NAVFAC
SPECIFICATION

6781794
DB Replace Shop 940
Piping & Valves/Replace
300 PSIG Fuel Fired
Heat Exchanger B137

MCAS Cherry Point, NC
AMENDMENT #0007

IMPORTANT

This amendment should be acknowledged when your proposal is submitted. Failure to acknowledge the amendment may constitute grounds for rejection of the proposal.

If your proposal has been submitted prior to the receipt of this amendment, acknowledgement should be made by telegram, which should state whether the price contained in your proposal is to remain unchanged, is to be decreased by an amount, or is to be increased by an amount. The acknowledgement must be received prior to proposal opening time.

AMENDMENT OF SOLICITATION/MODIFICATION OF CONTRACT

1. CONTRACT ID CODE

PAGE 1 OF PAGES 2

2. AMENDMENT/MODIFICATION NO.	3. EFFECTIVE DATE	4. REQUISITION/PURCHASE REQ. NO.	5. PROJECT NO. (If applicable)
0007	08/08/2023	6781794	

6. ISSUED BY   Code N40085

CG MCAS Cherry Point
FACILITIES, ROICC
B-87, 748 Roosevelt Blvd.
PSC BOX 8006
CHERRY POINT, NC 28533

7. ADMINISTERED BY (If other than item 6.)   Code

8. NAME AND ADDRESS OF CONTRACTOR (No., street, county, State and ZIP Code)

AMENDMENT MUST BE ACKNOWLEDGED WITH YOUR PROPOSAL

CODE   FACILITY CODE

☒ 9A. AMENDMENT OF SOLICITATION
DB Replace Shop 940 Piping & Valves/Replace 300 PSIG Fuel Fired Heat Exchanger B137

9B. DATED (SEE ITEM 11)

☐ 10A. MODIFICATION OF CONTRACT/ORDER NO.

10B. DATED (SEE ITEM 13)

11. THIS ITEM ONLY APPLIES TO AMENDMENTS OF SOLICITATIONS

☒ The above numbered solicitation is amended as set forth in item 14. The hour and date specified for receipt of Offers ☐ **is extended** ☒ **is not extended**. Offers must acknowledge receipt of this amendment prior to the hour and date specified in the solicitation or as amended, by one of the following methods: (a) By completing items 8 and 15, and returning 1 copy of the amendment; (b) By acknowledging receipt of this amendment on each copy of the offer submitted; or (c) By separate letter or telegram which includes a reference to the solicitation and amendment numbers. FAILURE OF YOUR ACKNOWLEDGMENT TO BE RECEIVED AT THE PLACE DESIGNATED FOR THE RECEIPT OF OFFERS PRIOR TO THE HOUR AND DATE SPECIFIED MAY RESULT IN REJECTION OF YOUR OFFER. If by virtue of this amendment you desire to change an offer already submitted, such change may be made by telegram or letter, provided each telegram or letter makes reference to the solicitation and this amendment, and is received prior to the opening hour and date specified.

12. ACCOUNTING AND APPROPRIATION DATA (if required)

13. THIS ITEM APPLIES ONLY TO MODIFICATIONS OF CONTRACTS/ORDERS, IT MODIFIES THE CONTRACT/ORDER NO. AS DESCRIBED IN ITEM 14.

☐ A. THIS CHANGE ORDER IS ISSUED PURSUANT TO: (Specify authority) THE CHANGES SET FORTH IN ITEM 14. ARE MADE IN THE CONTRACT ORDER NO. IN ITEM 10A.

☐ B. THE ABOVE NUMBERED CONTRACT/ORDER IS MODIFIED TO REFLECT THE ADMINISTRATION CHANGES (such as changes in paying office, appropriation date, etc.) SET FORTH IN ITEM 14, PURSUANT TO THE AUTHORITY OF FAR 43.103 (b).

☐ C. THIS SUPPLEMENTAL AGREEMENT IS ENTERED INTO PURSUANT TO AUTHORITY OF:

☐ D. OTHER: (specify type of modification and authority)

E. IMPORTANT: Contractor ☐ is not ☐ is required to sign this document and return **original** to the issuing office.

14. DESCRIPTION OF AMENDMENT/MODIFICATION (Organized by UCF section headings, including solicitation/contract subject matter where feasible.)

6781794 DB Replace Shop 940 Piping & Valves/Replace 300 PSIG Fuel Fired Heat Exchanger B137, Marine Corps Air Station Cherry Point, NC

Amendment 0007 is being issued to answer pre-award RFI's and extend the proposal due date.

The deadline to submit pre-award RFI's HAS PASSED. No further RFI will be answered.

The proposal due date has been extended to 11 August 2023 at 12:00 PM local time.

See Attached.

15A. NAME AND TITLE OF SIGNER (Type or print)		16A. NAME AND TITLE OF CONTRACTING OFFICER (Type or print)	
15B. CONTRACTOR/OFFEROR (Same as Item 8) (Signature of person authorized to sign)	15C. DATE SIGNED	16B. UNITED STATES OF AMERICA BY (Signature of Contracting Officer)	16C. DATE SIGNED

RFI Responses:

1. Please provide information for the required mechanical maintenance platform mentioned in the first paragraph of section ESR/A10. The RFP gives a required LL of 40 psf but the concept drawings do not show this platform.

   Response: APPENDIX 1 MARKED UP PIPE DRAWINGS show drawings of existing conditions including around the current heat exchanger. Reference E1020 FUEL FIRED HEAT EXCHANGER Paragraph 14 for additional performance technical specifications for maintenance platforms. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

2. Please verify that the SER may perform the required foundation design based on 1500 psf allowable soil bearing pressure, as is allowed by the IBC without a geotechnical report.

   Response: Reference PART THREE – PROJECT PROGRAM A10 FOUNDATIONS and PART FOUR PERFORMANCE TECHNICAL SPECIFICATIONS SECTION A-10 FOUNDATIONS. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

3. Page M-104, Valves shown between gridlines C/D, 2/3 appear to be butterfly valves. Valves shown on gridline B, 2/3 appear to be gate valves. Please confirm these are intended to be different styles of valves, or if they should all be butterfly or all be gate valves.

   Response: APPENDIX 1 MARKED UP PIPE DRAWINGS show drawings of existing conditions of the piping system including valves. Reference M-104 LEGEND AND ABBREVIATIONS. Reference PART THREE – PROJECT PROGRAM 1.0 PROJECT DESCRIPTION and ENGINEERING SYSTEM REQUIREMENTS D20 PIPING. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

4. Page M-104, Note one located between gridline A/B and 2, indicates new gate valve. Please confirm gate valve is desired in lieu of other valve style (butterfly)

   Response: APPENDIX 1 MARKED UP PIPE DRAWINGS show drawings of existing conditions of the piping system including valves. Reference M-104 LEGEND AND ABBREVIATIONS. Reference PART THREE – PROJECT PROGRAM 1.0 PROJECT DESCRIPTION and ENGINEERING SYSTEM REQUIREMENTS D20 PIPING. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

5. Page M-103, note 2 between gridline B/C near gridline 2, indicates a gate valve on line CH#3. Valves indicated on same griline (b/C) but serving CH1 and CH2 are shown as butterfly valves. Please confirm valve types are intended to be different between CH1, CH2 and CH3.

   Response: APPENDIX 1 MARKED UP PIPE DRAWINGS show drawings of existing conditions of the piping system including valves. Reference M-103 LEGEND AND ABBREVIATIONS. Reference PART THREE – PROJECT PROGRAM 1.0 PROJECT DESCRIPTION and ENGINEERING SYSTEM REQUIREMENTS D20 PIPING. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

6. Page M-104, During the site walk it was noted that both silencers shown on page M104 are not existing. Please confirm new silencers are to be added as part of the project scope.

Response: Silencers are located on the roof and need to be replaced. Reference revised PART THREE – PROJECT PROGRAM, ENGINEERING SYSTEMS REQUIREMENTS, D20 PIPING, D1010 NARRATIVE with revision date in footer. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

7. Page M-106, During the site walk it was noted that the two silencers shown near griline A/2 are existing. Please confirm if they are to be demolished and new silencers are to be included in scope of project, or if connecting to existing silencers is desired.

   Response: Yes, the silencers are to be replaced. Reference revised PART THREE – PROJECT PROGRAM, ENGINEERING SYSTEMS REQUIREMENTS, D20 PIPING, D1010 NARRATIVE with revision date in footer. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

8. Page T-2, 300 PSI fuel Fired heat exchanger is shown on gridline C/4. Please confirm if this is a separate pricing option or if this is to be replaced as part of the scope of the project.

   Response: Reference PART THREE – PROJECT PROGRAM 1.0 PROJECT DESCRIPTION Item 2. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

9. Page 233 of the RFP states: "All demolition, equipment and equipment pad installation, and testing, shall be completed in 90 days. Construction shall not commence until all materials and equipment are on site". Will the Government please consider increasing the amount of days from 90 to 120 to allow for adequate time to execute this work in a manner which meets the end state requirement of the project stakeholders to include safety and quality control? Currently this 90 day requirement seems to place overall undue project risk for both the Government and the Contractor.

   Response: Reference revised PART THREE – PROJECT PROGRAM, ENGINEERING SYSTEM REQUIREMENTS E10 EQUIPMENT with revision date in footer. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

10. Please confirm the use of flanges in the system, where transitioning between existing piping and new, and other locations will be acceptable on the project.

    Response: Reference PART THREE – PROJECT PROGRAM, ENGINEERING SYSTEM REQUIREMENTS E10 EQUIPMENT, E1020 FUEL FIRED HEAT EXCHANGER page 227 "After demolition of existing piping, the tie-in flange shall have rated blind flanges installed on the inlet and outlet of all existing pressurized lines." and page 234 "Suitably rated blind flanges shall be Installed on the upstream side of inlet process air and on the downstream side of the outlet process air and all other relevant sites prior to any dismantling of the existing NHE." Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

11. Please confirm the cleaning method of new sections of piping, prior to being placed in operation, is via compressed air. Please also confirm pressure and CFM required for air cleaning.

    Response: Reference APPENDIX 2 Specification Section 15212 subsection 3.2 CLEANING AND CLEANNESS REQUIREMENTS. Also reference PART THREE – PROJECT PROGRAM, ENGINEERING

SYSTEMS REQUIREMENTS, D20 PIPING, D1010 NARRATIVE item 7. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

12. Sheet M-106 shows inlet piping on both sides of the 300 PSI FFHE. Please indicate where the building service side of the 300 PSI FFHE is located.

    Response: Reference revised APPENDIX 1 – MARKED UP PIPE DRAWINGS drawing M-106 with revision date in footer. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

13. Part 6 Appendix 1 and 2 provided the most specific information related to the work. The marked up as-builts provided in APP 1 are incomplete with numerous sheets missing notably specific floor plans. We require a completed set in order to understand features of the work.

    Response: Reference PART THREE – PROJECT PROGRAM, ENGINEERING SYSTEMS REQUIREMENTS, D20 PIPING, D1010 NARRATIVE item 10. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

14. What is the significance of the yellow highlights on the M9 and M10 drawings? Is this to represent the piping to be removed and replaced? If so, is the mechanical equipment that is also highlighted (eg the mufflers) also to be replaced? If so please give the requirements

    Response: The yellow highlights represent the piping to be removed and replaced. Reference revised APPENDIX 1 – MARKED UP PIPE DRAWINGS drawing M9 with revision date in footer. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

15. Appendix 1 shows piping plans with pipe size only for the systems on the roof. None of the remaining pipe systems indicated to be replaced are sized. In many areas it was impossible to determine the pipe size due to the insulation and the location of some of the systems. If available, please provide a floor plan with pipe routing for piping on the first floor. Also, please provide pipe sizing for the pipe to be replaced.

    Response: Reference revised APPENDIX 1 MARKED UP PIPE DRAWINGS M-6, 12728296, 12728297, and 1272830 with revision date in footer. Reference PART THREE – PROJECT PROGRAM, ENGINEERING SYSTEMS REQUIREMENTS, D20 PIPING, D1010 NARRATIVE item 10. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

16. There are valves described in the RFP to be replaced (notably MK1 and MK9). There is not a clear correlation of these marks and the valves described in specification section 15212 (appendix 2). Please provide a valve schedule of valves to be replaced along with clarification on the applicable specification.

    Response: Reference PART THREE – PROJECT PROGRAM, ENGINEERING SYSTEM REQUIREMENTS, D50 ELECTRICAL, D5020 INSTRUMENTATION, page 231 "Contractor shall walk down and document all instrumentation within scope boundary to verify current as-built conditions. Documentation to include at a minimum: Instrument Tag, Full Model/Manufacturer number, and Serial Number." Submit proposals in accordance with RFP, Specifications, Drawings and all amendments.

17. Please provide additional requirements for connected equipment – i.e. mufflers, silencers the performance requirements and details for this equipment is unclear in the RFP.

    Response: Reference revised PART THREE – PROJECT PROGRAM, ENGINEERING SYSTEMS REQUIREMENTS, D20 PIPING, D1010 NARRATIVE with revision date in footer. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

18. The RFP gives the heat exchanger equipment a #- M/N:685 ODF-4112; EIN: 65923X22513 and described generally the makeup of this unit. Are there shop drawings of this unit available? Can the Navy offer manufacturer or vendor information from so that the offerors could get a replacement unit quoted?

    Response: Reference revised PART THREE – PROJECT PROGRAM, ENGINEERING SYSTEMS REQUIREMENTS, E10 EQUIPMENT, E1020 FUEL FIRED HEAT EXCHANGER with revision date in footer. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

19. Not sure how long pricing the heat exchanger will take as it seems very specialized/custom unit from a manufacturer- such that we would need additional time to get this unit quoted. Is the previous manufacturer known and perhaps aware the Navy is anticipating replacing this unit?

    Response: Reference PART THREE – PROJECT PROGRAM, ENGINEERING SYSTEMS REQUIREMENTS, E10 EQUIPMENT, E1020 FUEL FIRED HEAT EXCHANGER. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

20. The RFP drawings lists the replacement of the heat exchanger as an option. However, the bid form does not include an option item. IS this work an option?

    Response: Response: Reference PART THREE – PROJECT PROGRAM 1.0 PROJECT DESCRIPTION Item 2. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

21. We require pipe sizes, details and connection details at the heat exchanger including for peripheral equipment at the heat exchanger (e.g. blowers, stacks, fuel tank etc). Please confirm if this equipment is to be replaced or simply reconnected.

    Response: Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

22. Is the performance of the current heat exchanger acceptable such that a one to one replacement would be acceptable? Similarly is the design of the present system sufficient to meet the current performance requirements. There is not enough performance information available nor sufficient time in the proposal schedule to provide additional design calculation

    Response: Reference PART THREE – PROJECT PROGRAM, ENGINEERING SYSTEMS REQUIREMENTS, E10 EQUIPMENT, E1020 FUEL FIRED HEAT EXCHANGER. Submit proposals in accordance with RFP, Specifications, Drawings, and all amendments.

CONTINUATION SHEET

PROJECT TABLE OF CONTENTS
SECTION 6. ENGINEERING SYSTEMS REQUIREMENTS D20 PIPING is deleted and SECTION 6. ENGINEERING SYSTEMS REQUIREMENTS D20 PIPING dated 8/4/23, as shown in the footer, is added to the Project Table of Contents and accompanies this Amendment.

SECTION 6. ENGINEERING SYSTEMS REQUIREMENTS E10 EQUIPMENT is deleted and SECTION 6. ENGINEERING SYSTEMS REQUIREMENTS E10 EQUIPMENT dated 8/4/23, as shown in the footer, is added to the Project Table of Contents and accompanies this Amendment.

SECTION APPENDIX 1 - MARKED UP PIPING DRAWINGS is deleted and SECTION APPENDIX 1 - MARKED UP PIPING DRAWINGS dated 8/7/23, as shown in the footer, is added to the Project Table of Contents and accompanies this Amendment.

6. ENGINEERING SYSTEMS REQUIREMENTS

D20 PIPING

SYSTEM DESCRIPTION

Building 137 houses the military aircraft pneumatic component testing systems in shop 940. Piping and valves are routed throughout the 940 shop and mechanical room and feed all the (6) test systems that make up the testing systems. This over-all scope for the piping includes replacing the notated 940 shop piping including all notated manual valves, control valves, instrumentation & pipe supports including spring cans.

D1010 NARRATIVE

During the design phase for this project, the contractor will have to work with the project team on developing the phased shutdown and tie-in sequence to complete the project with minimal effect on other testing stations. All work cannot be performed at one major shutdown additional piping and valves may have to be installed to perform the phased shutdowns for the project.

1. All demolition of existing piping, valves, and silencers to be removed will be part of the phased approach shutdown.
2. After demolition of existing piping, the tie-in flange shall have rated blind flanges installed on the inlet and outlet of all existing pressurized lines.
3. All piping to be replaced up to each test station isolation valve on the inlet side and all piping from the isolation valve on the outlet side, including silencers.
4. All metals used must meet the requirements of ASME (American Society of Mechanical Engineers) B31.1.
5. All piping materials including valves must be designed, constructed, installed and hydro tested per ASME B31.1.
6. Provide insulation on all hot sides of the piping.
7. See Appendix 2, the Y (year) – 2000 (not updated) for piping specifications attached section 15212 & 15216 are for reference only, and the AE awarded shall update with new codes and dates for all piping specs for the project.
8. Pipe stress analysis shall be performed on all hot side of the 300 psig & 850 psig piping. In addition, the pipe stress analysis shall provide for expansion of the 300 psig and 850 psig FFHE outlet process air pipe to eliminate potentially harmful stress to the tube bundle assembly. The piping exiting the FFHE shall not contain expansion joints. The piping shall be designed based on an operating temperature of 1,000 degrees F and 1250 degrees F (2) temperature cycles per day, 250 days per year (approximately 12,500 cycles over 25 years).
9. P&ID's to be provided by the contractor for the project and as-built after construction is complete.

10. See Appendix 1 for pipe and silencers to be replaced see highlighted approximate piping arrangements drawings M-101, M-102, M-103, M-104, M-105, M-106, M-9 (Y-2000/ not updated) M-10 (Y-2000 / not updated) & T-2 (Y-2000/ not updated) AE awarded the project will have to determine the true existing conditions to be replaced. Drawings do not show all the piping, shut-off valves, control valves, silencers, etc. Contractor must verify all existing conditions of piping systems.
11. All piping in the existing mechanical room will be designed by future Architect/Engineering firm. No additional scope will be required except to add some manual shut off valves to transition from project to project.
12. The new heat exchanger is for bid option only and to bid separately from the pipe replacement part of the project.

Contractor must validate and document all new piping, fittings, silencers, & components on the 300 and 800 networks are compatible for the temperatures and pressures. Provide the replacements for all deficient components.

Contractor must field verify all new piping and existing piping at tie-in locations.

A pipe stress analysis shall be performed, prior to the start of acceptance testing, on the following sections of pipe:

Piping section exiting the new 300 NHE (300 psig FFHE) on the 300 psig network (hot and cold) and continuing through to the last pipe/spring anchor.

Bypass piping section exiting the new 300 NHE (300 psig FFHE) and connected to the 800 psig network (hot and cold) and continuing through to the last bypass pipe/spring anchor. Analyze this section for the situation when the double block bleed valve is being utilized and fully functional.

