

A1 PLUMBING SITE PLAN
1/16" = 1'-0"

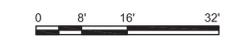
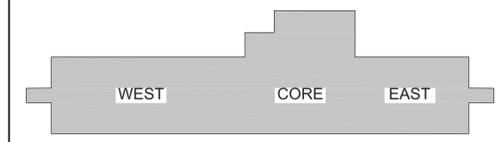
GENERAL NOTES

1. REFER TO CIVIL DRAWINGS FOR ADDITIONAL NOTES AND REQUIREMENTS
2. REFER TO PLUMBING FIXTURE SCHEDULE FOR FIXTURE ROUGH-IN SIZES.
3. REFER TO PLUMBING P-5X SERIES DRAWINGS FOR DETAILS.
4. EXISTING CONDITIONS ARE BASED ON INFORMATION OBTAINED FROM AVAILABLE AS-BUILT PLANS AND FIELD INVESTIGATIONS. FIELD VERIFY EXISTING CONDITIONS PRIOR TO THE START OF WORK.
5. ALL UNDERGROUND PIPING IS TO REMAIN, UNLESS OTHERWISE NOTED.

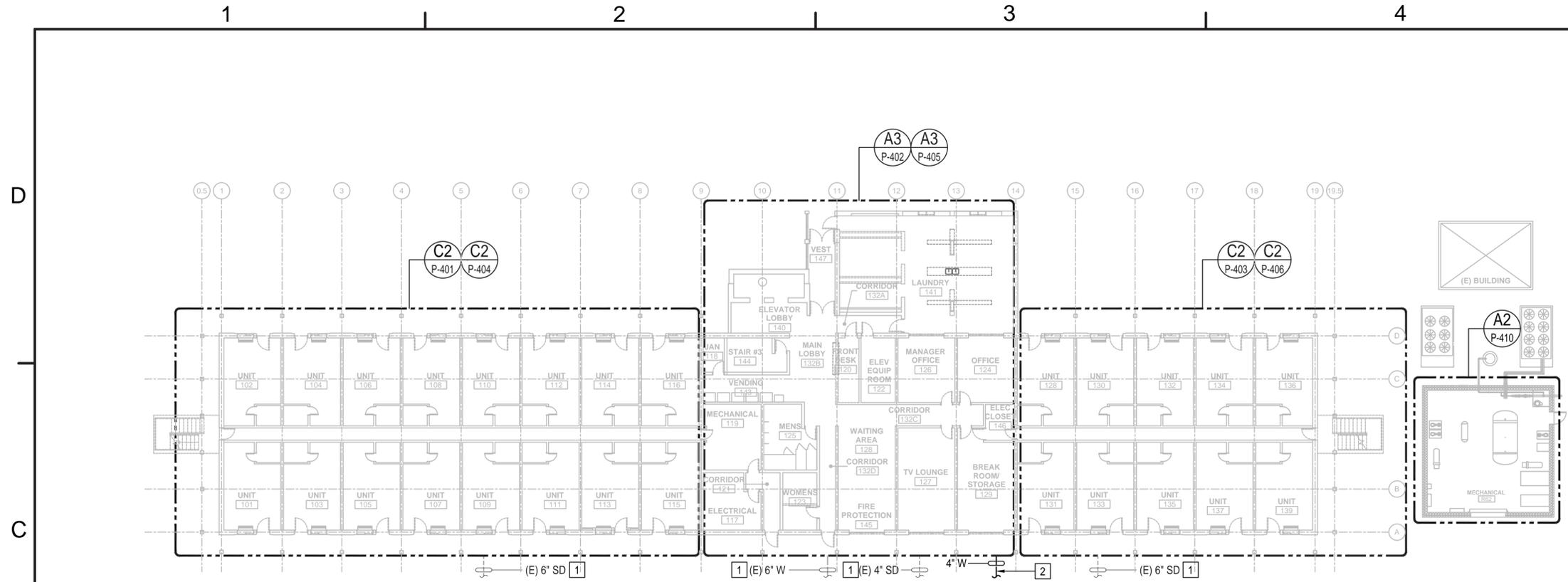
KEY NOTES

1. EXISTING DOMESTIC WATER PIPING UNDERGROUND TO REMAIN
2. NATURAL GAS CONNECTION TO CENTRAL PLANT FROM VIRGINIA NATURAL GAS.

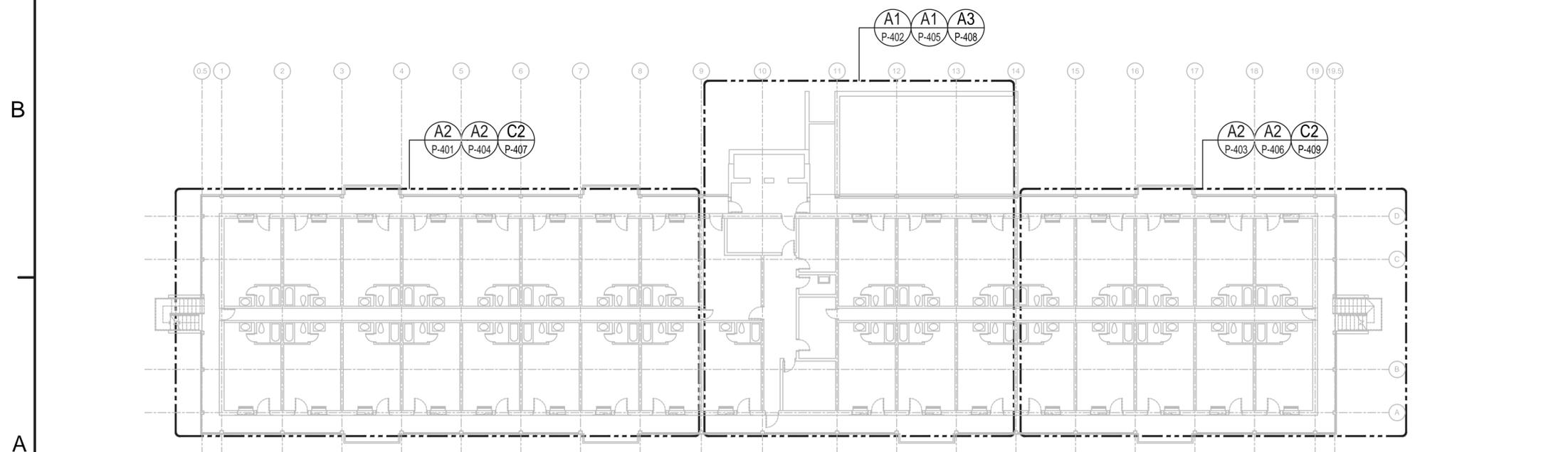
KEY PLAN



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| DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC NORFOLK, VIRGINIA NAVAL STATION NORFOLK Q4/BQ RENOVATE BUILDING R61 PLUMBING SITE PLAN | |
| SCALE: AS NOTED | |
| PROJECT NO. 1355149 | |
| CONSTRUCTION CONTRACT NO. N40085-10-D-5333-D.O. 0012 | |
| NAVFAC DRAWING NO. | |
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C1 PLUMBING 1ST FLOOR PLAN
1/16" = 1'-0"



A1 PLUMBING 2ND - 6TH FLOOR PLAN
1/16" = 1'-0"



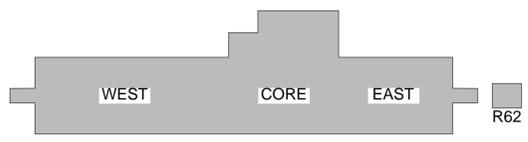
GENERAL NOTES

- REFER TO ARCHITECTURAL FLOOR PLANS FOR ADDITIONAL NOTES AND REQUIREMENTS.
- EXISTING CONDITIONS ARE BASED ON INFORMATION OBTAINED FROM AVAILABLE AS-BUILT PLANS AND FIELD INVESTIGATIONS. FIELD VERIFY EXISTING CONDITIONS PRIOR TO THE START OF WORK.
- VERIFY AS-BUILT CONDITIONS PRIOR TO COMMENCEMENT OF DEMOLITION.

KEY NOTES

- UNDERGROUND PIPING TO REMAIN.
- REFER TO CIVIL DRAWINGS FOR CONTINUATION.

KEY PLAN



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| PM/DM |
| BRANCH MANAGER |
| CHIEF ENGINEER |

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NAVAL STATION NORFOLK
NORFOLK, VIRGINIA
Q4/BQ RENOVATE BUILDING R61
PLUMBING PLANS

SCALE: AS NOTED
PROJECT NO. 1355149
CONSTRUCTION CONTRACT NO. N40085-10-D-5333-D.O. 0012
NAVFAC DRAWING NO.

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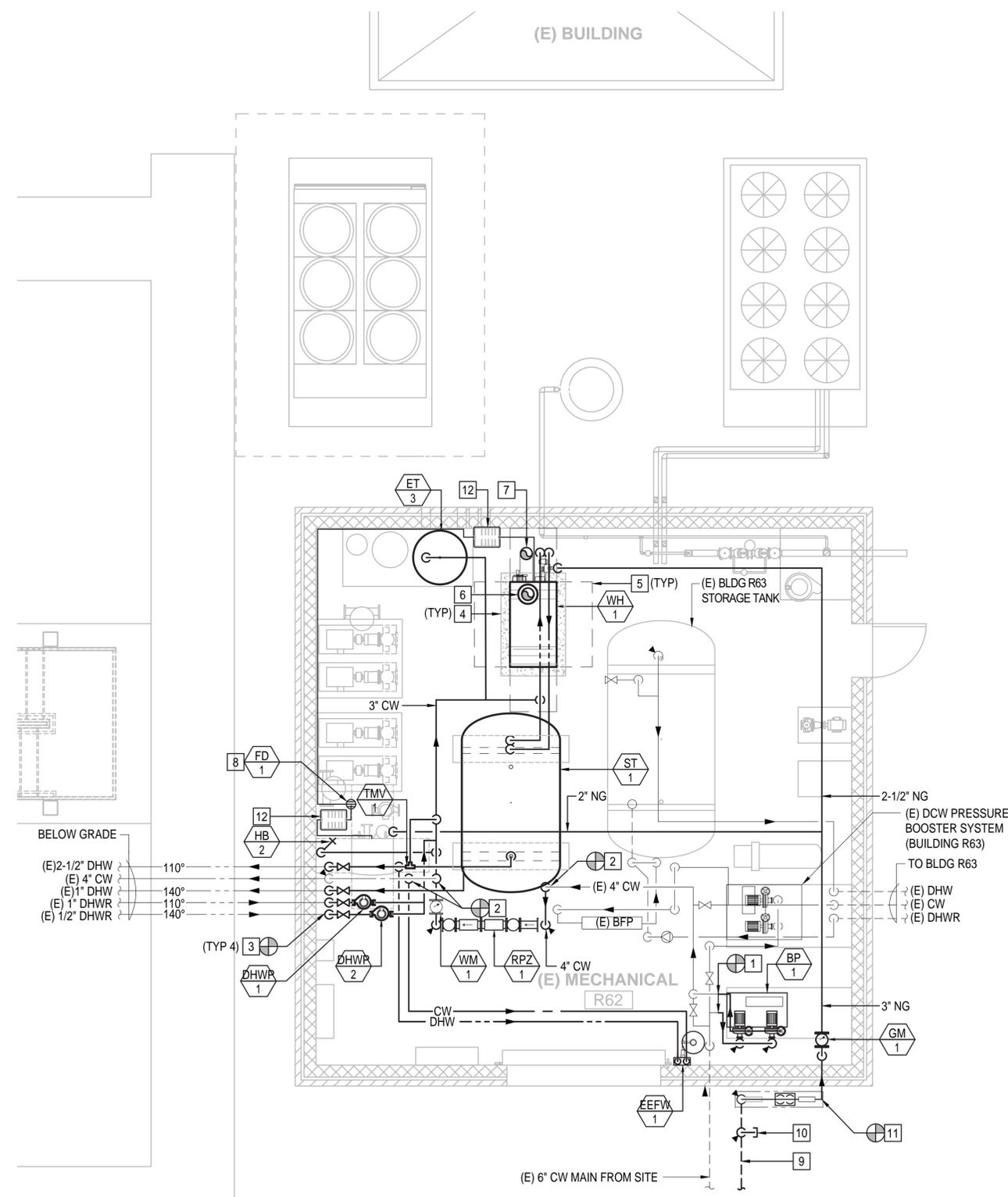
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A2 PLUMBING ENLARGED CENTRAL PLANT PLAN
 1/4" = 1'-0"

GENERAL NOTES

1. REFER TO ARCHITECTURAL FLOOR PLANS FOR ADDITIONAL NOTES AND REQUIREMENTS.
2. EXISTING CONDITIONS ARE BASED ON INFORMATION OBTAINED FROM AVAILABLE AS-BUILT PLANS AND FIELD INVESTIGATIONS. FIELD VERIFY EXISTING CONDITIONS PRIOR TO THE START OF WORK.
3. VERIFY AS-BUILT CONDITIONS PRIOR TO COMMENCEMENT OF WORK.
4. REUSE ALL EXISTING OPENING IN WALLS AND FLOORS FOR NEW CONNECTIONS.
5. REFER TO WASTE AND VENT PLANS FOR PLUMBING FIXTURE TAGS.

KEY NOTES

1. CONNECT AND INSTALL CW PIPING AT POC DOWN TO BOOSTER PUMP. PROVIDE ISOLATION VALVE AT VERTICAL.
2. CONNECT AND INSTALL CW PIPING AT POC DOWN TO BACKFLOW PREVENTER AS SHOWN ON PLAN.
3. INSTALL DOMESTIC WATER PIPING DOWN TO EXISTING PIPING AT 6" ABOVE FINISHED FLOOR.
4. PROVIDE 4" THICK HOUSEKEEPING PAD. REFER TO STRUCTURAL DRAWINGS FOR DETAILS.
5. PROVIDE MANUFACTURER'S REQUIRED SERVICE CLEARANCE.
6. WATER HEATER EXHAUST FLUE. REFER TO MECHANICAL DRAWINGS FOR DETAILS.
7. WATER HEATER COMBUSTION AIR INTAKE. REFER TO MECHANICAL DRAWINGS FOR DETAILS.
8. INSTALL FLOOR DRAIN WASTE & VENT PIPING TO EXISTING.
9. GAS TO BE PROVIDED UP TO AND INCLUDING METER BY VIRGINIA NATURAL GAS. REFER TO CIVIL DRAWING FOR CONTINUATION.
10. GAS PIPING UP FROM UNDERGROUND FOR FUTURE METER BY VIRGINIA NATURAL GAS.
11. INSTALL NATURAL GAS PIPING AFTER METER AT POC AS SHOWN ON PLAN.
12. PROVIDE CONDENSATE CHEMICAL TREATMENT UNIT AND ROUTE CD PIPING FULL SIZE TO EXISTING FLOOR DRAIN.

KEY PLAN



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DEPARTMENT OF THE NAVY
 NAVAL FACILITIES ENGINEERING COMMAND
 NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
 NAVAL STATION NORFOLK
 NORFOLK, VIRGINIA
Q4/BQ RENOVATE BUILDING R61
PLUMBING ENLARGED CENTRAL PLANT PLAN

SCALE: AS NOTED
 PROJECT NO: 1355149
 CONSTRUCTION CONTRACT NO: N40085-10-D-5333-D.O. 0012
 NAVAC DRAWING NO.

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PLUMBING EQUIPMENT SCHEDULE

| SYMBOL | TYPE | DESCRIPTION | REMARKS |
|--|---|---|---------|
|  | WATER HEATER | CONDENSING, GAS, 96% MAX. EFFICIENCY, 1700 MBH INPUT, 1632 MBH OUTPUT, 20:1 TURNDOWN RATIO, 120V/60HZ/1PH 30 AMPS, STAINLESS STEEL HEAT EXCHANGER, 160 PSI WORKING PRESSURE, 125 PSI ASME PRESSURE RATING, PROVIDE WITH FACTORY INTEGRAL CIRCULATION PUMP, 1461 LBS DRY WEIGHT. | ①②③④ |
|  | STORAGE TANK | HORIZONTAL 1600 GALLONS CAPACITY, 66" DIAMETER BY 120" LONG, 15572 LBS, 125 PSI ASME PRESSURE RATING. | |
|  | DOMESTIC HOT WATER 110°F RECIRCULATION PUMP | 10 GPM 15 FT HD 1/8 HP. INLINE | |
|  | DOMESTIC HOT WATER 140°F RECIRCULATION PUMP | 3 GPM 13 FT HD 1/8 HP. INLINE | |
|  | DUPLEX BOOSTER PUMP SYSTEM | VARIABLE SPEED DUPLEX PUMP EACH PUMP SIZED AT 200 GPM @ 65' TDH, 25 PSIG INLET PRESSURE, 60 PSIG OUTLET PRESSURE 7.5 HP, 460V, 60 HZ, 3 PHASE, 1750 RPM. | |
|  | EXPANSION TANK | BLADDER TYPE, 317 GALLON CAPACITY, 206.1 GALLON ACCEPTANCE VOLUME, 36" DIAMETER x 98" HEIGHT, 914 LBS. APPROXIMATE SHIPPING WEIGHT | |
|  | THERMOSTATIC MIXING VALVE | 112 GPM MAX FLOW, MAX 10 PSI PRESSURE DROP, SET @ 110°F | |
|  | REDUCED PRESSURE ZONE BACKFLOW PREVENTER | HORIZONTAL, INTERIOR MOUNTED, SIZE " AT 12 PSI MAX PRESSURE DROP, 200 GPM FLOW, 175 PSI MAX OPERATING PRESSURE, 33°F-180°F MAX OPERATING TEMPERATURE, (FLOW RATE BASED ON MAX FLOW FOR EXISTING DOMESTIC COLD WATER PIPE SIZE AT A VELOCITY OF 6 FEET PER SECOND.) (MAIN DOMESTIC WATER BACKFLOW) | |
|  | REDUCED PRESSURE ZONE BACKFLOW PREVENTER | HORIZONTAL, INTERIOR MOUNTED, SIZE " AT 10 PSI MAX PRESSURE DROP, 12 GPM FLOW, 175 PSI MAX OPERATING PRESSURE, 33°F-180°F MAX OPERATING TEMPERATURE, (FLOW RATE BASED ON MAX FLOW FOR EXISTING DOMESTIC COLD WATER PIPE SIZE AT A VELOCITY OF 6 FEET PER SECOND.) (HEATING HOT WATER & CHILLED WATER MAKE UP) | |
|  | SUMP PUMP | 50 GPM, 20 FT HEAD, 120 V, 1/2 HP, PROVIDE OIL SENSING CONTROL AND ALARM, ASME 17.1 COMPLIANT | |
|  | DDC PULSE WATER METER | DDC SYSTEM PULSE WATER METER. NEPTUNE WATER METER AND RIOTRONICS TRANSMITTER. | |
|  | DDC PULSE GAS METER | DDC SYSTEM PULSE METER. | |

- ① HIGH LIMIT TEMPERATURE CONTROL WITH MANUAL RESET.
- ② COMBINATION PRESSURE & TEMPERATURE GAUGE.
- ③ LOW WATER CUT-OFF CONTROL WITH MANUAL RESET.
- ④ PROVIDE WITH MANUFACTURER'S CIRCULATION PUMP AND INSTALL BY CONTRACTOR.

PLUMBING FIXTURE SCHEDULE

| SYMBOL | FIXTURE | ROUGH-IN | | | | | | REMARKS |
|--|-------------------------|----------|--------|----|--------|--------|---------|---|
| | | HW | CW | W | TRAP | V | GPM/GPF | |
|  | WATER CLOSET | NA | 1-1/4" | 4" | INT. | 2" | 1.6/1.1 | WALL MOUNTED, VITREOUS WHITE CHINA, DUAL FUNCTION FLUSH VALVE WATER CLOSETS. |
|  | WATER CLOSET | NA | 1-1/4" | 4" | INT. | 2" | 1.6/1.1 | WALL MOUNTED, VITREOUS WHITE CHINA, DUAL FUNCTION FLUSH VALVES WATER CLOSETS. ADA COMPLIANT. |
|  | WATER CLOSET | NA | 1-1/4" | 4" | INT. | 2" | 1.28 | FLOOR MOUNTED, BACK OUTLET FLUSH TANK, VITREOUS WHITE CHINA, MANUAL FLUSH VALVES WATER CLOSETS. |
|  | URINAL | NA | 3/4" | 2" | INT. | 1-1/2" | 0.125 | WALL MOUNTED, VITREOUS WHITE CHINA, MANUAL FLUSH VALVE WITH MANUAL FLUSH CONTROL. |
|  | LAVATORY | 1/2" | 1/2" | 2" | 1-1/2" | 1-1/2" | 0.5 | UNDER MOUNT VITREOUS CHINA WITH SOLID SURFACE COUNTER. HARDWIRED ELECTRONIC CONTROLS. PROVIDE WITH GRID STRAINER. ADA COMPLIANT. |
|  | LAVATORY | 1/2" | 1/2" | 2" | 1-1/2" | 1-1/2" | 0.5 | UNDER MOUNT VITREOUS CHINA WITH SOLID SURFACE COUNTER. MANUAL CENTER SET FAUCET. PROVIDE WITH POP UP DRAIN. |
|  | MOP SINK | 3/4" | 3/4" | 3" | 3" | 2" | 1.5 | FLOOR-MOUNTED PRE-CAST TERRAZZO. CAST BRASS HOT & COLD WATER WALL MOUNTED UTILITY FAUCET WITH VACUUM BREAKER, 3/4" HOSE CONNECTION AND PAIL HOOK. |
|  | DRINKING FOUNTAIN | NA | 1/2" | 2" | 3" | 1-1/2" | N/A | WALL MOUNTED REFRIGERATED WATER COOLER VANDAL RESISTANT DRINKING FOUNTAIN. ADA COMPLIANT. |
|  | FLOOR DRAIN | NA | NA | 2" | 2" | 1-1/2" | N/A | EPOXY COATED CAST IRON WITH ANCHOR FLANGE. NICKEL BRONZE PLATED STRAINERS. PROVIDE TRAP PRIMER CONNECTION WHERE REQUIRED. |
|  | SHOWER | 1/2" | 1/2" | 2" | 1-1/2" | 1-1/2" | 1.5 | TEMPERATURE AND PRESSURE BALANCING MIXING VALVE WITH SHOWER HEAD, ONE PIECE SOLID SURFACE SHOWER FLOOR RECEPTOR WITH DRAIN. ELEVATION OF SHOWER PAN TO ALLOW HORIZONTAL DRAINAGE ABOVE FINISHED FLOOR |
|  | WASHER BOX | 3/4" | 3/4" | 2" | 2" | 1-1/2" | N/A | WASHING MACHINE WATER BOX WITH WATER HAMMER ARRESTORS. |
|  | HOSE BIB | NA | 3/4" | NA | NA | NA | N/A | HOSE BIBB RECESSED WITH VACUUM BREAKER, KEY LOCK, FOR OUTDOOR USE |
|  | HOSE BIB | NA | 3/4" | NA | NA | NA | N/A | HOSE BIBB RECESSED WITH VACUUM BREAKER, FOR INDOOR USE. |
|  | EMERGENCY EYE/FACE WASH | 1-1/4" | 1-1/4" | NA | NA | NA | N/A | WALL MOUNTED, SELF-CLEANING, NON-CLOGGING EYE & FACE WASH WITH QUICK OPENING, STAINLESS STEEL RECEPTOR, WATER TEMPERING VALVE, TEPID WATER (65° - 95°). EMERGENCY ALARM SYSTEM. |

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| DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC NORFOLK, VIRGINIA NAVAL STATION NORFOLK Q4/BQ RENOVATE BUILDING R61 PLUMBING SCHEDULES | |
| SCALE: AS NOTED PROJECT NO. 1355149 CONSTRUCTION CONTRACT NO. N40085-10-D-5333-D.O. 0012 NAVFAC DRAWING NO. SHEET OF | |
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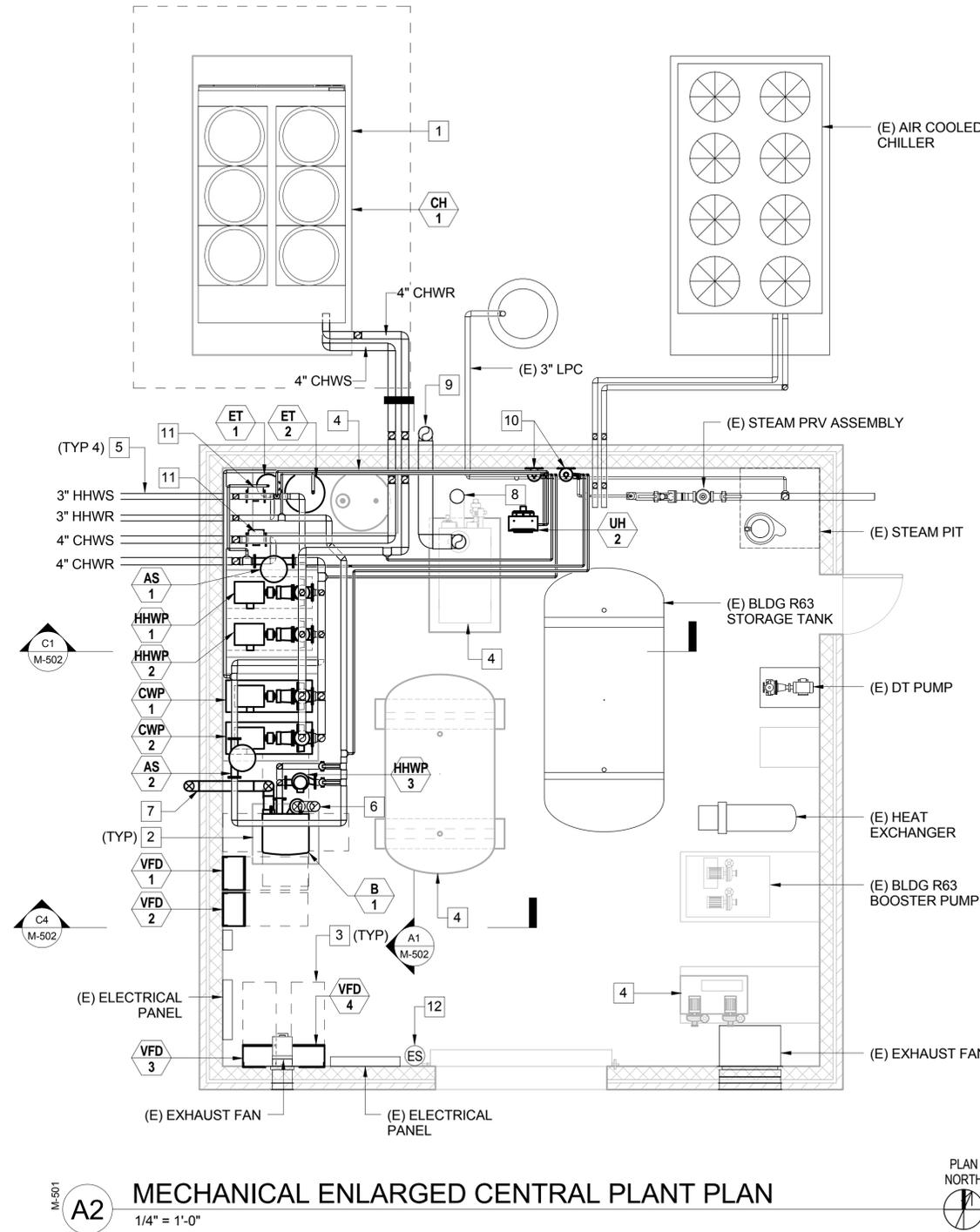
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A2 MECHANICAL ENLARGED CENTRAL PLANT PLAN
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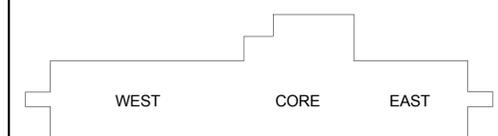
GENERAL NOTES

1. REFER TO M-200 DRAWING FOR MECHANICAL ZONING PLAN AND TEMPERATURE SENSOR LOCATIONS.
2. REFER TO M-407-409 DRAWINGS FOR MECHANICAL PIPING PLANS.
3. REFER TO M-501 DRAWINGS FOR SECTIONS.
4. REFER TO M-503 DRAWINGS FOR ISOMETRIC.
5. REFER TO M-8X SERIES FOR CONTROLS.
6. REFER TO M-6X SERIES FOR DETAILS.
7. REFER TO M-9X SERIES DRAWINGS FOR HHW & CHW CONTROL DIAGRAMS.
8. FIELD VERIFY (E) FLOOR PENETRATIONS TO BE REUSED. INCLUDE ON DETAILED SHOP DRAWINGS.

