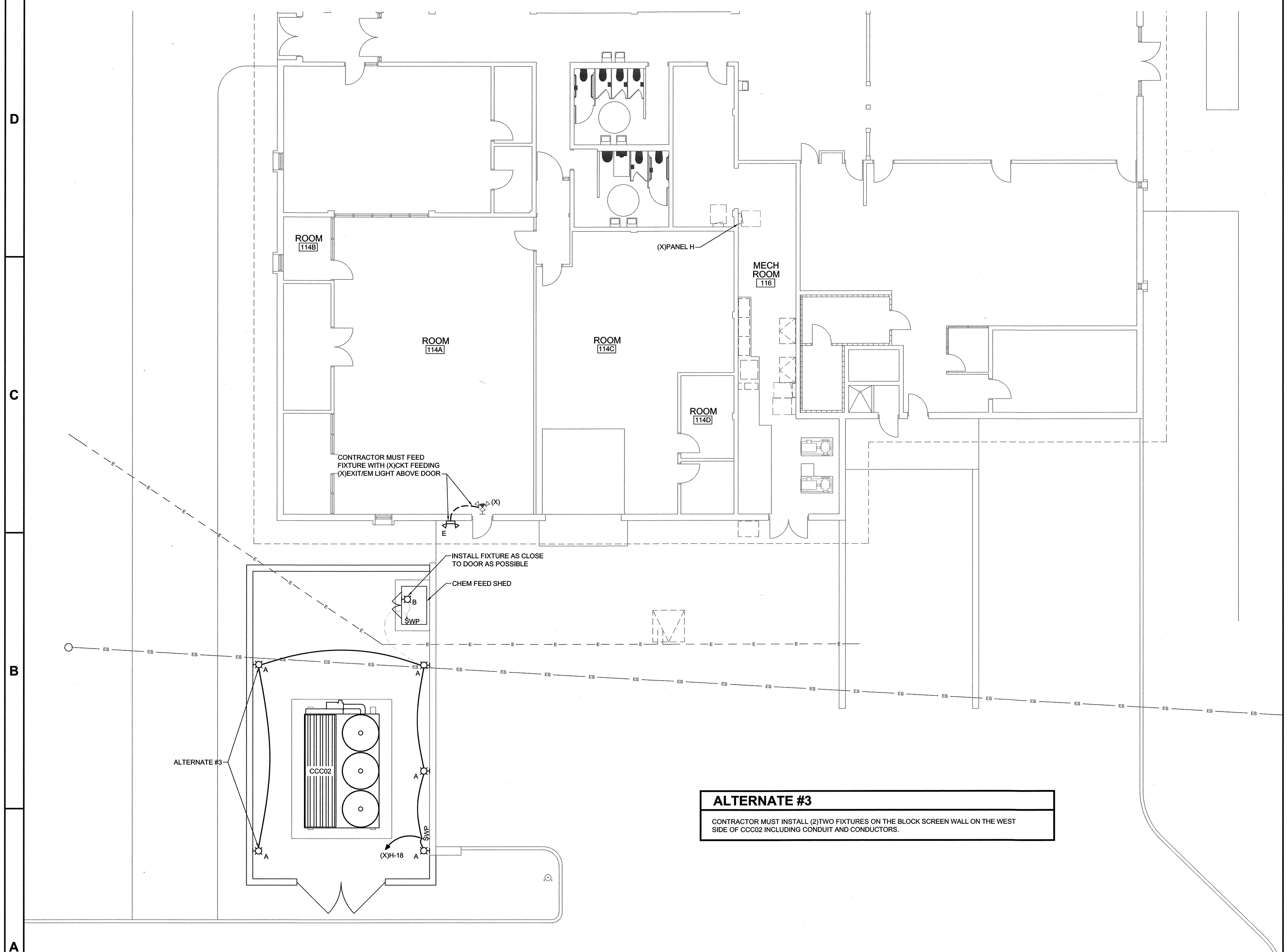
PARTIAL FLOOR PLAN POWER

JOB NO.:	19170
DRAWN:	JLG
DESIGNED:	JLG
CHECKED:	WAC

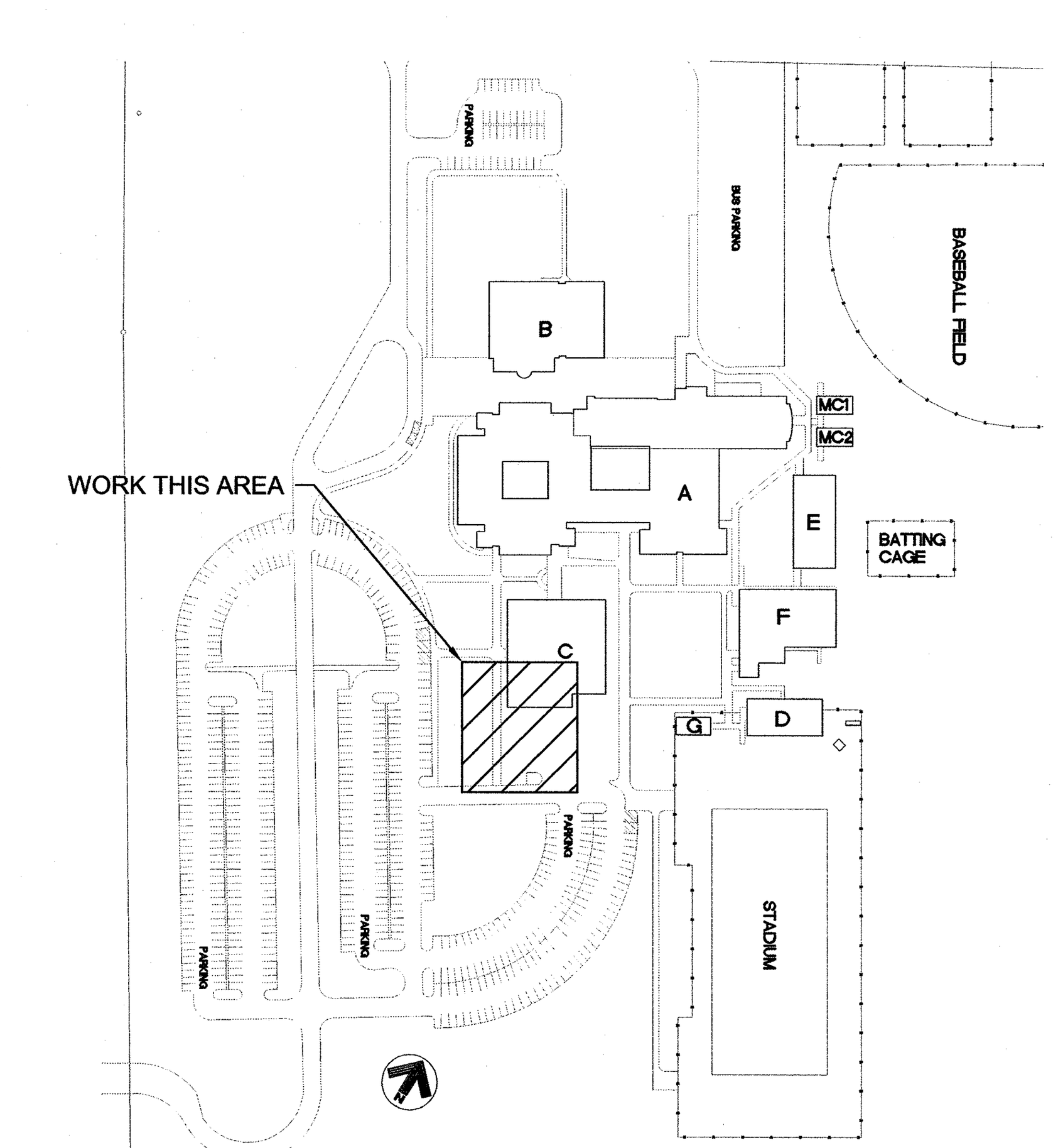
DRAWING NO:
E-101

REVISION:
0

NHCS PROJECT NUMBER 20-9215-1



A1 PARTIAL FLOOR PLAN
1/8" = 1'-0"



A5 KEYPLAN
NOT TO SCALE

NHCS PROJECT NUMBER 20-9216-1

Revision No:	DESCRIPTION:	Date:
0	ISSUED FOR CONSTRUCTION	11.27.19
A	ISSUED FOR REVIEW	11.15.19

REVISIONS

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NORTH CAROLINA PROFESSIONAL SEAL 023311 ENGINEER W. ALLEN CRIBB
11/27/19

New Hanover County Schools
Emlsey A Laney High School
CLOSED CIRCUIT COOLER ADDITION
2700 NORTH COLLEGE ROAD, WILMINGTON, NORTH CAROLINA

PARTIAL FLOOR PLAN
LIGHTING

JOB NO.:	19170
DRAWN:	JLG
DESIGNED:	JLG
CHECKED:	WAC

DRAWING NO:
E-201

REVISION:
0

MECHANICAL PIPE SYMBOLS

	3-WAY CONTROL VALVE
	2-WAY CONTROL VALVE
	BALL VALVE
	BLOCK VALVE / SHUTOFF VALVE
	GAUGE
	PUMP
	ANGLE VALVE
	DRAIN
	CHECK VALVE
	GLOBE VALVE
	FLOW TRANSMITTER
	STEAM TRAP
RPZ	RPZ
NC	NORMALLY CLOSED
	BOILER BLOWDOWN VALVE (SUPPLIED WITH BOILER)
	BOILER STOP CHECK VALVE
	FLANGED BUTTERFLY VALVE
	FLANGE
	FLOW MEASURING ORIFICE

NOTE: ALL ITEMS MAY NOT BE USED IN PROJECT.

MECHANICAL LEGEND

	INDICATES TO DEMOLISH
	EXTENT OF DEMOLITION
	POINT OF CONNECTION

NOTE: ALL ITEMS MAY NOT BE USED IN PROJECT.

MECHANICAL PIPE LEGEND

CWS	CONDENSER WATER SUPPLY
CWR	CONDENSER WATER RETURN
	COOLING TOWER MAKE-UP WATER
(X)CWS	EXISTING CONDENSER WATER SUPPLY
(X)CWR	EXISTING CONDENSER WATER RETURN
	EXISTING COLD WATER

MECHANICAL GENERAL NOTES:

1. ALL MECHANICAL WORK SHALL BE IN STRICT COMPLIANCE WITH ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND STANDARDS.
2. ALL DIMENSIONS AND ELEVATIONS FOR NEW EQUIPMENT, PIPING AND APPARATUS ARE APPROXIMATE AND ARE ONLY FOR CONTRACTOR'S GUIDANCE. CONTRACTOR SHALL SUBMIT DIMENSIONS AND ELEVATIONS VERIFIED IN THE FIELD. PIPING INDICATED ON THE DRAWINGS, SECTIONS AND PROSPECTIVE VIEWS ARE SHOWN DIAGRAMMATICALLY. DUCT AND PIPE ELEVATIONS IN EXACT LOCATIONS SHALL BE DETERMINED BY THE INSTALLING CONTRACTOR AND DETAILED ON THE SHOP DRAWINGS.
3. CONTRACTOR MUST ACCOUNT FOR THE THICKNESS OF EXTERIOR INSULATION WHEN DETERMINING INSTALLATION CLEARANCES.
4. THE CONTRACTOR SHALL TEMPORARILY COVER ALL EXPOSED PIPE OPENINGS WITH A NON-COMBUSTIBLE MATERIAL, AND SEAL THEM AIR TIGHT TO PREVENT CONTAMINATION OF THE RESPECTIVE SYSTEMS DURING CONSTRUCTION.
5. CONTRACTOR SHALL REMOVE AND DISPOSE OF OFFSITE ALL DEMOLISHED WORK IN ACCEPTABLE AND SAFE MANNER AND SHALL KEEP ALL NON-WORK AREAS CLEAN AND SAFE.
6. ALL EXISTING EQUIPMENT AND CONNECTIONS THAT NEED TO BE TEMPORARILY DEMOLISHED FOR RIGGING AND / OR INSTALLATION SHALL BE REINSTALLED AND BROUGHT BACK TO ORIGINAL CONDITIONS PRIOR TO TEMPORARY REMOVAL.
7. INSTALL WORK SO AS TO BE READILY ACCESSIBLE FOR OPERATION, MAINTENANCE AND REPAIR. MINOR DEVIATIONS FROM DRAWINGS MAY BE MADE TO ACCOMPLISH THIS, BUT CHANGES WHICH INVOLVE EXTRA COST SHALL NOT BE MADE WITHOUT APPROVAL.

MECHANICAL ABBREVIATIONS

ABBREVIATION	TERM
ADJ	ADJUSTABLE
AMCA	AIR MOVEMENT AND CONTROL ASSOCIATION
AMP	AMPERE (AMP, AMPS)
ASTM	AMERICAN SOCIETY OF TESTING AND MATERIALS
CFM	CUBIC FEET PER MINUTE
CIP	CAST IN PLACE
CMU	CONCRETE MASONRY UNIT
COP	COEFFICIENT OF PERFORMANCE
DB	DRY BULB
DEG OR °	DEGREE
EA	EXHAUST AIR
EG	EXHAUST GRILLE
EAT	ENTERING AIR TEMPERATURE
ECM	ELECTRONICALLY COMMUTATED MOTOR
EER	ENERGY EFFICIENCY RATIO
ESP	EXTERNAL STATIC PRESSURE
F	FAN
°F	FAHRENHEIT
FLA	FULL LOAD AMPS
FT	FEET
HC	HOT WATER COIL
HGT OR H	HEIGHT
HP	HORSEPOWER
HR	HOUR(S)
IN.	INCH
IN.-WG	INCHES WATER GAUGE
KW	KILOWATT
LAT	LEAVING AIR TEMPERATURE
LBS	POUNDS
L	LOUVER
MAX	MAXIMUM
MBH	1000 BTUH
MCA	MINIMUM CIRCUIT AMPACITY
MCWB	MEAN COINCIDENT WET BULB
MIN.	MINIMUM
MOCP	MAXIMUM OVER CURRENT PROTECTION
NEMA	NATIONAL ELECTRICAL MANUFACTURERS ASSOC.
OZ	OUNCE
OA	OUTSIDE AIR
%	PERCENT
RA	RETURN AIR
RG	RETURN GRILLE
RPM	REVOLUTIONS PER MINUTE
RTU	ROOF TOP UNIT
SA	SUPPLY AIR
SF	SQUARE-FEET
SG	SUPPLY GRILLE
SQ	SQUARE
TG	TRANSFER GRILLE
TYP	TYPICAL
UH	UNIT HEATER
V/PH/HZ	VOLT/PHASE/HERTZ
VTR	VENT THROUGH ROOF
W	WIDTH
WB	WET BULB

NOTE: ALL ABBREVIATIONS MAY NOT BE USED IN PROJECT.

