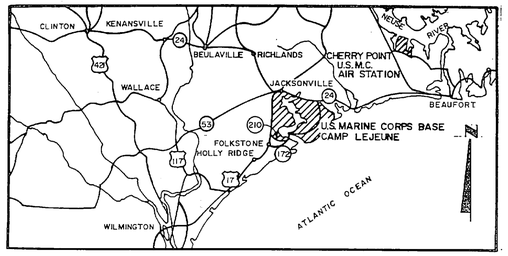
REVISIONS			
SYM.	DESCRIPTION	DATE	APPROVED

REPLACE CHILLER - BUILDING 89

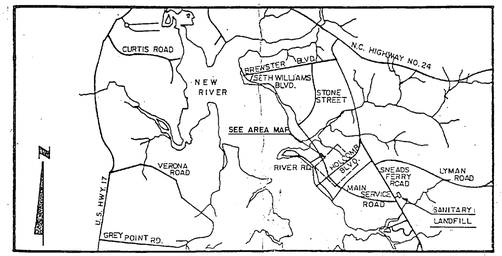
UNITED STATES MARINE CORPS BASE

CAMP LEJEUNE, NORTH CAROLINA



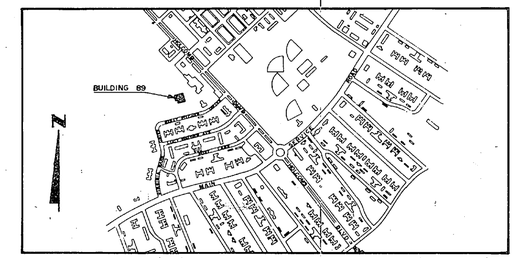
LOCATION MAP

1" = 13 MILES



VICINITY MAP

1" = 8000'



AREA MAP

1" = 1000'

SCHEDULE OF DRAWINGS		
DRAWING NUMBER	NAVFAC DWG. NUMBER	SHEET TITLE
C-1	4132990	COVER SHEET
A-1	4132991	BUILDING CROSS SECTION - NEW WORK
A-2	4132992	PARTIAL ROOF PLAN & DETAILS - NEW WORK
M-1	4132993	MECHANICAL FLOOR PLAN - DEMOLITION
M-2	4132994	MECHANICAL ROOF PLAN - DEMOLITION
M-3	4132995	MECHANICAL FLOOR PLANS - DEMO & NEW WORK
M-4	4132996	MECHANICAL FLOOR PLAN - NEW WORK
M-5	4132997	MECHANICAL ROOF PLAN - NEW WORK
M-6	4132998	MECHANICAL DETAILS & SECTIONS
M-7	4132999	MECHANICAL CONTROL DIAGRAMS
E-1	4133000	ELECTRICAL LIGHTING FLOOR PLAN - DEMOLITION
E-2	4133001	ELECTRICAL POWER FLOOR PLAN - DEMOLITION
E-3	4133002	ELECTRICAL LANE LIGHTING CONTROL - DEMOLITION
E-4	4133003	ELECTRICAL LIGHTING FLOOR PLAN - NEW WORK
E-5	4133004	ELECTRICAL POWER FLOOR PLAN - NEW WORK
E-6	4133005	ELECTRICAL LANE LIGHTING CONTROL - NEW WORK

GRAPHIC SCALES:

1" = 13 MILES: 10 5 0 10 20 30 40 50

1" = 8,000': 8,000' 0' 8000' 16,000' 24,000' 32,000'

1" = 1,000': 1,000' 0' 1,000' 2,000' 3,000' 4,000'

NORTH CAROLINA REGISTERED PROFESSIONAL ENGINEER SEAL 7986 JAMES H. CHEATHAM, JR.

C-1

CHEATHAM AND ASSOCIATES
CONSULTING ENGINEERS
WILMINGTON, NORTH CAROLINA

DES. J G W
DR. L A B
CHK. J H C
SUBMITTED BY: Samuel H. Cheatham, Jr.
DESIGN DIR. J.G.
APPROVED: PRO BR DIR. Nora 7-28-86 DATE
SATISFACTORY TO: DATE

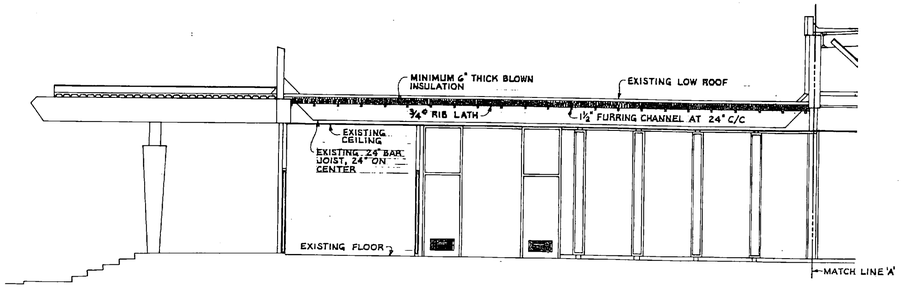
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

REPLACE CHILLER - BUILDING 89

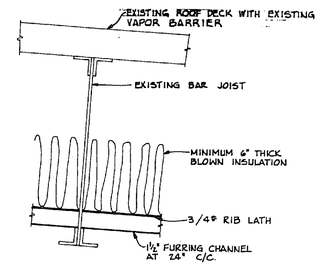
COVER SHEET

SIZE F | CODE IDENT. NO. 80091 | NAVFAC ECAIMS NO. 4132990
CONSTR. CONTR. NO. N62470-84-B-7914
SCALE: GRAPHIC | SPEC. 05-04-7014 | SHEET 1 OF 16

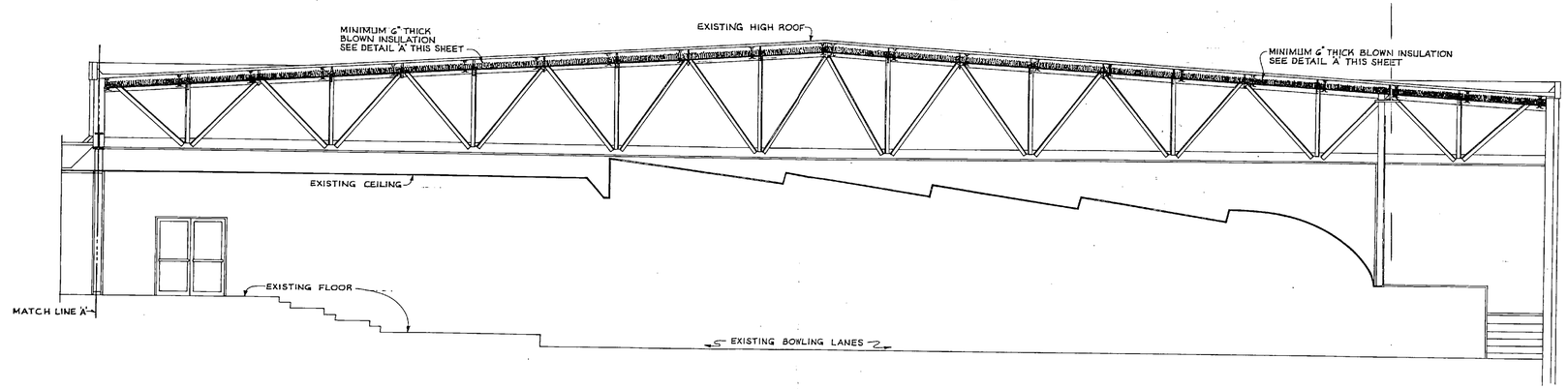
REVISIONS			
SYM.	DESCRIPTION	DATE	APPROVED



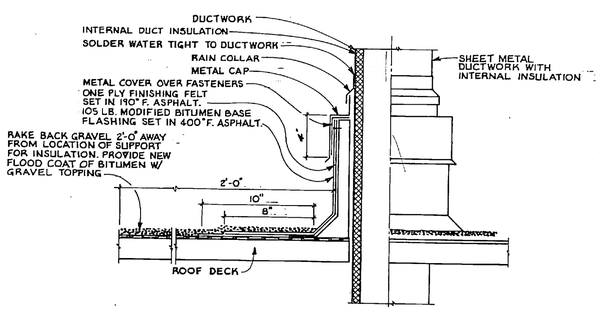
BUILDING CROSS SECTION
SCALE: 1/4" = 1'-0"



A / A-1 / A-1 DETAIL
SCALE: 3" = 1'-0"



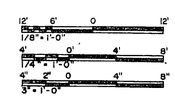
BUILDING CROSS SECTION
SCALE: 1/4" = 1'-0"



A / A-2 / A-1 ROOF CURB DETAIL
NO SCALE
M-5

NOTE:
SEE SHEET M-1 FOR BUILDING FLOOR PLAN AREA. COMPLETE BUILDING ROOF AREA SHALL BE INSULATED.

GRAPHIC SCALE:



NORTH CAROLINA REGISTERED ARCHITECT JAMES E. CHEATHAM JR.

A-1

CHEATHAM AND ASSOCIATES
CONSULTING ENGINEERS
WILMINGTON, NORTH CAROLINA

DES. JGW
DR. JEM
CHK. JHC
SUBMITTED BY: Kenneth Chaisson
DESIGN ENG.
APPROVED: FOR OIC DACE — DATE 7-28-86
SATISFACTORY TO: — DATE

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

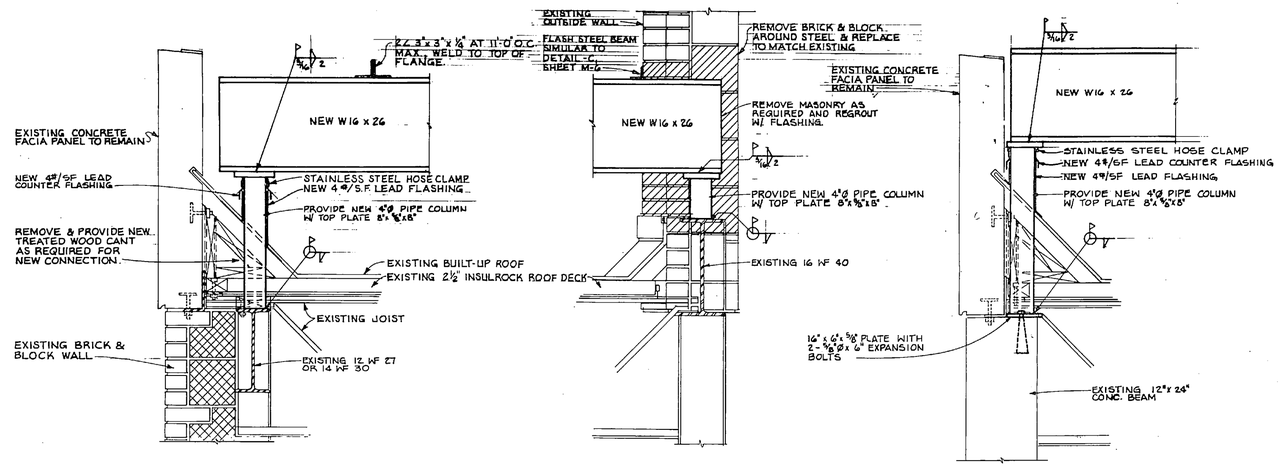
REPLACE CHILLER - BUILDING 89

BUILDING CROSS SECTION-NEW WORK

SIZE	CODE IDENT. NO.	NAVFAC DRAWING NO.
F	80081	4132991

CONSTR. CONTR. NO. N62470-84-B-7914
SCALE: GRAPHIC | SPEC. 03-84-7914 | SHEET 2 OF 16

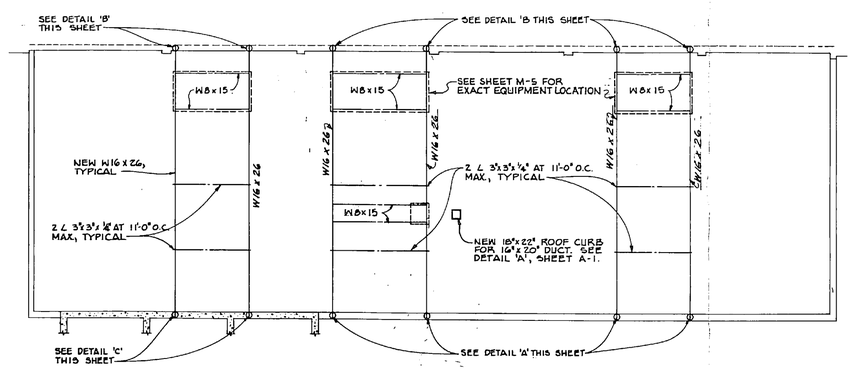
REVISIONS			
SYM.	DESCRIPTION	DATE	APPROVED



A A-3 A-3 DETAIL
SCALE: 1 1/2" = 1'-0"

B A-3 A-3 DETAIL
SCALE: 1 1/2" = 1'-0"

C A-3 A-3 DETAIL
SCALE: 1 1/2" = 1'-0"



PARTIAL ROOF PLAN - NEW WORK
SCALE: 1/8" = 1'-0"

GRAPHIC SCALES:

12' 6' 0 12'
1/8" = 1'-0"

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

NORTH CAROLINA REGISTERED ARCHITECT JOHN H. CHEATHAM, JR.