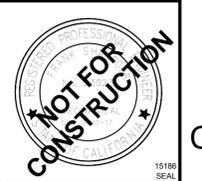
KEY NOTES

1. PROVIDE ENLARGED EQUIPMENT PAD TO ACCOMMODATE NEW CHILLER. REFER TO STRUCTURAL FOR DETAILS.
2. PROVIDE 4" THICK HOUSEKEEPING PAD.
3. PROVIDE MANUFACTURER RECOMMENDED SERVICE CLEARANCE.
4. PLUMBING EQUIPMENT. REFER TO PLUMBING DRAWINGS FOR DETAILS.
5. REFER TO M-409 FOR CONTINUATION.
6. PROVIDE VERTICAL VENT THRU ROOF. DISCHARGE MINIMUM 4'-0" ABOVE ROOF. REFER TO MANUFACTURER INSTALLATION INSTRUCTIONS FOR FURTHER REQUIREMENTS.
7. PROVIDE HORIZONTAL AIR INTAKE THRU WALL. REFER TO MANUFACTURER INSTALLATION INSTRUCTIONS FOR FURTHER REQUIREMENTS.
8. PROVIDE VERTICAL VENT THRU ROOF. DISCHARGE MINIMUM 4'-0" ABOVE ROOF. MINIMUM EQUAL LENGTH SHALL BE 18'-0". ELBOWS EQUAL 5'-0".
9. PROVIDE HORIZONTAL AIR INTAKE THRU WALL. LOCATE 8'-0" AFG. MINIMUM EQUAL LENGTH SHALL BE 12'-0". ELBOWS EQUAL 5'-0".
10. PROVIDE HHW AND CHW CHEMICAL POT FEEDERS. SEE SHEET M-901 & M-902 FOR DETAILS.
11. PROVIDE CHW BYPASS WITH MOTORIZED CONTROL VALVE. SEE SHEET M-902 FOR DETAILS.
12. PROVIDE HARD-WIRE EMERGENCY SHUTDOWN BUTTON TO BOILER / WATER HEATER CONTROL PANEL.

KEY PLAN



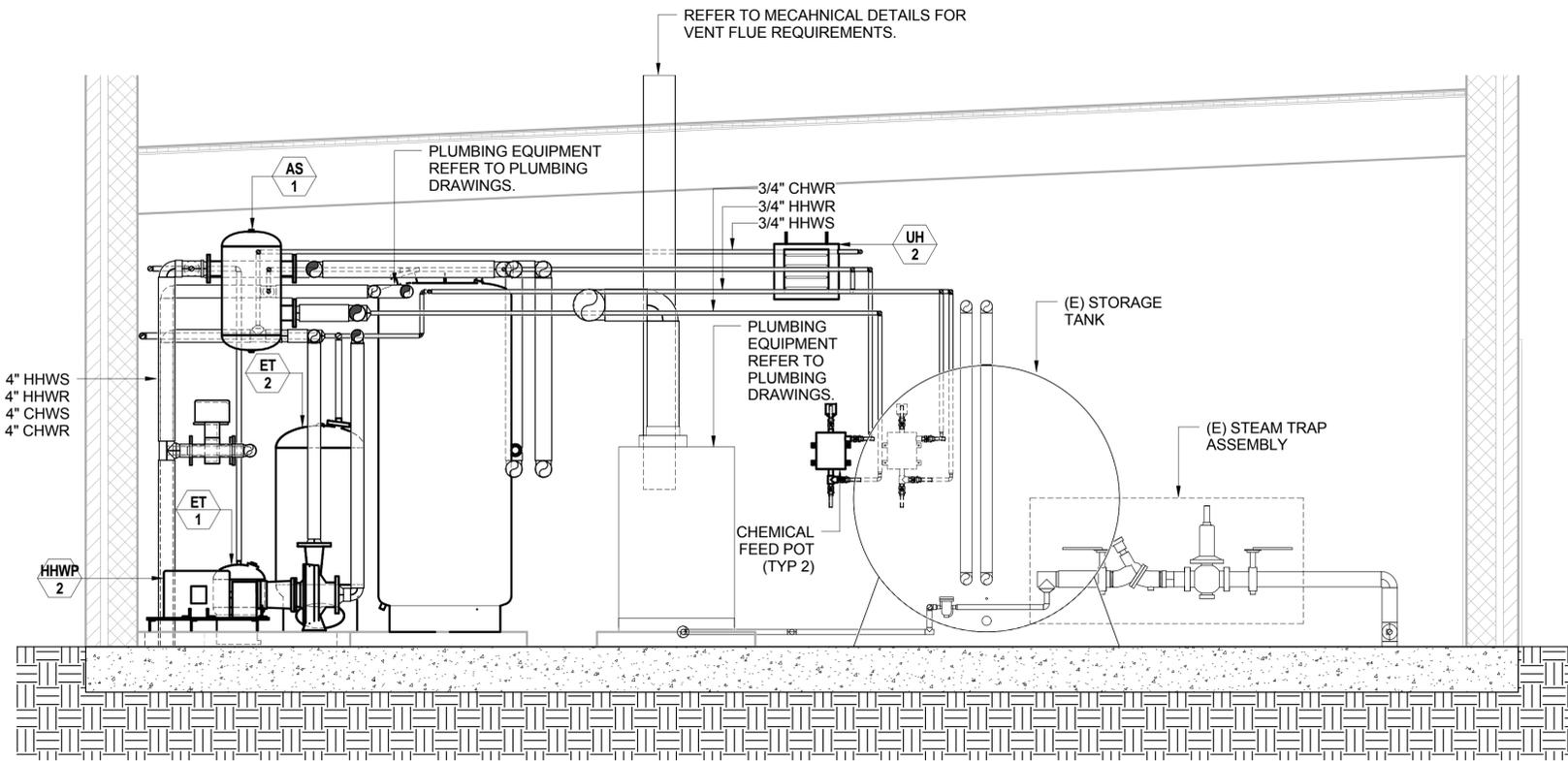
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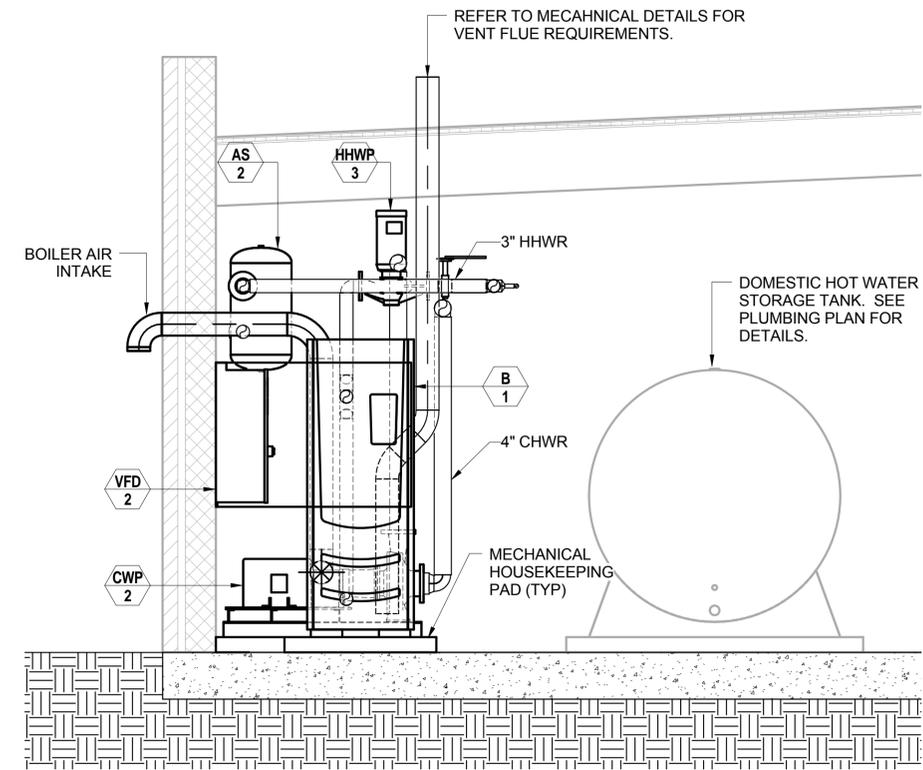
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 NAVAL FACILITIES ENGINEERING COMMAND
 NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
 NORFOLK, VIRGINIA
 NAVAL STATION NORFOLK
 Q4/BQ RENOVATE BUILDING R61
 MECHANICAL ENLARGED CENTRAL PLANT PLAN

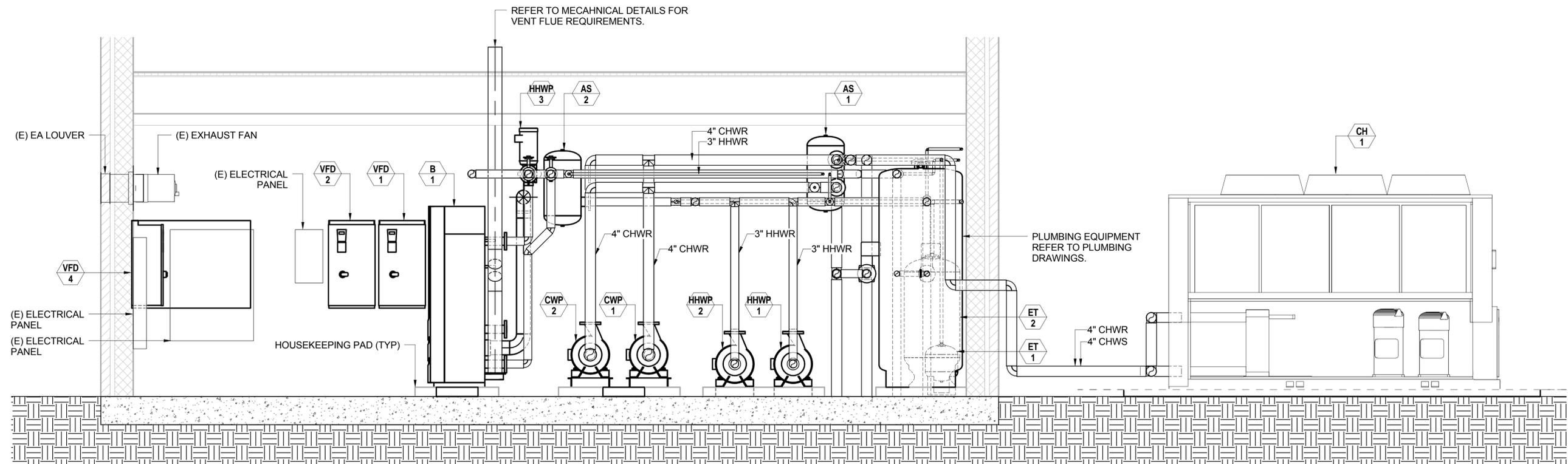
| |
|--|
| SCALE: AS NOTED |
| PROJECT NO. 1355149 |
| CONSTRUCTION CONTRACT NO. N40085-10-D-5333-D.O. 0012 |
| NAVFAC DRAWING NO. |
| SHEET OF |
| M-410 |



M-410 **C1** MECHANICAL CENTRAL PLANT BUILDING SECTION 2
1/2" = 1'-0"



M-410 **C4** MECHANICAL CENTRAL PLANT BUILDING SECTION 1
1/2" = 1'-0"



M-410 **A1** MECHANICAL CENTRAL PLANT LONGITUDINAL SECTION
1/2" = 1'-0"

| | |
|--|--------------------------------------|
| DATE | |
| DESCRIPTION | |
| SHEET | |
| NAVFAC | |
| NOT FOR CONSTRUCTION | |
| RQC RQ CONSTRUCTION, LLC | |
| Shadpour Consulting Engineers, Inc. 1075 Van Ness Avenue, Suite 1000 San Francisco, CA 94109 | |
| APPROVED | |
| FOR COMMANDER NAVFAC | |
| ACTIVITY | |
| SATISFACTORY TO DATE | |
| DES. RM. | DRW. GBDN |
| CHK. JC | |
| PM/DM | |
| BRANCH MANAGER | |
| CHIEF ENGINEER | |
| DEPARTMENT OF THE NAVY | NAVAL FACILITIES ENGINEERING COMMAND |
| NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC | NORFOLK, VIRGINIA |
| NAVAL STATION NORFOLK | Q4/BQ RENOVATE BUILDING R61 |
| MECHANICAL SECTIONS | |
| SCALE: AS NOTED | |
| PROJECT NO. 1355149 | |
| CONSTRUCTION CONTRACT NO. N40085-10-D-5333-D.O. 0012 | |
| NAVFAC DRAWING NO. | |
| SHEET | OF |
| M-502 | |

DEDICATED OUTSIDE AIR UNIT SCHEDULE

| SYMBOL | DESCRIPTION | AREA SERVED | SUPPLY FAN | | | | PRE-HEAT COIL | | | | | | | COOLING COIL | | | | | | | | RE-HEAT COIL | | | | | | | | | | |
|--------|---------------|-------------|------------|-------------|------|--------|---------------|-----------|----------|----------|----------------------|------|----------|--------------|---------------|----------------|-------|-----------|----------|----|----------|--------------|----------------------|------|----------|----------|---------------|-----------|-----------|----------|----------|----------------------|
| | | | CFM | ESP (IN WC) | BHP | MIN HP | CAP (MBH) | MIN. ROWS | EAT (F°) | LAT (F°) | MAX. AIR PD (IN. WC) | GPM | EWT (F°) | LWT (F°) | WATER PD (FT) | CAPACITY (MBH) | | MIN. ROWS | EAT (F°) | | LAT (F°) | | MAX. AIR PD (IN. WC) | GPM | EWT (F°) | LWT (F°) | WATER PD (FT) | CAP (MBH) | MIN. ROWS | EAT (F°) | LAT (F°) | MAX. AIR PD (IN. WC) |
| | | | | | | | | | | | | | | | | SENS | TOTAL | | DB | WB | DB | WB | | | | | | | | | | |
| OAU 1 | INDOOR CUSTOM | 1ST FLOOR | 2,120 | 1.25 | 3.72 | 5 | 80.1 | 2 | 20 | 55 | .1 | 5.34 | 180 | 150 | 1 | 80.1 | 163.5 | 6 | 91 | 77 | 56 | 55 | .5 | 32.7 | 44 | 54 | 5 | 45.8 | 2 | 55 | 75 | .1 |
| OAU 2 | INDOOR CUSTOM | 2ND FLOOR | 2,270 | 1.25 | 3.72 | 5 | 85.8 | 2 | 20 | 55 | .1 | 5.72 | 180 | 150 | 1 | 85.8 | 163.6 | 6 | 91 | 77 | 56 | 55 | .5 | 32.7 | 44 | 54 | 5 | 49.1 | 2 | 55 | 75 | .1 |
| OAU 3 | INDOOR CUSTOM | 3RD FLOOR | 2,270 | 1.25 | 3.72 | 5 | 85.8 | 2 | 20 | 55 | .1 | 5.72 | 180 | 150 | 1 | 85.8 | 163.6 | 6 | 91 | 77 | 56 | 55 | .5 | 32.7 | 44 | 54 | 5 | 49.1 | 2 | 55 | 75 | .1 |
| OAU 4 | INDOOR CUSTOM | 4TH FLOOR | 2,270 | 1.25 | 3.72 | 5 | 85.8 | 2 | 20 | 55 | .1 | 5.72 | 180 | 150 | 1 | 85.8 | 163.6 | 6 | 91 | 77 | 56 | 55 | .5 | 32.7 | 44 | 54 | 5 | 49.1 | 2 | 55 | 75 | .1 |
| OAU 5 | INDOOR CUSTOM | 5TH FLOOR | 2,270 | 1.25 | 3.72 | 5 | 85.8 | 2 | 20 | 55 | .1 | 5.72 | 180 | 150 | 1 | 85.8 | 163.6 | 6 | 91 | 77 | 56 | 55 | .5 | 32.7 | 44 | 54 | 5 | 49.1 | 2 | 55 | 75 | .1 |
| OAU 6 | INDOOR CUSTOM | 6TH FLOOR | 2,270 | 1.25 | 3.72 | 5 | 85.8 | 2 | 20 | 55 | .1 | 5.72 | 180 | 150 | 1 | 85.8 | 163.6 | 6 | 91 | 77 | 56 | 55 | .5 | 32.7 | 44 | 54 | 5 | 49.1 | 2 | 55 | 75 | .1 |

DEDICATED OUTSIDE AIR UNIT SCHEDULE (CONTINUED)

| RE-HEAT COIL | | | | FILTERS | | UNIT ELECTRICAL DATA | | | | | MAX. OPER. WEIGHT (LBS) | MOUNTING DETAIL | REMARKS |
|--------------|----------|----------|---------------|------------|--------------|----------------------|----|-----|-------|------|-------------------------|-----------------|---------|
| GPM | EWT (F°) | LWT (F°) | WATER PD (FT) | PRE FILTER | FINAL FILTER | V | PH | FLA | MCA | MOCP | | | |
| 3.1 | 180 | 150 | 1 | 2" MERV8 | 12" MERV13 | 460 | 3 | 60 | 10.25 | 15 | 1425 | A2/M-602 | ①②③④⑤ |
| 3.3 | 180 | 150 | 1 | 2" MERV8 | 12" MERV13 | 460 | 3 | 60 | 10.25 | 15 | 1425 | A2/M-602 | ①②③④⑤ |
| 3.3 | 180 | 150 | 1 | 2" MERV8 | 12" MERV13 | 460 | 3 | 60 | 10.25 | 15 | 1425 | A2/M-602 | ①②③④⑤ |
| 3.3 | 180 | 150 | 1 | 2" MERV8 | 12" MERV13 | 460 | 3 | 60 | 10.25 | 15 | 1425 | A2/M-602 | ①②③④⑤ |
| 3.3 | 180 | 150 | 1 | 2" MERV8 | 12" MERV13 | 460 | 3 | 60 | 10.25 | 15 | 1425 | A2/M-602 | ①②③④⑤ |
| 3.3 | 180 | 150 | 1 | 2" MERV8 | 12" MERV13 | 460 | 3 | 60 | 10.25 | 15 | 1425 | A2/M-602 | ①②③④⑤⑥ |

- ① PROVIDE WITH SINGLE POINT ELECTRICAL CONNECTION, SERVICE POWER AND LIGHTING, GFI RECEPTACLE, BACNET DDC BY UNIT MANUFACTURER.
- ② UNIT SHALL BE SHIPPED TO SITE IN SMALLEST SECTIONS POSSIBLE AND ASSEMBLED IN THE FIELD.
- ③ PROVIDE UNIT WITH SMOKE DUCT DETECTORS AS THE UNIT IS OVER 2,000 CFM.
- ④ PROVIDE WITH CFM AIR FLOW MONITORING STATION.
- ⑤ PROVIDE WITH DOUBLE WALL CONSTRUCTION.
- ⑥ PROVIDE 3 WAY CONTROL VALVE AT RE-HEAT COIL

ROOFTOP UNIT SCHEDULE

| SYMBOL | DESCRIPTION | AREA SERVED | EVAPORATIVE FAN | | | | | | COOLING CAPACITY | | | | HEATING | | | | COMPRESSOR ELECTRICAL DATA | | | | | | FILTERS | | MAX. OPER. WEIGHT (LBS) | REFRIG. TYPE | MOUNTING DETAIL | REMARKS | | |
|--------|--------------------|--------------|-----------------|-------------|-------|--------|------|------|------------------|----------|----------|-----------------|----------|----------|----------|-----------------|----------------------------|----|----|-----|-----|------|---------|--------------|-------------------------|--------------|-----------------|---------|----------|-----------------|
| | | | CFM | ESP (IN WC) | DRIVE | MIN HP | MCA | MCOP | AMB (F°) | EDB (F°) | EWB (F°) | TOTAL CAP (MBH) | AMB (F°) | EDB (F°) | LDB (F°) | TOTAL CAP (MBH) | V | PH | HZ | QTY | HP | RLA | LRA | MIN OA (CFM) | | | | | TK. | MIN. AREA SQ FT |
| RTU 1 | PACKAGED HEAT PUMP | LAUNDRY ROOM | 3,000 | 1.0 | BELT | 1.0 | 41.4 | 60 | 95 | 80 | 67 | 94.0 | 47 | 70 | 96.9 | 89.6 | 480 | 3 | 60 | 1 | 7.5 | 26.0 | 181.5 | 300 | 2" MERV8 | 12" MERV13 | 810 | R410 | C2/M-602 | ① |

- ① PROVIDE WITH VIBRATION ISOLATION BASE AND CURB.

SPLIT SYSTEM AIR CONDITIONING UNIT SCHEDULE (COOLING ONLY)

| SYMBOL | DESCRIPTION | AREA SERVED | INDOOR FAN SECTION | | | | | | | | | | OUTDOOR SECTION | | | | | | COMBINED COOLING CAPACITY | | | | | REMARKS | |
|--------|-------------------------|-------------------|--------------------|-----|--------|-----------------|----|----|-----|-------------------|------------|--------|----------------------|-----------------|----|----|-----|-------------------|---------------------------|----------|----------|----------|------|---------|------|
| | | | MOTOR | | | ELECTRICAL DATA | | | | OPER WEIGHT (LBS) | MTG DETAIL | SYMBOL | DESCRIPTION | ELECTRICAL DATA | | | | OPER WEIGHT (LBS) | TOTAL SENSIBLE (BTUH) | AMB (F°) | EDB (F°) | EWB (F°) | SEER | | |
| | | | CFM | ESP | DRIVE | V | PH | HZ | MCA | | | | | V | PH | HZ | MCA | | | | | | | | MOCP |
| SS 1 | DUCTLESS - WALL MOUNTED | ELEVATOR ROOM 122 | 450 | N/A | DIRECT | 208 | 1 | 60 | 1 | 50 | A1/M-602 | SCU 1 | AIR-COOLED CONDENSER | 208 | 1 | 60 | 12 | 15 | 170 | 12,000 | 100 | 80 | 67 | 20.5 | ①② |
| SS 2 | DUCTLESS - WALL MOUNTED | STORAGE ROOM 218 | 825 | N/A | DIRECT | 208 | 1 | 60 | 1 | 50 | A1/M-602 | SCU 2 | AIR-COOLED CONDENSER | 208 | 1 | 60 | 23. | 35 | 170 | 36,000 | 100 | 80 | 67 | 16 | ①② |

- ① PROVIDE WITH MANUFACTURER'S FILTER AND PROGRAMMABLE WALL THERMOSTAT, SET THERMOSTAT AT 70°F (ADJ).
- ② INDOOR AND OUTDOOR SHALL BE A MATCHED SET FROM THE SAME MANUFACTURER.

