

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS

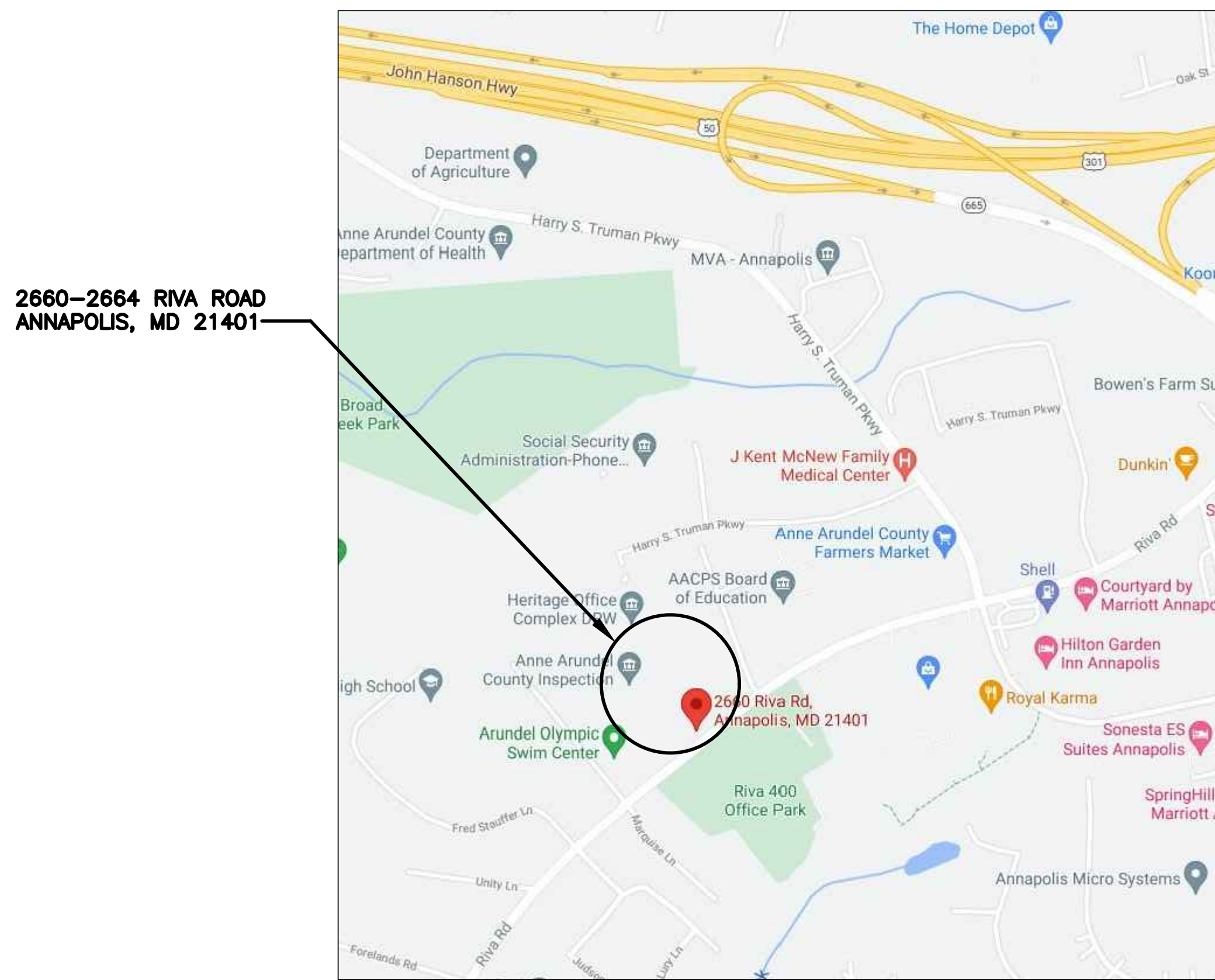
DEPARTMENT OF PUBLIC WORKS

BUREAU OF ENGINEERING
2662 RIVA ROAD
ANNAPLOIS, MD 21401-7374
(410) 222-7549

HERITAGE COMPLEX RTU REPLACEMENT

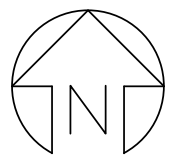
2660-2664 RIVA ROAD
ANNAPOLIS, MD 21401

DATE: SEPTEMBER 22, 2023
PROJECT NUMBER: C537800
CONTRACT NUMBER: C537896

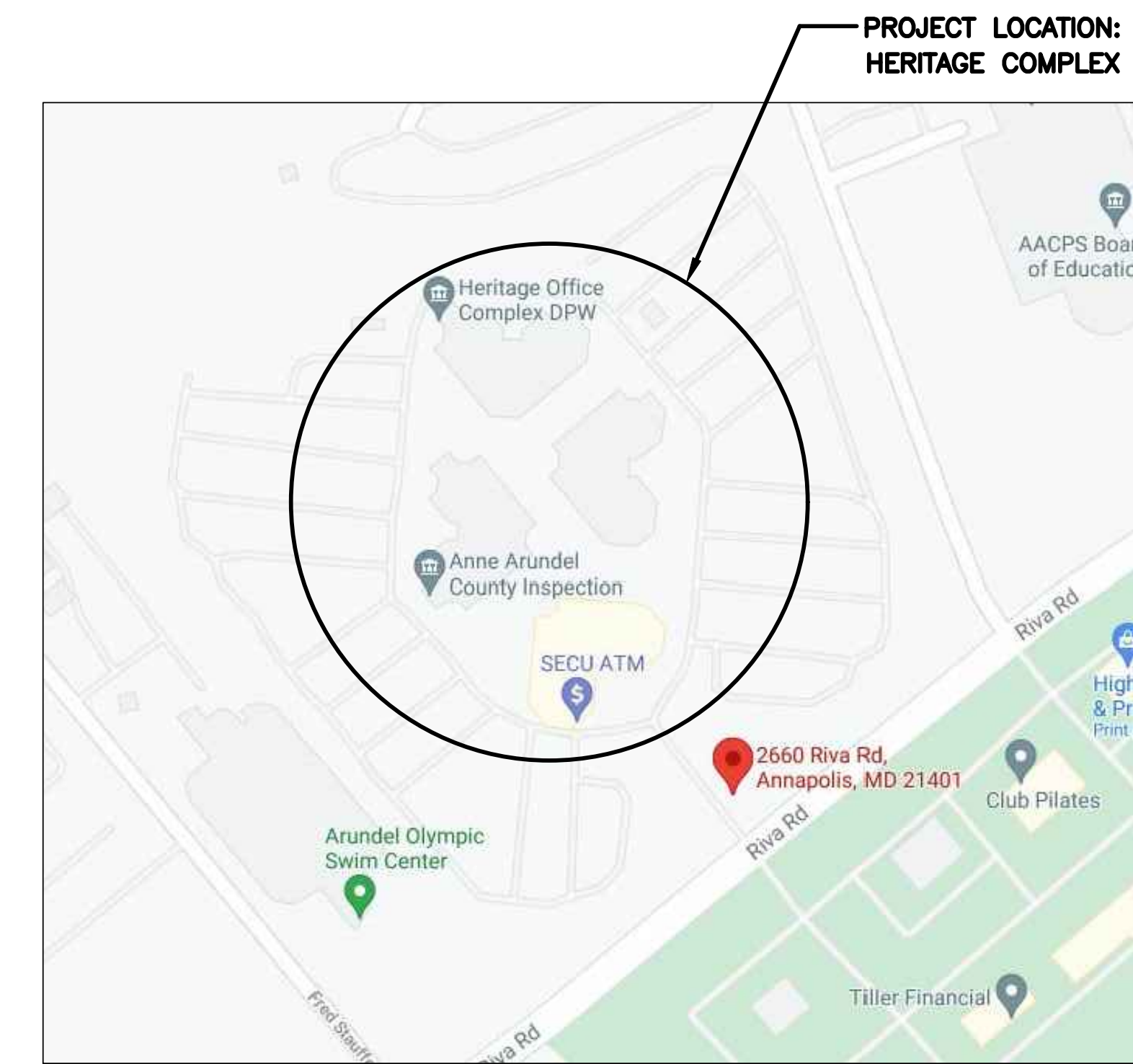


2660-2664 RIVA ROAD
ANNAPOLIS, MD 21401

VICINITY MAP
SCALE: NONE

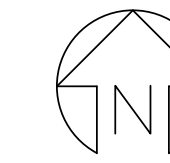


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PROJECT LOCATION:
HERITAGE COMPLEX

SITE MAP
SCALE: NONE



PREPARED BY:



RMF ENGINEERING, Inc
5520 RESEARCH PARK DRIVE SUITE 300
BALTIMORE, MD 21228

FINAL SUBMISSION

| | | | | | | | | | |
|--|--|---|---|--|---|---|--|--|--|
| <p>RMF ENGINEERING, INC 5520 RESEARCH PARK DR, 3RD FLR BALTIMORE, MD 21228 P: 410.576-0505 F: 410.385-0327 RMF Project No. 121004.A0</p> | | REVISIONS | | | | ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS | | | |
| | | NO. DESCRIPTION BY DATE FINAL SUBMISSION 09-22-2023 | APPROVED DATE 12/7/2023 PROJECT ENGINEER David C. Bruner | APPROVED DATE 12/6/2023 PROJECT MANAGER David C. Bruner | SCALE: NTS MFS PROJECT NO. C537800 SHEET 1 OF 22 PROPOSAL NO. C537896 | GENERAL ENGINEERING HERITAGE COMPLEX - RTU REPLACEMENT TITLE SHEET AND DRAWING INDEX Drawing No.: G000 | | | |

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License Number: 54343, EXP. DATE: 05/14/2025

MECHANICAL ABBREVIATIONS

NOTE: THIS IS A STANDARD ABBREVIATION LIST. SOME ABBREVIATIONS MAY NOT APPEAR ON THE ACCOMPANYING DRAWINGS.

| | |
|----------|---------------------------------------|
| A | COMPRESSED AIR |
| AAV | AUTOMATIC AIR VENT |
| ACV | AUTOMATIC CONTROL VALVE |
| AD | ACCESS DOOR, AREA DRAIN |
| AF | ANTIFREEZE |
| AFF | ABOVE FINISHED FLOOR |
| AR | ARGON GAS |
| ATC | AUTOMATIC TEMPERATURE CONTROL |
| | |
| BAS | BUILDING AUTOMATION SYSTEM |
| BBD | BOILER BLOWDOWN |
| BCWR | BEARING COOLING WATER RETURN |
| BCWS | BEARING COOLING WATER SUPPLY |
| BDD | BACKDRAFT DAMPER |
| BFP | BACKFLOW PREVENTER |
| BHP | BRAKE HORSEPOWER |
| BMS | BUILDING MANAGEMENT SYSTEM |
| BO | BLOW OFF |
| BTU | BRITISH THERMAL UNIT |
| BTUH | BRITISH THERMAL UNIT PER HOUR |
| | |
| °C | DEGREE(S) CELSIUS |
| CA | CONTROL AIR |
| CBD | CONTINUOUS BLOWDOWN |
| CC | CAMPUS CONDENSATE |
| CCMS | CENTRAL CONTROL AND MONITORING SYSTEM |
| CD | CONDENSATE DRAIN |
| CF | CHEMICAL FEED |
| CFM | CUBIC FEET PER MINUTE |
| CHR | CHILLED WATER RETURN |
| CHS | CHILLED WATER SUPPLY |
| CO | CLEANOUT |
| CO2 | CARBON DIOXIDE |
| CS | CLEAN STEAM |
| CW | COLD WATER, CITY WATER |
| CWR | CONDENSER WATER RETURN |
| CWS | CONDENSER WATER SUPPLY |
| | |
| D | DEEP, DRAIN WATER |
| DB | DECIBEL, DRY BULB |
| DDC | DIRECT DIGITAL CONTROL |
| DHR | DISTRIBUTION HEATING WATER RETURN |
| DHS | DISTRIBUTION HEATING WATER SUPPLY |
| DIR | DEIONIZED WATER RETURN |
| DIS | DEIONIZED WATER SUPPLY |
| DL | DOOR LOUVER |
| DN | DOWN |
| DSP | DRY SPRINKLER PIPE |
| DTR | DUAL TEMPERATURE RETURN |
| DTS | DUAL TEMPERATURE SUPPLY |
| DW | DISTILLED WATER |
| | |
| EA | EXHAUST AIR |
| EAT | ENTERING AIR TEMPERATURE |
| EJ | EXPANSION JOINT |
| EMS | ENERGY MANAGEMENT SYSTEM |
| ESP | EXTERNAL STATIC PRESSURE |
| ETC | ETCETERA |
| EVAC | GAS EVACUATION |
| EWT | ENTERING WATER TEMPERATURE |
| EX | EXISTING |
| | |
| °F | DEGREE(S) FAHRENHEIT |
| F | FIRE LINE |
| FC | FLEXIBLE CONNECTION |
| FD | FIRE DAMPER, FOUNDATION DRAIN |
| FDV | FIRE DEPARTMENT VALVE |
| FF | FINISHED FLOOR |
| FFE | FINISHED FLOOR ELEVATION |
| FIN/FT | FINS PER FEET |
| FIN/INCH | FINS PER INCH |
| FM | FLOWMETER |
| FMF | FLOWMETER FITTING |
| FOF | FUEL OIL FILL |
| FOO | FUEL OIL OVERFLOW |
| FOR | FUEL OIL RETURN |
| FOS | FUEL OIL SUPPLY |

| | |
|--------|---|
| FOT | FUEL OIL TRANSFER |
| FOV | FUEL OIL VENT |
| FPM | FEET PER MINUTE |
| FPS | FEET PER SECOND |
| FS | FLOW SWITCH |
| FT | FOOT, FEET |
| FWR | FEED WATER RETURN |
| FWS | FEED WATER SUPPLY |
| | |
| G | NATURAL GAS |
| GHR | GLYCOL HEATING RETURN |
| GHS | GLYCOL HEATING SUPPLY |
| GPH | GALLONS PER HOUR |
| GPM | GALLONS PER MINUTE |
| GR | AUTOMOTIVE LUBRICATION PIPING |
| | |
| H | HIGH |
| HB | HOSE BIBB |
| HED | HOSE END DRAIN VALVE |
| HP | HORSEPOWER |
| HPR | HIGH PRESSURE STEAM RETURN |
| HPS | HIGH PRESSURE STEAM SUPPLY |
| HR | HEATING WATER RETURN |
| HRR | HEAT RECOVERY RETURN |
| HRS | HEAT RECOVERY SUPPLY |
| HS | HEATING WATER SUPPLY |
| HT | HEIGHT |
| HTHR | HIGH TEMPERATURE HEATING WATER RETURN |
| HTHS | HIGH TEMPERATURE HEATING WATER SUPPLY |
| HW | HOT WATER |
| HWR | HOT WATER RECIRCULATION |
| HZ | HERTZ |
| | |
| IA | INSTRUMENT AIR |
| ICW | INDUSTRIAL COLD WATER |
| IHW | INDUSTRIAL HOT WATER |
| IHR | INDUSTRIAL HOT WATER RECIRCULATION |
| IN | INCH, INCHES |
| INV EL | INVERT ELEVATION |
| | |
| KW | KILOWATTS |
| | |
| L | LONG, LENGTH |
| LA | LABORATORY AIR |
| LAT | LEAVING AIR TEMPERATURE |
| LBS | POUNDS |
| LBS/HR | POUNDS PER HOUR |
| LN | LIQUID NITROGEN |
| LP | LIQUID PROPANE |
| LPG | LIQUID PETROLEUM GAS |
| LPR | LOW PRESSURE STEAM RETURN |
| LPS | LOW PRESSURE STEAM SUPPLY |
| LV | LABORATORY VENT, LABORATORY VACUUM |
| LW | LABORATORY WASTE |
| LWT | LEAVING WATER TEMPERATURE |
| | |
| MA | MEDICAL AIR |
| MAV | MANUAL AIR VENT |
| MBH | THOUSAND BRITISH THERMAL UNITS PER HOUR |
| MCC | MOTOR CONTROL CENTER |
| MO | MOTOR OIL PIPING |
| MOD | MOTOR OPERATED DAMPER |
| MPR | MEDIUM PRESSURE STEAM RETURN |
| MPS | MEDIUM PRESSURE STEAM SUPPLY |
| MV | MEDICAL VACUUM |
| | |
| N | NITROGEN |
| NA | NOT APPLICABLE |
| NC | NOISE CRITERIA, NORMALLY CLOSED |
| NFPA | NATIONAL FIRE PROTECTION ASSOCIATION |
| NIC | NOT IN CONTRACT OR SCOPE |
| NO | NORMALLY OPEN, NITROUS OXIDE |
| NPSH | NET POSITIVE SUCTION HEAD |
| | |
| O | OXYGEN |
| OA | OUTSIDE AIR |
| OD | OVERFLOW DRAIN |

| | |
|-------|-------------------------------------|
| OED | OPEN ENDED DUCT |
| OS&Y | OUTSIDE STEM AND YOKE |
| | |
| P&ID | PROCESS AND INSTRUMENTATION DIAGRAM |
| PA | PLANT AIR |
| PC | PUMPED CONDENSATE |
| PCR | PUMPED CONDENSATE RECIRCULATION |
| PCHR | PRIMARY CHILLED WATER RETURN |
| PCHS | PRIMARY CHILLED WATER SUPPLY |
| PCWR | PROCESS COOLING WATER RETURN |
| PCWS | PROCESS COOLING WATER SUPPLY |
| PD | PRESSURE DROP, PUMP DISCHARGE |
| PGR | PROCESS GLYCOL WATER RETURN |
| PGS | PROCESS GLYCOL WATER SUPPLY |
| PH | PHASE |
| PHR | PRIMARY HEATING RETURN |
| PHS | PRIMARY HEATING SUPPLY |
| PIV | POST INDICATING VALVE |
| PPH | POUNDS PER HOUR |
| PRV | PRESSURE REDUCING VALVE |
| PSI | POUNDS PER SQUARE INCH |
| PSIG | POUNDS PER SQUARE INCH GAUGE |
| | |
| RA | RETURN AIR, RELIEF AIR |
| RD | REFRIGERANT DISCHARGE |
| RH | RELATIVE HUMIDITY |
| RHR | REFRIGERANT HEAT RECOVERY |
| RL | REFRIGERANT LIQUID |
| ROR | REVERSE OSMOSIS WATER RETURN |
| ROS | REVERSE OSMOSIS WATER SUPPLY |
| RPM | REVOLUTIONS PER MINUTE |
| RS | REFRIGERANT SUCTION |
| RV | RELIEF VENT, REFRIGERANT VENT |
| RX | REMOVE EXISTING |
| | |
| SA | SUPPLY AIR |
| SAN | SANITARY, SOIL, WASTE |
| SCHR | SECONDARY CHILLED WATER RETURN |
| SCHS | SECONDARY CHILLED WATER SUPPLY |
| SD | STORM DRAIN, SMOKE DETECTOR |
| SF | SQUARE FOOT |
| SHR | SECONDARY HEATING WATER RETURN |
| SHS | SECONDARY HEATING WATER SUPPLY |
| SL | SOUND LINING |
| SP | STATIC PRESSURE |
| SPR | SPRINKLER LINE |
| SS | STAINLESS STEEL |
| SQ FT | SQUARE FOOT |
| SW | SOFT WATER |
| | |
| ΔT | TEMPERATURE DIFFERENCE |
| TS | TAMPER SWITCH |
| TSP | TOTAL STATIC PRESSURE |
| TWR | TEMPERED WATER RETURN |
| TWS | TEMPERED WATER SUPPLY |
| TW | TREATED WATER |
| TYP | TYPICAL |
| | |
| UCD | UNDERCUT DOOR |
| UL | UNDERWRITERS LABORATORIES |
| | |
| V | VACUUM, VOLTS |
| VD | VOLUME DAMPER |
| VFD | VARIABLE FREQUENCY DRIVE |
| VPD | VACUUM PUMP DISCHARGE |
| VSD | VARIABLE SPEED DRIVE |
| VTR | VENT THROUGH ROOF |
| | |
| W | WATTS, WIDE |
| WB | WET BULB |
| WC | WATER COLUMN |
| WG | WATER GAUGE |
| WH | WALL HYDRANT |
| WWF | WELDED WIRE FABRIC |
| WWM | WELDED WIRE MESH |

MECHANICAL LEGEND

PIPING SYMBOLS

| SYMBOL | DESCRIPTION |
|-----------|---------------------------|
| —CHS— | CHILLED WATER SUPPLY |
| ---CHR--- | CHILLED WATER RETURN |
| ---CD--- | CONDENSATE DRAIN |
| ---HR--- | HEATING WATER RETURN |
| ---HS--- | HEATING WATER SUPPLY |
| ---RL--- | REFRIGERANT LIQUID |
| ---RHR--- | REFRIGERANT HEAT RECOVERY |
| ---RS--- | REFRIGERANT SUCTION |

PIPING COMPONENTS AND SPECIALTIES

| SYMBOL | DESCRIPTION |
|--------|---------------|
| — | PIPE GUIDE |
| —H— | PIPE HANGER |
| —X— | PIPE ANCHOR |
| —X— | FLEXIBLE PIPE |
| —FM— | FLOW METER |
| —P— | PUMP |

EQUIPMENT DESIGNATIONS

| SYMBOL | DESCRIPTION |
|--------|---|
| AHU-X | AIR HANDLING UNIT DESIGNATION |
| CU-X | CONDENSING UNIT DESIGNATION |
| CRU-X | COMPUTER ROOM AIR CONDITIONING UNIT DESIGNATION |
| EH-X | ELECTRIC HEATER DESIGNATION |
| RTU-X | ROOF TOP UNIT DESIGNATION |
| SSAC-X | SPLIT SYSTEM AIR CONDITIONING DESIGNATION |
| SSHP-X | SPLIT SYSTEM HEAT PUMP DESIGNATION |

DUCTWORK SYMBOLS

| SYMBOL | DESCRIPTION |
|---------|---|
| → | AIR FLOW |
| —VD— | VOLUME DAMPER |
| —FC— | FLEXIBLE CONNECTION |
| —HAD— | HORIZONTAL ACCESS DOOR |
| —VAD— | VERTICAL ACCESS DOOR |
| —E— | ELBOW WITH DOUBLE THICKNESS TURNING VANES |
| —RBT— | RECTANGULAR BRANCH TAKE-OFF |
| —RBT— | BELL MOUTH BRANCH TAKE-OFF |
| —RBT— | ROUND BRANCH TAKE-OFF |
| —RDB— | ROUND DUCT DROP OFF BOTTOM |
| —DT— | DUCT TRANSITION |
| —SRT— | SQUARE TO ROUND TRANSITION |
| —UD/DN— | DUCTWORK CHANGE IN ELEVATION (UP OR DOWN) |
| —SUA— | SUPPLY/OUTSIDE AIR DUCT RISER |
| —RA— | RETURN AIR DUCT RISER |
| —EUA— | EXHAUST/RELIEF AIR DUCT RISER |
| —RDR— | ROUND DUCT RISER (SMALLER THAN 12") |
| —RDR— | ROUND DUCT RISER (12" AND LARGER) |
| —X— | AIR DEVICE IDENTIFIER |

GENERAL SYMBOLS

PIPING SYMBOLS

| SYMBOL | DESCRIPTION |
|--------|--|
| —D— | PIPE DROP |
| —R— | PIPE RISE |
| —C— | PIPE CAP |
| —BTO— | BRANCH TAKE OFF |
| —DTE— | PIPE DROP TEE |
| —RTE— | PIPE RISE TEE |
| —SV— | SHUTOFF VALVE (REFER TO SPECIFICATIONS FOR TYPE) |
| —ACV— | AUTOMATIC CONTROL VALVE (TWO-WAY) |
| —S— | STRAINER |
| —PRV— | PRESSURE RELIEF VALVE |
| —BV— | BALL VALVE |
| —U— | UNION |
| —T— | THERMOMETER |
| —PT— | PRESSURE/TEMPERATURE PLUG |
| —FA— | FLOW ARROW |

LINETYPE SYMBOLS

| DESIGNATION | DESCRIPTION |
|-------------|-----------------------|
| ----- | DEMOLITION WORK |
| ----- | EXISTING WORK |
| ----- | FUTURE WORK |
| ----- | NEW WORK |
| ----- | MATCHLINE |
| ----- | PART PLAN DESIGNATION |

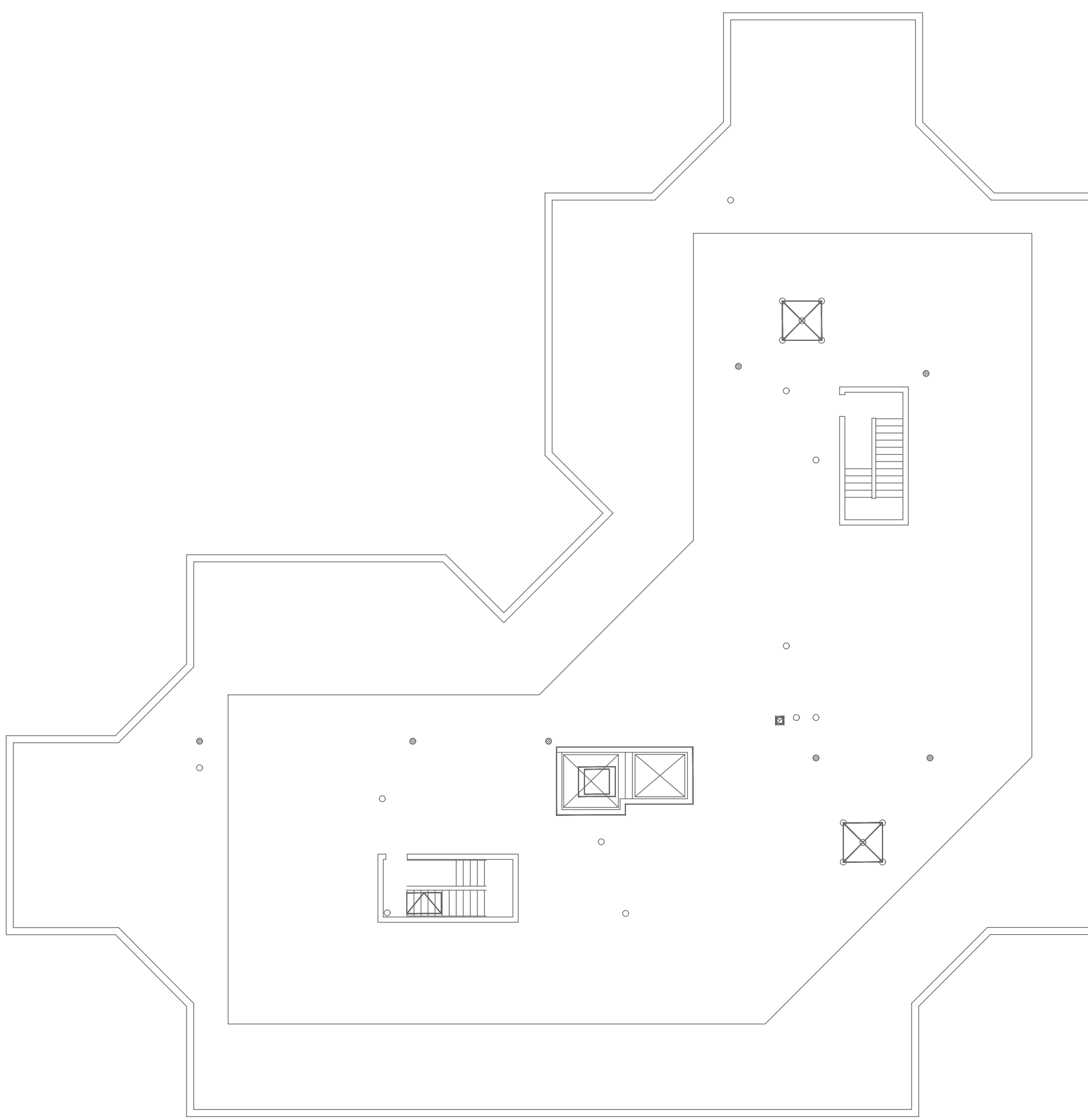
REFERENCE SYMBOLS

| DESIGNATION | DESCRIPTION |
|-------------|--|
| XX | FLOOR PLAN NUMBER |
| XX | PARTIAL FLOOR PLAN NUMBER |
| XX | ELEVATION = LETTER |
| XX | DETAIL = NUMBER |
| XX | SHEET NUMBER ON WHICH THE PARTIAL PLAN, ELEVATION OR DETAIL IS DRAWN |
| XX | SHEET NUMBER WHERE PARTIAL PLAN, ELEVATION OR DETAIL IS TAKEN FROM |
| → | NORTH ARROW |
| ● | POINT OF CONNECTION TO EXISTING |
| ○ | POINT OF DISCONNECTION |