MECHANICAL DEMOLITION NOTES

1. THE CONTRACTOR SHALL REVIEW THE DRAWINGS AND SPECIFICATIONS FOR DEMOLITION REQUIREMENTS AND LAYOUT HIS WORK IN A COMPATIBLE AND COMPLEMENTARY MANNER. REMOVE ALL EQUIPMENT,SUPPORTS, CONTROLS, ACCESSORIES, ETC..., AND MECHANICAL ITEMS MADE OBSOLETE BY THESE ALTERATIONS AS SHOWN IN THE MECHANICAL DRAWINGS. ALL ITEMS TO BE REMOVED OR MODIFIED MAY NOT BE SHOWN, HOWEVER, THIS CONTRACTOR SHALL REMOVE ANY MECHANICAL WORK AS REQUIRED BY THE CONSTRUCTION OR AS DIRECTED BY THE OPERATIONS AND MAINTENANCE DEPARTMENT OF THE SCHOOL SYSTEM. SURVEY THE AFFECTED AREAS BEFORE SUBMITTING A BID.
2. SCHEDULING OF DEMOLITION - COORDINATE SCHEDULING OF MECHANICAL DEMOLITION WORK WITH THE SCHOOL SCHEDULE AND SCHOOL SYSTEM SO AS TO MINIMIZE DISRUPTION OF THE SCHOOL'S USE OF THE FACILITIES AND MAINTAIN THE CONSTRUCTION SEQUENCE. SEE DRAWINGS AND SPECIFICATIONS FOR ADDITIONAL INSTRUCTIONS CONCERNING PHASING AND SEQUENCE OF WORK.
3. DEMOLISHED MATERIALS - UNLESS SPECIFICALLY REQUESTED BY THE OPERATIONS AND MAINTENANCE DEPARTMENT OF THE SCHOOL SYSTEM, ALL DEMOLISHED MECHANICAL MATERIALS SHALL BECOME THE PROPERTY OF THE CONTRACTOR AND SHALL BE REMOVED FROM THE SITE AND DISPOSED OF PROPERLY.
4. CUTTING AND PATCHING - PERFORM CUTTING AND PATCHING FOR MECHANICAL WORK SO AS TO MINIMIZE DAMAGE TO CEILINGS, FLOORS AND WALLS.
5. THESE DRAWINGS ARE COMPILED BY THE ENGINEER FROM THE OPERATIONS AND MAINTENANCE DEPARTMENT OF THE SCHOOL SYSTEM'S AS-BUILT RECORD DRAWINGS AND LIMITED FIELD VERIFICATION OF EXISTING CONDITIONS FOR THE PURPOSE OF INDICATING THE WORK REQUIRED AND ARE BELIEVED TO BE CORRECT. NOTWITHSTANDING, THE CONTRACTOR SHALL VERIFY ALL PIPING, EQUIPMENT LOCATIONS, DIMENSIONS AND ALL FIELD CONDITIONS AFFECTING HIS WORK.
6. WHERE MECHANICAL SYSTEMS PASS THROUGH THE DEMOLITION AREAS TO SERVE OTHER PORTIONS OF THE PREMISES, THEY SHALL REMAIN OR BE SUITABLY RELOCATED AND THE SYSTEM RESTORED TO NORMAL OPERATION. ADVISE THE OPERATIONS AND MAINTENANCE DEPARTMENT OF THE SCHOOL SYSTEM IMMEDIATELY IF SUCH CONDITIONS ARE UNCOVERED BEFORE PROCEEDING WITH ADDITIONAL WORK.
7. PROTECT ALL EXISTING LIFE SAFETY SYSTEMS, FIRE ALARM AND PUBLIC ADDRESS SYSTEMS AND MAINTAIN THEM IN OPERATION THROUGHOUT THE PROGRESS OF THE WORK. NOTIFY THE OPERATIONS AND MAINTENANCE DEPARTMENT OF THE SCHOOL SYSTEM IN WRITING OF SHUTDOWNS ARE REQUIRED PRIOR TO ANY OUTAGE OF SERVICE. WHERE THE DURATION OF A PROPOSED OUTAGE CANNOT BE TOLERATED BY THE SCHOOL, PROVIDE TEMPORARY CONNECTIONS AS REQUIRED MAINTAINING SERVICE.
8. SURVEY THE AFFECTED AREAS BEFORE STARTING DEMOLITION AS ALL EXISTING CONDITIONS CANNOT BE COMPLETELY DEPICTED ON THE DRAWINGS AND SOME UNUSUAL CONDITIONS EXIST.
9. IF ANY UNUSUAL STRUCTURAL OR ARCHITECTURAL CONDITIONS ARE ENCOUNTERED DURING DEMOLITION, CONTACT THE OPERATIONS AND MAINTENANCE DEPARTMENT OF THE SCHOOL SYSTEM FOR ASSISTANCE.

DDC SYSTEM INTEGRATION NOTE:

THE ENERGY MANAGEMENT AND CONTROL SYSTEM INCLUDES ALL CONTROL POINTS, SEQUENCES, PROGRAMMING, AND GRAPHIC UPDATES FOR NEW AND EXISTING HVAC EQUIPMENT MODIFIED UNDER THIS PROJECT TO MATCH THE BUILDING STANDARD FOR A COMPLETE AND OPERABLE SYSTEM.

CLOSED CIRCUIT COOLING TOWER SCHEDULE

DRAWING CODE	DESIGN BASIS MFR	MODEL	ALTERNATE APPROVED MFRS	CAPACITY (MBH)	AIR SIDE				WATER SIDE					ELECTRICAL																		SOUND DATA										OPERATING WEIGHT (LBS)	NOTES	ACCESSORIES
					MOTOR(S) (QUAN.)	AIRFLOW (CFM)	HP #1 EA.	HP #2 EA.	FLOW (GPM)	EWT (°F)	LWT (°F)	EAT (°Fwb)	PRES. DROP (FT. H2O)	FAN VOLTAGE (V/PH/HZ)	FAN FLA #1 (AMPS)	FAN FLA #2 (AMPS)	FAN MCA (AMPS)	FAN MOCP (AMPS)	PUMP HP	PUMP VOLTAGE (V/PH/HZ)	PUMP FLA (AMPS)	PUMP MCA (AMPS)	PUMP MOCP (AMPS)	BASIN HEATER(S) QUAN.	BASIN HEATER(S) kW EA.	BASIN HEATER(S) VOLTAGE (V/PH/HZ)	BASIN HEATER(S) MCA (AMPS)	BASIN HEATER(S) MOCP (AMPS)	S.P.L. dB(A) AT 5' END	S.P.L. dB(A) AT 5' MOTOR SIDE	S.P.L. dB(A) AT 5' OPP END	S.P.L. dB(A) AT 5' OPP MTR SIDE	S.P.L. dB(A) AT 5' TOP	S.P.L. dB(A) AT 50' END	S.P.L. dB(A) AT 50' MOTOR SIDE	S.P.L. dB(A) AT 50' OPP END	S.P.L. dB(A) AT 50' OPP MTR SIDE	S.P.L. dB(A) AT 50' TOP			
(X) CCCT01	BAC	FVX - LQ661	N/A	7,015	2	-	10.0	20.0	1,220	104.0	92.5	80	17.3	460/3/60	14.0	27.0	-	-	7.5	460/3/60	11.0	-	-	1	16.0	460/3/60	19.4	-	-	-	-	-	-	-	-	-	-	-	-	-	6		-
CCCT02	BAC	FXV-1218C-36H-L	BAC, MARLEY	8,418	2	124,300	7.5	15.0	1,440	104.0	92.5	80	12.0	460/3/60	9.0	18.0	-	-	10.0	460/3/60	12.0	-	-	1	16.0	460/3/60	19.4	-	69.0	71.0	69.0	80.0	87.0	63.0	64.0	63.0	67.0	74.0	43,100		1,2,3,4,5	A THRU 0

NOTES:
1. REFER SPECIFICATION SECTION 236500 - CLOSED CIRCUIT COOLING TOWERS FOR FURTHER INFORMATION.
2. PROVIDE AUTOMATIC DRAIN VALVES AND AIR VENTS IN THE PIPING TO AND FROM THE COOLER TO ALLOW EMERGENCY DRAINING DURING FREEZE CONDITIONS IN THE EVENT OF POWER OR CONTROLS FAILURE.
3. THE MAKE-UP WATER SUPPLY, OVERFLOW AND DRAIN LINES, AS WELL AS THE PUMP AND PUMP PIPING UP TO THE OVERFLOW LEVEL MUST BE HEAT TRACED AND INSULATED. OTHER CONNECTIONS OR ACCESSORIES AT OR BELOW THE WATER LEVEL MUST BE HEAT TRACED AND INSULATED.
4. CHEMICAL TREATMENT PROVIDED FROM CHEMICAL TREATMENT STORAGE SHED ADJACENT TO TOWER..
5. CLOSED CIRCUIT COOLING TOWER CCCT02 SIZED/SCHEDULED FOR FUTURE CAPACITY.
6. EXISTING CLOSED CIRCUIT COOLING TOWER TO REMAIN.

ACCESSORIES:
A. PROVIDE PREMIUM EFFICIENCY INVERTER DUTY MOTORS FOR VFD.
B. STAINLESS STEEL UNIT CONSTRUCTION.
C. ULTRA LOW NOISE FAN (MANUFACTURERS OFFERING FOR LOWEST NOISE).
D. GALVANIZED STEEL FAN GUARD.
E. PVC FILL AND DRIFT ELIMINATORS.
F. GALVANIZED STEEL, FULL CIRCUIT COIL.
G. INTEGRAL PUMPS WITH END MAKE-UP DRAIN AND OVERFLOW CONNECTIONS.
H. ELECTRIC WATER LEVEL CONTROL. STANDPIPE ASSEMBLY, MAKE UP PIPING AND SOLENOID VALVE MUST BE HEAT TRACED AND INSULATED.
I. ELECTRICAL IMMERSION HEATERS SIZED TO MAINTAIN +40F WATER AT A 0F AMBIENT WITH ELECTRICAL.
J. COPPER HEATER ELEMENTS.
K. HEATER CONTROL PANEL WITH CONNECTOR AND DISCONNECT.
L. MECHANICAL VIBRATION CUTOUT SWITCH.
M. INTERNAL WALKWAY AND LADDER.
N. MOUNT ON STRUCTURAL CONCRETE CURBS, LENGTH AND WIDTH DISTANCES PER MANUFACTURER. PROVIDE 3/4" VIBRATION ISOLATION PADS BETWEEN TOWER CONCRETE CURBS.
O. DISCHARGE HOOD WITH POSITIVE CLOSURE DAMPERS.

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NORTH CAROLINA PROFESSIONAL SEAL 23551 ENGINEER DAVID M. HAHN 11/27/19

New Hanover County Schools
Emlsey A Laney High School
CLOSED CIRCUIT COOLER ADDITION
2700 NORTH COLLEGE ROAD, WILMINGTON, NORTH CAROLINA

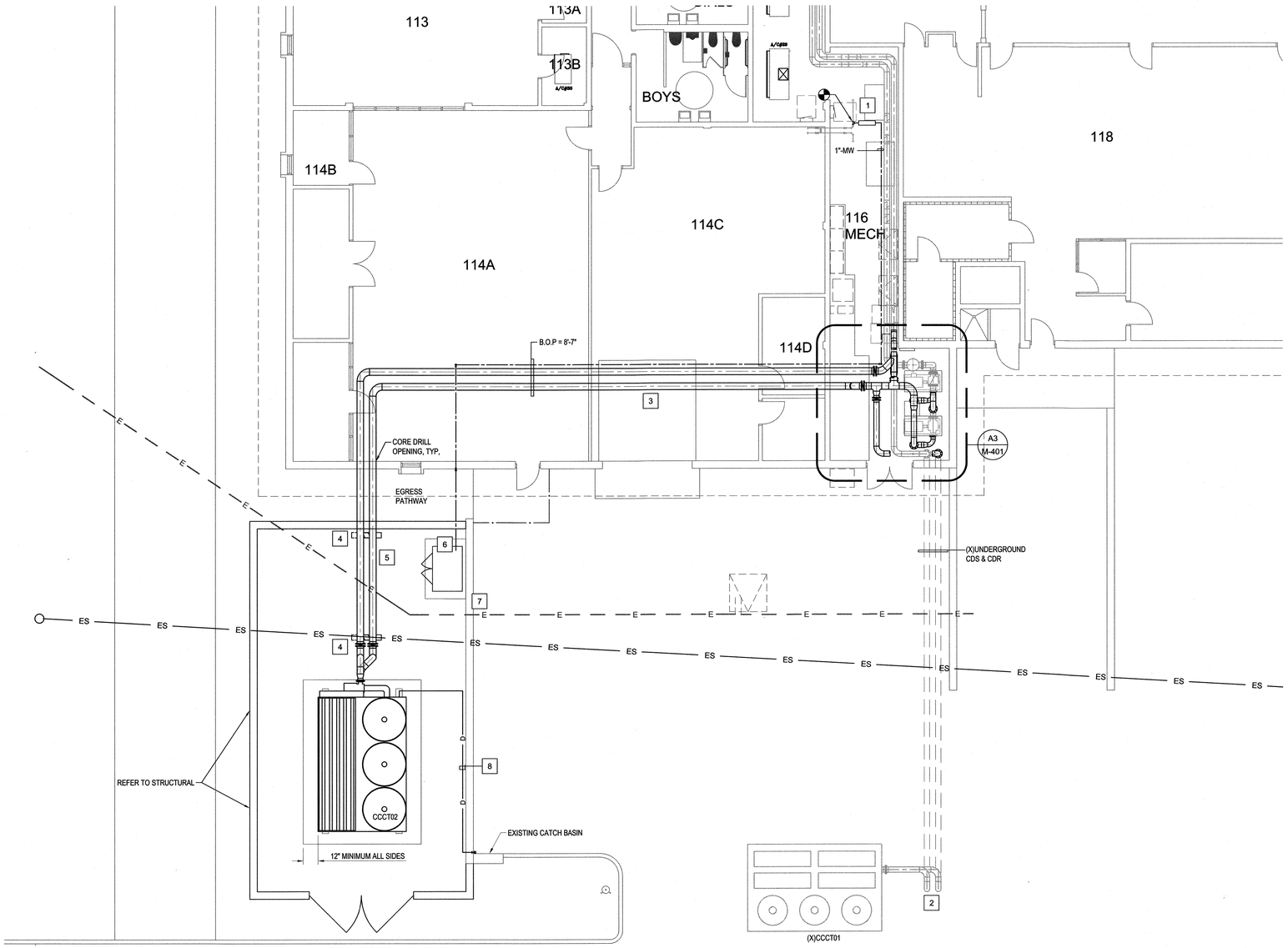
MECHANICAL
NOTES,LEGEND, ABBREVIATIONS
AND SCHEDULES

JOB NO.:	19170
DRAWN:	RWC
DESIGNED:	RWC
CHECKED:	DMH

DRAWING NO:
M-001

REVISION:
0

NHCS PROJECT NUMBER 20-9216-1



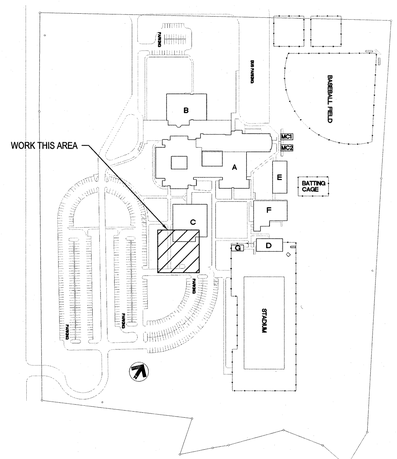
A1 **FLOOR PLAN**
1/8" = 1'-0"