Piping section exiting the 800 NHE (850 psig FFHE) to the cross connection between the 800H line and 300H line, represents the bypass spool location for the 800H and 300H lines. The subject hot spool section and cold side spool section is to be replaced with a properly rated double block bleed valve and associated components. The double block bleed valves shall have gauges and sensors to ensure safe switching from 300 psig to 850 psig. Analyze this section for the situation when the double block bleed valve is being utilized and fully functional.

Silencer Design Information:

Flow (All Lines):	300 Lbs/Min			
800H Line:	Design Pressure:	850 PSIG	Design Temperature:	1250°F
800C Line:	Design Pressure:	850 PSIG	Design Temperature:	120°F
300H Line:	Design Pressure:	300 PSIG	Design Temperature:	1250°F
300C Line:	Design Pressure:	300 PSIG	Design Temperature:	120°F

-- End of Section –

6. ENGINEERING SYSTEMS REQUIREMENTS

E10 EQUIPMENT

GENERAL SYSTEMS REQUIREMENTS - PROCESS

Provide Process Flow Diagram (PFD) with an integrated preliminary heat and material balance (HMB). Existing PFDs do not exist. PFD will include Major Equipment information for the new 300 PSIG Fuel Fired Heat Exchanger (Name, Equipment Number, Capacity/Flow, Material of Construction), process controls and instrumentation that control flow, and major process streams with directional flow. HMB information for major streams will include mass flow, volumetric flow, density, temperature, viscosity and phase.

Provide Process and Instrumentation Diagram(s) (P&ID) for all new and re-used equipment, piping, valves and instrumentation for all six (6) subsystems within the scope boundary as highlighted on M-101, M-102, M-103, M-104, M-105, and M-106. Existing P&IDs do not exist. Work shall include re-tuning on the affected P&ID Loops for all channels.

Provide preliminary demo drawing for all equipment, piping, valves and instrumentation for all six (6) subsystems within the scope boundary as highlighted on M-101, M-102, M-103, M-104, M-105, and M-106.

Provide process data input for the new 300 PSIG Fuel Fired Heat Exchanger (FFHE) Equipment Specification.

Provide a Piping Tie-In List detailing all Tie-Ins to existing piping, valves, etc. for all six (6) subsystems using highlighted boundaries shown on M-101, M-102, M-103, M-104, M-105, and M-106. Piping Tie-In Numbers and locations shall be noted on the P&IDs.

Generate Piping Line List with process data at maximum design and operating conditions for all six (6) subsystems.

Size and/or verify all replaced and/or new pipes and valves.

Each test cell piping network shall have piping network capacity (maximum pressure, maximum temperature, maximum flow, etc.) determined and stated on a comprehensive piping network drawing. All piping components on the drawing shall show the following information:

1. Name of Component.
2. Model Number.
3. Manufacturer.
4. Performance Information.

Maximum noise level for all associated components shall not exceed 84 dBA at three (3) feet. If required, noise attenuation shall be included.

Validate and document (spreadsheet and system drawing) all 300H and 800H components on the 300 and 800 networks are compatible for the working and design temperatures and pressures. Provide the replacements for all deficient components.

For all items that are to be replaced (pipe, valves, instruments, equipment, etc.), either due to scope requirements or found to be deficient, the Contractor shall provide a database/listing of all such items. The database/list shall clearly identify, for both the original replaced existing items and the recommended new items, all technical information (name of component, model number, manufacturer, specifications, operating/design conditions, calibration requirements, etc.) for those items. Reference must conform to an updated equivalent of an outdated Y-2000 Section 15212, High and Medium Pressure Compressed Air Piping, Page 22, Paragraph 2.7.2.5 for typical required information.

All demolition, equipment and equipment pad installation, and testing, shall be completed in 120 days. Construction shall not commence until all materials and equipment are on site.

Specify the proper type and thickness of insulation for all hot side piping.

The Contractor shall evaluate, size, and design the required replacement (mechanical and electrical) pump service that is required to pump the JP-5/JP-8 fuel from the fuel farm to the FFHE fuel tank. That subject design shall include all associated accessories (isolation valves, gauges, check valves, float switches, etc.) required to pump and troubleshoot the pumping of the subject JP-5/JP-8 fuel. The replacement fuel line shall be a double containment piping design or equivalent and made of stainless steel. The double containment pipe network shall have all appropriate sensors, wiring, and alarms for leak detection. In addition, double containment pipe design shall have proper drainage and disposal/storage to handle all interior leaks. A scaled schematic of the piping network with locations of leak detection sensors shall be displayed and monitored/ trended within METASYS. The Contractor shall design the JP-5/JP-8 fuel piping network so that sections of the piping can be isolated and removed/repaired as required. All underground piping shall be properly protected from corrosion.

Contractor shall determine if any additional utilities (air, electrical, fuel, etc.) are required for the new 300 psig FFHE. If additional utilities are required, then the specific grade and quality of the utility are to be defined. Based on the new 300 psig FFHE utility requirements, the Contractor shall design the proper measures to ensure all utilities provided are 100% compatible. All permanent measures needed to verify grade and quality of the subject utility are to be provided at the FRC East site.

Contractor shall develop a commissioning and acceptance test plan for all electrical/instrumentation, mechanical, and piping components. Operation, performance, calibration and test of all existing components and the subject component system shall be recorded at required ranges prior to any work/replacement. The same test, at the same ranges, on a component level and component system level shall be performed after all the new components and new piping are installed. Government acceptance of the test(s) requires the new (component level and component system level) test at least match or improve the existing performance (operation level, performance level, calibration level, and testing level). Contractor shall submit the commissioning and acceptance test plan for owner's approval. The commissioning and acceptance test plan shall include system tuning, testing, verification of equipment functionality, and process capability prove-out. Electrical/instrumentation and mechanical/piping check-out will precede commissioning activities to ensure that wiring, instruments, piping, valves and equipment are functional and ready for initial testing. Contractor shall perform all commissioning and acceptance tests per the plan, maintaining and completing testing/commissioning documentation, and for securing the necessary sign-offs at each stage in the commissioning process.

E1020 FUEL FIRED HEAT EXCHANGER:

The existing 300 PSIG Network Heat Exchanger (NHE) and all associated components, structural supports, platforms, and ladders shall be properly removed.

Manufacturer: Linde
Address: Five Sentry Parkway East, Blue Bell, PA 19422
Website: lindeus-engineering.com
2004 Model: ODF 685-4112
EIN: 65923X22513

The parts of the NHE are defined as the following:

1. Fuel Pumps (primary and backup).
2. Blower(s).
3. Exhaust Stack.
4. Heat Exchanger.
5. Structural supports for all components including access/maintenance platforms and access ladders.
6. Concrete equipment pads, as required if not reused.
7. Internal piping of the NHE and its associated components.
8. Control Panel for the NHE and all associated parts and wiring.
9. Electrical (power) distribution panel and associated parts and wiring.

Suitably rated blind flanges shall be installed on the upstream side of inlet process air and on the downstream side of the outlet process air and all other relevant sites prior to any dismantling of the existing NHE.

Supply and Install a new 300 psig Fuel Fired Heat Exchanger (FFHE).

All external piping connections shall be reconnected to the new FFHE and fully functional when the new FFHE has been fully installed. The new FFHE shall be a current-production model, which, on the date this solicitation is issued, has been designed, engineered, and sold or offered for sale through advertisements or manufacturer’s published catalogs or brochures. Products such as prototype units, pre-production models, or a highly modified current model, where major components have been redesigned, do not qualify as meeting this requirement.

All FFHE components, except the FFHE control panel, shall fit a foot print of 12’ Width x 21’ Depth. The burner and fuel tank(s), if required, shall be placed in accordance with the requirements of NFPA 31.

The existing NHE exhaust stack shall be completely demolished and replaced with a new stack for the FFHE. Contactor shall perform structure (stress, temperature) analysis on the new structure and any supplied high temperature piping to ensure they are able to expand and contract as needed due to the forces and temperature differences (0 to 1,250 degrees F).

Design and sizing requirements for the new FFHE shall include:

1. The FFHE shall be capable of using JP-5 or JP-8 or a blended mixture. JP-5/JP-8 fuel is defined as a fuel containing either 100% JP-5 or 100% JP-8 or a blend/mixture

of JP-5 with JP-8.

2. The FFHE shall be a free-standing structure, designed for outdoor installation, JP-5/JP-8 fuel-fired burner with propane pilot and electronic ignition, heat exchanger tube bundle, combustion chamber, exhaust stack, and a combustion air blower. The elements of combustion shall not come in direct contact with the process air. The combustion system components and the control cabinet for the FFHE shall be designed to be securely anchored/fastened to the existing slab/building structure.
3. The combustion system shall meet the following performance requirements:

Continuously variable process air flow rate	Primary use: @300 psig: 0-300 ppm is normal
Inlet process air pressure	300 PSIG - 350 psig
Inlet process air temperature	70 degrees F to 110 degrees F
Selectable outlet process air temperature	800 degrees F to 1,250 degrees F +/- 10 degrees F
Minimum thermal efficiency	65% Low Heating Value (LHV) for JP-5/JP-8 fuel with an inlet process air flow and temperature of 300 PPM and 70 - 100 degrees F with an ambient temperature of 70 degrees F
Pressure drop across the FFHE system from the process air inlet pipe connection to the process air outlet pipe connection	Shall not exceed 10 PSID at 300 PPM
Overall thermal efficiency	Overall thermal efficiency ≥ 70% High Heating Value (HHV) at design conditions, as fired on JP-5/JP-8 fuel

4. Contractor shall confirm the above required combustion system performance requirements.
5. The temperature and safety control system shall be designed for outdoor operation. The temperature and safety control system shall also include a control cabinet, designed for indoor installation (See T-2 or PE-21528M), containing a process controller, monitoring and safety controls and monitoring instrumentation displays. All controls and safety devices shall be in accordance with ASME CSD-1-2014.
6. The FFHE shall be capable of a cold start-up with no process air flow through the heat exchanger tube bundle. After the start-up has been initiated, an outlet process air temperature of 1250 degrees F shall be obtainable in less than 30 minutes with 300 PPM process air flow. After the initial start-up, the FFHE shall automatically heat up the process air to the selected outlet process air temperature in three (3) minutes or less, without any detrimental effects on the equipment. It shall be designed to allow a minimum of 24 cycles per 24 hours (One cycle is defined as controls cycling from low flow to operating flow, back to no flow) without reducing expected combustion system life below 20 years.
7. The tube configuration shall be designed to protect the tubes from overheating in the high temperature zone of the heater and to obtain the required efficiency and control at the exhaust of the heater. Tubes shall be so arranged and supported as to avoid damaging or excessive noise-producing vibration. All internal expansion created by tubes operating at design temperatures shall not be transmitted to external inlet and outlet connections. All supports shall be capable of withstanding the rapid temperature changes required for start-up and cycling. Bundle shall be easily removed for inspection and for repair. Thermocouples on tubes shall be designed for replacement without removal of tube bundle.
8. Burner, piping, and equipment shall be furnished and installed in accordance with NFPA 31 and NFPA 86.
9. The equipment shall be provided with shutdown switches to begin automatic shutdown procedures. Operator shall not have to supervise the shutdown.
10. The FFHE shall have the required safety components to automatically shut off the fuel to the burner in the event of an adverse condition that could cause harm to personnel and/or equipment.

11. Provide the FFHE maximum heating capacity (MMBtu/hr.) as soon as it is calculated to FRC East's Air Quality Division (POC Matt Willis, 252-464-7046) for air permit requirements. Other information required to Matt Willis includes stack height and diameter, stack exit gas temperature and velocity, fan performance (SCFM @ IWC), rain cap type (if any), exhaust stack configuration (vertical or other detailed orientation), and whether the system will be equipped with a continuous trim oxygen system or other fuel ratio optimizer.
12. All piping shall be replaced with new piping that connects between the new FFHE and the shutoff/block valves on the inlet process air side and the shutoff/block valves on the on the outlet process air side.
13. The shutoff valves on the inlet 300 psig process air side and on the process outlet air side shall be replaced.
14. Install safe working surfaces accessible to and from the ground level in the form of ladder(s) or stair(s) for serviceable parts of the new FFHE that are three (3) feet or more above ground level. Working Platforms (to allow safe working area for a minimum of two (2) maintenance personnel), shall be provided at all locations that may require service or maintenance over the life of the FFHE. Working Platforms, ladders, and handrails shall be designed and installed in accordance with OSHA 29 CFR 1910 Subpart D - Walking-Working Surfaces.
15. In addition to the monitor and safety controls, the following parameters shall be measured and displayed on the indoor FFHE control panel. The FFHE controls shall have the ability to track, trend, and record the FFHE performance. Pressure and temperature indications shall give a normal operating reading near the midpoint of the scale range if analog gauges are supplied.
    - Outlet process air temperature (actual current reading) - readings monitored and trended through METASYS. The METASYS network values displayed and downloaded via network. All equipment connections and terminal connections need to be defined by A&E and provided through contractor.
    - Exhaust gas temperature
    - Internal gas temperature
    - tube wall temperature
    - Fuel supply pressure
    - Inlet process air pressure
    - Inlet process air temperature
    - Combustion air pressure
    - Heat exchange tube temperature
    - Stack temperature
    - Flame failure alarm
    - Process air pressure failure
    - Fuel pressure failure
    - High fuel pressure alarm
    - Differential pressure gauges
16. The new equipment controls and differential pressure gauge indicators shall be connected and directly interfacing with FRC East's existing Johnson Controls Facilities Management System (FMS). Verification of new equipment shall be

integrated into the existing Johnson Controls FMS system shall be conducted with an FRC East representative prior to project closeout and field verify the existing conditions to include the existing controls. Upgrade the existing controls graphics to match new equipment labeling. Controls graphics shall show the building and relative building locations of the equipment to closely match the drawings and As-Built locations. Both the new 300 NHE and the existing 800 NHE shall be connected to FRC East METASYS network. The following items (including all alarms and warnings) and all items monitored by indoor FFHE control panel shall be monitored and trended by METASYS. In addition, METASYS shall have all function tag number, typical ranges, normal value, warning, shut down and comment on normal operation (opens on decrease, low fire drive, opens on increase, etc.) entered and listed for all items:

- Flame scanner Failure
- Combustion Air Pressure Low
- Outlet Temperature Controller
- Outlet Temperature High
- HX Differential Pressure low
- Propane Pilot Gas Low
- Propane Pilot Gas High
- JP-5/JP-8 Pressure High
- JP-5/JP-8 Pressure Low
- Atomizing Air Pressure low
- Pilot mixer propane pressure
- Tube wall temperature controller
- Tube wall temperature high
- Tube gas temperature high
- Stack Temperature high
- Process inlet pressure low
- Process inlet temperature
- JP-5/JP-8 Fuel supply pressure

17. The FFHE combustion system tube bundle shall be constructed of material that meet or exceed the requirements of ASME B31.1 and be designed, constructed and stamped per ASME BPVC Section VIII, Division I. All metals used in the FFHE must meet or exceed the requirements of ASME B31.1 for each particular use in the FFHE.
18. The blower(s) shall be designed to operate outdoors, vibration isolators provided, with an inlet screen to prevent intake of foreign objects (including winter snow and ice). The equipment shall meet OSHA requirements for safety. The blower package shall include the blower and shall be supplied as complete, packaged unit including:
    - Motor
    - Mounting Frame
    - Necessary interconnecting piping
    - Controls

- Safety and operation instrumentation

The combustion air blower shall supply ambient air at the pressure and flow required for the burner to operate at design conditions.

19. Maximum noise level for the heater, including the blower and all other associated components, shall not exceed 84 dBA at 3 feet. If required, noise dampening shall be included.
20. As a minimum, shut-off valves, piping, support hangers, and anchors shall be provided to connect:
    - FFHE process air inlet and manual chain-operated shutoff valve to a flanged connection in the pneumatic piping subsystem.
    - Existing propane supply to the FFHE with a shutoff valve.
    - Existing JP-5/JP-8 fuel supply to the FFHE with shutoff valve.
    - Existing plant instrument air to FFHE with shutoff valve.
    - FFHE process air outlet and a manual chain-operated shutoff valve to a flanged connection in the pneumatic piping subsystem.
21. The FFHE outlet process air pipe shall be insulated per ASTM F683. All external exposed surfaces shall be insulated to minimize heat loss and eliminate personnel hazard or equipped with proper personnel protection guards.
22. A pipe stress analysis shall be performed, prior to the start of acceptance testing, on the following sections of pipe:
    - Piping section exiting the new FFHE on the 300 psig network (hot and cold) and continuing through to the last pipe/spring anchor.
    - Bypass piping section exiting the new FFHE and connected to the 800 psig network (hot and cold) and continuing through to the last bypass pipe/spring anchor. Analyze this section for the situation when the double block bleed valve is being utilized and fully functional.
    - Piping section exiting the existing 850 psig FFHE to the cross connection between the 800H line and 300H line, representing the bypass spool location for the 800H and 300 H lines. The subject hot spool section and cold side spool section is to be replaced with a properly rated double block bleed valve and associated components. The double block bleed valves shall have gauges and sensors to ensure safe switching from 300 psig to 850 psig. Analyze this section for the situation when the double block bleed valve is being utilized and fully functional.
23. Accessories provided with the FFHE shall include, but are not limited to, the following:
    - High Velocity JP-5/JP-8 fuel fired burner.
    - LP gas pilot ignition system.
    - Fuel-air control valve with low fire start interlock.
    - Pneumatically operated dilution air control valve.
    - Combustion air blower with motor, inlet silencer, and filter.
    - Tube temperature thermocouples.
    - Tube excess temperature switch.
    - Process air outlet temperature thermocouple.

- Temperature indicating-recording controller (proportional, auto reset and rate action).
- Manual and automatic fuel shut-off and vent valves.
- Flame scanner.
- Flame failure relay.
- Combustion air and fuel gas low pressure switches.
- High fuel gas pressure switch.
- Low process air flow switch.
- Control panel (for remote mounting) to include, but not be limited to items: Temperature indicating-recording controller, Flame scanner, Flame failure relay and pushbuttons, indicating lights and time delay relays.
- Junction box with ignition transformer (mounted on heater).
- Fuel pump, piping, and valves to bring JP-5/JP-8 fuel pressure up to the pressure required for FFHE.

24. All peculiar support equipment (tools, fixtures, jigs, instruments etc.) required to operate, maintain, and calibrate each of the subsystems and the overall FFHE shall be supplied with the FFHE.
25. All piping components (valves, gauges, pipe material etc.) shall be designed, constructed, installed and hydrostatically tested per ASME B31.1.
26. The new FFHE shall incorporate appropriate programmable logic controllers and required HMI (controls) for all operations.
27. The Contractor shall warrant the 300 FFHE and all associated parts for a minimum period of three (3) years, to include all parts and labor. This warranty period shall begin after Government acceptance. The warranty shall cover all costs (i.e., labor, travel, meals, hotel, parts, freight, materials, rigging, equipment, supervision, engineering, and transportation expenses) associated with warranty repair and support. Upon notification of a discrepancy covered by the warranty, the Contractor shall arrive at the depot within 48 hours to initiate repairs.
28. All sections and components of the new FFHE shall be OEM factory tested prior to shipment to FRC East.