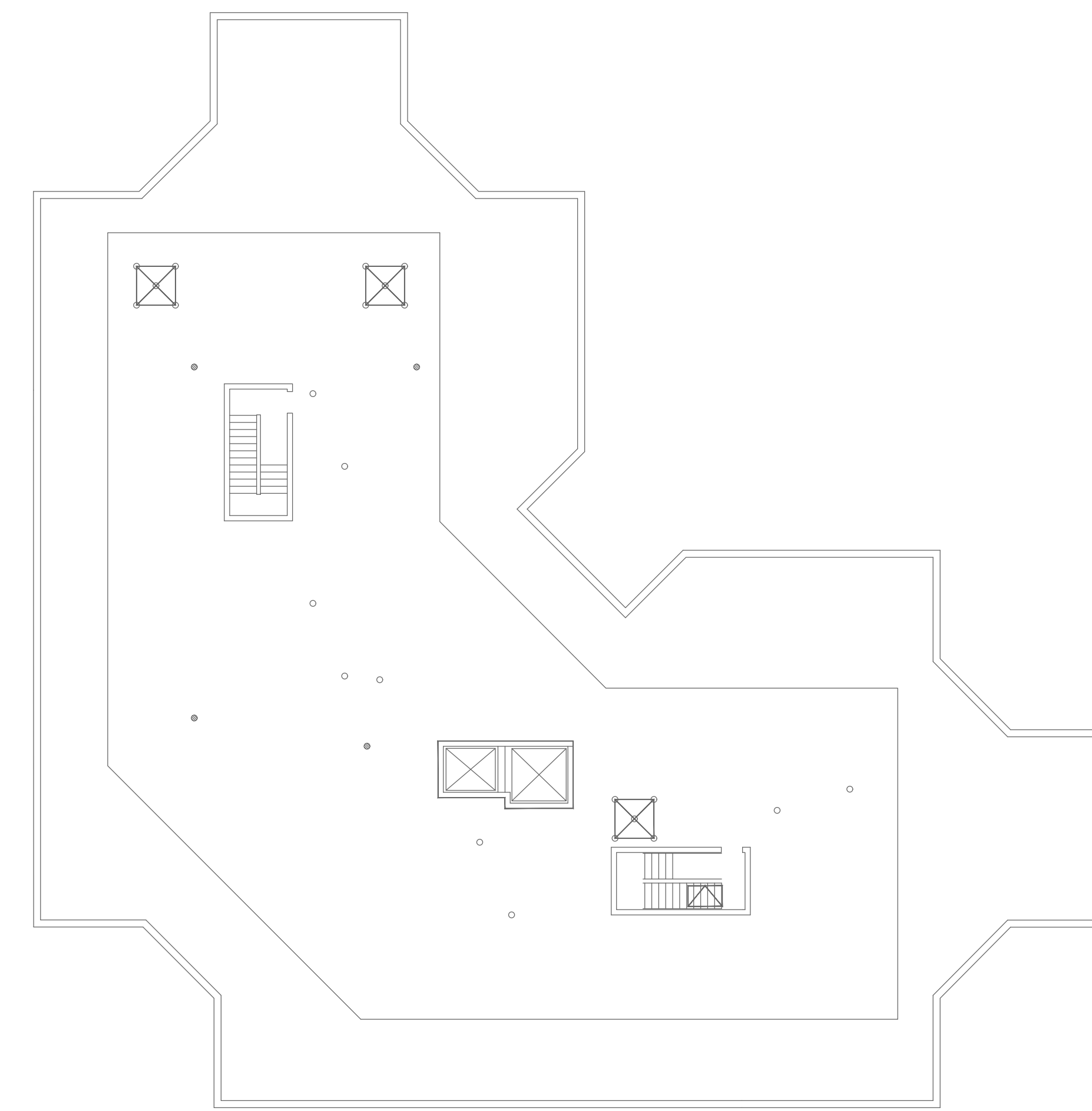
TEXT SYMBOLS

| SYMBOL | DESCRIPTION | SYMBOL | DESCRIPTION |
|--------|----------------------|--------|--------------------------|
| & | AND | ≥ | GREATER THAN OR EQUAL TO |
| @ | AT | x" | INCH(ES) |
| °F | DEGREE(S) FAHRENHEIT | < | LESS THAN |
| °C | DEGREE(S) CELSIUS | ≤ | LESS THAN OR EQUAL TO |
| ∅ | DIAMETER, PHASE | - | MINUS |
| / | DIVIDE BY, PER | x | MULTIPLY BY, BY |
| \$ | DOLLAR | # | NUMBER, POUND |
| = | EQUALS, EQUAL TO | % | PERCENT |
| x' | FEET, FOOT | + | PLUS |
| > | GREATER THAN | ± | PLUS OR MINUS |

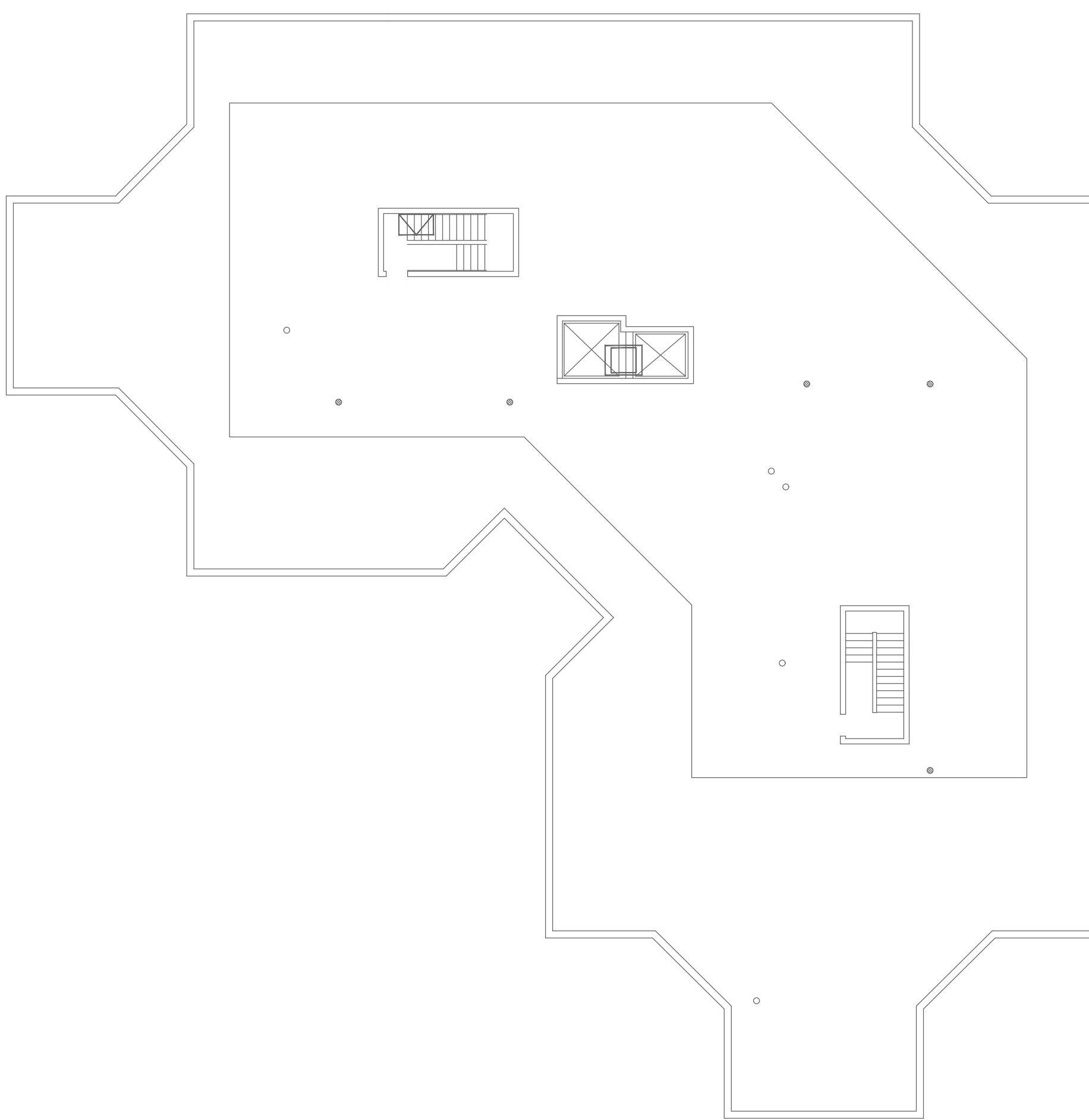
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| <p>Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License Number: 84343. EXP. DATE: 05/14/2025.</p> | <p>ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS</p> <p>SCALE: N.T.S. GENERAL ENGINEERING</p> <p>PROJECT: HERITAGE COMPLEX - RTU REPLACEMENT</p> <p>MECHANICAL ABBREVIATIONS</p> <p>PROPOSAL NO. C537896 Drawing No.: MO00</p> | | | | | | | | | | | | | | |



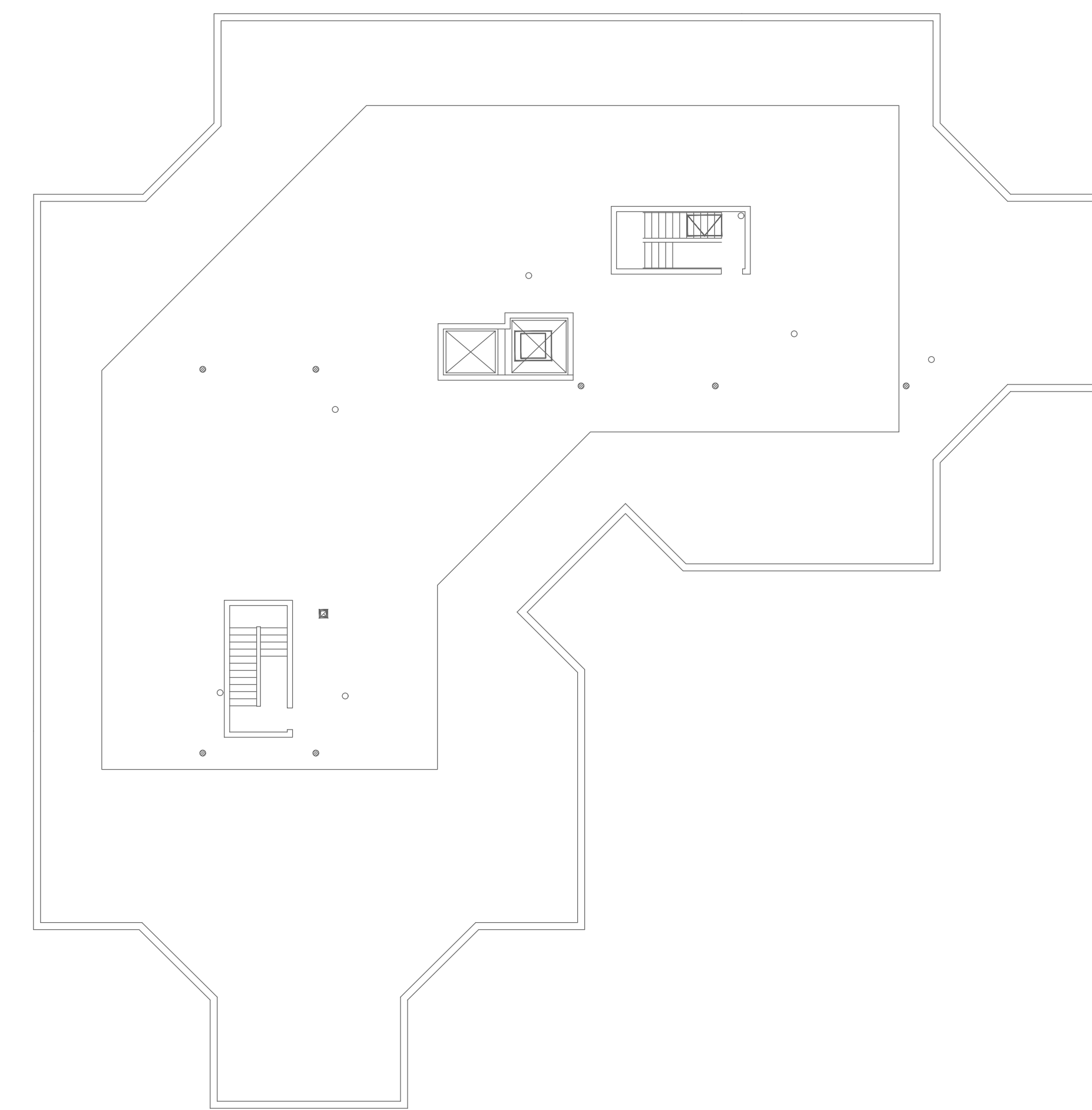
BUILDING 2664
DM103
M103



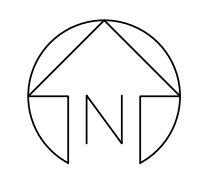
BUILDING 2662
DM102
M102



BUILDING 2666
DM104
M104

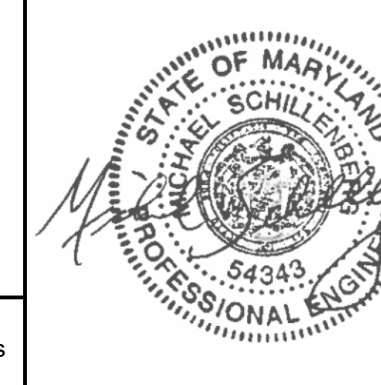


BUILDING 2660
DM101
M101



rmf RMF ENGINEERING, INC.
5520 RESEARCH PARK DR, 3RD FLR
BALTIMORE, MD 21228
P: 410.576-0505 F: 410.385-0327
RMF Project No. 121004.A0

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License Number ___54343___ EXP. DATE ___05/14/2025___



| REVISIONS | | | |
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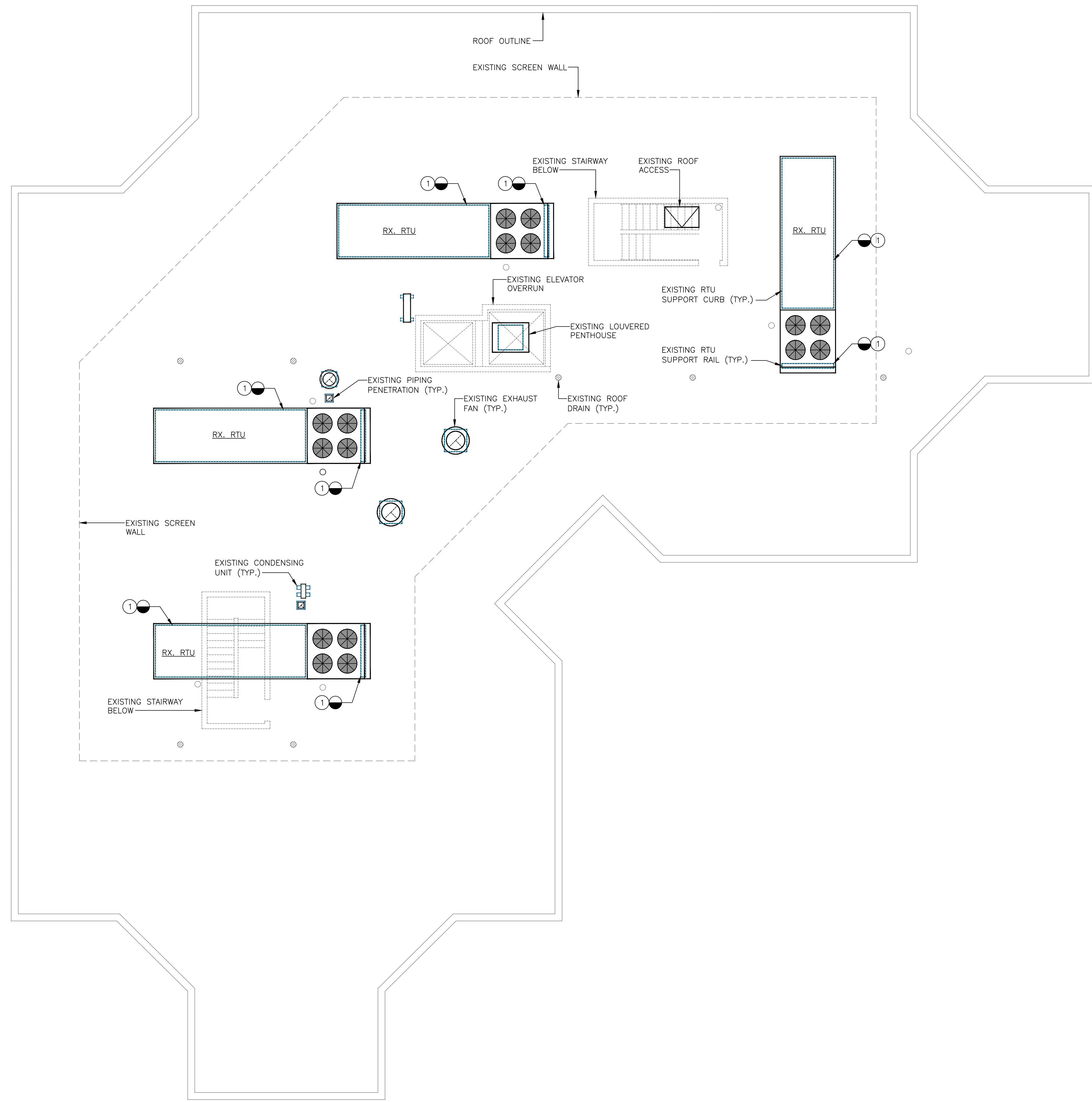
| APPROVED | | | | DATE | | APPROVED | | DATE | | SCALE: N.T.S. | | GENERAL ENGINEERING | |
|--------------------|--|-----------|--|---------------------|--|-----------|--|--|--|---------------------------------------|--|--|--|
| CHIEF ENGINEER | | 12/7/2023 | | PROJECT MANAGER | | 12/6/2023 | | CHECKED BY: MFS PROJECT NO. C537800 | | PROPOSAL NO. C537896 SHEET 3 OF 22 | | HERITAGE COMPLEX - RTU REPLACEMENT BUILDING OVERVIEW | |
| Drawing No.: M100 | | | | | | | | | | | | | |

GENERAL NOTES:

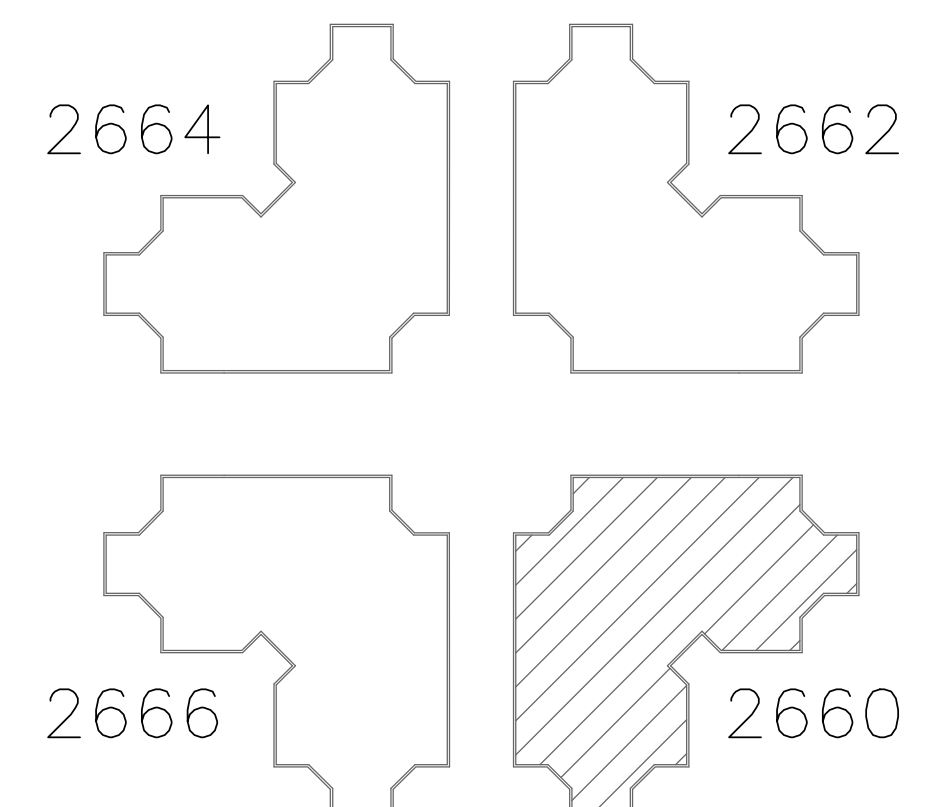
- EXISTING RTU EQUIPMENT CURBS AND EQUIPMENT RAILS SHALL REMAIN. CONTRACTOR SHALL INSPECT AND VERIFY THAT THE EQUIPMENT CURBS AND RAILS ARE IN ACCEPTABLE STRUCTURAL CONDITION FOR MOUNTING NEW RTUS. CONTRACTOR SHALL CONDUCT A VISUAL INSPECTION OF THE EXISTING CURB AND RAIL BEFORE DE-ENERGIZING AND REMOVING EXISTING RTU. A SIMPLE REPORT INCLUDING THE CONDITION OF EACH CURB AND RAIL AND POSSIBLE REPAIRS REQUIRED SHALL BE PRESENTED TO THE OWNER AND ENGINEER FOR APPROVAL. EXISTING EQUIPMENT CURB AND RAILS SHALL BE AND REMAIN WATER AND AIR TIGHT. DURING ENTIRE CONSTRUCTION PERIOD.
- CONTRACTOR SHALL INSPECT THE EXISTING FLASHING OF EQUIPMENT CURBS AND RAILS AND ENSURE THAT THE INTEGRITY OF THE SEAL IS MAINTAINED DURING DEMOLITION AND NEW CONSTRUCTION.
- RTU CONDENSATE PIPING SHALL BE REMOVED IN ITS ENTIRETY. ALL ROOF SUPPORTS AND STRAPPING SHALL BE REMOVED COMPLETELY. UNIT WITH CONDENSATE TRAPS INSTALLED WITHIN THE ROOF INSULATION SHALL BE REMOVED AND PATCH TO MATCH SURROUNDING AREA ROOFING MATERIAL. ALL REPAIRED ROOF MEMBRANE WHERE EQUIPMENT IS REMOVED SHALL BE PATCH TO MATCH THE EXISTING SURROUNDING MATERIAL OF THE EXISTING TO REMAIN ROOF. ALL INSULATION REPAIR SHALL BE INFILLED WITH SIMILAR RIGID INSULATION AND PATCH TO MATCH SURROUNDING MATERIAL.

DRAWING NOTES:

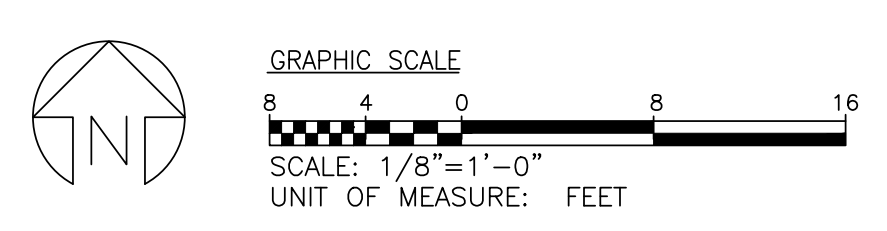
- ① REMOVE EXISTING RTU. EXISTING RTU ROOF CURB AND RAIL SHALL REMAIN. CONTRACTOR TO PROVIDE INTEGRITY ANALYSIS AS REQUIRED.