PLAN NORTH

GENERAL NOTES

KEYED NOTES

1. CONNECT INTO DOMESTIC COLD WATER PIPING. ADD RPZ AFTER TIE-IN. FIELD ROUTE IN MECHANICAL ROOM. MAINTAIN CLEARANCES FOR EXISTING EQUIPMENT AND ROOF ACCESS LADDER. DO NOT ROUTE OVER ELECTRICAL EQUIPMENT.
2. INSTALL FLOW METER IN VERTICAL PIPING TO AND FROM (X)CCCT01. INSTALL PER MANUFACTURERS RECOMMENDATIONS. REINSULATE PIPING. CONTROL WIRING BY CONTROLS CONTRACTOR.
3. ROUTE CDS, CDR AND MAKE-UP WATER TO CCCT02 THROUGH VOCATIONAL SHOPS. ROUTE UNDER EXISTING SHOP OVERHEAD DOOR. MAINTAIN MAXIMUM CLEARANCE HEIGHT WITHOUT COMPROMISING DOOR OPERATION.
4. PROVIDE PIPE RACK TO SUPPORT 10"-CDS AND CDR. PIPE RACK MUST BE INSTALLED INSIDE WALLED SPACE AS SHOWN. VERIFY LOCATION OF EXISTING UNDERGROUND SERVICES BEFORE CONSTRUCTION. SEE STRUCTURAL DRAWINGS FOR PIPE RACK DETAILS. PIPE RACK MUST BE INSTALLED TO KEEP PIPING LEVEL.
5. EXTERIOR EXPOSED PIPING TO BE INSULATED PER SPECIFICATIONS.
6. 1"-TOWER MAKE-UP WATER PIPING TO BE ROUTED IN TRENCH WITH ELECTRICAL CONDUIT TO CHEMICAL FEED SYSTEM IN BUILDING. VERIFY LOCATION OF UNDERGROUND UTILITIES BEFORE CONSTRUCTION.
7. DOUBLE DOOR 4' x 6' PRE-MANUFACTURED CHEMICAL TREATMENT STORAGE SHED ANCHORED TO HOUSEKEEPING PAD. CRAFTSMAN MODEL CMXRSSC6250 OR APPROVED EQUAL.
8. PROVIDE DRAIN FROM CCCT02 TO LOCATION SHOWN. PROVIDE ADEQUATE SUPPORTS AND MAINTAIN MAXIMUM CLEARANCE HEIGHT.



A5 **KEYPLAN**
NOT TO SCALE

PLAN NORTH

NHCS PROJECT NUMBER 20-9216-1

Revision No	DESCRIPTION:	Date:
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REVISIONS

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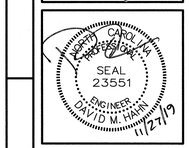


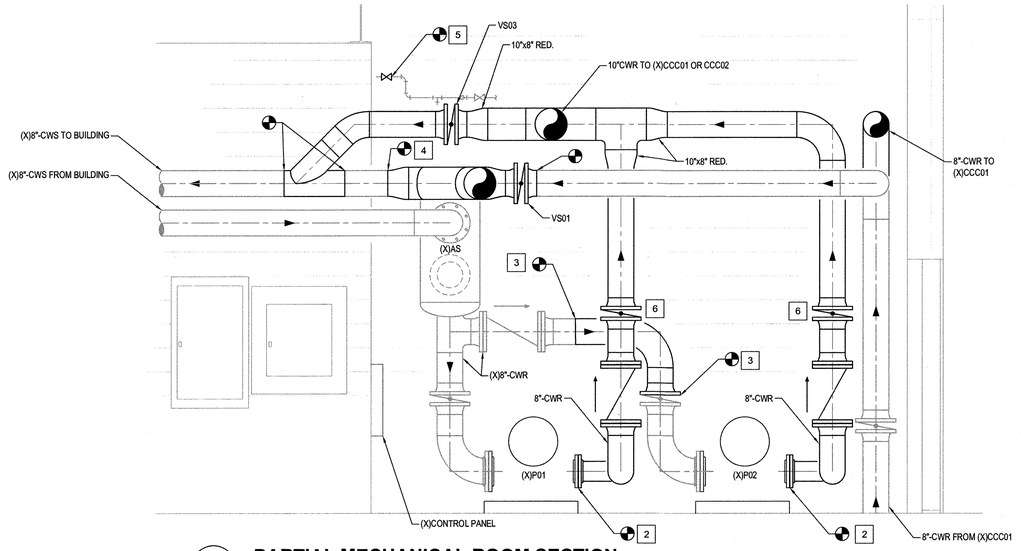
New Hanover County Schools
Emlsey A Laney High School
CLOSED CIRCUIT COOLER ADDITION
2700 NORTH COLLEGE ROAD, WILMINGTON, NORTH CAROLINA

FLOOR PLAN

JOB NO.:	19170
DRAWN:	RWC
DESIGNED:	RWC
CHECKED:	DMH

DRAWING NO:
M-101

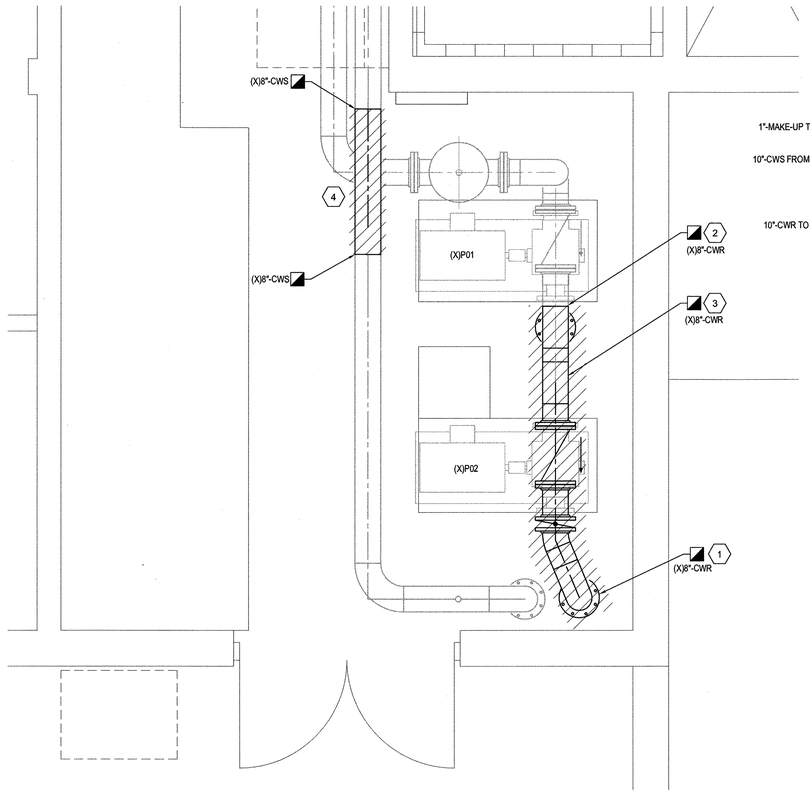
REVISION:
0



C3 PARTIAL MECHANICAL ROOM SECTION

1/2" = 1'-0"

0 1' 2' 4'

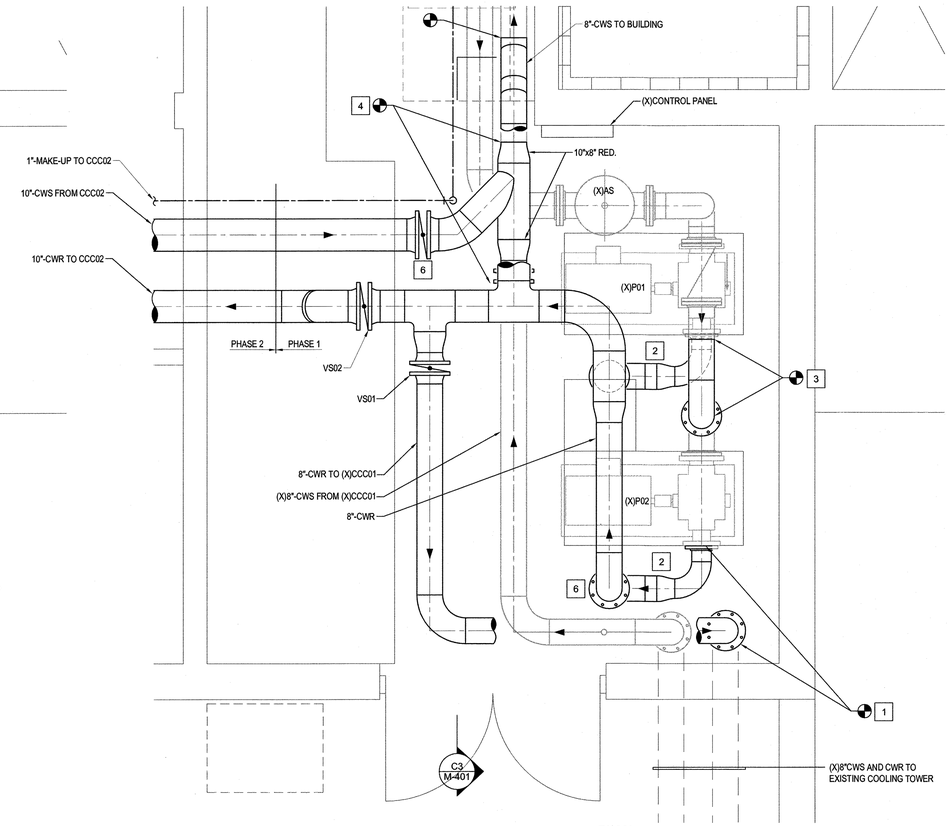


A1 PARTIAL MECHANICAL ROOM DEMOLITION PLAN

1/2" = 1'-0"

0 1' 2' 4'

PLAN NORTH



A3 PARTIAL MECHANICAL ROOM PLAN

1/2" = 1'-0"

0 1' 2' 4'

PLAN NORTH

GENERAL NOTES

KEYED NOTES

1. PROVIDE 8"-CWR PIPING TO FLANGE SET AT FLOOR.
2. PROVIDE 6"-CWR PIPING FROM (X)P01. ECCENTRIC 8"x6" REDUCER MUST BE INSTALLED AS FLAT ON TOP TO VERTICALLY MOUNTED 8" CHECK VALVE AND 8" SHUT-OFF VALVE. 10"X8" REDUCER TO 10" HEADER AS SHOWN IN SECTION C3/M-401.
3. PROVIDE 8"-CWR PIPING FROM HEADER DOWN TO SHUT-OFF VALVE AT (X)P02.
4. PROVIDE TWO 10"x8" REDUCERS, 8" BUTTERFLY VALVE AND FLANGES AND A 10" 45° LATERAL FITTING.
5. REPLACE BROKEN EXISTING GATE VALVE WITH 1" BALL VALVE.
6. MANUAL ISOLATION VALVE.

KEYED DEMOLITION NOTES

1. DEMOLISH EXISTING 8"-CWR TO EXISTING COOLING TOWER DOWN TO FLANGE SET.
2. 6" FLANGE AND REDUCER ATTACHED TO PUMP TO BE DEMOLISHED UP TO AND INCLUDING TEE AT HEADER.
3. DEMOLISH 8" TEE DOWN TO EXISTING SHUT-OFF VALVE.
4. DEMOLISH 8"-CWS PIPE TO ACCEPT TWO 10"x8" REDUCERS, AN 8" BUTTERFLY VALVE WITH FLANGES AND A 10" 45° LATERAL FITTING.

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23551 ENGINEER DAVID M. HAHN 11/27/19

New Hanover County Schools
Emlsey A Laney High School
CLOSED CIRCUIT COOLER ADDITION
2700 NORTH COLLEGE ROAD, WILMINGTON, NORTH CAROLINA

ENLARGED PLANS

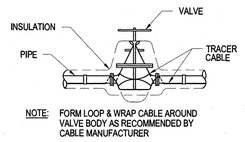
JOB NO.:	19170
DRAWN:	RWC
DESIGNED:	RWC
CHECKED:	DMH

DRAWING NO:

M-401

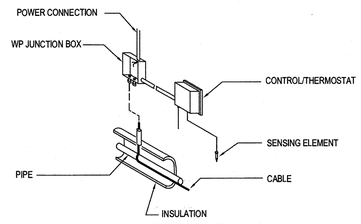
REVISION:
0

NHCS PROJECT NUMBER 20-9216-1



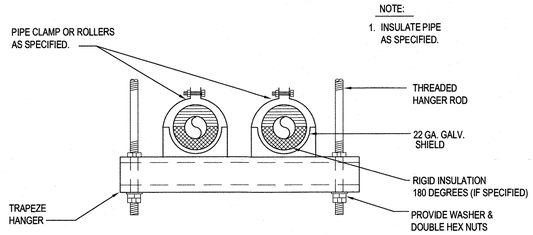
NOTE: FORM LOOP & WRAP CABLE AROUND VALVE BODY AS RECOMMENDED BY CABLE MANUFACTURER

D1 TYPICAL WATER VALVE TRACING PATTERN
NOT TO SCALE

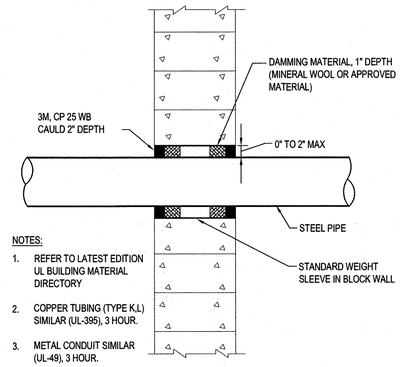


CONTROL INSTALLATION

D2 FREEZE PROTECTION CABLE DETAIL
NOT TO SCALE



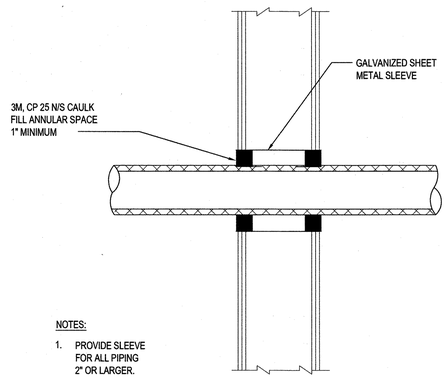
D3 TRAPEZE HANGER
NOT TO SCALE



NOTES:
1. REFER TO LATEST EDITION UL BUILDING MATERIAL DIRECTORY
2. COPPER TUBING (TYPE K,L) SIMILAR (UL-395), 3 HOUR.
3. METAL CONDUIT SIMILAR (UL-49), 3 HOUR.