DATE: _____

SYMBOL: _____

DESCRIPTION: _____

STATE: _____

APPROVED: _____

FOR COMMANDER NAVFAC: _____

ACTIVITY: _____

SATISFACTORY TO DATE: _____

DES: RM | DRW: DN/CS | CHK: JC

PROJECT: _____

BRANCH MANAGER: _____

CHIEF ENGINEER: _____

DEPARTMENT OF THE NAVY
 NAVAL FACILITIES ENGINEERING COMMAND
 NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
 NORFOLK, VIRGINIA
 NAVAL STATION NORFOLK
 Q4/BQ RENOVATE BUILDING R61
 MECHANICAL SCHEDULES

SCALE: AS NOTED

PROJECT NO: 1355149

CONSTRUCTION CONTRACT NO: N40085-10-D-5333-D.O. 0012

NAVFAC DRAWING NO: _____

SHEET: _____ OF _____

M-701

PACKAGE 2 - PREFINAL - 05.19.16

FAN COIL SCHEDULE

| SYMBOL | DESCRIPTION | AREA SERVED | SUPPLY FAN | | | | | | | | | COOLING COIL | | | | | | | | | | HEATING COIL | | | | | | | | MAX. OPER. WEIGHT (LBS) | MOUNTING DETAIL | REMARKS | | | |
|--------|-------------|------------------------------|------------|-------------|-------------|------|-----|--------|-----|----|----|----------------|-------|-----------|----------|----|----------|------|----------------------|-----|----------|--------------|---------------|-----------|-----------|----------|----------|----------------------|-----|-------------------------|-----------------|---------|----------|----------|---------------|
| | | | CFM | ESP (IN WC) | MIN. OA CFM | RPM | BHP | MIN HP | V | HZ | PH | CAPACITY (MBH) | | MIN. ROWS | EAT (F°) | | LAT (F°) | | MAX. AIR PD (IN. WC) | GPM | EWT (F°) | LWT (F°) | WATER PD (FT) | CAP (MBH) | MIN. ROWS | EAT (F°) | LAT (F°) | MAX. AIR PD (IN. WC) | GPM | | | | EWT (F°) | LWT (F°) | WATER PD (FT) |
| | | | | | | | | | | | | SENS | TOTAL | | DB | WB | DB | WB | | | | | | | | | | | | | | | | | |
| FC 1.1 | 4-PIPE UNIT | MAIN LOBBY 132B | 270 | 0.5 | 110 | 1080 | .10 | 1/8 | 208 | 60 | 1 | 5.5 | 8.2 | 3 | 75 | 56 | - | 0.25 | 1.6 | 44 | 54 | 5.0 | 5.9 | 1 | 70 | 90 | .1 | 0.4 | 180 | 150 | 1.6 | 80 | A2/M-601 | ① | |
| FC 1.2 | 4-PIPE UNIT | ELEVATOR LOBBY 140 | 105 | 0.5 | 45 | 990 | .10 | 1/8 | 208 | 60 | 1 | 2.2 | 3.2 | 3 | 75 | 56 | - | 0.25 | 0.6 | 44 | 54 | 5.0 | 2.6 | 1 | 70 | 90 | .1 | 0.2 | 180 | 150 | 0.9 | 55 | A2/M-601 | ① | |
| FC 1.3 | 4-PIPE UNIT | WAITING AREA 128 | 420 | 0.5 | 95 | 1080 | .20 | 1/4 | 208 | 60 | 1 | 8.6 | 11.5 | 3 | 75 | 56 | - | 0.25 | 2.3 | 44 | 54 | 5.0 | 9.4 | 1 | 70 | 90 | .1 | 0.6 | 180 | 150 | 3.5 | 105 | A2/M-601 | ① | |
| FC 1.4 | 4-PIPE UNIT | MANAGER OFFICE 126 | 175 | 0.5 | 30 | 990 | .10 | 1/8 | 208 | 60 | 1 | 3.6 | 4.5 | 3 | 75 | 56 | - | 0.25 | 0.9 | 44 | 54 | 5.0 | 3.9 | 1 | 70 | 90 | .1 | 0.3 | 180 | 150 | 0.9 | 55 | A2/M-601 | ① | |
| FC 1.5 | 4-PIPE UNIT | OFFICE 124 | 175 | 0.5 | 30 | 990 | .10 | 1/8 | 208 | 60 | 1 | 3.6 | 4.5 | 3 | 75 | 56 | - | 0.25 | 0.9 | 44 | 54 | 5.0 | 3.9 | 1 | 70 | 90 | .1 | 0.3 | 180 | 150 | 0.9 | 55 | A2/M-601 | ① | |
| FC 1.6 | 4-PIPE UNIT | TV LOUNGE 127 | 350 | 0.5 | 95 | 1080 | .20 | 1/4 | 208 | 60 | 1 | 7.2 | 9.7 | 3 | 75 | 56 | - | 0.25 | 1.9 | 44 | 54 | 5.0 | 6.2 | 1 | 70 | 90 | .1 | 0.4 | 180 | 150 | 3.5 | 105 | A2/M-601 | ① | |
| FC 1.7 | 4-PIPE UNIT | BREAKROOM 129 | 350 | 0.5 | 85 | 1080 | .20 | 1/4 | 208 | 60 | 1 | 7.2 | 9.7 | 3 | 75 | 56 | - | 0.25 | 1.9 | 44 | 54 | 5.0 | 7.9 | 1 | 70 | 90 | .1 | 0.5 | 180 | 150 | 3.5 | 105 | A2/M-601 | ① | |
| FC 2.1 | 4-PIPE UNIT | CORRIDOR & STORAGE 2ND FLOOR | 245 | 0.5 | 90 | 990 | .10 | 1/8 | 208 | 60 | 1 | 5.0 | 5.7 | 3 | 75 | 56 | - | 0.25 | 1.1 | 44 | 54 | 5.0 | 5.4 | 1 | 70 | 90 | .1 | 0.4 | 180 | 150 | 0.9 | 55 | A2/M-601 | ① | |
| FC 3.1 | 4-PIPE UNIT | CORRIDOR & STORAGE 3RD FLOOR | 245 | 0.5 | 90 | 990 | .10 | 1/8 | 208 | 60 | 1 | 5.0 | 5.7 | 3 | 75 | 56 | - | 0.25 | 1.1 | 44 | 54 | 5.0 | 5.4 | 1 | 70 | 90 | .1 | 0.4 | 180 | 150 | 0.9 | 55 | A2/M-601 | ① | |
| FC 4.1 | 4-PIPE UNIT | CORRIDOR & STORAGE 4TH FLOOR | 245 | 0.5 | 90 | 990 | .10 | 1/8 | 208 | 60 | 1 | 5.0 | 5.7 | 3 | 75 | 56 | - | 0.25 | 1.1 | 44 | 54 | 5.0 | 5.4 | 1 | 70 | 90 | .1 | 0.4 | 180 | 150 | 0.9 | 55 | A2/M-601 | ① | |
| FC 5.1 | 4-PIPE UNIT | CORRIDOR & STORAGE 5TH FLOOR | 245 | 0.5 | 90 | 990 | .10 | 1/8 | 208 | 60 | 1 | 5.0 | 5.7 | 3 | 75 | 56 | - | 0.25 | 1.1 | 44 | 54 | 5.0 | 5.4 | 1 | 70 | 90 | .1 | 0.4 | 180 | 150 | 0.9 | 55 | A2/M-601 | ① | |
| FC 6.1 | 4-PIPE UNIT | CORRIDOR & STORAGE 6TH FLOOR | 250 | 0.5 | 90 | 990 | .10 | 1/8 | 208 | 60 | 1 | 5.1 | 6.5 | 3 | 75 | 56 | - | 0.25 | 1.3 | 44 | 54 | 5.0 | 6.0 | 1 | 70 | 90 | .1 | 0.4 | 180 | 150 | 0.9 | 55 | A2/M-601 | ① | |

① FILTERS PROVIDED AT RETURN GRILLE.

EXHAUST FAN SCHEDULE

| SYMBOL | DESCRIPTION | AREA SERVED | CFM | ESP | DRIVE | RPM | MOTOR | | | | | OPER WEIGHT (LBS) | MOUNTING DETAIL | REMARKS |
|------------------|---------------|-----------------------------|------|------|--------|------|-------|--------|-----|----|----|-------------------|-----------------|---------|
| | | | | | | | BHP | MIN HP | V | PH | Hz | | | |
| EF 1 | MUSHROOM TYPE | LIVING UNITS | 660 | 1.5 | DIRECT | 2348 | 0.39 | 1/2 | 115 | 1 | 60 | 42 | C2/M-601 | ①③④ |
| EF 2 | MUSHROOM TYPE | LIVING UNITS | 660 | 1.5 | DIRECT | 2348 | 0.39 | 1/2 | 115 | 1 | 60 | 42 | C2/M-601 | ①③④ |
| EF 3 | MUSHROOM TYPE | LIVING UNITS | 660 | 1.5 | DIRECT | 2348 | 0.39 | 1/2 | 115 | 1 | 60 | 42 | C2/M-601 | ①③④ |
| EF 4 | MUSHROOM TYPE | LIVING UNITS | 660 | 1.5 | DIRECT | 2348 | 0.39 | 1/2 | 115 | 1 | 60 | 42 | C2/M-601 | ①③④ |
| EF 5 | MUSHROOM TYPE | LIVING UNITS | 660 | 1.5 | DIRECT | 2348 | 0.39 | 1/2 | 115 | 1 | 60 | 42 | C2/M-601 | ①③④ |
| EF 6 | MUSHROOM TYPE | LIVING UNITS | 660 | 1.5 | DIRECT | 2348 | 0.39 | 1/2 | 115 | 1 | 60 | 42 | C2/M-601 | ①③④ |
| EF 7 | MUSHROOM TYPE | LIVING UNITS | 140 | 1.0 | DIRECT | 1592 | 0.08 | 1/4 | 115 | 1 | 60 | 37 | C2/M-601 | ①③④ |
| EF 8 | MUSHROOM TYPE | LIVING UNITS | 550 | 1.5 | DIRECT | 2221 | 0.32 | 1/2 | 115 | 1 | 60 | 42 | C2/M-601 | ①③④ |
| EF 9 | MUSHROOM TYPE | LIVING UNITS | 660 | 1.5 | DIRECT | 2348 | 0.39 | 1/2 | 115 | 1 | 60 | 42 | C2/M-601 | ①③④ |
| EF 10 | MUSHROOM TYPE | JAN. RM 1ST THRU 6TH FLOOR | 400 | 1.0 | DIRECT | 1624 | 0.15 | 1/4 | 115 | 1 | 60 | 37 | C2/M-601 | ①③④ |
| EF 11 | INLINE TYPE | MECHANICAL ROOM 119 | 315 | 0.5 | DIRECT | 1724 | 0.07 | 1/10 | 115 | 1 | 60 | 49 | A2/M-601 | ①②⑤ |
| EF 12 | INLINE TYPE | ELECTRICAL ROOM 117 | 2000 | 0.75 | DIRECT | 1535 | 0.71 | 1 | 208 | 3 | 60 | 120 | A2/M-601 | ①②⑤ |
| EF 13 | INLINE TYPE | MENS 125 & WOMENS 123 | 380 | 0.5 | DIRECT | 1725 | 0.08 | 1/10 | 115 | 1 | 60 | 49 | A2/M-601 | ①③④ |
| EF 14 THRU EF 18 | INLINE TYPE | MECH. RM 2ND THRU 6TH FLOOR | 375 | 0.5 | DIRECT | 1725 | 0.08 | 1/10 | 115 | 1 | 60 | 49 | A2/M-601 | ①②⑤ |
| EF 19 THRU EF 23 | INLINE TYPE | ELECT. RM 2ND TO 6TH FLOOR | 160 | 0.5 | DIRECT | 1725 | 0.04 | 1/10 | 115 | 1 | 60 | 34 | A2/M-601 | ①②④ |

① PROVIDE ENERGY STAR FANS. ② PROVIDE FAN WITH BACKDRAFT DAMPER ③ PROVIDE WITH LOW LEAKAGE ATFP DAMPER
④ FAN TO RUN CONTINUOUSLY IN OCCUPIED MODE. ⑤ FAN TO BE CONTROLLED BY THERMOSTAT.

VARIABLE FREQUENCY DRIVE SCHEDULE

| SYMBOL | DESCRIPTION | UNIT SERVED | LOCATION(S) | ELECTRICAL | | | | DIMENSIONS HxWxD (IN) | OPER. WEIGHT (LBS) | REMARKS |
|--------|--------------------------|-------------|-----------------|------------|-------|----|----|-----------------------|--------------------|---------|
| | | | | HP | VOLTS | PH | HZ | | | |
| VFD 1 | VARIABLE FREQUENCY DRIVE | CWP-1 | MECHANICAL ROOM | 7.5 | 208 | 3 | 60 | 20x5x9 | 20 | |
| VFD 2 | VARIABLE FREQUENCY DRIVE | CWP-2 | MECHANICAL ROOM | 7.5 | 208 | 3 | 60 | 20x5x9 | 20 | |
| VFD 3 | VARIABLE FREQUENCY DRIVE | HHWP-1 | MECHANICAL ROOM | 5.0 | 208 | 3 | 60 | 15x5x9 | 20 | |
| VFD 4 | VARIABLE FREQUENCY DRIVE | HHWP-2 | MECHANICAL ROOM | 5.0 | 208 | 3 | 60 | 15x5x9 | 20 | |



APPROVED
FOR COMMANDER NAVFAC
ACTIVITY
SATISFACTORY TO DATE
DES: RM DRW: DW/GE CHK: JC
PW/DM
BRANCH MANAGER
CHIEF ENGINEER

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
NORFOLK, VIRGINIA
NAVAL STATION NORFOLK
Q4/BQ RENOVATE BUILDING R61
MECHANICAL SCHEDULES

SCALE: AS NOTED
PROJECT NO: 1355149
CONSTRUCTION CONTRACT NO: N40085-10-D-5333-D.O. 0012
NAVFAC DRAWING NO.

SHEET 07
M-702

PACKAGED TERMINAL HEAT PUMP SCHEDULE

| SYMBOL | DESCRIPTION | AREA SERVED | EVAPORATIVE FAN | | | COOLING CAPACITY | | | | | HEATING | | | ELECTRICAL DATA | | | | | MAX. OPER. WEIGHT (LBS) | REFRIG. TYPE | EER | |
|---|--------------------|--------------------------|-----------------|-------------|--------|------------------|----------|----------|-----------------|-----------------|----------|-----------------|---------------------|-----------------|----|-----|-----|------|-------------------------|--------------|-----|--|
| | | | CFM | ESP (IN WC) | DRIVE | AMB (F°) | EDB (F°) | EWB (F°) | TOTAL CAP (MBH) | SENS. CAP (MBH) | AMB (F°) | TOTAL CAP (MBH) | ELEC. EMG HEAT (KW) | V | PH | FLA | MCA | MOCP | | | | |
|  | PACKAGED HEAT PUMP | LIVING UNIT | 240 | 0.1 | DIRECT | 95 | 75 | 63 | 7,185 | 5,750 | 68 | 7,000 | 2.05 | 208 | 1 | 21 | 12 | 15 | 110 | R-410a | 12 | |
|  | PACKAGED HEAT PUMP | LIVING UNIT CORNER ROOMS | 240 | 0.1 | DIRECT | 95 | 75 | 63 | 7,300 | 5,750 | 68 | 7,000 | 2.05 | 208 | 1 | 21 | 12 | 15 | 110 | R-410a | 12 | |

ELECTRIC UNIT HEATER SCHEDULE

| SYMBOL | DESCRIPTION | AREA SERVED | FAN | | | CAPACITY (BTU/HR) | | CAPACITY (KW) | | ELECTRICAL DATA | | | MAX. MTG HEIGHT (FT) | MAX. OPER. WEIGHT (LBS) | MOUNTING DETAIL | REMARKS |
|---|----------------------|---------------------|-----|------------|-----------|-------------------|-----------|---------------|----|-----------------|---|----|----------------------|-------------------------|-----------------|---------|
| | | | CFM | HIGH STAGE | LOW STAGE | HIGH STAGE | LOW STAGE | V | PH | HZ | | | | | | |
|  | ELECTRIC UNIT HEATER | ELECTRICAL ROOM 117 | 530 | 17,100 | N/A | 5 | N/A | 208 | 3 | 60 | 8 | 52 | C1/M-501 | | | |

BASEBOARD UNIT HEATER SCHEDULE

| SYMBOL | DESCRIPTION | AREA SERVED | WATTS | LENGTH (FT.) | ELECTRICAL DATA | | | MAX. OPER. WEIGHT (LBS) | REMARKS |
|---|----------------------|-------------|-------|--------------|-----------------|----|----|-------------------------|---------|
| | | | | | V | PH | HZ | | |
|  | ELECTRIC UNIT HEATER | R61 | 2,000 | 8 | 208 | 3 | 60 | 18.5 | |

CHILLER SCHEDULE

| SYMBOL | DESCRIPTION | AREA SERVED | NOMINAL CAPACITY (TONS) | REFRIGERANT TYPE | EVAPORATOR DATA | | | | CONDENSER FAN DATA | | | | | COMPRESSOR ELECTRICAL DATA | | | | | TOTAL UNIT ELECTRICAL DATA | | | | | Kw/TON (MAX) | EMER. POWER | MAX. OPER. WEIGHT (LBS) | REMARKS | | |
|---|-------------------|-------------|-------------------------|------------------|-----------------|----------|----------|-------------|--------------------|-----|----|-----|----|----------------------------|-----|-----|-----|-----|----------------------------|----|-----|------|-----|--------------|-------------|-------------------------|---------|-------|-----|
| | | | | | GPM | EWT (°F) | LWT (°F) | MAX PD (FT) | AMB (°F) | QTY | KW | V | PH | HZ | QTY | RLA | LRA | V | PH | HZ | MCA | MOPD | V | | | | | PH | HZ |
|  | AIR COOLED SCROLL | BLDG R61 | 90 | R410a | 225 | 54 | 44 | 11.1 | 95 | 6 | 1 | 460 | 3 | 60 | 4 | 42 | 260 | 460 | 3 | 60 | 182 | 200 | 460 | 3 | 60 | 1.06 | NO | 6,000 | ①②③ |

① CHILLER SHALL BE CAPABLE OF OPERATING AT MINIMUM OF 60% OF FULL CAPACITY. ② PROVIDE CONTROL CARDS AS REQUIRED FOR CONNECTION BACNET DDC SYSTEM. ③ PROVIDE WITH FACTORY PAINTED FINISH TO PASS SALT SPRAY TEST AND CONDENSER COIL CORROSION PROTECTION SYSTEM.

HEATING HOT WATER BOILER SCHEDULE

| SYMBOL | DESCRIPTION | AREA SERVED | FUEL | MBTUH | | MAX EFF | EWT (°F) | LWT (°F) | GPM/ MIN FLOW | ELECTRICAL DATA | | | | ASME PRESSURE RATING (PSI) | MAX. OPER. WEIGHT (LBS) | REMARKS |
|---|-------------|-------------|-------------|-------|--------|---------|----------|----------|---------------|-----------------|----|----|-----|----------------------------|-------------------------|---------|
| | | | | INPUT | OUTPUT | | | | | V | PH | HZ | FLA | | | |
|  | CONDENSING | BLDG R61 | NATURAL GAS | 1000 | 960 | 96% | 150 | 180 | 175/12 | 120 | 1 | 60 | 13 | 160 | 2,000 | ①②③ |

① HIGH LIMIT TEMPERATURE CONTROL WITH MANUAL RESET. ② COMBINATION PRESSURE & TEMPERATURE GAUGE. ③ LOW WATER CUT-OFF CONTROL WITH MANUAL RESET.

PUMP SCHEDULE

| SYMBOL | DESCRIPTION | SERVICE | FLOW GPM | HEAD FT | INLET WATER TEMP (°F) | MOTOR DATA | | | | | MIN EFF | MAX. OPER. WEIGHT (LBS) | MOUNTING DETAIL | REMARKS |
|---|--------------------------|-------------------|----------|---------|-----------------------|------------|-----|-----|----|----|---------|-------------------------|-----------------|---------|
| | | | | | | HP | BHP | V | HZ | PH | | | | |
|  | CENTRIFUGAL BASE MOUNTED | CHILLED WATER | 225 | 80 | 44 | 7.5 | 6 | 208 | 60 | 3 | 60% | 500 | B1/M-601 | ①② |
|  | CENTRIFUGAL BASE MOUNTED | CHILLED WATER | 225 | 80 | 44 | 7.5 | 6 | 208 | 60 | 3 | 60% | 500 | B1/M-601 | ①②③ |
|  | CENTRIFUGAL BASE MOUNTED | HEATING HOT WATER | 65 | 75 | 180 | 5.0 | 4 | 208 | 60 | 3 | 60% | 400 | B1/M-601 | ①② |
|  | CENTRIFUGAL BASE MOUNTED | HEATING HOT WATER | 65 | 75 | 180 | 5.0 | 4 | 208 | 60 | 3 | 60% | 400 | B1/M-601 | ①②③ |
|  | INLINE | HEATING HOT WATER | 65 | 25 | 180 | 1.0 | .75 | 208 | 60 | 3 | 60% | 200 | B1/M-601 | ①②④ |

① MOTOR SHALL BE NON-OVERLOADING OVER ENTIRE CURVE. ② EACH PUMP SIZED FOR 100% DESIGN FLOW. ③ STANDBY PUMP. ④ PRIMARY CIRCULATION PUMP.

| | |
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| DATE | |
| DESCRIPTION | |
| SYMBOL | |
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| APPROVED | |
| FOR COMMANDER NAVFAC | |
| ACTIVITY | |
| SATISFACTORY TO DATE | |
| DES. RM | DRW. DN/VS |
| CHK. JC | |
| FWDM | |
| BRANCH MANAGER | |
| CHIEF ENGINEER | |
| DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC NORFOLK, VIRGINIA NAVAL STATION NORFOLK Q4/BQ RENOVATE BUILDING R61 MECHANICAL SCHEDULES | |
| SCALE: AS NOTED | |
| PROJECT NO. 1355149 | |
| CONSTRUCTION CONTRACT NO. N40085-10-D-5333-D.O. 0012 | |
| NAVFAC DRAWING NO. | |
| SHEET | OF |
| M-703 | |

HOT WATER UNIT HEATER SCHEDULE

| SYMBOL | DESCRIPTION | AREA SERVED | FAN | | | | TOTAL HEATING CAPACITY (MBH) | GPM | ELECTRICAL DATA | | | | MAX. OPER. WEIGHT (LBS) | MOUNTING DETAIL | REMARKS |
|--------|-------------------------------|-------------------|-----|------|--------|------|------------------------------|-----|-----------------|----|----|-----|-------------------------|-----------------|---------|
| | | | CFM | RPM | DRIVE | HP | | | V | PH | HZ | AMP | | | |
| UH 2 | HEATING HOT WATER UNIT HEATER | CENTRAL PLANT R62 | 730 | 1550 | DIRECT | 1/12 | 30,900 | 3.2 | 115 | 1 | 60 | 3.0 | 50 | C1/M-601 | ① |

① PROVIDE WITH EXPLOSION PROOF CAPABILITY.

EXPANSION TANK SCHEDULE

| SYMBOL | DESCRIPTION | SERVICE | TOTAL VOLUME (GAL) | ACCEPT. VOLUME (GAL) | DIA (IN) | HEIGHT (IN) | ASME RATED PRESS (PSI) | MAX DESIGN TEMP (°F) | FACTORY PRE-CHARGE PRESS (PSIG) | WORKING PRESS (PSI) | MAX. OPER. WEIGHT (LBS) | REMARKS |
|--------|----------------|-------------------|--------------------|----------------------|----------|-------------|------------------------|----------------------|---------------------------------|---------------------|-------------------------|---------|
| ET 1 | DIAPHRAGM TYPE | CHILLED WATER | 8 | 5 | 14 | 22.5 | 125 | 60 | 12 | 125 | 45 | ① |
| ET 2 | BLADDER TYPE | HEATING HOT WATER | 79 | 79 | 24 | 57.75 | 250 | 240 | 12 | 125 | 320 | ① |

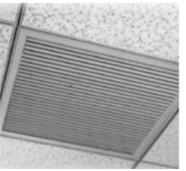
① ASME RATED TANK.

AIR SEPARATOR SCHEDULE

| SYMBOL | DESCRIPTION | SERVICE | GPM | DIMENSION | | MAX PD (PSI) | MAX. OPER. WEIGHT (LBS) | REMARKS |
|--------|---------------------------------|-------------------|-----|-----------|-------------|--------------|-------------------------|---------|
| | | | | DIA (IN) | HEIGHT (IN) | | | |
| AS 1 | INLINE TANGENTIAL AIR SEPARATOR | CHILLED WATER | 225 | 16 | 32 | 5 | 125 | ① |
| AS 2 | INLINE TANGENTIAL AIR SEPARATOR | HEATING HOT WATER | 65 | 12 | 25 | 5 | 45 | ① |

① ASME RATED.

AIR DISTRIBUTION SCHEDULE

| SYMBOL | SERVICE | DESCRIPTION | NECK SIZE | CFM RANGE | MOUNTING SURFACE | PHOTO | REMARKS |
|--------|-----------------------|---|-----------|-----------|--|---|--|
| A CFM | SUPPLY AIR | 4-WAY, MODULAR CORE CEILING DIFFUSER | 6"Ø | 0-95 | T-BAR/ HARD CEILING |  | ALUMINUM CONSTRUCTION |
| | | | 8"Ø | 95-210 | | | |
| | | | 10"Ø | 210-370 | | | |
| | | | 12"Ø | 370-600 | | | |
| | | | 14"Ø | 600-900 | | | |
| B CFM | RETURN AIR | FILTER GRILLE W/ 5" MERV 13 FILTER FOR HORIZONTAL FAN COILS | NECK SIZE | MAX CFM | T-BAR/ HARD CEILING |  | ALUMINUM CONSTRUCTION |
| | | | 6"Ø | 190 | | | |
| | | | 8"Ø | 340 | | | |
| | | | 10"Ø | 560 | | | |
| | | | 12"Ø | 890 | | | |
| C CFM | SUPPLY AIR | SUPPLY GRILLE | NECK SIZE | MAX CFM | SIDEWALL OR DUCTWORK. HARD CEILING WHERE INDICATED |  | STEEL CONSTRUCTION 45-DEG. FIXED BLADE |
| | | | 10x6 | 150 | | | |
| | | | 12x8 | 250 | | | |
| | | | 18x10 | 450 | | | |
| | | | 24x12 | 650 | | | |
| | | | 24x16 | 1,000 | | | |
| D CFM | RETURN OR EXHAUST AIR | FIXED ANGLE SIDEWALL REGISTER | NECK SIZE | MAX CFM | SIDEWALL OR DUCTWORK. HARD CEILING WHERE INDICATED |  | STEEL CONSTRUCTION 45-DEG. FIXED BLADE |
| | | | 10x6 | 150 | | | |
| | | | 12x8 | 250 | | | |
| | | | 18x10 | 450 | | | |
| | | | 24x12 | 650 | | | |
| | | | 24x16 | 1,000 | | | |
| E CFM | RETURN AIR | RETURN GRILLE | NECK SIZE | MAX CFM | T-BAR/ HARD CEILING |  | ALUMINUM CONSTRUCTION |
| | | | 6"Ø | 190 | | | |
| | | | 8"Ø | 340 | | | |
| | | | 10"Ø | 560 | | | |
| | | | 12"Ø | 890 | | | |
| | | | 14"Ø | 1190 | | | |
| 16"Ø | 1610 | | | | | | |



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|-------------------------------|
| APPROVED |
| FOR COMMANDER NAVFAC |
| ACTIVITY |
| SATISFACTORY TO DATE |
| DES RM DRW DN/CS CHK JC |
| PM/DM |
| BRANCH MANAGER |
| CHIEF ENGINEER |

DEPARTMENT OF THE NAVY
 NAVAL FACILITIES ENGINEERING COMMAND
 NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
 NORFOLK, VIRGINIA
 NAVAL STATION NORFOLK
 Q4/BQ RENOVATE BUILDING R61
 MECHANICAL SCHEDULES

SCALE: AS NOTED
 PROJECT NO. 1355149
 CONSTRUCTION CONTRACT NO. N40085-10-D-5333-D.O. 0012
 NAVFAC DRAWING NO.

SHEET OF
M-704

DESIGN CONDITIONS

| ROOM DESCRIPTION | INDOOR | | OUTDOOR | | | REMARKS | |
|------------------------------|--------|-----|---------|------|--------|---------|---|
| | SUMMER | | SUMMER | | WINTER | | |
| | °FDB | %RH | °FDB | °FWB | °FDB | | |
| ALL SPACES | 75 | 50 | 68 | 91.0 | 77.0 | 20 | ① |
| STAIRWELLS | - | - | 55 | 91.0 | 77.0 | 20 | ② |
| TELCOMM ROOMS | 70 | 50 | 70 | 91.0 | 77.0 | 20 | ③ |
| MECHANICAL & ELECTRICAL ROOM | - | - | 55 | 91.0 | 77.0 | 20 | ④ |
| ELEVATOR MACHINE ROOM | 75 | 50 | - | 91.0 | 77.0 | 20 | ④ |

① INCLUDES TOILETS AND HALLWAYS WITHIN THE BUILDING UNLESS INDICATED OTHERWISE. ② HEATING ONLY.
 ③ COOLING ONLY. ④ HEATING AND VENTILATING ONLY. PROVIDE 10 AIR CHANGES PER HOUR.