ROOF PLAN BUILDING 2660 – DEMOLITION



KEY PLAN:



| | | | | | | | | | |
|--|--|---|--|---|--|--|--|---|--|
| RMF ENGINEERING, INC. 5520 RESEARCH PARK DR, 3RD FLR BALTIMORE, MD 21228 P: 410.576-0505 F: 410.385-0327 RMF Project No. 121004.A0 | | REVISIONS NO. DESCRIPTION BY DATE FINAL SUBMISSION 09-22-2023 | | | | ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS GENERAL ENGINEERING | | | |
| | | APPROVED DATE 12/7/2023 David C. Bruner CHIEF ENGINEER | | APPROVED DATE 12/6/2023 Diego Velazquez PROJECT MANAGER | | SCALE: 1/8"=1'0" BRUNER MFS CHECKED BY SLD PROJECT NO. C537800 SHEET NO. 4 OF 22 PROPOSAL NO. C537896 | | HERITAGE COMPLEX – RTU REPLACEMENT MECHANICAL HVAC BUILDING 2660 ROOF PLAN – DEMOLITION Drawing No.: MD101 | |

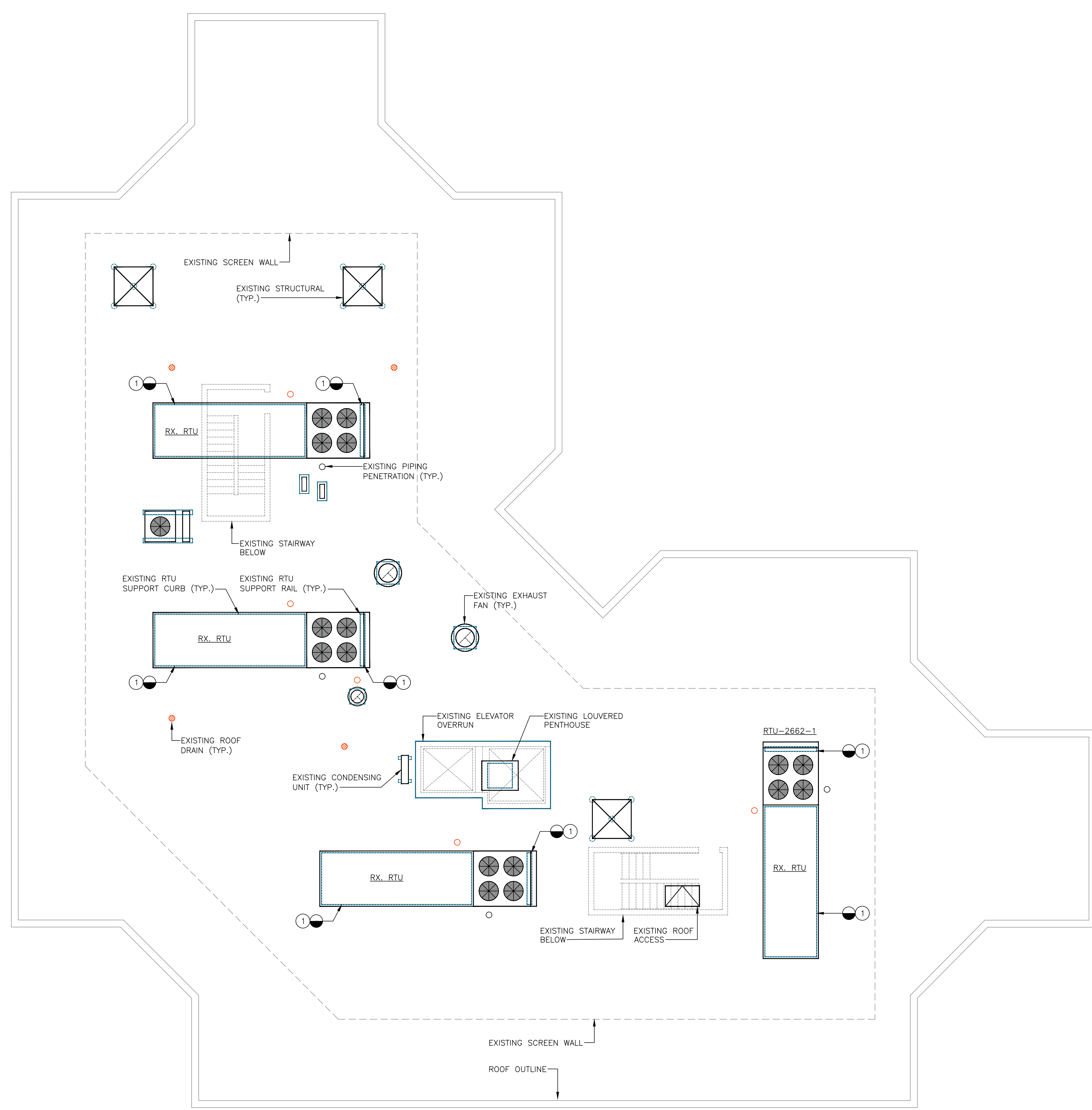
Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License Number ___54343___ EXP. DATE ___05/14/2025___

GENERAL NOTES:

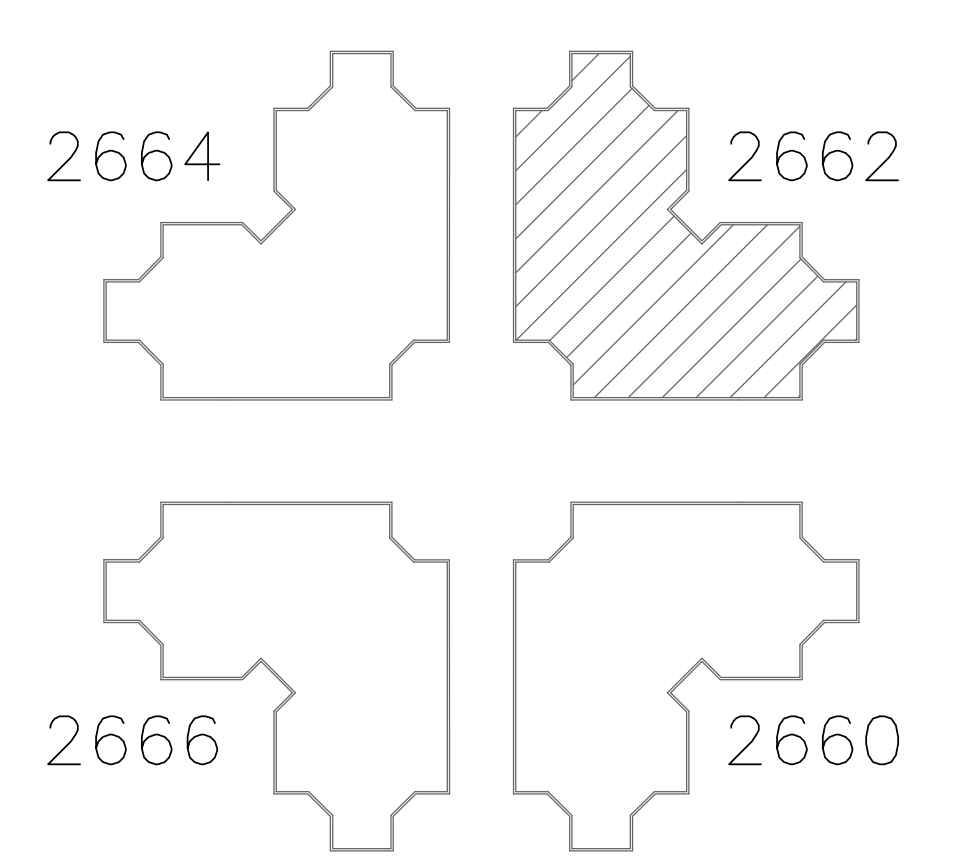
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DRAWING NOTES:

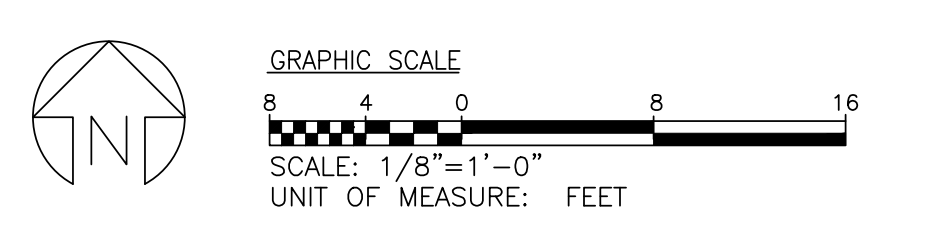
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- REMOVE EXISTING RTU. EXISTING RTU ROOF RAIL SHALL REMAIN. CONTRACTOR TO PROVIDE INTEGRITY ANALYSIS AS REQUIRED.



ROOF PLAN BUILDING 2662 - DEMOLITION



KEY PLAN:



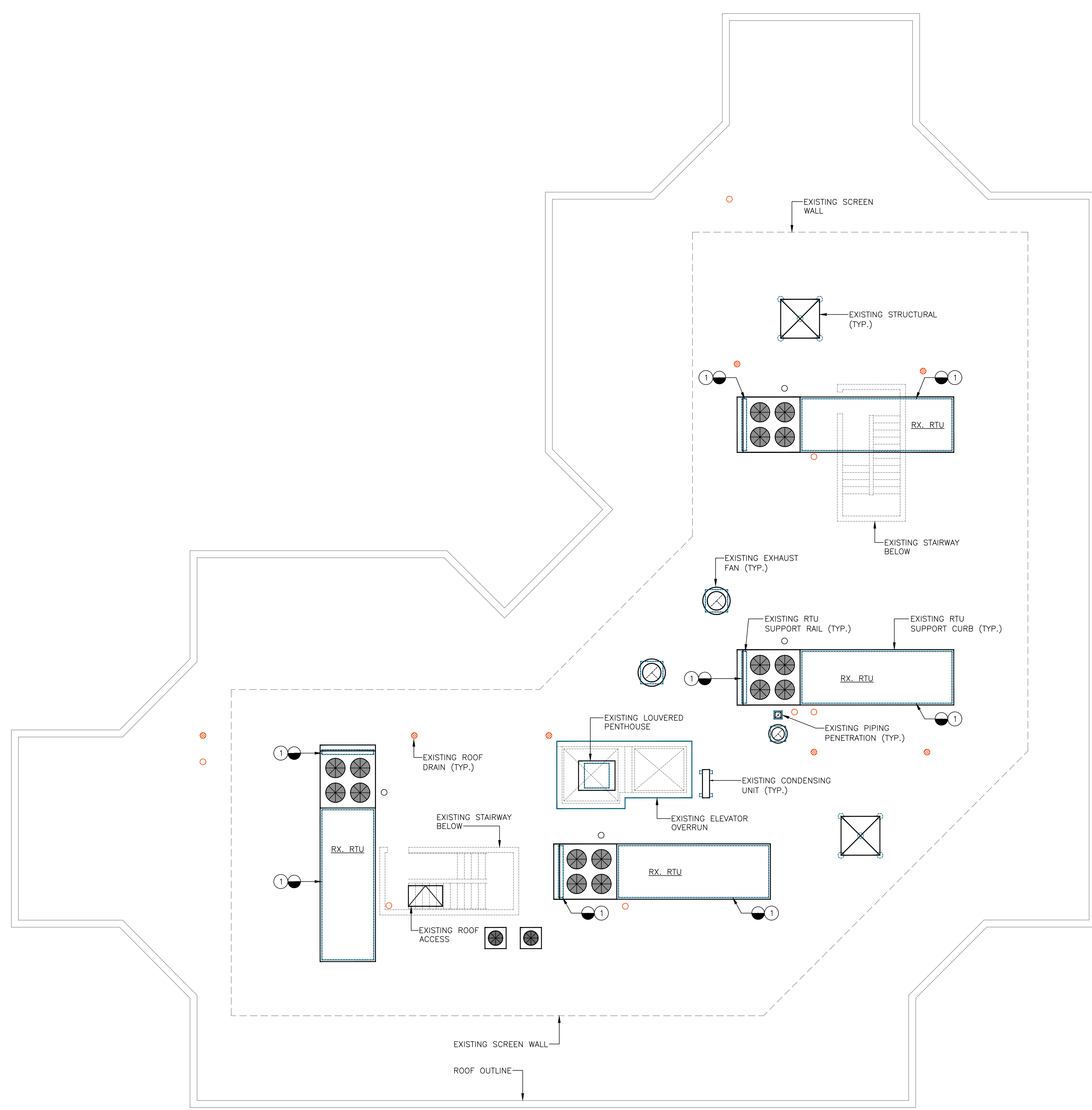
| <p>RMF ENGINEERING, INC. 5520 RESEARCH PARK DR, 3RD FLR BALTIMORE, MD 21228 P: 410.576-0505 F: 410.385-0327 RMF Project No. 121004.A0</p> <p>Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License Number: 54343 EXP. DATE: 05/14/2025</p> | | <p>REVISIONS</p> <table border="1"> <thead> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>BY</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>FINAL SUBMISSION</td> <td></td> <td>09-22-2023</td> </tr> </tbody> </table> | | | NO. | DESCRIPTION | BY | DATE | 1 | FINAL SUBMISSION | | 09-22-2023 | <p>APPROVED BY: <i>David C. Bruner</i> DATE: 12/7/2023</p> <p>APPROVED BY: <i>David C. Bruner</i> DATE: 12/7/2023</p> <p>APPROVED BY: <i>David C. Bruner</i> DATE: 12/7/2023</p> | | | | <p>ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS</p> <p>SCALE: 1/8"=1'-0"</p> <p>PROJECT NO. C537800</p> <p>PROPOSAL NO. C537896</p> | | | |
|--|------------------|---|-------------|----|------|-------------|----|------|---|------------------|--|------------|--|--|--|--|---|--|--|--|
| | | NO. | DESCRIPTION | BY | DATE | | | | | | | | | | | | | | | |
| 1 | FINAL SUBMISSION | | 09-22-2023 | | | | | | | | | | | | | | | | | |
| <p>HERITAGE COMPLEX - RTU REPLACEMENT</p> <p>MECHANICAL HVAC BUILDING 2662</p> <p>ROOF PLAN - DEMOLITION</p> <p>Drawing No.: MD102</p> | | | | | | | | | | | | | | | | | | | | |

GENERAL NOTES:

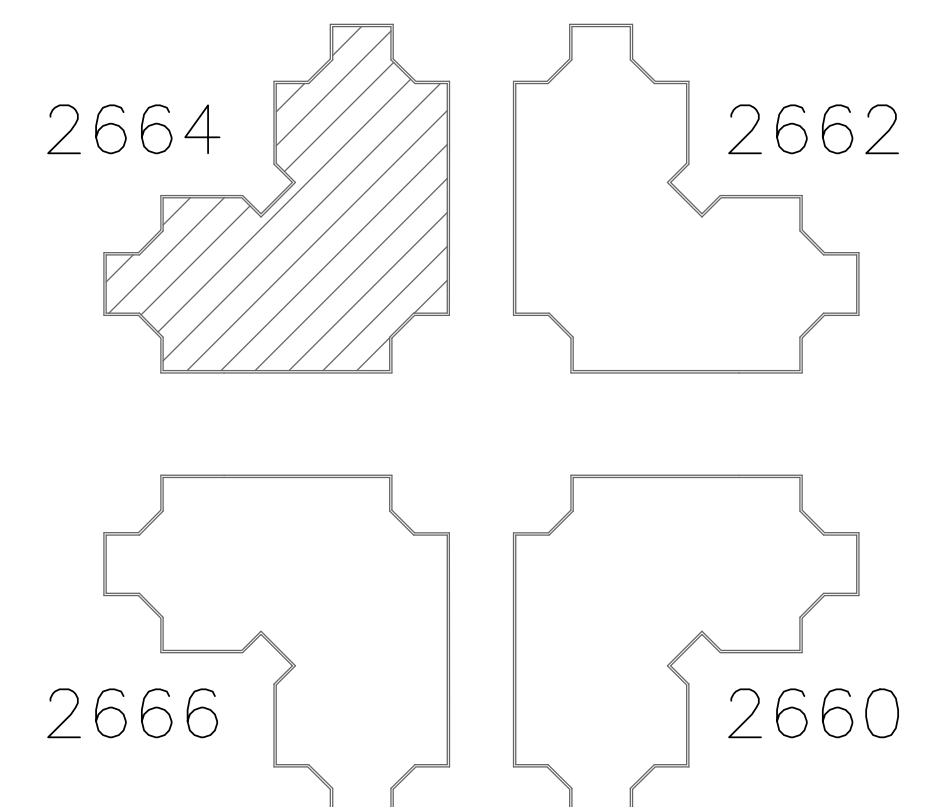
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DRAWING NOTES:

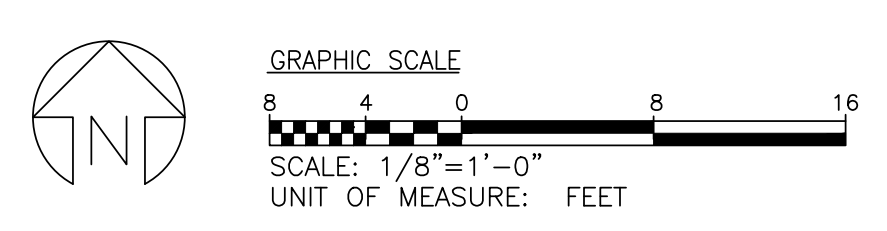
- REMOVE EXISTING RTU. EXISTING RTU ROOF CURB SHALL REMAIN. CONTRACTOR TO PROVIDE INTEGRITY ANALYSIS AS REQUIRED.
- REMOVE EXISTING RTU. EXISTING RTU ROOF RAIL SHALL REMAIN. CONTRACTOR TO PROVIDE INTEGRITY ANALYSIS AS REQUIRED.



ROOF PLAN BUILDING 2664 – DEMOLITION



KEY PLAN:



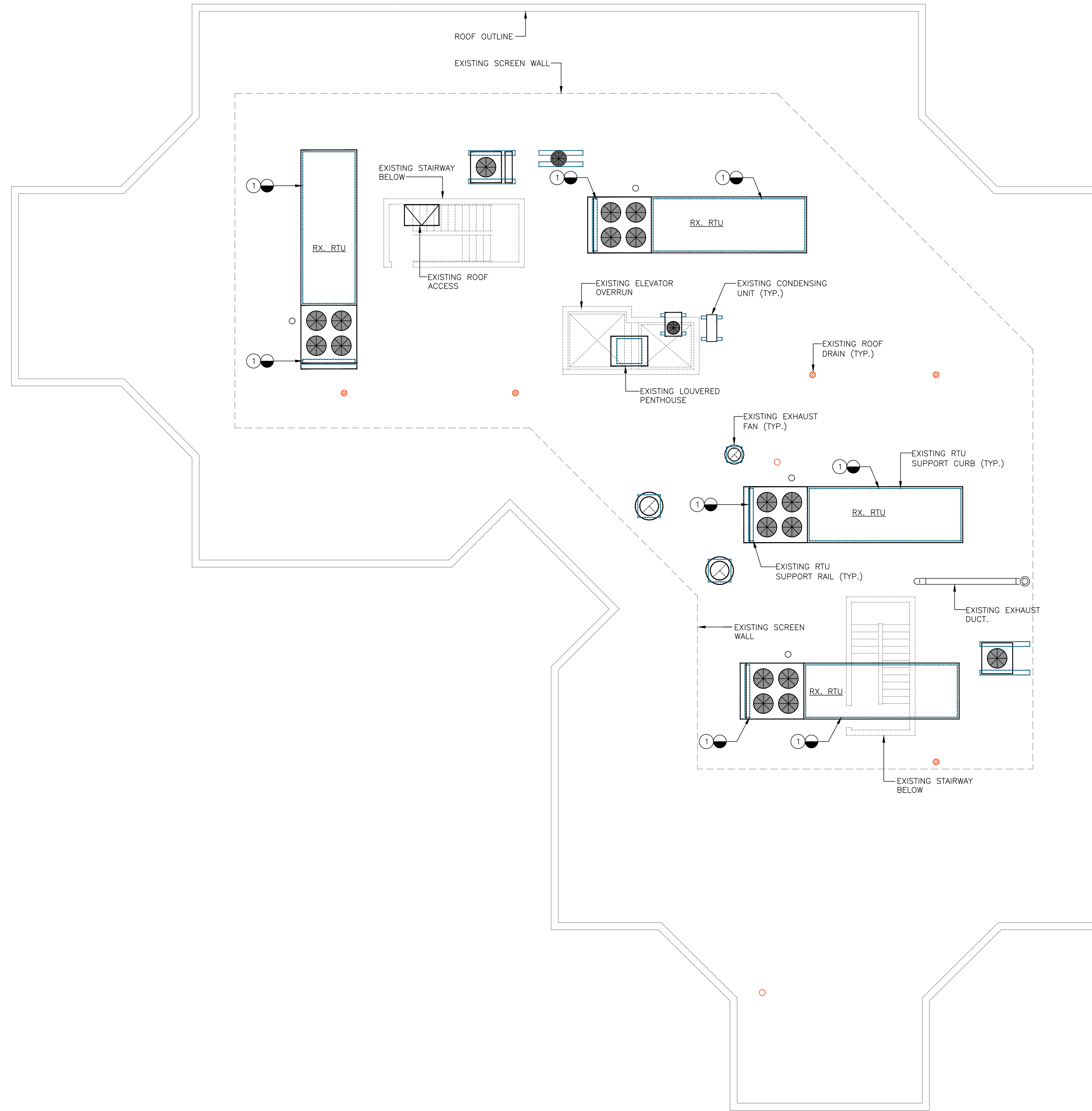
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| RMF ENGINEERING, INC. 5520 RESEARCH PARK DR, 3RD FLR BALTIMORE, MD 21228 P: 410.576-0505 F: 410.385-0327 RMF Project No. 121004.A0 | | REVISIONS | | ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS | |
| | | NO. DESCRIPTION BY DATE | APPROVED DATE | APPROVED DATE | SCALE: 1/8"=1'-0" |
| Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License Number ___54343___ EXP DATE ___05/14/2025___ | | 12/7/2023 14 David C. Brown 12/6/2023 10/20/2023 MFS | 12/7/2023 14 David C. Brown 12/6/2023 10/20/2023 MFS | HERITAGE COMPLEX – RTU REPLACEMENT | |
| | | APPROVED DATE | APPROVED DATE | MECHANICAL HVAC BUILDING 2664 | |
| | | 12/7/2023 14 David C. Brown 12/7/2023 10/20/2023 MFS | 12/7/2023 14 David C. Brown 12/7/2023 10/20/2023 MFS | ROOF PLAN – DEMOLITION | |
| | | ASSISTANT CHIEF ENGINEER | CHIEF ENGINEER | Drawing No.: MD103 | |

GENERAL NOTES:

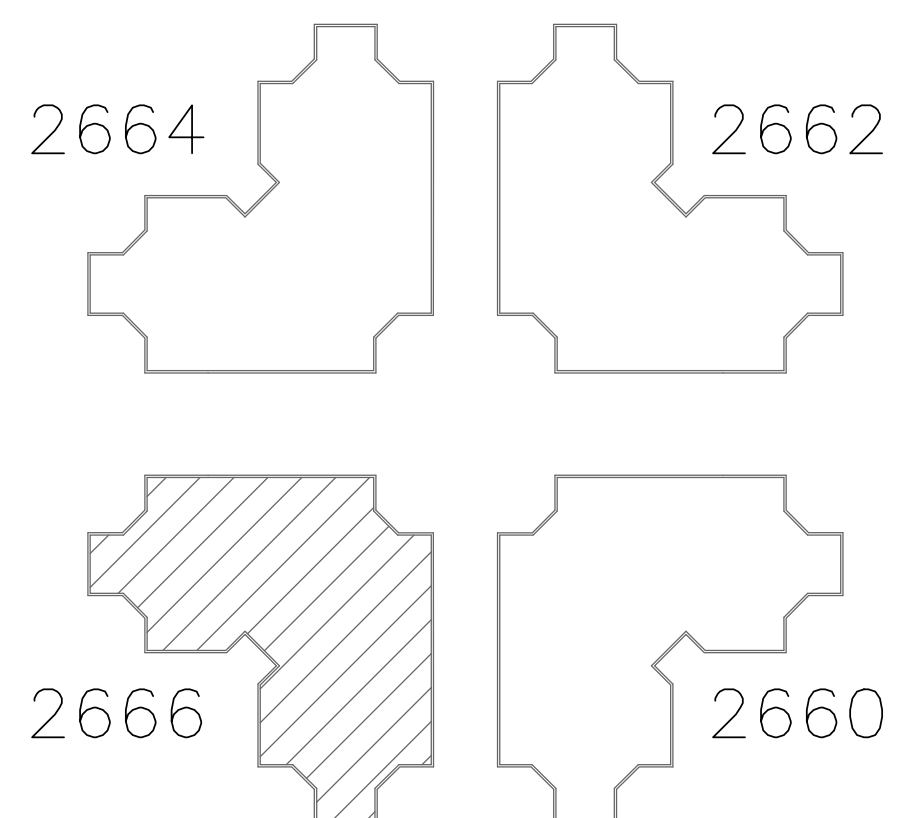
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DRAWING NOTES:

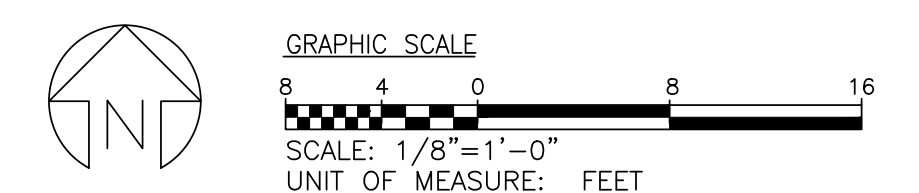
- REMOVE EXISTING RTU. EXISTING RTU ROOF CURB SHALL REMAIN. CONTRACTOR TO PROVIDE INTEGRITY ANALYSIS AS REQUIRED.
- REMOVE EXISTING RTU. EXISTING RTU ROOF RAIL SHALL REMAIN. CONTRACTOR TO PROVIDE INTEGRITY ANALYSIS AS REQUIRED.



ROOF PLAN BUILDING 2666 – DEMOLITION



KEY PLAN:



| <p>RMF ENGINEERING, INC. 5520 RESEARCH PARK DR, 3RD FLR BALTIMORE, MD 21228 P: 410.576-0505 F: 410.385-0327 RMF Project No. 121004.A0</p> | | <p>REVISIONS</p> <table border="1"> <thead> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>BY</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td>FINAL SUBMISSION</td> <td> </td> <td>09-22-2023</td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> <tr> <td> </td> <td> </td> <td> </td> <td> </td> </tr> </tbody> </table> | | | | NO. | DESCRIPTION | BY | DATE | | FINAL SUBMISSION | | 09-22-2023 | | | | | | | | | | | | | <p>APPROVED BY: <i>David O. Bruner</i> DATE: 12/7/2023</p> <p>APPROVED BY: <i>David O. Bruner</i> DATE: 12/7/2023</p> <p>APPROVED BY: <i>David O. Bruner</i> DATE: 12/7/2023</p> | | | |
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| | | NO. | DESCRIPTION | BY | DATE | | | | | | | | | | | | | | | | | | | | | | | | |
| | FINAL SUBMISSION | | 09-22-2023 | | | | | | | | | | | | | | | | | | | | | | | | | | |
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| <p>Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License Number: 54343. EXP. DATE: 05/14/2025.</p> | | <p>ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS GENERAL ENGINEERING</p> <p>PROJECT NO. C537800 PROJECT NO. C537800 PROJECT NO. C537800</p> <p>DATE: 12/7/2023 08:19 DATE: 12/7/2023 08:19 DATE: 12/7/2023 08:19</p> <p>PROPOSAL NO. C537896</p> | | | | | | | | | | | | | | | | | | | | | | | | | | | |

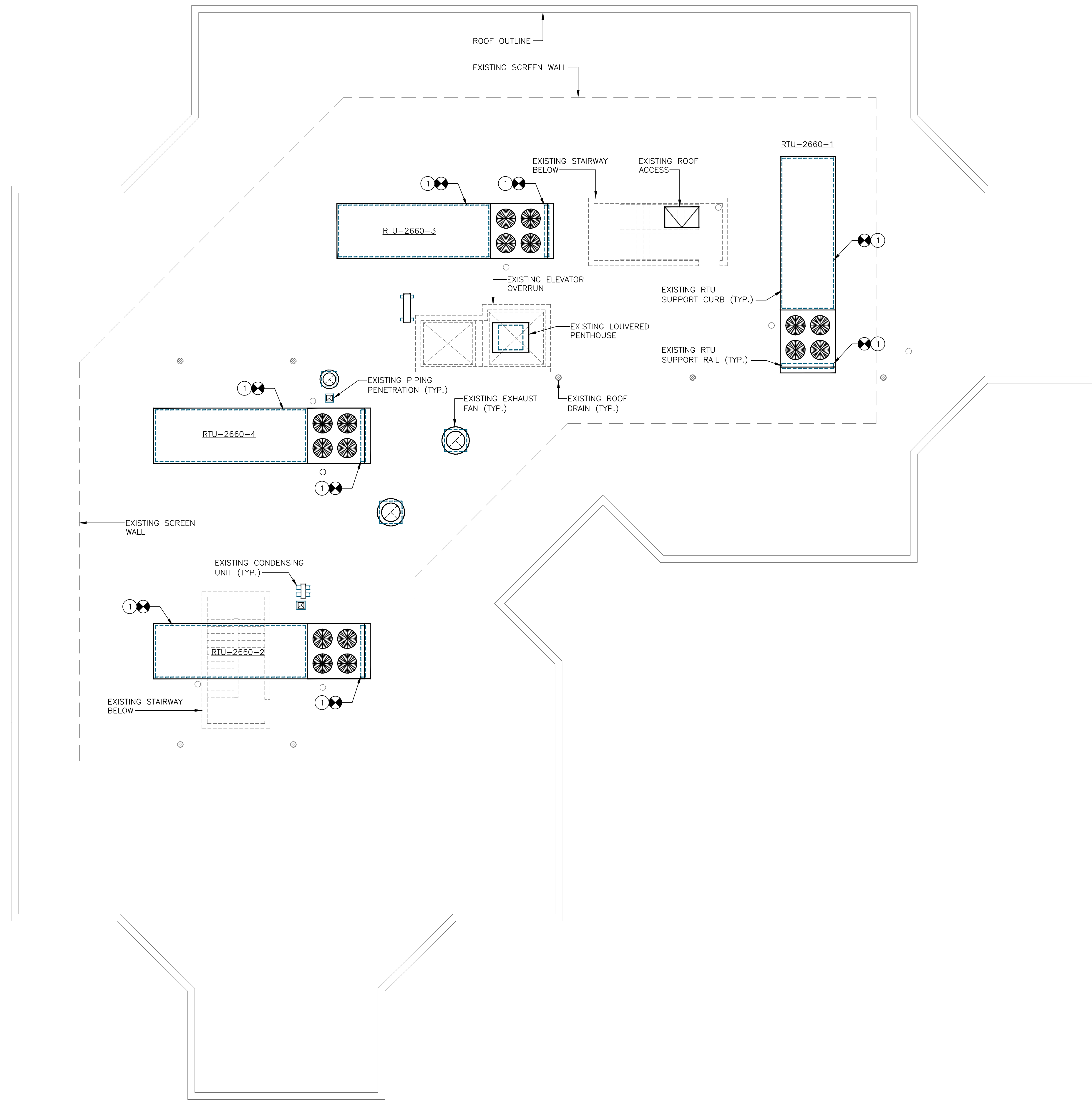
HERITAGE COMPLEX – RTU REPLACEMENT
MECHANICAL HVAC BUILDING 2666
ROOF PLAN – DEMOLITION
Drawing No.: MD104