A-2

CHEATHAM AND ASSOCIATES
CONSULTING ENGINEERS
WILMINGTON, NORTH CAROLINA

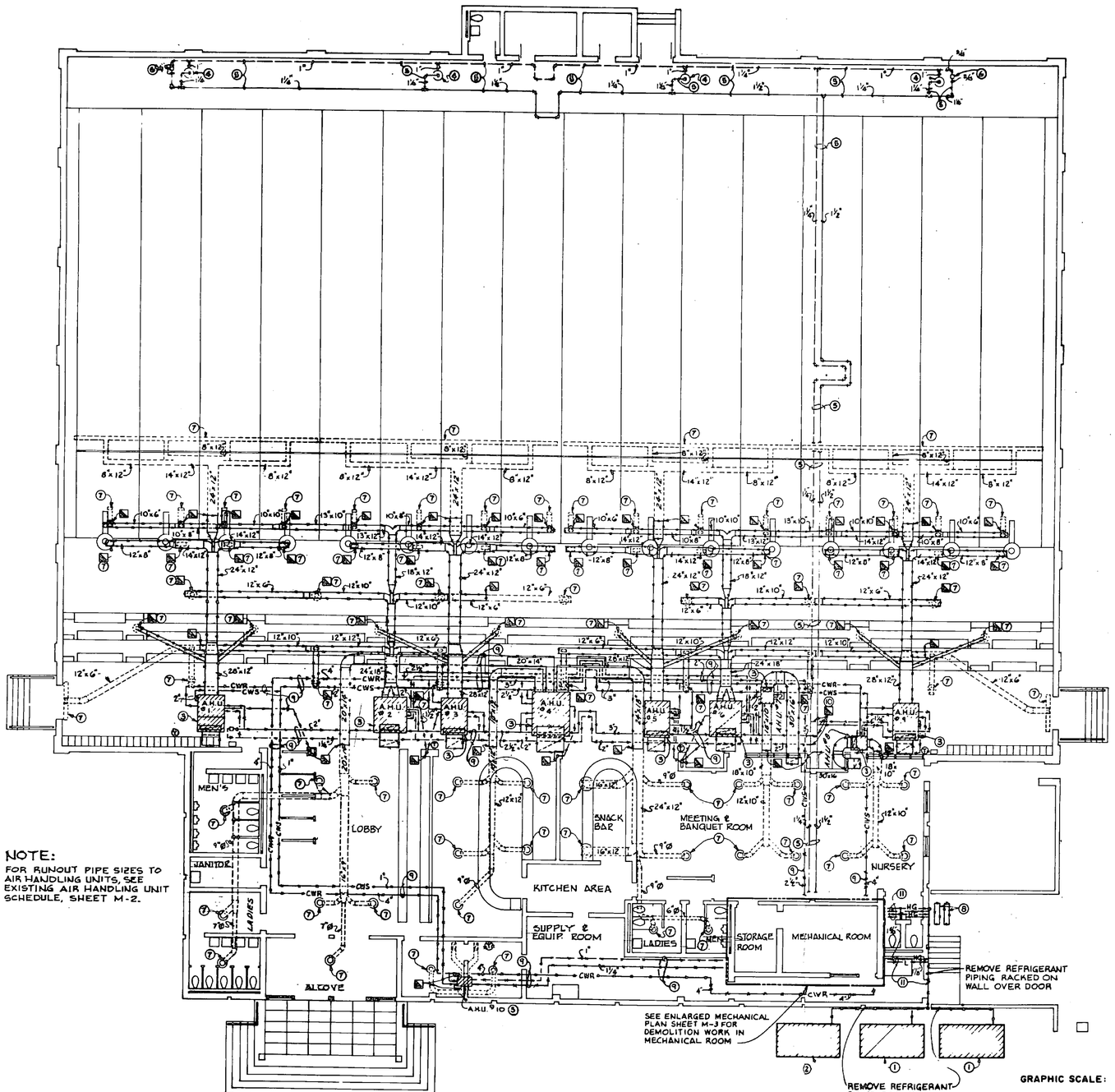
DES. JGW
DR. JEM, LAB
CHK. JHC
SUBMITTED BY: [signature]
DESIGN DIV. [signature]
APPROVED: DIV. DR. CHIEF [signature] DATE 7-28-85
CATHODIC DIV. TR: DATE

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

REPLACE CHILLER BUILDING 89

PARTIAL ROOF PLAN & DETAILS
NEW WORK

DATE F | CODE IDENT. NO. 80091 | NAVFAC DRAWING NO. 4132992
CONSTR. CONTR. NO. N62470-84-B-7914
SCALE: GRAPHIC | SPEC. 05-84-7914 | SHEET 3 OF 16



NOTE:
FOR RUNOUT PIPE SIZES TO AIR HANDLING UNITS, SEE EXISTING AIR HANDLING UNIT SCHEDULE, SHEET M-2.

MECHANICAL FLOOR PLAN-DEMOLITION
SCALE: 1/8" = 1'-0"

GRAPHIC SCALE:
12' 6' 0 12'
1/8" = 1'-0"

KEYED NOTES: (THIS SHEET ONLY)

1. REMOVE EXISTING AIR COOLED CONDENSERS SERVING 100 TON CHILLER AND RELATED CONTROLS TO CHILLER.
2. REMOVE EXISTING AIR COOLED CONDENSER SERVING 30 TON CHILLER AND RELATED CONTROLS TO CHILLER.
3. REMOVE EXISTING AIR HANDLING UNIT , FILTER MIXING BOX, FRESH AIR INTAKE DUCT, RETURN AIR DUCT WITH GRILLE, THERMOSTAT, CONTROLS AND RELATED PIPING WITH VALVES. REMOVE BRANCH PNEUMATIC CONTROL TUBING TO MAIN AIR LINE AND CAP.
4. EXISTING UNIT HEATER AND CONTROLS TO REMAIN.
5. EXISTING PIPING TO REMAIN. REMOVE ASBESTOS PIPE INSULATION.
6. EXISTING CONDENSATE TRAP ASSEMBLY TO REMAIN. REMOVE EXISTING ASBESTOS INSULATION.
7. EXISTING AIR DISTRIBUTION DEVICE TO REMAIN.
8. REMOVE EXISTING REFRIGERANT RECEIVERS.
9. REMOVE EXISTING PIPING WITH ASBESTOS INSULATION.
10. PROVIDE NEW PIPE CAPS.
11. REMOVE EXISTING REFRIGERANT PIPING, (2) 1-1/8" LIQUID AND (2) 2-1/8" H.G. SERVING 100 TON CHILLER AND (1) 1-1/8" LIQUID AND (1) 1-5/8" H.G. SERVING 30 TON CHILLER.

LEGEND:

- REMOVE EXISTING PIPING OR DUCTWORK
- REMOVE EXISTING EQUIPMENT
- EXISTING DUCTWORK & EQUIPMENT TO REMAIN.
- NEW DUCTWORK
- DR — DRAIN PIPING
- D — DETERGENT PIPING
- DOMESTIC HOT WATER PIPING
- LOW PRESSURE STEAM PIPING (0-15 PSI), EXISTING
- LOW PRESSURE CONDENSATE PIPING (0-15 PSI), EXISTING
- HWS — HOT WATER SUPPLY PIPING
- HWR — HOT WATER RETURN PIPING
- CWS — CHILLED WATER SUPPLY PIPING
- CWR — CHILLED WATER RETURN PIPING
- HG — REFRIGERANT HOT GAS PIPING
- L — REFRIGERANT LIQUID PIPING
- GATE VALVE
- CHECK VALVE
- UNION
- FLANGE
- PRESSURE GAUGE WITH GAUGE COCK
- THERMOMETER
- THERMOSTAT
- U.H. UNIT HEATER
- TERMINATION POINT OF DEMOLITION
- POINT OF NEW CONNECTION TO EXISTING
- SD SMOKE DETECTOR
- BALANCING VALVE
- PRESSURE REDUCING VALVE
- CONTROL VALVE - 2 WAY
- CONTROL VALVE - 3 WAY

M-1

CHEATHAM AND ASSOCIATES
CONSULTING ENGINEERS
WILMINGTON, NORTH CAROLINA

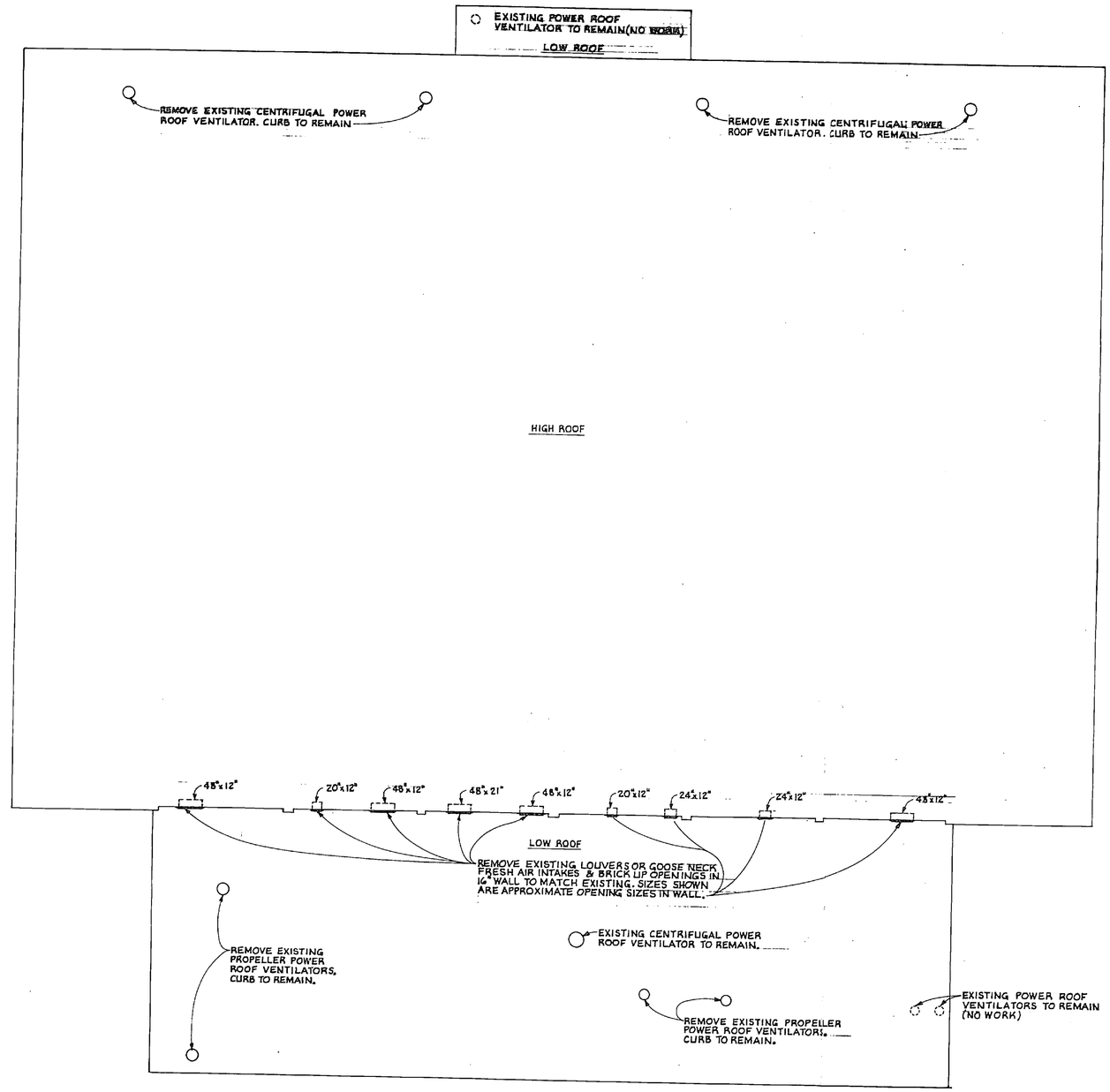
DEPARTMENT OF THE ARMY NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

DES. JGW
DR. LAB-JEM
CHK. JHC
SUBMITTED BY: Kenneth Cheatham
CHIEF ENG. JHC
APPROVED: FOR OR ENGR. 7-28-86
CONCURRENCE TO: DATE

REPLACE CHILLER-BUILDING 69

MECHANICAL
FLOOR PLAN-DEMOLITION

SIZE F | CODE IDENT. NO. 69961 | DRAWING NO. 4132993
SERIAL NO. 62470-89-B-7386
SCALE: GRAPHIC | SPEC. 05-64-7814 | SHEET 4 OF 16



ROOF PLAN - DEMOLITION
SCALE: 1/8" = 1'-0"

GRAPHIC SCALE:

12' 6' 0 12'
1/8" = 1'-0"