Contractor shall develop a commissioning and acceptance test plan for the new FFHE and all its associated electrical/instrumentation, mechanical, and piping components. Contractor shall submit the commissioning and acceptance test plan for owner's approval. The commissioning and acceptance test plan shall include system tuning, testing, verification of equipment functionality, and process capability prove-out. Electrical/instrumentation and mechanical/piping check-out will precede commissioning activities to ensure that wiring, instruments, piping, valves and equipment are functional and ready for initial testing. Contractor shall perform all commissioning and acceptance tests per the Plan, maintaining and completing testing/commissioning documentation, and for securing the necessary sign-offs at each stage in the commissioning process.

Tests, as a minimum, shall:

1. Define the objectives and requirements of the performance test (which includes all OEM test (dry out/bake out test) to ensure performance of system and all installed components. Production shall not be shut down for more than two (2) consecutive days (or total of three (3) days for all tests) for any one (1) test. Base line

performance metrics and values (vibration levels, temperature levels, etc.) need to be defined, in writing, prior to installation. The subject performance test(s) shall be created and written by the Contractor and submitted for acceptance by OEM and approved by the Government and A&E 60 days before any onsite FFHE construction work commences.

2. Define the objectives and requirements of the acceptance test to ensure the system and all installed components meet acceptable conditions (maximum number of startups allowed, time frame to prove all components are fully operational and penalty for inability to perform). Production shall not be shut down for more than two (2) consecutive days for any one (1) test (or total of three (3) days for all tests). The subject acceptance test(s) shall be created and written up by the Contractor and submitted for acceptance by OEM and approved by the Government and A&E 60 days before any onsite FFHE construction commences.

Required documentation and manuals are listed below. The Contractor shall provide one (1) electronic copy of all drawings in .dxf / dwg file format, manuals in pdf and word file format, and two (2) hard copies.

1. Engineering Documentation. The A&E shall provide complete drawings of the system. Drawings shall include Block Diagrams, P&IDs, Single Lines, Signal Flow Diagram, PLC Configuration Drawings, Pneumatic Flow Diagrams, Physical System Layouts, Hydraulic Schematics, Pneumatic Schematics, Electrical/Electronic Schematics, and Mechanical Component Drawings. All diagrams shall be cross-referenced to each other, and include component, identity, locations, and I/O channels entry points. The document shall further break down the system diagrams into component schematics, I/O channel signals, power distribution, and wiring connections. Wiring tables shall be provided for all plugs, jacks, and terminal boards with their associated signal designation. The document shall provide a list of all switches, relay indicators, valves, and controls and how it relates to the above diagrams and their locations. Supplemental manuals or copies shall be provided during training on the materials presented to demonstrate how to use the manual to perform signal tracing on the system. The Contractor shall provide one (1) electronic copy of all drawings in .dxf/ dwg file format, and two (2) hard copies. Within each drawing there shall be the Drawing Number, Part Number, and Bill of Materials (BOM). All views required to manufacture the component, material, current revision of the drawing, and finish requirements (if none required, state “No finish required”). The Contractor shall apply ASME Y14.100-2000 “Engineering Drawing Practices” drawing standards. The drawings shall be included as part of the Contractors normal drawing submission. DI-E-5586 is for reference only. Contractor format is acceptable upon government approval.
2. Maintenance Manuals.The A&E and Contractor shall provide maintenance manuals. The first submission shall be delivered 15 days before pre-shipment acceptance testing. The maintenance manuals shall include information on diagnostic, periodic, and preventive maintenance on all equipment. This shall include critical voltage checks, system power supplies, and any components that would allow full system operation. The manual describe critical removal and replacement procedures and the location of the major and complex component procedures list in the Provisioning Document. Supplemental manuals or copies of this manual shall be provided during training on the materials presented to demonstrate how to use the manual to perform maintenance on the system. The final submission shall be delivered 10 days prior to final acceptance testing. Contractor format is acceptable upon Government approval.

3. Operators Manual (OM): The Contractor shall provide an Operators Manual that describes in a step-by-step fashion how to energize, warm-up, start-up, test, operate, and shut down the FFHE. The step-by-step procedures shall include all associated equipment, computer software, instrumentation, controls, sensors, and alarms. The OM shall also describe the emergency conditions for shutdown of the system. The OM must be approved prior to the start of commissioning of the equipment. Contractor format is acceptable upon Government approval.
4. Process Schematic: The contractor shall provide a process schematic detailing the operation of the FFHE.

Contractor shall supply new FFHE training for a period of at least three (3) eight-hour days and shall thoroughly familiarize personnel with operating and maintaining all mechanical, electrical and electronic equipment and controls in the 300 psig FFHE and all associated components. The Contractor shall create and submit training plan 60 days before acceptance testing for review and acceptance. All technical manuals listed shall be used extensively as reference materials during this training. Training shall include actual hands-on instruction with the equipment.

1. Mechanical maintenance training shall include as a minimum:
    - Review all 300 psig FFHE and all associated components mechanical schematics and drawings.
    - Component location and function of the 300 psig FFHE and all associated components.
    - Troubleshooting procedures and techniques of the 300 psig FFHE and all associated components.
    - Repair procedures including disassembly and assembly of all 300 psig FFHE and all associated components.
    - Adjustments, calibration, setups (when, how, where) of all 300 psig FFHE and all associated components.
    - Preventive maintenance procedures of all 300 psig FFHE and all associated components.
    - Thoroughly familiarize (hands on training) all personnel with programming the 300 psig FFHE and all associated components.
    - Thoroughly familiarize (hands on training) all personnel with operating and calibrating the 300 psig FFHE and all associated components.
    - Thoroughly familiarize (hands on training) all personnel with maintaining and troubleshooting the 300 psig FFHE and all associated components.
    - Review the formalized procedure for LOTO procedure for all 300 psig FFHE and all associated components.
2. Electrical and electronic maintenance training shall include as a minimum:
    - Review electrical and electronic wiring schematics and drawings for the 300 psig FFHE and all associated components.
    - Troubleshooting procedures and techniques for the 300 psig FFHE and all associated components.
    - Electrical and electronic equipment servicing for the 300 psig FFHE and all associated components.
    - Procedures for adjustments (locating equipment, adjustments to be made,

equipment required to make adjustments) for the 300 psig FFHE and all associated components.

- Adjustments, calibration, setups (when, how, where) of the 300 psig FFHE and all associated components.
- Preventive maintenance procedures of the 300 psig FFHE and all associated components.
- Thoroughly familiarize (hands on training) all personnel with programming the 300 psig FFHE and all associated components.
- Thoroughly familiarize (hands on training) all personnel with operating and calibrating the 300 psig FFHE and all associated components.
- Thoroughly familiarize (hands on training) all personnel with maintaining and troubleshooting the 300 psig FFHE and all associated components.
- Review the formalized procedure for LOTO procedure for the 300 psig FFHE and all associated components.

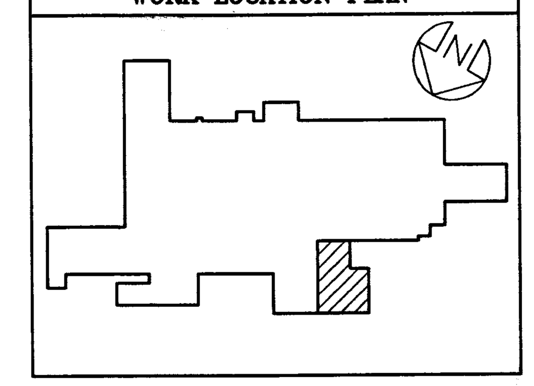
--End of Section--

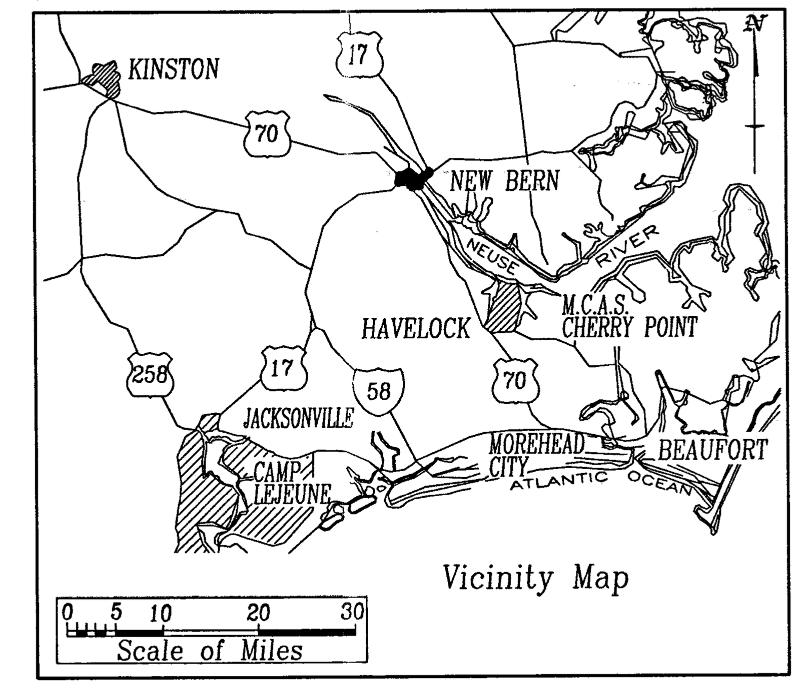
APPENDIX 1 – MARKED UP PIPING DRAWINGS

REPLACE PNEUMATIC TEST CELL PIPING BUILDING NO.137 MCAS CHERRY POINT N.C.

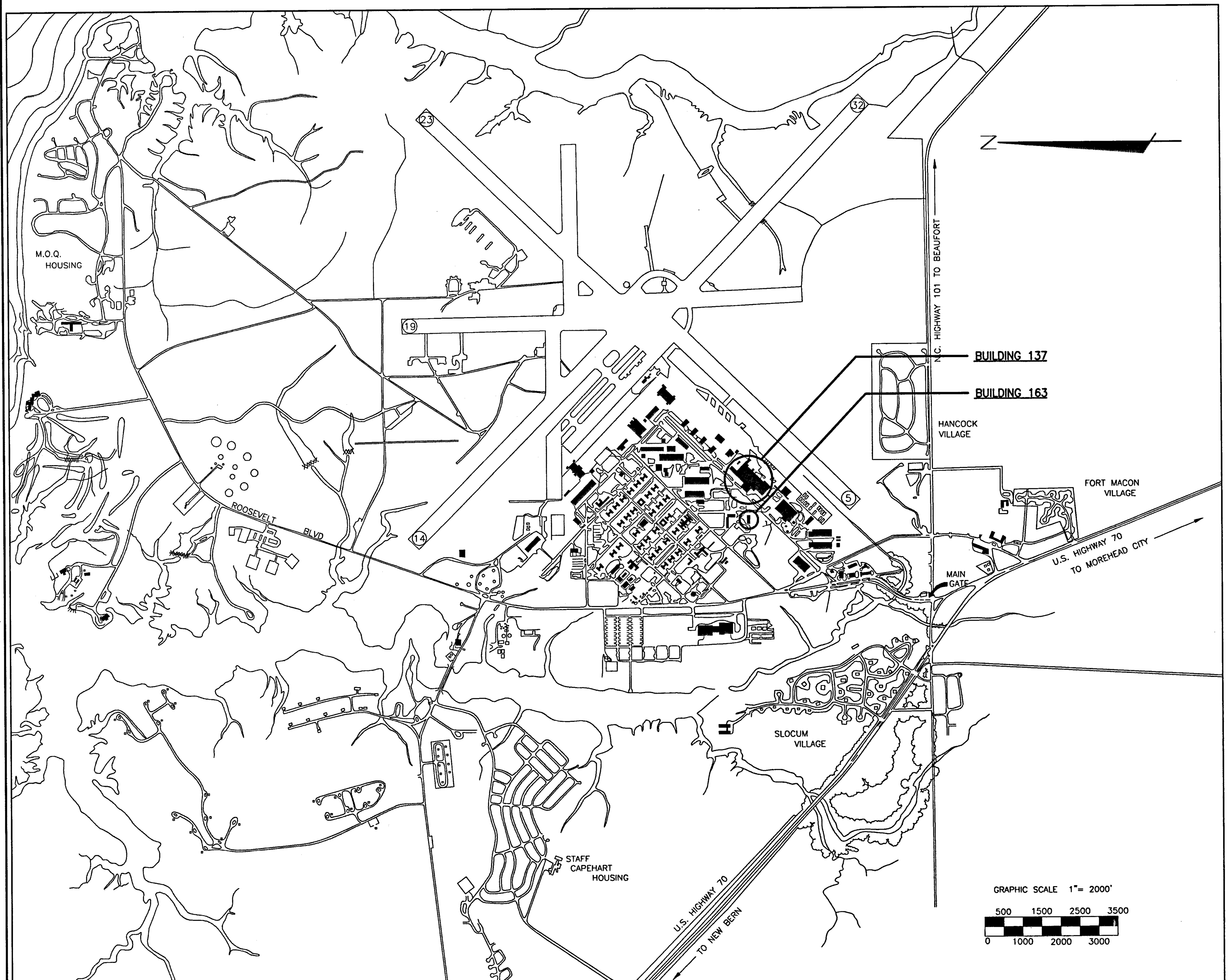
PROJECT NO.CP9174M

BLDG. 137 WORK LOCATION PLAN





Vicinity Map



DRAWING INDEX

SHEET NUMBER	TITLE	NAVFAC NO.
T-1	TITLE SHEET	4406696
T-2	ACCESS PLAN	4406697
S-1	PIPE SUPPORT DETAILS	4406698
S-2	PIPE SUPPORT DETAILS	4406699
S-3	PIPE SUPPORT DETAILS	4406700
S-4	PIPE SUPPORT DETAILS	4406701
M-1	MECHANICAL LEGENDS AND ABBREVIATIONS	4406702
M-2	COMPRESSOR ROOM AND APU TEST FACILITY - DEMOLITION	4406703
M-3	TEST STATION AND FURNACE AREA - DEMOLITION	4406704
M-4	CHANNEL ROOM - UPPER AND LOWER LEVEL - DEMOLITION	4406705
M-5	SOUTH END - ROOF PLAN - DEMOLITION	4406706
M-6	COMPRESSOR ROOM AND APU TEST FACILITY - NEW WORK	4406707
M-7	TEST STATION AND FURNACE AREA - NEW WORK	4406708
M-8	CHANNEL ROOM - UPPER AND LOWER LEVEL - NEW WORK	4406709
M-9	SOUTH END - ROOF PLAN - NEW WORK	4406710
M-10	NORTH END - ROOF PLAN - NEW WORK	4406711
M-11	SECTIONS A & B - NEW WORK	4406712
M-12	PIPING SCHEMATIC - DEMOLITION	4406713
M-13	PIPING SCHEMATIC - NEW WORK	4406714
E-1	EMERGENCY POWER OFF SWITCH DIAGRAMS	4406715
E-2	TEST STATION AND FURNACE AREA - NEW WORK	4406716
E-3	COMPRESSOR ROOM AND APU TEST FACILITY - NEW WORK	4406717
E-4	CHANNEL ROOM - UPPER AND LOWER LEVEL - NEW WORK	4406718

SYM.	DESCRIPTION	DATE	APPROVED
	REVISIONS		

A/E: DMZ DESIGN; JML DRAWN; RJB REVIEW; VGB CHIEF ARCH./ ENGR.
FED: PROJECT MANAGER; FIRE PROTECTION; QUALITY CONTROL; DIVISION MANAGER; DESIGN DIRECTOR

RMF ENGINEERING, INC.
190 WEST OSTEND STREET
BALTIMORE, MARYLAND 21230

A/E CONTRACT NO. N62470-98-M-6282

APPROVED [signature] DATE 3/15/00
ACTIVITY - SATISFACTORY TO
APPROVED LCDR R.E. [signature] DATE 20MAR00
FOR EFD FOR COMMANDER NAVFAC

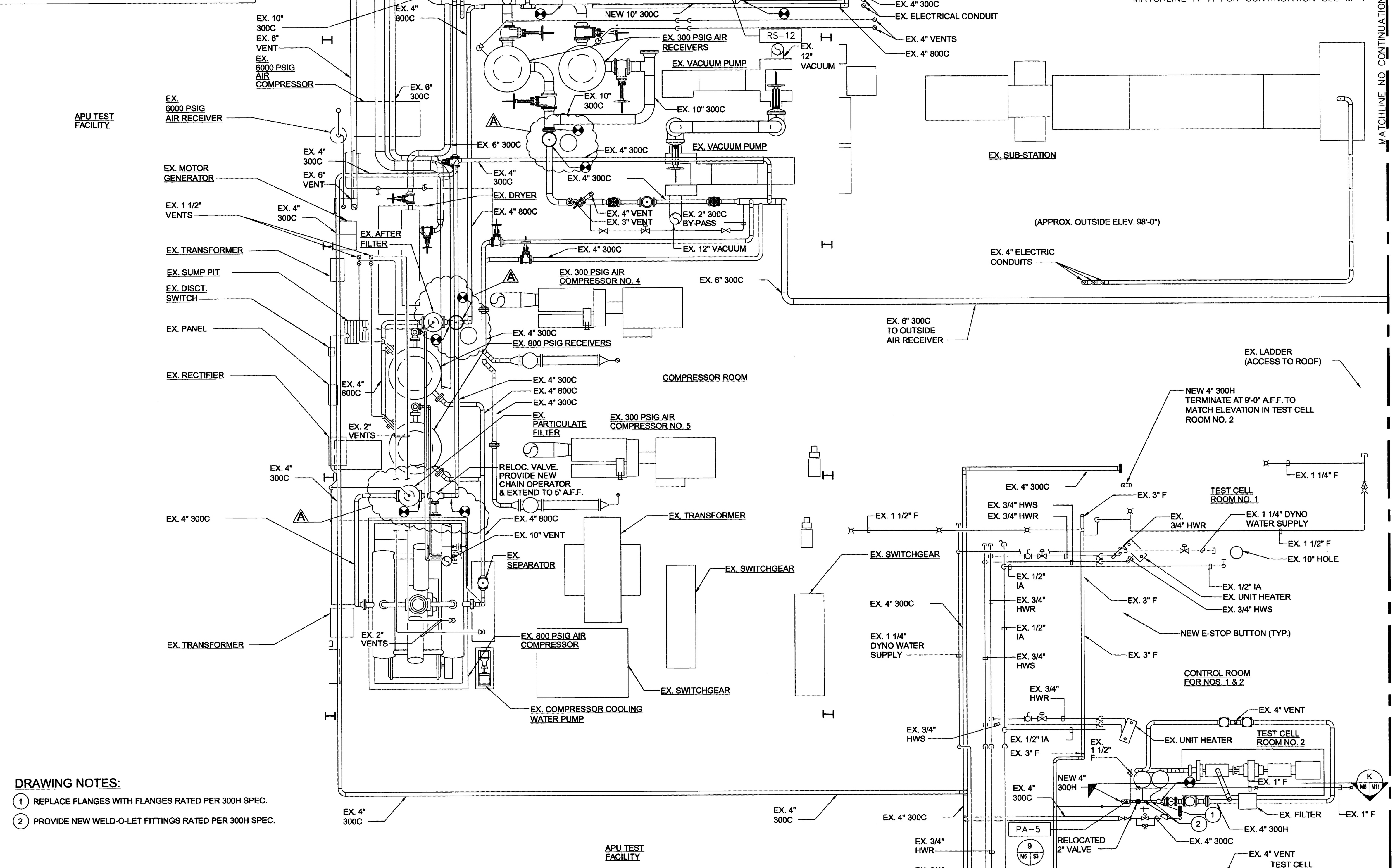
SEAL

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS AIR STATION, CHERRY POINT, N.C.
CP9174M, REPLACE PNEUMATIC TEST CELL PIPING, BUILDING 137
TITLE SHEET