GENERAL NOTES:

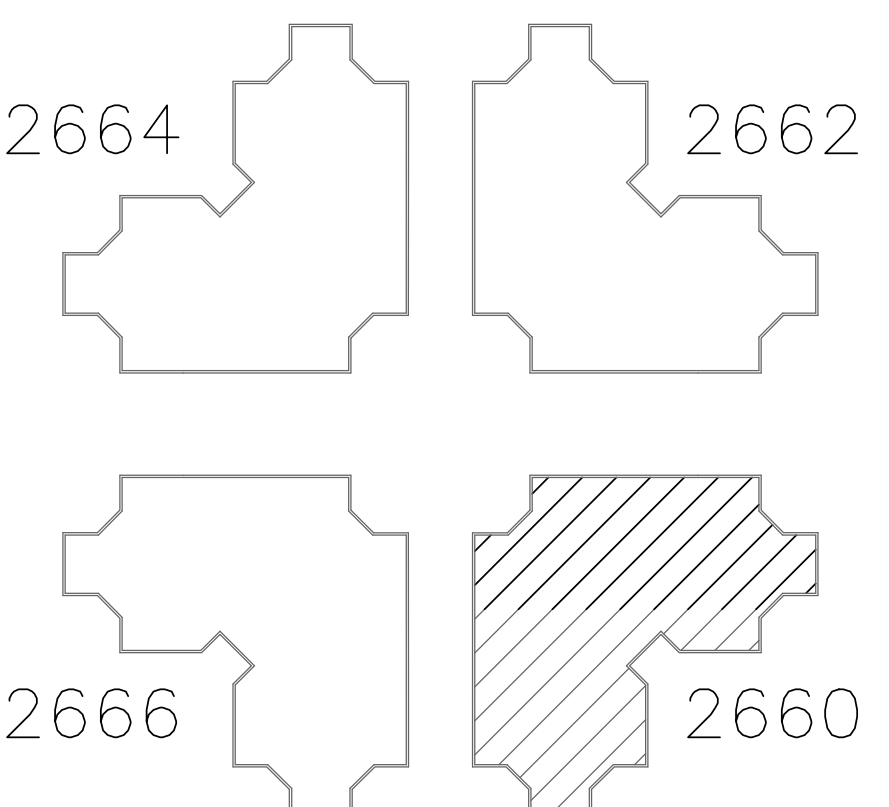
1. NEW RTUS SHALL REUSE EXISTING EQUIPMENT CURBS AND EQUIPMENT RAILS. CONTRACTOR SHALL COORDINATE EXACT LOCATION AND SIZES OF NEW RTU AND ASSOCIATED CURBS BEFORE ORDERING UNITS TO ENSURE WATER AND AIR TIGHT FIT. CURB ADAPTORS ARE REQUIRED FOR NEW RTUS AND SHALL EXTEND TO COVER THE ENTIRE FOOTPRINT OF THE UNIT. EXISTING DUCT SIZES FOR EACH UNIT ARE APPROXIMATELY 46X30 INCHES FOR SUPPLY AND 52X48 FOR RETURN. CONTRACTOR SHALL FIELD VERIFY ALL TRANSITION SIZES REQUIRED FROM NEW RTU OPENINGS TO EXISTING TO REMAIN DUCTWORK. FLEXIBLE CONNECTIONS SHALL BE PROVIDED BETWEEN THE RTU AND THE BUILDING DUCTWORK.
2. CONTRACTOR SHALL INSPECT THE EXISTING FLASHING OF EQUIPMENT CURBS AND RAILS UPON INSTALLATION OF NEW EQUIPMENT.
3. RTU CONDENSATE PIPING SHALL TERMINATE WITHIN 1 FOOT OF NEAREST ROOF DRAIN. DRAIN PIPING SHALL BE HARD PIPED AND SUPPORTED ON ROOF WITH PATE STYLE SUPPORTS. THE ROUTING OF THE PIPING SHALL BE COORDINATED WITH NEW AND OTHER EXISTING TO REMAIN EQUIPMENT.

DRAWING NOTES:

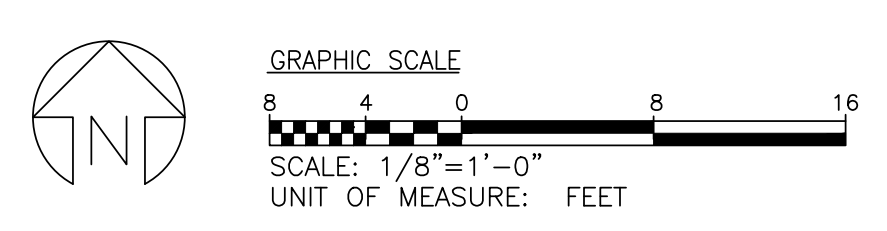
- ① COORDINATE AND ATTACHED NEW RTU CURB ADAPTOR TO EXISTING TO REMAIN ROOF CURB AND EQUIPMENT RAIL.



ROOF PLAN BUILDING 2660 – NEW WORK



KEY PLAN:



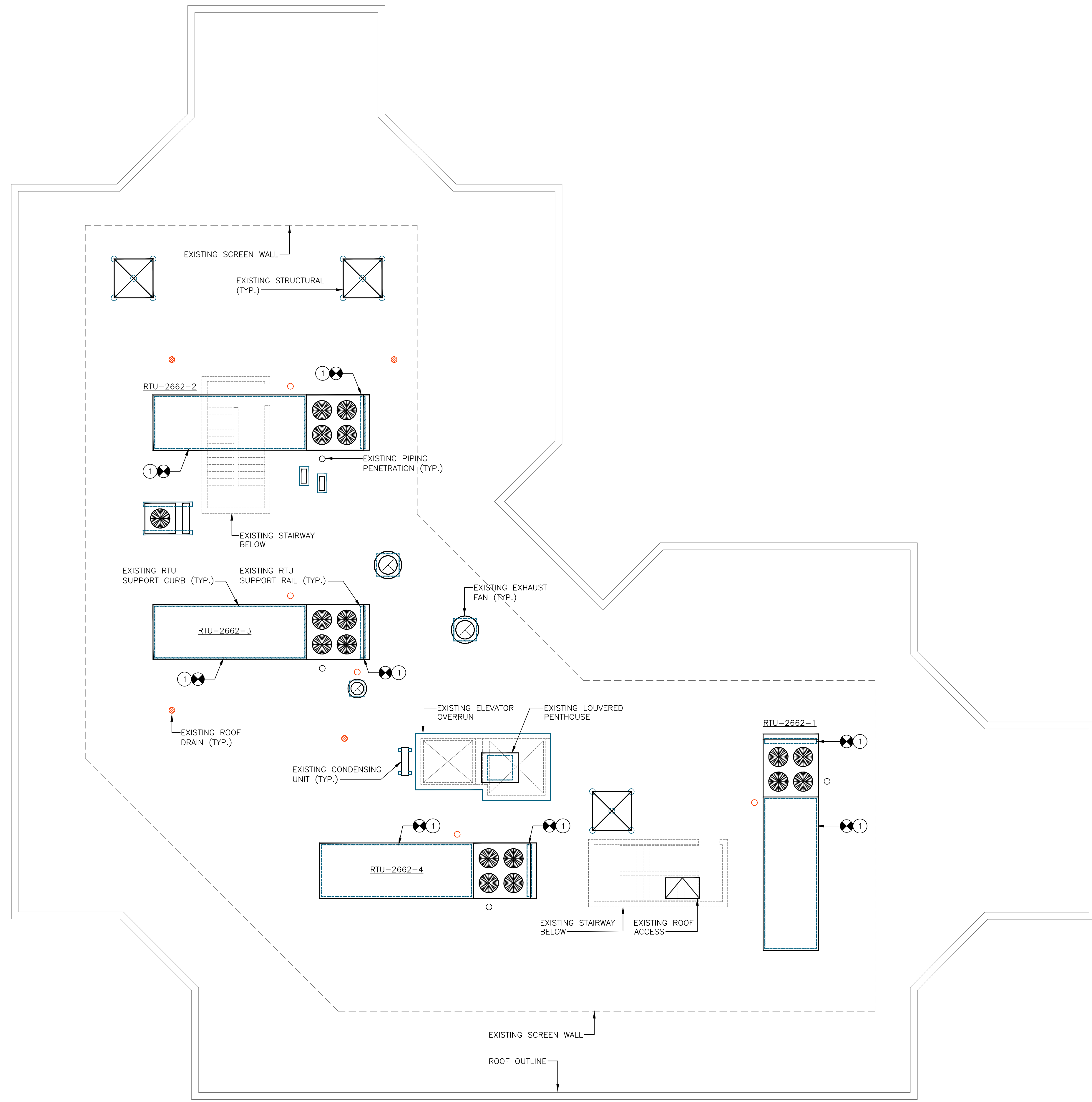
| <p>RMF ENGINEERING, INC. 5520 RESEARCH PARK DR, 3RD FLR BALTIMORE, MD 21228 P: 410.576-0505 F: 410.385-0327 RMF Project No. 121004.A0</p> | | <p>REVISIONS</p> <table border="1"> <thead> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>BY</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>FINAL SUBMISSION</td> <td></td> <td>09-22-2023</td> </tr> </tbody> </table> | | | | NO. | DESCRIPTION | BY | DATE | 1 | FINAL SUBMISSION | | 09-22-2023 | <p>APPROVED BY: <i>David C. Bruner</i> DATE: 12/7/2023</p> <p>APPROVED BY: <i>David C. Bruner</i> DATE: 12/7/2023</p> <p>APPROVED BY: <i>David C. Bruner</i> DATE: 12/7/2023</p> | | | |
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GENERAL NOTES:

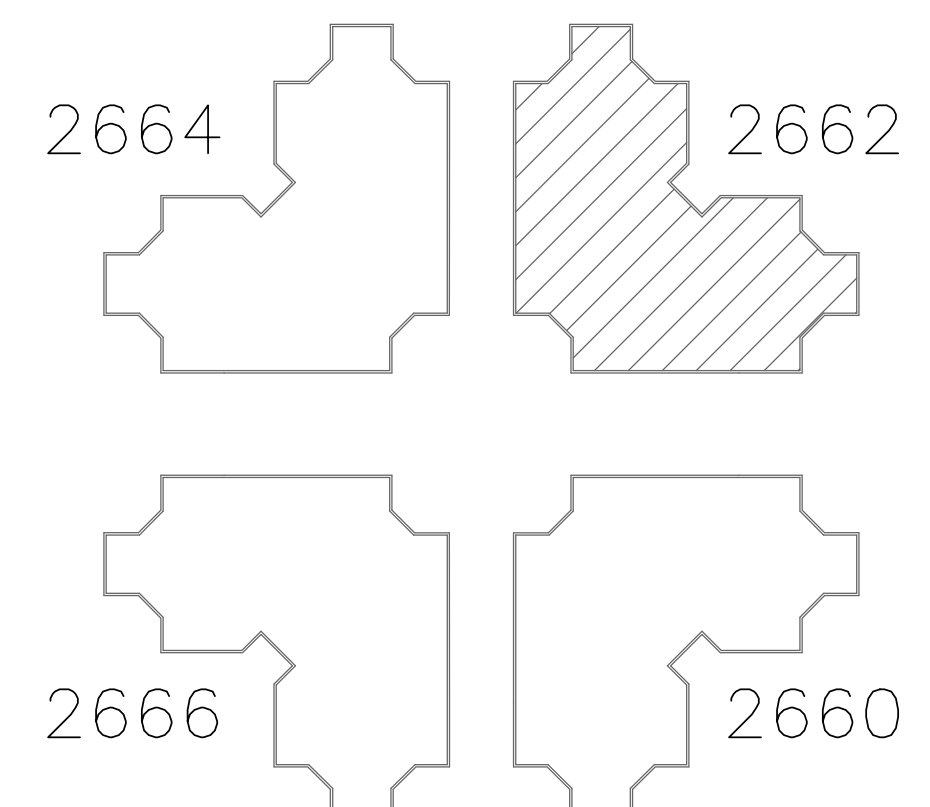
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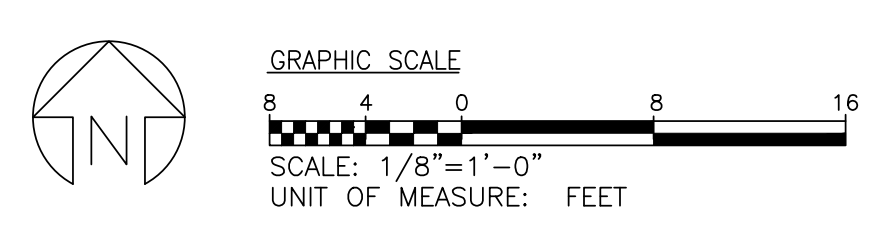
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ROOF PLAN BUILDING 2662 – NEW WORK



KEY PLAN:



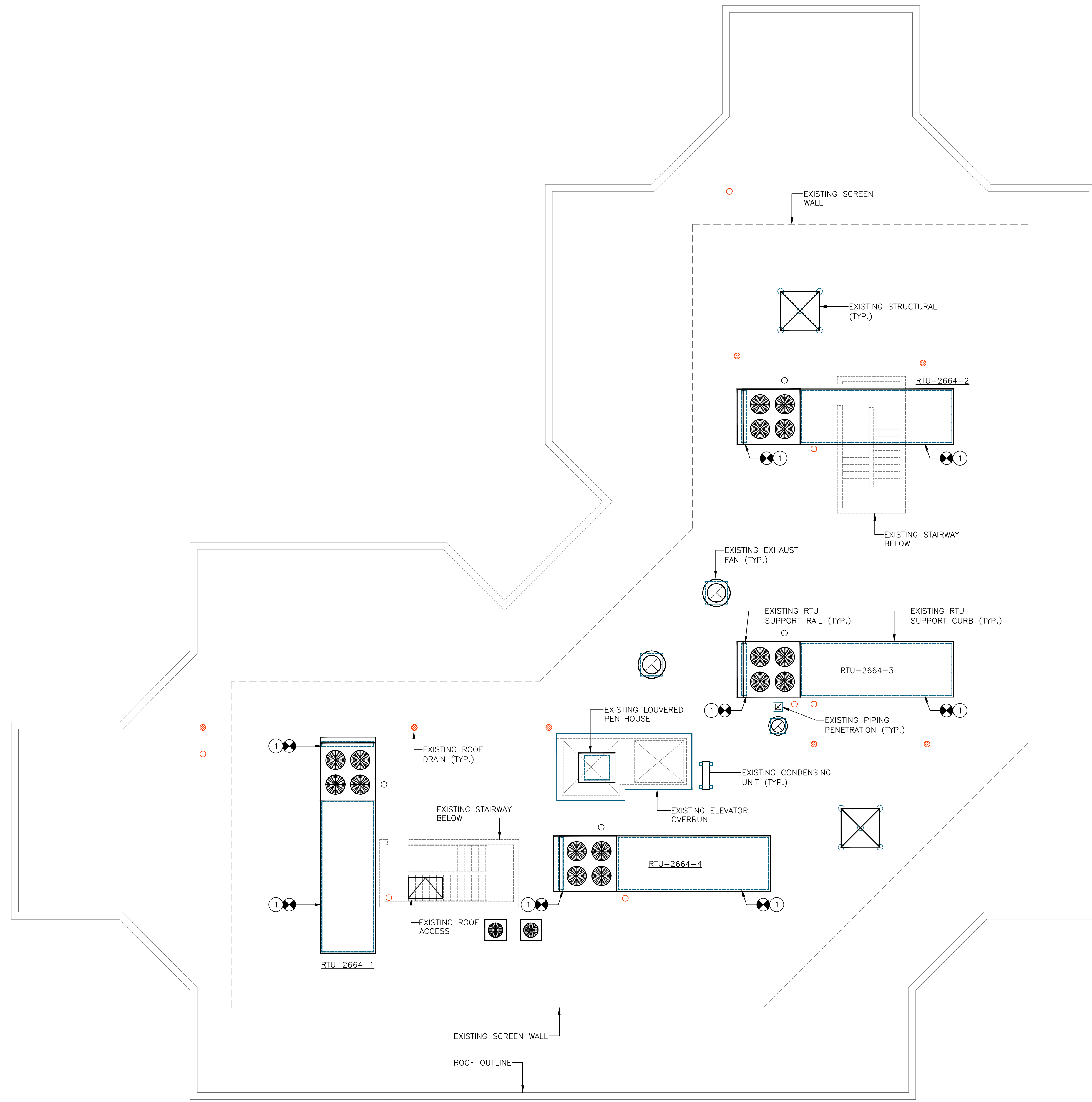
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| | | NO. | DESCRIPTION | BY | DATE | | | | | | | | | | | | | | | | | | | | | | |
| | FINAL SUBMISSION | | 09-22-2023 | | | | | | | | | | | | | | | | | | | | | | | | |
| <p>Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License Number: 54343. EXP. DATE: 05/14/2025.</p> | | <p>ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS</p> <p>GENERAL ENGINEERING</p> <p>HERITAGE COMPLEX – RTU REPLACEMENT MECHANICAL HVAC BUILDING 2662 ROOF PLAN – NEW WORK</p> | | <p>SCALE: 1/8" = 1'-0"</p> <p>CHECKED BY: MFS</p> <p>PROJECT NO. C537800</p> <p>DATE: 12/7/2023</p> <p>PROPOSAL NO. C537896</p> | | | | <p>Drawing No.: M102</p> | | | | | | | | | | | | | | | | | | | |

GENERAL NOTES:

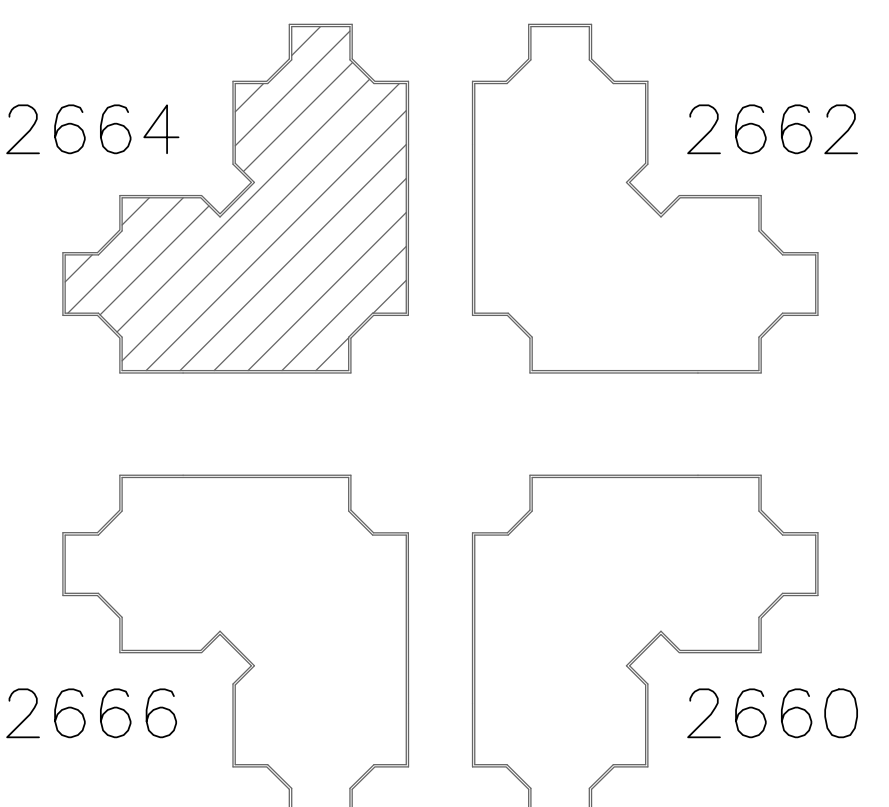
1. NEW RTUS SHALL REUSE EXISTING EQUIPMENT CURBS AND EQUIPMENT RAILS. CONTRACTOR SHALL COORDINATE EXACT LOCATION AND SIZES OF NEW RTU AND ASSOCIATED CURBS BEFORE ORDERING UNITS TO ENSURE WATER AND AIR TIGHT FIT. CURB ADAPTORS ARE REQUIRED FOR NEW RTUS AND SHALL EXTEND TO COVER THE ENTIRE FOOTPRINT OF THE UNIT. EXISTING DUCT SIZES FOR EACH UNIT ARE APPROXIMATELY 46X30 INCHES FOR SUPPLY AND 52X48 FOR RETURN. CONTRACTOR SHALL FIELD VERIFY ALL TRANSITION SIZES REQUIRED FROM NEW RTU OPENINGS TO EXISTING TO REMAIN DUCTWORK. FLEXIBLE CONNECTIONS SHALL BE PROVIDED BETWEEN THE RTU AND THE BUILDING DUCTWORK.
2. CONTRACTOR SHALL INSPECT THE EXISTING FLASHING OF EQUIPMENT CURBS AND RAILS UPON INSTALLATION OF NEW EQUIPMENT.
3. RTU CONDENSATE PIPING SHALL TERMINATE WITHIN 1 FOOT OF NEAREST ROOF DRAIN. DRAIN PIPING SHALL BE HARD PIPED AND SUPPORTED ON ROOF WITH PATE STYLE SUPPORTS. THE ROUTING OF THE PIPING SHALL BE COORDINATED WITH NEW AND OTHER EXISTING TO REMAIN EQUIPMENT.

DRAWING NOTES:

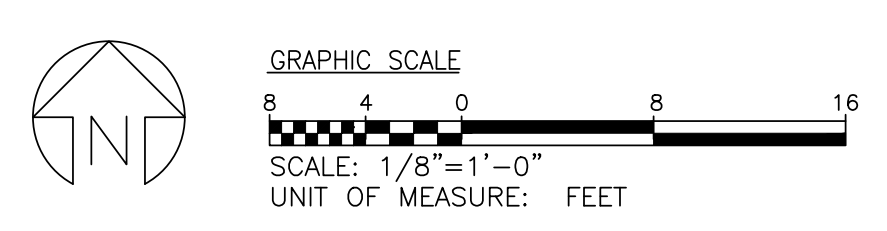
- ① COORDINATE AND ATTACHED NEW RTU CURB ADAPTOR TO EXISTING TO REMAIN ROOF CURB AND EQUIPMENT RAIL.



ROOF PLAN BUILDING 2664 – NEW WORK



KEY PLAN:



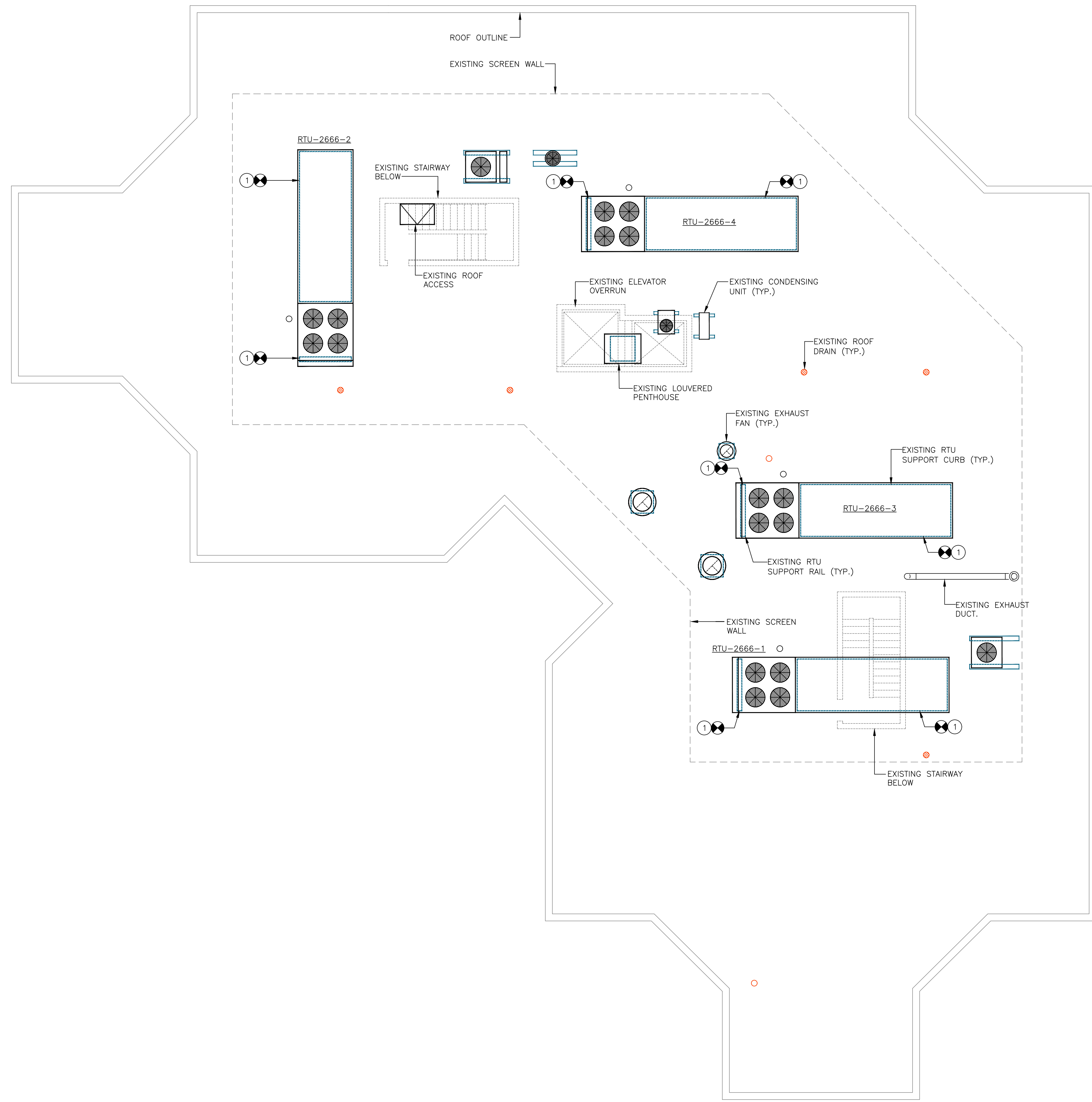
| | | | | | |
|--|--|--|--|---|--|
| RMF ENGINEERING, INC. 5520 RESEARCH PARK DR, 3RD FLR BALTIMORE, MD 21228 P: 410.576-0505 F: 410.385-0327 RMF Project No. 121004.A0 | | REVISIONS NO. DESCRIPTION BY DATE FINAL SUBMISSION 09-22-2023 | | ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS GENERAL ENGINEERING | |
| | | APPROVED DATE: 12/7/2023 BY: <i>David O. Bruner</i> PROFESSIONAL ENGINEER | APPROVED DATE: 12/7/2023 BY: <i>Diego Velazquez</i> PROJECT MANAGER | SCALE: 1/8"=1'-0" CHECKED BY: SLD PROJECT NO. C537800 SHEET NO. 10 OF 22 PROPOSAL NO. C537896 | HERITAGE COMPLEX – RTU REPLACEMENT MECHANICAL HVAC BUILDING 2664 ROOF PLAN – NEW WORK Drawing No.: M103 |

GENERAL NOTES:

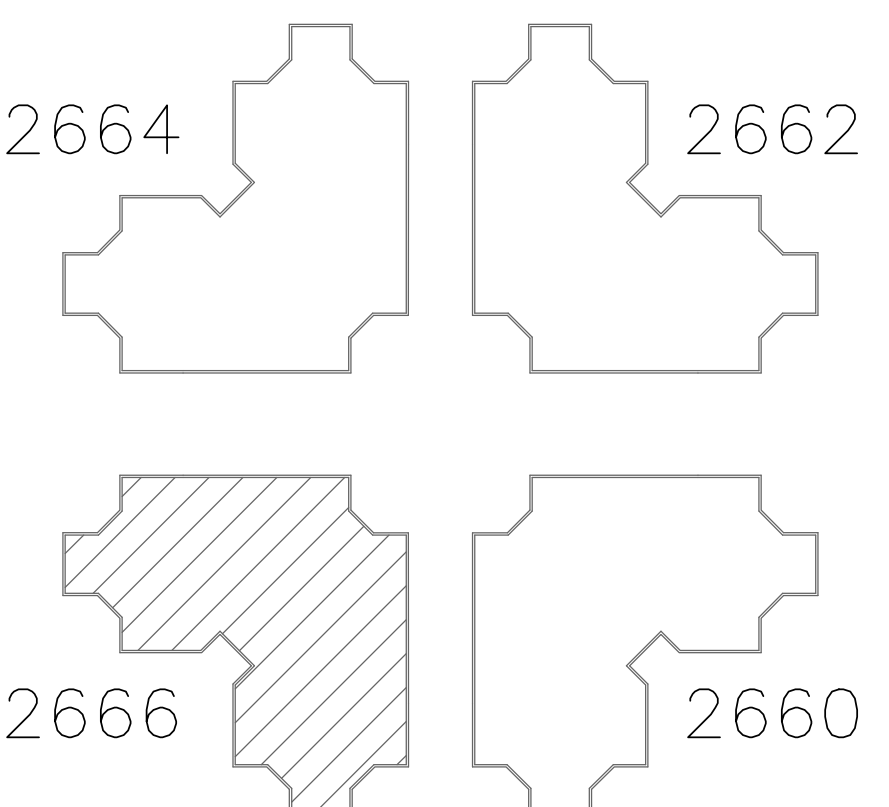
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DRAWING NOTES:

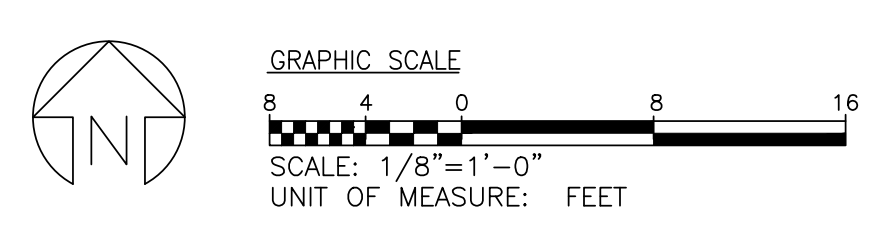
- ① COORDINATE AND ATTACHED NEW RTU CURB ADAPTOR TO EXISTING TO REMAIN ROOF CURB AND EQUIPMENT RAIL.