RECOMMENDED MINIMUM DUCT SEAL CLASS

| DUCT LOCATION | SUPPLY | | EXHAUST | RETURN |
|----------------------|-------------|-----------|---------|--------|
| | < = 2 IN WC | > 2 IN WC | | |
| OUTDOORS | A | A | A | A |
| UNCONDITIONED SPACES | A | A | A | A |
| CONDITIONED SPACES | A | A | A | A |

DUCT CONSTRUCTION AND LEAK TEST SCHEDULE

| MARK | DUCT PRESSURE CLASS INCHES WATER COLUMN | | | | ROUND/OVAL | | RECTANGLE | | DUCT TEST PRESSURE INCHES WATER COLUMN | REMARKS |
|------------------------------|---|-------------|--------------|------------------|-----------------|-----------------|-----------------|-----------------|--|---------|
| | SUPPLY DUCT | RETURN DUCT | EXHAUST DUCT | OUTSIDE AIR DUCT | DUCT SEAL CLASS | DUCT LEAK CLASS | DUCT SEAL CLASS | DUCT LEAK CLASS | | |
| | OAU-1 THRU OAU-6 | 2 | - | - | - | A | 12 | A | | |
| FAN COILS/ PACKAGE HEAT PUMP | 2 | - | - | - | A | 12 | A | 24 | 2.0 | ① |
| EF-1 THRU 10 | - | - | -2 | - | A | 12 | A | 24 | 2.0 | ① |
| EF-11 THRU 23 | - | - | -1 | - | A | 12 | A | 24 | 1.0 | ① |

① TEST IN ACCORDANCE WITH SPEC SECTION 230593, HVAC TESTING/ADJUSTING/BALANCING AND THE PROCEDURES IN SMACNA HVAC AIR DUCT LEAKAGE TEST MANUAL, 1985 EDITION.

BUILDING AIR BALANCE CALCULATION

| AREA | OA (CFM) | EA (CFM) | % POSITIVE | REMARKS |
|----------------------------------|----------|----------|---------------|---------|
| TYPICAL LIVING UNIT | 60 | 25 | OA 240% OF EA | |
| LEVEL 1 CORE | 490 | 440 | OA 111% OF EA | |
| LEVEL 2 THRU 6 CORE (EACH FLOOR) | 215 | 185 | OA 116% OF EA | |



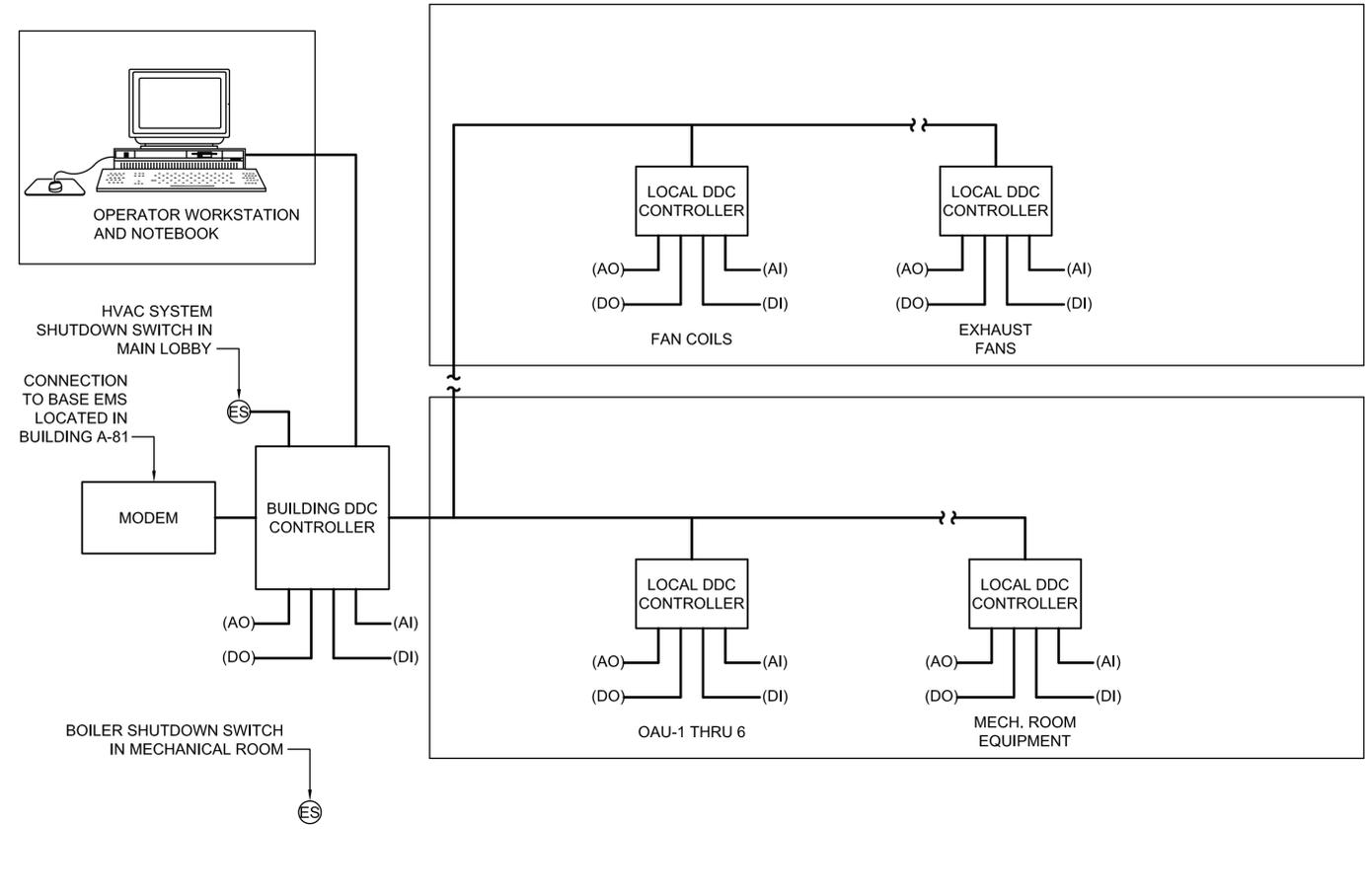
APPROVED
 FOR COMMANDER NAVFAC
 ACTIVITY
 SATISFACTORY TO DATE
 DES: RM DRW: DW/GB CHK: JC
 PM/DM
 BRANCH MANAGER
 CHIEF ENGINEER

DEPARTMENT OF THE NAVY
 NAVAL FACILITIES ENGINEERING COMMAND
 NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
 NORFOLK, VIRGINIA
 NAVAL STATION NORFOLK
 Q4/BQ RENOVATE BUILDING R61
 MECHANICAL SCHEDULES

SCALE: AS NOTED
 PROJECT NO: 1355149
 CONSTRUCTION CONTRACT NO: N40085-10-D-5333-D.O. 0012
 NAVFAC DRAWING NO.
 SHEET OF

CONTROLS LEGEND

| SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION |
|--------|---|--------|---|
| [AI] | DDC ANALOG INPUT POINT W/ ADJUSTABLE PID GAIN CONTROL | [R] | RELAY |
| [AO] | DDC ANALOG OUTPUT POINT W/ ADJUSTABLE PID GAIN CONTROL | [UC] | UNIT CONTROLLER |
| [DI] | DDC DIGITAL INPUT POINT W/ INDICATING LIGHT ON DDC PANEL | [T] | SPACE TEMPERATURE SENSOR / THERMOSTAT |
| [DO] | DDC DIGITAL OUTPUT POINT W/ MANUAL OVERRIDE AND INDICATING LIGHT ON DDC PANEL | [OS] | OCCUPANCY SENSOR |
| [T] | TEMPERATURE SENSOR W/ PIPING WELL | [S] | WALL SWITCH |
| [MS] | MOTOR STARTER | [T] | TEMPERATURE SENSOR |
| [F] | FLOW METER | [H] | HUMIDITY SENSOR |
| [FS] | FLOW SWITCH | [V] | TWO-WAY CONTROL VALVE - VERIFY & PROVIDE A VALVE SCHEDULE |
| [DPS] | DIFFERENTIAL PRESSURE SENSOR | [V] | THREE-WAY CONTROL VALVE - VERIFY & PROVIDE A VALVE SCHEDULE |
| [CSR] | CURRENT SENSING RELAY | [LAN] | LOCAL AREA NETWORK |
| [S.D.] | DUCT SMOKE DETECTOR - COORDINATE WITH ELECTRICAL CONTRACTOR FOR POWER SUPPLY | [DDC] | DIRECT DIGITAL CONTROL |
| [MD] | MOTORIZED DAMPER | [PID] | PROPORTIONAL, INTEGRAL, DIRIVITIVE |
| [LLMD] | LOW LEAKAGE MOTORIZED ATFP DAMPER | [TSP] | TWISTED SHIELDED PAIR |
| [RS] | ROTATION SENSOR | [DP] | DIFFERENTIAL PRESSURE |
| [ES] | EMERGENCY SHUTDOWN SWITCH | [E] | COORDINATE WITH ELECTRICAL |
| | | [FZ] | FREEZE STAT |



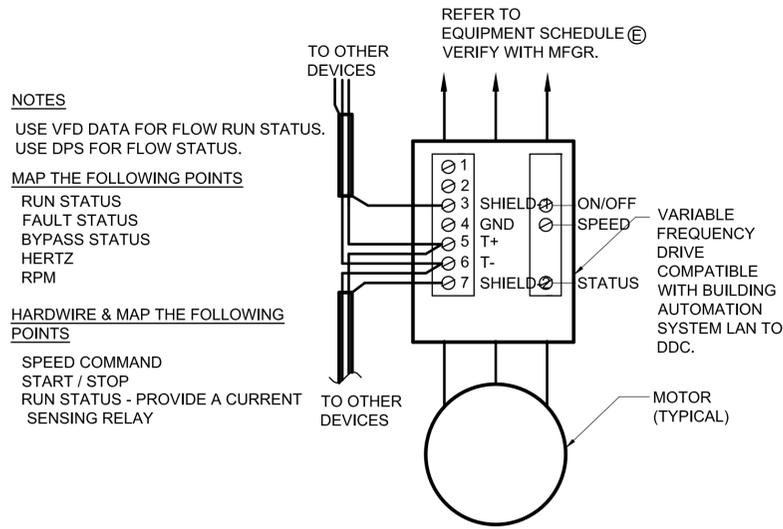
B3 DDC SYSTEM ARCHITECTURE DIAGRAM
SCALE: NONE

DDC MINIMUM CONTROLS POINT LIST

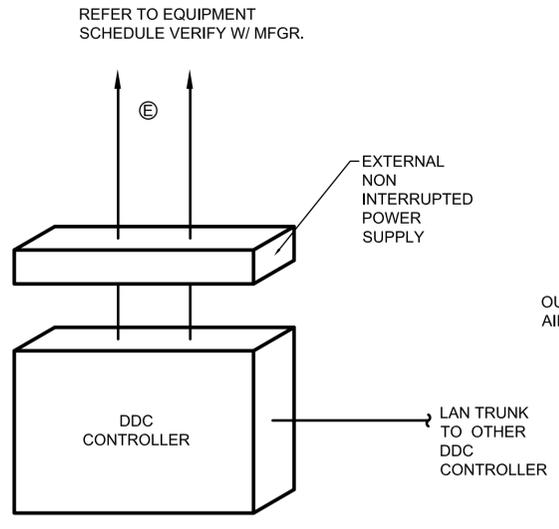
| OUTSIDE AIR UNIT (OAU) ① | CHILLED WATER SYSTEM ① | FAN COILS | EXHAUST FAN (EF1 THRU 10, 13 19 THRU 23) | EXHAUST FAN (EF11,12,14 THRU 18) | SPLIT SYSTEM COOLING UNIT | UNIT HEATER | |
|---|--|---|---|--|---------------------------|---|--|
| OUTSIDE AIR LOW LEAKAGE DAMPER OPEN / CLOSE (DO) SUPPLY FAN START / STOP (DO) SUPPLY FAN RUN STATUS (DI) SUPPLY FAN FAULT STATUS (DI) HEATING COIL AIR TEMPERATURE (AI) HEATING COIL AIR HUMIDITY (AI) COOLING COIL AIR TEMPERATURE (AI) COOLING COIL AIR TEMPERATURE (AI) SUPPLY AIR TEMPERATURE (AI) SUPPLY AIR HUMIDITY (AI) AIRFLOW MONITORING STATION (AI) FILTER STATUS (DI) SMOKE DETECTOR (DI) CHILLED WATER 2-WAY VALVE (AO) CHILLED WATER 2-WAY VALVE POSITION (AI) HOT WATER 2-WAY VALVE (AO) HOT WATER 2-WAY VALVE POSITION (AI) REHEAT COIL WATER 2-WAY VALVE (AO) REHEAT COIL WATER 2-WAY VALVE POSITION (AI) | CHILLED WATER RETURN TEMPERATURE (AI) CHILLED WATER SUPPLY TEMPERATURE (AI) OUTSIDE AIR TEMPERATURE (AI) OUTSIDE AIR HUMIDITY (AI) CHILLED WATER PUMP VFD STATUS(AI) CHILLER RUN STATUS (AI) CHILLER START/STOP (AI) CHILLED WATER BYPASS VALVE (AI) (AO) CHILLER CONTROL VALVE (AI) (AO) DIFFERENTIAL PRESSURE SENSOR (AI) | SUPPLY AIR TEMPERATURE (AI) CHILLED WATER VALVE POSITIONS (AI/AO) HOT WATER VALVE POSITIONS (AI/AO) SUPPLY FAN START/STOP (DO) SUPPLY FAN RUN STATUS (DI) SUPPLY FAN FAULT STATUS (DI) | FAN STATUS (DI) FAN START / STOP (DO) | SPACE TEMPERATURE (AI) FAN STATUS (DI) FAN START / STOP (DO) | SPACE TEMPERATURE (AI) | FAN STATUS (DI) SPACE TEMPERATURE (AI) | |
| | HEATING HOT WATER SYSTEM ① HOT WATER RETURN TEMPERATURE (AI) WATER SUPPLY TEMPERATURE (AI) OUTSIDE AIR TEMPERATURE (AI) OUTSIDE AIR HUMIDITY (AI) HOT WATER BYPASS VALVE (AI) (AO) BOILER CONTROL VALVE (AI) (AO) DIFFERENTIAL PRESSURE SENSOR (AI) BOILER STATUS (DI) BOILER ALARM (DI) BOILER START/STOP (DO) PRIMARY PUMP (HHWP-3) START/STOP (DO) SECONDARY PUMP VFD STATUS (AI) BOILER ALARM (DI) BOILER SUPPLY TEMPERATURE (AI) BOILER RETURN TEMPERATURE (AI) | VARIABLE FREQUENCY DRIVES (VFD) SPEED COMMAND (AO) START / STOP (DO) RUN STATUS (DI) (PROVIDE A CURRENT SENSING RELAY) | GENERAL BUILDING MONITORING ② TOTAL ELECTRICITY CONSUMED IN KWH (DI) TOTAL GAS CONSUMED IN 1000 CFH (DI) TOTAL WATER CONSUMED IN 1000 GALLONS (DI) PHASE STATUS (DI) | HVAC SHUTDOWN SWITCH HVAC SYSTEM SHUTDOWN SWITCH STATUS (DI) SHUTDOWN ALL HVAC SYSTEMS (DO) (EXCLUDES PTHP) CLOSE OUTSIDE AIR UNIT (OAU-1 THRU 6) SUPPLY AIR DAMPER (DO) CLOSE EXHAUST AIR DAMPERS (EF-1 THRU 10, 13) | | | |

① PROVIDE ONE OUTSIDE AIR TEMPERATURE AND HUMIDITY STATION PER BUILDING LOCATED ON NORTH WALL WITH SUN SHIELD.
 ② PROVIDE METERS WITH USAGE READINGS AND RECORDS FOR DAILY, WEEKLY, MONTHLY, AND YEARLY USAGE.

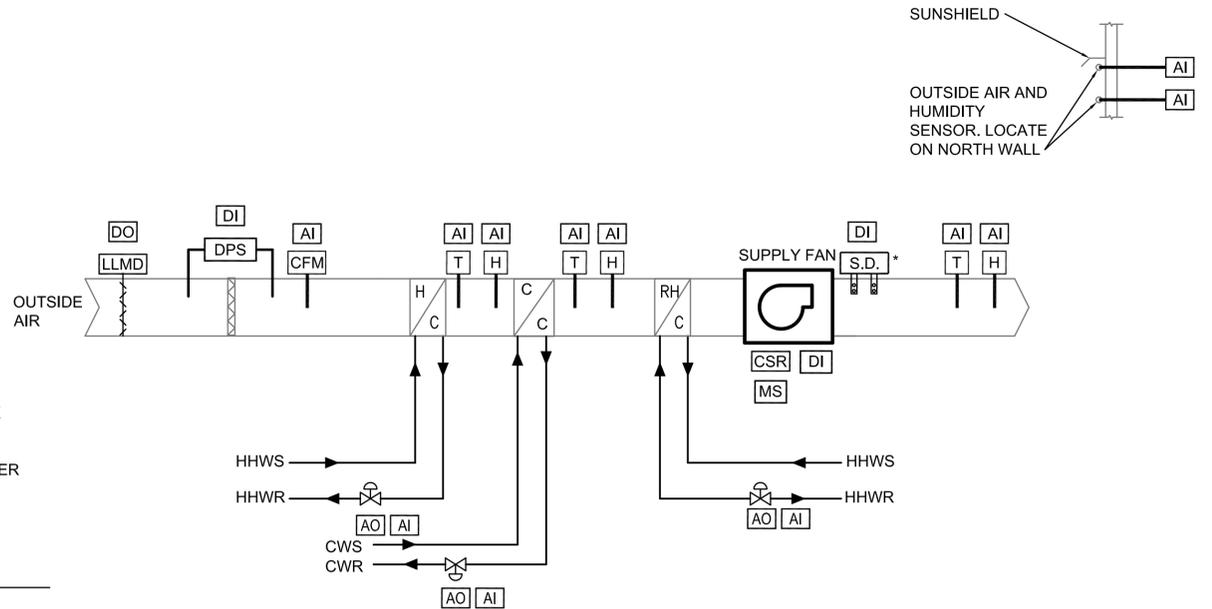
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| DATE | APPROVED |
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| APPROVED | |
| FOR COMMANDER NAVFAC | |
| ACTIVITY | |
| SATISFACTORY TO DATE | |
| DES RM | DRW DN/GR |
| CHK | JC |
| PWDM | |
| BRANCH MANAGER | |
| CHIEF ENGINEER | |
| DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC NORFOLK, VIRGINIA NAVAL STATION NORFOLK Q4/BQ RENOVATE BUILDING R61 MECHANICAL CONTROLS | |
| SCALE: AS NOTED | |
| PROJECT NO. 1355149 | |
| CONSTRUCTION CONTRACT NO. N40085-10-D-5333-D.O. 0012 | |
| NAVFAC DRAWING NO. | |
| SHEET | OF |
| M-801 | |



C1 TYPICAL VFD CONTROL DIAGRAM
SCALE: NONE

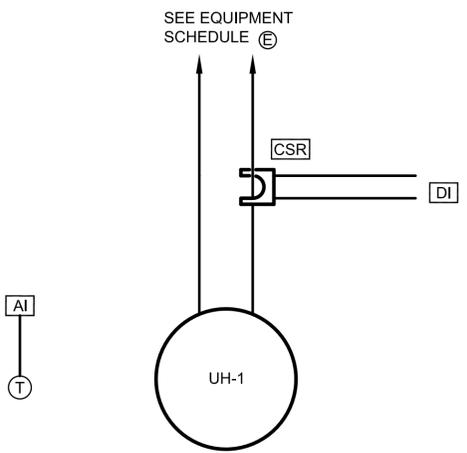


C2 DDC CONTROLLER DIAGRAM
SCALE: NONE

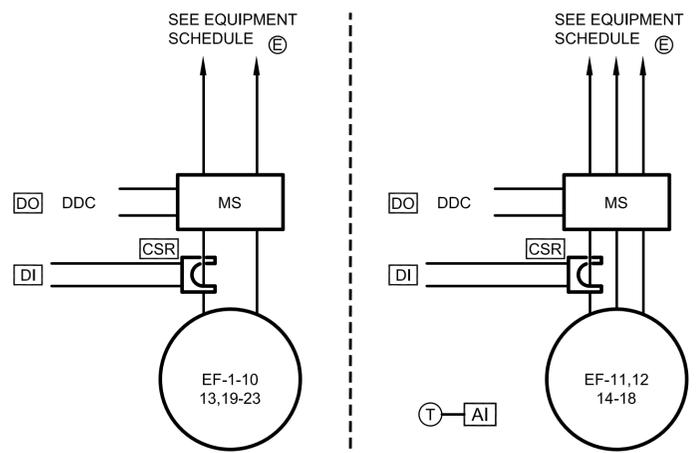


* PROVIDE SMOKE DETECTOR FOR FAN SHUTDOWN FOR ALL SYSTEMS OVER 2000 CFM. COORDINATE WITH ELECTRICAL & FIRE PROTECTION DRAWINGS.

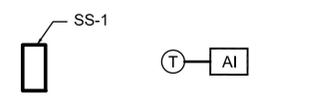
C3 OUTSIDE AIR HANDLING UNIT CONTROL DIAGRAM
SCALE: NONE



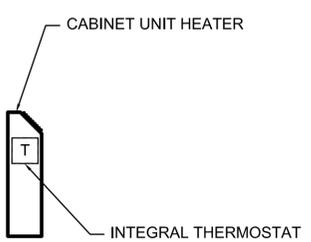
B1 ELECTRIC UNIT HEATER CONTROL DIAGRAM
SCALE: NONE



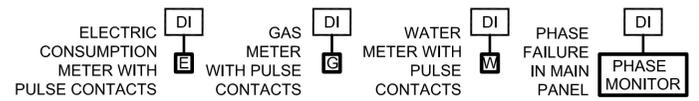
B2 EXHAUST FAN CONTROL DIAGRAM
SCALE: NONE



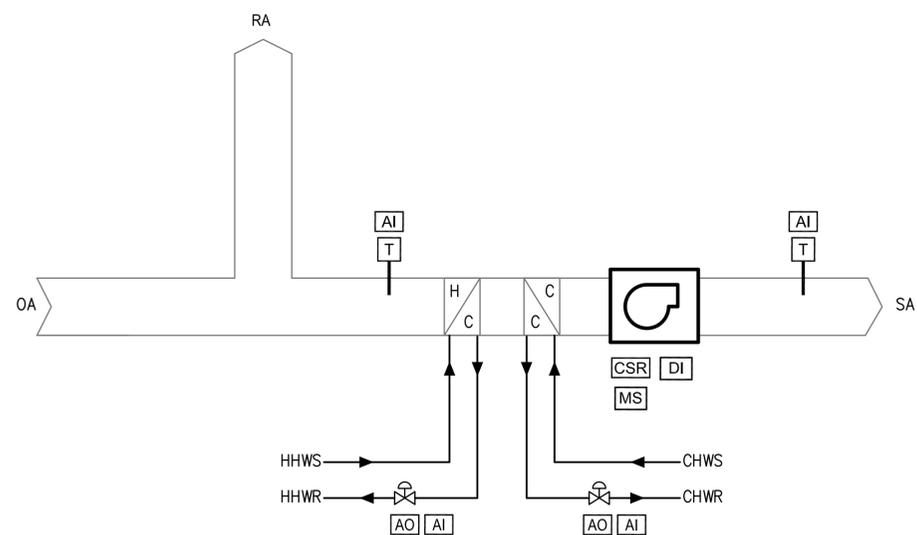
A1 SPLIT SYSTEM CONTROL DIAGRAM
SCALE: NONE



A1 BASEBOARD HEATER CONTROL DIAGRAM
SCALE: NONE



A2 UTILITIES MONITORING DIAGRAM
SCALE: NONE



A3 FAN COIL CONTROL DIAGRAM
SCALE: NONE

| | |
|---|-------------------------------|
| DATE | APPROVED |
| DESCRIPTION | FOR COMMANDER NAVFAC |
| SYMBOL | ACTIVITY |
| | SATISFACTORY TO DATE |
| | DES. RM. DRW. DN/GB. CHK. JC. |
| | PM/DM |
| | BRANCH MANAGER |
| | CHIEF ENGINEER |
| DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC NORFOLK, VIRGINIA NAVAL STATION NORFOLK Q4/BQ RENOVATE BUILDING R61 MECHANICAL CONTROLS | |
| SCALE: AS NOTED | |
| PROJECT NO. 1355149 | |
| CONSTRUCTION CONTRACT NO. N40085-10-D-5333-D.O. 0012 | |
| NAVFAC DRAWING NO. | |
| SHEET | OF |
| M-802 | |

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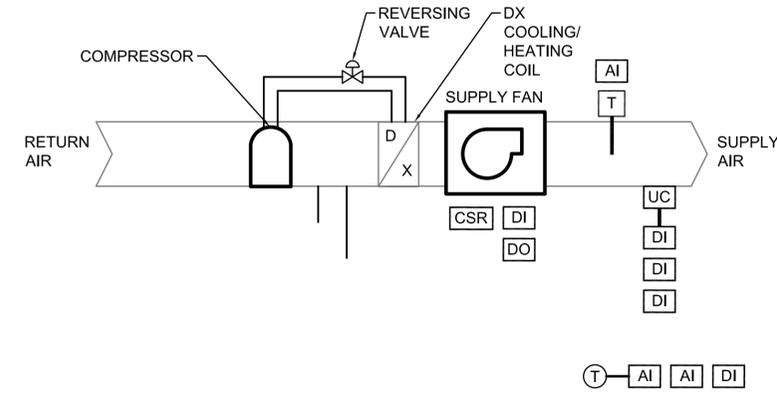
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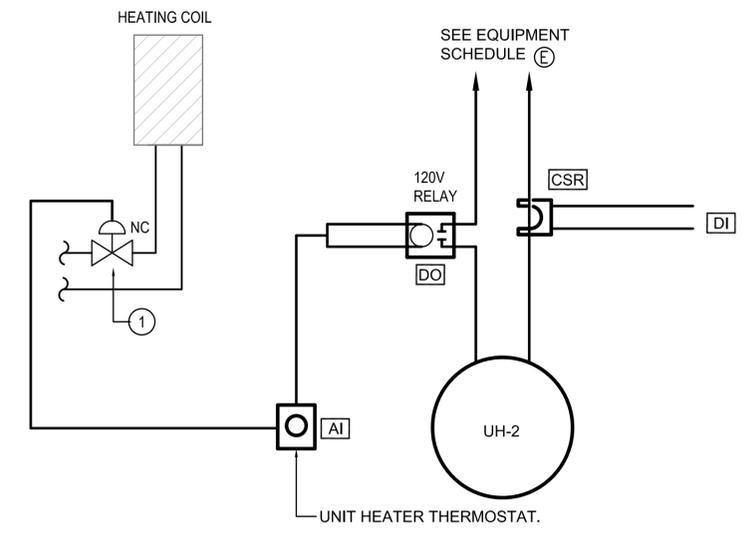
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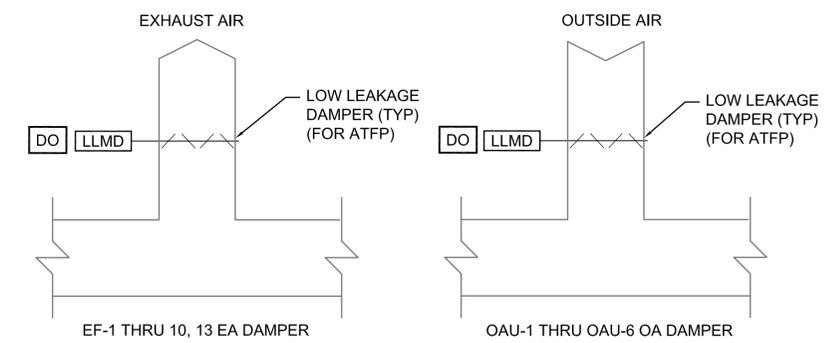
MAP THE FOLLOWING POINTS
 ACTUAL COOLING SET POINT
 ACTUAL HEATING SET POINT
 COMPRESSOR RESET
 COMPRESSOR COMMAND
 EMERGENCY SHUT DOWN COMMAND
 OCCUPIED COOLING SET POINT
 OCCUPIED HEATING SET POINT

C1 ROOFTOP HEAT PUMP UNIT CONTROL DIAGRAM
 SCALE: NONE



NOTES:
 ① CONTROL VALVE SUPPLIED WITH UNIT HEATER.