CODE ID. NO. 80091 SIZE D
SCALE: 1/4" = 1'-0"
FED DRAWING NO.
STA. PROJ. NO. CP9174M
SPEC. NO. 05-99-3587
CONSTR. CONTR. NO. 015227
NAVFAC DRAWING NO. 4406696
SHEET 1 OF 23

T-1

AS-BUILT DRAWING AVAILABLE ON ELECTRONIC FILE



DRAWING NOTES:

1. REPLACE FLANGES WITH FLANGES RATED PER 300H SPEC.
2. PROVIDE NEW WELD-O-LET FITTINGS RATED PER 300H SPEC.

GRAPHIC SCALE
4 0 4 8
SCALE: 1/4" = 1'-0"

COMPRESSOR ROOM AND APU TEST FACILITY - NEW WORK

SCALE: 1/4"=1'-0"
(FLR. ELEV. 100'-0")

REVISION DATE 8/7/23

THIS DOCUMENT ORIGINALLY ISSUED AND SEALED BY JOHN E. HOVERMALE JR. 19970 MD

RECORD DRAWING

SYM.	DESCRIPTION	DATE
A	REVISED PER AS-BUILT MARKED UP DRAWINGS	01/17/03

REVISIONS

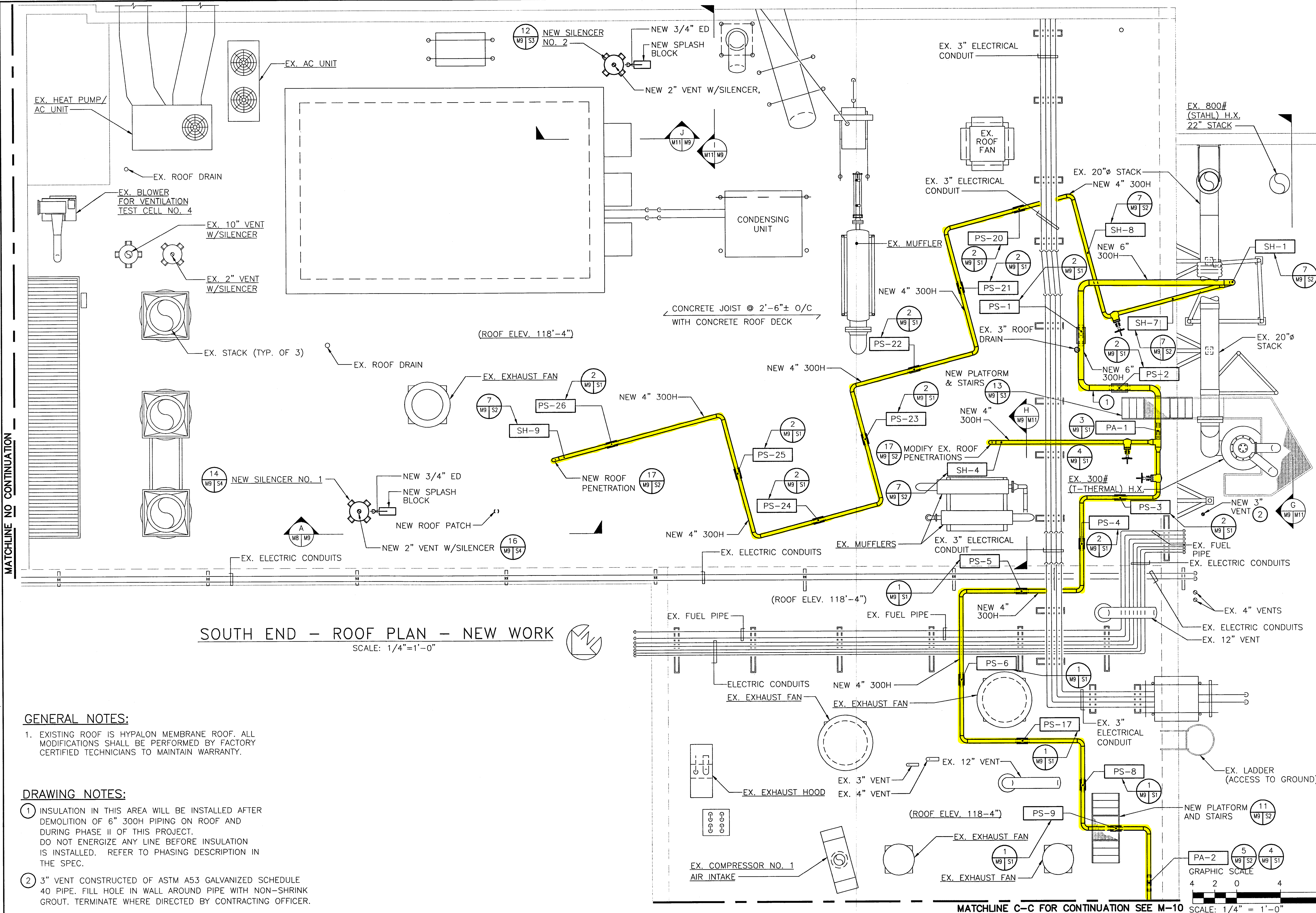
A/E FED
DMZ DESIGN
JML DRAWN
RJB REVIEW
VGB CHIEF ARCH/ENGR.
PROJECT MANAGER
FIRE PROTECTION
QUALITY CONTROL
DIVISION MANAGER
DESIGN DIRECTOR

RMF ENGINEERING, INC.
190 WEST OSTEND STREET
BALTIMORE, MARYLAND 21230
A/E CONTRACT NO. N62470-98-M-6282
APPROVED DATE
ACTIVITY - SATISFACTORY TO
APPROVED DATE
FOR EFD FOR COMMANDER NAVFAC
SEAL

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS AIR STATION, CHERRY POINT, N.C.
CP9174M, REPLACE PNEUMATIC TEST CELL PIPING,
BUILDING 137
COMPRESSOR ROOM AND APU TEST FACILITY - NEW WORK

CODE ID. NO. 80091 SIZE D
SCALE: 1/4" = 1'-0"
FED DRAWING NO.
STA. PROJ. NO. CP9174M
SPEC. NO. 05-99-3587
CONSTR. CONTR. NO. N62470-99-C-3587
NAVFAC DRAWING NO. 4406707
SHEET 12 OF 23

M-6



SOUTH END - ROOF PLAN - NEW WORK

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

GENERAL NOTES:

1. EXISTING ROOF IS HYPALON MEMBRANE ROOF. ALL MODIFICATIONS SHALL BE PERFORMED BY FACTORY CERTIFIED TECHNICIANS TO MAINTAIN WARRANTY.

DRAWING NOTES:

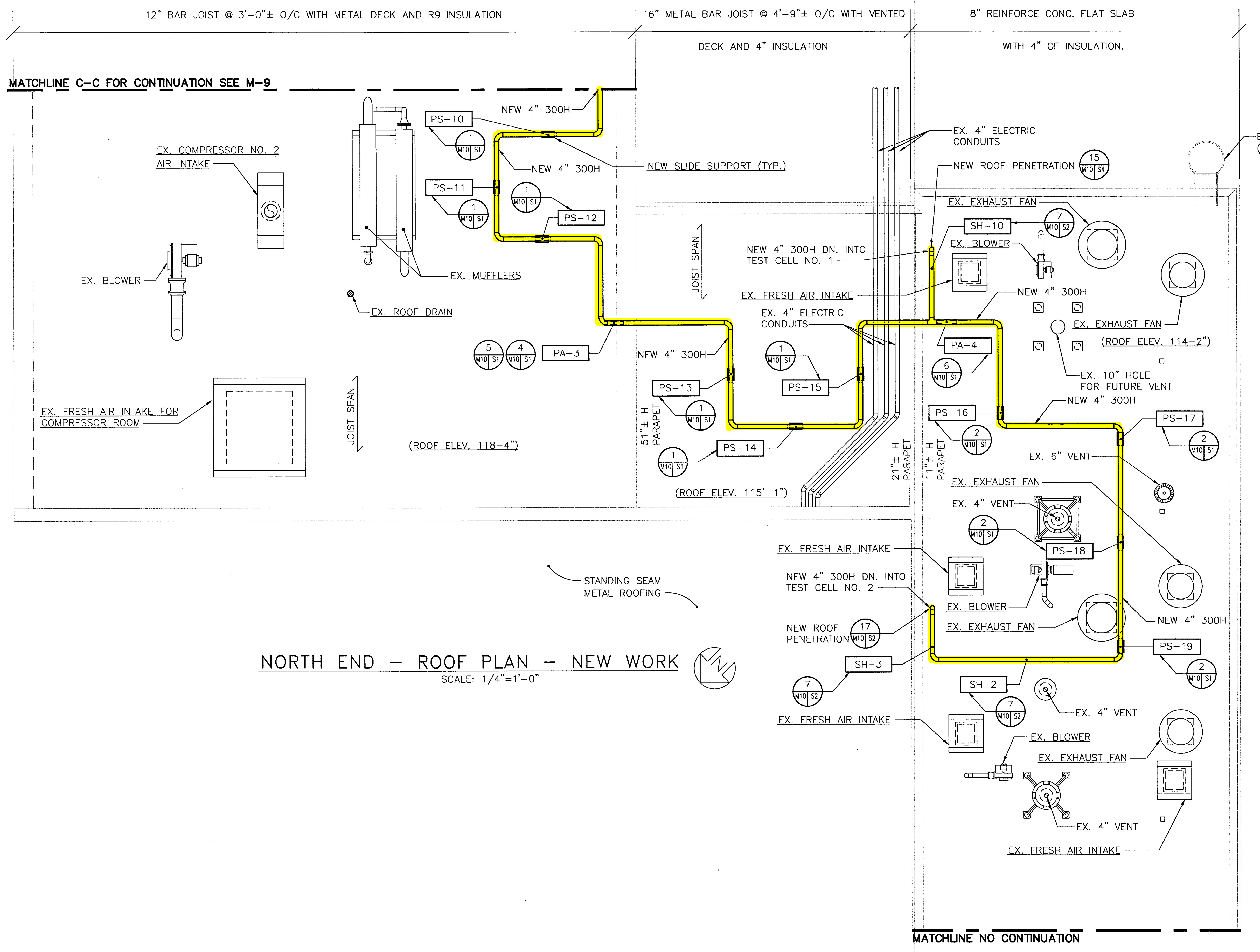
1. INSULATION IN THIS AREA WILL BE INSTALLED AFTER DEMOLITION OF 6" 300H PIPING ON ROOF AND DURING PHASE II OF THIS PROJECT. DO NOT ENERGIZE ANY LINE BEFORE INSULATION IS INSTALLED. REFER TO PHASING DESCRIPTION IN THE SPEC.
2. 3" VENT CONSTRUCTED OF ASTM A53 GALVANIZED SCHEDULE 40 PIPE. FILL HOLE IN WALL AROUND PIPE WITH NON-SHRINK GROUT. TERMINATE WHERE DIRECTED BY CONTRACTING OFFICER.

REVISIONS

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND
MARINE CORPS AIR STATION, CHERRY POINT, N.C.
CP9174M, REPLACE PNEUMATIC TEST CELL PIPING, BUILDING 137
SOUTH END - ROOF PLAN - NEW WORK

CODE ID. NO. 80091 SIZE D
SCALE: 1/4" = 1'-0"
FED DRAWING NO.
STA. PROJ. NO. CP9174M
SPEC. NO. 05-99-3587
CONSTR. CONTR. NO. 015227
NAVFAC DRAWING NO. 4406710
SHEET 15 OF 23

M-9



NORTH END – ROOF PLAN – NEW WORK

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

GRAPHIC SCALE

4 2 0 4 8

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

GENERAL NOTES:

1. EXISTING ROOF IS HYPALON MEMBRANE ROOF. ALL MODIFICATIONS SHALL BE PERFORMED BY FACTORY CERTIFIED TECHNICIANS TO MAINTAIN WARRANTY.

REVISIONS

SYM. DESCRIPTION DATE APPROVED

A/E FED

DMZ DESIGN

JML DRAWN

RJB REVIEW

VGB CHIEF ARCH./ ENGR.

PROJECT MANAGER

FIRE PROTECTION

QUALITY CONTROL

DIVISION MANAGER

DESIGN DIRECTOR

RMF ENGINEERING, INC. 190 WEST OSTEND STREET BALTIMORE, MARYLAND 21230

A/E CONTRACT NO. N62470-98-M-6282

APPROVED DATE 3/15/00

ACTIVITY – SATISFACTORY TO

APPROVED DATE 3/20/00

FOR EFD FOR COMMANDER NAVFAC

SEAL

DEPARTMENT OF THE NAVY NAVAL FACILITIES ENGINEERING COMMAND

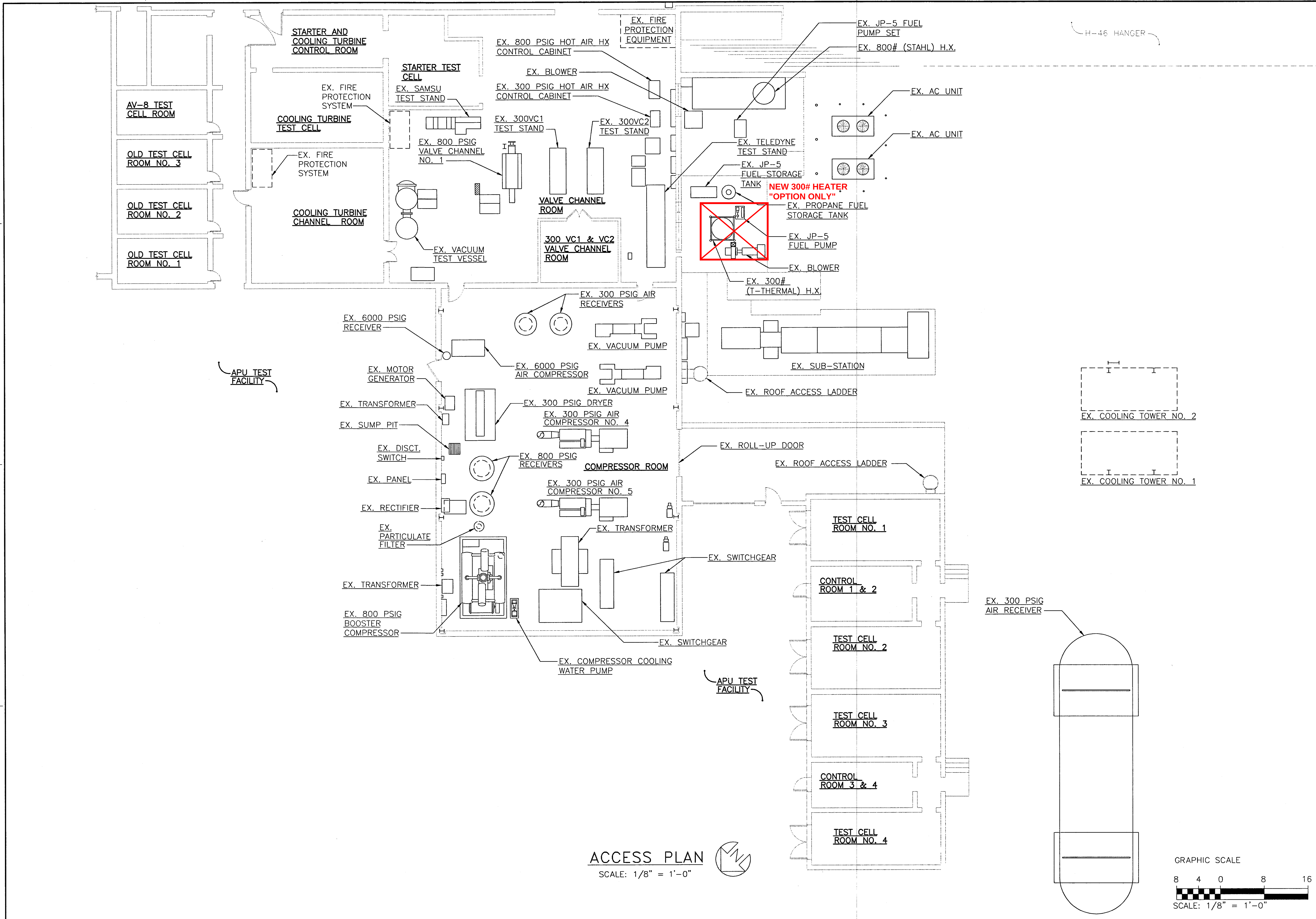
MARINE CORPS AIR STATION, CHERRY POINT, N.C.

CP9174M, REPLACE PNEUMATIC TEST CELL PIPING, BUILDING 137

NORTH END – ROOF PLAN – NEW WORK

CODE ID. NO. 80091	SIZE D
SCALE: 1/4" = 1'-0"	
FED DRAWING NO.	
STA. PROJ. NO. CP9174M	
SPEC. NO. 05-99-3587	
CONSTR. CONTR. NO. 015227	
NAVFAC DRAWING NO. 4406711	
SHEET 16 OF 23	

M-10



ACCESS PLAN

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

REVISIONS

DEPARTMENT OF THE NAVY
NAVAL FACILITIES ENGINEERING COMMAND

MARINE CORPS AIR STATION, CHERRY POINT, N.C.