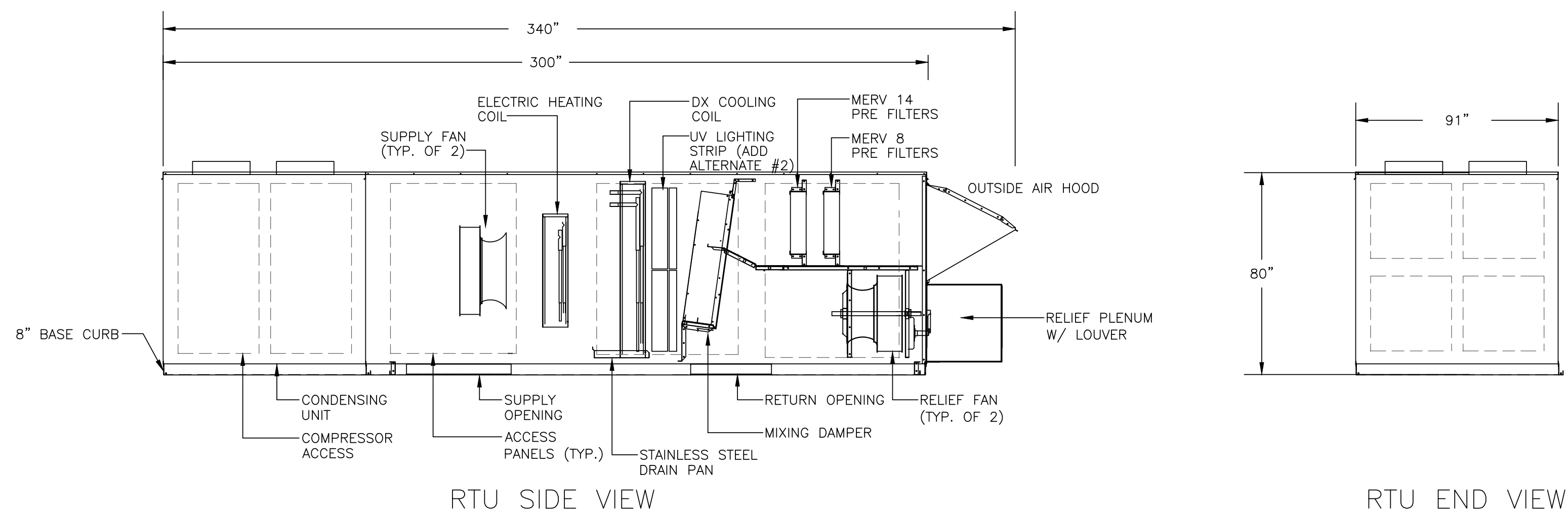
ROOF PLAN BUILDING 2666 – NEW WORK



KEY PLAN:

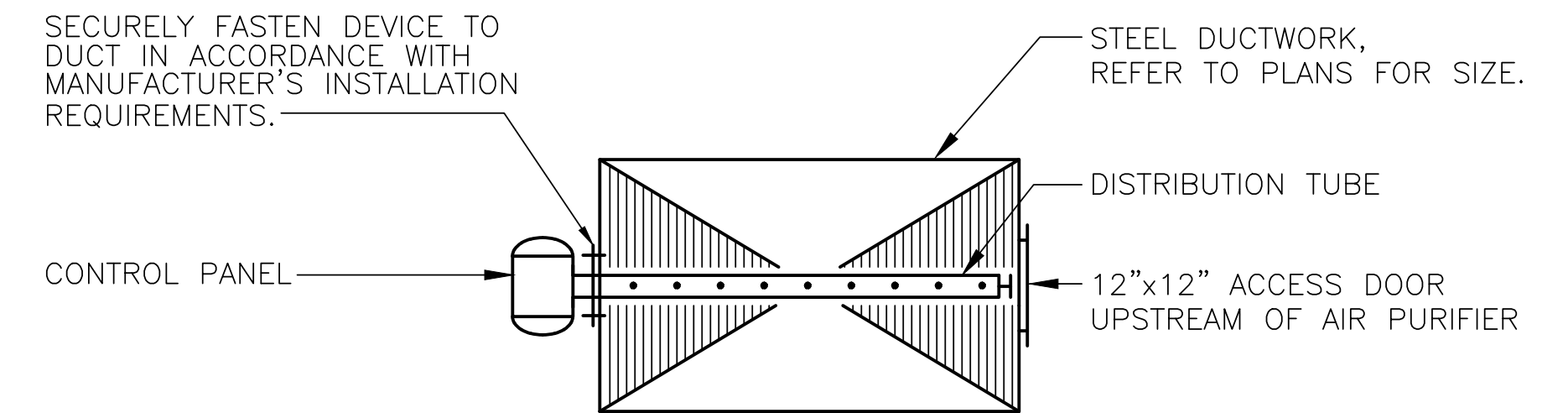


| <p>RMF ENGINEERING, INC. 5520 RESEARCH PARK DR, 3RD FLR BALTIMORE, MD 21228 P: 410.576-0505 F: 410.385-0327 RMF Project No. 121004.A0</p> | | <p>REVISIONS</p> <table border="1"> <thead> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>BY</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td>FINAL SUBMISSION</td> <td> </td> <td>09-22-2023</td> </tr> </tbody> </table> | | | | NO. | DESCRIPTION | BY | DATE | | FINAL SUBMISSION | | 09-22-2023 | <p>APPROVED BY: <i>David O. Bruner</i> DATE: 12/7/2023</p> <p>APPROVED BY: <i>Diego Velazquez</i> DATE: 12/6/2023</p> <p>APPROVED BY: <i>Diego Velazquez</i> DATE: 12/7/2023</p> | | | |
|--|------------------|--|-------------|----|------|-----|-------------|----|------|--|------------------|--|------------|--|--|--|--|
| | | NO. | DESCRIPTION | BY | DATE | | | | | | | | | | | | |
| | FINAL SUBMISSION | | 09-22-2023 | | | | | | | | | | | | | | |
| <p>Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License Number: 54343. EXP. DATE: 05/14/2025.</p> | | <p>ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS GENERAL ENGINEERING</p> <p>PROJECT NO. C537800 PROJECT MANAGER: <i>Diego Velazquez</i> CHECKED BY: SLD PROJECT NO. C537800 DRAWN BY: <i>Diego Velazquez</i> DATE: 12/7/2023 OF 22 PROPOSAL NO. C537896</p> | | | | | | | | | | | | | | | |



NOTES:

1. ALL DEBRIS FROM EXISTING ROOF CURB SHALL BE REMOVED BEFORE INSTALLATION ON NEW CURB ADAPTOR AND RTU.
2. EXISTING SMOKE DAMPER SHALL BE REUSED AND RECONNECTED AS FIELD CONDITIONS ALLOW. CONTROLS OF SMOKE DAMPER SHALL BE INTEGRATED BACK INTO NEW RTU.
3. ALL NEW DUCT CONNECTIONS FROM RTU TO EXISTING DUCT RISERS SHALL BE INSULATED WITH MINIMUM 1 INCH THICK CLOSED CELL INSULATION.
4. CONTRACTOR TO VERIFY ALL EXISTING RTU CURB DIMENSIONS BEFORE PURCHASE AND INSTALL OF NEW CURB ADAPTOR. NEW CURB ADAPTOR SHALL BE FULLY COORDINATED WITH MANUFACTURER AND NEW RTU DIMENSIONS.



NOTES:

1. INSTALL MULTIPLE UNITS PER MANUFACTURER RECOMMENDATIONS AND REQUIREMENTS. UNIT SHALL BE ACCESSIBLE VIA ACCESS PANEL IN DUCT. UNIT SHALL BE INSTALLED UPSTREAM OF ALL BRANCH DUCT CONNECTIONS AND LOCATED IN THE RISER DUCT.
2. COORDINATE POWER REQUIREMENTS WITH ELECTRICAL DRAWINGS.
3. SUBMITTED AND INSTALLED UNIT SHALL BE UL LISTED AND ENERGY STAR CERTIFIED.
4. CONTROLS FOR DEVICE SHALL BE INTERLOCKED WITH AIR FLOW SWITCH LOCATED IN RTU. REFER TO CONTROLS AND SPECIFICATIONS FOR MORE DETAILS.

**DETAIL - BIPOLAR IONIZATION TUBE (DUCT MOUNTED)
ADD ALTERNATE #1**

SCALE: NONE **2**

DETAIL - TYPICAL ROOF TOP UNIT

SCALE: NONE **1**

SCALE: NONE **1**

AIR HANDLING UNIT SCHEDULE

| DESIGNATION | LOCATION | UNIT CFM | UNIT TONS | MIN. OA CFM | SUPPLY FAN SECTION | | | | EXHAUST FAN SECTION | | | | COOLING COIL DATA | | | | | | HEATING SECTION | | | | ELECTRICAL V/ø/Hz | BASIS OF DESIGN | REMARKS | | | | | | | | | | | | |
|-------------------|----------------|----------|-----------|-------------|--------------------|---------------------------|---------------------------|----------------|---------------------|------|------|------|---------------------------|---------------------------|----------------|-----------|------|-----|-----------------|--------|-----------|----------|-------------------|-----------------|---------|----------------------|-------------|------|------------------------------------|---------------|--------|--------|--------------------|------------------------------------|----------|-------|-----------------------|
| | | | | | CFM | TSP INCH H ₂ O | ESP INCH H ₂ O | NUMBER OF FANS | MOTOR BHP | HP | RPM | CFM | TSP INCH H ₂ O | ESP INCH H ₂ O | NUMBER OF FANS | MOTOR BHP | HP | RPM | EAT °F | LAT °F | TOTAL MBH | SENS MBH | | | | MAXIMUM FACE VEL FPM | No OF COILS | ROWS | MAXIMUM AIR PD IN H ₂ O | CAPACITY (KW) | EAT °F | LAT °F | TOTAL OUTPUT (MBH) | MAXIMUM AIR PD IN H ₂ O | MOP | MCA | |
| RTU-2660-1 THRU 4 | ROOF BLDG 2660 | 16500 | 50 | 4200 | 8250 | 6.5 | 3.0 | 2 | 11.6 | 2@20 | 2100 | 7750 | 1.5 | 2 | 3.8 | 2@7.5 | 1900 | 80 | 67 | 55 | 54 | 725 | 595 | 475 | 1 | 4 | 0.75 | 90 | 52.5 | 70 | 310 | 0.4 | 200 | 185 | 460/3/60 | TRANE | VFD, 18" CURB ADAPTOR |
| RTU-2662-1 THRU 4 | ROOF BLDG 2662 | 16500 | 50 | 4200 | 8250 | 6.5 | 3.0 | 2 | 11.6 | 2@20 | 2100 | 7750 | 1.5 | 2 | 3.8 | 2@7.5 | 1900 | 80 | 67 | 55 | 54 | 725 | 595 | 475 | 1 | 4 | 0.75 | 90 | 52.5 | 70 | 310 | 0.4 | 200 | 185 | 460/3/60 | TRANE | VFD, 18" CURB ADAPTOR |
| RTU-2664-1 THRU 4 | ROOF BLDG 2664 | 16500 | 50 | 4200 | 8250 | 6.5 | 3.0 | 2 | 11.6 | 2@20 | 2100 | 7750 | 1.5 | 2 | 3.8 | 2@7.5 | 1900 | 80 | 67 | 55 | 54 | 725 | 595 | 475 | 1 | 4 | 0.75 | 90 | 52.5 | 70 | 310 | 0.4 | 200 | 185 | 460/3/60 | TRANE | VFD, 18" CURB ADAPTOR |
| RTU-2666-1 THRU 4 | ROOF BLDG 2666 | 16500 | 50 | 4200 | 8250 | 6.5 | 3.0 | 2 | 11.6 | 2@20 | 2100 | 7750 | 1.5 | 2 | 3.8 | 2@7.5 | 1900 | 80 | 67 | 55 | 54 | 725 | 595 | 475 | 1 | 4 | 0.75 | 90 | 52.5 | 70 | 310 | 0.4 | 200 | 185 | 460/3/60 | TRANE | VFD, 18" CURB ADAPTOR |

NOTES: UNITS SHALL BE PROVIDED WITH EQUIPMENT CURB ADAPTOR TO FIT ON EXISTING ROOF CURB. UNIT SHALL BE PROVIDED WITH INTERNAL VFDs AND SINGLE POINT ELECTRICAL CONNECTION. UNITS SHALL BE PROVIDED WITH MERV 8 PRE FILTERS AND MERV 14 FINAL FILTERS. UNIT SHALL BE EQUIPPED WITH ECONOMIZER CONTROLS. IF ADD ALTERNATE #2 IS ACCEPTED PROVIDE UV LIGHT SATURATION SECTION FOR AIR AND COIL DISINFECTION, REFER TO .

BIPOLAR IONIZATION (ALTERNATE 1)

DESIGNATION : AFD-2660-1 THRU 4, AFD-2662-1 THRU 4, AFD-2664-1 THRU 4, AFD-2666-1 THRU 4

SERVICE : RTU SUPPLY AIR DUCT

TOTAL SYSTEM CAPACITY (FLOW): 16,500

TUBE LENGTH: 9 INCH (EACH)

TUBE (BLADE) QUANTITY: FOUR (PER RTU)

MATERIAL: CARBON FIBER

MAX. AIR PRESSURE DROP: .05 INCH

VOLTAGE: 120 V

CONSUMPTION: 5 WATTS (EACH)

FLA: 0.1 AMPS (EACH)

BASIS OF DESIGN : PHENOMENAL AIRE SERIES C (C20)

REMARKS : UNIT SHALL BE PROVIDED WITH INTEGRAL CONTROL PANEL. DIRECT SUPPLY DUCT MOUNTED. PROVIDE 4 BLADES/UNITS PER RTU. PROVIDE WEATHER PROOF DISCONNECT PER RTU. UNITS SHALL BE UL LISTED AND ZERO EMISSIONS.

UV AIR DISINFECTION (ALTERNATE 2)

DESIGNATION : AFD-2660-1 THRU 4, AFD-2662-1 THRU 4, AFD-2664-1 THRU 4, AFD-2666-1 THRU 4

SERVICE : RTU'S

CAPACITY (FLOW): 16,500

LIGHT QUANTITY: 10 (PER RTU)

TUBE LENGTH: 18 INCH

VOLTAGE: 120V

WATTS: 95 W (PER LIGHT)

FRAME MATERIAL: ALUMINUM

SIZE: 74' x 80'

WEIGHT: 40 LBS

BASIS OF DESIGN : LUMALIER AR95

REMARKS : PRE COIL IN UNIT MOUNTED. UNITS SHALL BE CIRCUITED INDEPENDENT OF RTU. PROVIDE WEATHER PROOF DISCONNECT PER RTU. VERIFY LIGHT INSTALLATION AND MOUNTING WITH MANUFACTURER.

rmf RMF ENGINEERING, INC.
5520 RESEARCH PARK DR, 3RD FLR
BALTIMORE, MD 21228
P: 410.576-0505 F: 410.385-0327
RMF Project No. 121004.A0



Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License Number 84343 EXP DATE 05/14/2025

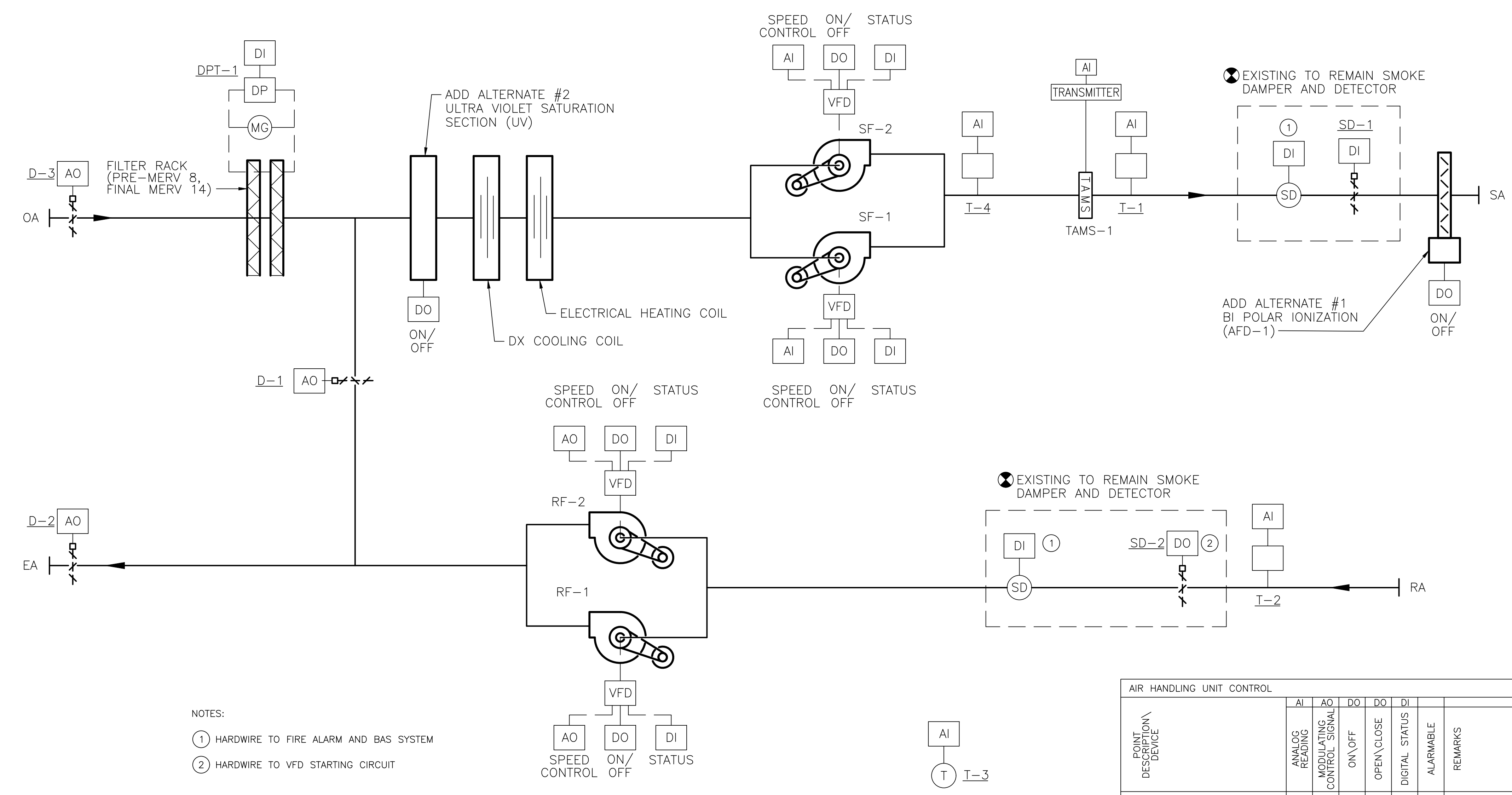
REVISIONS

| NO. | DESCRIPTION | BY | DATE |
|-----|------------------|----|------------|
| 1 | FINAL SUBMISSION | | 09-22-2023 |

ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS

| | | | | | |
|---|---|---|---|---------------------|------------------------------------|
| APPROVED <i>David O. Bruner</i> 12/7/2023 | APPROVED <i>David O. Bruner</i> 12/7/2023 | APPROVED <i>David O. Bruner</i> 12/7/2023 | APPROVED <i>David O. Bruner</i> 12/7/2023 | SCALE: NTS | GENERAL ENGINEERING |
| PROJECT MANAGER | PROJECT MANAGER | CHECKED BY MFS | CHECKED BY MFS | PROJECT NO. C537800 | HERITAGE COMPLEX - RTU REPLACEMENT |
| ASSISTANT CHIEF ENGINEER | CHIEF, RIGHT OF WAY SERVICES | PROPOSAL NO. C537896 | SHEET NO. 12 OF 22 | | MECHANICAL DETAILS AND SCHEDULES |

Drawing No.: M500



NOTES:
 ① HARDWIRE TO FIRE ALARM AND BAS SYSTEM
 ② HARDWIRE TO VFD STARTING CIRCUIT

ROOF TOP UNIT SCHEMATIC (TYP. OF 16)
 SCALE: NONE

| AIR HANDLING UNIT CONTROL | | | | | | |
|--|----|----|----|----|--------|--------------------|
| POINT DESCRIPTION/DEVICE | AI | AO | DO | DI | ALARMA | REMARKS |
| SF-1 | | x | x | | x | SUPPLY FAN |
| SF-2 | | x | x | | x | SUPPLY FAN |
| RF-1 | | x | x | | x | RETURN FAN |
| RF-2 | | x | x | | x | RETURN FAN |
| D-1 | | x | | | | RETURN DAMPER |
| D-2 | | x | | | | RELIEF DAMPER |
| D-3 | | x | | | | OUTSIDE AIR DAMPER |
| SD | | | | | x | TYP. 2 |
| SD-1 | | | | | x | TYP. 2 |
| T-1 | x | | | | x | DUCT TEMP (SA) |
| T-2 | x | | | | x | DUCT TEMP (RA) |
| T-3 | x | | | | x | SPACE TEMP |
| FS-1 | x | | | | x | FREEZE STAT |
| PF-1 (PRE FILTER ALARM) | x | | | | x | |
| AFD-1, BIPOLAR IONIZATION (ADD ALTERNATE #1) | | | x | | x | |
| UV-1, ULTRA VIOLET LIGHT (ADD ALTERNATE #2) | | | x | | x | |

CONTROL SCHEMATIC

GENERAL:
 RTU SHALL BE ENERGIZED THROUGH THE EXISTING BAS OR LOCAL CONTROLLER. THE INTEGRAL CONTROL PANEL (ICP) FOR THE UNIT SHALL MAINTAIN THE DISCHARGE SET POINT OF THE UNIT AT 55F. THE BAS SHALL MODULATE DIRECTLY OR THROUGH THE ICP THE VARIABLE FREQUENCY DRIVE (VFD) AS REQUIRED. TEMPERATURE TRANSMITTER TT-1 SHALL REPORT TO THE BAS THE UNIT'S DISCHARGE TEMPERATURE. THE UNITS AIRFLOW MONITORING SYSTEM, TAMS-1, SHALL VERIFY AIRFLOW AND INTERLOCK WITH THE UNITS OA DAMPER TO MAINTAIN MINIMUM VENTILATION AIR TO THE BUILDING.

COOLING: RTU IS AN DX (HEAT PUMP) SYSTEM WITH STAGES OF COOLING AND AN AUXILIARY ELECTRICAL HEATING COIL TO MAINTAIN A 55F DISCHARGE TEMPERATURE, WHICH SHALL BE CONTROLLED THROUGH THE INTEGRAL CONTROL PANEL OR BAS. THE COOLING MODE WILL BE ENABLED WHEN THE OUTSIDE AIR TEMPERATURE RISES ABOVE THE OUTSIDE AIR COOLING SETPOINT. DURING THE COOLING MODE, THE DDC CONTROLLER WILL MODULATE THE DIGITAL COMPRESSOR AND/OR STAGE FIXED COMPRESSOR COOLING TO MAINTAIN THE SUPPLY AIR COOLING SETPOINT. THE COOLING MODE WILL REMAIN ACTIVE UNTIL THE OUTSIDE AIR TEMPERATURE FALLS BELOW THE OUTSIDE AIR COOLING SETPOINT. COOLING STAGES ARE MAINTAINED BY ADJUSTABLE MINIMUM ON, OFF, STAGE UP AND STAGE DOWN TIMERS.

HEATING: RTU HAS AN HEAT PUMP HEATING SYSTEM ALONG WITH AN AUXILIARY ELECTRIC HEATING COIL FOR LOW OUTDOOR AIR TEMPERATURE OPERATION. THE INTEGRAL CONTROL PANELS SHALL MODULATING THE COMPRESSORS FOR HEAT PUMP OPERATION OR ELECTRICAL HEATING COIL OPERATION (OR BOTH) IN ORDER TO MAINTAIN THE DISCHARGE SET POINT AT 55F AT ALL TIMES. THE HEATING MODE WILL BE ENABLED WHEN THE OUTSIDE AIR TEMPERATURE FALLS BELOW THE OUTSIDE AIR HEATING SETPOINT AND THE UNIT IS NOT IN THE DEHUMIDIFICATION MODE. DURING THE HEATING MODE, THE DDC CONTROLLER WILL MODULATE THE COMPRESSOR OR ELECTRIC HEATING COIL TO MAINTAIN THE SUPPLY AIR HEATING SETPOINT. THE HEATING MODE WILL REMAIN ACTIVE UNTIL THE OUTSIDE AIR TEMPERATURE RISES ABOVE THE OUTSIDE AIR HEATING SETPOINT. HEATING IS MAINTAINED BY ADJUSTABLE MINIMUM ON, OFF, STAGE UP AND STAGE DOWN TIMERS.