C4 HEATING HOT WATER UNIT HEATER
 SCALE: NONE



LOW LEAKAGE DAMPER NOTE:
 PROVIDE LOW LEAKAGE ATFP CONTROL DAMPER TO INTERLOCK WITH ATFP CONTROL AND EQUIPMENT OPERATION. PROVIDE CONTROL DAMPER TO INTERLOCK WITH EQUIPMENT REFER TO PLANS FOR SPECIFIC LOCATIONS.

EMERGENCY SHUTDOWN SWITCH NOTE:
 SHUTDOWN SWITCH IS AN ALARM BOX WITH PUSH BUTTON, HINGED COVER, AUDIBLE ALARM WHEN THE COVER IS RAISED, AND INSCRIPTION "ALARM SOUNDS WHEN COVER IS RAISED."

A4 EMERGENCY SHUTDOWN CONTROL DIAGRAMS
 SCALE: NONE

| | |
|--|--------------------------------------|
| DATE | APPROVED |
| DESCRIPTION | |
| SYMBOL | |
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| APPROVED | |
| FOR COMMANDER NAVFAC | |
| ACTIVITY | |
| SATISFACTORY TO DATE | |
| DES. RM | DRW. DN/CS |
| CHK. JC | |
| PM/DM | |
| BRANCH MANAGER | |
| CHIEF ENGINEER | |
| DEPARTMENT OF THE NAVY | NAVAL FACILITIES ENGINEERING COMMAND |
| NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC | NORFOLK, VIRGINIA |
| NAVAL STATION NORFOLK | Q4/BQ RENOVATE BUILDING R61 |
| | MECHANICAL CONTROLS |
| SCALE: AS NOTED | |
| PROJECT NO. 1355149 | |
| CONSTRUCTION CONTRACT NO. N40085-10-D-5333-D.O. 0012 | |
| NAVFAC DRAWING NO. | |
| SHEET | OF |
| M-803 | |
| PACKAGE 2 - PREFINAL - 05.19.16 | |

GENERAL

THE DDC CONTROL SYSTEM SHALL INTERFACE WITH VIA MODEM AND GOVERNMENT FURNISHED TELEPHONE LINES TO THE EXISTING OPERATOR WORKSTATION SERVER LOCATED IN BUILDING A-81 DDC OFFICE.

THE BUILDING SHALL HAVE AN OPERATOR SELECTABLE BUILDING OCCUPIED/UNOCCUPIED/NIGHT SETBACK MODE. IN THE OCCUPIED MODE, THE BUILDING SHALL BE IN THE OCCUPIED MODE AS DESCRIBED. IN THE UNOCCUPIED MODE ALL EQUIPMENT SHALL BE OFF. IN THE NIGHT SETBACK THE BUILDING SHALL BE IN THE NIGHT SETBACK/SETUP MODE AS DESCRIBED.

THE BUILDING WILL BE SET UP FOR 24 HOUR A DAY/7 DAY A WEEK OCCUPIED MODE AT THIS POINT.

FAN COILS (WSHP-101 THRU WSHP-225)

OCCUPIED MODE

THE SUPPLY FAN SHALL BE STARTED ACCORDING TO THE SCHEDULE. AFTER THE SUPPLY FAN HAS BEEN STARTED, THE OCCUPIED CONTROL SEQUENCE SHALL BE ENABLED

FACTORY MOUNTED AND WIRED CONTROL VALVES SHALL OPEN UPON UNIT BEING ENERGIZED WHEN CALLING FOR HEATING AND COOLING TO ALLOW CONDENSER WATER TO FLOW THROUGH CONDENSER COIL.

THE HOT WATER COIL AND COOLING COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN THE SPACE TEMPERATURE SETPOINT. THE HEATING COIL AND COOLING COIL OPERATION SHALL BE PROVIDED WITH A DEADBAND TO PREVENT OVERLAP. THE CONTROL VALVE SHALL MODULATE TO MAINTAIN A COOLING TEMPERATURE SETPOINT OF 75°FDB (ADJ) AND HEATING TEMPERATURE SETPOINT OF 68°FDB (ADJ).

EACH THERMOSTAT SHALL HAVE THE ABILITY FOR THE BUILDING OCCUPANT TO ADJUST THE TEMPERATURE SETTING BETWEEN 73°FDB-77°FDB IN COOLING MODE AND 68°FDB-72°FDB IN HEATING MODE. ALL TEMPERATURE SETTINGS FOR THE TEMPERATURE SENSORS OUTSIDE OF THESE RANGES SHALL ONLY BE ADJUSTABLE FROM THE CENTRAL DDC SYSTEM.

NIGHT SETBACK/NIGHT SETUP

IN NIGHT SETBACK MODE THE SUPPLY FAN SHALL OPERATE AND THE HEATING AND COOLING COIL SHALL MODULATE TO MAINTAIN THE COOLING ZONE TEMPERATURE SETPOINT OF 82°FDB (ADJ) AND HEATING TEMPERATURE SETPOINT OF 65°FDB (ADJ).

ALARM MONITOR

THE CURRENT SENSOR AT THE FAN SHALL MONITOR AND ALARM WHEN A FAN FAILURE IS INDICATED.

SHUTDOWN

WHEN THE UNIT IS SHUTDOWN BY EITHER A STOP COMMAND OR SYSTEM SAFETY, THE UNIT WILL BE SET AS FOLLOWS:

SUPPLY FAN WILL BE DEENERGIZED HEATING AND COOLING COIL CONTROL VALVES SHALL CLOSE

EF-1 THRU 10, EF-13, 19 THRU 23 CONTROLS

WHEN INDEXED IN THE OCCUPIED MODE BY THE BUILDING PROGRAM, THE FAN SHALL RUN CONTINUOUSLY. IN UNOCCUPIED MODE THE FAN SHALL BE OFF. OPERATION STATUS SHALL BE MONITORED.

AN ALARM SHALL BE GENERATED IF THE FAN IS ENABLED AND NOT RUNNING.

EF-11,12,14 THRU 16 CONTROLS

DDC SYSTEM SHALL ENERGIZE THE EXHAUST FAN WHEN SPACE TEMPERATURE SENSOR RISES ABOVE SPACE TEMPERATURE SETPOINT 85°F (ADJ.), AND DE-ENERGIZE THE FAN UPON TEMPERATURE FALL BELOW SET-POINT. AN ALARM SHALL BE GENERATED IF THE FAN IS ENABLED AND NOT RUNNING.

UNIT HEATER CONTROLS (UH-1)

WHEN THE TEMPERATURE SENSOR FALLS BELOW ITS SETPOINT OF 50°F (ADJ.), THE FAN MOTOR AND ELEMENTS SHALL ENERGIZE. WHEN THE TEMPERATURE SENSORS RISES ABOVE ITS SETPOINT OF 50°FDB (ADJ) THE FAN MOTOR AND ELEMENTS SHALL DE-ENERGIZE. OPERATION STATUS AND ZONE TEMPERATURE SHALL BE MONITORED.

AN ALARM SHALL BE GENERATED IF THE TEMPERATURE SENSOR SETTING STAYS BELOW 50°FDB (ADJ) FOR AN HOUR (ADJ.).

UNIT HEATER CONTROLS (UH-2)

WHEN THE TEMPERATURE SENSOR FALLS BELOW ITS SETPOINT OF 50°F (ADJ.), THE FAN MOTOR SHALL ENERGIZE AND CONTROL VALVE SHALL OPEN/MODULATE. WHEN THE TEMPERATURE SENSORS RISES ABOVE ITS SETPOINT OF 50°FDB (ADJ) THE FAN MOTOR SHALL DE-ENERGIZE AND CONTROL VALVE SHALL CLOSE. OPERATION STATUS AND ZONE TEMPERATURE SHALL BE MONITORED.

AN ALARM SHALL BE GENERATED IF THE TEMPERATURE SENSOR SETTING STAYS BELOW 50°FDB (ADJ) FOR AN HOUR (ADJ.).

BASEBOARD UNIT HEATER CONTROLS (BUH-1)

THE UNIT SHALL OPERATE UNDER ITS OWN CONTROLS WITHOUT CONNECTION TO THE DDC WHEN THE TEMPERATURE SENSOR FALLS BELOW ITS SETPOINT OF 50°F (ADJ.), THE ELEMENTS SHALL ENERGIZE. WHEN THE TEMPERATURE SENSORS RISES ABOVE ITS SETPOINT OF 50°FDB (ADJ) THE ELEMENTS DE-ENERGIZE AND CONTROL VALVE SHALL CLOSE. .

PACKAGE ROOFTOP HEAT PUMP (RTU-1)

OCCUPIED MODE

FACTORY MOUNTED CONTROL PANEL SHALL INTERFACE WITH DDC SYSTEM. SYSTEM SHALL OPERATE UNDER ITS OWN INTERNAL CONTROLS TO MAINTAIN SPACE SETPOINT TEMPERATURE. .

THE UNIT COMPRESSOR SHALL MODULATE/CYCLE IN SEQUENCE TO MAINTAIN THE COOLING ZONE TEMPERATURE SETPOINT OF 75°FDB (ADJ) AND HEATING TEMPERATURE SETPOINT OF 68 °FDB (ADJ).

THE SUPPLY FAN SHALL BE STARTED ACCORDING TO THE SCHEDULE. AFTER THE SUPPLY FAN HAS BEEN STARTED, THE OCCUPIED CONTROL SEQUENCE SHALL BE ENABLED.

WHEN THE ZONE TEMPERATURE FALLS BELOW THE SETPOINT, THE REVERSING VALVE WILL BE INDEXED TO PROVIDE HEATING WHEN THE COMPRESSOR IS RUNNING. WHEN THE ZONE TEMPERATURE RISES ABOVE THE SETPOINT, THE REVERSING VALVE WILL BE INDEXED TO PROVIDE COOLING WHEN THE COMPRESSOR IS RUNNING.

EACH THERMOSTAT SHALL HAVE THE ABILITY FOR THE BUILDING OCCUPANT TO ADJUST THE TEMPERATURE SETTING BETWEEN 73°FDB-77°FDB IN COOLING MODE AND 68°FDB-72°FDB IN HEATING MODE. ALL TEMPERATURE SETTINGS FOR THE TEMPERATURE SENSORS OUTSIDE OF THESE RANGES SHALL ONLY BE ADJUSTABLE FROM THE CENTRAL DDC SYSTEM.

UNOCCUPIED MODE (NIGHT SETBACK/NIGHT SETUP)

IN UNOCCUPIED MODE, THE UNIT COMPRESSOR AND UNIT SUPPLY FAN SHALL MODULATE/CYCLE IN SEQUENCE TO MAINTAIN THE COOLING ZONE TEMPERATURE SETPOINT OF 82°FDB (ADJ) AND HEATING TEMPERATURE SETPOINT OF 65°FDB (ADJ).

ALARM MONITOR

THE HEAT PUMP TROUBLE ALARM SHALL BE MONITORED BY THE UNIT CONTROLLER AND ALARMED AT THE OPERATOR WORKSTATION. FACTORY MOUNTED BACNET CONTROLLER WITH ALARMS SHALL IDENTIFY THE CAUSE OF THE PROBLEM.

SHUTDOWN

WHEN THE UNIT IS SHUTDOWN BY EITHER A STOP COMMAND OR SYSTEM SAFETY, THE UNIT WILL BE SET AS FOLLOWS: SUPPLY FAN WILL BE DEENERGIZED COMPRESSOR WILL BE DEENERGIZED

PHASE MONITOR CONTROLS

THE PHASES IN THE MAIN ELECTRICAL PANEL SHALL BE MONITORED, AND IF A PHASE FAILURE OCCURS AN ALARM SHALL BE GENERATED AT THE OPERATOR WORKSTATION.

HVAC EMERGENCY SHUTDOWN SWITCH

THE EMERGENCY SHUTDOWN SWITCH SHALL SHUTDOWN ALL THE HVAC SYSTEMS AND CLOSE ALL THE LOW LEAKAGE MOTORIZED DAMPERS VIA THE DDC SYSTEM WHEN THE SWITCH IS ENABLED. THE DDC SYSTEM SHALL ALARM. SWITCH SHALL REQUIRE MANUAL RESET.

THE ENCLOSURE AROUND THE HVAC SHUTDOWN SWITCH SHALL ENERGIZE AN AUDIBLE ALARM WHEN THE ENCLOSURE IS OPENED. WHEN THE ENCLOSURE IS SHUT THE AUDIBLE ALARM SHALL DE-ENERGIZE.

OUTSIDE AIR UNIT (OAU-1 THRU 6) CONTROL

THE SUPPLY FAN SHALL OPERATE CONTINUOUSLY DURING OCCUPIED MODE TO MAINTAIN. UPON ENTERING OCCUPIED MODE THE LOW LEAKAGE ATFP DAMPER SHALL OPEN. UPON CONFIRMATION THE DAMPER IS OPEN THE SUPPLY FAN SHALL ENERGIZE.

THE PREHEAT COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN 55F (ADJUSTABLE) DISCHARGE AIR TEMPERATURE.

THE COOLING COIL CONTROL VALVE SHALL MODULATE TO MAINTAIN 55F (ADJUSTABLE) DISCHARGE AIR TEMPERATURE AND A DEW POINT DISCHARGE AIR TEMPERATURE OF 53F(ADJUSTABLE) PROVIDE A DEADBAND BETWEEN PREHEAT COIL AND COOLING COIL OPERATION TO PREVENT OVERLAP.

THE REHEAT COIL CONTROL VALVE SHALL MODULATE MAINTAIN A DISCHARGE SET POINT OF 75°F(ADJ.) AND 50% RH (ADJ.) DURING COOLING AND A SET POINT OF 70°F(ADJ.) DURING HEATING.

THE UNIT SHALL SHUT DOWN AND GENERATE AN ALARM UPON RECEIVING A SMOKE DETECTOR STATUS. THE DDC SYSTEM SHALL SEND A SIGNAL TO THE FIRE ALARM PANEL. THE UNIT SHALL BE REQUIRED TO BE MANUALLY RESTARTED.

THE DDC SHALL MONITOR THE SUPPLY FAN STATUS AND ALARM WHEN THE FAN INDICATES A FAILURE.

THE DDC SHALL MONITOR THE DISCHARGE AIR TEMPERATURES AND ALARM WHEN TEMPERATURE IS +/- 5°F (ADJUSTABLE) FROM SETPOINT

THE DDC SYSTEM SHALL MONITOR ALL POINTS LISTED IN THE CONTROL DIAGRAM AND POINTS LIST. THESE POINTS SHALL BE SHOWN IN THE GRAPHICS PACKAGE AND SHALL BE ABLE TO TREND THE DATA.

FILTER PRESSURE SHALL GENERATE ON SENSING THE DIFFERENTIAL PRESSURE ABOVE ITS SETPOINT (ADJ.).

PACKAGED TERMINAL HEAT PUMPS (PTHP-1,2)

THE PACKAGED TERMINAL HEAT PUMPS IN THE LIVING UNITS SHALL OPERATE UNDER THERE OWN INTERNAL CONTROLS TO MAINTAIN THE SETPOINT TEMPERATURE 75°F(COOLING) 68°F(HEATING) (ADJ.) THE DDC SHAL NOT INTERFACE OR MONITOR UNITS.

SS-1-2/CU-1-2 CONTROLS

OPERATING MODE MEMORY:

AFTER THE SYSTEM IS TURNED OFF OR IN THE EVENT OF A POWER FAILURE, THE SYSTEM SHALL HAVE THE ABILITY TO REMAIN IN THE LAST OPERATING MODE SELECTED. WHEN THE SYSTEM IS TURNED ON OR THE POWER IS RESTORED, THE SYSTEM SHALL CONTINUE TO OPERATE IN LAST OPERATING MODE SELECTED AS WHEN THE SYSTEM WAS SHUT DOWN.

SCHEDULING:

THE SYSTEM SHALL PROVIDE 7 DAY, 4 EVENT SCHEDULING CAPABILITIES.

FAN OPERATION:

THE FAN SPEED SHALL BE SELECTED BY PRESSING A BUTTON (HIGH, MEDIUM, OR LOW SPEED). THE FAN IS CAPABLE OF OPERATION IN EITHER COOLING OR AUTO MODE. IN AUTO MODE THE FAN SHALL OPERATE WITH THE OUTDOOR UNIT COMPRESSOR.

COOLING MODE:

WHEN THE ROOM TEMPERATURE RISES ABOVE THE TEMPERATURE SENSOR SETPOINT (75 °FDB ADJ.), THE FAN COIL RELAY BOARD SHALL ENERGIZE, THE INDOOR FAN SHALL ENERGIZE (IF THE FAN ISN'T ALREADY OPERATING), AND THE OUTDOOR COMPRESSOR AND OUTDOOR FAN SHALL ENERGIZE. WHEN THE ROOM TEMPERATURE DROPS BELOW THE TEMPERATURE SETTING THE REVERSE SHALL OCCUR.

ELECTRIC METER CONTROLS

THE CONTROLLER SHALL MONITOR THE ELECTRIC METER FOR ELECTRICAL CONSUMPTION ON A CONTINUAL BASIS. THESE VALUES SHALL BE MADE AVAILABLE TO THE SYSTEM AT ALL TIMES.

ALARM SHALL BE GENERATED AS FOLLOWS:

METER ALARM:

SENSOR READING INDICATE AN INVALID VALUE FROM THE ELECTRIC METER.

PEAK DEMAND:

THE CONTROLLER SHALL MONITOR AND RECORD THE PEAK (HIGH AND LOW) DEMAND READING FROM THE ELECTRIC METER. PEAK READINGS SHALL BE RECORDED ON A DAILY, MONTH TO DATE, AND YEAR TO DATE BASIS.

USAGE HISTORY:

THE CONTROLLER SHALL MONITOR AND RECORD ELECTRICAL METER READINGS AS TO PROVIDE A POWER CONSUMTION HISTORY. USAGE READINGS SHALL BE RECORDED ON A DAILY, MONTH TO DATE, AND YEAR TO DATE BASIS.

WATER METER CONTROLS

THE CONTROLLER SHALL MONITOR THE WATER METER FOR WATER CONSUMPTION ON A CONTINUAL BASIS. THESE VALUES SHALL BE MADE AVAILABLE TO THE SYSTEM AT ALL TIMES.

ALARM SHALL BE GENERATED AS FOLLOWS:

METER ALARM:

SENSOR READING INDICATE AN INVALID VALUE FROM THE WATER METER.

PEAK DEMAND:

THE CONTROLLER SHALL MONITOR AND RECORD THE PEAK (HIGH AND LOW) DEMAND READING FROM THE WATER METER. PEAK READINGS SHALL BE RECORDED ON A DAILY, MONTH TO DATE, AND YEAR TO DATE BASIS.

USAGE HISTORY:

THE CONTROLLER SHALL MONITOR AND RECORD WATER METER READINGS AS TO PROVIDE A WATER CONSUMPTION HISTORY. USAGE READINGS SHALL BE RECORDED ON A DAILY, WEEK TO DATE, MONTH TO DATE, AND YEAR TO DATE BASIS.

GAS METER CONTROLS

THE CONTROLLER SHALL MONITOR THE GAS METER FOR GAS CONSUMPTION ON A CONTINUAL BASIS. THESE VALUES SHALL BE MADE AVAILABLE TO THE SYSTEM AT ALL TIMES.

ALARM SHALL BE GENERATED AS FOLLOWS:

METER ALARM:

SENSOR READING INDICATE AN INVALID VALUE FROM THE GAS METER.

PEAK DEMAND:

THE CONTROLLER SHALL MONITOR AND RECORD THE PEAK (HIGH AND LOW) DEMAND READING FROM THE GAS METER. PEAK READINGS SHALL BE RECORDED ON A DAILY, MONTH TO DATE, AND YEAR TO DATE BASIS.

USAGE HISTORY:

THE CONTROLLER SHALL MONITOR AND RECORD GAS METER READINGS AS TO PROVIDE GAS CONSUMPTION HISTORY. USAGE READINGS SHALL BE RECORDED ON A DAILY, WEEK TO DATE, MONTH TO DATE, AND YEAR TO DATE BASIS.

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APPROVED

FOR COMMANDER NAFAC

ACTIVITY

SATISFACTORY TO DATE

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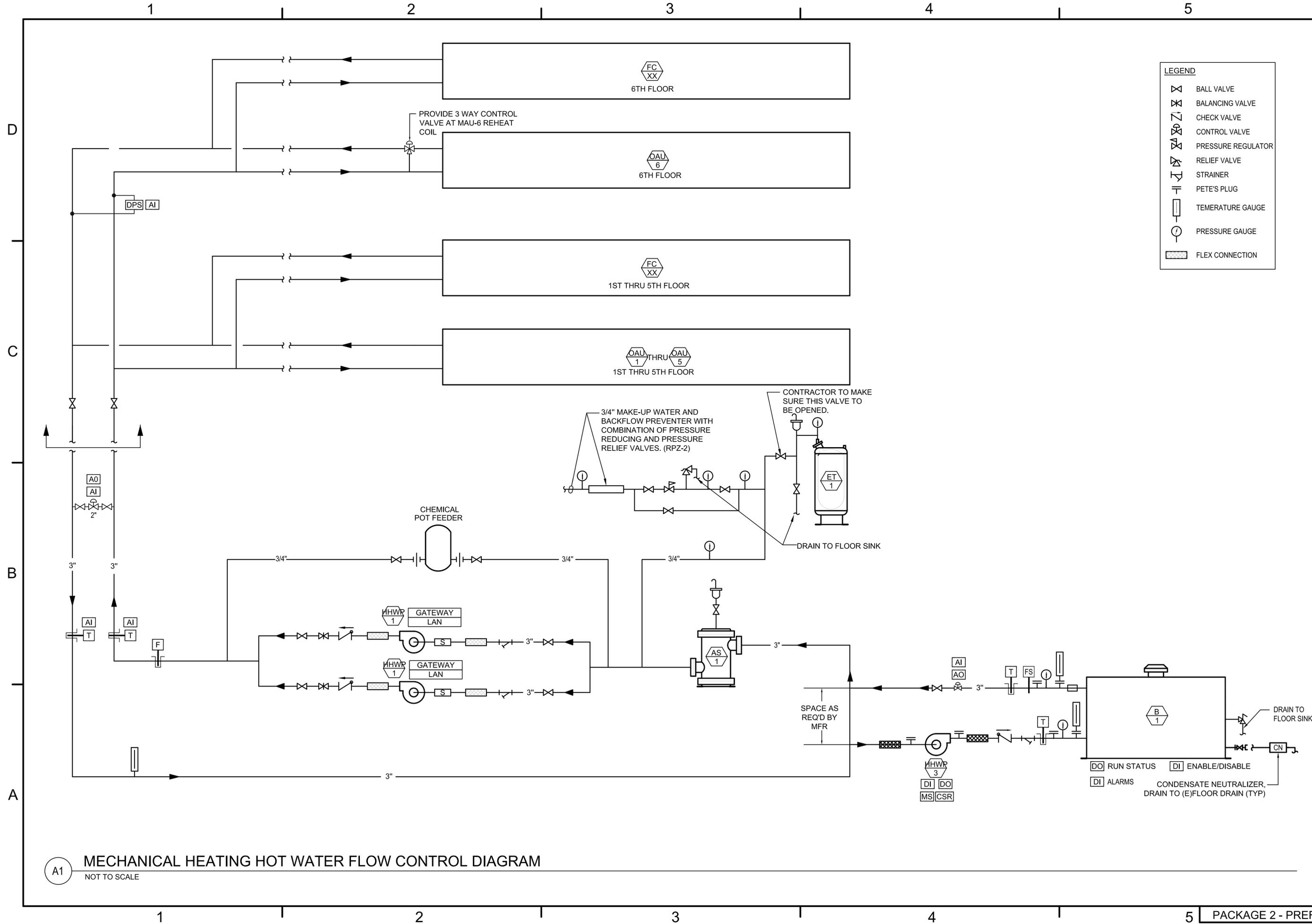
PM/DM

BRANCH MANAGER

CHIEF ENGINEER

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC REGIONAL OFFICE NORFOLK, VIRGINIA NAVAL STATION NORFOLK Q4/BQ RENOVATE BUILDING R61 MECHANICAL SEQUENCE OF OPERATIONS

SCALE: AS NOTED PROJECT NO. 1355149 CONSTRUCTION CONTRACT NO. N40085-10-D-5333-D.O. 0012 NAFAC DRAWING NO. SHEET OF M-804



LEGEND

- ⊗ BALL VALVE
- ⊗ BALANCING VALVE
- ∇ CHECK VALVE
- ⊗ CONTROL VALVE
- ⊗ PRESSURE REGULATOR
- ∇ RELIEF VALVE
- ∇ STRAINER
- ∇ PETE'S PLUG
- ∇ TEMPERATURE GAUGE
- ∇ PRESSURE GAUGE
- ∇ FLEX CONNECTION

NAVAC

REGISTERED PROFESSIONAL ENGINEER
FRANK SHADPOUR
MECHANICAL
NO. 39815
EXPIRES 03-30-17
STATE OF CALIFORNIA
15188 SEAL

RQC
RQ CONSTRUCTION, LLC

Shadpour Consulting Engineers, Inc.
1075 Via del Camino, First Floor
San Diego, CA 92117

APPROVED

FOR COMMANDER NAVAC

ACTIVITY

SATISFACTORY TO DATE

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PM/DAM

BRANCH MANAGER

CHIEF ENGINEER

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NORFOLK, VIRGINIA

NAVAL STATION NORFOLK
Q4/BQ RENOVATE BUILDING R61
MECHANICAL HHW CONTROL DIAGRAM

SCALE: AS NOTED

PROJECT NO. 1355149

CONSTRUCTION CONTRACT NO. N40085-10-D-5333-D.O. 0012

NAVFAC DRAWING NO.