NON-INSULATED METAL PIPE AND METAL CONDUIT THROUGH PENETRATION FIRESTOP SYSTEM (UL#CAJ1044) ONE, TWO, AND THREE HOUR CONCRETE AND BLOCK WALL

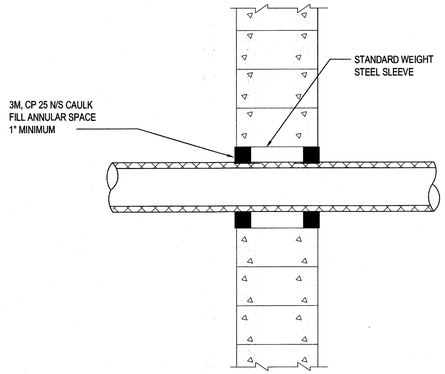
C5 PENETRATION DETAIL
NOT TO SCALE



NOTES:
1. PROVIDE SLEEVE FOR ALL PIPING 2" OR LARGER.

INSULATED AND NON-INSULATED METAL PIPE AND CONDUIT
NON RATED GYPSUM WALL

B1 PENETRATION DETAIL
NOT TO SCALE



INSULATED AND NON-INSULATED METAL PIPE AND CONDUIT
NON-RATED CONCRETE OR BLOCK WALL

B2 PENETRATION DETAIL
NOT TO SCALE

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New Hanover County Schools
Emlsey A Laney High School
CLOSED CIRCUIT COOLER ADDITION
2700 NORTH COLLEGE ROAD, WILMINGTON, NORTH CAROLINA

MECHANICAL DETAILS

JOB NO.:	19170
DRAWN:	RWC
DESIGNED:	RWC
CHECKED:	DMH

DRAWING NO:
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REVISION:
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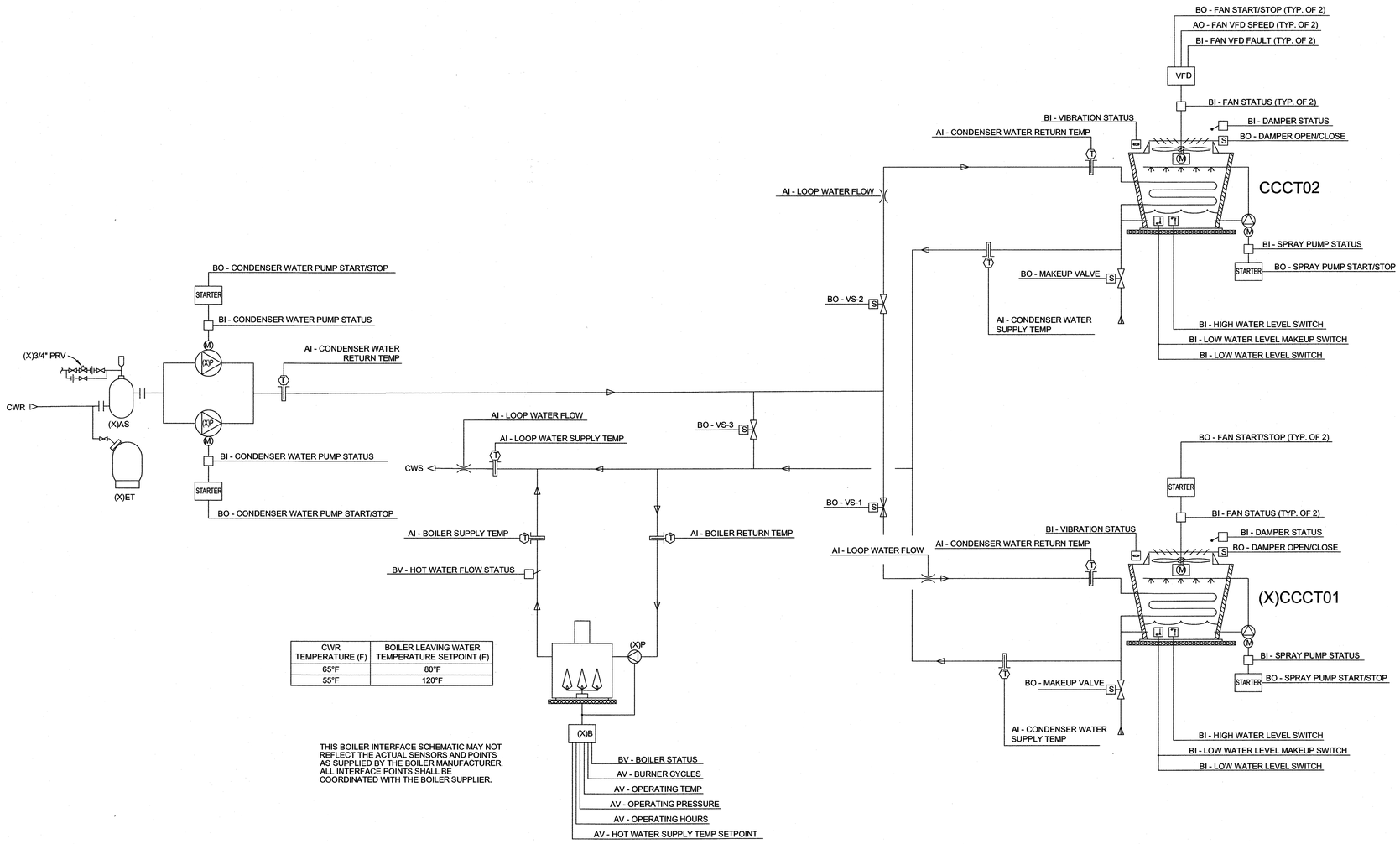

CWR TEMPERATURE (F)	BOILER LEAVING WATER TEMPERATURE SETPOINT (F)
65°F	80°F
55°F	120°F

THIS BOILER INTERFACE SCHEMATIC MAY NOT REFLECT THE ACTUAL SENSORS AND POINTS AS SUPPLIED BY THE BOILER MANUFACTURER. ALL INTERFACE POINTS SHALL BE COORDINATED WITH THE BOILER SUPPLIER.

B3 WATER LOOP CONTROL SCHEMATIC
NOT TO SCALE

DDC CONTRACTOR RESPONSIBLE FOR 120V POWER AND LOW VOLTAGE FOR CONTROL SYSTEM. REFER TO ELECTRICAL DRAWINGS FOR DEDICATED BREAKERS PROVIDING 120V POWER SOURCE.

WATER LOOP SEQUENCE OF OPERATION

SYSTEM START/STOP CONTROL:

START/STOP SYSTEM BASED ON (1) USER-DEFINED "ON/OFF" SCHEDULE, (2) DEMAND FOR HEATING OR COOLING BY SECONDARY SYSTEMS AS USER-DEFINED, OR (3) OPERATOR COMMAND, AS FOLLOWS:

"OFF" PERIOD:
COMMAND LOOP PUMPS, BOILERS, AND CLOSED CIRCUIT COOLERS "OFF" UNLESS FIVE (ADJ.) OR MORE WSHP UNITS ARE COMMANDED "ON." IF OFF PLANT CONTROL IS REQUIRED, STARTUP AND CONTROL SEQUENCE WILL BE THE SAME AS THE ON SEQUENCE BELOW

"ON" PERIOD:
COMMAND ONE CONDENSER WATER LOOP PUMP, (X)P01 OR (X)P02 "ON". CONFIRM PUMP STATUS.

CONFIRM LOOP FLOW VIA DIFFERENTIAL PRESSURE INDICATION, MONITORED FROM THE DIFFERENTIAL PRESSURE TRANSMITTED INSTALLED IN THE MAIN MECHANICAL ROOM THAT THE PUMPS ARE LOCATED IN.

IF PUMP FAILS TO START OR LOOP FLOW IS NOT CONFIRMED WITHIN 2 MINUTES, COMMAND PUMP "OFF," INITIATE ALARM, AND COMMAND SECOND PUMP "ON."

THE LEAD/LAG OPERATION SHALL ALTERNATE THE PUMPS BASED ON RUNTIME WHENEVER THE SYSTEM IS ENABLED FROM A DISABLED STATE. A TRANSITION FROM A DISABLED TO ENABLED STATED WILL OCCUR ANYTIME THE PLANT IS REQUIRED TO RUN, BASED ON THE START/STOP SEQUENCE ABOVE. THE CONDENSER WATER PUMP WITH THE LOWEST RUNTIME WILL BECOME THE LEAD.

EACH PUMP SHALL HAVE A MAINTENANCE SWITCH, P#-MS, WHICH CAN BE SET TO "DISABLED" TO REMOVE THAT PUMP FROM THE STAGING LOGIC IN THE EVENT OF A MECHANICAL FAILURE. DEFAULT VALUE FOR THE MAINTENANCE SWITCH IS ENABLED.

"ON" PERIOD CONDENSER WATER TEMPERATURE CONTROL:

MAINTAIN CWR TEMPERATURE AT HEATING SETPOINT OF 70 DEG F:
IF CWR TEMPERATURE FALLS BELOW 60°F SETPOINT, MODULATE LOOP BYPASS VALVE TO DIVERT FLOW TO BOILERS AND ENABLE BOILER(S) OPERATION PER BOILER STAGING SEQUENCE BELOW. WHEN CONDENSER WATER LOOP RETURN TEMPERATURE RISES TO 75°F, DISABLE BOILER(S) OPERATION.

MAINTAIN CWR TEMPERATURE AT COOLING SETPOINT OF 75 DEG F:
IF CWR TEMPERATURE RISES ABOVE 85°F SETPOINT, MODULATE LOOP BYPASS VALVE TO DIVERT FLOW TO CLOSED CIRCUIT COOLERS AND ENABLE CLOSED CIRCUIT COOLER OPERATION PER CLOSED CIRCUIT COOLERS STAGING SEQUENCE BELOW. WHEN CONDENSER WATER LOOP RETURN TEMPERATURE FALLS TO 70°F, DISABLE CLOSED CIRCUIT COOLER OPERATION.

CONDENSER WATER LOOP RETURN HEATING SETPOINT "CWRHT-SP"
CONDENSER WATER LOOP RETURN COOLING SETPOINT "CWRCT-SP"

START/STOP BOILER AS FOLLOWS:

COMMAND BOILER ISOLATION VALVE "OPEN".

COMMAND BOILER HOT WATER PUMP "ON".
CONFIRM PUMP STATUS.
CONFIRM HOT WATER FLOW THROUGH BOILER VIA DIFFERENTIAL PRESSURE FLOW SENSOR.
IF EITHER THE BOILER PUMP STATUS OR THE DIFFERENTIAL PRESSURE SWITCH DOES NOT CONFIRM PUMP OPERATION AND/OR FLOW, THE BOILER PUMP, AND THE BOILER WILL BE SHUTDOWN, AN ALARM WILL BE GENERATED THAT WILL REQUIRE AN OPERATOR RESET THROUGH THE DDC SYSTEM. THIS INCLUDES CLOSING THE ISOLATION VALVE.

COMMAND BOILER "ON" THROUGH HARDWIRED COMMAND TO BOILER.
IF BOILER FAILS TO START WITHIN 3 MINUTES, IF THE BOILER LEAVING WATER TEMPERATURE DOES NOT INCREASE, OR IF THE BOILER INDICATES AN INTERNAL ALARM/FAULT THE BOILER WILL BE SHUTDOWN, AN ALARM WILL BE GENERATED THAT WILL REQUIRE AN OPERATOR RESET THROUGH THE DDC SYSTEM. THIS INCLUDES COMMAND IN THE BOILER PUMP AND THE ISOLATION VALVE CLOSED.

CLOSED CIRCUIT COOLERS STAGING SEQUENCE:

MAINTAIN CONDENSER WATER SUPPLY TEMPERATURE AT 75°F SETPOINT

START/STOP EACH STAGE OF CLOSED CIRCUIT COOLERS IN SEQUENCE, AS REQUIRED TO MAINTAIN CWS TEMPERATURE AT SETPOINT, AS FOLLOWS:

STAGE 1: ON A RISE OF CWS WATER TEMPERATURE ABOVE SETPOINT, OPEN DISCHARGE AIR DAMPERS AND ISOLATION VALVES ON BOTH CLOSED CIRCUIT COOLERS.

STAGE 2: ON A CONTINUED RISE OF CWS TEMPERATURE ABOVE SETPOINT, COMMAND EVAPORATIVE COOLING SPRAY PUMP ON BOTH CIRCUIT COOLERS "ON."

STAGE 3: ON A CONTINUED RISE OF CWS TEMPERATURE ABOVE SETPOINT, COMMAND FAN ON BOTH CIRCUIT COOLERS "ON" ACCORDINGLY. COMMAND SMALL FAN ON (X) CCCT01 TO MAINTAIN CWS TEMPERATURE AND MODULATE THRU VFD FOR CCCT02 TO MAINTAIN CWS TEMPERATURE.

STAGE 4: ON A CONTINUED RISE OF CWS TEMPERATURE ABOVE SETPOINT, COMMAND LARGE FAN ON (X) CCCT01 TO MAINTAIN CWS TEMPERATURE.

CLOSED CIRCUIT COOLING TOWER FREEZE PROTECTION:

WHEN OUTSIDE AIR TEMPERATURES ARE BELOW 38 DEG F (ADJ.), AUXILIARY HEAT LOAD AND MINIMUM FLOW RATE AS DETERMINED BY MANUFACTURER MUST BE MAINTAINED ON THE COIL AT ALL TIMES SO THAT THE WATER TEMPERATURE DOES NOT DROP BELOW 50 DEG F WHEN THE COOLER IS SHUT DOWN.

WHEN THE UNIT IS OFF AND OUTSIDE AIR TEMPERATURE ARE BELOW 38 DEG F (ADJ.), ENERGIZE BASIN HEATER.

ROTATE CLOSED CIRCUIT COOLER "ON/OFF" SEQUENCE TO EQUALIZE RUNTIME BETWEEN CLOSED CIRCUIT COOLERS:

THE LEAD/LAG OPERATION WILL ALTERNATE THE CLOSED CIRCUIT COOLERS BASED ON RUNTIME WHENEVER THE SYSTEM IS ENABLED FROM A DISABLED STATE. A TRANSITION FROM A DISABLED TO ENABLED STATED WILL OCCUR ANYTIME THE PLANT IS REQUIRED TO RUN, BASED ON THE START/STOP SEQUENCE ABOVE. THE CLOSED CIRCUIT COOLER WITH THE LOWEST RUNTIME WILL BECOME THE LEAD.