REVISIONS			
SYM.	DESCRIPTION	DATE	APPROVED

EXISTING AIR HANDLING UNIT PIPING SCHEDULE
(RUNOUT PIPE SIZES FOR DEMOLITION WORK)

AIR HANDLING UNIT	CHILLED WATER SUPPLY	CHILLED WATER RETURN	STEAM SUPPLY	STEAM CONDENSATE	REMARKS
A.H.U. #1	2"	2"	2"	1¼"	
A.H.U. #2	2"	2"	1½"	1"	
A.H.U. #3	2"	2"	2"	1¼"	
A.H.U. #4	2½"	2½"	2½"	1½"	
A.H.U. #5	2"	2"	2"	1¼"	
A.H.U. #6	2"	2"	1½"	1"	
A.H.U. #7	1¼"	1¼"	1¼"	1"	
A.H.U. #8	1¼"	1¼"	1¼"	1"	
A.H.U. #9	2"	2"	2"	1¼"	

M-2

CHEATHAM AND ASSOCIATES
CONSULTING ENGINEERS
WILMINGTON, NORTH CAROLINA

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

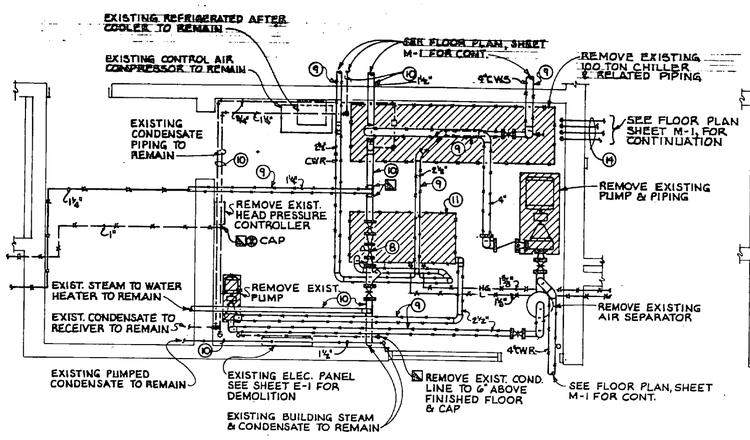
REPLACE CHILLER - BUILDING 89

MECHANICAL
ROOF PLAN - DEMOLITION

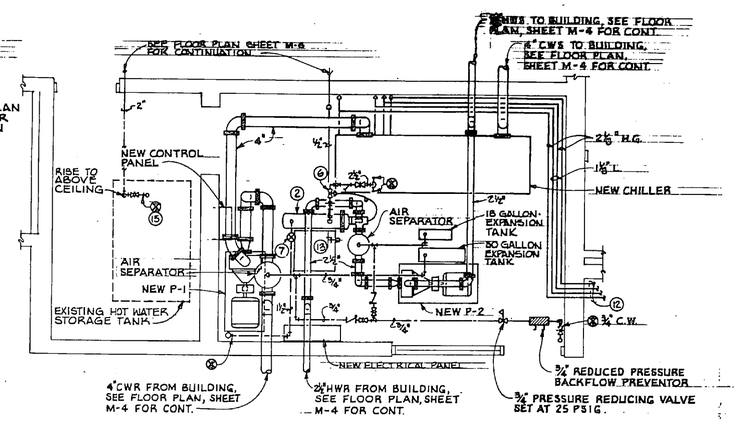
DES. JGW
DR. LAB - JEM
CHK. JHC
SUBMITTED BY: James H. Cheatham Jr.
DESIGN DIR. [signature]
APPROVED: PWD OR SHCC [signature] DATE 7-28-86
SATISFACTORY TO: DATE

SIZE F | CODE IDENT. NO. 80091 | NAVFAC DRAWING NO. 4132994
CONSTR. CONTR. NO. N 62470-84-B-7914
SCALE: GRAPHIC | SPEC. 05-84-7914 | SHEET 5 OF 16

REVISIONS			
SYM.	DESCRIPTION	DATE	APPROVED



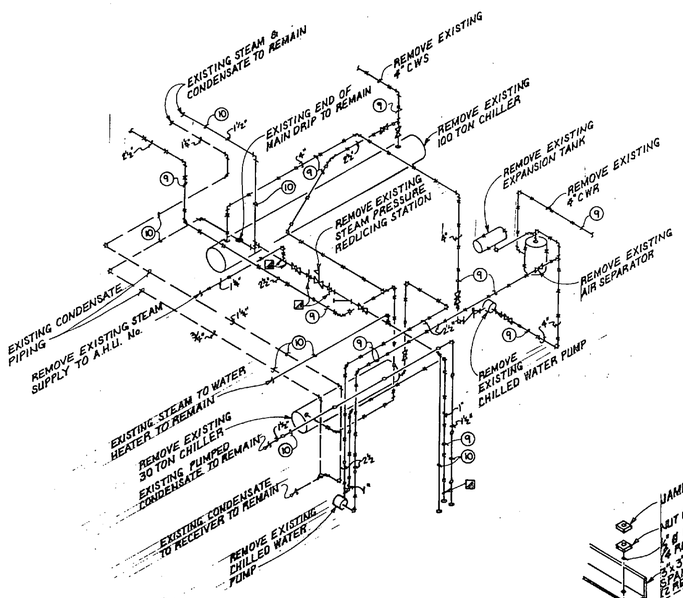
ENLARGED MECHANICAL ROOM PLAN-DEMOLITION
SCALE: 3/8"=1'-0"



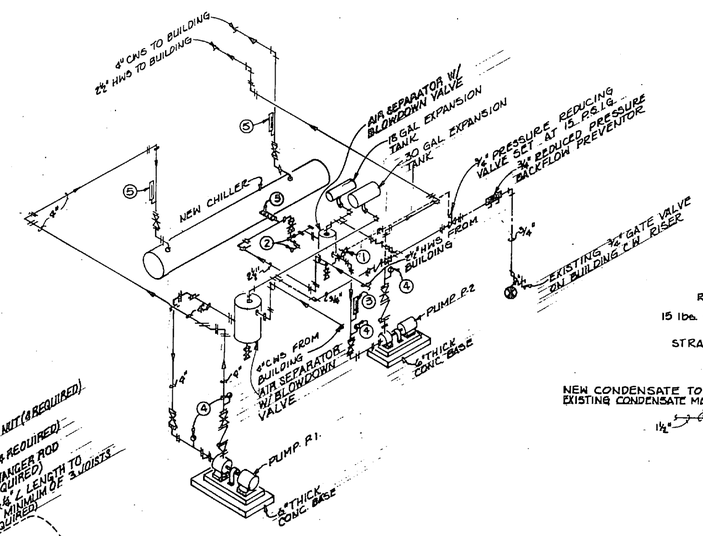
ENLARGED MECHANICAL ROOM FLOOR PLAN-NEW WORK
SCALE: 3/8"=1'-0"

KEYED NOTES: (THIS SHEET ONLY)

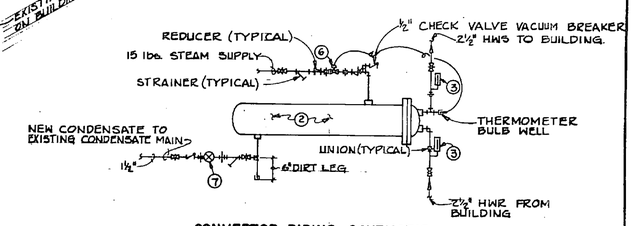
1. PROVIDE NEW PRESSURE RELIEF VALVE WITH CAPACITY OF 1,800,000 BTU/HR, SET AT 60 PSIG.
2. PROVIDE NEW STEAM TO WATER CONVERTOR, 672 LBS/HR STEAM AT 5 PSIG IN SHELL, 67.2 GPM TEMP TUBES WIT 140 DEGREE F. ENT. 180 DEGREE F LVT 1 FOOT WATER PRESSURE DROP. SEE DETAIL 'A', THIS SHEET.
3. THERMOMETER, 30-240 DEGREE F.
4. PRESSURE GAGE, 0-60 PSI.
5. THERMOSTAT, 0-120 DEGREE F.
6. PROVIDE NEW STEAM CONTROL VALVE, 672 LBS/HR., 10 PSIG DROP.
7. PROVIDE NEW 1-1/2" F & T TRAP, 1600 LBS/HR., 5 PSI DROP.
8. REMOVE EXISTING STEAM PRESSURE REDUCING VALVE AND PROVIDE NEW STEAM PRESSURE REDUCING VALVE WITH CAPACITY OF 840 LBS/HR. 150 PSI INLET PRESSURE AND 15 PSI OUTLET PRESSURE. PROVIDE ELECTRIC PILOT CONTROL VALVE TO SHUT-OFF STEAM WHEN OUTSIDE TEMPERATURE RISES ABOVE 60 DEGREE F.
9. REMOVE EXISTING PIPING WITH ASBESTOS INSULATION.
10. REMOVE EXISTING ASBESTOS PIPE INSULATION. PIPING TO REMAIN. PROVIDE NEW PIPE INSULATION.
11. REMOVE EXISTING 30 TON CHILLER.
12. SEE FLOOR PLAN, SHEET M-4 FOR CONTINUATION.
13. NEW DETERGENT TANK AND PUMP FOR AIR HANDLING UNIT FILTER WASHDOWN SYSTEM.
14. REMOVE EXISTING REFRIGERANT PIPING, (2) 1-1/8" LIQUID AND (2) 2-1/8" D.G. SERVING 100 TON CHILLER.
15. PROVIDE NEW 2" HOT WATER CONNECTION TO EXISTING 2" VERTICAL HOT WATER AT EXISTING HOT WATER STORAGE TANK.



MECHANICAL ROOM PIPING SCHEMATIC - DEMOLITION
NO SCALE

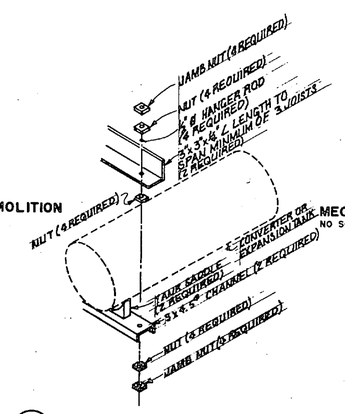


MECHANICAL ROOM PIPING SCHEMATIC-NEW WORK
NO SCALE



CONVERTOR PIPING SCHEMATIC
NO SCALE

PUMP SCHEDULE								
SYMBOL	GPM	HEAD IN FT.	H P	RPM	MIN. % EFFIC'Y	ELECTRICAL VOLTS	ELECTRICAL PHASE	TYPE
P-1	270	55	7½	1750	73	208	3	END SUCTION, BASE MOUNTED
P-2	67.2	35	1½	1750	60	208	3	END SUCTION, BASE MOUNTED



A
M-3 DETAIL
CONVERTER/EXPANSION TANK MOUNTING DETAIL

GRAPHIC SCALE:

M-3

CHEATHAM AND ASSOCIATES
CONSULTING ENGINEERS
WILMINGTON, NORTH CAROLINA

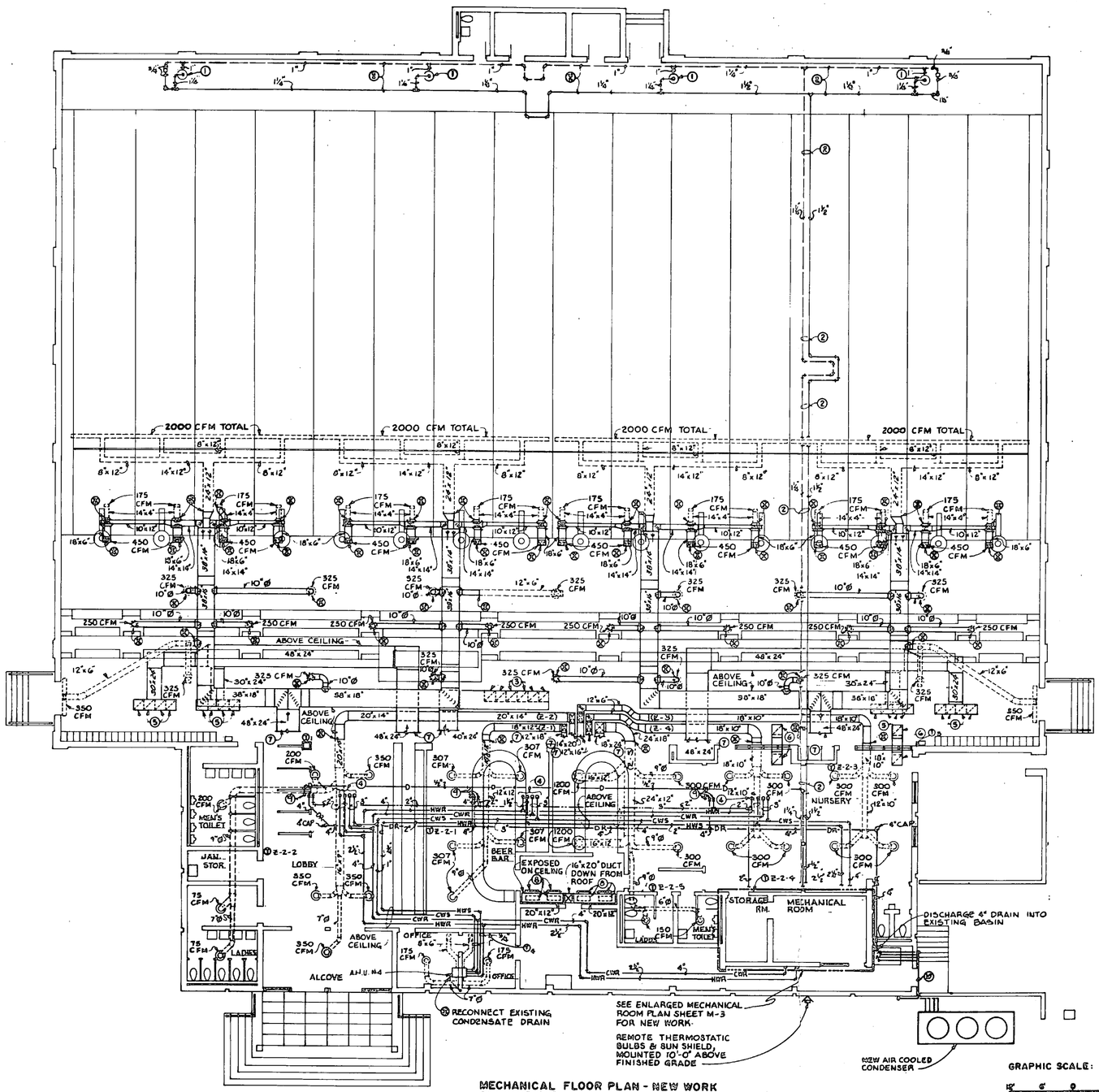
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