SHEET 01 OF 01

M-901

PACKAGE 2 - PREFINAL - 05.19.16

A1 MECHANICAL HEATING HOT WATER FLOW CONTROL DIAGRAM
NOT TO SCALE

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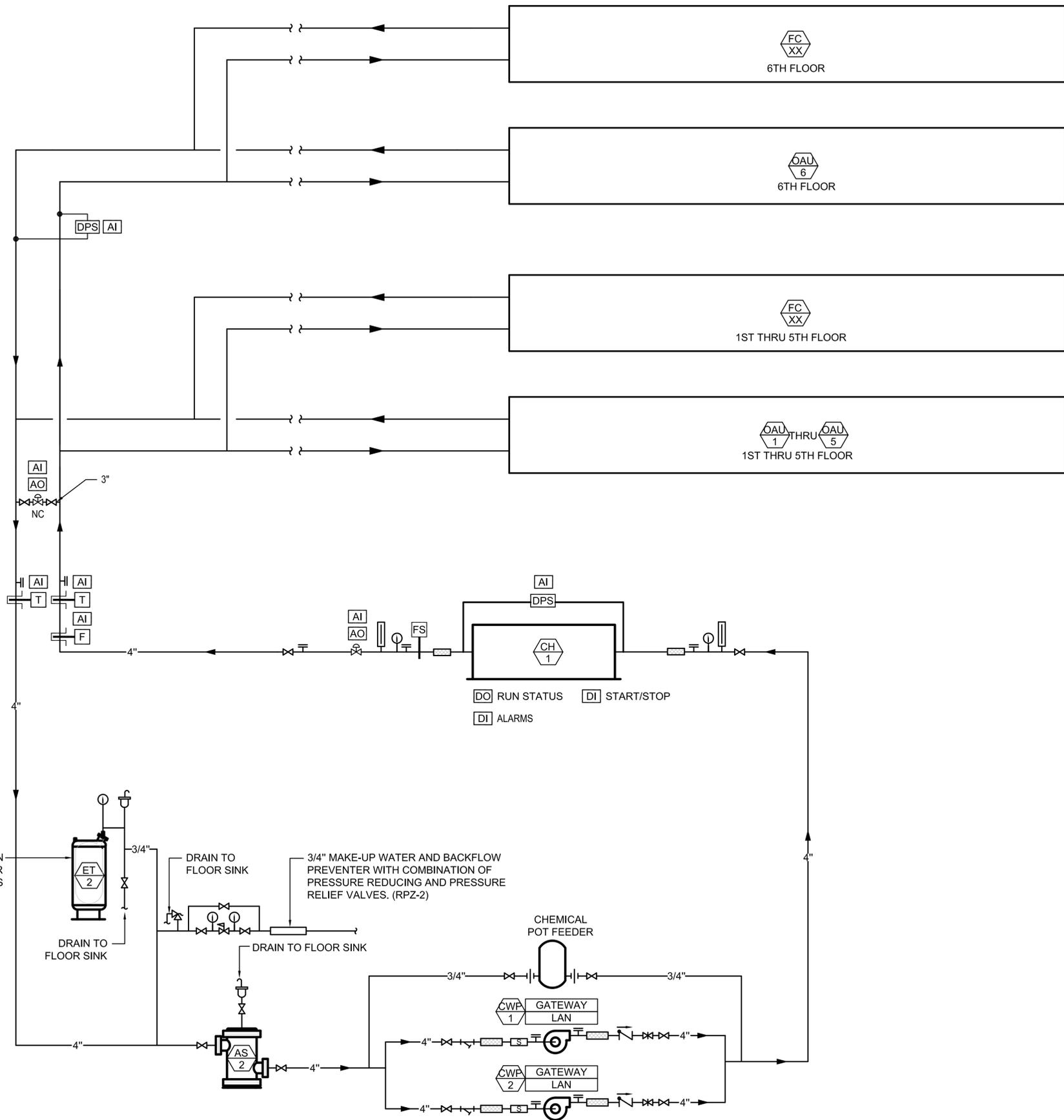
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LEGEND

- BALL VALVE
- BALANCING VALVE
- CHECK VALVE
- CONTROL VALVE
- PRESSURE REGULATOR
- RELIEF VALVE
- STRAINER
- PETE'S PLUG
- TEMPERATURE GAUGE
- PRESSURE GAUGE
- FLEX CONNECTION

A1 MECHANICAL CHILLED WATER FLOW CONTROL DIAGRAM
NOT TO SCALE

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| DATE | APPROVED |
| DESCRIPTION | |
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| DES. RM | DRW. DRWG |
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| BRANCH MANAGER | |
| CHIEF ENGINEER | |
| DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC NORFOLK, VIRGINIA NAVAL STATION NORFOLK Q4/BQ RENOVATE BUILDING R61 MECHANICAL CHW CONTROL DIAGRAM | |
| SCALE: AS NOTED | |
| PROJECT NO. 1355149 | |
| CONSTRUCTION CONTRACT NO. N40085-10-D-5333-D.O. 0012 | |
| NAVFAC DRAWING NO. | |
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| M-902 | |

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CONTROLS SYMBOL LIST

| SYMBOL | DESCRIPTION |
|--------|---|
| | SWITCH MOUNTED IN SURFACE BOX, +48" UNLESS NOTED OTHERWISE. |
| | SWITCH-RECESSED, +48" UNLESS NOTED OTHERWISE. |
| | SPST WALL SWITCH, LETTERS INDICATE THE NUMBER OF SWITCHES AND OUTLETS THEY CONTROL. MOUNTED FLUSH IN BOX AT +48" U.O.N. |
| | WALL BOX DIMMER, +48" UNLESS NOTED OTHERWISE. |
| | REMOTE DIMMER SWITCH, +48" UNLESS NOTED OTHERWISE. |
| | KEYED WALL SWITCH, +48" UNLESS NOTED OTHERWISE. |
| | MANUAL MOTOR STARTER, +48" UNLESS NOTED OTHERWISE. |
| | WALL SWITCH WITH PILOT LIGHT, +48" UNLESS NOTED OTHERWISE. |
| | SPDT WALL SWITCH, MOMENTARY CONTACT, CENTER MAINTAINED, +48" UNLESS NOTED OTHERWISE. |
| | DPST WALL SWITCH, +48" UNLESS NOTED OTHERWISE. |
| | THREE-WAY WALL SWITCH, +48" UNLESS NOTED OTHERWISE. |
| | FOUR-WAY WALL SWITCH, +48" UNLESS NOTED OTHERWISE. |
| | JUNCTION BOX, FLUSH MOUNTED AT +18" UNLESS NOTED OTHERWISE. |
| | JUNCTION BOX, SURFACE MOUNTED AT +18" UNLESS NOTED OTHERWISE. |
| | CEILING MOUNTED JUNCTION BOX. |
| | JUNCTION BOX PLEX. |
| | JUNCTION BOX WITH FLEXIBLE CONDUIT CONNECTION. |
| | THERMOSTAT OUTLET, MOUNTED AT +60" UNLESS NOTED OTHERWISE. |
| | PUSHBUTTON STATION. |
| | WALL CLOCK/INTERVAL TIMER, MOUNTED AS INDICATED ON PLANS. |
| | CONTACTOR. |
| | PHOTOCELL MOUNTED AS NOTED ON PLANS. |
| | SOLENOID VALVE. |
| | TIME CLOCK. |
| | INFRARED OCCUPANCY SENSOR. |
| | RECESSED WALL SWITCH OCCUPANCY SENSOR. |
| | SURFACE WALL SWITCH OCCUPANCY SENSOR. |
| | ULTRASONIC OCCUPANCY SENSOR. |
| | DUAL TECHNOLOGY OCCUPANCY SENSOR. |
| | RELAY. |

POWER SYMBOL LIST

| SYMBOL | DESCRIPTION |
|--------|--|
| | DUPLEX CONVENIENCE OUTLET MOUNTED IN FLUSH BOX AT +18" UNLESS NOTED OTHERWISE. |
| | DUPLEX CONVENIENCE OUTLET MOUNTED IN SURFACE BOX AT +18" UNLESS NOTED OTHERWISE. |
| | DOUBLE DUPLEX CONVENIENCE OUTLET, +18" UNLESS NOTED OTHERWISE. |
| | CONVENIENCE OUTLET WITH INTEGRAL GROUND FAULT INTERRUPTER, +18" UNLESS NOTED OTHERWISE. |
| | CONVENIENCE OUTLET WITH INTEGRAL ARC FAULT CIRCUIT INTERRUPTER, +18" UNLESS NOTED OTHERWISE. |
| | SINGLE CONVENIENCE OUTLET, +18" UNLESS NOTED OTHERWISE. |
| | DUPLEX CONVENIENCE OUTLET, TOP HALF SWITCHED, +18" UNLESS NOTED OTHERWISE. |
| | DUPLEX CONVENIENCE OUTLET WITH ISOLATED GROUND, +18" UNLESS NOTED OTHERWISE. |
| | FLOOR MOUNTED DUPLEX CONVENIENCE OUTLET. |
| | CONDUIT MOUNTED DUPLEX CONVENIENCE OUTLET. |
| | FLUSH FLOOR BOX W/ DUPLEX RECEPTACLE. |
| | MULTI SERVICE FLUSH FLOOR BOX. |
| | FLUSH FLOOR POWER SYSTEM FURNITURE FEED. |
| | CLOCK HANGER OUTLET, MOUNTED AS INDICATED ON PLANS. |
| | SPECIAL PURPOSE RECEPTACLE, +18" UNLESS NOTED OTHERWISE, NEMA CONFIGURATION AS NOTED ON THE PLANS. |
| | WALL MOUNTED POWER SYSTEM FURNITURE FEED. |
| | TYPE "A" SURFACE MTD. MULTI OUTLET ASSEMBLY, MOUNTING HEIGHT AS NOTED ON PLANS. |
| | TYPE "A" SURFACE MTD. METAL RACEWAY, MOUNTING HEIGHT AS NOTED ON PLANS. |
| | FLUSH MOUNTED BRANCH CIRCUIT PANELBOARD. |
| | SURFACE MOUNTED BRANCH CIRCUIT PANELBOARD. |
| | DISTRIBUTION BOARD. |
| | DISTRIBUTION PANELBOARD. |
| | TERMINAL CABINET. |
| | GROUND ROD. |
| | GROUNDING BUS BAR W/MINIMUM #6 COPPER WIRE TO EQUIPMENT GROUND BUS. |

SITE UTILITIES SYMBOL LIST

| SYMBOL | DESCRIPTION |
|--------|--|
| | ELECTRICAL HANDHOLE FLUSH IN GRADE. |
| | ELECTRICAL MANHOLE FLUSH IN GRADE. |
| | TELEPHONE SYSTEM HANDHOLE. |
| | TELEPHONE SYSTEM MANHOLE. |
| | CONCRETE PULLBOX FLUSH IN GRADE, SIZE AS INDICATED ON PLANS. |

TELECOMMUNICATIONS SYMB LIST

| SYMBOL | DESCRIPTION |
|--------|---|
| | TELEPHONE OUTLET, +18" UNLESS NOTED OTHERWISE. |
| | WALL TELEPHONE OUTLET, +48" UNLESS NOTED OTHERWISE. |
| | COMBINATION TELEPHONE AND DATA OUTLET, +18" UNLESS NOTED OTHERWISE. |
| | DATA SYSTEM OUTLET, +18" UNLESS NOTED OTHERWISE. |
| | CATV SYSTEM OUTLET, +18" UNLESS NOTED OTHERWISE. |
| | WALL MOUNTED TELECOMMUNICATION SYSTEM FURNITURE FEED. |
| | FLOOR MOUNTED TELEPHONE OUTLET. |
| | FLOOR MOUNTED COMBINATION TELEPHONE AND DATA OUTLET. |
| | FLOOR MOUNTED DATA SYSTEM OUTLET. |
| | TELEPHONE BACKBOARD, SIZE AS NOTED ON PLANS. |

LIGHTING SYMBOL LIST

| SYMBOL | DESCRIPTION |
|--------|---|
| | LIGHT FIXTURE. SEE LIGHT FIXTURE SCHEDULE FOR MORE INFORMATION. |
| | LIGHT FIXTURE WITH EMERGENCY BALLAST. REFER TO FIXTURE SCHEDULE FOR MORE INFORMATION. |

WIRING / EQUIP CONNECT SYMB LIST

| SYMBOL | DESCRIPTION |
|--------|--|
| | CEILING MOUNTED JUNCTION BOX. |
| | JUNCTION BOX, FLUSH MOUNTED AT +18" UNLESS NOTED OTHERWISE. |
| | JUNCTION BOX, SURFACE MOUNTED AT +18" UNLESS NOTED OTHERWISE. |
| | JUNCTION BOX WITH FLEXIBLE CONDUIT CONNECTION. |
| | BRANCH CIRCUIT CONDUIT, CONCEALED IN WALL OR CEILING. |
| | BRANCH CIRCUIT CONDUIT, CONCEALED IN FLOOR OR UNDERGROUND. |
| | BRANCH CIRCUIT CONDUIT, RUN EXPOSED. |
| | 2# 12, 3/4"C. 5# 12, 3/4"C. |
| | 3# 12, 3/4"C. 6# 12, 3/4"C. |
| | 4# 12, 3/4"C. 7# 10, 3/4"C. |
| | DISCONNECT SWITCH, "F" INDICATES FUSED TYPE, MOUNTED AT +54" UNLESS NOTED OTHERWISE. |
| | MAGNETIC MOTOR STARTER, MOUNTED AT +54" UNLESS NOTED OTHERWISE. |
| | COMBINATION MOTOR STARTER, MOUNTED AT +54" UNLESS NOTED OTHERWISE. |
| | EMERGENCY SYSTEM CONDUIT. |
| | ALARM SYSTEM CONDUIT, 3/4" C.O. UNLESS NOTED OTHERWISE. |
| | FIRE ALARM SYSTEM CONDUIT. |
| | TELEPHONE SYSTEM CONDUIT, 3/4" C.O. UNLESS NOTED OTHERWISE. |
| | PUBLIC ADDRESS SYSTEM CONDUIT. |
| | INTERCOM SYSTEM CONDUIT. |
| | TELEVISION SYSTEM CONDUIT. |
| | DATA SYSTEM CONDUIT. |
| | BARE COPPER GROUND CONDUCTOR. |
| | LOW VOLTAGE CIRCUIT. |
| | CONDUIT RUN TURNED UP. |
| | CONDUIT RUN TURNED DOWN. |
| | CONDUIT RUN STUBBED OUT. |
| | BRANCH CIRCUIT HOMERUN WITH PANEL AND CIRCUIT DESIGNATED. |
| | INDICATES NEW CONDUCTORS IN EXISTING CONDUIT. |
| | FLEXIBLE CONDUIT W/ POINT OF CONNECTION. |
| | POINT OF CONNECTION. |
| | CABLE TRAY. |
| | INTEGRAL KILOWATT-HOUR METER. |
| | KILOWATT-HOUR METER WITH CT'S. |
| | FUSE. |
| | FUSIBLE ELEMENT. |
| | CIRCUIT BREAKER. |
| | SWITCH. |
| | TRANSFER SWITCH. |
| | GENERATOR. |
| | CONTACT. |
| | GROUND. |
| | SHEET NOTE REFERENCE. |
| | MOTOR. |
| | FEEDER SIZE REFERENCE. |
| | TRANSFORMER. |
| | FUSED SWITCH. |
| | PANELBOARD. |

ABBREVIATIONS

| SUFFIX | DESCRIPTION |
|-------------|---|
| AC | ABOVE COUNTER |
| AFF | ABOVE FINISH FLOOR. |
| AWG | AMERICAN WIRE GAUGE. |
| AMP, A | AMPERE. |
| A.I.C. | AMPERES INTERRUPTING CAPACITY (SYMMETRICAL). |
| AF/AT | AMP FRAME, AMP TRIP. |
| AS/AF | AMP SWITCH, AMP FUSE. |
| ATS | AUTOMATIC TRANSFER SWITCH. |
| AUX | AUXILIARY CONTACTS. |
| BR | BRANCH. |
| BLDG | BUILDING. |
| CIRC., CKT. | CIRCUIT. |
| SFD | COMBINATION SMOKE FIRE DAMPER. |
| C | CONDUIT. |
| C.O. | CONDUIT ONLY, COMPLETE WITH PULLSTRING. |
| CT | CURRENT TRANSFORMER. |
| CPT | CONTROL POWER TRANSFORMER. |
| DIA | DIAMETER. |
| DISC | DISCONNECT. |
| DIST | DISTRIBUTION. |
| E.C. | ELECTRICAL CONTRACTOR. |
| EMS | ENERGY MANAGEMENT CONTROL SYSTEM. |
| EMT | ELECTRICAL METALLIC TUBING. |
| EWC | ELECTRIC WATER COOLER. |
| E.P.O. | EMERGENCY POWER OFF. |
| EF | EXHAUST FAN. |
| FA | FIRE ALARM. |
| FLA | FULL LOAD AMPS. |
| GFCI | GROUND FAULT CIRCUIT INTERRUPTER. |
| HOA | HAND-OFF-AUTO. |
| HACR | HEATING AIR CONDITIONING REFRIGERATION. |
| HVAC | HEATING, VENTILATING AND AIR CONDITIONING. |
| HID | HIGH INTENSITY DISCHARGE. |
| HP | HORSEPOWER. |
| HPS | HIGH PRESSURE SODIUM. |
| IG | ISOLATED GROUND. |
| JBOX | JUNCTION BOX. |
| KAIC | KILOVOLT AMPERES AVAILABLE INRUSH CURRENT. |
| KVA | KILOVOLT AMPERES. |
| KW | KILOWATT. |
| KWH | KILOWATT HOUR. |
| LTG, LTS | LIGHTING. |
| LPS | LOW PRESSURE SODIUM. |
| MCCP | MAXIMUM OVERCURRENT PROTECTION. |
| MCB | MAIN CIRCUIT BREAKER. |
| MLO | MAIN LUGS ONLY. |
| M | METER. |
| MM | METER MAIN. |
| MH | METAL HALIDE. |
| MIN. | MINIMUM. |
| MCA | MINIMUM CIRCUIT AMPS. |
| MCM | THOUSAND CIRCULAR MILS. |
| MFR. | MANUFACTURER. |
| MTD | MOUNTED. |
| MCP | MOTOR CIRCUIT PROTECTOR. |
| MW | MICROWAVE. |
| NEC | NATIONAL ELECTRICAL CODE. |
| NEMA | NATIONAL ELECTRICAL MANUFACTURER'S ASSOCIATION. |
| NC | NORMALLY CLOSED. |
| NO | NORMALLY OPENED. |
| NF | NON-FUSED. |
| NIC | NOT IN CONTRACT. |
| NL | NIGHT LIGHT. |
| N.T.S. | NOT TO SCALE. |
| OFCI | OWNER FURNISHED, CONTRACTOR INSTALLED. |
| %Z | PERCENT IMPEDANCE. |
| PH. or ~ | PHASE. |
| PC | PHOTOCELL. |
| PVC | POLY VINYL CHLORIDE. |
| PRIMARY | OVER 600 VOLTS. |
| PROVIDE | FURNISH, INSTALL AND CONNECT. |
| PT | POTENTIAL TRANSFORMER. |
| REC. RECEPT | RECEPTACLE. |
| REF | REFRIGERATOR. |
| RGS | RIGID GALVANIZED STEEL. |
| S | SINGLE LINE DIAGRAM. |
| SCC | SHORT CIRCUIT CURRENT. |
| SFD | SMOKE FIRE DAMPER. |
| STB | SHUNT TRIP BREAKER. |
| TEL/DATA | TELEPHONE AND DATA. |
| TV | TELEVISION. |
| T.V.S.S. | TRANSIENT VOLTAGE SURGE SUPPRESSION. |
| TYP | TYPICAL. |
| U.G.P.S. | UNDERGROUND PULL SECTION. |
| U.O.N. | UNLESS OTHERWISE NOTED. |
| U.P.S. | UNINTERRUPTABLE POWER SYSTEM. |
| VAV | VARIABLE AIR VOLUME. |
| V | VOLTS. |
| VA | VOLT AMPERES. |
| VD | VOLTAGE DROP. |
| WP | WEATHERPROOF. |
| XFMR | TRANSFORMER. |
| X | INDICATES EXISTING TO REMAIN. |
| XR | INDICATES EXISTING TO BE REMOVED. |
| XL | INDICATES EXISTING TO BE RELOCATED. |
| XN | INDICATES NEW LOCATION OF RELOCATED EQUIPMENT. |

ELECTRICAL DRAWING LIST

| Sheet Number | Sheet Title |
|--------------|---|
| E-001 | ELECTRICAL LEGEND AND ABBREVIATIONS |
| ES100 | ELECTRICAL SITE PLAN |
| E-111 | ELECTRICAL 1ST FLOOR LIGHTING PLAN |
| E-112 | ELECTRICAL 2 - 6 FLOOR LIGHTING PLAN |
| E-113 | ELECTRICAL ROOF LIGHTING PLAN |
| E-114 | ELECTRICAL R62 POWER AND LIGHTING PLAN |
| E-121 | ELECTRICAL 1ST FLOOR POWER PLAN |
| E-122 | ELECTRICAL 2 - 6 FLOOR POWER PLAN |
| E-123 | ELECTRICAL ROOF POWER PLAN |
| E-124 | ELECTRICAL R62 POWER PLAN |
| E-402 | ENLARGED PLAN - POWER - 1ST FLOOR CORE |
| E-401 | ENLARGED PLAN - LIGHTING - 1ST FLOOR CORE |
| E-404 | ENLARGED PLAN - POWER - 2ND - 6TH FLOOR CORE |
| E-403 | ENLARGED PLAN - LIGHTING - 2ND - 6TH FLOOR CORE |
| E-405 | ENLARGED PLAN - POWER AND LIGHTING - LAUNDRY ROOM |
| E-406 | ENLARGED PLAN - POWER AND LIGHTING - BEQ UNIT |
| E-601 | ELECTRICAL SINGLE LINE DIAGRAM |
| E-501 | ELECTRICAL DETAILS |
| E-701 | ELECTRICAL LUMINAIRE SCHEDULE |
| E-702 | ELECTRICAL FEEDER SCHEDULE |
| E-703 | ELECTRICAL PANEL SCHEDULES |
| E-704 | ELECTRICAL PANEL SCHEDULES |
| E-705 | ELECTRICAL PANEL SCHEDULES |
| E-706 | ELECTRICAL PANEL SCHEDULES |
| E-707 | ELECTRICAL PANEL SCHEDULES |

GENERAL NOTES

- 20A, 120V CIRCUITS LONGER THAN 100' - USE #10AWG TO LIMIT VOLTAGE DROP ON BRANCH CIRCUITS TO 3%
- 20A, 120V CIRCUITS LONGER THAN 150' - USE #8AWG TO LIMIT VOLTAGE DROP ON BRANCH CIRCUITS TO 3%
- 20A, 277V CIRCUITS LONGER THAN 150' - USE #10AWG TO LIMIT VOLTAGE DROP ON BRANCH CIRCUIT TO 3%

DATE

DESCRIPTION

SYN



NOT FOR CONSTRUCTION

RQC

RQ CONSTRUCTION, LLC

RANDALL LAMB

APPROVED

FOR COMMANDER NAVFAC

ACTIVITY

SATISFACTORY TO DATE

DES. Designer: JRW Author: CHK Checker:

PM/DM

BRANCH MANAGER

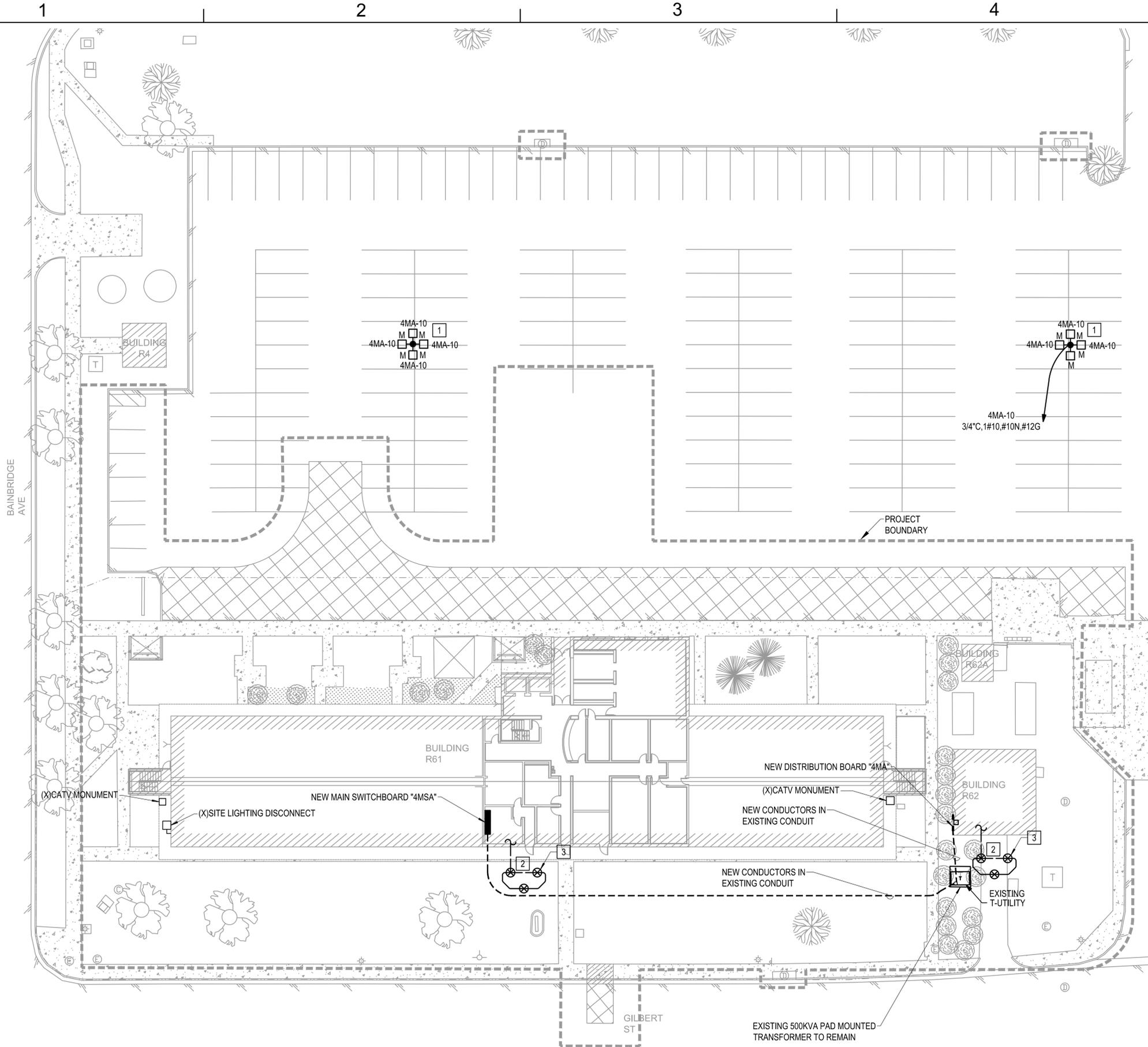
CHIEF ENGINEER

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC
NORFOLK, VIRGINIA
NAVAL STATION NORFOLK
Q4/BQ RENOVATE BUILDING R61
ELECTRICAL LEGEND AND ABBREVIATIONS