EACH CLOSED CIRCUIT COOLERS WILL ALSO HAVE A MAINTENANCE SWITCH, CCCT#-MS, WHICH CAN BE SET TO "DISABLED" TO REMOVE THAT CLOSED CIRCUIT COOLER FROM THE STAGING LOGIC IN THE EVENT OF A MECHANICAL FAILURE. DEFAULT VALUE FOR THE MAINTENANCE SWITCH IS ENABLED.

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New Hanover County Schools
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CLOSED CIRCUIT COOLER ADDITION
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MECHANICAL CONTROLS

JOB NO.:	19170
DRAWN:	RWC
DESIGNED:	RWC
CHECKED:	DMH

DRAWING NO:
M-601

REVISION:
0

NHCS PROJECT NUMBER 20-9216-1

GENERAL NOTES:

DESIGN LOADS:
1. 2018 NC STATE BUILDING CODE/2015 IBC & ASCE/SEI 7-10
2. BUILDING CLASSIFICATION RISK: CATEGORY III
3. DESIGN LIVE LOADS (OPERATING) – COOLING TOWER: 43,100 LBS
4. WIND DESIGN:
   DESIGN WIND VELOCITY: 154 MPH (ULT)
   EXPOSURE CATEGORY: B
   DIRECTIONALITY FACTOR: Kd = 0.85
   DESIGN BASE SHEAR: Vx = 8.5 KIPS; Vy = 14.20 KIPS
   COMPONENTS & CLADDING PRESSURES:
   MAX SCREEN WALL PRESSURE: 36.8 PSF
   CHAIN LINK FENCE WIND PRESSURE (90% SOLID): 21.2 PSF (ULT)
5. SNOW DESIGN:
   IMPORTANCE FACTOR: Is = 1.10
   GROUND SNOW LOAD: Pg = 10 PSF
   SNOW EXPOSURE FACTOR: Ce = 1.0
   THERMAL FACTOR: Ct = 1.2
   DESIGN SNOW LOAD: Pf = 9.2 PSF
6. SEISMIC DESIGN:
   RISK CATEGORY: III
   SITE CLASS: D (TAKEN FROM ADJ. BLDG. ECS REPORT #22.23296)
   SEISMIC DESIGN CATEGORY: C
   SPECTRAL RESPONSE COEFFICIENTS: Sds = 22.3%g; Sd1 = 14.35%g
   SPECTRAL RESPONSE ACCELERATION: S_S = 20.9%g; S_1 = 8.9%g
   COMPONENT AMPLIFICATION FACTOR: ap = 1.0
   COMPONENT RESPONSE MODIFICATION FACTOR: R_p = 2.5
   SEISMIC RESPONSE COEFFICIENT: Fp = $0.036W_p$
   COMPONENT IMPORTANCE FACTOR: Ip = 1.0
   SEISMIC DEMANDS ON NONSTRUCTURAL COMPONENTS
   DESIGN BASE SHEAR: Vx=Vy= 1.54 KIPS

GENERAL:
1. CONTRACTOR SHALL PROVIDE ALL LAYOUT REQUIRED TO CONSTRUCT HIS WORK.
2. THE CONTRACTOR SHALL FIELD VERIFY EXISTING DIMENSIONS AND CONDITIONS WHERE NEW CONSTRUCTION JOINS EXISTING CONSTRUCTION. CONTRACTOR SHALL NOTIFY THE ENGINEER UPON DISCREPANCIES WITH DRAWINGS.
3. ALL WORK IS TO CONFORM TO THE LATEST REVISIONS OF ALL APPLICABLE FEDERAL, STATE AND LOCAL CODES AND REGULATIONS.
4. ALL WORK AREAS ARE TO BE KEPT CLEAN, ORDERLY, AND SAFE ON A DAILY BASIS.
5. ANY MODIFICATIONS TO PLANS, DESIGN OR SPECIFICATIONS MUST HAVE PRIOR APPROVAL BY THE ENGINEER.
6. CONTRACTOR SHALL FURNISH ALL LABOR, MATERIAL, AND EQUIPMENT TO ACCOMPLISH THE WORK AS SHOWN ON THESE PLANS. ANY WORK NECESSARY TO COMPLETE THE WORK SHOWN BUT NOT SPECIFICALLY CALLED OUT, SHALL NOT CONSTRUE REASON FOR CONTRACT MODIFICATION.
7. ANY DAMAGE TO EXISTING PROPERTY, STRUCTURE OR EQUIPMENT MADE BECAUSE OF CONSTRUCTION UNDER THIS CONTRACT MUST BE REPAIRED/REPLACED BY THE CONTRACTOR AT CONTRACTOR'S EXPENSE TO EXISTING CONDITIONS.
8. CONTRACTOR SHALL VERIFY EXISTING CONDITIONS AND DIMENSIONS THAT AFFECT NEW WORK PRIOR TO CONSTRUCTION OR FABRICATION. CONTRACTOR SHALL NOTIFY ENGINEER PRIOR TO CONSTRUCTION OR FABRICATION SHOULD DISCREPANCIES DEVELOP.
9. STRUCTURAL DRAWINGS SHALL BE USED IN CONJUNCTION WITH THE MECHANICAL AND ELECTRICAL DRAWINGS
10. FOR DIMENSIONS NOT SHOWN ON THE DRAWINGS, REFER TO THE MECHANICAL OR ELECTRICAL DRAWINGS.
11. WALLS SHALL BE BRACED BY CONTRACTOR AGAINST WIND, CONSTRUCTION LOADS, AND OTHER TEMP. FORCES, UNTIL ERECTION IS COMPLETE.
12. NO OPENING SHALL BE MADE IN ANY STRUCTURAL MEMBER WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER.
13. NO CHANGES IN SIZE OR DIMENSION OF STRUCTURAL MEMBERS SHALL BE MADE WITHOUT THE WRITTEN APPROVAL OF THE ENGINEER.
14. DO NOT SCALE THESE DRAWINGS, USE DIMENSIONS.

FOUNDATION
1. FOUNDATION & PAD DESIGN BASED ON AN ALLOWABLE SOIL PRESSURE OF 2,000 PSF. AS TAKEN FROM NEARBY ADJACENT BUILDING ADDITIONS GEOTECHNICAL REPORT BY ECS CAROLINAS LLP, DATED AUGUST 18,2015 (ECS #22.23044)
2. REMOVE TOPSOIL, ORGANICS, SOFT CLAY, AND OTHER UNSUITABLE MATERIALS UNDER ALL FLOOR SLABS, FOOTINGS AND 10'-0" BEYOND BUILDING WALLS. BACKFILL AS REQUIRED WITH CLEAN SELECTED FILL COMPACTED IN 8-INCH LAYERS TO A MINIMUM OF 95 PERCENT OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT IN ALL LAYERS UP TO THE UPPER ONE FOOT. FILL TO BE PLACED WITHIN 12 INCHES OF THE DESIGN SUBGRADE ELEVATION IS TO BE COMPACTED TO 98 PERCENT OF THE STANDARD PROCTOR MAXIMUM DRY DENSITY AT OPTIMUM MOISTURE CONTENT. COMPACT UPPER 12" OF EXISTING SUBGRADE TO 95%.
3. AFTER STRIPPING, DENSIFY EXPOSED SANDS BY PROOFROLLING WITH A 10-TON VIBRATORY STEEL-WHEELED ROLLER & ANY SOFT, OR UNSUITABLE SURFACE CONDITIONS, WHICH PUMPS OR RUTS EXCESSIVELY, SHALL BE BROUGHT TO THE ARCHITECT'S ATTENTION. THESE UNSUITABLE SURFACES SHALL BE UNDERCUT & REPLACED WITH GRANULAR BACKFILL SUCH AS #57 STONE.
4. CLEAN SELECT SAND FILL SHALL MEET UNIFIED SOIL CLASSIFICATION OF SP, SP-SM OR SP-SC AND SHALL HAVE A MINIMUM STANDARD PROCTOR DRY DENSITY OF 110 PCF.
5. CONTRACTOR SHALL NOTIFY ENGINEER FOR INSPECTION OF SUBGRADE PRIOR TO POURING ANY CONCRETE.
6. BEARING CAPACITY SHALL BE VERIFIED BY A REGISTERED GEOTECHNICAL ENGINEER PRIOR TO PLACING CONCRETE. WRITTEN REPORTS OF FINDINGS SHALL BE SUBMITTED TO THE ENGINEER.
7. CONTRACTOR SHALL DEWATER AS NECESSARY PRIOR TO EXCAVATING.
8. CONTRACTOR SHALL PROTECT ALL FOUNDATION EXCAVATIONS FROM DETERIORATION DUE TO EXPOSURE TO MOISTURE UNTIL FOUNDATIONS AND BACK FILLING HAVE BEEN COMPLETED.

STRUCTURAL MASONRY
1. ALL MASONRY WALLS ARE CONSIDERED STRUCTURAL MASONRY.
2. COMPRESSIVE STRENGTH OF MASONRY UNITS:
   A. CONCRETE UNITS: (NORMAL WEIGHT) ASTM C90 TYPE II, f'm = 1,900 PSI (MIN.).
      I. PROVIDE INTEGRAL WATER REPELLANT FOR CMU'S AND MORTAR, WHEN TESTED ACCORDING TO ASTM E514
   B. CLAY UNITS: FACE BRICK, ASTM C216, GRADE SW, TYPE FBS, f'm = 3,350 PSI.
      I. INITIAL RATED OF ABSORPTION: LESS THAN 30 G/30 SQ. IN. PER MINUTE WHEN TESTED ACCORDING TO ASTM C67.
      II. PROVIDE BRICK THAT HAS BEEN TESTED ACCORDING TO ASTM C67 AND IS RATED "NOT EFFLORESCED".
      III. PROVIDE FACE BRICK MATCHING COLOR RANGE, TEXTURE AND SIZE OF EXISTING ADJACENT BUILDING'S BRICKWORK.
      IV. PROVIDE TEMPORARY 48" X 48" MOCKUP PANEL FOR OWNER APPROVAL OF BRICK SELECTION.
3. MASONRY GROUT: ASTM C476 GROUT, f'm = 1,900 psi, COARSE TYPE: SLUMP: 8" TO 11".
4. PROVIDE FULL HEIGHT VERTICAL BARS OF SIZE SHOWN ON SECTION, EXTENDING FROM TOP OF SLAB/TOP OF EXISTING GROUT FILL TO THE TOP OF THE WALL WITH A STANDARD 90° HOOK (9") INTO THE NEW UPPER BOND BEAM AND INTO FOOTING. PROVIDE SAME SIZE VERTICAL BARS AT THE FOLLOWING LOCATIONS:
   A. TWO (2) ADD'L BARS WITHIN 4" OF ALL WALL CORNERS & CONTROL JOINTS.
   B. TWO (2) ADD'L BARS WITHIN 16" MAX OF EACH SIDE OF ALL WALL OPENINGS.
   C. TWO (2) ADD'L BARS WITHIN 8" MAX. OF ALL WALL ENDS.
   D. BARS AT SPACING OR QUANTITY AS SHOWN ON PLANS.
5. FILL ALL CORES CONTAINING REINFORCEMENT WITH MASONRY GROUT.
6. PIPE SLEEVES, MISCELLANEOUS OPENINGS, ETC., NOT SHOWN SHALL BE SIZED AND LOCATED AS NOTED ON DRAWINGS BY OTHER DISCIPLINES. COORDINATE ALL REINFORCING FOR ALL OPENINGS PRIOR TO CONSTRUCTION.
7. ALL MASONRY MATERIALS, CONSTRUCTION, INSPECTION, AND TESTING SHALL CONFORM TO THE NORTH CAROLINA STATE BUILDING CODE & BUILDING CODE REQUIREMENTS FOR MASONRY STRUCTURES
8. LAP SPLICES FOR BARS SHALL BE 50 BAR DIAMETERS MINIMUM.
9. PLACE GROUT IN LIFTS NOT EXCEEDING 5 FEET.
10. BOND BEAM REINFORCEMENT AND HORIZONTAL WALL REINFORCEMENT SHALL BE CONTINUOUS AT CORNERS. PROVIDE CORNER REINFORCEMENT TO LAP WITH TYPICAL REINFORCEMENT.
11. HORIZONTAL MASONRY REINFORCING, ASTM A951:
   A. WIRE SIZE FOR SIDE RODS: 3/16-INCH DIAMETER.
   B. WIRE SIZE FOR CROSS RODS: 9 GA
   C. SPACING OF CROSS RODS NOT MORE THAN 16 INCHES ON CENTER.
   D. PROVIDE BUTT-WELDED, LADDER-BOX REINFORCING.
   E. HOT-DIPPED GALVANIZED STEEL.
   F. "250 LADDER-BOX MESH BY HOHMANN AND BARNARD, INC. OR EQUIVALENT.
12. SEALANT: PROVIDE ONE-COMPONENT, HIGH PERFORMANCE, UV-RESISTANT, NONPRIMING, GUNGRADE, ELASTOMERIC POLYURETHANE SEALANT, MEETING ASTM C920, TYPE S, GRADE NS, CLASS 35, USE NT, PLUS 35% MINUS 35% MOVEMENT. COLOR: TO CLOSELY MATCH EXISTING/NEW BRICK COLOR.
13. BACKER RODS AND BOND-BREAKER TAPE: ASTM C1330, TYPE C (CLOSED-CELL MATERIAL WITH A SURFACE SKIN) AND OF SIZE AND DENSITY TO CONTROL SEALANT DEPTH AND OTHERWISE CONTRIBUTE TO PRODUCING OPTIMUM SEALANT PERFORMANCE. PROVIDE POLYETHYLENE, SELF-ADHESIVE TAPE OR OTHER PLASTIC TAPE AS RECOMMENDED BY SEALANT MANUFACTURER FOR PREVENTING SEALANT FROM ADHERING TO JOINT SURFACES AT BACK OF JOINT.
14. SUBMITTALS: SUBMIT MATERIAL CERTIFICATES FOR ALL MASONRY UNITS, REPELLENTS, CEMENTITIOUS MATERIALS, MORTAR ADMIXTURES AND ACCESSORIES.