REPLACE CHILLER-BUILDING 89

MECHANICAL
FLOOR PLANS-DEMO & NEW WORK

DES. JGW
DR. LAB-JEM
CHK. JHC
SUBMITTED BY: [signature]
DESIGN DIR. [signature]
APPROVED: PWD CO ENGR [signature] DATE 7-28-86
SATISFACTORY TO: DATE

SIZE F
CODE IDENT. NO. 80091
DRAWING SHEET NO. 432995
CONTR. CONTROL NO. N62470-84-B-7914
SCALE: GRAPHIC SPEC. 05-84-7914 SHEET 6 OF 16



MECHANICAL FLOOR PLAN - NEW WORK
SCALE: 1/8" = 1'-0"

GRAPHIC SCALE:
1/8" = 1'-0"

KEYED NOTES: (THIS SHEET ONLY)

1. EXISTING UNIT HEATER AND CONTROLS TO REMAIN. (NO WORK)
2. EXISTING PIPING. PROVIDE NEW PIPE INSULATION.
3. NEW 24" X 24" LAY-IN CEILING RETURN AIR GRILLE, 1277 CFM EACH.
4. NEW HOT WATER SUPPLY, HOT WATER RETURN, CHILLED WATER SUPPLY AND CHILLED WATER RETURN TO AND FROM NEW AIR HANDLING UNIT ON ROOF.
5. NEW 24" X 24" LAY-IN CEILING RETURN AIR GRILLE, 1553 CFM EACH.
6. NEW 24" X 24" LAY-IN TRANSFER AIR GRILLES WITH 24" X 10" DUCT
7. SEE ROOF PLAN, SHEET M-5 FOR CONTINUATION.
8. PROVIDE NEW 30" X 10" SUPPLY AIR REGISTERS, 362.5 CFM EACH. (8 REQUIRED)
9. 2" DOMESTIC HOT WATER AND 1/2" DETERGENT UP TO ELECTROSTATIC FILTER SECTION. 4" DRAIN DOWN FROM FILTER.
10. RACK NEW 2-1/8" H.G. AND 1-1/8" LIQUID LINES ON WALL ABOVE DOOR. (2 SETS)
11. REFRIGERANT PIPING DOWN ON WALL.

CHILLER SCHEDULE

SYMBOL	CAPACITY TONS REFR.*	COOLER LWT °F	COOLER GPM	COOLER MAX. P.D.	ELECTRICAL VOLTAGE	ELECTRICAL AMPS**
CHILLER	100	44	270	15'	208 V, 3Ø	295

* BASED ON 0.0005 FOULING FACTOR
** RUNNING LOAD AMPH.

AIR COOLED CONDENSER SCHEDULE

SYMBOL	EAT	CFM	ELECTRICAL HP	ELECTRICAL VOLTAGE	REMARKS
CONDENSER	95°F	66,700	(3) 7.5	208 V, 3Ø	

M-4

CHEATHAM AND ASSOCIATES
CONSULTING ENGINEERS
WILMINGTON, NORTH CAROLINA

MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

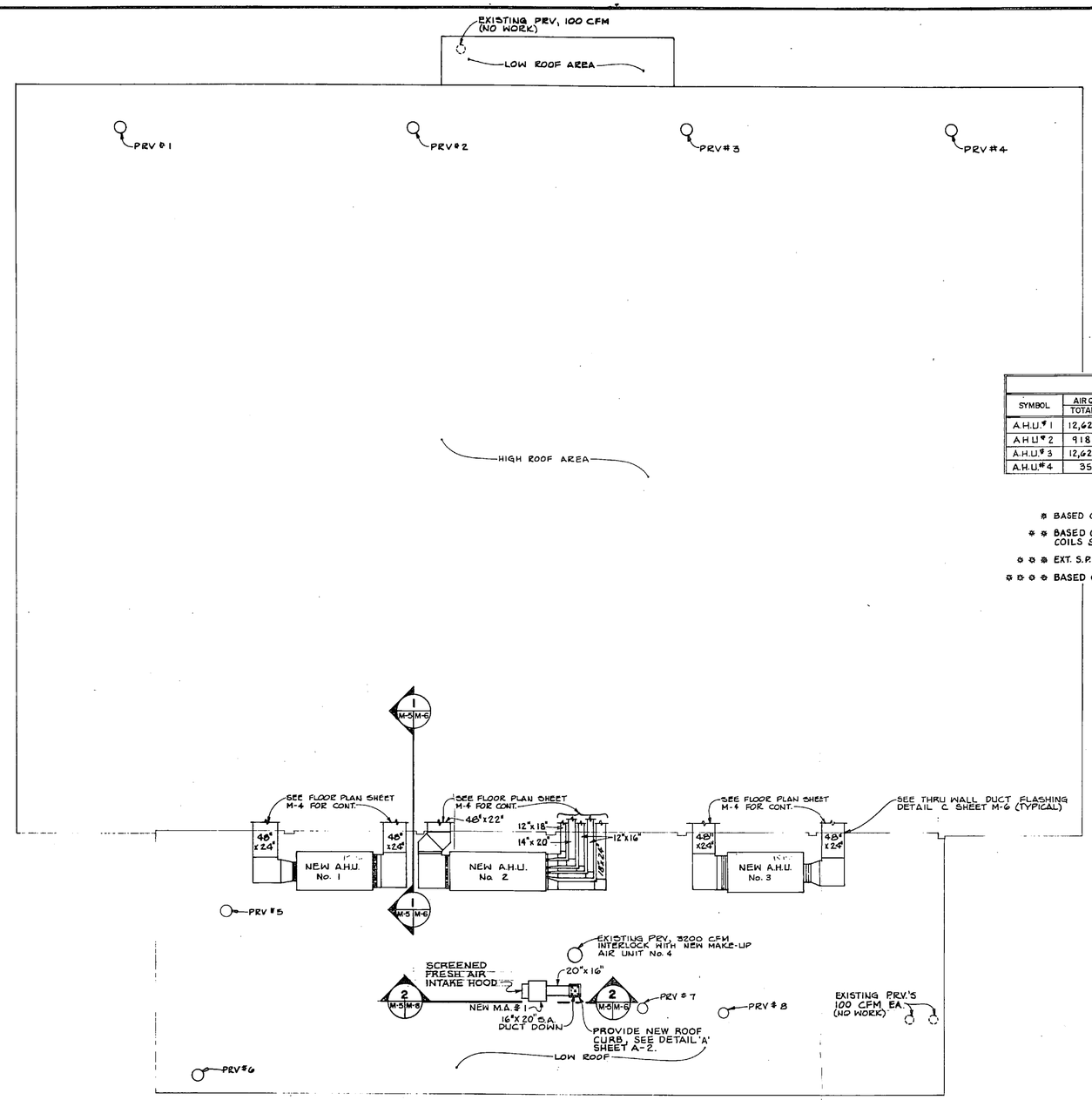
REPLACE CHILLER-BUILDING 89

MECHANICAL
FLOOR PLAN - NEW WORK

DES. JGW
DR. LAB - JEM
CHK. JHC
APPROVED: Flow 7-28-86
DATE: 7-28-86

SIZE F | CODE IDENT. NO. 80091 | MARINE DRAWING NO. 4132996
CONSTR. CONTR. NO. N62470-89-B-7914
SCALE: GRAPHIC | SPEC. 00-84-7914 | SHEET 7 OF 16

REVISIONS			
SYM.	DESCRIPTION	DATE	APPROVED



ROOF PLAN-NEW WORK

SCALE: 1/8"=1'-0"

GRAPHIC SCALES

12' 6' 0 12'

1/8"=1'-0"

POWER ROOF VENTILATOR SCHEDULE

SYMBOL	CFM	ESP "H_2O	RPM	TIP SPEED	HP	ELECTRICAL	TYPE	REMARKS
PRV #1	1100	.10"	1260	3670	¼	120V., 1Ø	ROOF MOUNTED, BELT DRIVE, CENTRIFUGAL	
PRV #2	1100	.10"	1260	3670	¼	↓	↓	
PRV #3	1100	.10"	1260	3670	¼	↓	↓	
PRV #4	1100	.10"	1260	3670	¼	↓	↓	
PRV #5	250	.125"	1500	2765	1/60	↓	ROOF MOUNTED, DIRECT DRIVE, CENTRIFUGAL	W/SOLID STATE SPEED CONTROL
PRV #6	200	.125"	1500	2765	1/60	↓	↓	↓
PRV #7	100	.125"	1050	2234	1/100	↓	↓	↓
PRV #8	100	.125"	1050	2234	1/100	↓	↓	↓

AIR HANDLING UNIT SCHEDULE

SYMBOL	AIR QUAN. C.F.M. TOTAL	AIR QUAN. C.F.M. OUTSIDE	EXT. S.P. ✱✱✱	MAX. H.P.	ELECTRIC SERVICE	COOLING COIL ✱✱ EDB	EWB	LDB	LWB	GTH	GPM✱	RUNOUT SIZE	HEATING COIL ✱✱✱✱ ENTERING AIR TEMP.	GTH	GPM	RUNOUT SIZE	REMARKS
A.H.U. #1	12,625	2062	.45	15	208V, 3Ø	80.9	67.9	56.3	55.2	481,303	98	3"	60.6	238,500	24	2"	SINGLE ZONE
A.H.U. #2	9185	1525	.45	7½	208V, 3Ø	80.9	67.9	56.3	55.2	341,743	72	2½"	60.6	173,500	18	1½"	MULTI-ZONE
A.H.U. #3	12,625	2062	.45	15	208V, 3Ø	80.9	67.9	56.3	55.2	481,303	98	3"	60.6	238,500	24	2"	SINGLE ZONE
A.H.U. #4	350	45	.25	¼	120V, 1Ø	84.2	67.2	59.0	57.0	10,000	2	¾"	59.2	11,700	1.2	¾"	FAN COIL

✱ BASED ON 47°F. E.W.T. & 10°F. RISE. MAXIMUM PRESSURE DROP OF 20' FOR COIL & CONTROL VALVE.

✱✱ BASED ON A MAXIMUM COIL FACE VELOCITY OF 600 F.P.M. & A MAXIMUM AIR SIDE PRESSURE DROP OF 1.0". COILS SHALL HAVE A MINIMUM OF 6 ROWS & 8 FINS PER INCH.

✱✱✱ EXT. S.P. INCLUDES SUPPLY & RETURN AIR DUCTWORK & GRILLES. FILTERS IN UNIT ARE NOT INCLUDED IN THIS FIGURE

✱✱✱✱ BASED ON 180°F. E.W.T. & 20°F. DROP. MAXIMUM PRESSURE DROP OF 10' FOR COIL & CONTROL VALVE.

ELECTROSTATIC FILTER SCHEDULE

A.H.U. SYMBOL	C.F.M.	PRE-FILTER	WASH-WATER CAPACITY✱	ELECTRICAL	REMARKS
1	12,625	30 %	30	208V, 1Ø	INTERNALLY WIRED WITH A.H.U.
2	9185	↓	24	↓	↓
3	12,625	↓	30	↓	↓

✱GPM

MAKE-UP AIR HANDLING UNIT SCHEDULE

SYMBOL	O.S. AIR QUANTITY	EXT. S.P.✱	ELECTRICAL H.P.	ELECTRICAL VOLTAGE
M.A. #1	2900	.25	1½	208V, 3Ø

✱ EXT. S.P. INCLUDES SUPPLY & RETURN AIR DUCTWORK & GRILLES. FILTERS IN UNIT ARE NOT INCLUDED IN THIS FIGURE.