SCALE: AS NOTED
EPROJCT NO. 1355149
CONSTRUCTION CONTRACT NO. N40085-10-D-5333-D.O.0012
NAVFAC DRAWING NO.
SHEET OF

E-001

PACKAGE 2 - PREFINAL - 05.19.16

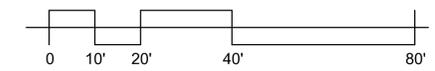


GENERAL NOTES

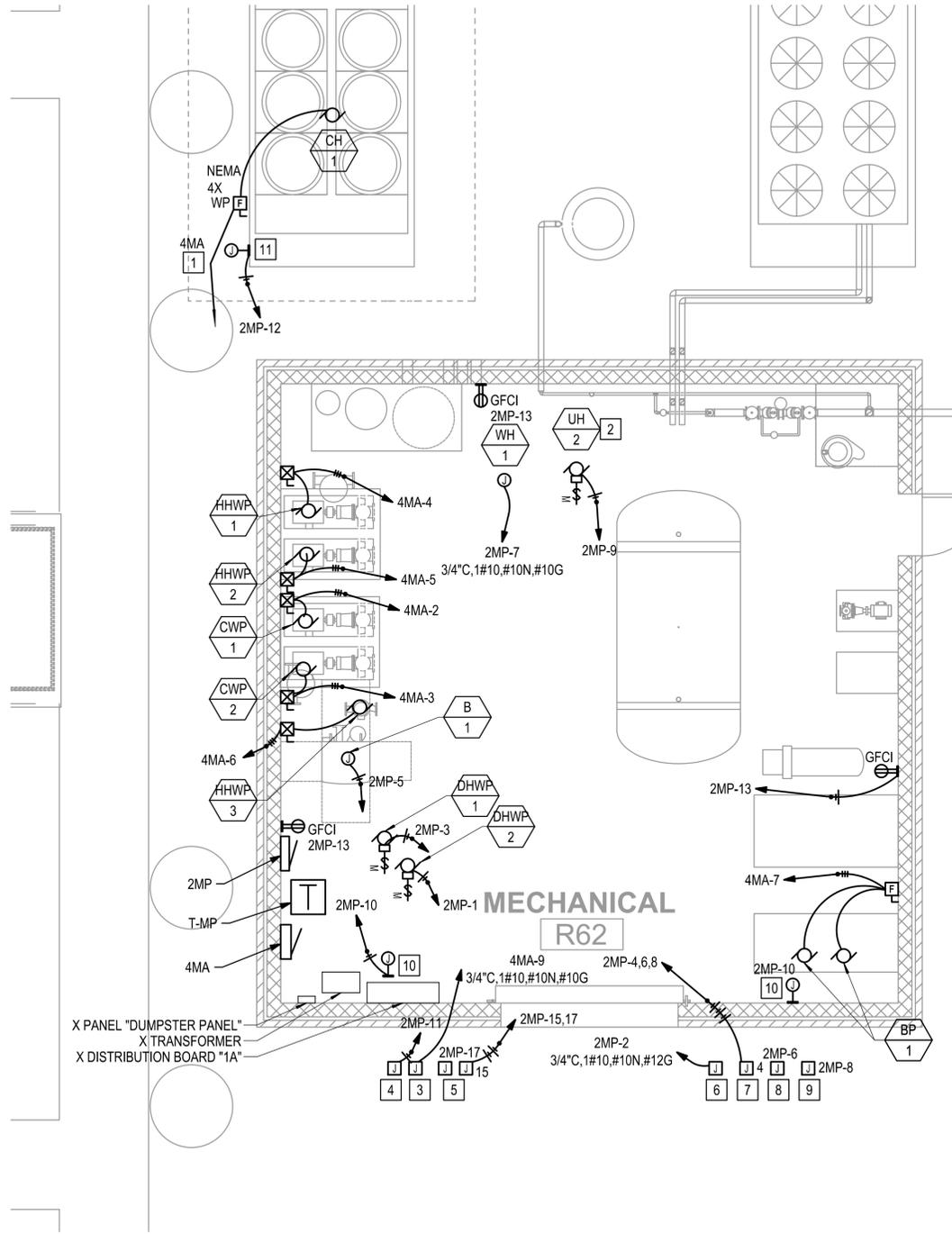
1. PARKING LOT LIGHTING TO BE PHOTO SENSOR ON/PHOTO SENSOR OFF.

- # KEYNOTES**
1. PROVIDE NEW FIXTURES ON EXISTING POLE.
 2. GROUND ROD TRIAD. REFER TO DETAILS A2 AND C2 ON SHEET E-501 AND GROUNDING RISER DIAGRAM ON SHEET E-601 FOR MORE INFORMATION. COORDINATE LOCATION IN LANDSCAPING WITH SITE CONDITIONS.
 3. GROUND ROD INSPECTION TEXT WELL. COORDINATE LOCATION IN LANDSCAPING WITH SITE CONDITIONS.

A1 ELECTRICAL SITE PLAN
SCALE: 1"=20'



| | | |
|--|----------------|-------------|
| APPROVED | DATE | APP'R |
| FOR COMMANDER NAVFAC | ACTIVITY | DESCRIPTION |
| SATISFACTORY TO DATE | DESIGNER | CHK |
| DESIGNER | AUTHOR | CHK |
| PM/DM | BRANCH MANAGER | |
| CHIEF ENGINEER | | |
| DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC NORFOLK, VIRGINIA NAVAL STATION NORFOLK Q4/BQ RENOVATE BUILDING R61 ELECTRICAL SITE PLAN | | |
| SCALE: AS NOTED PROJECT NO. 1355149 CONSTRUCTION CONTRACT NO. N40085-10-D-5333-D.O.0012 NAVFAC DRAWING NO. | | |
| SHEET | OF | |
| ES100 | | |
| 11/13/2015 11:12:07 AM | | |



A3 ELECTRICAL R62 POWER PLAN
SCALE: 1/4" = 1'-0"

GENERAL NOTES

1. PROVIDE STAINLESS STEEL COVER PLATES.
2. REFER TO SINGLE LINE DIAGRAM FOR FEEDER SIZES.
3. PROVIDE EXPLOSION PROOF FITTINGS.
4. EXTEND STREET LIGHTING CIRCUIT TO NEW HOME RUN LOCATION. PROVIDE TEMPORARY POWER FOR GILBERT STREET LIGHTING DURING CONSTRUCTION.
5. EXTEND BRANCH CIRCUIT FOR CATV SERVICE. COORDINATE LOCATION WITH CATV PROVIDER. PROVIDE TEMPORARY POWER FOR CATV PEDESTAL DURING CONSTRUCTION.
6. EXTEND 2 x (2#12, #12G) TO NEXUS METERS ON PAD MOUNTED TRANSFORMERS. PROVIDE TEMPORARY POWER DURING CONSTRUCTION.
7. RECONNECT HEAT TRACE FOR BUILDING R63. PROVIDE TEMPORARY POWER FOR HEAT TRACE DURING CONSTRUCTION.
8. PROVIDE CONNECTION TO ADVANCE CONTROL SYSTEM. COORDINATE CONNECTION LOCATION WITH MECHANICAL CONTRACTOR.
9. CONNECTION TO FRACTIONAL HP DOMESTIC HOT WATER PUMP MOTOR SERVING BUILDING R63. PROVIDE TEMPORARY POWER DURING CONSTRUCTION.
10. CONNECTION TO STEAM PIT SUMP PUMP.
11. PROVIDE CONNECTION FOR EXISTING-TO-REMAIN EXHAUST FANS.
12. PROVIDE HEAT TRACE CONNECTION.

KEYNOTES

1. REFER TO SINGLE LINE DIAGRAM FOR FEEDER SIZES.
2. PROVIDE EXPLOSION PROOF FITTINGS.
3. EXTEND STREET LIGHTING CIRCUIT TO NEW HOME RUN LOCATION. PROVIDE TEMPORARY POWER FOR GILBERT STREET LIGHTING DURING CONSTRUCTION.
4. EXTEND BRANCH CIRCUIT FOR CATV SERVICE. COORDINATE LOCATION WITH CATV PROVIDER. PROVIDE TEMPORARY POWER FOR CATV PEDESTAL DURING CONSTRUCTION.
5. EXTEND 2 x (2#12, #12G) TO NEXUS METERS ON PAD MOUNTED TRANSFORMERS. PROVIDE TEMPORARY POWER DURING CONSTRUCTION.
6. RECONNECT HEAT TRACE FOR BUILDING R63. PROVIDE TEMPORARY POWER FOR HEAT TRACE DURING CONSTRUCTION.
7. PROVIDE CONNECTION TO ADVANCE CONTROL SYSTEM. COORDINATE CONNECTION LOCATION WITH MECHANICAL CONTRACTOR.
8. CONNECTION TO FRACTIONAL HP DOMESTIC HOT WATER PUMP MOTOR SERVING BUILDING R63. PROVIDE TEMPORARY POWER DURING CONSTRUCTION.
9. CONNECTION TO STEAM PIT SUMP PUMP.
10. PROVIDE CONNECTION FOR EXISTING-TO-REMAIN EXHAUST FANS.
11. PROVIDE HEAT TRACE CONNECTION.

| NO. | DATE | DESCRIPTION | BY | CHK |
|-----|------|-------------|----|-----|
| | | | | |
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NOT FOR CONSTRUCTION



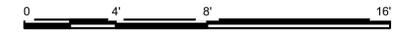
RANDALL LAMB
CONSULTING ENGINEERS

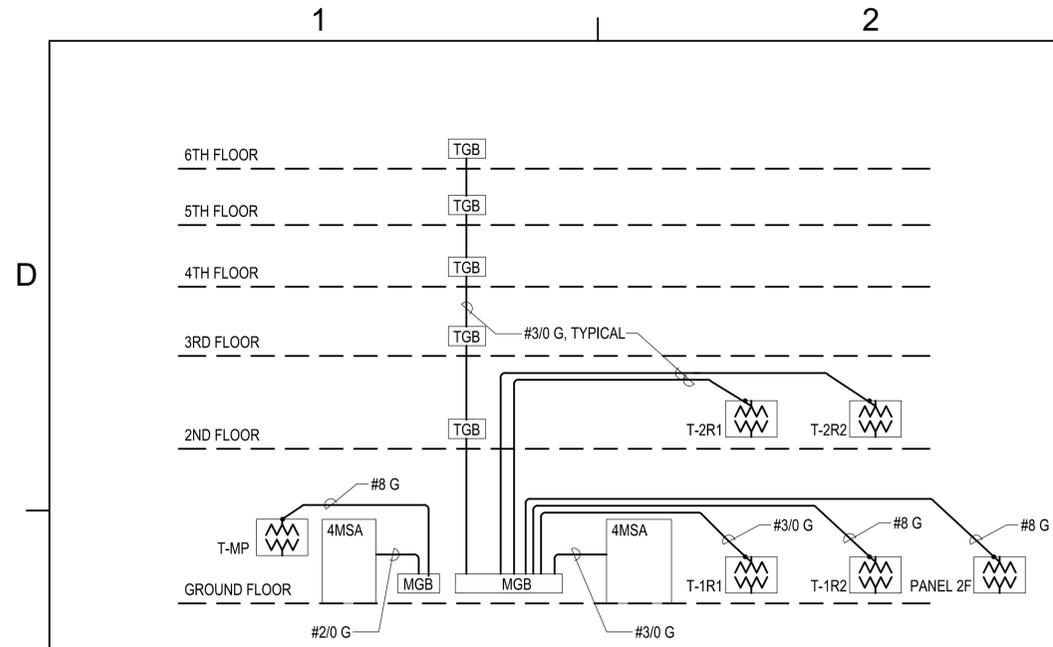
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| FOR COMMANDER NAVFAC |
| ACTIVITY |
| SATISFACTORY TO DATE |
| DES Designer: JRW Author: CHK Checker |
| PM/DM |
| BRANCH MANAGER |
| CHIEF ENGINEER |

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC
NORFOLK, VIRGINIA
NAVAL STATION NORFOLK
Q4/BQ RENOVATE BUILDING R61
ELECTRICAL R62 POWER PLAN

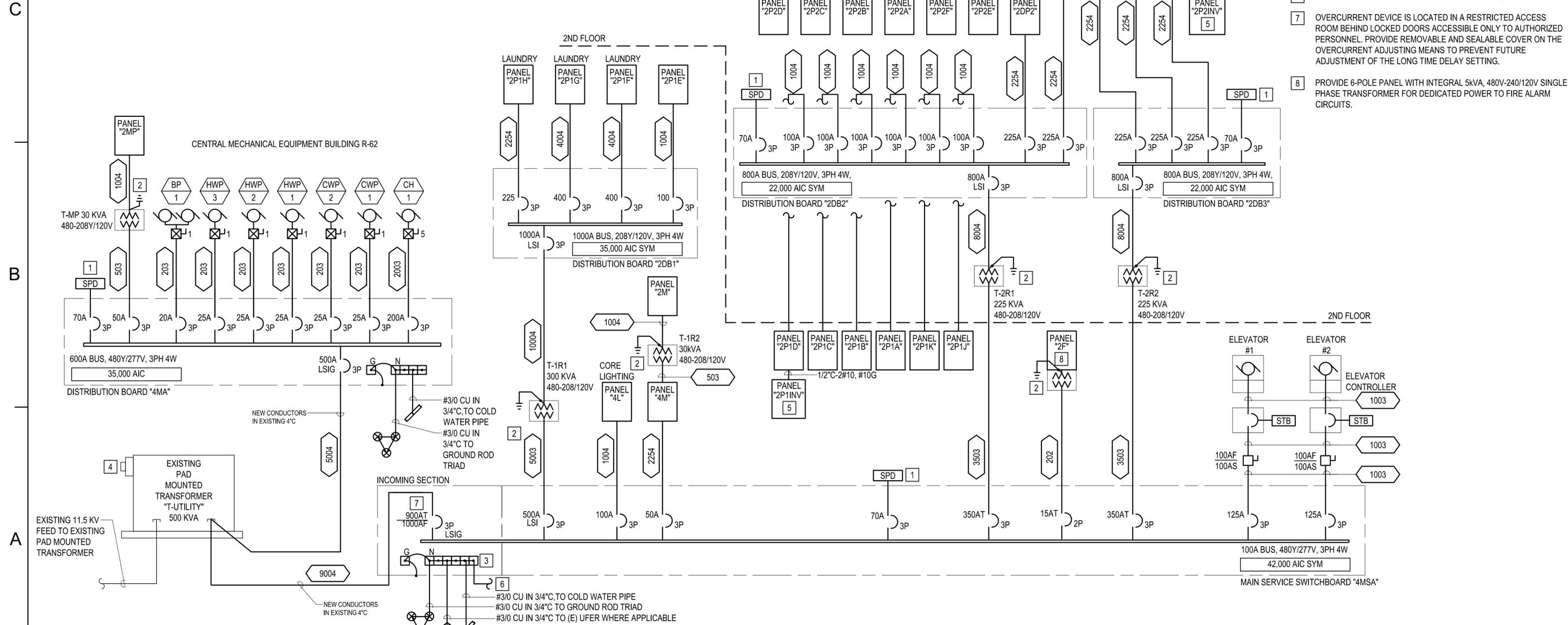
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| SCALE: AS NOTED |
| PROJECT NO. 1355149 |
| CONSTRUCTION CONTRACT NO. N40085-10-D-5333-D.O.0012 |
| NAVFAC DRAWING NO. |
| SHEET OF |

E-124





C1 GROUNDING DIAGRAM
SCALE: N/A



A1 ELECTRICAL SINGLE LINE DIAGRAM
SCALE: N/A

- GENERAL NOTES**
1. PROVIDE A MINIMUM OF 10 PERCENT SPARE CIRCUIT BREAKER(S) AND 10 PERCENT FULLY BUSSED BREAKER SPACE IN EACH BRANCH PANEL.
 2. PROVIDE 20 PERCENT FULL BUSSED 3-POLE CIRCUIT SPACE IN SWITCHBOARD AND DISTRIBUTION BOARDS RATED OVER 400A.
 3. REFER TO FEEDER SCHEDULE ON SHEET E-702 FOR MORE INFORMATION.

- KEYNOTES**
1. PROVIDE SERVICE ENTRANCE SURGE PROTECTION DEVICE WITHIN 48" CONDUCTOR LENGTH OF SWITCHBOARD BUSSING.
 2. PROVIDE GROUNDING ELECTRODE CONDUCTOR, REFER TO GROUNDING RISER DIAGRAM FOR MORE INFORMATION.
 3. PROVIDE GROUNDING ELECTRODE CONDUCTOR, SIZE AS NOTED TO COLD WATER PIPE, BUILDING STEEL AND/OR APPROVED GROUNDING ELECTRODES IN COMPLIANCE WITH THE CEC.
 4. EXISTING NEXUS 1272 SERIES ELEC METER.
 5. 2000W EMERGENCY LIGHTING INVERTER FOR EMERGENCY LIGHTING AT PERIMETER BALCONY/WALKWAY. CIRCUIT WITH 2#10, #10G.
 6. TO MAIN GROUND BUS. SEE GROUNDING DIAGRAM, THIS SHEET.
 7. OVERCURRENT DEVICE IS LOCATED IN A RESTRICTED ACCESS ROOM BEHIND LOCKED DOORS ACCESSIBLE ONLY TO AUTHORIZED PERSONNEL. PROVIDE REMOVABLE AND SEALABLE COVER ON THE OVERCURRENT ADJUSTING MEANS TO PREVENT FUTURE ADJUSTMENT OF THE LONG TIME DELAY SETTING.
 8. PROVIDE 6-POLE PANEL WITH INTEGRAL 5KVA, 480V-240/120V SINGLE PHASE TRANSFORMER FOR DEDICATED POWER TO FIRE ALARM CIRCUITS.

| | | | |
|---|--------|-----|--------------|
| APPROVED | DATE | BY | DESCRIPTION |
|  NOT FOR CONSTRUCTION | | | |
|  RQC CONSTRUCTION, LLC | | | |
|  RANDALL LAMB <small>2000 Park Avenue, Suite 200, Norfolk, VA 23502-1000</small> | | | |
| APPROVED | | | |
| FOR COMMANDER NAVFAC | | | |
| ACTIVITY | | | |
| SATISFACTORY TO DATE | | | |
| DES | Design | REV | Author / CHK |
| PROJECT MANAGER | | | |
| BRANCH MANAGER | | | |
| CHIEF ENGINEER | | | |
| NAVAL FACILITIES ENGINEERING COMMAND NAVAL FACILITIES ENGINEERING COMMAND - MID-ATLANTIC NORFOLK, VIRGINIA | | | |
| NAVAL STATION NORFOLK Q4/BQ RENOVATE BUILDING R61 ELECTRICAL SINGLE LINE DIAGRAM | | | |
| SCALE: AS NOTED | | | |
| PROJECT NO. 1355149 | | | |
| CONSTRUCTION CONTRACT NO. N40085-10-D-5333-D.O.0012 | | | |
| NAVFAC DRAWING NO. | | | |
| SHEET | OF | | |
| E-601 | | | |

| 4MA | | LOAD SUMMARY | | | |
|-------------------------------|-----------------------|---------------|-----------------|-----------|-------------|
| ROOM | VOLTS 480Y/277V 3P 4W | AIC 35,000 | | | |
| MOUNTING SURFACE | BUS AMPS 600 | MAIN BKR 500 | | | |
| FED FROM T-UTILITY | NEUTRAL 100% | LUGS STANDARD | | | |
| NOTE | | | | | |
| | CONN. KVA | CALC. KVA | | CONN. KVA | CALC. KVA |
| LIGHTING | 7.72 | 9.65 (125%) | CONTINUOUS | 12 | 15 (125%) |
| LARGEST MOTOR | 151 | 189 (125%) | HEATING | 2 | 2 (100%) |
| OTHER MOTORS | 0.552 | 0.552 (100%) | NONCONTINUOUS | 51.2 | 51.2 (100%) |
| RECEPTACLES | 0.54 | 0.54 (50%>10) | KITCHEN EQUIP | 0 | 0 (N/A) |
| EXISTING LOAD | 0 | 0 (125%) | NONCOIN/DIVERSE | 0 | 0 (N/A) |
| | | | TOTAL KVA | 225 | 268 |
| BALANCED THREE PHASE AMPS 322 | | | | | |

| 4L | | LOAD SUMMARY | | | | | |
|---|-----------------------|---------------|---------------------|-----------------|---------|-----------|---------------------|
| ROOM | VOLTS 480Y/277V 3P 4W | AIC 22,000 | | | | | |
| MOUNTING SURFACE | BUS AMPS 100 | MAIN BKR MLO | | | | | |
| FED FROM 4MSA | NEUTRAL 100% | LUGS STANDARD | | | | | |
| NOTE | | | | | | | |
| CKT # | CKT BKR | LOAD KVA | CIRCUIT DESCRIPTION | CKT # | CKT BKR | LOAD KVA | CIRCUIT DESCRIPTION |
| 1 | 20/1 | 0 | SPACE | a | 2 | 20/1 | 0 |
| 3 | 20/1 | 0 | SPACE | b | 4 | 20/1 | 0 |
| 5 | 20/1 | 0 | SPACE | c | 6 | 20/1 | 0 |
| 7 | 20/1 | 0 | SPACE | d | 8 | 20/1 | 0 |
| 9 | 20/1 | 0 | SPACE | e | 10 | 20/1 | 0 |
| 11 | 20/1 | 0 | SPACE | f | 12 | 20/1 | 0 |
| 13 | 20/1 | 0 | SPACE | g | 14 | 20/1 | 0 |
| 15 | 20/1 | 0 | SPACE | h | 16 | 20/1 | 0 |
| 17 | 20/1 | 0 | SPACE | i | 18 | 20/1 | 0 |
| 19 | 20/1 | 0 | SPACE | j | 20 | 20/1 | 0 |
| 21 | 20/1 | 0 | SPACE | k | 22 | 20/1 | 0 |
| 23 | 20/1 | 0 | SPACE | l | 24 | 20/1 | 0 |
| 25 | 20/1 | 0 | SPACE | m | 26 | 20/1 | 0 |
| 27 | 20/1 | 0 | SPACE | n | 28 | 20/1 | 0 |
| 29 | 20/1 | 0 | SPACE | o | 30 | 20/1 | 0 |
| 31 | 20/1 | 0 | SPACE | p | 32 | 20/1 | 0 |
| 33 | 20/1 | 0 | SPACE | q | 34 | 20/1 | 0 |
| 35 | 20/1 | 0 | SPACE | r | 36 | 20/1 | 1.61 |
| 37 | 20/1 | 0 | SPACE | s | 38 | 20/1 | 2 |
| 39 | 20/1 | 0 | SPACE | t | 40 | 20/1 | 1.24 |
| 41 | 20/1 | 0 | SPACE | u | 42 | 20/1 | 0 |
| | | CONN. KVA | CALC. KVA | | | CONN. KVA | CALC. KVA |
| LIGHTING | 0 | 4.84 | 6.05 (125%) | CONTINUOUS | 0 | 0 | 0 (125%) |
| LARGEST MOTOR | 0 | 0 | 0 (125%) | HEATING | 0 | 0 | 0 (100%) |
| OTHER MOTORS | 0 | 0 | 0 (100%) | NONCONTINUOUS | 0 | 0 | 0 (100%) |
| RECEPTACLES | 0 | 0 | 0 (50%>10) | KITCHEN EQUIP | 0 | 0 | 0 (N/A) |
| EXISTING LOAD | 0 | 0 | 0 (125%) | NONCOIN/DIVERSE | 0 | 0 | 0 (N/A) |
| | | | | TOTAL KVA | 4.84 | 6.05 | |
| BALANCED THREE PHASE AMPS 7.28 | | | | | | | |
| PHASE BALANCE PERCENT: PHASE A 124% PHASE B 76.6% PHASE C 99.7% | | | | | | | |

| 2MP | | LOAD SUMMARY | | | | | |
|---|-----------------------|---------------|---------------------|-----------------|---------|-----------|---------------------|
| ROOM | VOLTS 208Y/120V 3P 4W | AIC 22,000 | | | | | |
| MOUNTING SURFACE | BUS AMPS 100 | MAIN BKR 100 | | | | | |
| FED FROM T-MP | NEUTRAL 100% | LUGS STANDARD | | | | | |
| NOTE | | | | | | | |
| CKT # | CKT BKR | LOAD KVA | CIRCUIT DESCRIPTION | CKT # | CKT BKR | LOAD KVA | CIRCUIT DESCRIPTION |
| 1 | 20/1 | 1.9 | DHWP-2 | a | 2 | 20/1 | 1 |
| 3 | 20/1 | 1.9 | DHWP-1 | b | 4 | 20/1 | 0.5 |
| 5 | 20/1 | 1.5 | B-1 | c | 6 | 20/1 | 0.5 |
| 7 | 30/1 | 1.9 | WH-1 | d | 8 | 20/1 | 0.5 |
| 9 | 20/1 | 0.552 | UH-2 | e | 10 | 20/1 | 1 |
| 11 | 20/1 | 0.5 | CATV PEDESTAL | f | 12 | 20/1 | 1 |
| 13 | 20/1 | 0.54 | RECEPTACLE | g | 14 | 20/1 | 0 |
| 15 | 20/1 | 0.5 | NEXUS METER | h | 16 | 20/1 | 0 |
| 17 | 20/1 | 0.5 | NEXUS METER | i | 18 | 20/1 | 0 |
| 19 | 20/1 | 0 | SPACE | j | 20 | 20/1 | 0 |
| 21 | 20/1 | 0 | SPACE | k | 22 | 20/1 | 0 |
| 23 | 20/1 | 0 | SPACE | l | 24 | 20/1 | 0 |
| 25 | 20/1 | 0 | SPACE | m | 26 | 20/1 | 0 |
| 27 | 20/1 | 0 | SPACE | n | 28 | 20/1 | 0 |
| 29 | 20/1 | 0 | SPACE | o | 30 | 20/1 | 0 |
| 31 | 20/1 | 0 | SPACE | p | 32 | 20/1 | 0 |
| 33 | 20/1 | 0 | SPACE | q | 34 | 20/1 | 0 |
| 35 | 20/1 | 0 | SPACE | r | 36 | 20/1 | 0 |
| 37 | 20/1 | 0 | SPACE | s | 38 | 20/1 | 0 |
| 39 | 20/1 | 0 | SPACE | t | 40 | 20/1 | 0 |
| 41 | 20/1 | 0 | SPACE | u | 42 | 20/1 | 0 |
| | | CONN. KVA | CALC. KVA | | | CONN. KVA | CALC. KVA |
| LIGHTING | 0 | 0 | 0 (125%) | CONTINUOUS | 5.7 | 7.13 | 125% |
| LARGEST MOTOR | 0.552 | 0.69 | 125% | HEATING | 2 | 2 | 100% |
| OTHER MOTORS | 0 | 0 | 100% | NONCONTINUOUS | 5.5 | 5.5 | 100% |
| RECEPTACLES | 0.54 | 0.54 | 50%>10 | KITCHEN EQUIP | 0 | 0 | N/A |
| EXISTING LOAD | 0 | 0 | 125% | NONCOIN/DIVERSE | 0 | 0 | N/A |
| | | | | TOTAL KVA | 14.3 | 15.9 | |
| BALANCED THREE PHASE AMPS 44 | | | | | | | |
| PHASE BALANCE PERCENT: PHASE A 123% PHASE B 93.5% PHASE C 84% | | | | | | | |