DEHUMIDIFICATION MODE: THE DEHUMIDIFICATION MODE WILL BE ENABLED ANYTIME THE OUTSIDE AIR DEWPOINT RISES ABOVE THE SUPPLY AIR DEWPOINT SETPOINT. DURING THE DEHUMIDIFICATION MODE, THE DDC CONTROLLER WILL MODULATE AND/OR STAGE FIXED COOLING TO MAINTAIN THE SUPPLY AIR DEWPOINT SETPOINT. THE DEHUMIDIFICATION MODE WILL REMAIN ACTIVE UNTIL THE OUTSIDE AIR DEWPOINT FALLS BELOW THE SUPPLY AIR DEWPOINT SETPOINT. REHEAT WILL BE THROUGH THE AUXILIARY ELECTRIC HEATING COIL TO MAINTAIN THE SUPPLY AIR COOLING SETPOINT MINUS 1°F.

SUPPLY FANS: SUPPLY FANS SHALL BE ENERGIZED DURING OCCUPIED MODE. DURING OCCUPIED MODE THE SUPPLY FAN SHALL RUN AT 100% TO PROVIDE VENTILATION TO THE BUILDING. DURING UNOCCUPIED MODE THE SUPPLY FAN SHALL MODULATE TO PROVIDE A MINIMUM OF 50% AIRFLOW.

ADD ALTERNATE #1
 BIPOLAR IONIZATION (AFD-1): IONIZATION SYSTEM SHALL ENERGIZE UPON PROVEN AIRFLOW BY TAMS-1. THE UNITS INTEGRAL CONTROL PANEL SHALL BE CONNECTED INTO THE BUILDINGS BAS FOR MONITORING. UNIT SHALL BE ALARMABLE TO THE BAS.

ADD ALTERNATE #2
 ULTRA VIOLET (UV) LIGHT SATURATION SECTION TO BE PROVIDED UPON APPROVAL. UV LIGHT SECTION SHALL BE ENERGIZED AND REMAIN ENERGIZED DURING RTU OPERATION. UV UNIT SHALL BE DE-ENERGIZED WHEN UNIT POWER IS OFF. UV LIGHT SHALL BE ALARMABLE, SIGNAL SHALL BE SENT TO EXISTING BAS SYSTEM UPON FAILURE.

ECONOMIZER CYCLE: DAMPERS D-1, D-2, AND D-3 SHALL MODULATE TO MAINTAIN THE LOWEST ENTERING ENTHALPHY DURING THE SUMMER MONTHS AND NO LOWER THAN 45F ENTERING TEMP DURING THE WINTER MONTHS AS INDICATED BY T-4.

SAFETIES:
 TEMPERATURE TRANSMITTER, TT-1, SHALL ALARM 5 DEGREES ABOVE OR BELOW SET POINT. IF TT-1 READS A TEMPERATURE OF 50 DEGREES F OR LOWER THE AHU SHALL DE-ENERGIZE AND SEND AN ALARM TO THE BAS. IF TT-1 READS A TEMPERATURE OF 95 DEGREES F OR HIGHER THE AHU SHALL DE-ENERGIZE AND SEND AN ALARM TO THE BAS.

IN THE EVENT OF A DIRTY FILTER WHEN THE SUPPLY FAN IS ENERGIZED UNIT SHALL SEND AN ALARM TO THE BAS.

A DISCHARGE PRESSURE TRANSDUCER WILL BE MONITORED ON EACH COMPRESSOR OR REFRIGERANT CIRCUIT. THE CONDENSER FAN SIGNAL (VFD) IS MODULATED TO MAINTAIN 110F (365PSI) CONDENSING TEMPERATURE DURING THE COOLING AND DEHUMIDIFICATION MODES. DURING THE HEATING MODE THE CONDENSER FAN SIGNAL WILL BE AT 100%. ONCE INITIALIZED, THE CONDENSER FANS WILL RUN AT 100% FOR 30SEC AND THEN DROP TO 50% FOR AN ADDITIONAL 30SEC.

UNITS SHALL BE INTEGRATED INTO THE BUILDING EXISTING CONTROL PANEL AND BUILDING SMOKE CONTROL SEQUENCING. LOCATION OF BUILDING RTU CONTROL PANEL SHALL BE CONFIRMED AND VERIFIED BY THE CONTRACTOR. TYPICAL PANEL LOCATIONS ARE LOCATED ON THE FOURTH FLOOR ELECTRICAL CLOSET. EXISTING SMOKE EVACUATION PUSH BUTTON FOR EACH BUILDING SHALL BE REMAIN AND BE INTEGRATED INTO NEW UNITS.

| | | | | | | | | |
|---|--|--|--|---|---|---|--|--|
| <p>RMF ENGINEERING, INC. 5520 RESEARCH PARK DR, 3RD FLR BALTIMORE, MD 21228 P: 410.576-0505 F: 410.385-0327 RMF Project No. 121004.A0</p> | | REVISIONS NO. DESCRIPTION BY DATE FINAL SUBMISSION 09-22-2023 | | | ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS GENERAL ENGINEERING HERITAGE COMPLEX - RTU REPLACEMENT MECHANICAL CONTROL SEQUENCES Drawing No.: M700 | | | |
| | | APPROVED DATE 12/7/2023 PROJECT MANAGER PROJECT NO. C537800 SHEET NO. TS OF 22 PROPOSAL NO. C537896 | | APPROVED DATE 12/6/2023 CHECKED BY MFS PROJECT NO. C537800 SHEET NO. TS OF 22 PROPOSAL NO. C537896 | | SCALE: NTS DRAWN BY MFS CHECKED BY MFS PROJECT NO. C537800 SHEET NO. TS OF 22 PROPOSAL NO. C537896 | | |

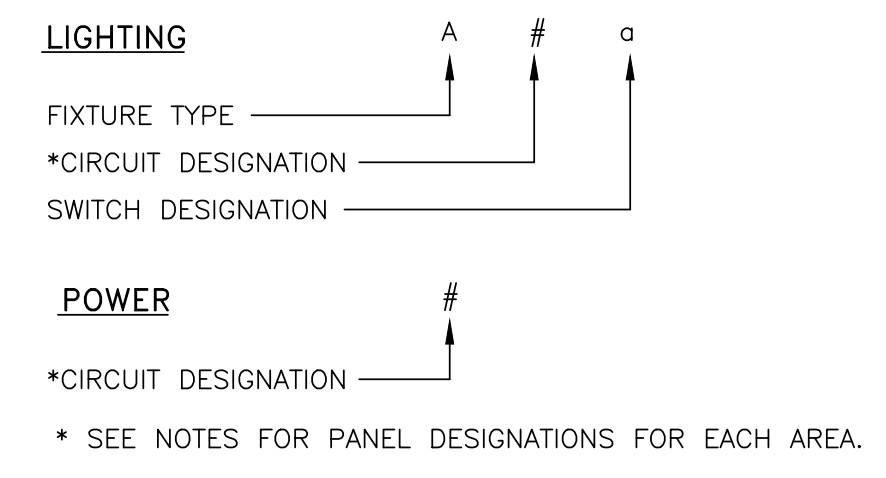
ELECTRICAL ABBREVIATIONS

| | | | |
|----------|---------------------------------|------------|--|
| A, AMP | - AMPERE | KVAR | - KILOVOLT AMPERES REACTIVE |
| AC | - ALTERNATING CURRENT | KW | - KILOWATTS |
| A/C | - AIR CONDITIONING | KWH | - KILOWATT HOUR |
| AFF | - ABOVE FINISHED FLOOR | LA | - LIGHTNING ARRESTOR |
| AFG | - ABOVE FINAL GRADE | LC | - LIGHTING CONTACTOR |
| AHU | - AIR HANDLING UNIT | LTG | - LIGHTING |
| AIC | - AMPS INTERRUPTING CAPACITY | LTNG | - LIGHTNING |
| ALT | - ALTERNATE | LP | - LIGHTING PANEL |
| ANN | - ANNUNCIATOR | LRA | - LOCKED ROTOR AMPERES |
| APPROX | - APPROXIMATELY | MATV | - MASTER ANTENNA TELEVISION |
| ARCH | - ARCHITECT | MCB | - MAIN CIRCUIT BREAKER |
| ATC | - AUTOMATIC TEMPERATURE CONTROL | MCC | - MOTOR CONTROL CENTER |
| ATS | - AUTOMATIC TRANSFER SWITCH | MEH | - METAL HALIDE |
| AWG | - AMERICAN WIRE GAUGE | MH | - MANHOLE, MOUNTING HEIGHT |
| BAS | - BUILDING AUTOMATION SYSTEM | MLO | - MAIN LUGS ONLY |
| BFC | - BELOW FINISHED CEILING | MSP | - MOTOR STARTER PANEL |
| BFG | - BELOW FINISHED GRADE | MTD | - MOUNTED |
| BLDG | - BUILDING | MV | - MERCURY VAPOR |
| BOD | - BOTTOM OF DEVICE | NC | - NORMALLY CLOSED |
| C, CND | - CONDUIT | NEC | - NATIONAL ELECTRICAL CODE |
| CATV | - CABLE TELEVISION | NESS | - NON-FUSED SAFETY SWITCH |
| CB | - CIRCUIT BREAKER | NO | - NUMBER, NORMALLY OPEN |
| CCTV | - CLOSED CIRCUIT TELEVISION | OC | - ON CENTER |
| CKT | - CIRCUIT | OFCI | - OWNER FURNISHED CONTRACTOR INSTALLED |
| CL | - CURRENT LIMITING | OFI | - OWNER FURNISHED OWNER INSTALLED |
| CLG | - CEILING | OH | - OVERHEAD |
| CONN | - CONNECT | Ø, PH | - PHASE |
| CPT | - CONTROL POWER TRANSFORMER | P | - POLE |
| CT | - CURRENT TRANSFORMER | PB | - PUSHBUTTON |
| CTR | - CENTER | PF | - POWER FACTOR |
| CU, CO | - COPPER | PFCC | - POWER FACTOR CORRECTION CAPACITOR |
| CX | - CONNECT TO EXISTING | PI | - PILOT LIGHT |
| DC | - DIRECT CURRENT | PLC | - PROGRAMMABLE LIGHTING CONTROL |
| DISC | - DISCONNECT | PNL | - PANEL |
| DN | - DOWN | PP | - POWER PANEL |
| DP | - DISTRIBUTION PANEL | PR | - PAIR |
| DPST | - DOUBLE POLE SINGLE THROW | PT | - POTENTIAL TRANSFORMER |
| DPDT | - DOUBLE POLE DOUBLE THROW | PVC | - POLYVINYL CHLORIDE |
| DT | - DOUBLE THROW | P | - PUMP |
| DWG | - DRAWING | QTY | - QUANTITY |
| E, EMERG | - EMERGENCY | RCS | - REMOTE CONTROL SWITCH |
| EA | - EACH | REC, RECP | - RECEPTACLE |
| EC | - EMPTY CONDUIT | REQ'D | - REQUIRED |
| EF | - EXHAUST FAN | RFI | - RADIO FREQUENCY INTERFERENCE |
| EH | - ELECTRIC HEATER | RGS | - RIGID GALVANIZED STEEL |
| ELEC | - ELECTRIC | RLA | - RUNNING LOAD AMPERES |
| ELEV | - ELEVATION | RM | - ROOM |
| ETR | - EXISTING TO REMAIN | RVAT | - REDUCED VOLTAGE AUTO TRANSFORMER |
| EX | - EXISTING | RX | - REMOVE EXISTING |
| EXP | - EXPOSED | SC | - SURGE CAPACITOR |
| EWC | - ELECTRIC WATER COOLER | SEC | - SECONDARY |
| FR | - FRAME | SN, S/N | - SOLID NEUTRAL |
| FA | - FIRE ALARM | SP | - SURGE PROTECTION |
| FAAP | - FIRE ALARM ANNUNCIATOR PANEL | SPDT | - SINGLE POLE DOUBLE THROW |
| FACP | - FIRE ALARM CONTROL PANEL | SS | - SAFETY SWITCH |
| FBO | - FURNISHED BY OTHERS | SST | - SOLID STATE |
| FC | - FAN COIL | ST | - SINGLE THROW |
| FDR | - FEEDER | SW | - SWITCH |
| FLA | - FULL LOAD AMPERES | SWBD | - SWITCHBOARD |
| FLR | - FLOOR | TBR | - TO BE REMOVED |
| FU | - FUSED AND FUSIBLE | TC | - TIME CLOCK |
| FUSS | - FUSED SAFETY SWITCH | TEL, TELE | - TELEPHONE |
| FVR | - FULL VOLTAGE REVERSING | TOD | - TOP OF DEVICE |
| FVNR | - FULL VOLTAGE NON-REVERSING | TRANS/XFMR | - TRANSFORMER |
| GEN | - GENERATOR, GENERAL | TH | - TUNGSTEN HALOGEN |
| GFI | - GROUND FAULT INTERRUPTER | TTB | - TELEPHONE TERMINAL BOARD |
| GFR | - GROUND FAULT RELAY | TW | - TWISTED |
| GRD | - GROUND | TYP | - TYPICAL |
| GRS | - GALVANIZED RIGID STEEL | UG | - UNDERGROUND |
| HID | - HIGH INTENSITY DISCHARGE | UH | - UNIT HEATER |
| HOA | - HAND-OFF-AUTOMATIC | UON | - UNLESS OTHERWISE NOTED |
| HP | - HORSEPOWER | V | - VOLTS |
| HPS | - HIGH PRESSURE SODIUM | VFC | - VARIABLE FREQUENCY CONTROLLER |
| HTR | - HEATER | W | - WATTS, WIRE |
| HV | - HIGH VOLTAGE | W/ | - WITH |
| HZ | - HERTZ | WP | - WEATHER-PROOF |
| IG | - ISOLATED GROUND | XP | - EXPLOSION PROOF |
| JB | - JUNCTION BOX | 2S1W | - 2 SPEED SINGLE WINDING |
| KCMIL | - THOUSAND CIRCULAR MILS | 2S2W | - 2 SPEED DOUBLE WINDING |
| KV | - KILOVOLTS | | |
| KVA | - KILOVOLT AMPERES | | |

POWER SYMBOLS

| SYMBOL | DESCRIPTIONS | MH (UON) |
|--------|--|----------|
| | NON-FUSED DISCONNECT SWITCH | |
| | PANELBOARD | |
| | DISTRIBUTION PANELBOARD | |
| | TRANSFORMER | |
| | RACEWAY "UP" OR "TOWARDS" | |
| | RACEWAY "DOWN" OR "AWAY" | |
| | CIRCUIT CONCEALED IN WALLS OR CEILING SPACE. CONDUCTORS SHALL BE MINIMUM 2#12 AWG AND 1#12 AWG GROUND IN 3/4" CONDUIT, (UNLESS OTHERWISE NOTED) | |
| | RACEWAY CONCEALED IN SLAB OR BELOW GRADE. | |
| | BRANCH CIRCUIT HOMERUN TO PANELBOARD. QUANTITY OF CIRCUITS INDICATED BY ARROWS (→). NUMBER OF CONDUCTORS SHALL BE MINIMUM 2#12 AWG AND 1#12 AWG GROUND IN 3/4" CONDUIT, (UNLESS OTHERWISE NOTED) | |
| | RACEWAY RUN EXPOSED. CONDUCTORS SHALL BE MINIMUM 2#12 AWG AND 1#12 AWG IN 3/4" CONDUIT, (UNLESS OTHERWISE NOTED) | |
| | 20A DUPLEX RECEPTACLE | |
| | DUCT TYPE SMOKE DETECTOR | |

CIRCUIT DESIGNATIONS



EQUIPMENT DESIGNATIONS

| DESIGNATION | DESCRIPTIONS |
|-------------|----------------------|
| SWGR | SWITCHGEAR |
| SWBD | SWITCHBOARD |
| PNL | PANELBOARD |
| MCC | MOTOR CONTROL CENTER |
| XFMR | TRANSFORMER |

GENERAL NOTES:

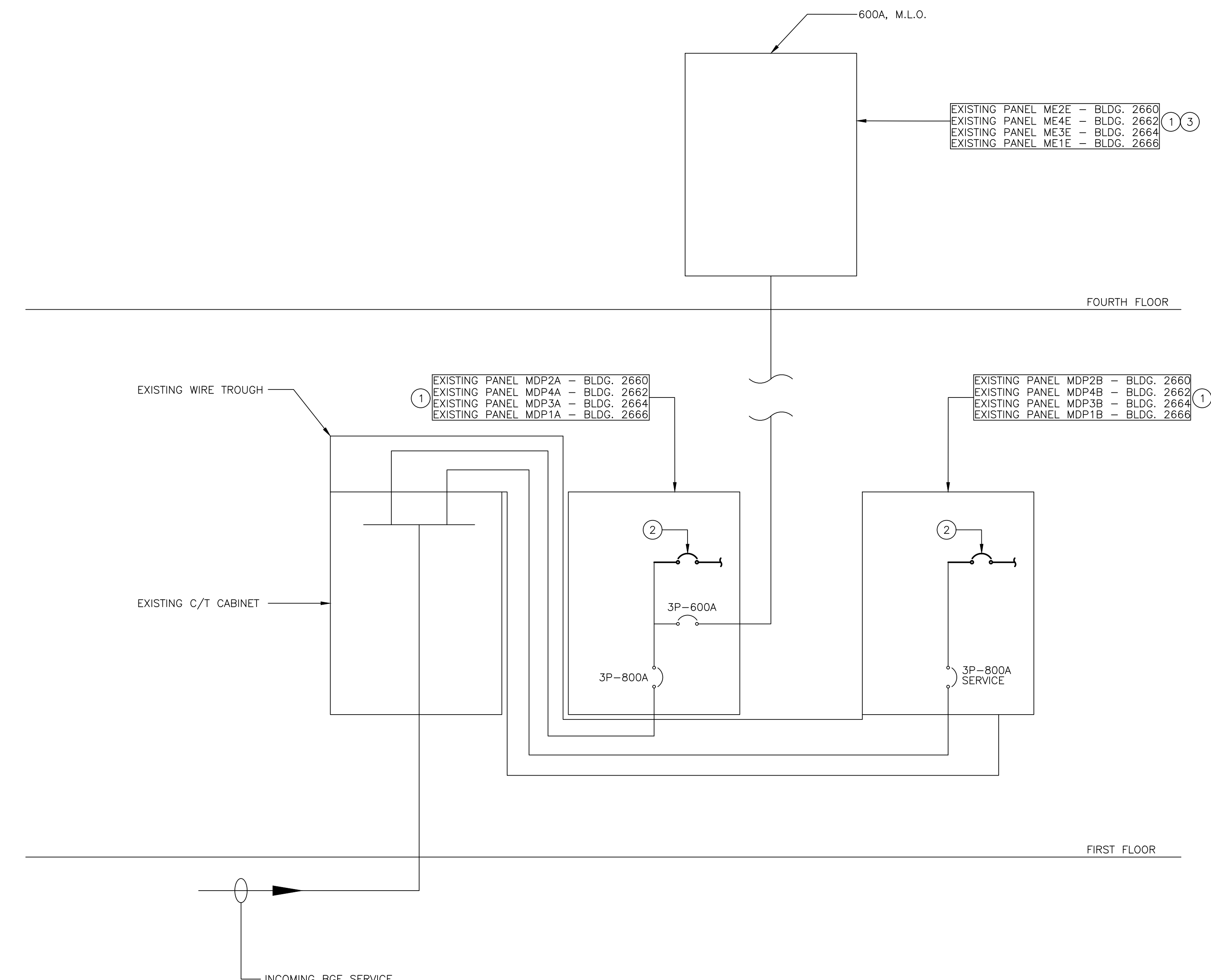
- THIS IS A STANDARD SYMBOL LIST. SOME SYMBOLS MAY NOT APPEAR ON THE ACCOMPANYING DRAWINGS.
- REFER TO SPECIFICATIONS FOR DETAILED REQUIREMENTS.
- PLAN & SECTION SYMBOLS MAY ALSO BE USED ON RISER DIAGRAMS.
- ON SINGLE LINE DIAGRAMS FOR 3 PHASE SYSTEMS, DEVICE QUANTITY = 3 UNLESS OTHERWISE NOTED.
- DEVICE SHALL BE MOUNTED A MINIMUM OF 80" AFF TO BOTTOM OF DEVICE LENS AND BELOW THE FINISHED CEILING OF NOT LESS THAN 6".
- UNLESS OTHERWISE NOTED ALL INTERIOR CONDUITS AND BOXES SHALL BE CONCEALED.
- DUCT SMOKE DETECTORS TO BE U.L. LISTED FOR EXISTING SYSTEM. DEVICES TO BE INSTALLED AND APPROVED BY NICET STAFF.

SPECIAL SYSTEMS SYMBOLS

| SYMBOL | DESCRIPTIONS | MH (UON) |
|--------|---------------------|----------|
| | DUCT SMOKE DETECTOR | |

ELECTRICAL DRAWING PRESENTATION

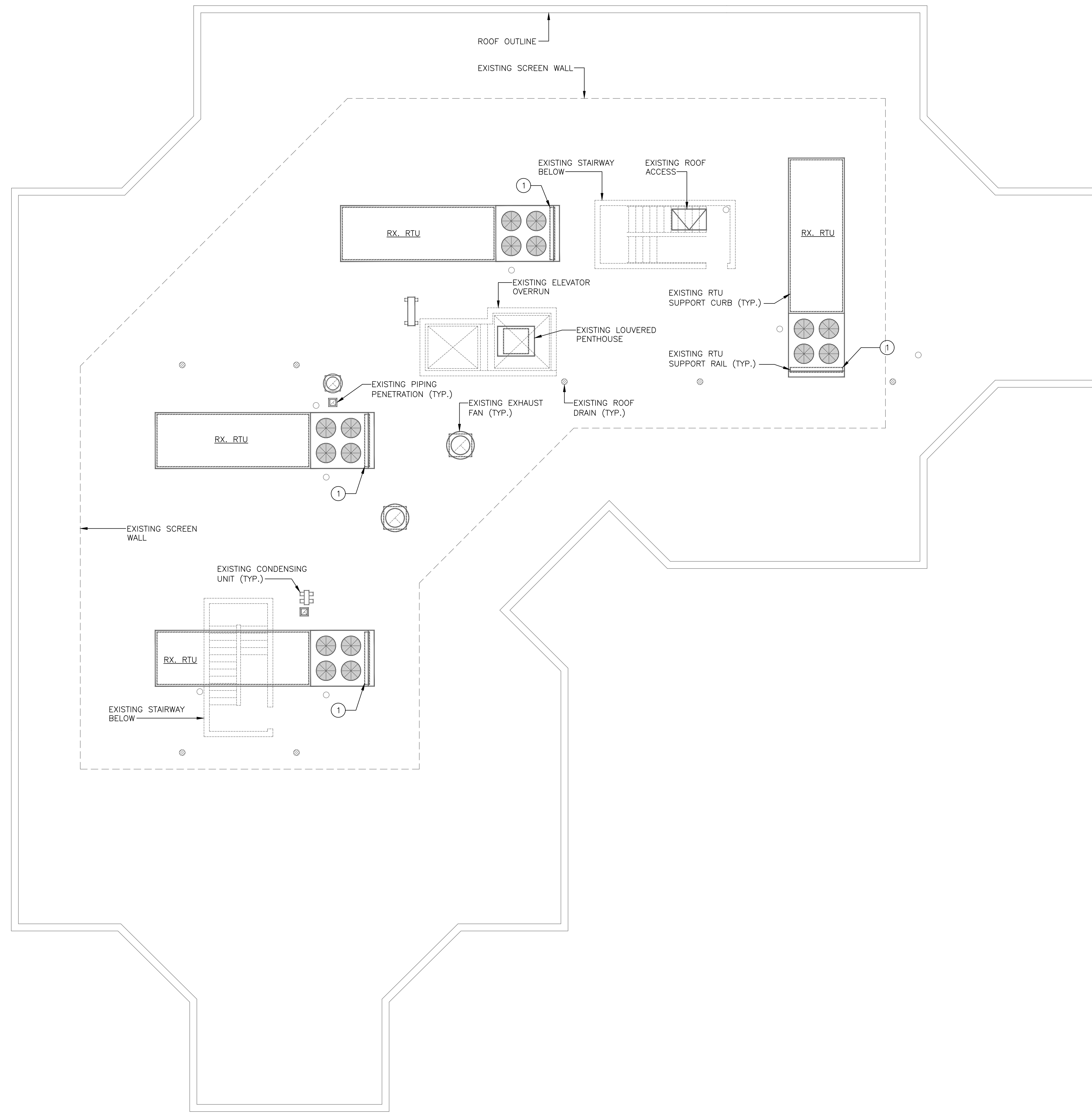
| SYMBOL | DESCRIPTIONS |
|--------|--|
| | REVISION NUMBER 2 |
| | DRAWING NOTE NUMBER 2 |
| | EQUIPMENT TAG NUMBER - REFER TO EQUIPMENT SCHEDULE |
| | SECTION/ELEVATION IDENTIFICATION |
| | PART PLAN AND DETAIL IDENTIFICATION |
| | EXISTING LINE TYPE |
| | NEW ELECTRICAL WORK LINE TYPE |
| | FUTURE ELECTRICAL WORK LINE TYPE |
| | DEMOLITION LINE TYPE ON DEMOLITION DRAWINGS |



EXISTING POWER DISTRIBUTION DIAGRAM

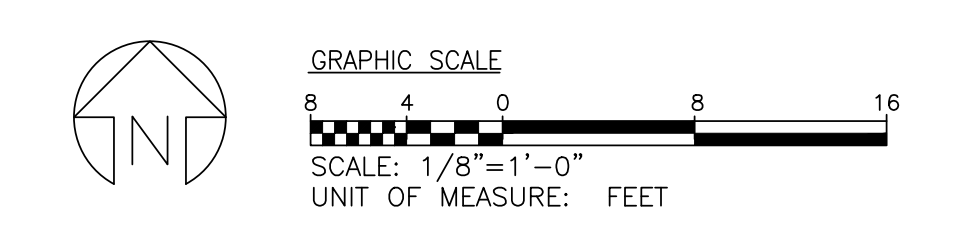
- GE TYPE CCB - RATED 22,000 AIC.
- PROVIDE A 3P-200A BREAKER - GE TYPE TFK IN EXISTING SPACE. CONNECT RTU INDICATED ON PLAN. TYPICAL FOR EACH PANEL INDICATED.
- REMOVE 4: 3P-175A CIRCUIT BREAKERS. PROVIDE 2: 3P-200A BREAKERS AND CONNECT RTU'S INDICATED ON PLAN. GE TYPE TFK CIRCUIT BREAKERS - TYPICAL FOR EACH PANEL INDICATED.

| <p>RMF ENGINEERING, INC. 5520 RESEARCH PARK DR, 3RD FLR BALTIMORE, MD 21228 P: 410.576-0505 F: 410.385-0327 RMF Project No. 121004.A0</p> | | <p>REVISIONS</p> <table border="1"> <thead> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>BY</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td>1</td> <td>FINAL SUBMISSION</td> <td></td> <td>09-22-2023</td> </tr> </tbody> </table> | | NO. | DESCRIPTION | BY | DATE | 1 | FINAL SUBMISSION | | 09-22-2023 | <p>APPROVED</p> <table border="1"> <tr> <td>DATE: 12/7/2023</td> <td>APPROVED: [Signature]</td> </tr> <tr> <td>DATE: 12/6/2023</td> <td>APPROVED: [Signature]</td> </tr> </table> | | DATE: 12/7/2023 | APPROVED: [Signature] | DATE: 12/6/2023 | APPROVED: [Signature] |
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| | | NO. | DESCRIPTION | BY | DATE | | | | | | | | | | | | |
| 1 | FINAL SUBMISSION | | 09-22-2023 | | | | | | | | | | | | | | |
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| DATE: 12/6/2023 | APPROVED: [Signature] | | | | | | | | | | | | | | | | |
| <p>Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License Number: 16961. EXP. DATE: 06/14/2024.</p> | | <p>ANNE ARUNDEL COUNTY DEPARTMENT OF PUBLIC WORKS</p> <p>SCALE: N.T.S. GENERAL ENGINEERING</p> <p>PROJECT: HERITAGE COMPLEX - RTU REPLACEMENT</p> <p>CHECKED BY: SLD PROJECT NO. C537800</p> <p>DATE: 12/7/2023</p> | | <p>DATE: 12/7/2023</p> <p>PROJECT MANAGER: [Signature]</p> <p>CHECKED BY: SLD PROJECT NO. C537800</p> <p>DATE: 12/7/2023</p> <p>PROPOSAL NO. C537896</p> | | | | | | | | | | | | | |



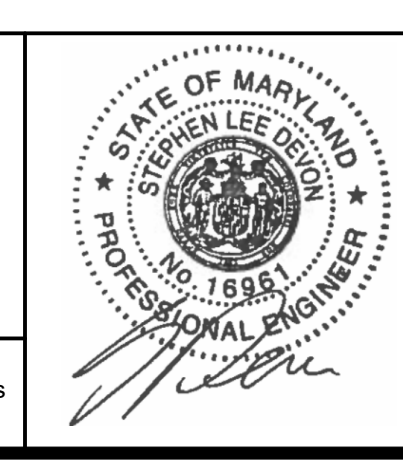
DRAWING NOTES:
 ① REMOVE EXISTING DISCONNECT AND FEEDER BACK TO PANELBOARD ON FOURTH FLOOR IN ELECTRICAL ROOM. REMOVE BREAKER FROM PANELBOARD. DISCONNECT AND REMOVE EXISTING DUCT SMOKE DETECTORS.