M-5

CHEATHAM AND ASSOCIATES
CONSULTING ENGINEERS
WILMINGTON, NORTH CAROLINA

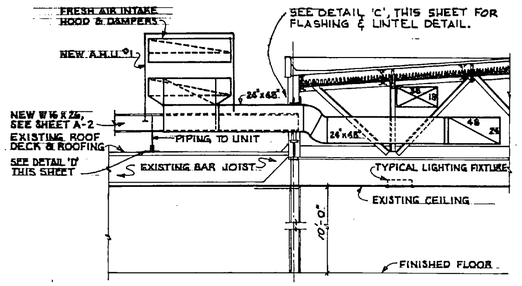
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

DES. JGW
DR. LAB
CHK. JHC
SUBMITTED BY: James H. Cheatham
DESIGN ENG. Pec
APPROVED: FOR DO OIC DATE 7-28-86
SATISFACTORY TO: DATE

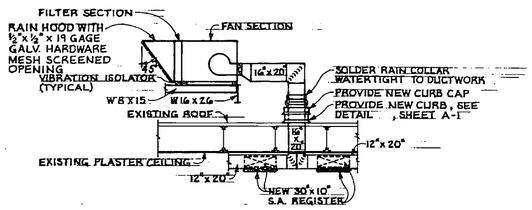
REPLACE CHILLER - BUILDING 69

MECHANICAL
ROOF PLAN-NEW WORK

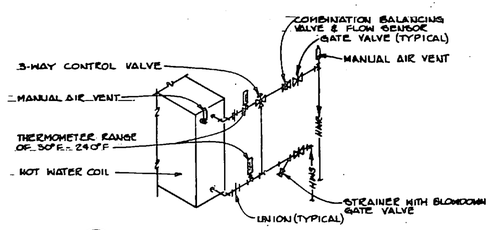
SIZE F | CODE IDENT. NO. 80091 | NAVFAC DRAWING NO. 4132997
CONTR. CONTR. NO. N62470-84-B-7914
SCALE: GRAPHIC | CONS. 05-84-7914 | SHEET 8 OF 10



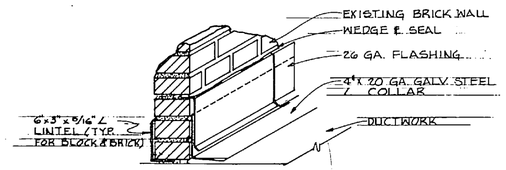
1 M-5 M-6 SECTION
SCALE: 1/4" = 1'-0"



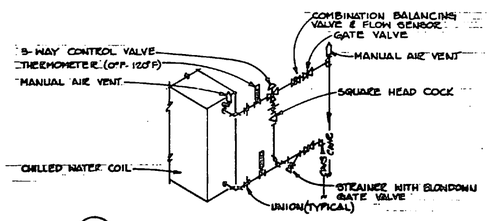
2 M-5 M-6 SECTION
SCALE: 1/4" = 1'-0"



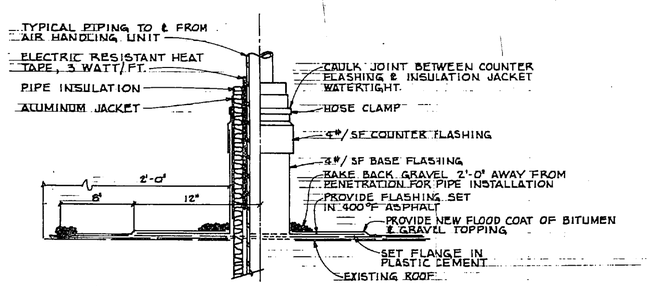
A M-6 M-6 HOT WATER COIL PIPING DETAIL
NO SCALE



C M-5 M-6 THRU WALL DUCT FLASHING DETAIL
NO SCALE



B M-6 M-6 CHILLED WATER COIL PIPING DETAIL
NO SCALE



D M-6 M-6 ROOF PIPE FLASHING DETAIL
NO SCALE

GRAPHIC SCALES:
6' 3' 0 6'
1/4" = 1'-0"

REVISIONS			
SYM.	DESCRIPTION	DATE	APPROVED

M-6

CHEATHAM AND ASSOCIATES
CONSULTING ENGINEERS
WILMINGTON, NORTH CAROLINA

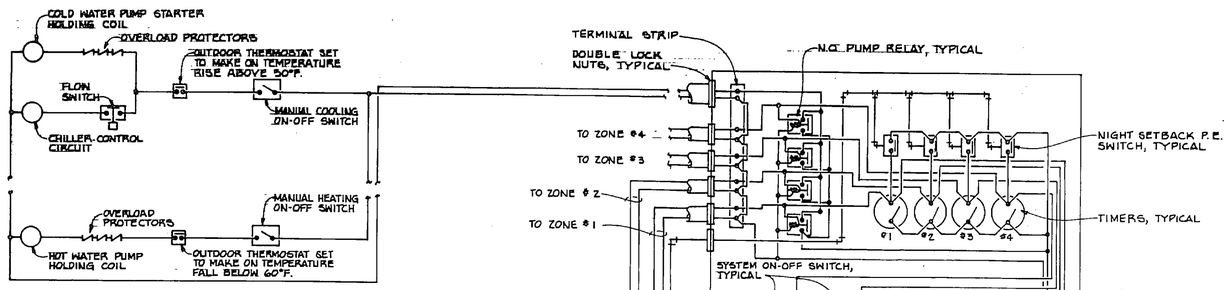
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

REPLACE CHILLER BUILDING 89

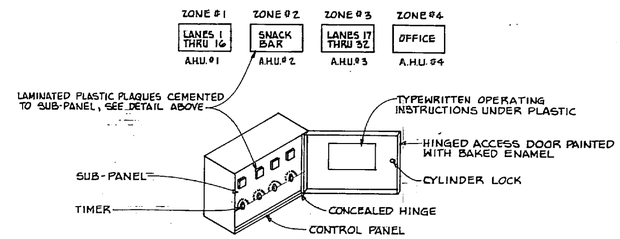
MECHANICAL
DETAILS & SECTIONS

DES. JGW
DR. JEM, LAB
CHK. JHC
SUBMITTED BY: [signature]
DESIGN DIR. [signature]
APPROVED: PWD OR CHCC [signature] DATE 7-28-86
SATISFACTORY TO: DATE

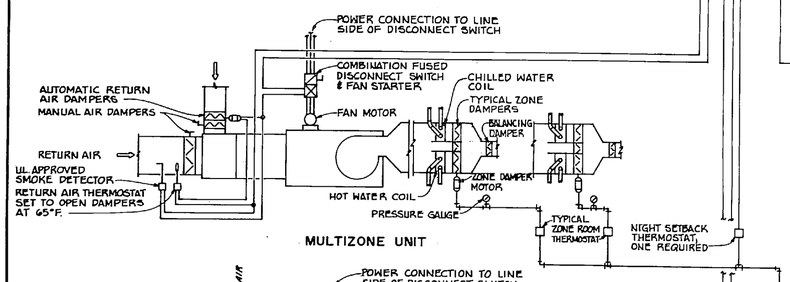
SIZE F | CODE IDENT. NO. 80091 | NAVY DRAWING NO. 4132998
CONTR. CONTR. NO. N62470-84-B-7914
SCALE: GRAPHIC | SPEC. 05-84-7914 | SHEET 9 OF 16



CLOCK & CONTROL PANEL

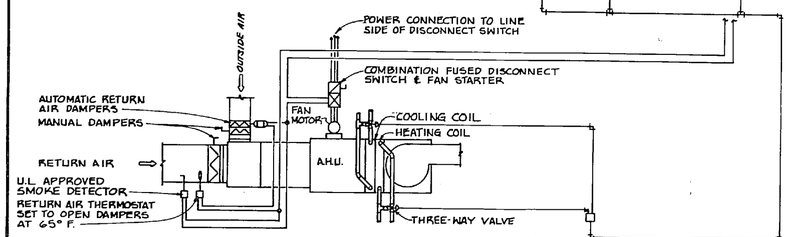


CONTROL PANEL DETAIL



MULTIZONE UNIT

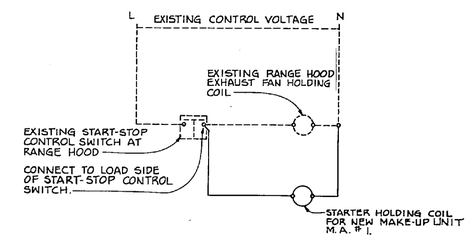
HEATING, VENTILATION & AIR CONDITIONING CONTROL DIAGRAM
NO SCALE



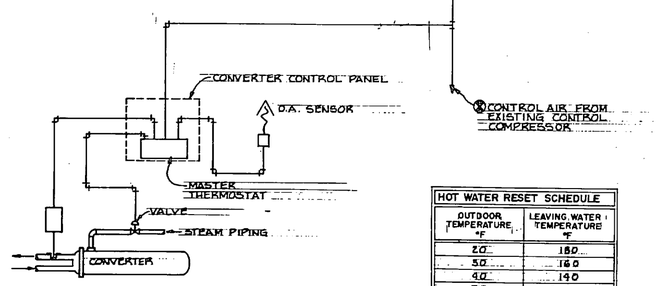
TYPICAL SINGLE ZONE UNIT

EMCS CONTROLS

1. DISCONNECT THE EMCS CONTROLS FOR THE NINE AHU'S AND TWO CHILLERS AND RECONNECT FOUR TO THE NEW AHU'S AND ONE TO THE NEW CHILLER.
2. THE SET POINTS FOR THE AHU'S ARE AS FOLLOWS:
   - (A) STOP START CONTROL
   - (B) SUPPLY AIR FLOW STATUS
   - (C) ROOM TEMPERATURE
3. THE SET POINTS FOR THE CHILLERS ARE AS FOLLOWS:
   - (A) START STOP CONTROL
   - (B) CHILLED WATER FLOW STATUS
   - (C) CHILLED WATER SUPPLY TEMPERATURE
   - (D) CHILLED WATER RETURN
   - (E) CHILLER DEMAND LIMIT CONTROL
   - (F) CHILLER STATUS



RANGE HOOD CONTROL SCHEMATIC
NO SCALE



CONVERTER CONTROL

HOT WATER RESET SCHEDULE	
OUTDOOR TEMPERATURE °F	LEAVING WATER TEMPERATURE °F
20	180
30	160
40	140
50	120
60	100

GRAPHIC SCALES:

M-7

CHEATHAM AND ASSOCIATES
CONSULTING ENGINEERS
WILMINGTON, NORTH CAROLINA

DES. JGW
DR. JEM, LAB
CHK. JHC
SUBMITTED BY:
DESIGN ENG.
APPROVED: FOR OIC DATE 7-28-86
REPRODUCIBLY TO: DATE

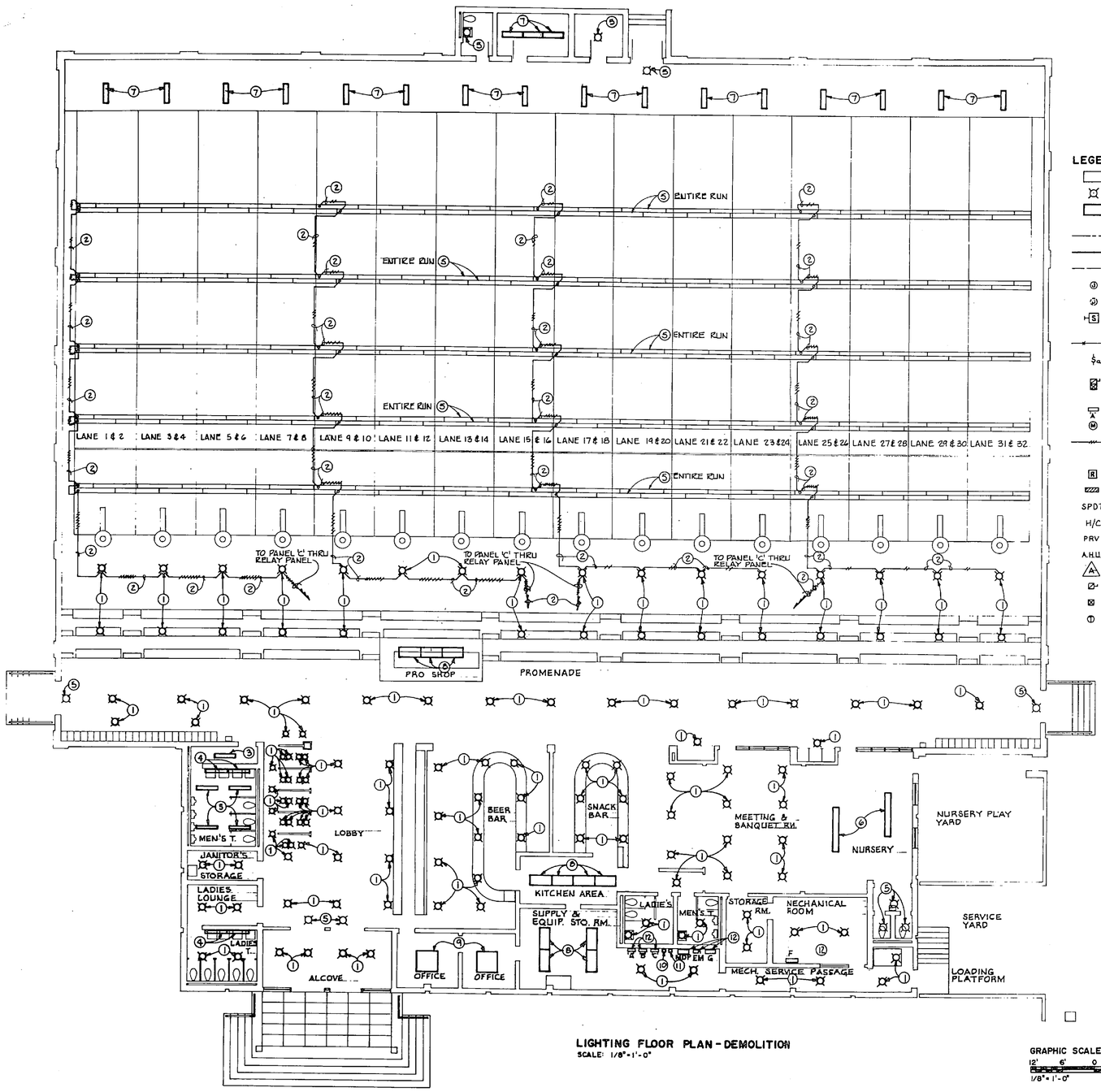
CONSTRUCTED BY THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