CONCRETE:
1. REINFORCED CONCRETE WORK SHALL CONFORM TO THE BUILDING CODE REQUIREMENTS FOR REINFORCED CONCRETE ACI 318-08 AND ALL SUBSEQUENT SUPPLEMENTS.
2. CONCRETE COMPRESSIVE STRENGTH AT 28 DAYS: 4000 PSI.
3. CONTRACTOR SHALL SUBMIT THE PROPOSED MIX DESIGN FOR REVIEW AND APPROVAL OF THE ENGINEER. THE PROPOSED MIX SHALL SHOW RESULTS FROM PREVIOUS TESTING.
4. REINFORCING STEEL: ASTM A615, GRADE 60, Fy = 60,000 PSI
5. MINIMUM CLEAR CONCRETE COVER ON REINFORCING:
   CONCRETE CAST AGAINST AND PERMANENTLY EXPOSED TO EARTH: 3" CONCRETE EXPOSED TO EARTH, WATER OR WEATHER: 2"
6. GROUT SHALL BE NON-SHRINK, NON-METALLIC GROUT COMPLYING WITH ASTM C1107 WITH A COMPRESSIVE STRENGTH OF 7000 PSI AFTER 7 DAYS. GROUT SHALL BE MIXED, PLACED AND CURED ACCORDING TO MANUFACTURER'S RECOMMENDATIONS.
7. DOWELS AND CONTINUOUS REINFORCING SHALL HAVE A MINIMUM LAP OF 42 BAR DIAMETERS.
8. PROVIDE AIR ENTRAINMENT OF 4 TO 6 PERCENT PER ASTM A260.
9. MAXIMUM SLUMP: 4 INCHES (ITL TEST PER ASTM C143).
10. THE CONTRACTOR SHALL WORK WITH THE OWNER'S CERTIFIED ITL FOR TESTING THE CONCRETE IN ACCORDANCE WITH ACI C172, C31 & C39. FOR EACH DAY'S PLACEMENT AS FOLLOWS: 1 SET OF 4 STANDARD CYLINDERS FOR EACH SET OF CYLINDERS, TEST 1 SPECIMEN AT 7 DAYS AND 2 SPECIMENS AT 28 DAYS. THE FOURTH SPECIMEN SHALL REMAIN IN CASE ADDITIONAL TESTS ARE REQUIRED.
11. ADDITIONAL TESTING FOR CONCRETE NOT UP TO STRENGTH SHALL BE PAID FOR BY THE CONTRACTOR. WET CURE ALL CONCRETE CONTINUOUSLY FOR 7 DAYS.
12. CONCRETE FINISH: STEEL TROWEL.
13. CURING COMPOUND: ASTM C309, TYPE I, CLASS B, DISSIPATING.
14. HEADED ANCHOR RODS: ASTM F1554, GRADE 55, STRAIGHT, WELDABLE, H.D. GALV. PER ASTM A153 CLASS C WITH HEAVY HEX CARBON STEEL NUTS ASTM A563 AND WASHERS ASTM F436 TYPE 1 HARDENED CARBON STEEL.
15. BONDING AGENT: ASTM C1059, TYPE II, NON-REDISPERSIBLE, ACRYLIC EMULSION OR STYRENE BUTADIENE.
16. POST INSTALLED ADHESIVE ANCHORS INTO CONCRETE SHALL BE THE HILTI HIT HY-150/ HIT-ICE OR HIT-RE 500 INJECTION SYSTEM. ALL ADHESIVE ANCHORS SHALL BE INSTALLED PER MANUFACTURER'S RECOMMENDATIONS. PROVIDE MINIMUM EMBEDMENT INTO CONCRETE AS SHOWN.

CHAIN LINK FENCE:
1. CHAIN LINK FENCE SHALL BE A DELEGATED DESIGN BY AN EXPERIENCED CHAIN LINK FENCE VENDOR.
2. FENCE SHALL BE GROUNDED IF REQUIRED BY ELECTRICAL – SEE ELECTRICAL DRAWINGS.
3. CHAIN LINK FABRIC SHALL BE 2" MESH NO. 9 GAGE GALVANIZED WIRE SECURELY FASTENED TO TENSION WIRE, LINE POSTS, RAILS, BRACES AND STRETCHER BARS SPACED AS SHOWN HEREON.
4. WIRE FASTENERS AND TIE CLIPS SHALL BE NO. 11 GAGE (W&M) GALVANIZED STEEL WIRE.
5. STEEL POSTS, RAILS AND GATE FRAMES SHALL BE AS NOTES AND AS DESIGN BY VENDOR.
6. AT THE CONTRACTOR'S OPTION, PIPE USED FOR FENCE CONSTRUCTION SHALL CONFORM TO THE DIMENSIONS AND WEIGHTS FOR EITHER "ORDINARY PIPE" OR "ALTERNATIVE PIPE". "ALTERNATIVE PIPE"SHALL BE HIGH STRENGTH STEEL PIPE MEETING THE REQUIREMENTS OF FED. SPEC. RR-F-191/3C.
7. TENSION WIRE SHALL BE CONTINUOUS BETWEEN END OR CORNER POST AND LINE BRACE POST. A TURNBUCKLE OR OTHER APPROVED TIGHTENING DEVICE SHALL BE USED FOR EACH CONTINUOUS SPAN OF TENSION WIRE.
8. TENSION WIRE SHALL BE AS DESIGNED AND SPECIFIED BY THE CHAIN LINK FENCE VENDOR.
9. CONCRETE FOOTINGS SHALL HAVE TOPS CROWNED AT GROUND LEVEL AND SHALL BE CLASS B.
10. TERMINATION OF FENCE AT OTHER STRUCTURES SHALL BE AS SHOWN ON PLANS WITH MANUFACTURER'S STANDARD DETAILS.
11. CHAIN LINK FABRIC SHALL BE TWISTED AND BARBED ON THE TOP AND BOTTOM SELVAGE.
12. FENCE SHALL BE CONSTRUCTED WITH ROUND PIPE COMPONENTS.
13. ATTACH SUPPORT ARMS AT EACH POST.
14. WHERE FENCE CROSSES UNDERGROUND UTILITY LINES, USE CAUTION AND HAVE ALL UTILITIES LOCATED AND MARKED BEFORE INSTALLING FENCE.
15. PROVIDE RAILS IN ACCORDANCE WITH FS RR-F-191/3, CLASS 1, STEEL PIPE, GRADE A.

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PROJECT 2019-5078-00

NHCS PROJECT NUMBER 20-9216-1

Revision No:	DESCRIPTION:	Date:
0	ISSUED FOR CONSTRUCTION	11.27.19

REVISIONS

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NC# P-0506

NORTH CAROLINA PROFESSIONAL SEAL 22967 ENGINEER ...EY R. TROUTMAN
11.27.2019

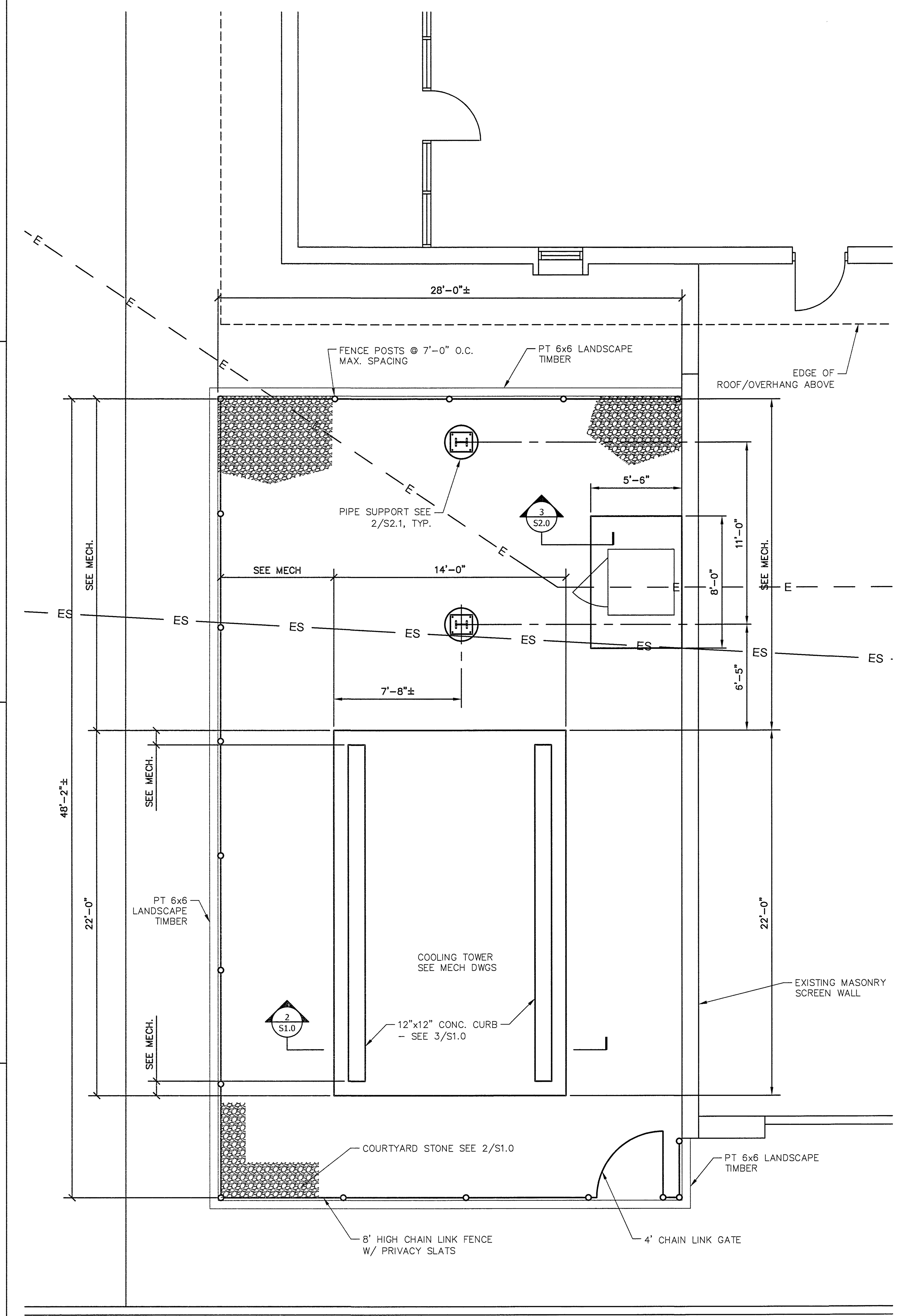
New Hanover County Schools
Emlsey A Laney High School
CLOSED CIRCUIT COOLER ADDITION
2700 NORTH COLLEGE ROAD, WILMINGTON, NORTH CAROLINA

GENERAL NOTES

JOB NO.:	19170
DRAWN:	LMN
DESIGNED:	JRT
CHECKED:	JRT

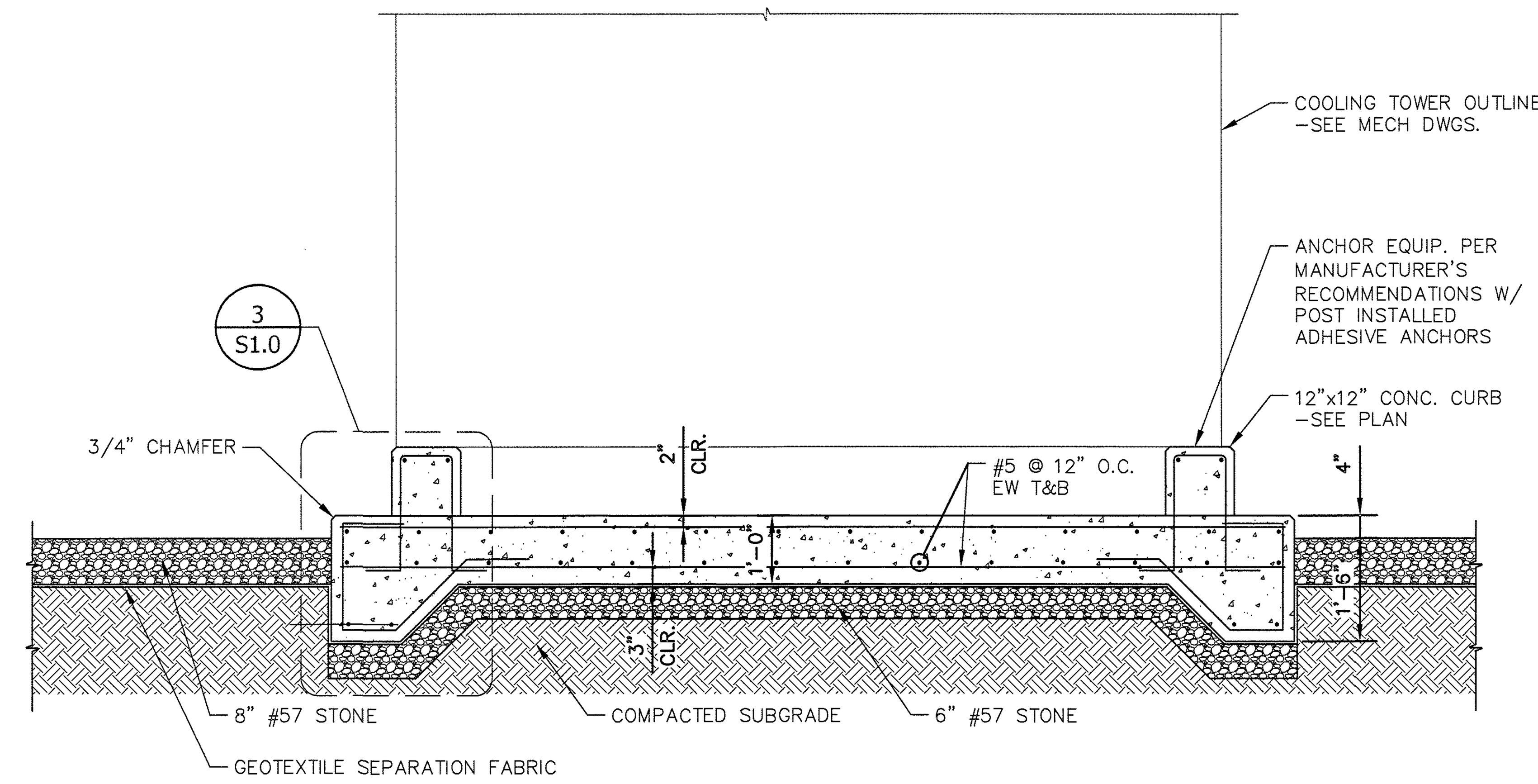
DRAWING NO:
S0.1

REVISION:
0



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

PLAN NOTES:
1. (*) ADJUST TO SUIT CHILLER PROVIDED.