CP9174M, REPLACE PNEUMATIC TEST CELL PIPING,
BUILDING 137

ACCESS PLAN

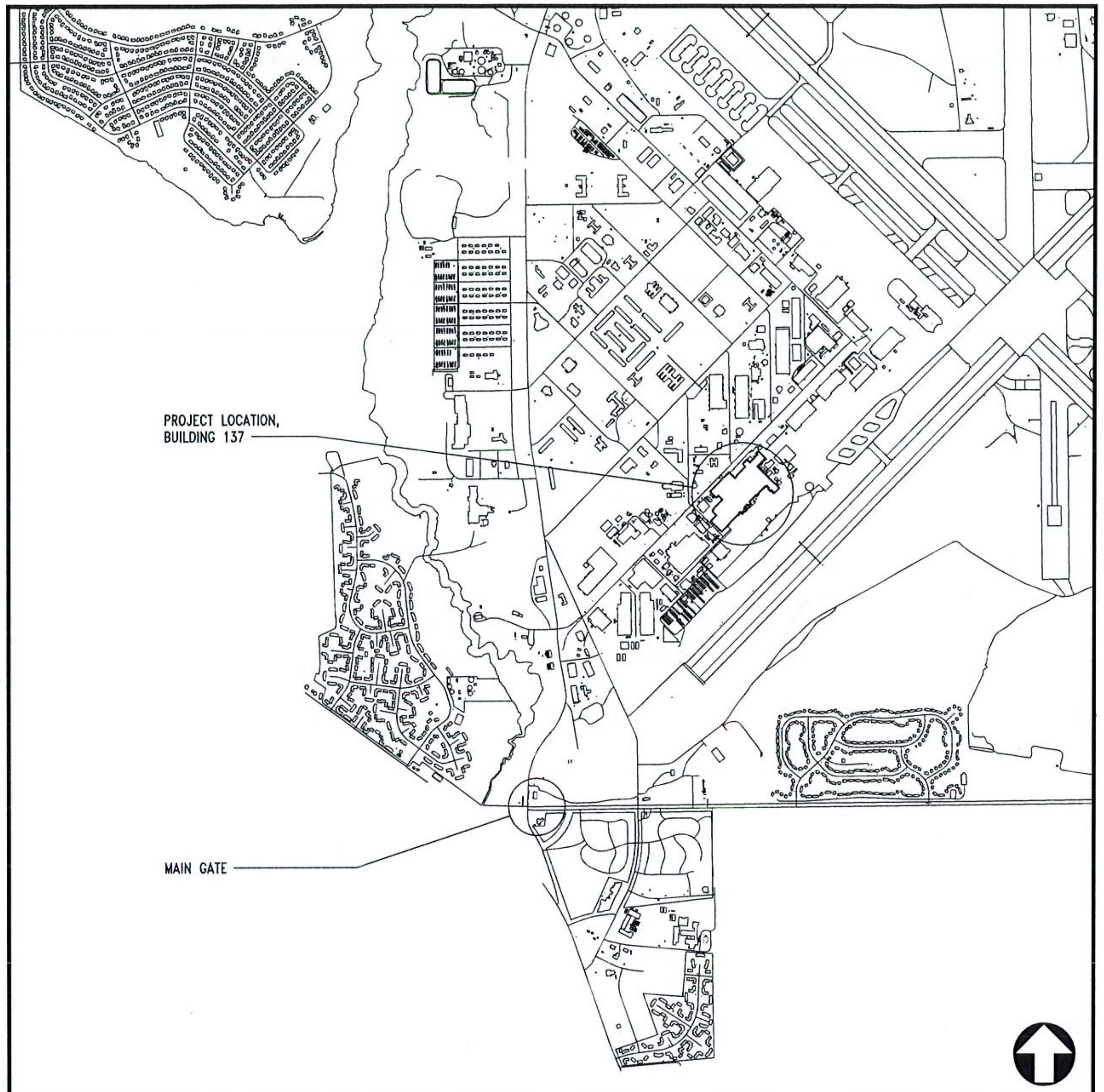
CODE ID. NO. 80091 SIZE D
SCALE: 1/4" = 1'-0"
FED DRAWING NO.
STA. PROJ. NO. CP9174M
SPEC. NO. 05-99-3587
CONSTR. CONTR. NO. 015227
NAVFAC DRAWING NO. 4406697
SHEET 2 OF 23

T-2

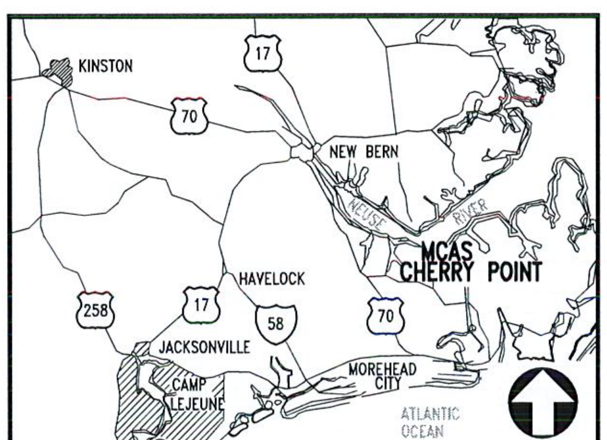
REPLACE 800 PSIG FUEL FIRED HEAT EXCHANGER

BUILDING 137, FRC-E

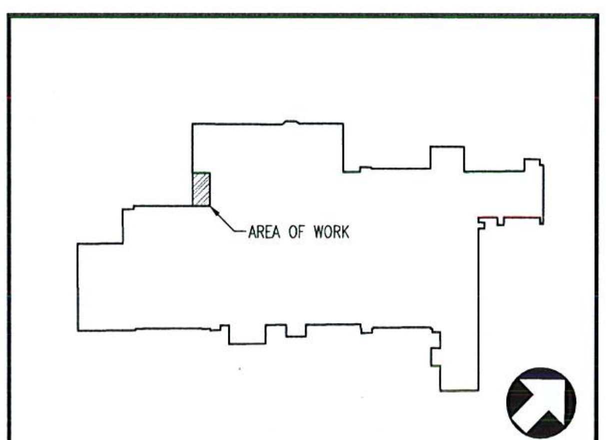
MARINE CORPS AIR STATION CHERRY POINT, NORTH CAROLINA PROJECT NO. XC85773



LOCATION MAP



VICINITY MAP



KEY PLAN

INDEX OF DRAWINGS

Pace COLLABORATIVE
VIRGINIA BEACH, VA
WWW.PACE-ENGINEERING.COM

COMMONWEALTH OF VIRGINIA
JASON A. KULENGUSKI
Lic. No. 052876
08-05-2016
PROFESSIONAL ENGINEER

DES MDP | DRW MTF | CHK JAK

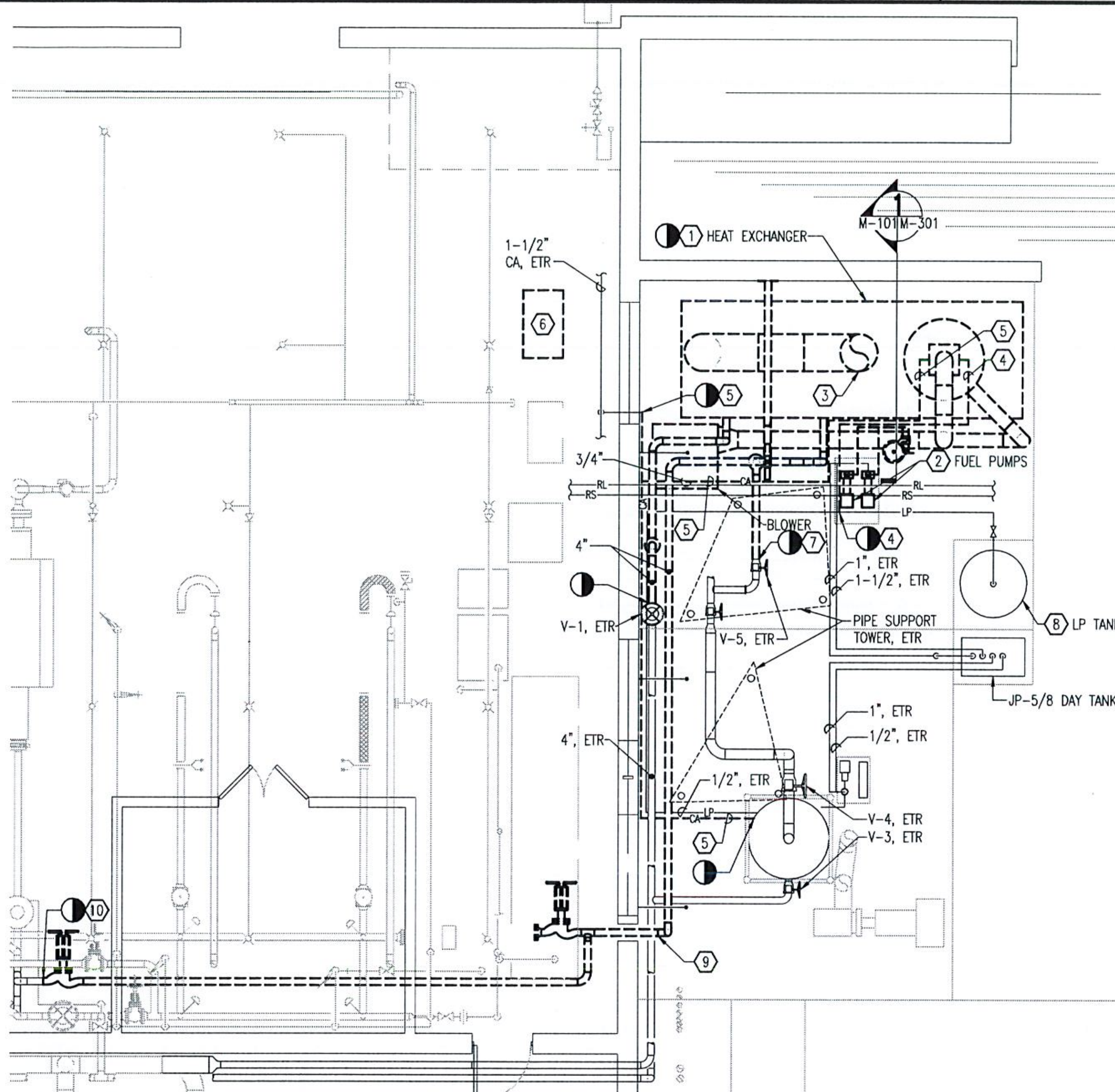
U.S. MARINE CORPS AIR STATION CHERRY POINT, NORTH CAROLINA
REPLACE 800 PSIG FUEL FIRED HEAT EXCHANGER - BLDG 137, FRC-E
TITLE SHEET

SCALE: AS NOTED
PROJECT NO.: XC85773
MAXIMO WORK ORDER NO.: W06414479
NAVFAC DRAWING NO.: 12728287
SHEET 1 of 17

G-001

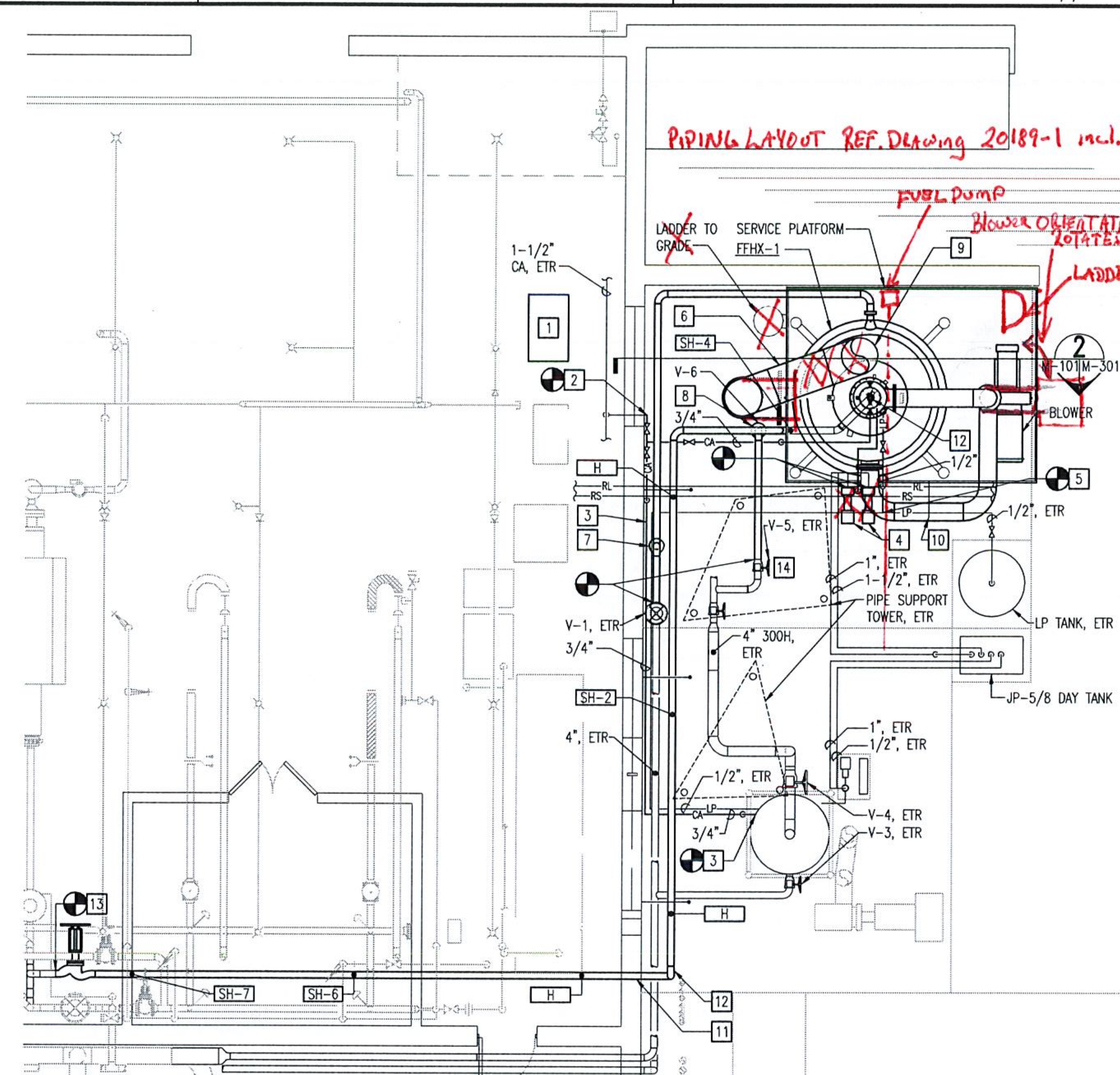
As Builts 12/10/19

REVISION DATE
8/7/23



HEAT EXCHANGER AREA – DEMOLITION

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



HEAT EXCHANGER AREA – NEW WORK

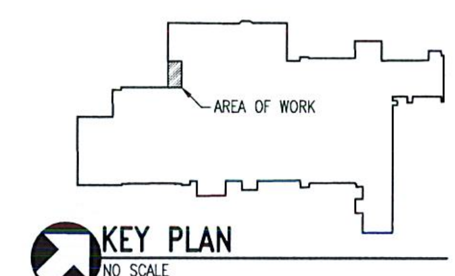
SCALE: 1/4" = 1'-0"

DEMOLITION NOTES

1. REMOVE EXISTING FUEL FIRED HEAT EXCHANGER, FLUE, AND ACCESSORIES COMPLETE.
2. REMOVE EXISTING FUEL PUMPS AND PIPE BETWEEN PUMPS AND HEAT EXCHANGER.
3. REMOVE EXISTING FLUE AND SUPPORTS COMPLETE.
4. REMOVE EXISTING 1/2" LP GAS TO EXISTING FUEL FIRED HEAT EXCHANGER.
5. REMOVE EXISTING 3/4" COMPRESSED AIR AT EXTERIOR OF BUILDING, INCLUDING 3/4" COMPRESSED AIR TO BOTH EXISTING FUEL FIRED HEAT EXCHANGERS. PRIOR TO ANY WORK (ISOLATION, REMOVAL, ADJUSTMENT OF VALVES, ETC.) STARTING ON THIS COMPRESSED AIR PIPING, CONTRACTING OFFICER AND FRC EAST (ENGINEERING AND PRODUCTION) SHALL BE CONTACTED, IN WRITING, FOR APPROVAL OF PROPOSED TIMELINE TO COMPLETELY REPLACE THIS COMPRESSED AIR LINE. NOTE THE COMPLETE AIR LINE REPLACEMENT SHALL OCCUR ON SUNDAY WHEN PRODUCTION IS NOT OPERATIONAL.
6. REMOVE EXISTING FUEL FIRED HEAT EXCHANGER PANEL AND ALL ASSOCIATED WIRE.
7. REMOVE EXISTING 4" 300H BACK TO OUTLET OF EXISTING BYPASS VALVE.
8. LP TANK SHALL BE DISCONNECTED AND TEMPORARILY RELOCATED A MINIMUM OF 50' FROM HOT WORK FOR THE DURATION OF HOT WORK. TEMPORARY LP TANK AND PIPE INSTALLATION AND REINSTALLATION SHALL BE PERFORMED BY LP TANK OWNER (AMERIGAS) AND PAID FOR BY CONTRACTOR. RELOCATION AND REINSTALLATION SHALL BE PERFORMED ON SUNDAYS.
9. PATCH BRICK WALL TO MATCH EXISTING.
10. REMOVE EXISTING 4" 800H FROM EXISTING FUEL FIRED HEAT EXCHANGER TO TEST CHAMBER, INCLUDING TEST CHAMBER ISOLATION VALVE.

NEW WORK NOTES

1. PROVIDE NEW FUEL FIRED HEAT EXCHANGER CONTROL PANEL AND ALL ACCESSORIES, SENSORS, TRANSDUCERS, AND WIRE TO NEW FUEL FIRED HEAT EXCHANGER.
2. PROVIDE NEW EXTERIOR 3/4" COMPRESSED AIR, CONNECT TO EXISTING AT BUILDING.
3. PROVIDE NEW 3/4" COMPRESSED AIR AT GRADE TO EXISTING FUEL FIRED HEAT EXCHANGER. PRIOR TO ANY WORK (ISOLATION, REMOVAL, ADJUSTMENT OF VALVES, ETC.) STARTING ON THIS COMPRESSED AIR PIPING, CONTRACTING OFFICER AND FRC EAST (ENGINEERING AND PRODUCTION) SHALL BE CONTACTED, IN WRITING, FOR APPROVAL OF PROPOSED TIMELINE TO COMPLETELY REPLACE THIS COMPRESSED AIR LINE. NOTE THE COMPLETE AIR LINE REPLACEMENT SHALL OCCUR ON SUNDAY WHEN PRODUCTION IS NOT OPERATIONAL.
4. PROVIDE NEW JP-5/8 FUEL PUMPS, P-1 AND P-2, CONNECT TO EXISTING 1-1/2" SUPPLY AND 1" RETURN. CONNECT 1-1/2" SUPPLY AND 1" RETURN TO NEW FUEL FIRED HEAT EXCHANGER BURNER. PROVIDE SAFETY SHUT-OFF VALVE, MOUNT SWITCH AND FUEL FIRED HEAT EXCHANGER EXTERIOR CONTROL PANEL.
5. PROVIDE NEW 1/2" LP TO FUEL FIRED HEAT EXCHANGER BURNER, CONNECT TO EXISTING 3/4" LP.
6. OFFSET 24"ø FLUE, PROVIDE 20 GAUGE 304 SS VENTILATED HEAT SHIELD AROUND FLUE FROM GRADE TO 8'-6" ABOVE SERVICE PLATFORM.
7. 4" 800C, PROVIDE TEE DOWN TO EXISTING 300C, TERMINATE WITH FLANGE. PROVIDE SPOOL PIECE AND DELIVER TO FRC-E.
8. PROVIDE FLANGED TEE WITH VALVE (V-6) DOWN ON 4" 800H, DIRECTLY ABOVE EXISTING 300H. PROVIDE SPOOL PIECE AND DELIVER TO FRC-E.
9. 24" 316SS FLUE, SUPPORT FROM PLATFORM STRUCTURE. PROVIDE GUIDES ON BUILDING. VERIFY DIAMETER WITH FUEL-FIRED HEAT EXCHANGER MANUFACTURER.
10. PROVIDE TEMPORARY SUPPORT FOR EXISTING LP, CA, AND RS/RL. PROVIDE PERMANENT SUPPORT FOR LP, CA, AND RS/RL FROM NEW PLATFORM.
11. PROVIDE NEW WALL PENETRATION, SEAL OPENING BETWEEN JACKET AND WALL.
12. PROVIDE GIMBAL JOINT FOR EXPANSION COMPENSATION.
13. PIPE ROUTING IS APPROXIMATE AND MAY BE REQUIRED TO CHANGE BASED ON THE PIPING STRESS AND CREEP ANALYSES TO ACCOMMODATE THE ACTUAL HEAT EXCHANGER PROVIDED.
14. PROVIDE INTERLOCK SO THAT V-5 LIMITS DISCHARGE AIR TEMPERATURE TO 1075°F.