REPLACE CHILLER BUILDING 89

MECHANICAL
CONTROL DIAGRAM

SIZE F | CODE IDENT. NO. 69001 | DRAWING NUMBER NO. 413999
CONSTR. DRAWING NO. 7462470-84-B-7914
SCALE: GRAPHIC | ORIG. 06-84-7914 | SHEET 10 OF 16

REVISIONS			
SYM.	DESCRIPTION	DATE	APPROVED



LIGHTING FLOOR PLAN - DEMOLITION
SCALE: 1/8"=1'-0"

GRAPHIC SCALES:
12' 6' 0 12'
1/8"=1'-0"

LEGEND:

- EXISTING FLUORESCENT FIXTURE TO REMAIN
- INCANDESCENT FIXTURE, SEE KEYED NOTES
- NEW FLUORESCENT FIXTURE WITH ENERGY SAVING BALLAST.
- EXISTING CONDUIT ABOVE SLAB TO REMAIN
- NEW CONDUIT
- EXISTING CONDUIT BELOW SLAB TO REMAIN
- EXISTING JUNCTION BOX TO REMAIN
- REMOVE EXISTING JUNCTION BOX
- FACTIONAL HORSEPOWER MOTOR STARTER WITH THERMAL OVERLOAD ELEMENT
- REMOVE EXISTING CONDUIT & CONDUCTORS
- NEW WALL MOUNTED LIGHTING SWITCH. LETTER DESIGNATES FIXTURES CONTROLLED.
- NEW COMBINATION DISCONNECT SWITCH & MAGNETIC MOTOR STARTER
- EXISTING ELECTRICAL PANEL
- MOTOR
- CONDUIT WITH NUMBER OF CIRCUIT CONDUCTORS INDICATED (DOES NOT INCLUDE GROUND CONDUCTOR).
- RELAY PANEL
- NEW ELECTRICAL PANEL
- SPDT SINGLE POLE DOUBLE THROW
- H/C HEAT CABLE
- PRV POWER ROOF VENTILATOR
- A.H.U. AIR HANDLING UNIT
- LIGHTING FIXTURE SYMBOL
- FUSIBLE DISCONNECT SWITCH
- MAGNETIC MOTOR STARTER
- OUTDOOR THERMOSTAT SET AT 35°F.

KEYED NOTES: (THIS SHEET ONLY)

1. REMOVE EXISTING INCANDESCENT LIGHT FIXTURE AND RELATED WIRING TO JUNCTION BOX ABOVE CEILING. JUNCTION BOX TO REMAIN.
2. REMOVE EXISTING CONDUCTORS, NUMBER AS INDICATED. RACEWAY SYSTEM TO REMAIN.
3. REMOVE EXISTING CEILING MOUNTED TWO TUBE FLUORESCENT STRIP FIXTURE.
4. REMOVE EXISTING WALL MOUNTED SINGLE TUBE 48" FLUORESCENT FIXTURE.
5. EXISTING FIXTURE TO REMAIN.
6. REMOVE EXISTING TWO TUBE 96" CEILING MOUNTED STRIP FLUORESCENT FIXTURE.
7. REMOVE EXISTING FLUORESCENT BALLASTS, TWO TUBE FIXTURE.
8. REMOVE EXISTING FLUORESCENT BALLASTS, FOUR TUBE FIXTURE.
9. REMOVE EXISTING FLUORESCENT BALLASTS, EIGHT TUBE FIXTURE.
10. REMOVE EXISTING RELAY PANEL SERVING LANES 1 THRU 16.
11. REMOVE EXISTING RELAY PANEL SERVING LANES 17 THRU 32.
12. EXISTING PANELS TO REMAIN.

E-1

CHEATHAM AND ASSOCIATES
CONSULTING ENGINEERS
WILMINGTON, NORTH CAROLINA

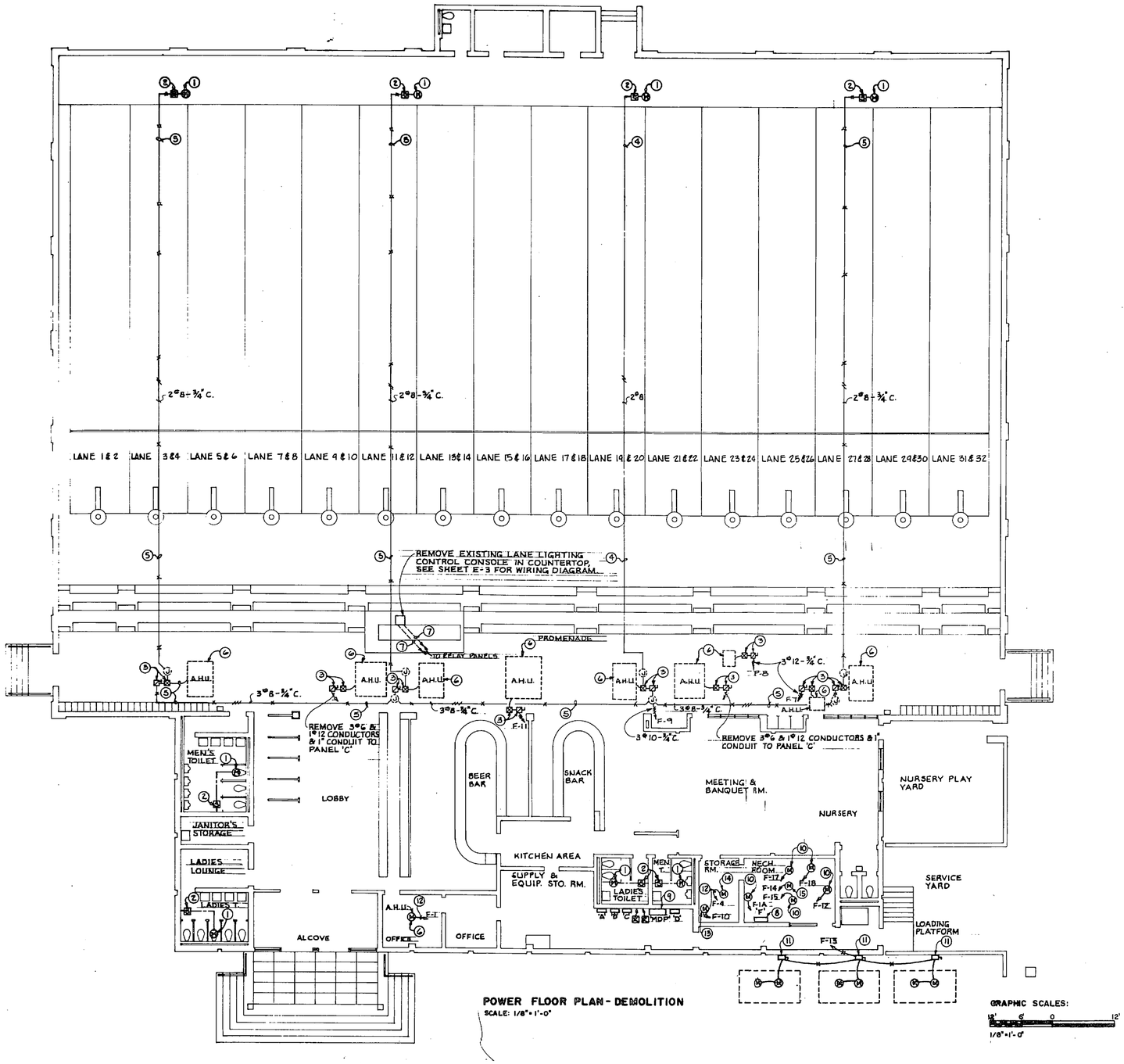
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

REPLACE CHILLER - BUILDING 89

ELECTRICAL
LIGHTING FLOOR PLAN - DEMOLITION

DES. JGW
DO. LAB
CHK. JHC
SUBMITTED BY: [signature]
DESIGN BIR. [signature]
APPROVED: PWO OR OICC DATE
[signature] 7-28-86
SATISFACTORY TO: DATE

SIZE F | CODE IDENT. NO. 80091 | NAVFAC DRAWING NO. 4133000
CONSTR. CONTR. NO. N62470-84-B-7914
SCALE: GRAPHIC | SPEC. 05-84-7914 | SHEET 11 OF 16



POWER FLOOR PLAN - DEMOLITION
SCALE: 1/8" = 1'-0"

GRAPHIC SCALES:
1/8" = 1'-0"

KEYED NOTES: (THIS SHEET ONLY)

1. DISCONNECT EXISTING POWER ROOF VENTILATOR.
2. REMOVE EXISTING THERMAL OVERLOAD ELEMENT.
3. REMOVE EXISTING DISCONNECT SWITCH AND MAGNETIC MOTOR STARTER.
4. REMOVE EXISTING CONDUCTORS. CONDUIT TO REMAIN.
5. REMOVE EXISTING CONDUIT AND CONDUCTORS.
6. REMOVE EXISTING AIR HANDLING UNIT MOTOR CONNECTIONS.
7. REMOVE EXISTING 5#14 CONDUCTORS. EXISTING 3/4" CONDUIT TO REMAIN.
8. REMOVE EXISTING PANEL 'F', 400 A. MAINS WITH (6) 1P-20 A., (2) 3P-15 A., (2) 3P-20 A., (4) 3P-30 A., (1) 3P-40 A., (1) 3P-150 A. AND (2) 3P-400 A. BREAKERS. REMOVE EXISTING PARALLEL FEEDERS, 4#250 MCM EACH IN EXISTING 3" CONDUITS. REMOVE EXISTING CONDUITS TO FLOOR AND SEALL OFF.
9. REMOVE EXISTING 3P-400 A. BREAKER SERVING PANEL 'F'.
10. REMOVE EXISTING MOTOR, STARTERS, CONDUIT AND CONDUCTORS.
11. REMOVE EXISTING SWITCHES, CONDUIT AND CONDUCTORS TO PANEL 'F'.
12. REMOVE EXISTING POWER CONDUCTORS TO PANEL 'F'. CONDUIT TO REMAIN.
13. EXISTING CONDENSATE PUMP TO REMAIN.
14. EXISTING DOMESTIC HOT WATER CIRCULATING PUMP TO REMAIN.
15. EXISTING EXHAUST FAN ON ROOF TO REMAIN.