2 - SECTION
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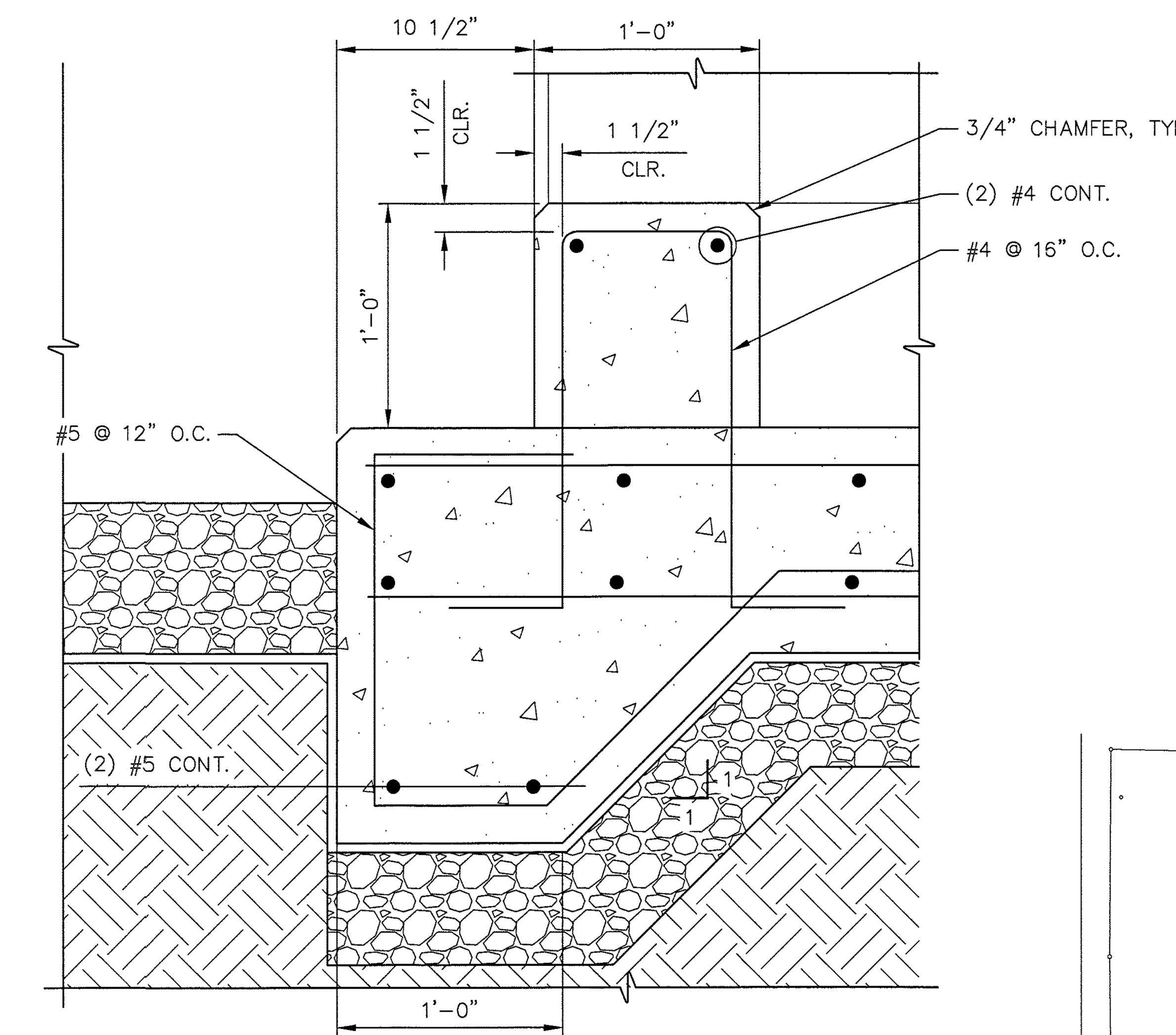

3 - DETAIL
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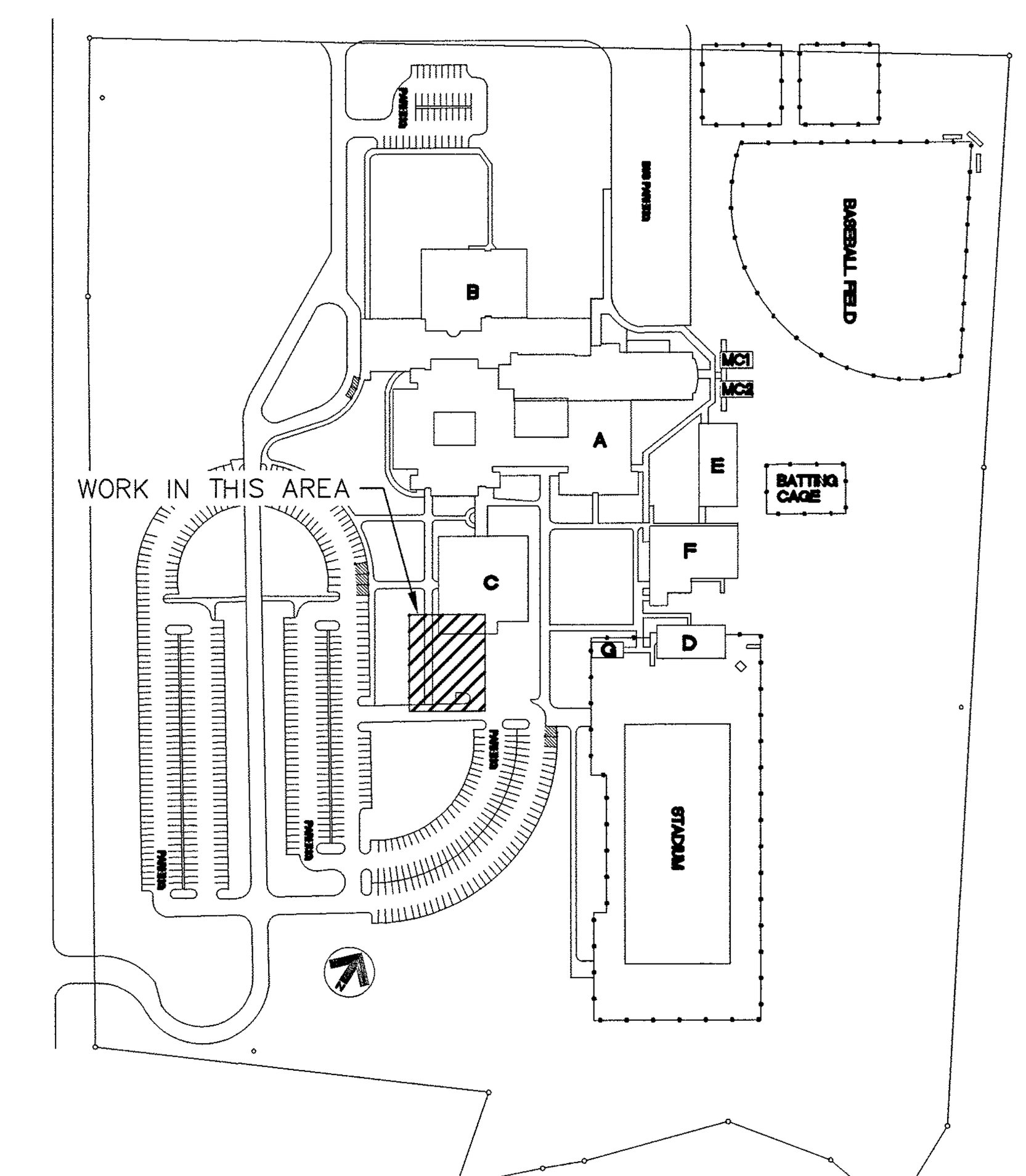

KEY PLAN
NOT TO SCALE

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PROJECT 2019-5078-03

NHCS PROJECT NUMBER 20-9216-1

Revision No:	DESCRIPTION:	Date:
0	ISSUED FOR CONSTRUCTION	11.27.19

REVISIONS

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 22567 R. TROUTMAN 11.27.2019

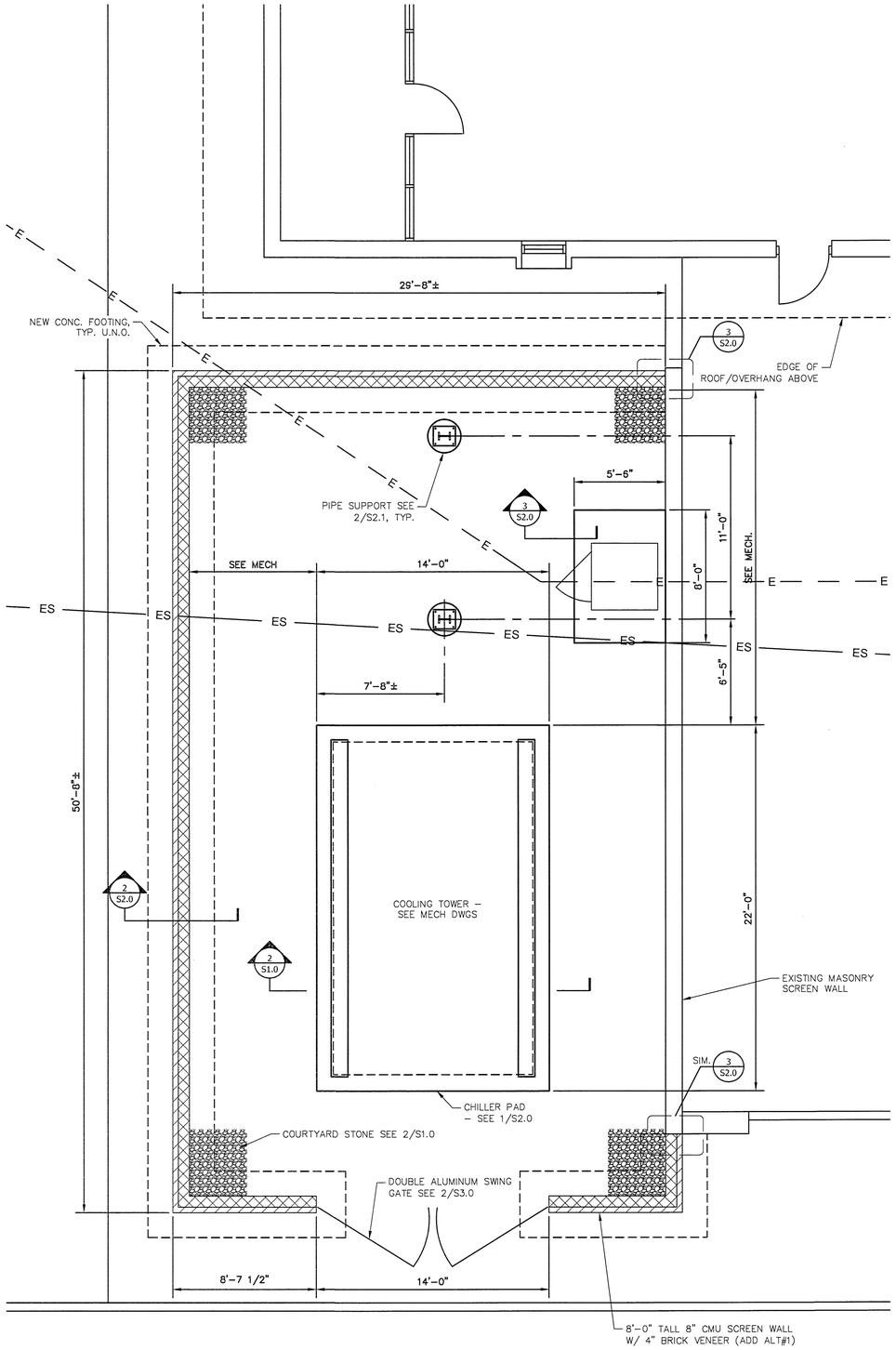
New Hanover County Schools
Emsley A Laney High School
CLOSED CIRCUIT COOLER ADDITION
2700 NORTH COLLEGE ROAD, WILMINGTON, NORTH CAROLINA

PLAN & SECTIONS

JOB NO.:	19170
DRAWN:	LMN
DESIGNED:	JRT
CHECKED:	JRT

DRAWING NO:
S1.0

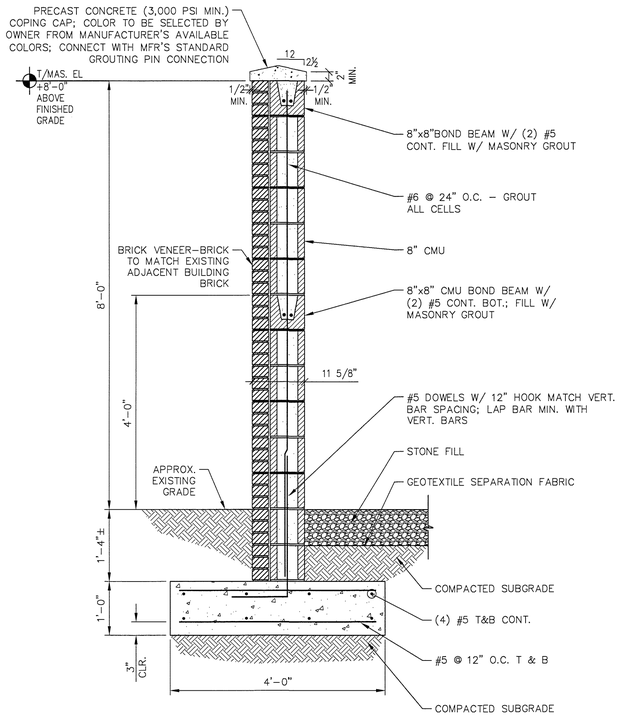
REVISION:
0



1 - PLAN (ADD ALT#1)

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

PLAN NOTES:
1. (*) ADJUST TO SUIT COOLING TOWER PROVIDED.