KEY PLAN

NO SCALE

GRAPHIC SCALE:

1/4" = 1'-0"   5'   0'   5'   10'

PACE COLLABORATIVE

COMMONWEALTH OF VIRGINIA — MICHAEL D. PICKARD — Lic. No. 026374 — 08-05-2016 — PROFESSIONAL ENGINEER

DES MDP | DRW MTF | CHK JAK

U.S. MARINE CORPS AIR STATION CHERRY POINT, NORTH CAROLINA

REPLACE 800 PSIG FUEL FIRED HEAT EXCHANGER - BLDG 137, FRC-E

HEAT EXCHANGER AREA FLOOR PLANS

SCALE: AS NOTED
PROJECT NO.: XC85773
MAXIMO WORK ORDER NO. W06414479
NAVFAC DRAWING NO. 12728296
SHEET 10 OF 17

M-101

AS Builds 12/10/17 BHB

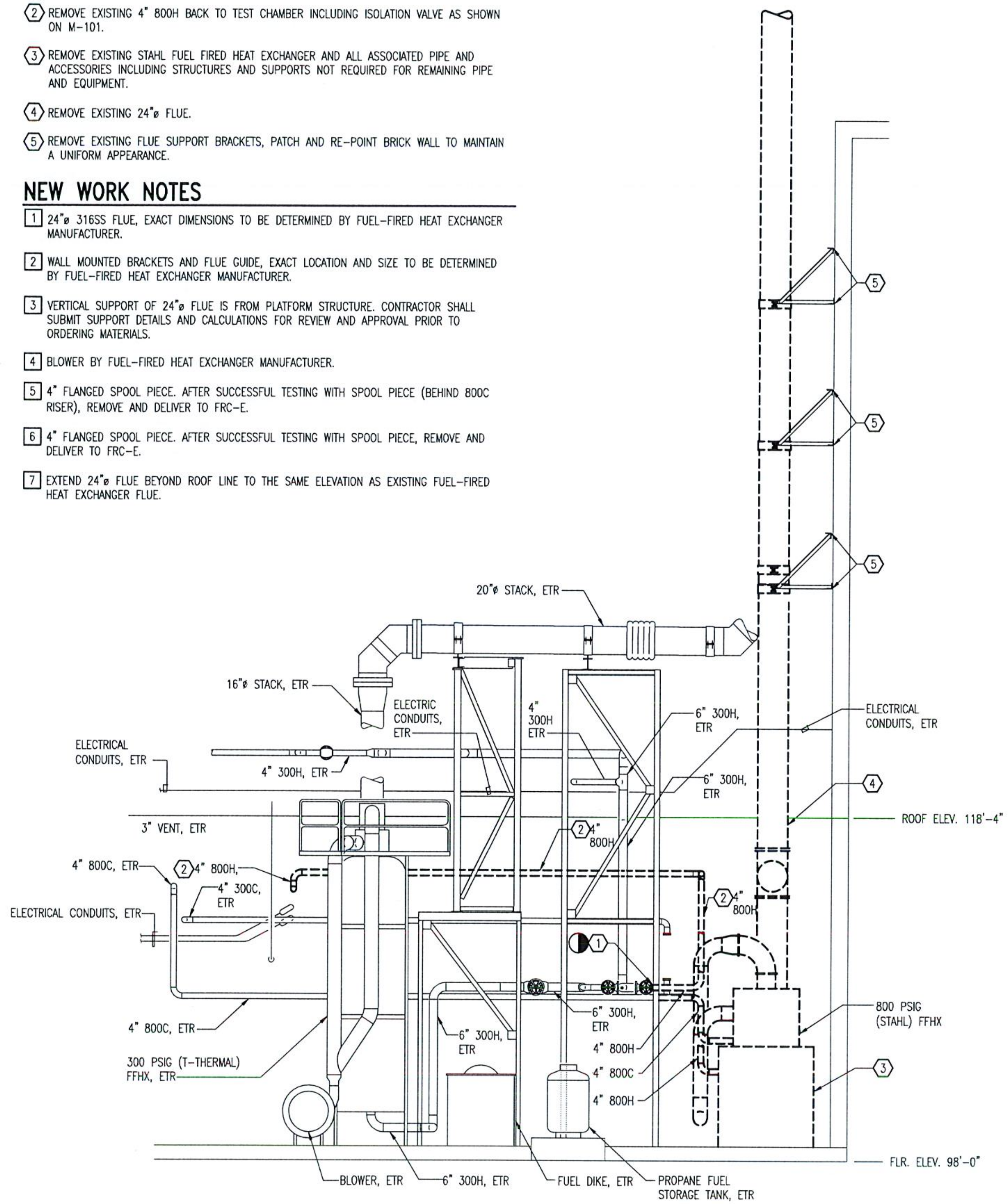
REVISION DATE 8/7/23

DEMOLITION NOTES

1. REMOVE EXISTING 6" 300H BACK TO AND INCLUDING ISOLATION VALVE.
2. REMOVE EXISTING 4" 800H BACK TO TEST CHAMBER INCLUDING ISOLATION VALVE AS SHOWN ON M-101.
3. REMOVE EXISTING STAHL FUEL FIRED HEAT EXCHANGER AND ALL ASSOCIATED PIPE AND ACCESSORIES INCLUDING STRUCTURES AND SUPPORTS NOT REQUIRED FOR REMAINING PIPE AND EQUIPMENT.
4. REMOVE EXISTING 24"ø FLUE.
5. REMOVE EXISTING FLUE SUPPORT BRACKETS, PATCH AND RE-POINT BRICK WALL TO MAINTAIN A UNIFORM APPEARANCE.

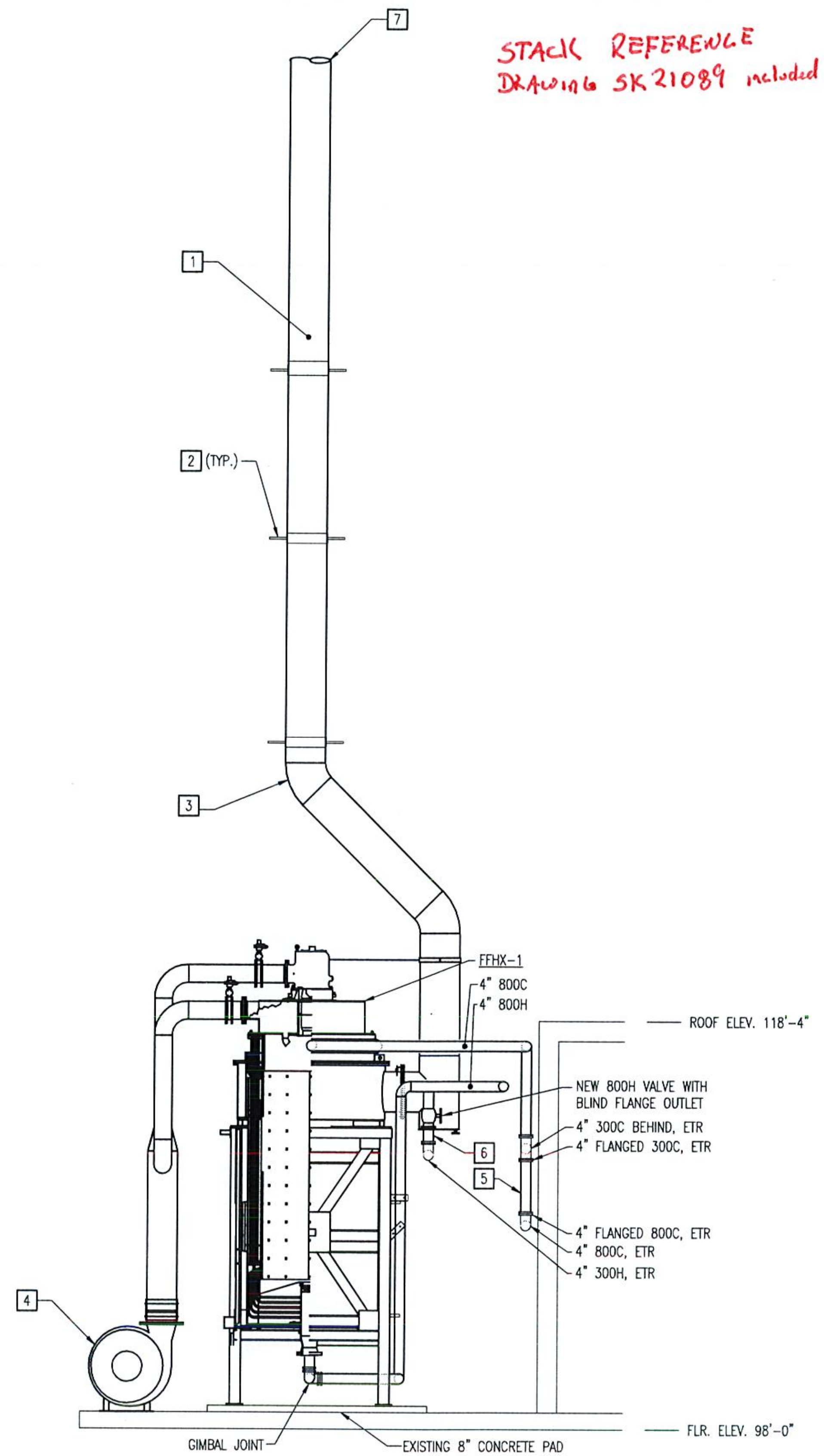
NEW WORK NOTES

1. 24"ø 316SS FLUE, EXACT DIMENSIONS TO BE DETERMINED BY FUEL-FIRED HEAT EXCHANGER MANUFACTURER.
2. WALL MOUNTED BRACKETS AND FLUE GUIDE, EXACT LOCATION AND SIZE TO BE DETERMINED BY FUEL-FIRED HEAT EXCHANGER MANUFACTURER.
3. VERTICAL SUPPORT OF 24"ø FLUE IS FROM PLATFORM STRUCTURE. CONTRACTOR SHALL SUBMIT SUPPORT DETAILS AND CALCULATIONS FOR REVIEW AND APPROVAL PRIOR TO ORDERING MATERIALS.
4. BLOWER BY FUEL-FIRED HEAT EXCHANGER MANUFACTURER.
5. 4" FLANGED SPOOL PIECE. AFTER SUCCESSFUL TESTING WITH SPOOL PIECE (BEHIND 800C RISER), REMOVE AND DELIVER TO FRC-E.
6. 4" FLANGED SPOOL PIECE. AFTER SUCCESSFUL TESTING WITH SPOOL PIECE, REMOVE AND DELIVER TO FRC-E.
7. EXTEND 24"ø FLUE BEYOND ROOF LINE TO THE SAME ELEVATION AS EXISTING FUEL-FIRED HEAT EXCHANGER FLUE.



1 M-101 M-301 SECTION AT HEAT EXCHANGER – DEMOLITION
NOT TO SCALE

STACK REFERENCE DRAWING SK21089 included



2 M-101 M-301 SECTION AT HEAT EXCHANGER – NEW WORK
NOT TO SCALE

Pace COLLABORATIVE

COMMONWEALTH OF VIRGINIA
MICHAEL D. PICKARD
Lic. No. 026374
08-05-2016
PROFESSIONAL ENGINEER

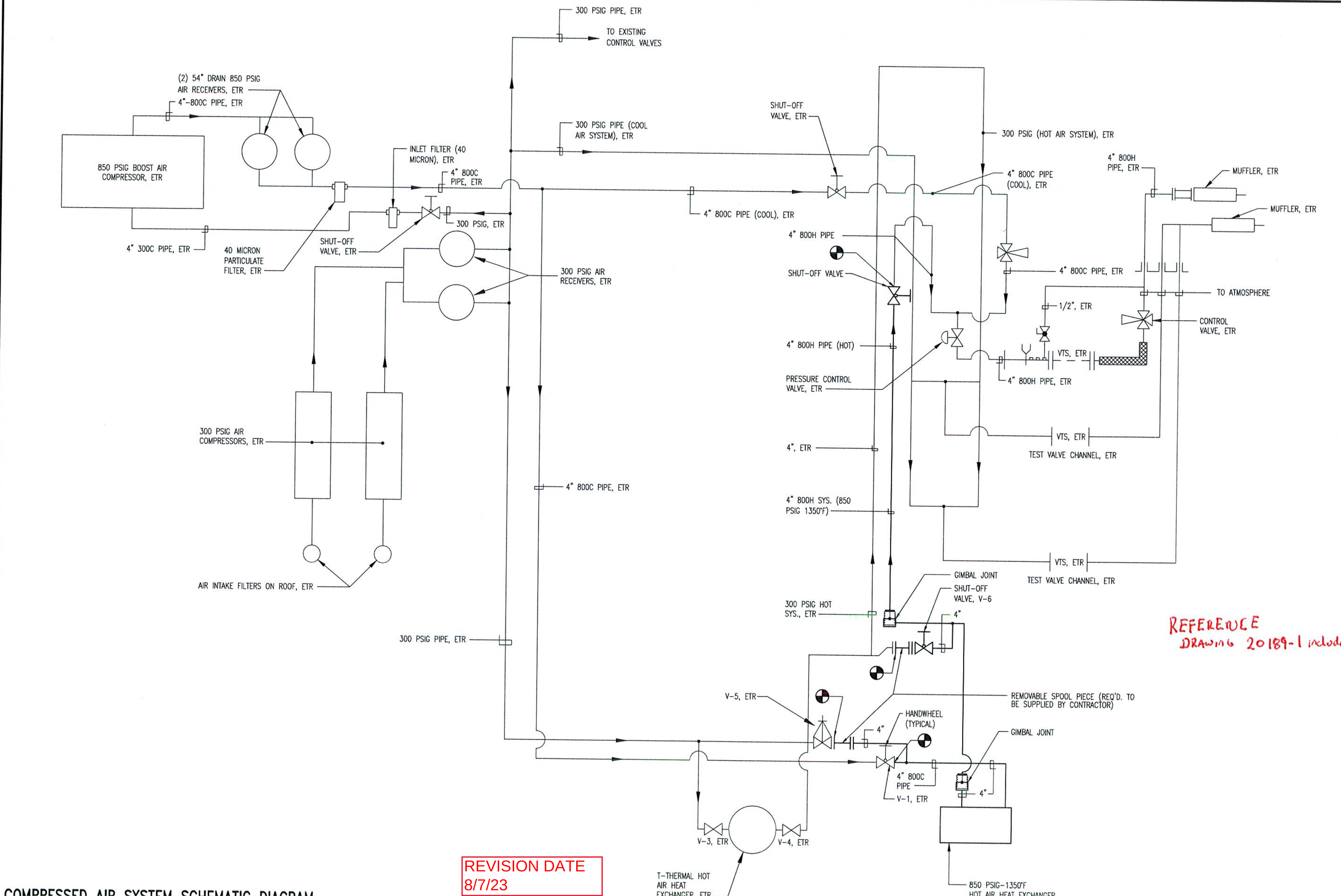
DES MDP | DRW MTF | CHK JAK

U.S. MARINE CORPS AIR STATION CHERRY POINT, NORTH CAROLINA
REPLACE 800 PSIG FUEL FIRED HEAT EXCHANGER - BLDG 137, FRC-E
SECTIONS

SCALE: AS NOTED
PROJECT NO.: XC85773
MAXIMO WORK ORDER NO. W06414479
NAVFAC DRAWING NO. 12728297
SHEET 11 OF 17
M-301

As Builts 12/10/19

REVISION DATE 8/7/23



REFERENCE DRAWING 20189-1 included

REVISION DATE 8/7/23

COMPRESSED AIR SYSTEM SCHEMATIC DIAGRAM

SCALE: NO SCALE

As Builts 12/10/19 BHB

Pace COLLABORATIVE
MECHANICAL ELECTRICAL ENGINEERS
VIRGINIA BEACH, VA
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COMMONWEALTH OF VIRGINIA
MICHAEL D. PICKARD
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08-05-2016
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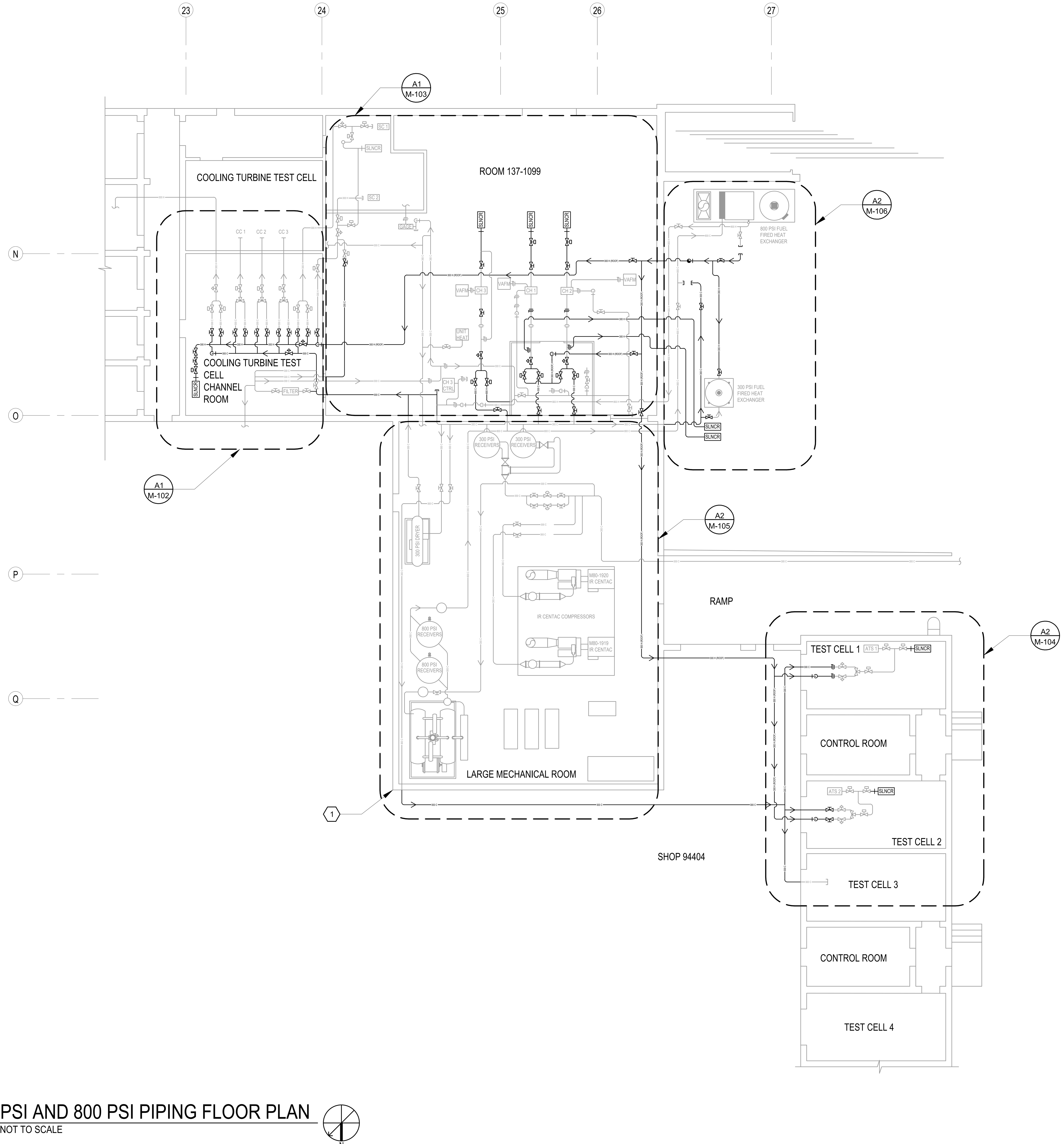
U.S. MARINE CORPS AIR STATION CHERRY POINT, NORTH CAROLINA