REVISIONS			
SYM.	DESCRIPTION	DATE	APPROVED

E-2

CHEATHAM AND ASSOCIATES
CONSULTING ENGINEERS
WILMINGTON, NORTH CAROLINA

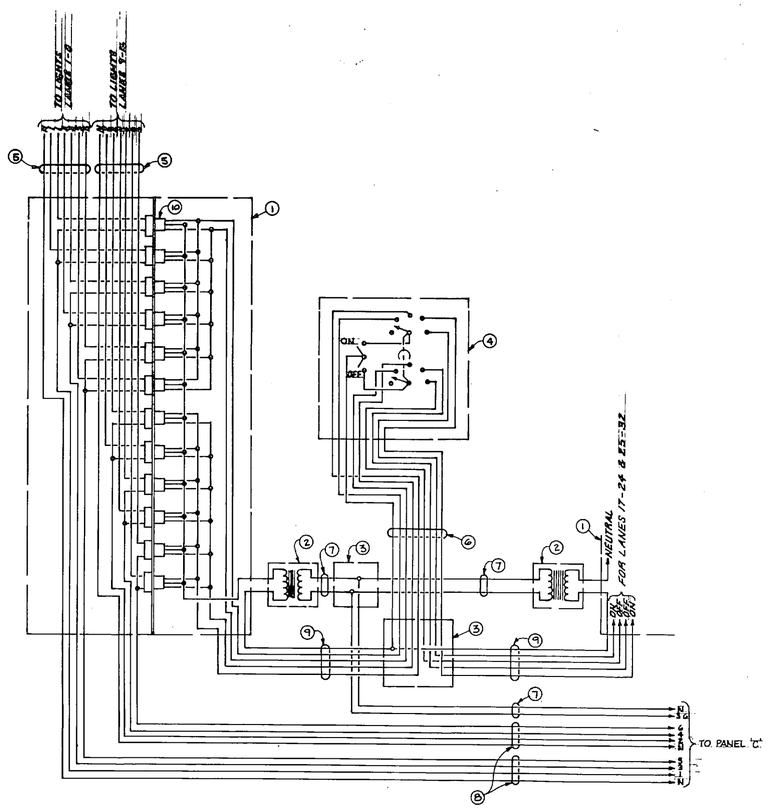
DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

REPLACE CHILLER - BUILDING 89

ELECTRICAL
POWER FLOOR PLAN - DEMOLITION

DES. JGW
DR. LAB, JGW
CHK. JHC
SUBMITTED BY: James H. Cheatham
DESIGN ENG. JHC
APPROVED: FOR CO CODE Thomas 7-28-86 DATE
CONTRACTORY TO: DATE

SIZE F | CODE IDENT. NO. 80001 | NAVDOCK DRAWING NO. 4183001
CONSTR. CONTR. NO. N62470-84-B-7914
SCALE: GRAPHIC | SPEC. 06-84-7914 | SHEET 12 OF 16



SCHEMATIC WIRING DIAGRAM FOR LOW VOLTAGE CONTROL OF LANE LIGHTING - DEMOLITION
LANES 1-8 & 9-16 SHOWN, LANES 17-24 & 25-32 IDENTICAL
NO SCALE

REVISIONS			
SYMB.	DESCRIPTION	DATE	APPROVED

KEYED NOTES: (THIS SHEET ONLY)

1. REMOVE EXISTING 12 GAUG SPDT RELAY PANEL AND RELATED CONDUCTORS.
2. EXISTING 120 VOLT, SINGLE PHASE -24 VOLT SIGNAL TRANSFORMER TO REMAIN.
3. EXISTING JUNCTION BOX TO REMAIN.
4. REMOVE EXISTING SELECTOR SWITCHES AND MASTER SWITCH IN COUNTERTOP CONTROL PANEL.
5. REMOVE EXISTING 7010 CONDUCTORS. EXISTING 1" CONDUIT TO REMAIN.
6. REMOVE EXISTING 9014 CONDUCTORS. EXISTING 1" CONDUIT TO REMAIN.
7. EXISTING CONDUIT AND CONDUCTORS TO REMAIN.
8. REMOVE EXISTING 4010 CONDUCTORS AND 3/4" CONDUIT.
9. REMOVE EXISTING 5014 CONDUCTORS. EXISTING 3/4" CONDUIT TO REMAIN.
10. REMOVE EXISTING SPDT LOW VOLTAGE OPERATED RELAYS.

E-3

CHEATHAM AND ASSOCIATES
CONSULTING ENGINEERS
WILMINGTON, NORTH CAROLINA

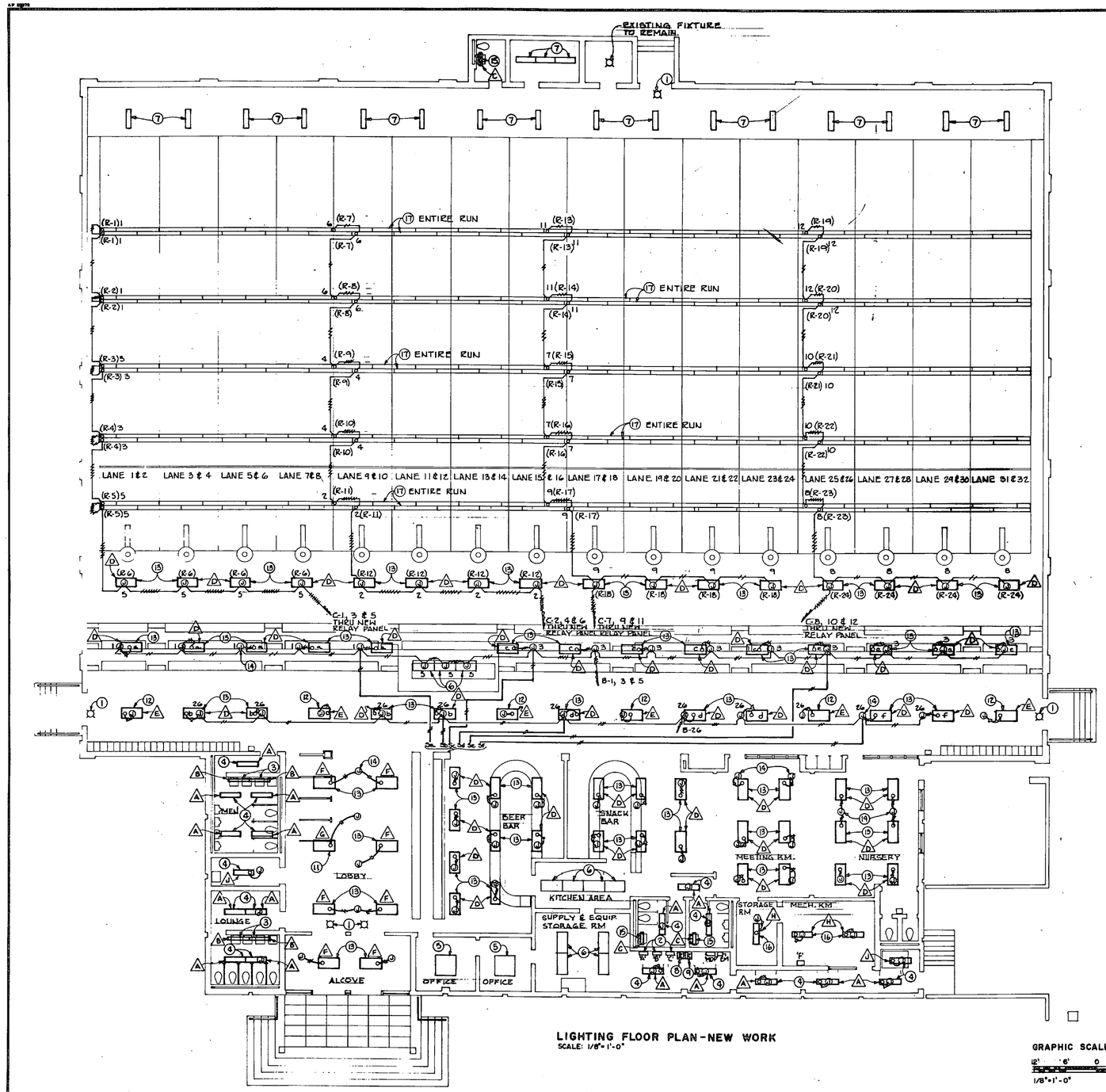
DES. JGW
DR. LAB
CHK. JHC
SUBMITTED BY: Joseph H. Cheatham
DESIGN DIR.
APPROVED: FOR OR CICC: Joseph H. Cheatham DATE 7-28-86
SATISFACTORY TO: DATE

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

REPLACE CHILLER - BUILDING 89

ELECTRICAL
LANE LIGHTING CONTROL - DEMOLITION

SIZE F | CODE IDENT. NO. 80001 | DWG. NO. 4153002
SUBSTD. COMPL. CT. N62470-84-B-7814
SCALE: GRAPHIC | SPEC. 05-84-7814 | SHEET 13 OF 16



LIGHTING FLOOR PLAN-NEW WORK
SCALE: 1/8"=1'-0"

GRAPHIC SCALES:
12' 6' 0 12'
1/8"=1'-0"

REVISIONS			
SYM.	DESCRIPTION	DATE	APPROVED

KEYED NOTES: (THIS SHEET ONLY)

1. EXISTING INCANDESCENT FIXTURE (EXIT LIGHT) TO REMAIN.
2. EXISTING PANELS
3. PROVIDE NEW WALL MOUNTED FIXTURE, SEE FIXTURE SCHEDULE.
4. PROVIDE NEW CEILING MOUNTED FIXTURE, SEE FIXTURE SCHEDULE.
5. PROVIDE NEW ENERGY SAVING BALLASTS, EXISTING 8 TUBE FIXTURE.
6. PROVIDE NEW ENERGY SAVING BALLASTS, EXISTING 4 TUBE FIXTURE.
7. PROVIDE NEW ENERGY SAVING BALLAST, EXISTING 2 TUBE FIXTURE.
8. PROVIDE NEW RELAY PANEL SERVING LANES 1 THRU 16. SEE SHEET E-6 FOR RELAY PANEL DETAILS.
9. PROVIDE NEW RELAY PANEL SERVING LANES 17 THRU 32. SEE SHEET E-6 FOR RELAY PANEL DETAILS.
10. PROVIDE NEW #10 THHN CONDUCTORS, NUMBER INDICATED IN EXISTING RACEWAY.
11. PROVIDE NEW LAY-IN FIXTURE. PROVIDE EMERGENCY POWER PACK FOR 2 TUBES. SEE FIXTURE SCHEDULE.
12. PROVIDE NEW LAY-IN FIXTURE WITH EMERGENCY POWER PACK. SEE FIXTURE SCHEDULE.
13. PROVIDE NEW LAY-IN FIXTURE. SEE FIXTURE SCHEDULE.
14. EXISTING JUNCTION BOX TO BE REUSED. (TYPICAL)
15. PROVIDE NEW WALL MOUNTED FIXTURE. SEE FIXTURE SCHEDULE.
16. PROVIDE NEW CEILING MOUNTED FIXTURE. SEE FIXTURE SCHEDULE.
17. EXISTING SINGLE 96" TUBE FLUORESCENT FIXTURES TO REMAIN.

LIGHTING FIXTURE SCHEDULE

FIXTURE SYMBOL	STYLE & TYPE - SEE SPECS FOR NAVFAC SKETCH No. OR SEE DETAIL ON PLANS	NUMBER & TYPE OF LAMPS	VOLT	MOUNTING	REMARKS
A	NL-1, TYPE A	2-F40 T-12LW	120	SURFACE	SEE NOTE 14
B	NL-4, TYPE C	2-F40 T-12LW	120	WALL, 6' A.F.F.	SEE NOTE 14
C	NL-4, TYPE A	2-20W T-12RS	120	WALL, 6' A.F.F.	SEE NOTE 14
D	NL-3, TYPE C	2-F40 T-12LW	120	LAY-IN	SEE NOTE 14
E	NL-3, TYPE C	2-F40 T-12LW	120	LAY-IN	SEE NOTE 14
F	NL-3, TYPE E	4-F40 T-12LW	120	LAY-IN	SEE NOTE 14
G	NL-3, TYPE E	4-F40 T-12LW	120	LAY-IN	SEE NOTE 14
H	NL-7, TYPE B	2-F40 T-12LW	120	SURFACE	SEE NOTE 14
I	NOT USED	—	—	—	—
J	NL-8	2-F40 T-12LW	120	SURFACE	SEE NOTE 14