| 2M | | LOAD SUMMARY | | | | | |
|--|-----------------------|---------------|---------------------|-----------------|---------|-----------|---------------------|
| ROOM | VOLTS 208Y/120V 3P 4W | AIC 22,000 | | | | | |
| MOUNTING SURFACE | BUS AMPS 100 | MAIN BKR 100 | | | | | |
| FED FROM T-1R2 | NEUTRAL 100% | LUGS STANDARD | | | | | |
| NOTE | | | | | | | |
| CKT # | CKT BKR | LOAD KVA | CIRCUIT DESCRIPTION | CKT # | CKT BKR | LOAD KVA | CIRCUIT DESCRIPTION |
| 1 | 20/1 | 0 | SPACE | a | 2 | 15/3 | 3.6 |
| 3 | 20/1 | 0 | SPACE | b | 4 | 15/3 | 3.6 |
| 5 | 20/1 | 0 | SPACE | c | 6 | 15/3 | 3.99 |
| 7 | 20/1 | 0 | SPACE | d | 8 | 20/3 | 3.99 |
| 9 | 20/1 | 0 | SPACE | e | 10 | 20/3 | 3.99 |
| 11 | 20/1 | 0 | SPACE | f | 12 | 20/3 | 3.99 |
| 13 | 20/1 | 0 | SPACE | g | 14 | 20/3 | 3.99 |
| 15 | 20/1 | 0 | SPACE | h | 16 | 20/3 | 3.99 |
| 17 | 20/1 | 0 | SPACE | i | 18 | 20/3 | 3.99 |
| 19 | 20/1 | 0 | SPACE | j | 20 | 20/1 | 1.39 |
| 21 | 20/1 | 0 | SPACE | k | 22 | 20/1 | 0.696 |
| 23 | 20/1 | 0 | SPACE | l | 24 | 20/1 | 0 |
| 25 | 20/1 | 0 | SPACE | m | 26 | 20/1 | 0 |
| 27 | 20/1 | 0 | SPACE | n | 28 | 20/1 | 0 |
| 29 | 20/1 | 0 | SPACE | o | 30 | 20/1 | 0 |
| 31 | 20/1 | 0 | SPACE | p | 32 | 20/3 | 5 |
| 33 | 20/1 | 0 | SPACE | q | 34 | 20/3 | 5 |
| 35 | 20/1 | 0 | SPACE | r | 36 | 20/3 | 5 |
| 37 | 20/1 | 0 | SPACE | s | 38 | 20/3 | 2 |
| 39 | 20/1 | 0 | SPACE | t | 40 | 20/3 | 2 |
| 41 | 20/1 | 0 | SPACE | u | 42 | 20/3 | 2 |
| | | CONN. KVA | CALC. KVA | | | CONN. KVA | CALC. KVA |
| LIGHTING | 0 | 0 | 0 (125%) | CONTINUOUS | 2.09 | 2.61 | 125% |
| LARGEST MOTOR | 3.6 | 0.9 | 125% | HEATING | 7 | 0 | 100% |
| OTHER MOTORS | 0 | 0 | 100% | NONCONTINUOUS | 0 | 0 | 100% |
| RECEPTACLES | 0 | 0 | 50%>10 | KITCHEN EQUIP | 0 | 0 | N/A |
| EXISTING LOAD | 0 | 0 | 125% | NONCOIN/DIVERSE | 0 | 0 | N/A |
| | | | | TOTAL KVA | 20.7 | 15.1 | |
| BALANCED THREE PHASE AMPS 41.9 | | | | | | | |
| PHASE BALANCE PERCENT: PHASE A 110% PHASE B 100% PHASE C 89.9% | | | | | | | |

| 4M | | LOAD SUMMARY | | | | | |
|--|-----------------------|---------------|---------------------|-----------------|---------|-----------|---------------------|
| ROOM | VOLTS 480Y/277V 3P 4W | AIC 22,000 | | | | | |
| MOUNTING SURFACE | BUS AMPS 225 | MAIN BKR MLO | | | | | |
| FED FROM 4MSA | NEUTRAL 100% | LUGS STANDARD | | | | | |
| NOTE | | | | | | | |
| CKT # | CKT BKR | LOAD KVA | CIRCUIT DESCRIPTION | CKT # | CKT BKR | LOAD KVA | CIRCUIT DESCRIPTION |
| 1 | 20/1 | 0 | SPACE | a | 2 | 15/3 | 8.5 |
| 3 | 20/1 | 0 | SPACE | b | 4 | 15/3 | 8.5 |
| 5 | 20/1 | 0 | SPACE | c | 6 | 15/3 | 8.5 |
| 7 | 20/1 | 0 | SPACE | d | 8 | 15/3 | 8.5 |
| 9 | 20/1 | 0 | SPACE | e | 10 | 15/3 | 8.5 |
| 11 | 20/1 | 0 | SPACE | f | 12 | 15/3 | 8.5 |
| 13 | 20/1 | 0 | SPACE | g | 14 | 15/3 | 8.5 |
| 15 | 20/1 | 0 | SPACE | h | 16 | 15/3 | 8.5 |
| 17 | 20/1 | 0 | SPACE | i | 18 | 15/3 | 8.5 |
| 19 | 20/1 | 0 | SPACE | j | 20 | 15/3 | 8.5 |
| 21 | 20/1 | 0 | SPACE | k | 22 | 15/3 | 8.5 |
| 23 | 20/1 | 0 | SPACE | l | 24 | 15/3 | 8.5 |
| 25 | 20/1 | 0 | SPACE | m | 26 | 15/3 | 8.5 |
| 27 | 20/1 | 0 | SPACE | n | 28 | 15/3 | 8.5 |
| 29 | 20/1 | 0 | SPACE | o | 30 | 15/3 | 8.5 |
| 31 | 20/1 | 0 | SPACE | p | 32 | 15/3 | 8.5 |
| 33 | 20/1 | 0 | SPACE | q | 34 | 15/3 | 8.5 |
| 35 | 20/1 | 0 | SPACE | r | 36 | 15/3 | 8.5 |
| 37 | 20/1 | 0 | SPACE | s | 38 | 50/3 | 20.7 |
| 39 | 20/1 | 0 | SPACE | t | 40 | 50/3 | 20.7 |
| 41 | 20/1 | 0 | SPACE | u | 42 | 50/3 | 20.7 |
| | | CONN. KVA | CALC. KVA | | | CONN. KVA | CALC. KVA |
| LIGHTING | 0 | 0 | 0 (125%) | CONTINUOUS | 53.1 | 66.4 | 125% |
| LARGEST MOTOR | 3.6 | 0.9 | 125% | HEATING | 7 | 0 | 100% |
| OTHER MOTORS | 0 | 0 | 100% | NONCONTINUOUS | 0 | 0 | 100% |
| RECEPTACLES | 0 | 0 | 50%>10 | KITCHEN EQUIP | 0 | 0 | N/A |
| EXISTING LOAD | 0 | 0 | 125% | NONCOIN/DIVERSE | 0 | 0 | N/A |
| | | | | TOTAL KVA | 71.7 | 78.8 | |
| BALANCED THREE PHASE AMPS 94.8 | | | | | | | |
| PHASE BALANCE PERCENT: PHASE A 100% PHASE B 101% PHASE C 98.5% | | | | | | | |

| SERVICE ENTRANCE TRANSFORMER SIZE CALCULATION | | | |
|--|---------------|-----------------|------------|
| CONNECTED LOADS | Connected kVA | Demand Factor * | Demand KVA |
| BARRACKS BUILDING R-61 | 1285 | 35% | 450 |
| CENTRAL MECHANICAL EQUIPMENT BUILDING R-62 | 225 | 60% | 135 |
| SERVICE ENTRANCE TRANSFORMER - MINIMUM KVA RATING | | | 585 |
| * - (UFC 3-501-01 Electrical Engineering, Section 3-2.3 Load Analysis and Appendix E, Table 1) | | | |

| R-62 | | Connected kVA |
|--|--|---------------|
| LIGHTING | | 7.7 |
| LARGEST MOTOR | | 151.0 |
| OTHER MOTORS | | 0.6 |
| RECEPTACLE (100% X 10,000VA + 50% REMAINDER) | | 0.5 |
| CONTINUOUS | | 12.0 |
| NON CONTINUOUS | | 51.2 |
| HEATING | | 2.0 |
| SUB-TOTAL COMMON AREA LOADS | | 225 |

| R-61 | | SQ. FT. |
|--|----------------------|---------------|
| BUILDING SPACES | | |
| ADMINISTRATION & SUPPORT | | 30,273 |
| BEQ ROOMS - 191 @ 262 SF EACH | | 50,042 |
| TOTAL | | 80,315 |
| R-61 PUBLIC/Common Areas (Administration & Support) | Connected kVA | |
| LIGHTING | | 7.3 |
| LARGEST MOTOR | | 43.3 |
| OTHER MOTORS | | 43.2 |
| RECEPTACLE | | 9.6 |
| CONTINUOUS | | 53.1 |
| NON CONTINUOUS | | 267.0 |
| HEATING | | 7.0 |
| SUB-TOTAL COMMON AREA LOADS | | 431 |

| R-61 BEQ UNITS | | QTY | VA | Connected kVA |
|----------------|--|-----|------|---------------|
| VANITY | | 191 | 180 | 34 |
| MICROWAVE | | 191 | 800 | 153 |
| REFRIGERATOR | | 191 | 192 | 37 |
| CONVENIENCE | | 955 | 180 | 172 |
| LIGHTING | | 191 | 226 | 43 |
| PTHP | | 191 | 2176 | 416 |

| 2DB1 | | LOAD SUMMARY | | | |
|----------------|------------------|-----------------------|---------------|---------------------------|---------------|
| ROOM | MOUNTING SURFACE | VOLTS 208Y/120V 3P 4W | BUS AMPS 1000 | AIC 35,000 | MAIN BKR 1000 |
| FED FROM T-1R1 | NOTE | NEUTRAL 100% | LUGS STANDARD | | |
| | | CONN. KVA | CALC. KVA | CONN. KVA | CALC. KVA |
| LIGHTING | | 2.71 | 3.39 (125%) | CONTINUOUS | 0 (125%) |
| LARGEST MOTOR | | 0 | 0 (125%) | HEATING | 0 (100%) |
| OTHER MOTORS | | 0 | 0 (100%) | NONCONTINUOUS | 268 (100%) |
| RECEPTACLES | | 9.9 | 9.9 (50%>10) | KITCHEN EQUIP | 0 (N/A) |
| EXISTING LOAD | | 0 | 0 (125%) | NONCOIN/DIVERSE | 0 (N/A) |
| | | | | TOTAL KVA | 280 |
| | | | | BALANCED THREE PHASE AMPS | 780 |

GENERAL NOTES

1. PROVIDE HACR TYPE BREAKERS FOR HVAC EQUIPMENT HAVING MOTOR LOADS. PLEASE SEE SPECIFICATIONS FOR FURTHER INFORMATION.

| Panel 2P1H | | ROOM MOUNTING SURFACE VOLTS 208Y/120V 3P 4W AIC 22,000 | | | | | |
|------------------------|---------|--|---------------------|---------------------------|---------|-------------|---------------------|
| FED FROM 2DB1 | | BUS AMPS 225 | | MAIN BKR MLO | | | |
| NOTE | | NEUTRAL 100% | | LUGS STANDARD | | | |
| CKT # | CKT BKR | LOAD KVA | CIRCUIT DESCRIPTION | CKT # | CKT BKR | LOAD KVA | CIRCUIT DESCRIPTION |
| 1 | 20/1 | 1.25 | WASHER | a 2 | 40/2 | 5.4 | DRYER |
| 3 | 20/1 | 1 | WASHER | b 4 | | | |
| 5 | 20/1 | 1.25 | WASHER | c 6 | 40/2 | 5.4 | DRYER |
| 7 | 20/1 | 1.25 | WASHER | a 8 | | | |
| 9 | 20/1 | 1.25 | WASHER | b 10 | 40/2 | 5.4 | DRYER |
| 11 | 20/1 | 0.36 | RECEPTACLE | c 12 | | | |
| 13 | 20/1 | 0.36 | RECEPTACLE | a 14 | 40/2 | 5.4 | DRYER |
| 15 | 20/1 | 0 | SPACE | b 16 | | | |
| 17 | 20/1 | 0 | SPACE | c 18 | 40/2 | 5.4 | DRYER |
| 19 | 20/1 | 0 | SPACE | a 20 | | | |
| 21 | 20/1 | 0 | SPACE | b 22 | 40/2 | 5.4 | DRYER |
| 23 | 20/1 | 0 | SPACE | c 24 | | | |
| 25 | 20/1 | 0 | SPACE | a 26 | 40/2 | 5.4 | DRYER |
| 27 | 20/1 | 0 | SPACE | b 28 | | | |
| 29 | 20/1 | 0 | SPACE | c 30 | 40/2 | 5.4 | DRYER |
| 31 | 20/1 | 0 | SPACE | a 32 | | | |
| 33 | 20/1 | 0 | SPACE | b 34 | 20/1 | 0 | SPACE |
| 35 | 20/1 | 0 | SPACE | c 36 | 20/1 | 0 | SPACE |
| 37 | 20/1 | 0 | SPACE | a 38 | 20/1 | 0 | SPACE |
| 39 | 20/1 | 0 | SPACE | b 40 | 20/1 | 0 | SPACE |
| 41 | 20/1 | 0 | SPACE | c 42 | 20/1 | 0 | SPACE |
| | | CONN. KVA | CALC. KVA | | | CONN. KVA | CALC. KVA |
| LIGHTING | | 0 | 0 (125%) | CONTINUOUS | | 0 | 0 (125%) |
| LARGEST MOTOR | | 0 | 0 (125%) | HEATING | | 0 | 0 (100%) |
| OTHER MOTORS | | 0 | 0 (100%) | NONCONTINUOUS | | 49.2 | 49.2 (100%) |
| RECEPTACLES | | 0.72 | 0.72 (50%>10) | KITCHEN EQUIP | | 0 | 0 (N/A) |
| EXISTING LOAD | | 0 | 0 (125%) | NONCOIN/DIVERSE | | 0 | 0 (N/A) |
| | | | | TOTAL KVA | | 49.9 | |
| | | | | BALANCED THREE PHASE AMPS | | 139 | |
| PHASE BALANCE PERCENT: | | PHASE A 114% | | PHASE B 94.8% | | PHASE C 91% | |

| Panel 2P1F | | ROOM MOUNTING SURFACE VOLTS 208Y/120V 3P 4W AIC 22,000 | | | | | |
|------------------------|---------|--|---------------------|---------------------------|---------|---------------|---------------------|
| FED FROM 2DB1 | | BUS AMPS 400 | | MAIN BKR MLO | | | |
| NOTE | | NEUTRAL 100% | | LUGS STANDARD | | | |
| CKT # | CKT BKR | LOAD KVA | CIRCUIT DESCRIPTION | CKT # | CKT BKR | LOAD KVA | CIRCUIT DESCRIPTION |
| 1 | 40/2 | 5.4 | DRYER | a 2 | 20/1 | 0 | SPACE |
| 3 | | | | b 4 | 40/2 | 5.4 | DRYER |
| 5 | 40/2 | 5.4 | DRYER | c 6 | | | |
| 7 | | | | a 8 | 40/2 | 5.4 | DRYER |
| 9 | 40/2 | 5.4 | DRYER | b 10 | | | |
| 11 | | | | c 12 | 40/2 | 5.4 | DRYER |
| 13 | 40/2 | 5.4 | DRYER | a 14 | | | |
| 15 | | | | b 16 | 40/2 | 5.4 | DRYER |
| 17 | 40/2 | 5.4 | DRYER | c 18 | | | |
| 19 | | | | a 20 | 40/2 | 5.4 | DRYER |
| 21 | 40/2 | 5.4 | DRYER | b 22 | | | |
| 23 | | | | c 24 | 40/2 | 5.4 | DRYER |
| 25 | 40/2 | 5.4 | DRYER | a 26 | | | |
| 27 | | | | b 28 | 40/2 | 5.4 | DRYER |
| 29 | 40/2 | 5.4 | DRYER | c 30 | | | |
| 31 | | | | a 32 | 40/2 | 5.4 | DRYER |
| 33 | 40/2 | 5.4 | DRYER | b 34 | | | |
| 35 | | | | c 36 | 40/2 | 5.4 | DRYER |
| 37 | 40/2 | 5.4 | DRYER | a 38 | | | |
| 39 | | | | b 40 | 40/2 | 5.4 | DRYER |
| 41 | 20/1 | 0 | SPACE | c 42 | | | |
| | | CONN. KVA | CALC. KVA | | | CONN. KVA | CALC. KVA |
| LIGHTING | | 0 | 0 (125%) | CONTINUOUS | | 0 | 0 (125%) |
| LARGEST MOTOR | | 0 | 0 (125%) | HEATING | | 0 | 0 (100%) |
| OTHER MOTORS | | 0 | 0 (100%) | NONCONTINUOUS | | 108 | 108 (100%) |
| RECEPTACLES | | 0 | 0 (50%>10) | KITCHEN EQUIP | | 0 | 0 (N/A) |
| EXISTING LOAD | | 0 | 0 (125%) | NONCOIN/DIVERSE | | 0 | 0 (N/A) |
| | | | | TOTAL KVA | | 108 | |
| | | | | BALANCED THREE PHASE AMPS | | 300 | |
| PHASE BALANCE PERCENT: | | PHASE A 97.5% | | PHASE B 105% | | PHASE C 97.5% | |

| Panel 2P1E | | ROOM MOUNTING SURFACE VOLTS 208Y/120V 3P 4W AIC 22,000 | | | | | |
|------------------------|---------|--|---|---------------------------|---------|---------------|----------------------|
| FED FROM 2DB1 | | BUS AMPS 100 | | MAIN BKR MLO | | | |
| NOTE | | NEUTRAL 100% | | LUGS STANDARD | | | |
| CKT # | CKT BKR | LOAD KVA | CIRCUIT DESCRIPTION | CKT # | CKT BKR | LOAD KVA | CIRCUIT DESCRIPTION |
| 1 | 20/1 | 0.86 | RECEPTACLE, TOILET | a 2 | 20/1 | 0 | SPACE |
| 3 | 20/1 | 1.11 | RECEPTACLE, TOILET | b 4 | 20/1 | 0 | SPACE |
| 5 | 20/1 | 0.75 | DRINKING FOUNTAIN | c 6 | 20/1 | 0 | SPACE |
| 7 | 20/1 | 0.18 | VENDING | a 8 | 20/1 | 0 | SPACE |
| 9 | 20/1 | 0.18 | VENDING | b 10 | 20/1 | 0 | SPACE |
| 11 | 20/1 | 0.18 | VENDING | c 12 | 20/1 | 0 | SPACE |
| 13 | 20/1 | 0.72 | RECEPTACLE | a 14 | 20/1 | 0 | SPACE |
| 15 | 20/1 | 0.18 | RECEPTACLE | b 16 | 20/1 | 0 | SPACE |
| 17 | 20/1 | 0.18 | RECEPTACLE | c 18 | 20/1 | 0 | SPACE |
| 19 | 20/1 | 0.72 | RECEPTACLE | a 20 | 20/1 | 0 | SPACE |
| 21 | 20/1 | 0.9 | RECEPTACLE | b 22 | 20/1 | 0 | SPACE |
| 23 | 20/1 | 0.9 | RECEPTACLE | c 24 | 20/1 | 0 | SPACE |
| 25 | 20/1 | 0.9 | RECEPTACLE | a 26 | 20/1 | 0 | SPACE |
| 27 | 20/1 | 0.72 | RECEPTACLE | b 28 | 20/1 | 0 | SPACE |
| 29 | 20/1 | 0.72 | RECEPTACLE | c 30 | 20/1 | 0 | SPACE |
| 31 | 20/1 | 0.36 | RECEPTACLE | a 32 | 20/1 | 0 | SPACE |
| 33 | 20/1 | 0.536 | LIGHTING, RECEPTACLE | b 34 | 20/1 | 0 | SPACE |
| 35 | 20/1 | 0.5 | JBOX SURFACE | c 36 | 20/1 | 0.18 | RECEPTACLE |
| 37 | 20/1 | 0.836 | LIGHTING | a 38 | 20/1 | 0.36 | RECEPTACLE |
| 39 | 20/1 | 1.44 | EM LTNG INVERTER EXIT, JBOX SURFACE, LIGHTING | b 40 | 20/1 | 0.18 | RECEPTACLE |
| 41 | 20/1 | 0 | SPACE | c 42 | 20/1 | 0.804 | LIGHTING, RECEPTACLE |
| | | CONN. KVA | CALC. KVA | | | CONN. KVA | CALC. KVA |
| LIGHTING | | 2.71 | 3.39 (125%) | CONTINUOUS | | 0 | 0 (125%) |
| LARGEST MOTOR | | 0 | 0 (125%) | HEATING | | 0 | 0 (100%) |
| OTHER MOTORS | | 0 | 0 (100%) | NONCONTINUOUS | | 2.5 | 2.5 (100%) |
| RECEPTACLES | | 9.18 | 9.18 (50%>10) | KITCHEN EQUIP | | 0 | 0 (N/A) |
| EXISTING LOAD | | 0 | 0 (125%) | NONCOIN/DIVERSE | | 0 | 0 (N/A) |
| | | | | TOTAL KVA | | 14.4 | 15.1 |
| | | | | BALANCED THREE PHASE AMPS | | 41.8 | |
| PHASE BALANCE PERCENT: | | PHASE A 103% | | PHASE B 109% | | PHASE C 87.8% | |

| Panel 2P1G | | ROOM MOUNTING SURFACE VOLTS 208Y/120V 3P 4W AIC 22,000 | | | | | |
|------------------------|---------|--|---------------------|---------------------------|---------|---------------|---------------------|
| FED FROM 2DB1 | | BUS AMPS 400 | | MAIN BKR MLO | | | |
| NOTE | | NEUTRAL 100% | | LUGS STANDARD | | | |
| CKT # | CKT BKR | LOAD KVA | CIRCUIT DESCRIPTION | CKT # | CKT BKR | LOAD KVA | CIRCUIT DESCRIPTION |
| 1 | 40/2 | 5.4 | DRYER | a 2 | 20/1 | 0 | SPACE |
| 3 | | | | b 4 | 40/2 | 5.4 | DRYER |
| 5 | 40/2 | 5.4 | DRYER | c 6 | | | |
| 7 | | | | a 8 | 40/2 | 5.4 | DRYER |
| 9 | 40/2 | 5.4 | DRYER | b 10 | | | |
| 11 | | | | c 12 | 40/2 | 5.4 | DRYER |
| 13 | 40/2 | 5.4 | DRYER | a 14 | | | |
| 15 | | | | b 16 | 40/2 | 5.4 | DRYER |
| 17 | 40/2 | 5.4 | DRYER | c 18 | | | |
| 19 | | | | a 20 | 40/2 | 5.4 | DRYER |
| 21 | 40/2 | 5.4 | DRYER | b 22 | | | |
| 23 | | | | c 24 | 40/2 | 5.4 | DRYER |
| 25 | 40/2 | 5.4 | DRYER | a 26 | | | |
| 27 | | | | b 28 | 40/2 | 5.4 | DRYER |
| 29 | 40/2 | 5.4 | DRYER | c 30 | | | |
| 31 | | | | a 32 | 40/2 | 5.4 | DRYER |
| 33 | 40/2 | 5.4 | DRYER | b 34 | | | |
| 35 | | | | c 36 | 40/2 | 5.4 | DRYER |
| 37 | 40/2 | 5.4 | DRYER | a 38 | | | |
| 39 | | | | b 40 | 40/2 | 5.4 | DRYER |
| 41 | 20/1 | 0 | SPACE | c 42 | | | |
| | | CONN. KVA | CALC. KVA | | | CONN. KVA | CALC. KVA |
| LIGHTING | | 0 | 0 (125%) | CONTINUOUS | | 0 | 0 (125%) |
| LARGEST MOTOR | | 0 | 0 (125%) | HEATING | | 0 | 0 (100%) |
| OTHER MOTORS | | 0 | 0 (100%) | NONCONTINUOUS | | 108 | 108 (100%) |
| RECEPTACLES | | 0 | 0 (50%>10) | KITCHEN EQUIP | | 0 | 0 (N/A) |
| EXISTING LOAD | | 0 | 0 (125%) | NONCOIN/DIVERSE | | 0 | 0 (N/A) |
| | | | | TOTAL KVA | | 108 | 108 |
| | | | | BALANCED THREE PHASE AMPS | | 300 | |
| PHASE BALANCE PERCENT: | | PHASE A 97.5% | | PHASE B 105% | | PHASE C 97.5% | |

| | |
|---|-----------------------------------|
| APPROVED | DATE |
| DESCRIPTION | SYN |
|  | |
|  | |
|  | |
| APPROVED | |
| FOR COMMANDER NAVFAC | |
| ACTIVITY | |
| SATISFACTORY TO DATE | |
| DES Designer: JRW Author: CHK Checker: | |
| PM/DM | |
| BRANCH MANAGER | |
| CHIEF ENGINEER | |
| DEPARTMENT OF THE NAVY | NAVFACILITIES ENGINEERING COMMAND |
| NAVFACILITIES ENGINEERING COMMAND ~ MID-ATLANTIC | NORFOLK, VIRGINIA |
| NAVAL STATION NORFOLK | Q4/BQ RENOVATE BUILDING R61 |
| | ELECTRICAL PANEL SCHEDULES |
| SCALE: AS NOTED | |
| PROJECT NO. 1355149 | |
| CONSTRUCTION CONTRACT NO. N40085-10-D-5333-D.O.0012 | |
| NAVFAC DRAWING NO. | |
| SHEET | OF |
| E-704 | |

| | |
|------|------|
| | 2DB1 |
| 2P1H | 2P1F |
| 2P1E | 2P1G |
| | |