REPLACE 800 PSIG FUEL FIRED HEAT EXCHANGER - BLDG 137, FRC-E

DIAGRAM

SCALE: AS NOTED
PROJECT NO.: XC85773
MAXIMO WORK ORDER NO. W06414479
NAVFAC DRAWING NO. 12728300
SHEET 14 OF 17
M-601



300 PSI AND 800 PSI PIPING FLOOR PLAN

SCALE: NOT TO SCALE

GENERAL NOTES

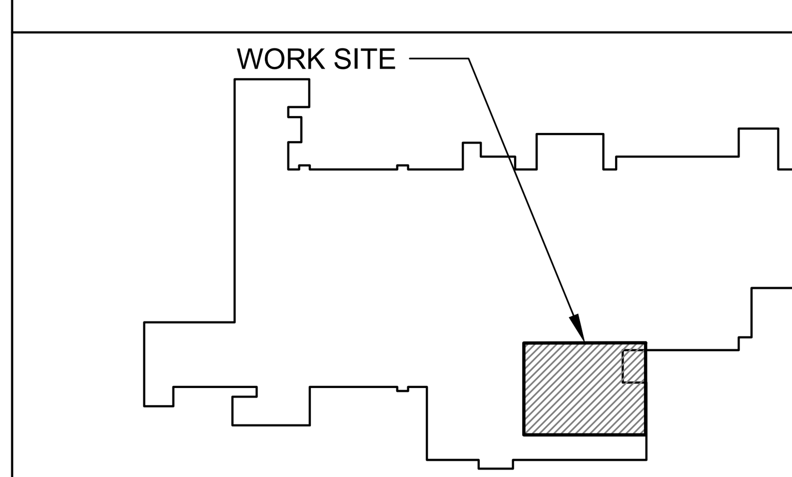
1. ALL WORK INDICATED ON THIS DRAWING(S) SHALL COMPLY WITH FEDERAL BUILDING CODES.
2. ALL WORK ASSOCIATED WITH THIS PACKAGE (I.E. - DELIVERY DATES, INSTALLATION, RELOCATIONS, ETC) SHALL BE COORDINATED THROUGH THE PROJECT MANAGER, JULIEN MILES 252-464-8837.
3. CONDITIONS SHOWN ARE BASED ON EXISTING PLANS AND FIELD OBSERVATION WITHOUT DEMOLITION.
4. DIMENSIONS SHOWN ARE APPROXIMATE. FIELD VERIFY ALL DIMENSIONS PRIOR TO ORDERING MATERIAL AND COMMENCING WORK.

KEYNOTES

1. CURRENTLY UNDER CONSTRUCTION. LAYOUT WILL CHANGE VIA DUKE ENERGY. LARGE MECHANICAL ROOM ONLY.

LEGEND AND ABBREVIATIONS

800 PSI -- HOT	800 H
800 PSI -- COLD	800 C
300 PSI -- HOT	300 H
300 PSI -- COLD	300 C
PIPE CONTINUES	
DIRECTION OF FLOW	
CAP	
PIPE TURN DOWN	
PIPE TURN UP	
ORIFICE PLATE	
BUTTERFLY VALVE	
MIXING VALVE	
MK. 1 VALVE	
MK. 9 VALVE	
GATE VALVE	
OTHER VALVES	
FILTER	FILTER
SILENCER	SLNCR
SILENCER ON ROOF	SLNCR
COOLING TURBINE CHANNEL	CC
STARTER CHANNEL	SC
CHANNEL	CHX
VARIABLE AREA FLOW METER	VAFM
CHANNEL 3 CONTROLLER	CH3 CTRL
MODINE UNIT HEATER	UNIT HEAT
PRESSURE GAGE	GAGE



B137 WORK LOCATION

SCALE: NOT TO SCALE

REV	DESCRIPTION	DATE	APPR

REVISION HISTORY

FLEET READINESS CENTER EAST

FRC

EFFICIENS - AGILIS - VELOX

PRELIMINARY NOT FOR CONSTRUCTION

CONSTRUCTION DIVISION APPROVED WHEN SIGNED

2022DEC21

DESIGNER	W.DOHENY
DRAWN	J.DRUMM
CHECKED	K. WETHERINGTON
REVIEWED	M. CHAPOTON
APPROVED	C. YDE

FLEET READINESS CENTER EAST
U.S. MARINE CORPS AIR STATION, CHERRY POINT, NC

300 PSI AND 800 PSI PIPING WORK

300 PSI & 800 PSI PIPING FLOOR PLAN

DIVISION DWG NO.
PE-22056

BUILDING 137

SHOP: 94400

SIZE	CAGE CODE
D	96916

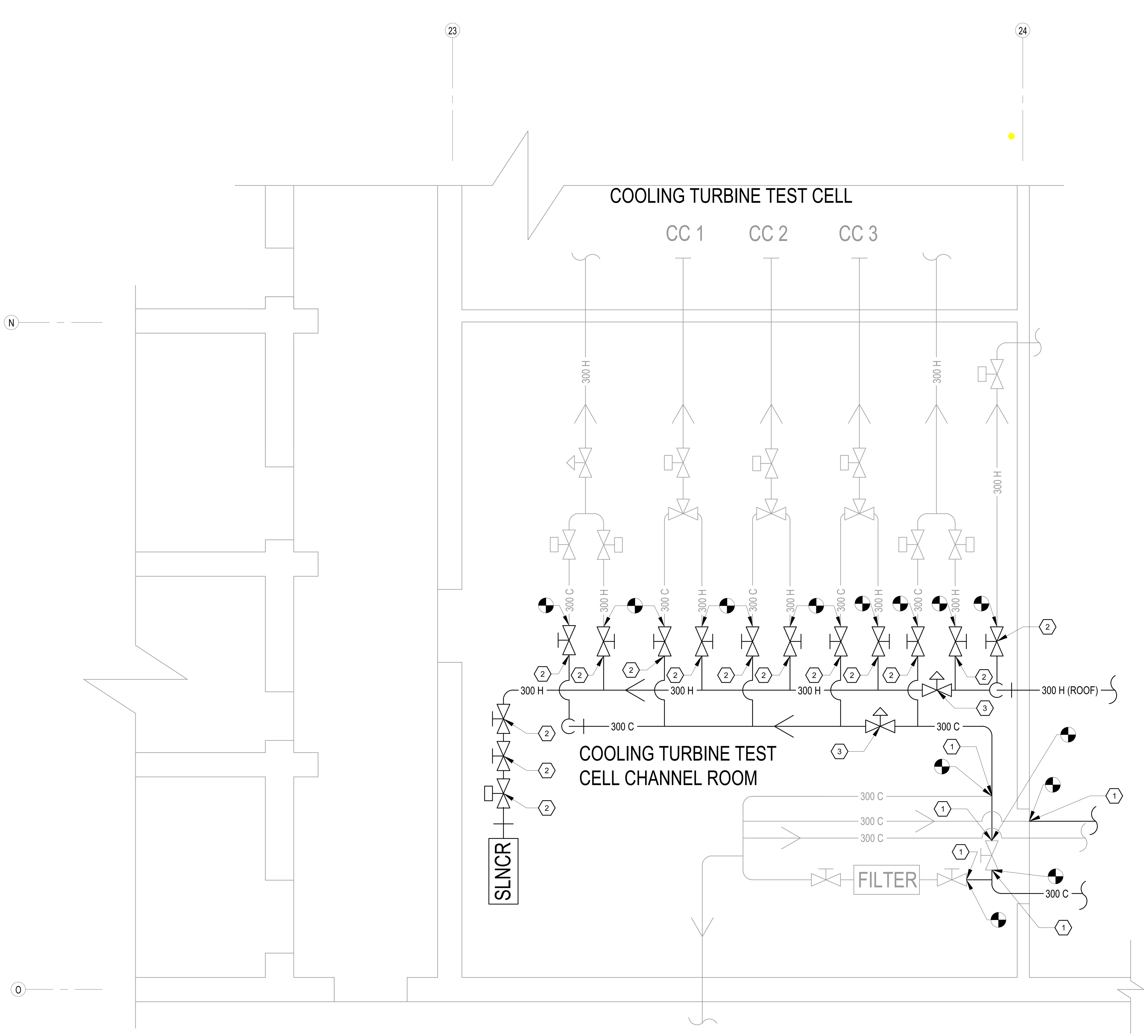
M-101

SCALE: AS NOTED

WO: XL93928

SHEET 1 OF 6

2-2019



A1 COOLING TURBINE TEST CELL CHANNEL ROOM
SCALE: NOT TO SCALE

GENERAL NOTES

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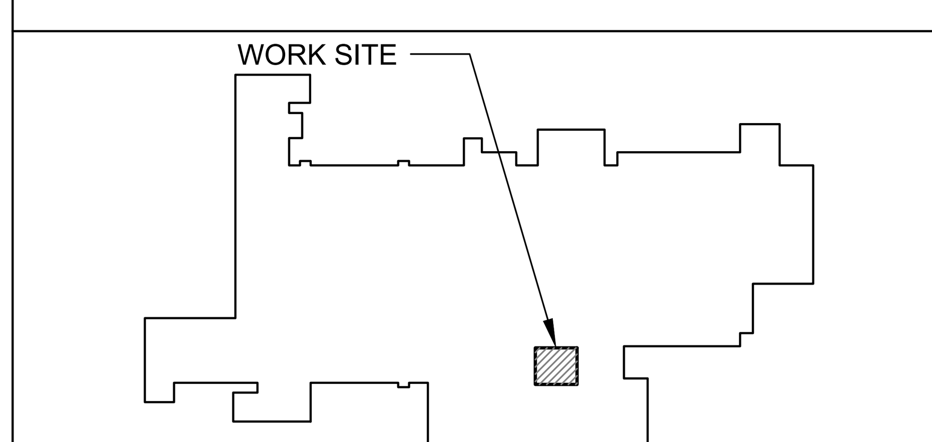
3. CONDITIONS SHOWN ARE BASED ON EXISTING PLANS AND FIELD OBSERVATION WITHOUT DEMOLITION.
4. DIMENSIONS SHOWN ARE APPROXIMATE. FIELD VERIFY ALL DIMENSIONS PRIOR TO ORDERING MATERIAL AND COMMENCING WORK.

KEYNOTES

1. TERMINATION POINT IS WHERE CARBON STEEL MEETS STAINLESS STEEL
2. VALVE TO BE REPLACED SHALL MATCH EXISTING.
3. VALVE TO BE REPLACED SHALL MATCH EXISTING. CHECK THE TRIM.

LEGEND AND ABBREVIATIONS

300 PSI -- HOT	300 H
300 PSI -- COLD	300 C
PIPE CONTINUES	
DIRECTION OF FLOW	
PIPE TURN DOWN	
MIXING VALVE	
MK. 1 VALVE	
MK. 9 VALVE	
GATE VALVE	
FILTER	FILTER
SILENCER ON ROOF	SLNCR
TERMINATION POINT	
COOLING TURBINE CHANNEL	CC



B137 WORK LOCATION
SCALE: NOT TO SCALE

REV	DESCRIPTION	DATE	APPR

REVISION HISTORY

FLEET READINESS CENTER EAST

PRELIMINARY NOT FOR CONSTRUCTION

NOT FOR CONSTRUCTION DIVISION APPROVED WHEN SIGNED 2022DEC21

DESIGNER	W.DOHENY
DRAWN	J.DRUMM
CHECKED	K. WETHERINGTON
REVIEWED	M. CHAPOTON
APPROVED	C. YDE

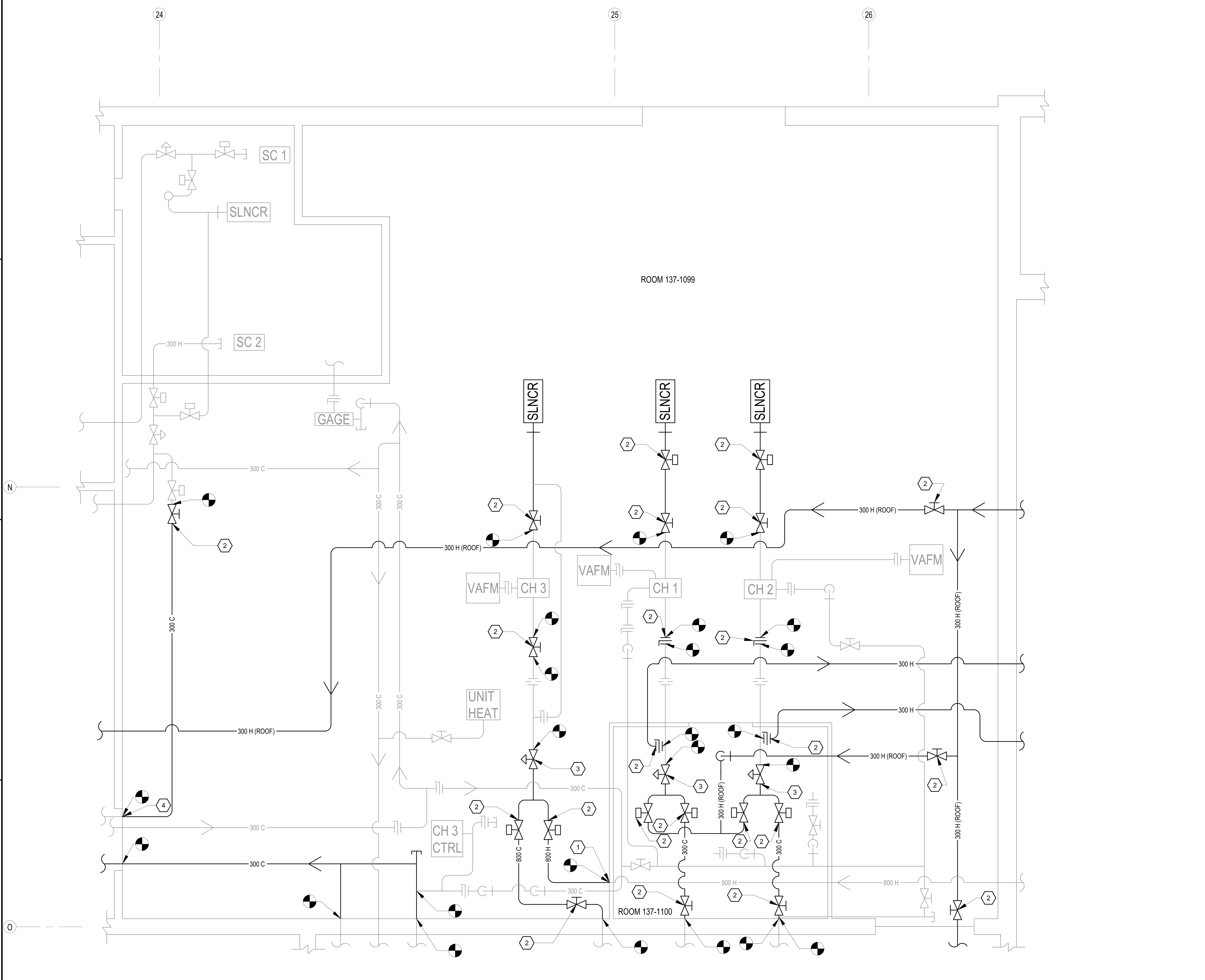
FLEET READINESS CENTER EAST
U.S. MARINE CORPS AIR STATION, CHERRY POINT, NC

300 PSI AND 800 PSI PIPING WORK
SMALL MECHANICAL ROOM PARTIAL FLOOR PLAN

DIVISION DWG NO.
PE-22056

BUILDING 137
SHOP: 94400
SIZE D
CAGE CODE 96916
M-102
SCALE: AS NOTED
WO: XL93928
SHEET 2 OF 6

2-2019



A1 ROOMS 137-1099 &137-1100 PARTIAL FLOOR PLAN

SCALE: NOT TO SCALE

GENERAL NOTES

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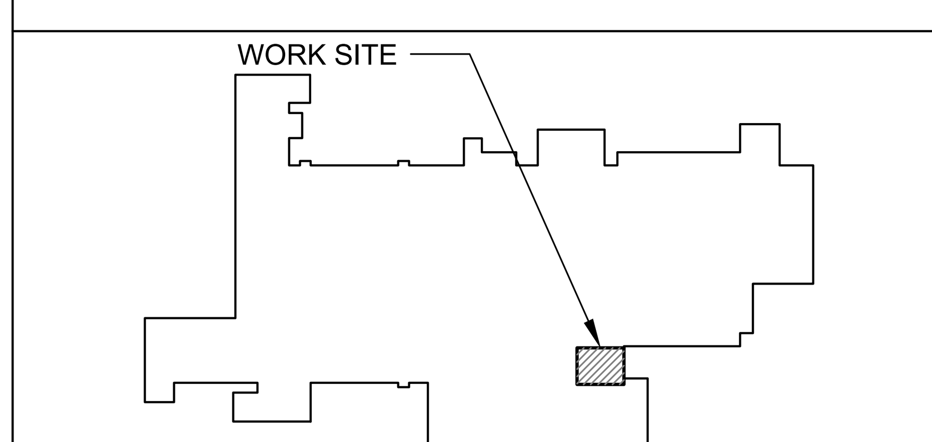
3. CONDITIONS SHOWN ARE BASED ON EXISTING PLANS AND FIELD OBSERVATION WITHOUT DEMOLITION.
4. DIMENSIONS SHOWN ARE APPROXIMATE. FIELD VERIFY ALL DIMENSIONS PRIOR TO ORDERING MATERIAL AND COMMENCING WORK.