E-4

CHEATHAM AND ASSOCIATES
CONSULTING ENGINEERS
WILMINGTON, NORTH CAROLINA

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

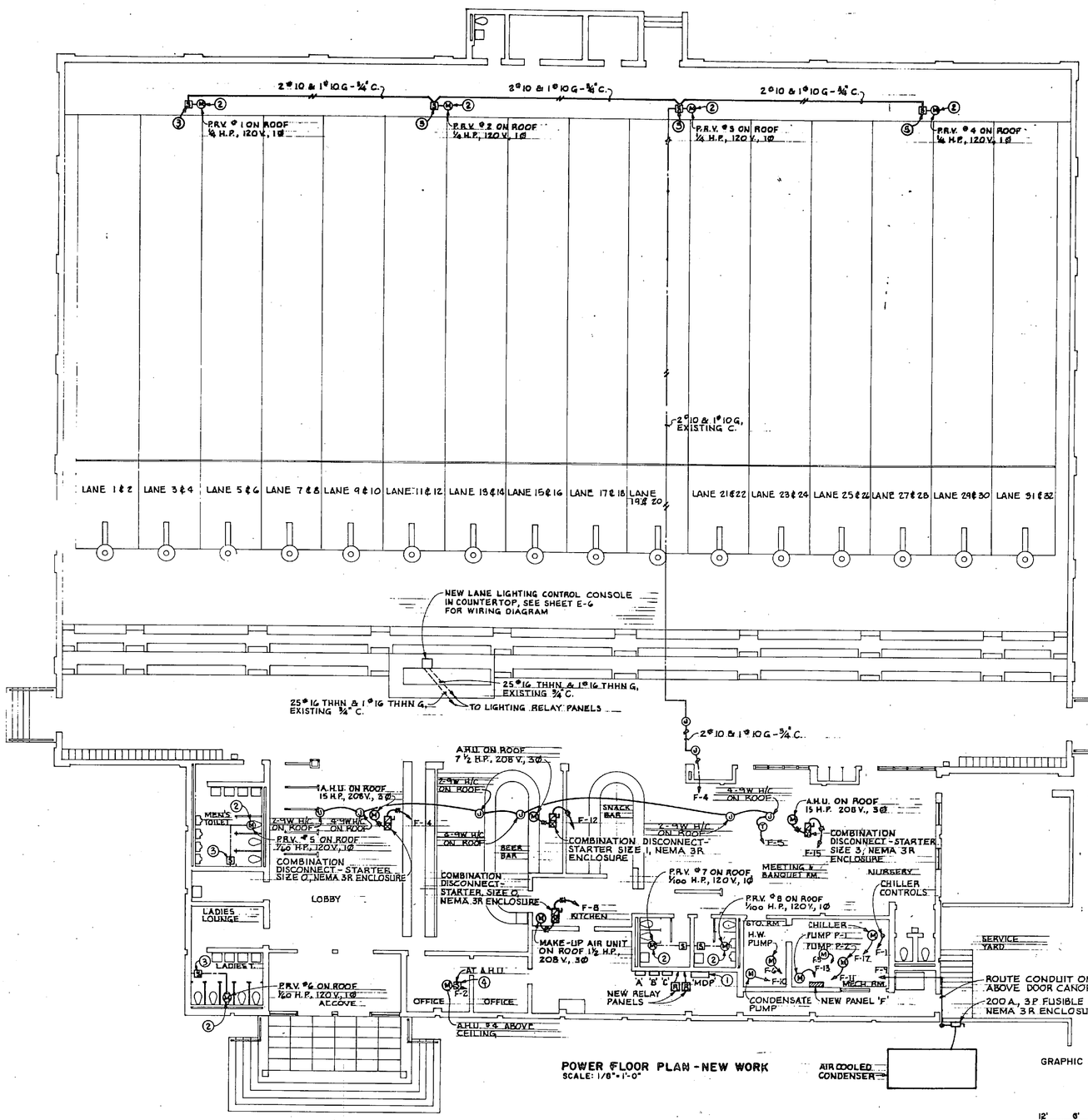
REPLACE CHILLER - BUILDING 89

ELECTRICAL
LIGHTING FLOOR PLAN - NEW WORK

DES. JGW
CH. LAB
CHK. UHC
SUBMITTED BY: James H. Cheatham
DESIGN CHK.
APPROVED: PWO CO CHCC DATE 7-28-86
SATISFACTORY TO: DATE

SIZE F | CODE IDENT. NO. 06001 | NAVFAC DRAWING NO. 4133003
CONSTR. CONTR. NO. N64270-84-B-7814
SCALE: GRAPHIC | SPEC. 05-84-7814 | SHEET 14 OF 16

SYM.	DESCRIPTION	DATE	APPROVED



POWER FLOOR PLAN - NEW WORK
SCALE: 1/8"=1'-0"

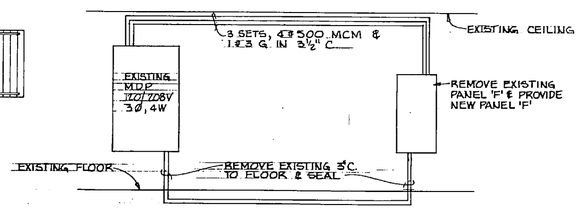
NEW PANEL 'F' - 3Ø, 4 WIRE, 120/208 V., S/N BAR, Gnd. BAR, 1000 A. MAINS, SURFACE MOUNTED NEMA 1 ENCLOSURE

CIR. No.	DESCRIPTION	WATT LOAD	PHASE A	PHASE B	PHASE C	BREAKERS POLE	BREAKERS TRIP	No. WIRES, SIZE, TYPE & CONDUIT	REMARKS
1	CHILLER CONTROLS	530	530	—	—	1	20	2-#12 & 1-#12G. ½" C.	
2	A.H.U. No. 4 ¼ H.P.	667	667	—	—	1	20	2-#12 & 1-#12 G. EXISTING C.	
3	DETERGENT PUMP (1/8 H.P)	828	—	828	—	1	20	—	
4	EXHAUST FANS (4@ ¼ H.P.)	2668	—	2668	—	1	30	2-#10 & 1-#10G. ¾" C.	
5	HEAT CABLE	162	—	—	162	1	20	—	
6	H.W. CIRCULATOR 1/6 H.P.	506	—	—	506	1	20	2-#12 & 1-#12 G. EXISTING C.	
7	SPACE	—	—	—	—	3	—	—	
8	MAKE-UP AIR UNIT 1½ H.P.	2061	687	687	687	3	15	3-#12 & 1-#12 G. ¾" C.	
9	AIR COOLED CONDENSER (3@7½ H.P)	26155	8718	8718	8719	3	125	3-#1/0 & 1-#6G. 2" C.	
10	CONDENSATE PUMP (2@ 2 H.P)	2520	840	840	840	3	30	3-#10 & 1-#10G. EXISTING C.	
11	PUMP P-2 1½ H.P. (HOT WATER)	2061	687	687	687	3	30	3-#10 & 1-#10G. ¾" C.	
12	NEW A.H.U. 7½ H.P.	8718	2906	2906	2906	3	50	3-#6 & 1-#10G. 1" C.	
13	PUMP P-1 7½ H.P. (CHILLED WATER)	8718	2906	2906	2906	3	50	3-#6 & 1-#10G. 1" C.	
14	NEW A.H.U. 15 H.P.	16,644	5548	5548	5548	3	100	3-#1 & 1-#8 G. 1½" C.	
15	NEW A.H.U. 15 H.P.	16,644	5548	5548	5548	3	100	3-#1 & 1-#8 G. 1½" C.	
16	SPACE	—	—	—	—	3	—	—	
17	CHILLER	106,279	35,426	35,426	35,426	3	600	2 SET-3-#500 MCM THHN & 1-#1 G-3½" C.	
18	SPACE	—	—	—	—	3	—	—	
TOTAL CONNECTED LOAD		185,161	68,465	66,762	63,935	542 A. CONNECTED LOAD			

* SINGLE POLE BREAKERS SHALL BE CLASS 12a RATED.
THREE POLE BREAKERS SHALL BE CLASS 12b RATED.

KEYED NOTES: (THIS SHEET ONLY)

1. PROVIDE NEW 3P-800 A., CLASS b, CICUIT BREAKER WITH 3 SETS OF 4@500 MCM THHN AND 1@3 GROUND IN EACH OF NEW 3-3 1/2" CONDUITS TO FEED 'F'.
2. PROVIDE CONNECTION TO NEW POWER ROOF VENTILATOR.
3. EXISTING FRACTIONAL HORSEPOWER MOTOR STARTER. PROVIDE NEW THERMAL OVERLOAD ELEMENT.
4. PROVIDE NEW FRACTIONAL HORSEPOWER STARTER WITH THERMAL OVERLOAD ELEMENT.



RISER DIAGRAM
NO SCALE

E-5

CHEATHAM AND ASSOCIATES
CONSULTING ENGINEERS
WILMINGTON, NORTH CAROLINA

DEPARTMENT OF THE NAVY — NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

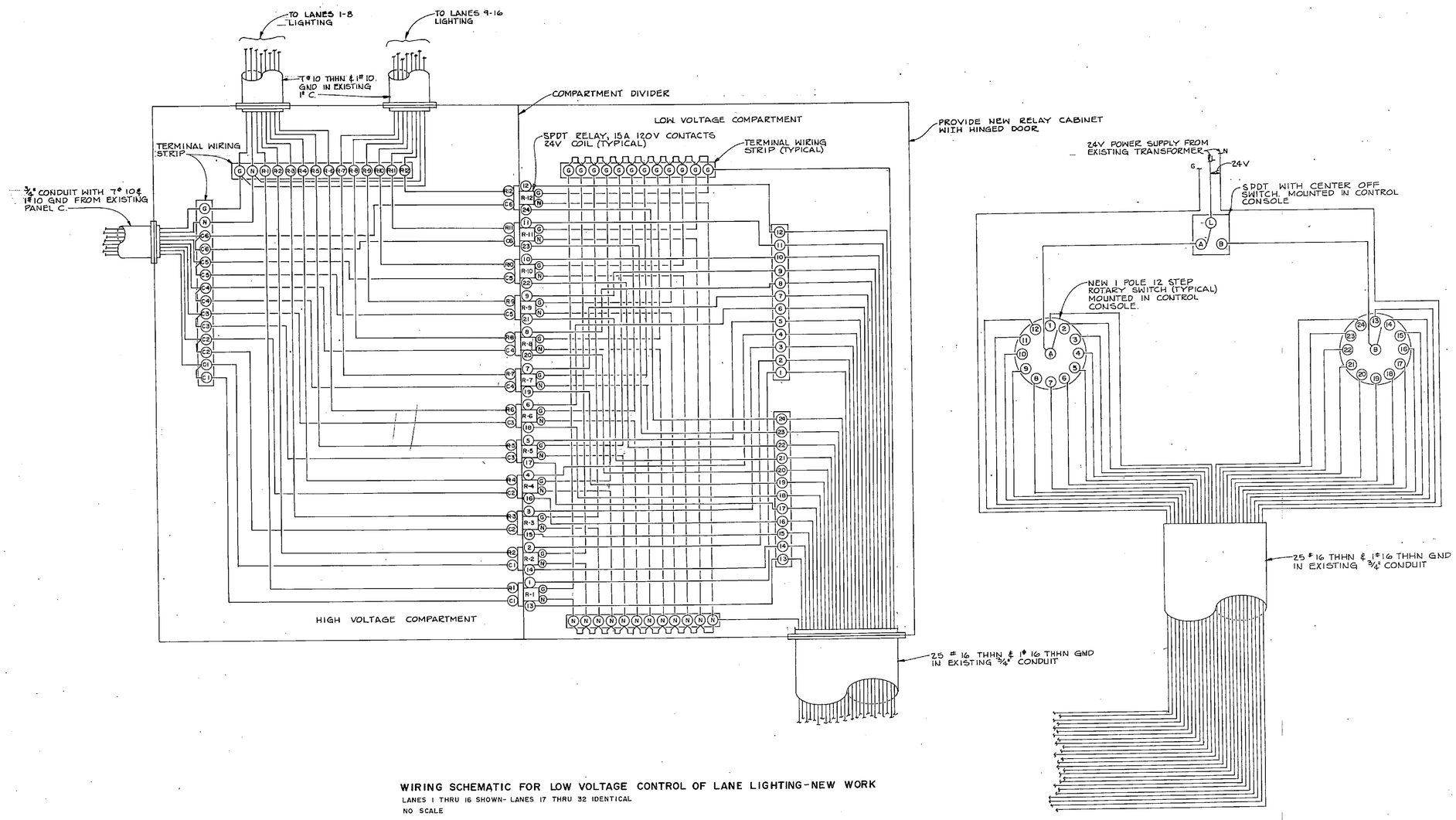
REPLACE CHILLER-BUILDING 89

ELECTRICAL
POWER FLOOR PLAN-NEW WORK

DES. J G W
DR. L A B - J E M
CHK. J H C
SUBMITTED BY
DESIGN ENG.
APPROVED: NAVFAC CO ENGR — DATE 7-28-80
SATISFACTORY TO: DATE

SIZE F | SHEET NO. 80091 | NAVFAC DRAWING NO. 4133004
CONSTR. CONTR. NO. N62470-89-B-7914
SCALE: GRAPHIC | SPEC. 05-84-7914 | SHEET 15 OF 16

REVISIONS			
SYMB.	DESCRIPTION	DATE	APPROVED



WIRING SCHEMATIC FOR LOW VOLTAGE CONTROL OF LANE LIGHTING-NEW WORK

LANES 1 THRU 16 SHOWN- LANES 17 THRU 32 IDENTICAL

NO SCALE

E-6

CHEATHAM AND ASSOCIATES
CONSULTING ENGINEERS
WILMINGTON, NORTH CAROLINA

DES. JGW
DR. JGW
CHK. JHC
SUBMITTED BY: James H. Cheatham
DESIGN DIR.:
APPROVED: FWO OR OICC — DATE 7-28-86
SATISFACTORY TO: — DATE

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS BASE
CAMP LEJEUNE, NORTH CAROLINA

REPLACE CHILLER-BUILDING 89

ELECTRICAL
LANE LIGHTING CONTROL-NEW WORK

SIZE	CODE IDENT. NO.	NAVFAC DRAWING NO.
F	80091	4133005

CONSTR. CONTR. NO. N62470-84-B-7914

SCALE: GRAPHIC | SPEC. 05-84-7914 | SHEET 16 OF 16