2 - SCREEN WALL SECTION (ADD ALT #1)

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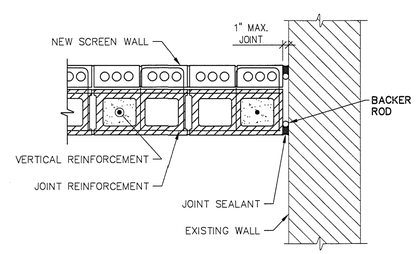
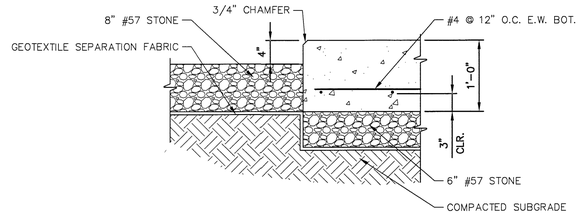


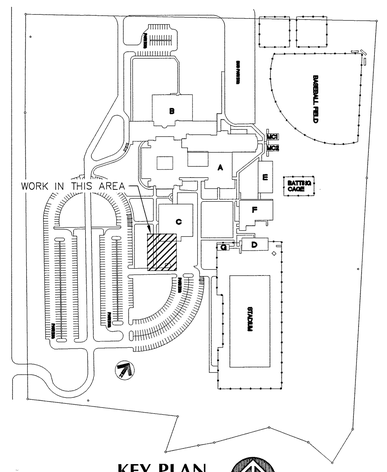
3 - END WALL PLAN

SCALE: 1"=1'-0"



4 - SHED FOUNDATION

SCALE: 1 " = 1'-0"



KEY PLAN

NOT TO SCALE

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PROJECT: 2019v-5078-00

Revision No.	DESCRIPTION:	Date:
0	ISSUED FOR CONSTRUCTION	11-27-19

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NORTH CAROLINA PROFESSIONAL ENGINEER SEAL 23567 JEREMY R. TROUTMAN 11-27-2019

New Hanover County Schools
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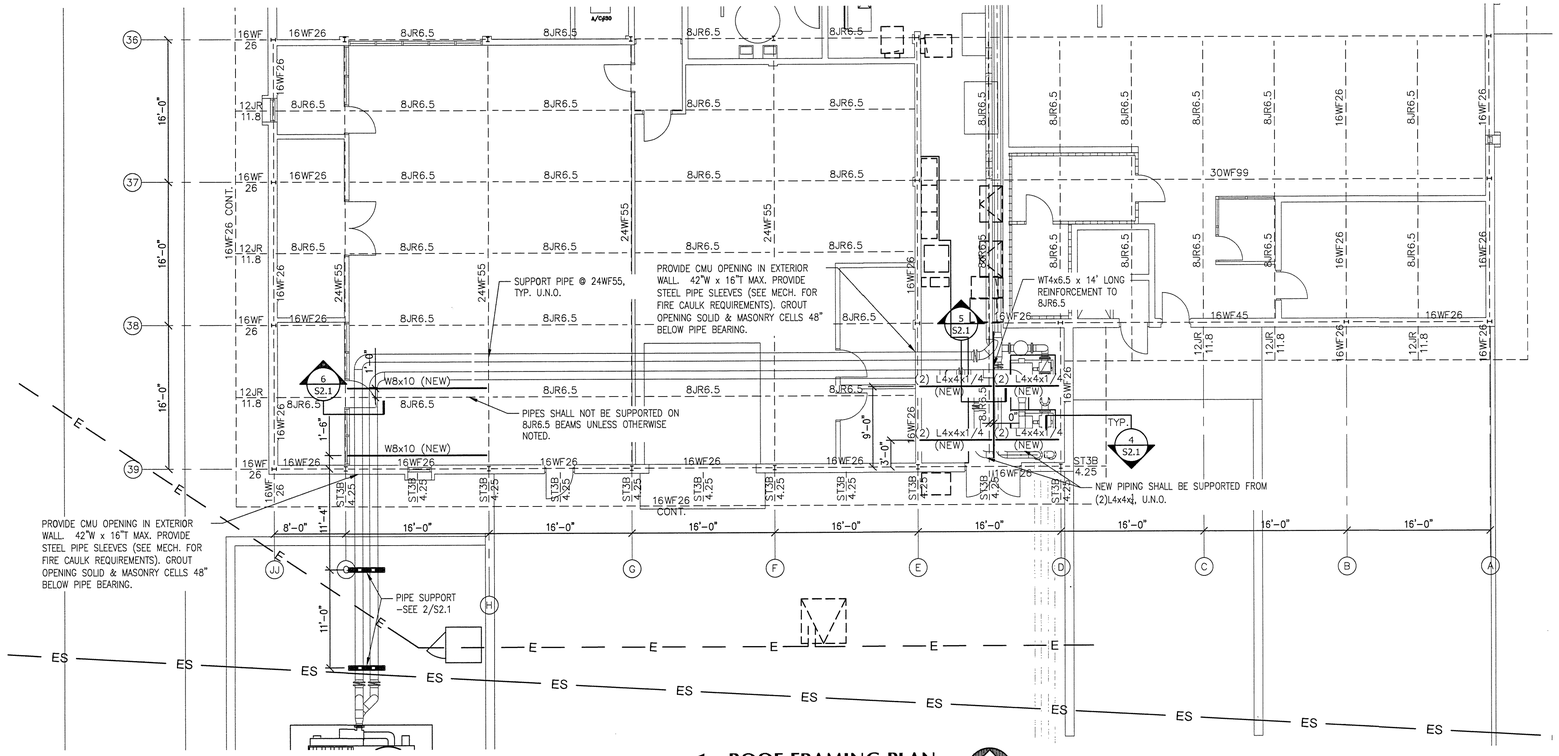
PLAN & SECTION (ADD ALT #1)

JOB NO.:	19170
DRAWN:	LMN
DESIGNED:	JRT
CHECKED:	JRT

DRAWING NO:
S2.0

REVISION:
0

NHCS PROJECT NUMBER: 20-0216-1



1 - ROOF FRAMING PLAN
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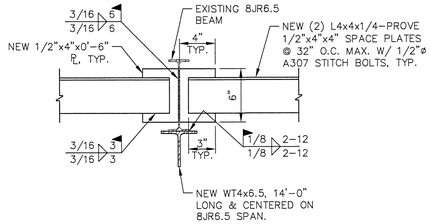

6 - 8JR6.5 REINFORCEMENT
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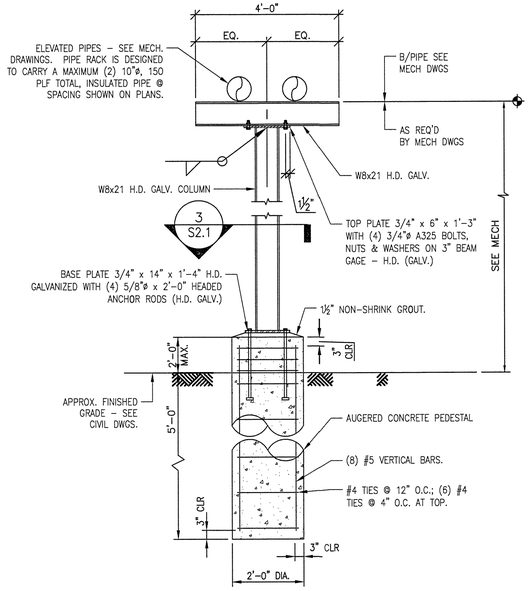
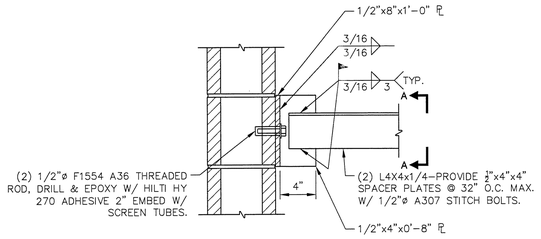
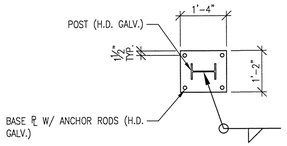


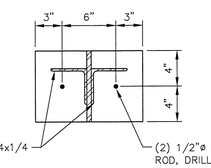
2 - PIPE SUPPORT DETAIL
NOT TO SCALE



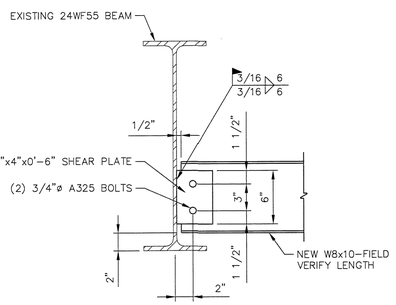


3 - BASE PLATE DETAIL
NOT TO SCALE

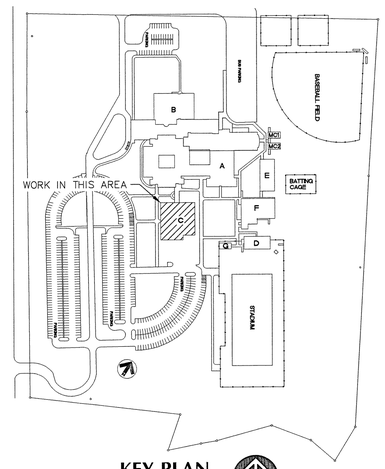
4 - WALL BRACKET
SCALE: 1 1/2" = 1'-0"



SECTION A-A



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



KEY PLAN
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Revision No.	DESCRIPTION	Date
0	ISSUED FOR CONSTRUCTION	11.27.19

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NORTH CAROLINA PROFESSIONAL SEAL 22572 ENGINEER JAMES R. TROUTMAN 11.27.19

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ROOF FRAMING PLAN, SECTIONS & DETAILS

JOB NO.:	19170
DRAWN:	LMN
DESIGNED:	JRT
CHECKED:	JRT

DRAWING NO.: **S2.1**

REVISION: 0

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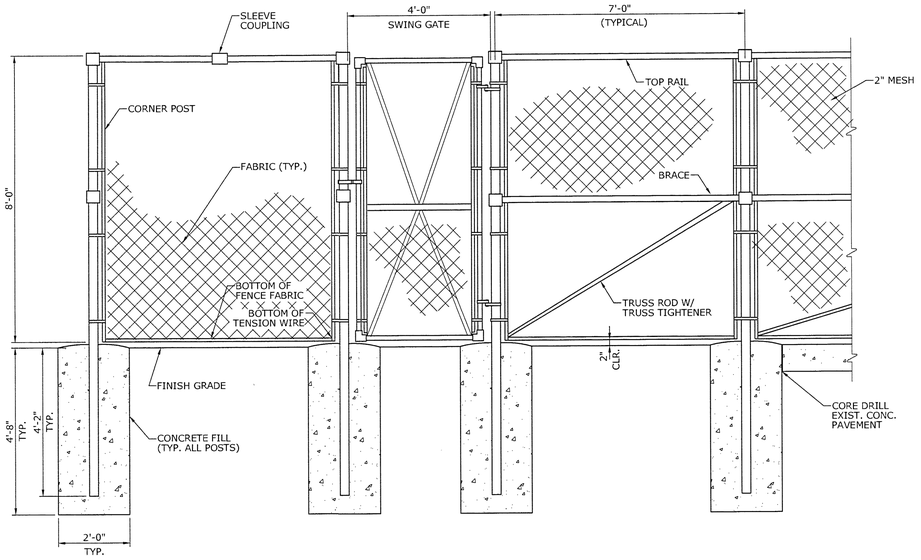
PROJECT 2019-5078-03

NHCS PROJECT NUMBER: 420-19216-1

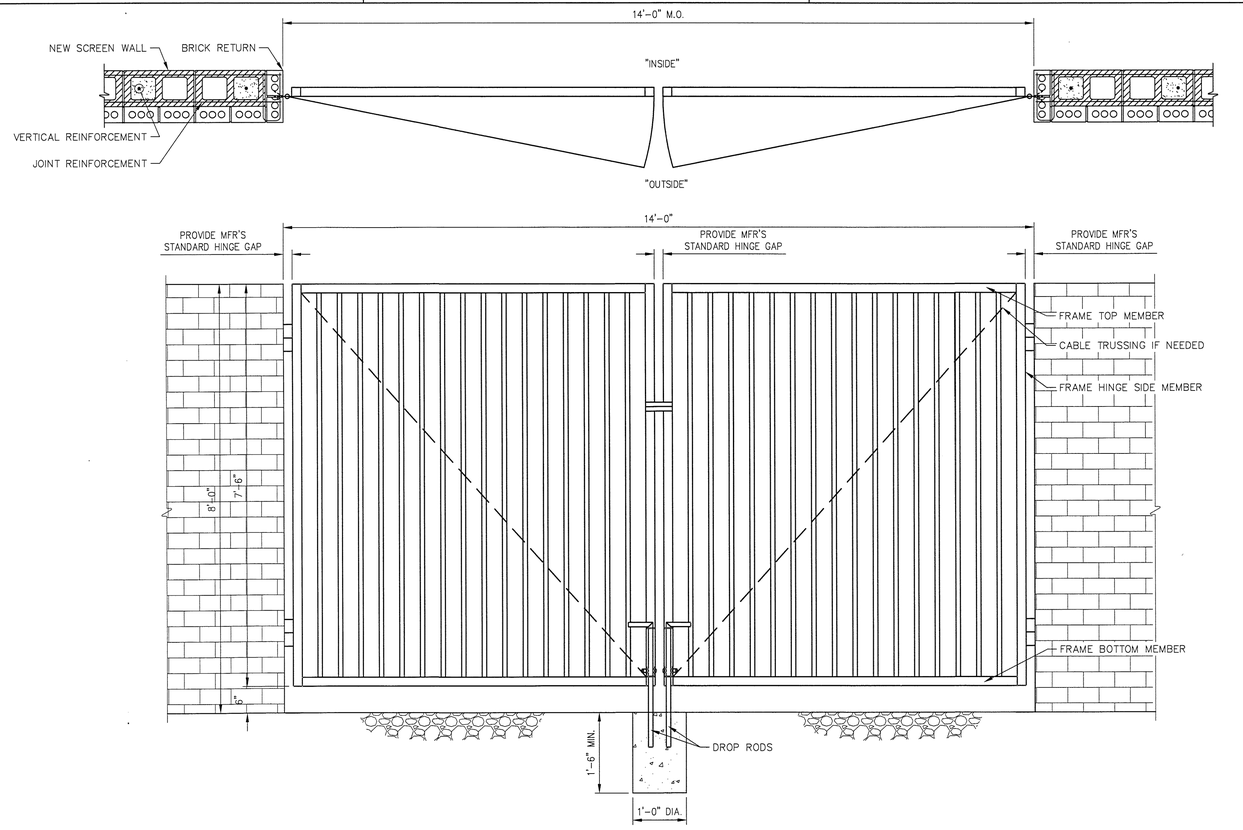


1 - CHAIN LINK FENCE DETAIL

NOT TO SCALE

NOTES:

1. LINE POSTS 4.00" DIA. (ASTM F1043, GROUP IC, GRADE 50).
2. END AND CORNER POSTS 4.00" DIA. (ASTM F1043, GROUP IC, GRADE 50).
3. TOP RAIL 1.66" DIA. MIN.
4. FITTINGS ARE ASTM, F626.
5. PROVIDE POST CAPS.
6. ALL MATERIAL H.D. GALVANIZED.
7. PROVIDE TUBULAR POLYETHYLENE PRIVACY SLATS (VERTICAL), MINIMUM 0.023 INCHES THICK WITH UV INHIBITOR; ~75%± WIND FACTOR; COLOR: TO BE SELECTED BY OWNER FROM MANUFACTURER'S STANDARD COLORS.
8. PROVIDE LIGHTING PROTECTION SYSTEM IF REQUIRED BY ELECTRICAL DRAWINGS.



2 - ALUMINUM GATE DETAIL

SCALE: 1" = 1'-0"

Revision NO.	DESCRIPTION	Date:
0	ISSUED FOR CONSTRUCTION	11-27-19

REVISIONS

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NORTH CAROLINA PROFESSIONAL SEAL 22957 ENGINEER JEFFREY R. TROUTMAN 11-27-19

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SECTIONS & DETAILS

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NC FIRM LICENSE NUMBER P-0113
PROJECT 2019-50784-0

JOB NO.:	19170
DRAWN:	LMN
DESIGNED:	JRT
CHECKED:	JRT

DRAWING NO:
S3.0

REVISION:
0

NHCS PROJECT NUMBER 20-0216-1