ROOF PLAN BUILDING 2660 – DEMOLITION



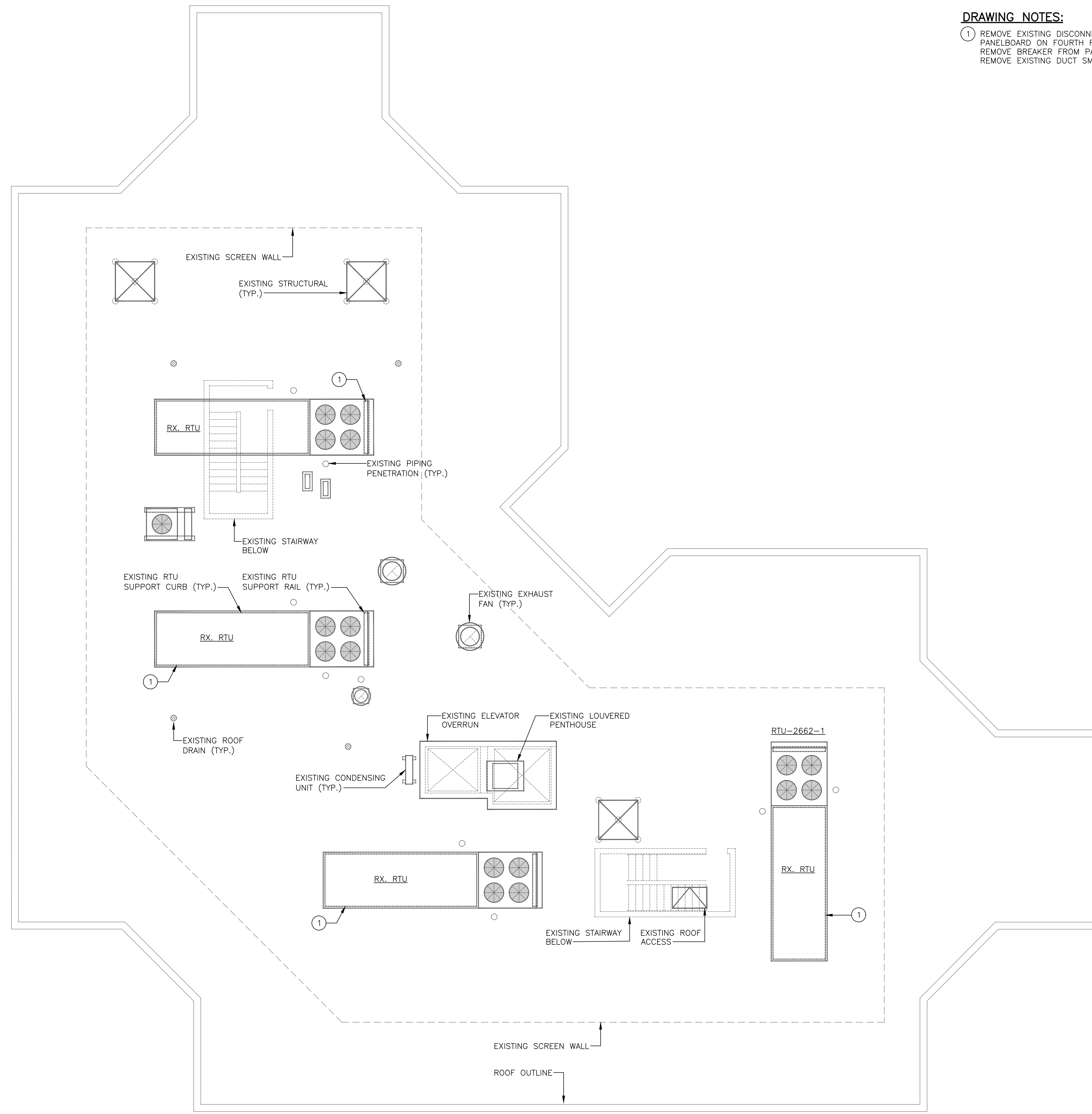
rmf RMF ENGINEERING, INC.
 5520 RESEARCH PARK DR, 3RD FLR
 BALTIMORE, MD 21228
 P: 410.576-0505 F: 410.385-0327
 RMF Project No. 121004.A0

Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License Number ___16961___ EXP. DATE ___06/14/2024___



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| | FINAL SUBMISSION | | 09-22-2023 |
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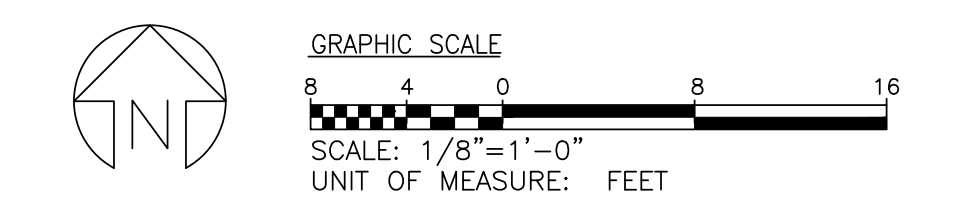
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| APPROVED | | DATE | | APPROVED | | DATE | | SCALE: 1/4"=1'0" | | GENERAL ENGINEERING | |
| <i>David C. Bruner</i> | | 12/7/2023 | | <i>Diego Velazquez</i> | | 12/6/2023 | | BRUNER CAS | | HERITAGE COMPLEX – RTU REPLACEMENT | |
| PROJECT ENGINEER | | DATE | | PROJECT MANAGER | | DATE | | CHECKED BY: SLD | | DEMOLITION ROOF PLAN | |
| APPROVED | | DATE | | APPROVED | | DATE | | PROJECT NO. C537800 | | ELECTRICAL – BUILDING 2660 | |
| <i>David C. Bruner</i> | | 12/7/2023 | | <i>Diego Velazquez</i> | | 12/7/2023 | | PAGE 15 OF 22 | | Drawing No.: ED101 | |
| CONSULTING CHIEF ENGINEER | | CHECKED/IN CHARGE OF WAY SERVICES | | PROPOSAL NO. C537896 | | | | | | | |



DRAWING NOTES:

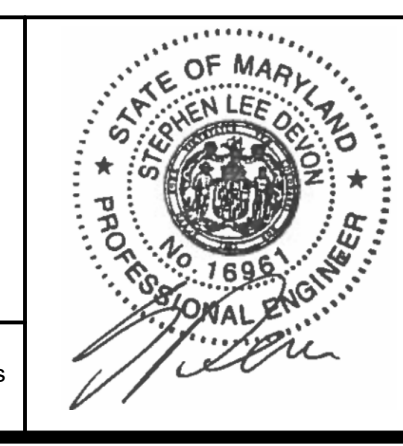
- ① REMOVE EXISTING DISCONNECT AND FEEDER BACK TO PANELBOARD ON FOURTH FLOOR IN ELECTRICAL ROOM. REMOVE BREAKER FROM PANELBOARD. DISCONNECT AND REMOVE EXISTING DUCT SMOKE DETECTORS.

ROOF PLAN BUILDING 2662 – DEMOLITION



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RMF Project No. 121004.A0

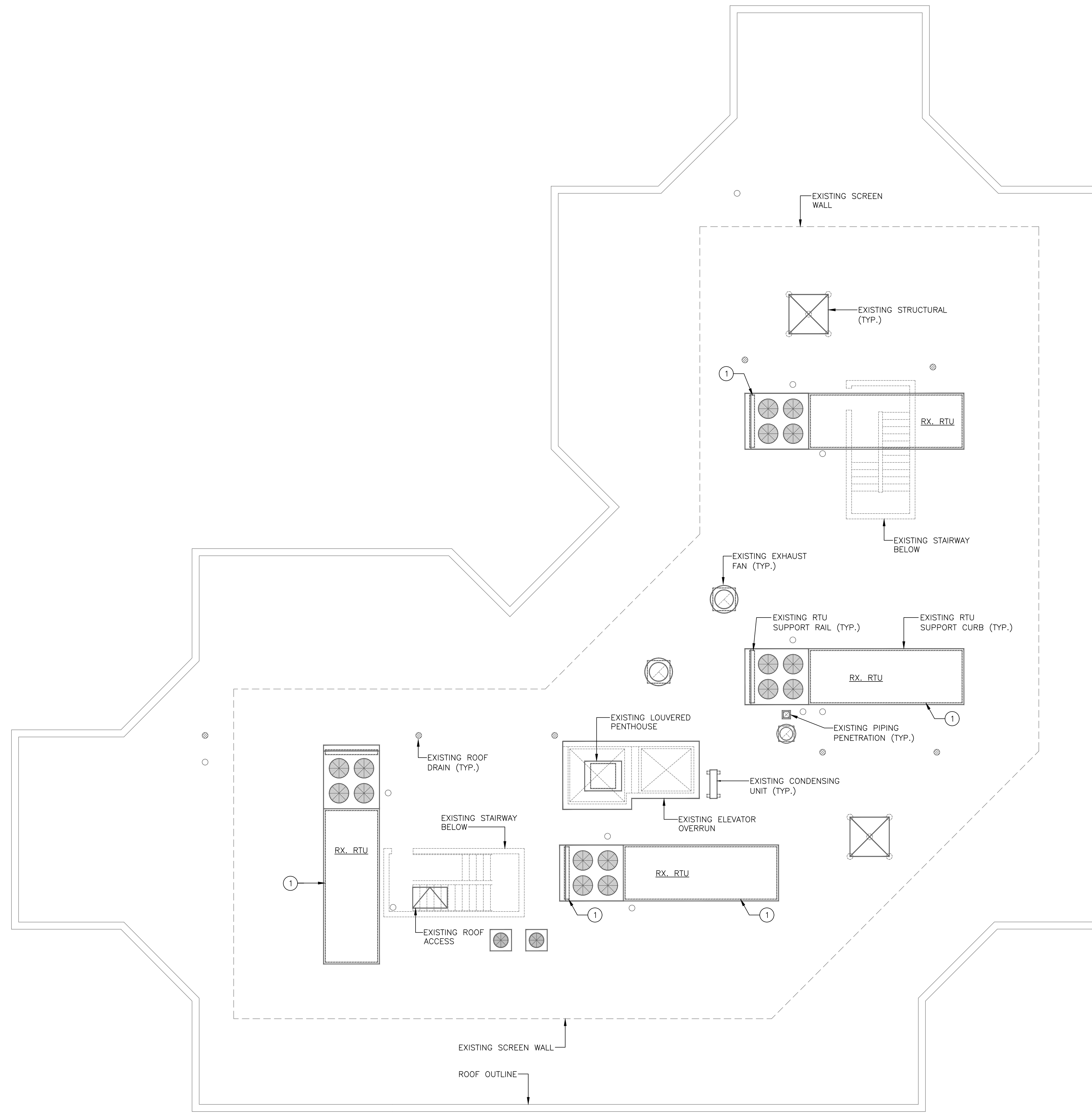
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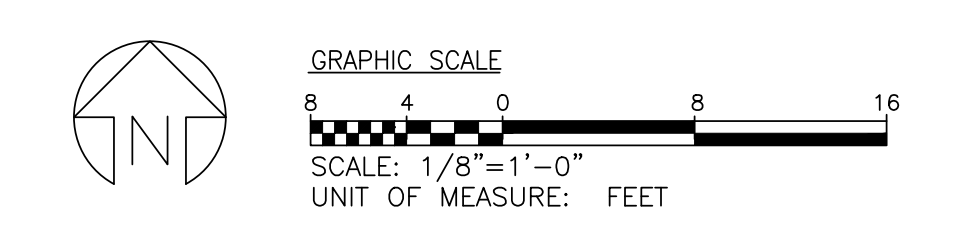
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DEPARTMENT OF PUBLIC WORKS**

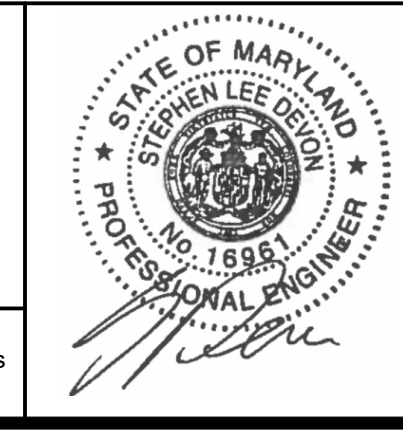
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| APPROVED <i>[Signature]</i> 12/7/2023 | DATE 12/7/2023 | APPROVED <i>[Signature]</i> 12/7/2023 | DATE 12/7/2023 | CHECKED BY: SLD PROJECT NO. C537800 | HERITAGE COMPLEX – RTU REPLACEMENT DEMOLITION ROOF PLAN – ELECTRICAL – BUILDING 2662 |
| CONSISTENT CHIEF ENGINEER | CHECKED/IN CHARGE OF WAY SERVICES | PROPOSAL NO. C537896 | Drawing No.: | 16 | ED102 |



ROOF PLAN BUILDING 2664 – DEMOLITION



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 RMF ENGINEERING, INC.
 5520 RESEARCH PARK DR, 3RD FLR
 BALTIMORE, MD 21228
 P: 410.576-0505 F: 410.385-0327
 RMF Project No. 121004.A0



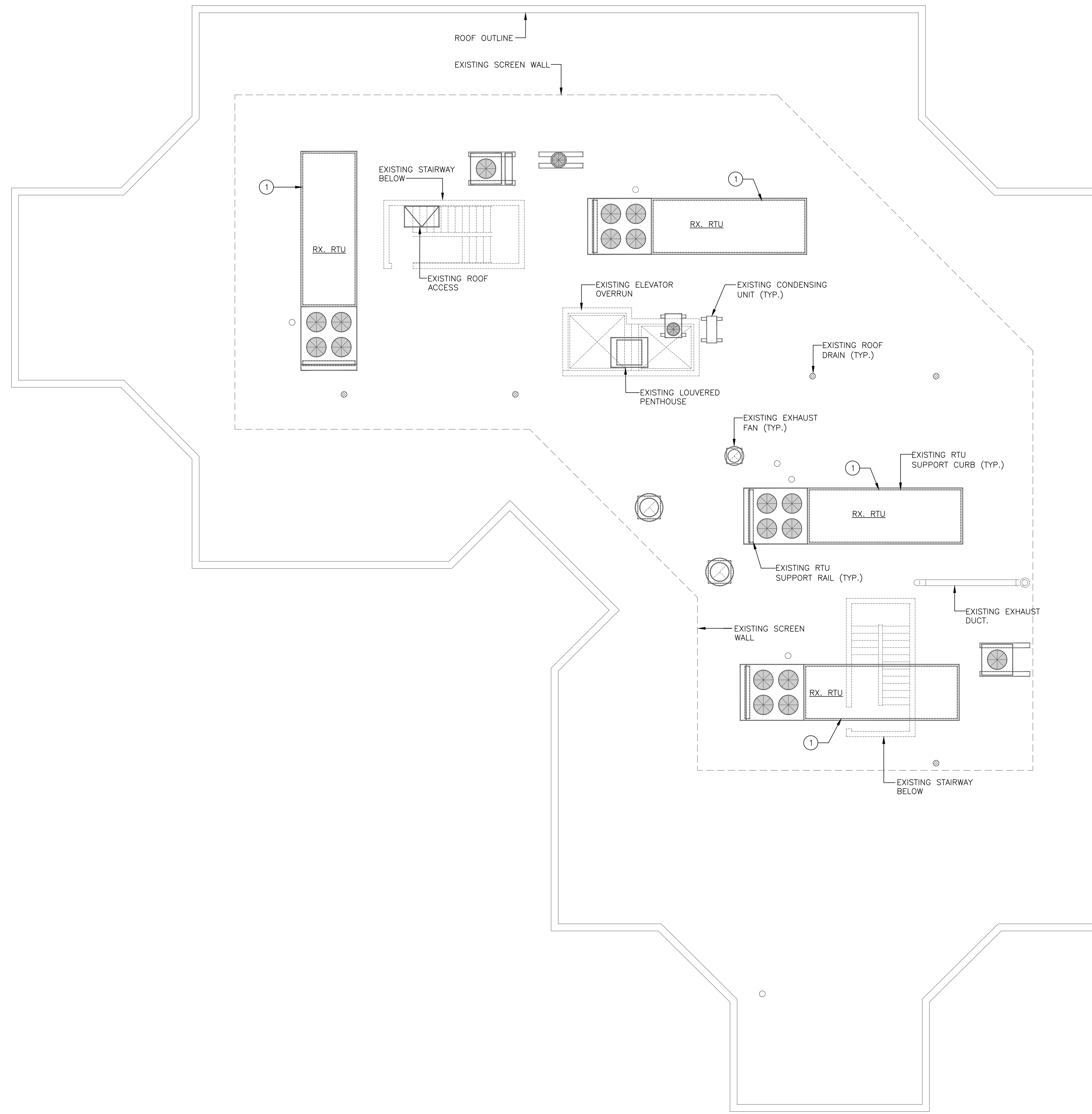
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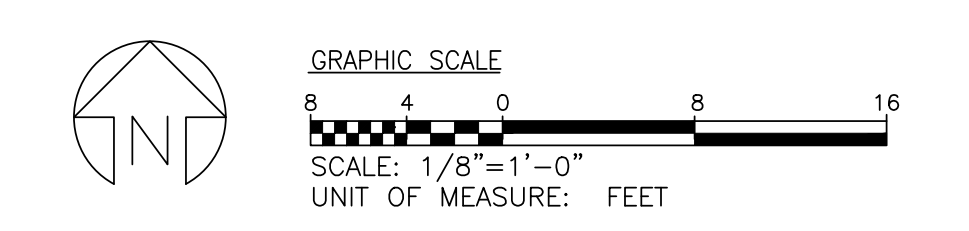
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| <i>David O. Bruner</i> | <i>David O. Bruner</i> | <i>David O. Bruner</i> | <i>David O. Bruner</i> | <i>David O. Bruner</i> | <i>David O. Bruner</i> | <i>David O. Bruner</i> | <i>David O. Bruner</i> | <i>David O. Bruner</i> | <i>David O. Bruner</i> | <i>David O. Bruner</i> | <i>David O. Bruner</i> |
| PROFESSIONAL ENGINEER | PROFESSIONAL ENGINEER | PROFESSIONAL ENGINEER | PROFESSIONAL ENGINEER | PROFESSIONAL ENGINEER | PROFESSIONAL ENGINEER | PROFESSIONAL ENGINEER | PROFESSIONAL ENGINEER | PROFESSIONAL ENGINEER | PROFESSIONAL ENGINEER | PROFESSIONAL ENGINEER | PROFESSIONAL ENGINEER |
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| PROJECT NO. 121004.A0 | | | | PROJECT NO. 121004.A0 | | | | PROJECT NO. 121004.A0 | | | |
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| SHEET 17 OF 22 | | | | SHEET 17 OF 22 | | | | SHEET 17 OF 22 | | | |
| PROPOSAL NO. C537896 | | | | PROPOSAL NO. C537896 | | | | PROPOSAL NO. C537896 | | | |
| DRAWING NO. ED103 | | | | DRAWING NO. ED103 | | | | DRAWING NO. ED103 | | | |

ANNE ARUNDEL COUNTY
 DEPARTMENT OF PUBLIC WORKS
 GENERAL ENGINEERING

HERITAGE COMPLEX – RTU REPLACEMENT
 DEMOLITION ROOF PLAN –
 ELECTRICAL – BUILDING 2664
 Drawing No.: ED103

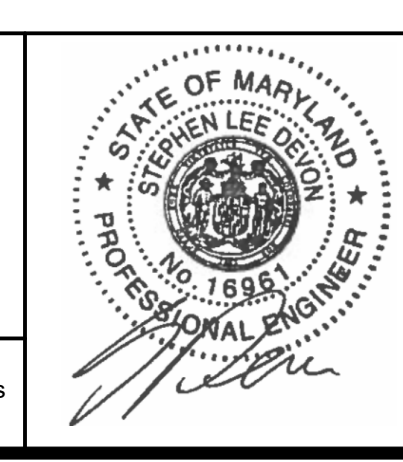


ROOF PLAN BUILDING 2666 – DEMOLITION



rmf RMF ENGINEERING, INC.
5520 RESEARCH PARK DR, 3RD FLR
BALTIMORE, MD 21228
P: 410.576-0505 F: 410.385-0327
RMF Project No. 121004.A0

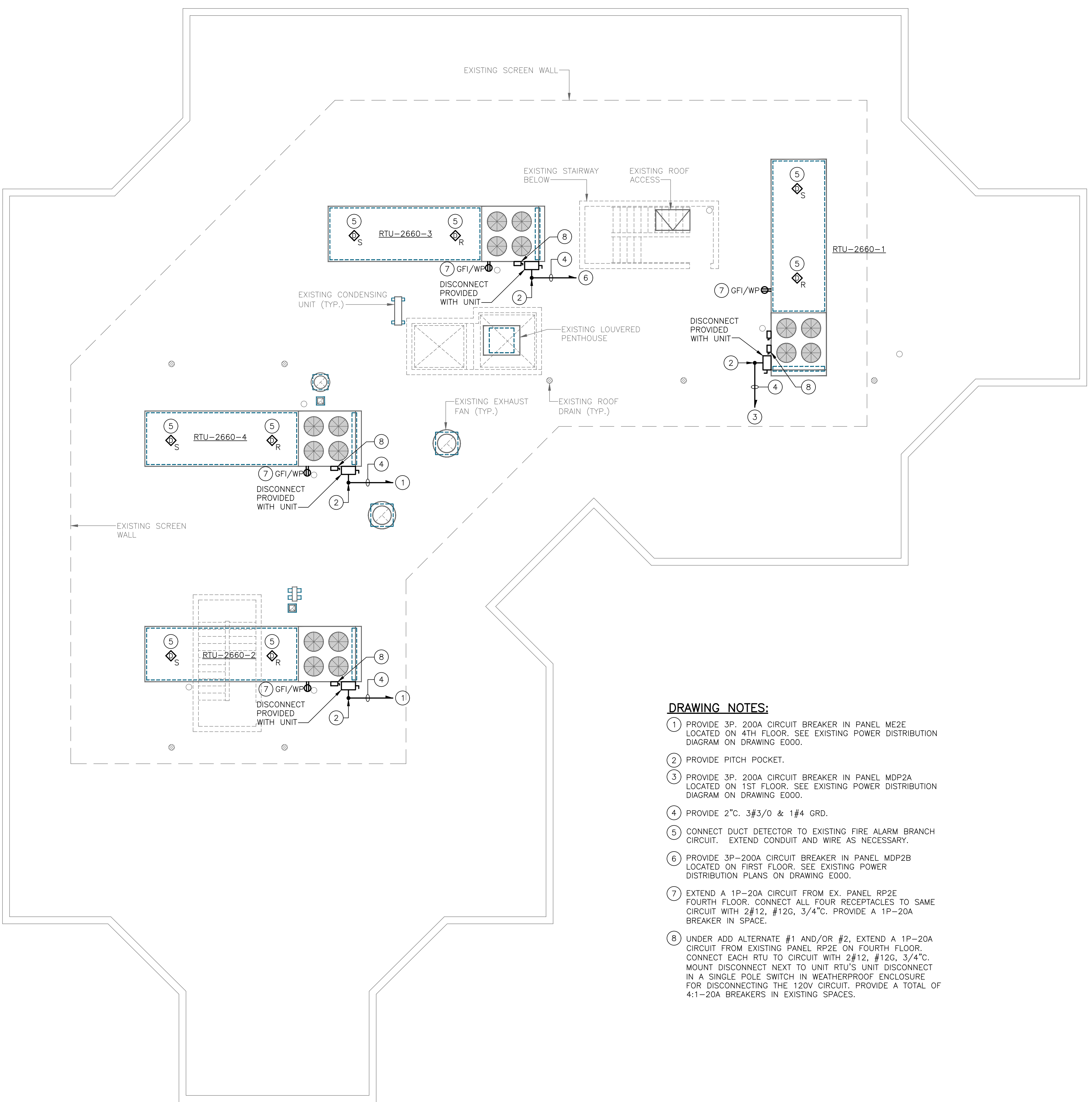
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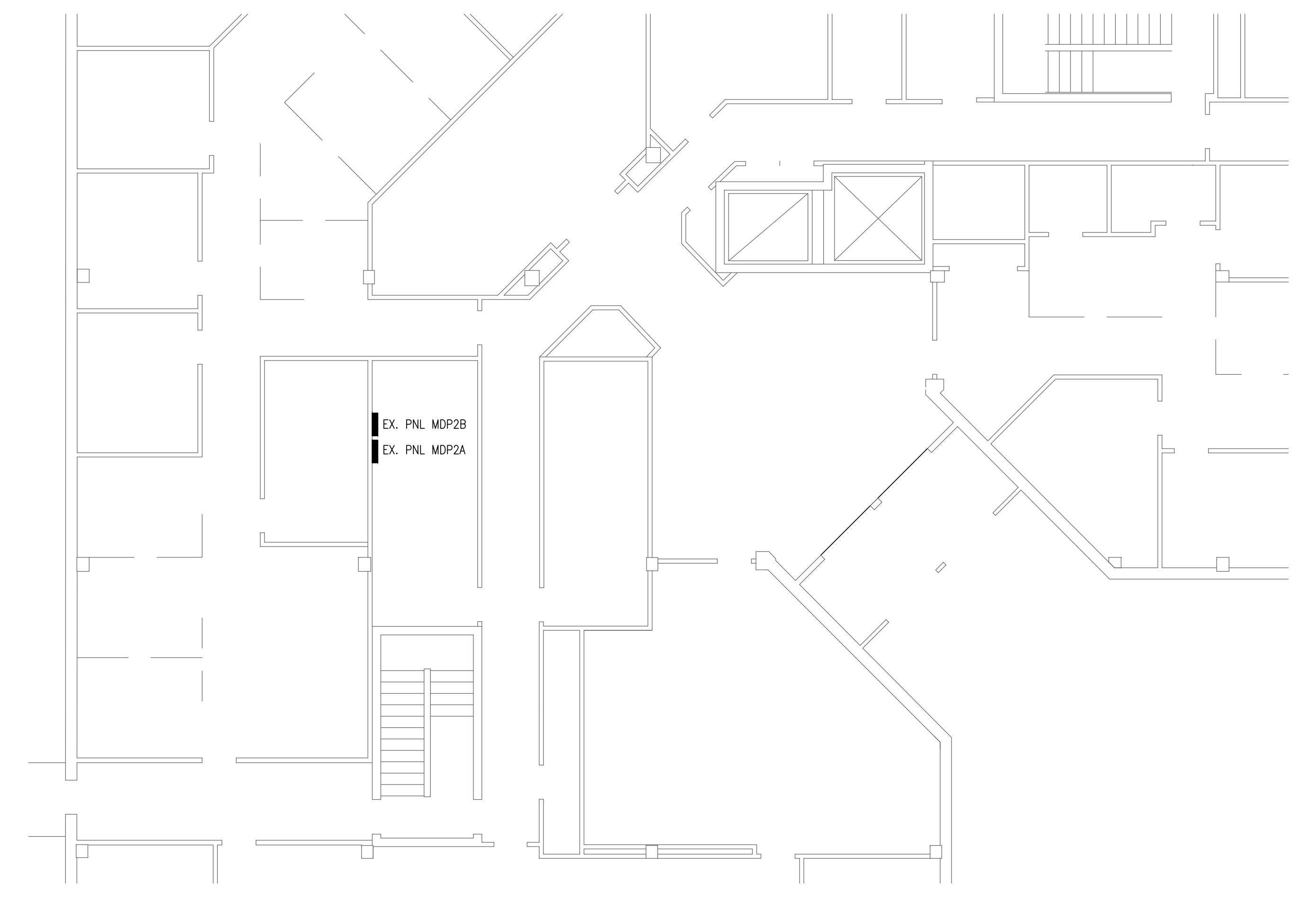
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| NO. | DESCRIPTION | BY | DATE |
| | FINAL SUBMISSION | | 09-22-2023 |
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DEPARTMENT OF PUBLIC WORKS**

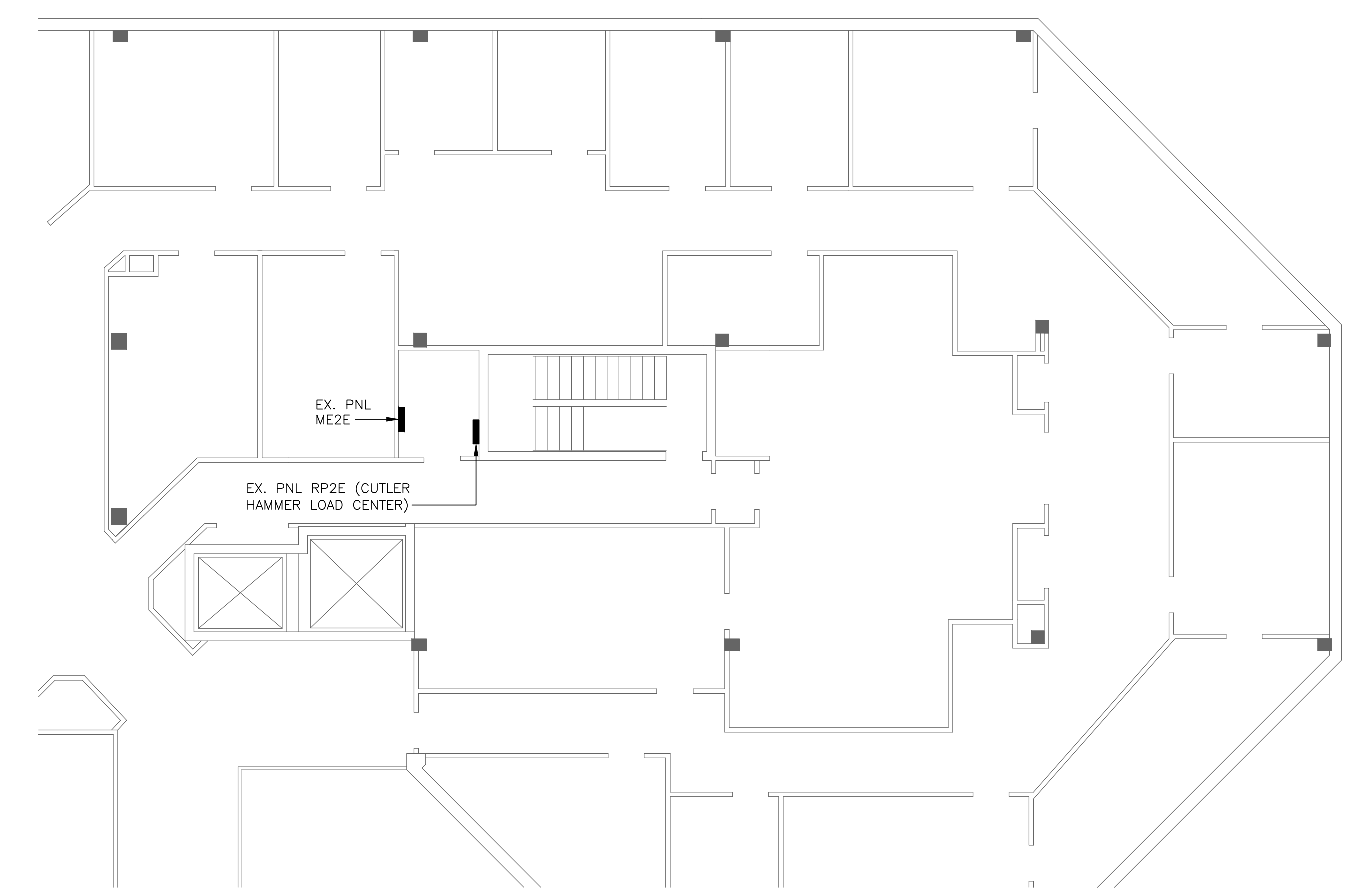
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| APPROVED <i>[Signature]</i> 12/7/2023 | DATE 12/7/2023 | APPROVED <i>[Signature]</i> 12/7/2023 | DATE 12/7/2023 | CHECKED BY: SLD PROJECT NO. C537800 | HERITAGE COMPLEX – RTU REPLACEMENT DEMOLITION ROOF PLAN – ELECTRICAL – BUILDING 2666 |
| CONSULTING CHIEF ENGINEER | CHECKER/IN-CHARGE OF WAY SERVICES | PROPOSAL NO. C537896 | Drawing No.: | 18 OF 22 | ED104 |



- DRAWING NOTES:**
- ① PROVIDE 3P, 200A CIRCUIT BREAKER IN PANEL ME2E LOCATED ON 4TH FLOOR, SEE EXISTING POWER DISTRIBUTION DIAGRAM ON DRAWING E000.
 - ② PROVIDE PITCH POCKET.
 - ③ PROVIDE 3P, 200A CIRCUIT BREAKER IN PANEL MDP2A LOCATED ON 1ST FLOOR, SEE EXISTING POWER DISTRIBUTION DIAGRAM ON DRAWING E000.
 - ④ PROVIDE 2" C. 3#3/0 & 1#4 GRD.
 - ⑤ CONNECT DUCT DETECTOR TO EXISTING FIRE ALARM BRANCH CIRCUIT. EXTEND CONDUIT AND WIRE AS NECESSARY.
 - ⑥ PROVIDE 3P-200A CIRCUIT BREAKER IN PANEL MDP2B LOCATED ON FIRST FLOOR, SEE EXISTING POWER DISTRIBUTION PLANS ON DRAWING E000.
 - ⑦ EXTEND A 1P-20A CIRCUIT FROM EX. PANEL RP2E FOURTH FLOOR, CONNECT ALL FOUR RECEPTACLES TO SAME CIRCUIT WITH 2#12, #12G, 3/4"C. PROVIDE A 1P-20A BREAKER IN SPACE.
 - ⑧ UNDER ADD ALTERNATE #1 AND/OR #2, EXTEND A 1P-20A CIRCUIT FROM EXISTING PANEL RP2E ON FOURTH FLOOR, CONNECT EACH RTU TO CIRCUIT WITH 2#12, #12G, 3/4"C. MOUNT DISCONNECT NEXT TO UNIT RTU'S UNIT DISCONNECT IN A SINGLE POLE SWITCH IN WEATHERPROOF ENCLOSURE FOR DISCONNECTING THE 120V CIRCUIT. PROVIDE A TOTAL OF 4:1-20A BREAKERS IN EXISTING SPACES.

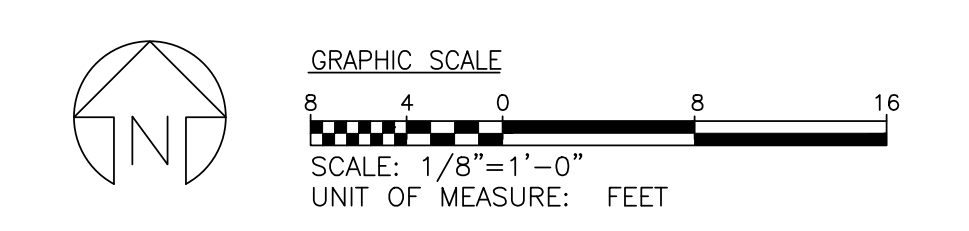


FIRST FLOOR PART PLAN BUILDING 2660

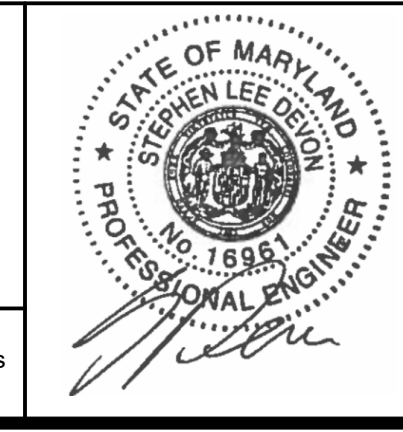


FOURTH FLOOR PART PLAN BUILDING 2660

ROOF PLAN BUILDING 2660 - NEW WORK



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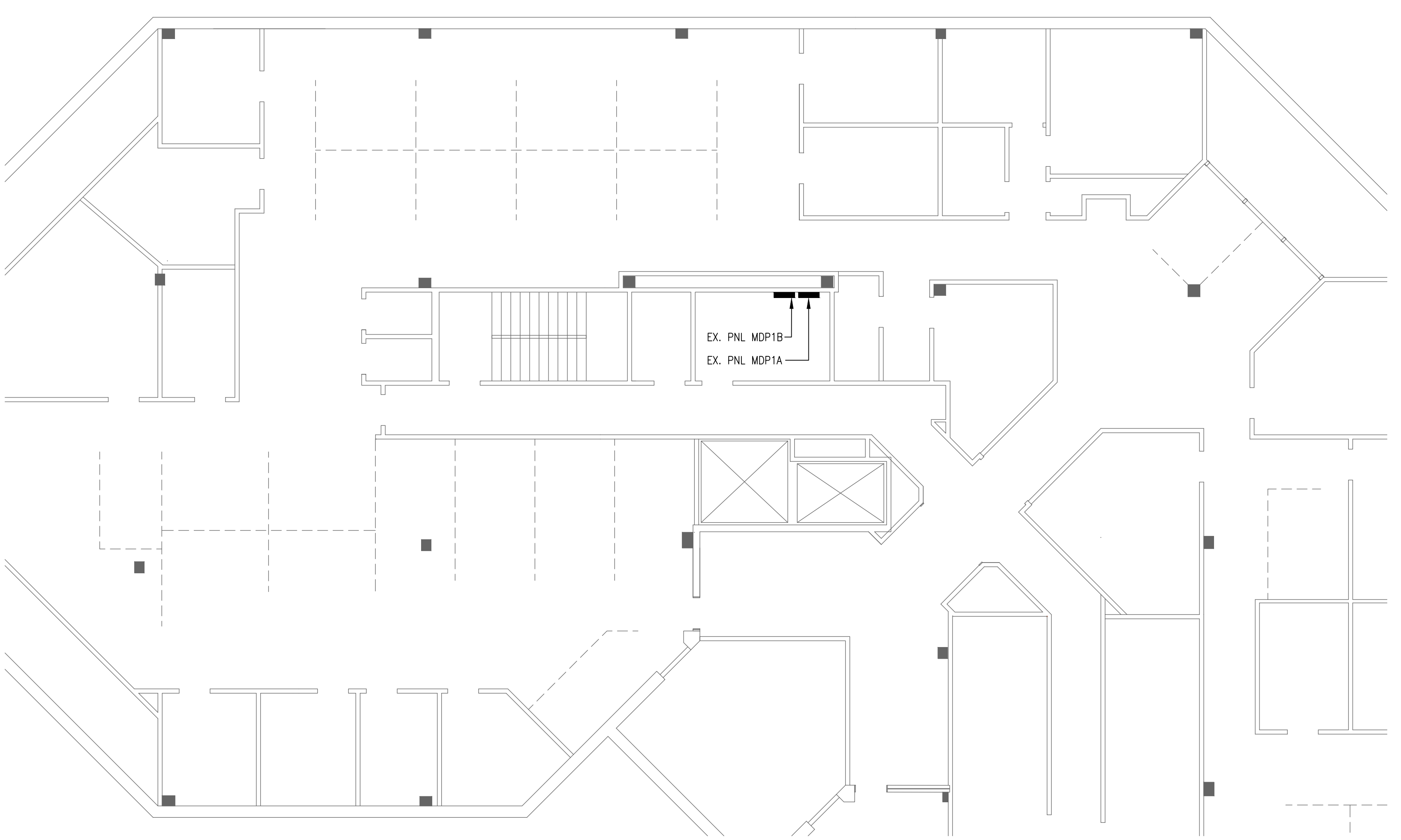


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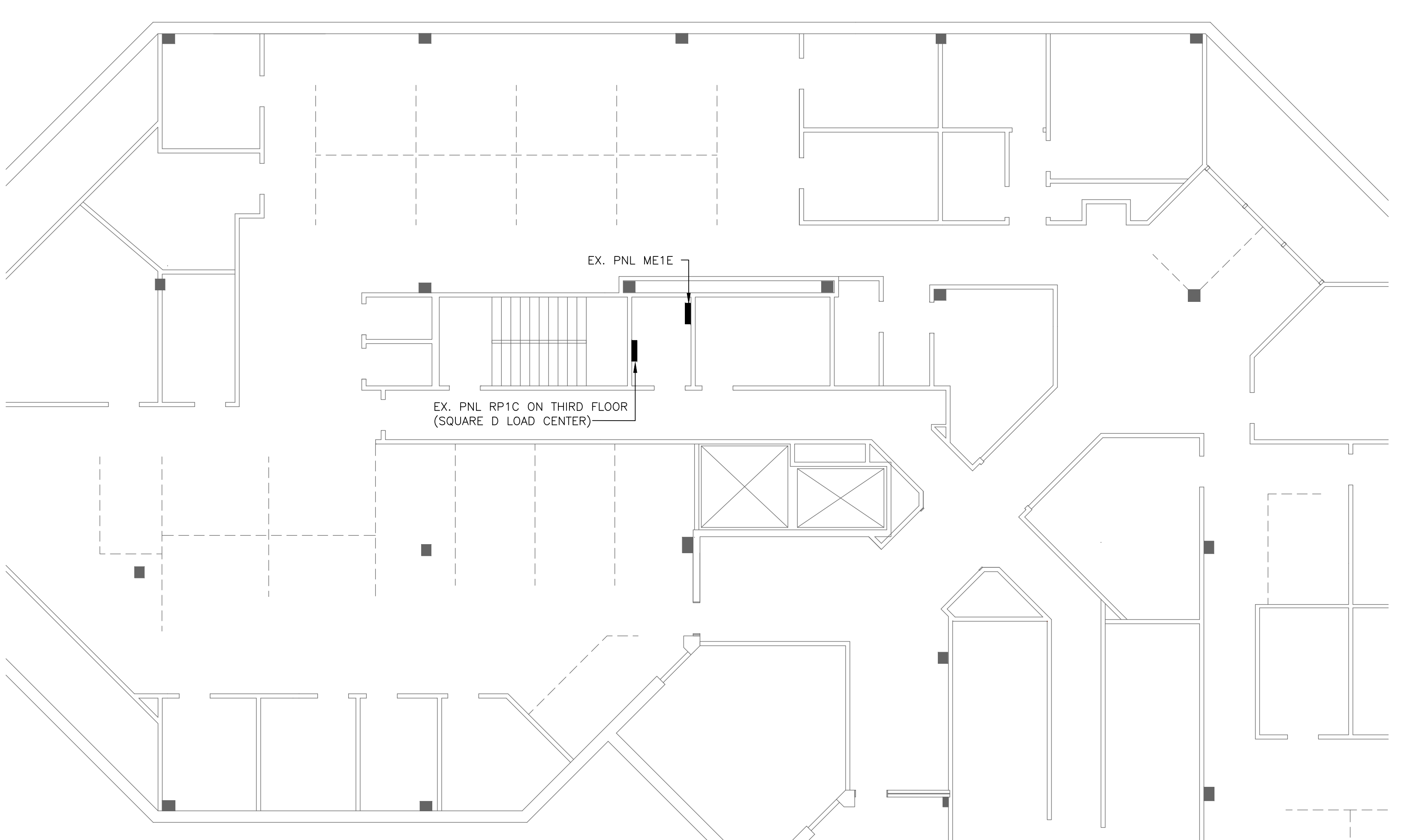
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|----------------------------------|--|-----------|--|----------------------------------|--|-----------|--|--------------------|--|---|--|
| APPROVED | | DATE | | APPROVED | | DATE | | SCALE: 1/4"=1'0" | | GENERAL ENGINEERING | |
| <i>David C. Bruner</i> | | 12/7/2023 | | <i>Diego Velazquez</i> | | 12/6/2023 | | 06:20:EST | | CAS | |
| REGISTERED PROFESSIONAL ENGINEER | | DATE | | PROJECT MANAGER | | DATE | | CHECKED BY | | HERITAGE COMPLEX - RTU REPLACEMENT | |
| APPROVED | | DATE | | APPROVED | | DATE | | PROJECT NO. | | NEW WORK ROOF PLAN - ELECTRICAL - BUILDING 2660 | |
| <i>David C. Bruner</i> | | 12/7/2023 | | <i>Diego Velazquez</i> | | 12/7/2023 | | 06:50 EST 19 OF 22 | | PROJECT NO. C537800 | |
| REGISTERED PROFESSIONAL ENGINEER | | DATE | | REGISTERED PROFESSIONAL ENGINEER | | DATE | | PROPOSAL NO. | | Drawing No. E101 | |
| | | | | | | | | C537896 | | | |

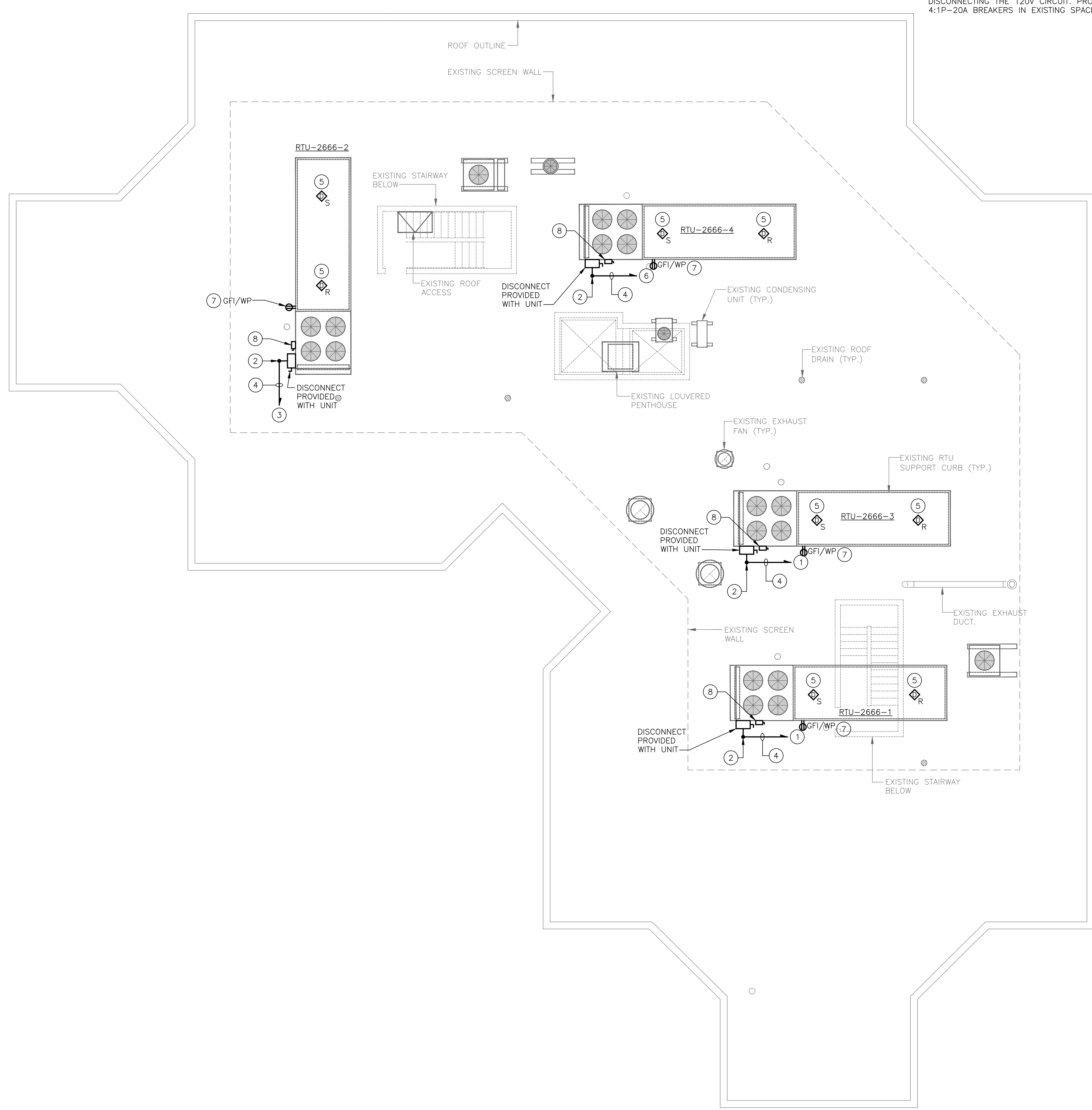
- DRAWING NOTES:**
- 1 PROVIDE 3P-200A CIRCUIT BREAKER IN PANEL ME1E LOCATED ON 4TH FLOOR. SEE EXISTING POWER DISTRIBUTION DIAGRAM ON DRAWING E000.
 - 2 PROVIDE PITCH POCKET.
 - 3 PROVIDE 3P-200A CIRCUIT BREAKER IN PANEL MDP1A LOCATED ON 1ST FLOOR. SEE EXISTING POWER DISTRIBUTION DIAGRAM ON DRAWING E000.
 - 4 PROVIDE 2" C. 3#3/0 & 1#4 GRD.
 - 5 CONNECT DUCT DETECTOR TO EXISTING FIRE ALARM BRANCH CIRCUIT. EXTEND CONDUIT AND WIRE AS NECESSARY.
 - 6 PROVIDE 3P-200A CIRCUIT BREAKER IN PANEL MDP1B LOCATED ON FIRST FLOOR. SEE EXISTING POWER DISTRIBUTION PLANS ON DRAWING E000.
 - 7 EXTEND A 1P-20A CIRCUIT FROM EX. PANEL RP1C ON FOURTH FLOOR. CONNECT ALL FOUR RECEPTACLES TO SAME CIRCUIT WITH 2#12, #12G, 3/4" C. PROVIDE A 1P-20A BREAKER IN SPACE.
 - 8 UNDER ADD ALTERNATE #1 AND/OR #2, EXTEND A 1P-20A CIRCUIT FROM EX. PANEL RP1C ON THIRD FLOOR. CONNECT EACH RTU TO CIRCUIT WITH 2#12, #12G, 3/4" C. MOUNT DISCONNECT NEXT TO UNIT RTU'S UNIT DISCONNECT IN A SINGLE POLE SWITCH IN WEATHERPROOF ENCLOSURE FOR DISCONNECTING THE 120V CIRCUIT. PROVIDE A TOTAL 4-1P-20A BREAKERS IN EXISTING SPACES.



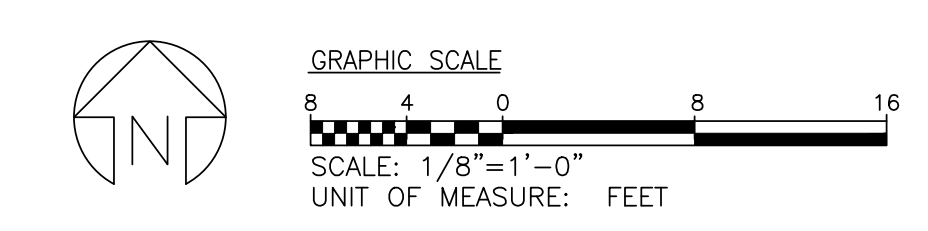
FIRST FLOOR PART PLAN BUILDING 2666



FOURTH FLOOR PART PLAN BUILDING 2666



ROOF PLAN BUILDING 2666 - NEW WORK



| <p>RMF ENGINEERING, INC. 5520 RESEARCH PARK DR, 3RD FLR BALTIMORE, MD 21228 P: 410.576-0505 F: 410.385-0327 RMF Project No. 121004.A0</p> | | <p>REVISIONS</p> <table border="1"> <thead> <tr> <th>NO.</th> <th>DESCRIPTION</th> <th>BY</th> <th>DATE</th> </tr> </thead> <tbody> <tr> <td> </td> <td>FINAL SUBMISSION</td> <td> </td> <td>09-22-2023</td> </tr> </tbody> </table> | | | | NO. | DESCRIPTION | BY | DATE | | FINAL SUBMISSION | | 09-22-2023 | <p>APPROVED BY: <i>David C. Bruner</i> DATE: 12/7/2023 PROJECT MANAGER: <i>Diego Velazquez</i> DATE: 12/6/2023 SCALE: 1/4"=1'0"</p> | | | |
|--|------------------|--|-------------|--|------|-----|-------------|----|------|--|------------------|--|------------|---|--|--|--|
| | | NO. | DESCRIPTION | BY | DATE | | | | | | | | | | | | |
| | FINAL SUBMISSION | | 09-22-2023 | | | | | | | | | | | | | | |
| <p>Professional Certification: I hereby certify that these documents were prepared or approved by me, and that I am a duly licensed professional engineer under the laws of the State of Maryland. License Number: 15981. EXP. DATE: 08/14/2024.</p> | | <p>APPROVED BY: <i>David C. Bruner</i> DATE: 12/7/2023 PROJECT MANAGER: <i>Diego Velazquez</i> DATE: 12/7/2023 CHECKED BY: SLD</p> | | <p>PROJECT NO. C537800 PROPOSAL NO. C537896 DRAWING NO. E104</p> | | | | | | | | | | | | | |

ANNE ARUNDEL COUNTY
DEPARTMENT OF PUBLIC WORKS
GENERAL ENGINEERING
HERITAGE COMPLEX - RTU REPLACEMENT
NEW WORK ROOF PLAN -
ELECTRICAL - BUILDING 2666