KEYNOTES

1. NEW GATE VALVE TO BE INSTALLED. INSTALL AT WALL.
2. VALVE TO BE REPLACED SHALL MATCH EXISTING.
3. VALVE TO BE REPLACED SHALL MATCH EXISTING. CHECK THE TRIM.
4. TERMINATION POINT IS WHERE CARBON STEEL MEETS STAINLESS STEEL

LEGEND AND ABBREVIATIONS

800 PSI -- HOT	800 H
800 PSI -- COLD	800 C
300 PSI -- HOT	300 H
300 PSI -- COLD	300 C
PIPE CONTINUES	
DIRECTION OF FLOW	
CAP	
PIPE TURN DOWN	
ORIFICE PLATE	
BUTTERFLY VALVE	
MIXING VALVE	
MK. 1 VALVE	
MK. 9 VALVE	
GATE VALVE	
FILTER	FILTER
SILENCER ON ROOF	SLNCR
TERMINATION POINT	
COOLING TURBINE CHANNEL	CC
STARTER CHANNEL	SC
CHANNEL	CHX
VARIABLE AREA FLOW METER	VAFM
CHANNEL 3 CONTROLLER	CH3 CTRL
MODINE UNIT HEATER	UNIT HEAT
PRESSURE GAGE	GAGE



B137 WORK LOCATION

SCALE: NOT TO SCALE

REV	DESCRIPTION	DATE	APPR
REVISION HISTORY			

FLEET READINESS CENTER EAST

PRELIMINARY NOT FOR CONSTRUCTION

DIVISION APPROVED WHEN SIGNED

2022DEC21

DESIGNER	W.DOHENY
DRAWN	J.DRUMM
CHECKED	K. WETHERINGTON
REVIEWED	M. CHAPOTON
APPROVED	C. YDE

FLEET READINESS CENTER EAST
U.S. MARINE CORPS AIR STATION, CHERRY POINT, NC

300 PSI AND 800 PSI PIPING WORK

ROOMS 137-1099 & 137-1100 PARTIAL FLOOR PLAN

DIVISION DWG NO. PE-22056

BUILDING 137

SHOP: 94400

SIZE	CAGE CODE
D	96916

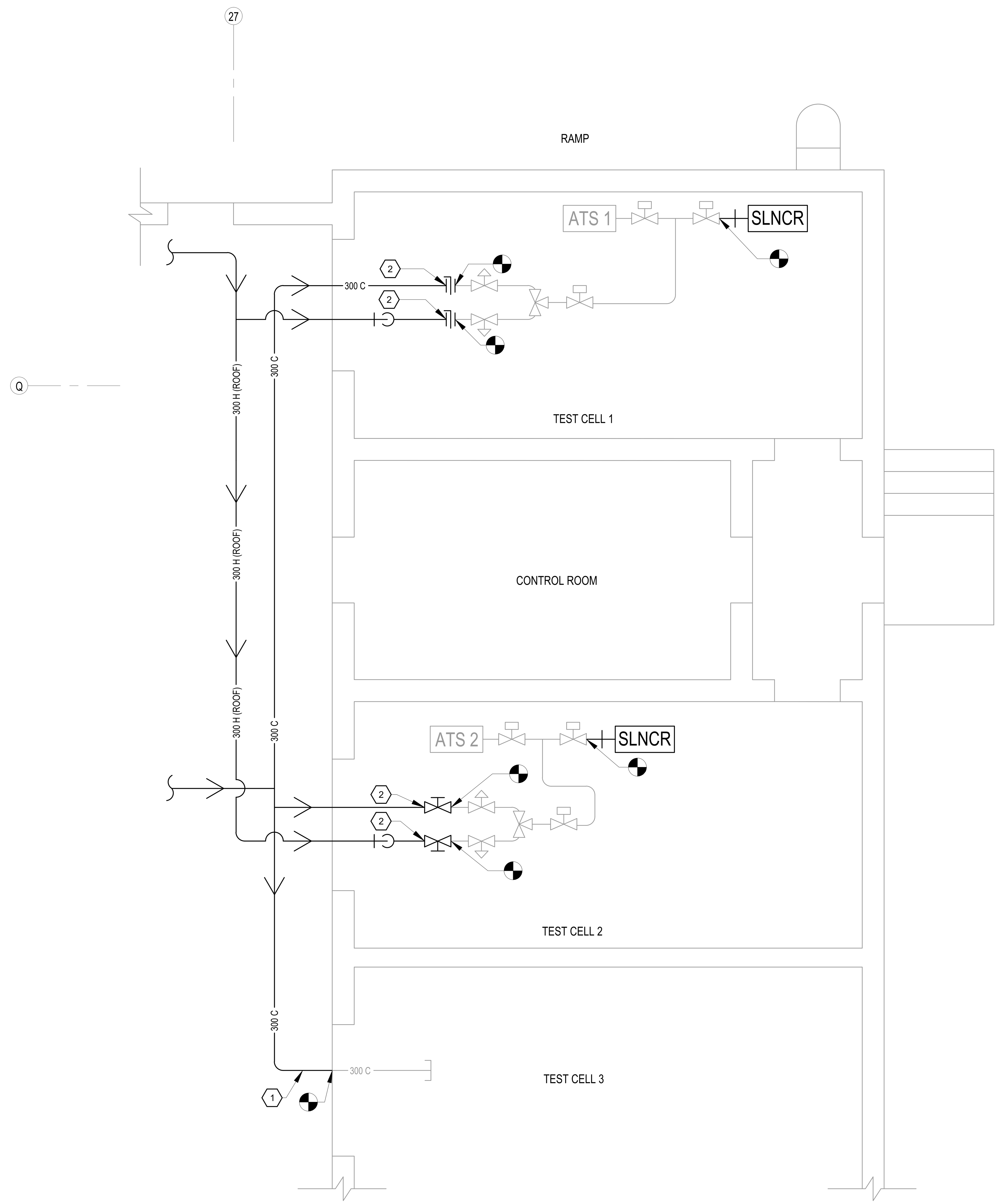
M-103

SCALE: AS NOTED

WO: XL93928

SHEET 3 OF 6

2-2019



A2 TEST CELL PARTIAL FLOOR PLAN
SCALE: NOT TO SCALE

GENERAL NOTES

1. ALL WORK INDICATED ON THIS DRAWING(S) SHALL COMPLY WITH FEDERAL BUILDING CODES.
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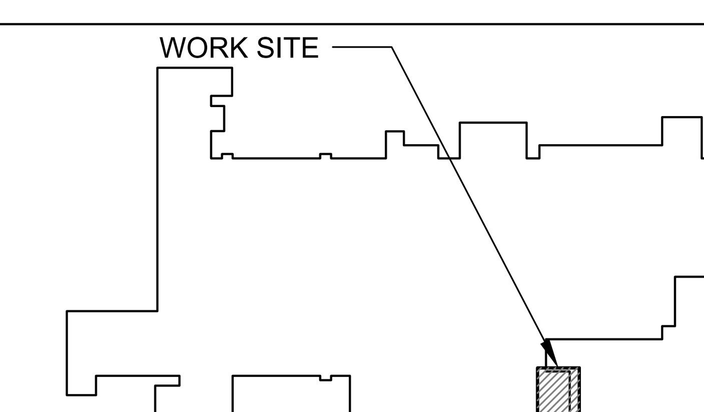
3. CONDITIONS SHOWN ARE BASED ON EXISTING PLANS AND FIELD OBSERVATION WITHOUT DEMOLITION.
4. DIMENSIONS SHOWN ARE APPROXIMATE. FIELD VERIFY ALL DIMENSIONS PRIOR TO ORDERING MATERIAL AND COMMENCING WORK.

KEYNOTES

1. NEW GATE VALVE TO BE INSTALLED. INSTALL AT WALL.
2. VALVE TO BE REPLACED SHALL MATCH EXISTING.

LEGEND AND ABBREVIATIONS

300 PSI -- HOT	300 H
300 PSI -- COLD	300 C
PIPE CONTINUES	
DIRECTION OF FLOW	
CAP	
PIPE TURN DOWN	
BUTTERFLY VALVE	
MIXING VALVE	
MK. 1 VALVE	
MK. 9 VALVE	
GATE VALVE	
SILENCER ON ROOF	SLNCR
TERMINATION POINT	
AIR TURBINE STARTER	ATS



B137 WORK LOCATION
SCALE: NOT TO SCALE

REV	DESCRIPTION	DATE	APPR

REVISION HISTORY

FLEET READINESS CENTER EAST

PRELIMINARY
NOT FOR CONSTRUCTION
DIVISION APPROVED WHEN SIGNED
2022DEC21

DESIGNER	W.DOHENY
DRAWN	J.DRUMM
CHECKED	K. WETHERINGTON
REVIEWED	M. CHAPOTON
APPROVED	C. YDE

FLEET READINESS CENTER EAST
U.S. MARINE CORPS AIR STATION, CHERRY POINT, NC

300 PSI AND 800 PSI PIPING WORK
TEST CELL PARTIAL FLOOR PLAN

DIVISION DWG NO.
PE-22056

BUILDING 137
SHOP: 94400
SIZE D | CAGE CODE 96916
M-104
SCALE: AS NOTED
WO: XL93928
SHEET 4 OF 6

2-2019

GENERAL NOTES

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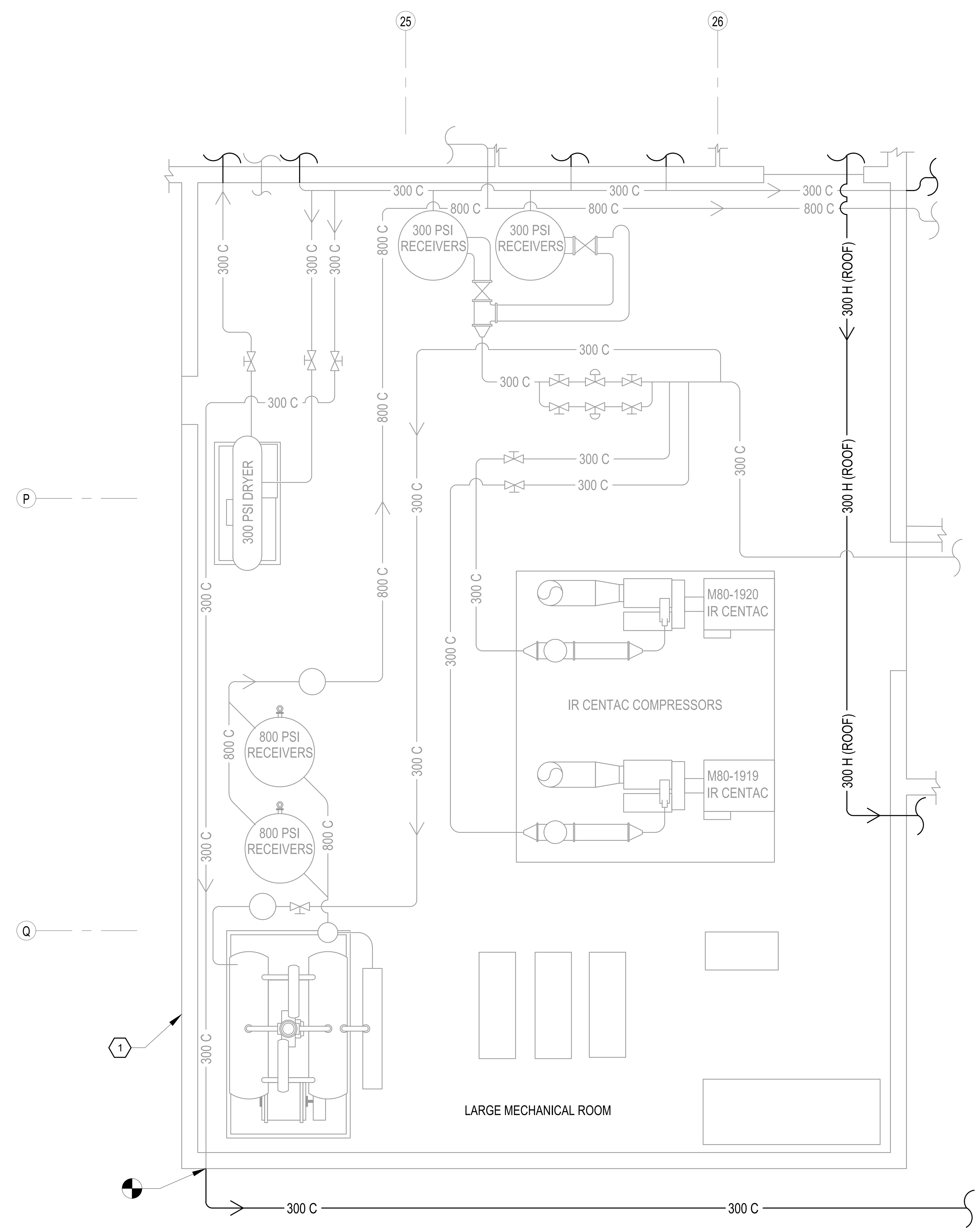
KEYNOTES

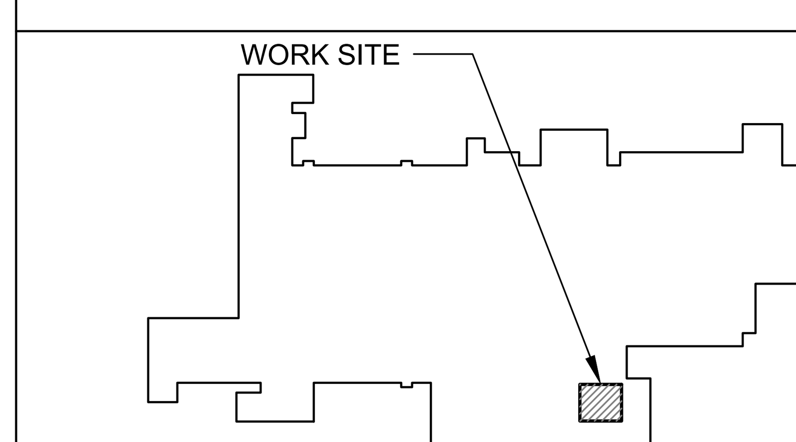
1. CURRENTLY UNDER CONSTRUCTION. LAYOUT WILL CHANGE VIA DUKE ENERGY. LARGE MECHANICAL ROOM ONLY.

LEGEND AND ABBREVIATIONS

800 PSI -- COLD	800 C
300 PSI -- HOT	300 H
300 PSI -- COLD	300 C
PIPE CONTINUES	
DIRECTION OF FLOW	
MK. 1 VALVE	
GATE VALVE	
OTHER VALVES	
TERMINATION POINT	



A2 LARGE MECHANICAL ROOM PARTIAL FLOOR PLAN
SCALE: NOT TO SCALE



B137 WORK LOCATION
SCALE: NOT TO SCALE

REV	DESCRIPTION	DATE	APPR

REVISION HISTORY

FLEET READINESS CENTER EAST

PRELIMINARY NOT FOR CONSTRUCTION

NOT FOR CONSTRUCTION DIVISION APPROVED WHEN SIGNED
2022DEC21

DESIGNER	W.DOHENY
DRAWN	J.DRUMM
CHECKED	K. WETHERINGTON
REVIEWED	M. CHAPOTON
APPROVED	C. YDE

FLEET READINESS CENTER EAST
U.S. MARINE CORPS AIR STATION, CHERRY POINT, NC
300 PSI AND 800 PSI PIPING WORK
LARGE MECHANICAL ROOM PARTIAL FLOOR PLAN

DIVISION DWG NO.
PE-22056

BUILDING 137
SHOP: 94400

SIZE	CAGE CODE
D	96916

M-105
SCALE: AS NOTED
WO: XL93928
SHEET 5 OF 6

2-2019

GENERAL NOTES

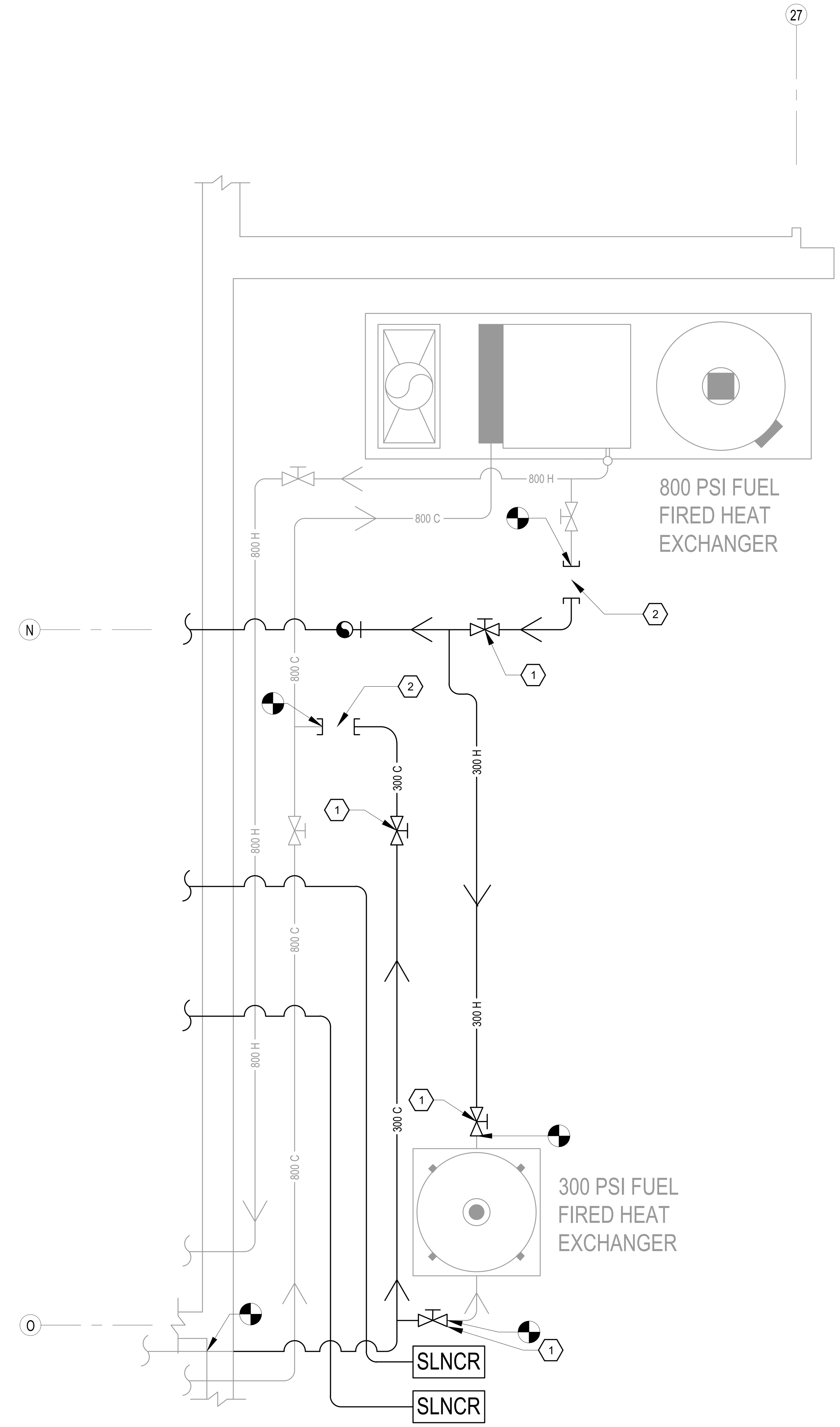
1. ALL WORK INDICATED ON THIS DRAWING(S) SHALL COMPLY WITH FEDERAL BUILDING CODES.
2. ALL WORK ASSOCIATED WITH THIS PACKAGE (I.E. - DELIVERY DATES, INSTALLATION, RELOCATIONS, ETC) SHALL BE COORDINATED THROUGH THE PROJECT MANAGER, JULIEN MILES 252-464-8837.
3. CONDITIONS SHOWN ARE BASED ON EXISTING PLANS AND FIELD OBSERVATION WITHOUT DEMOLITION.
4. DIMENSIONS SHOWN ARE APPROXIMATE. FIELD VERIFY ALL DIMENSIONS PRIOR TO ORDERING MATERIAL AND COMMENCING WORK.

KEYNOTES

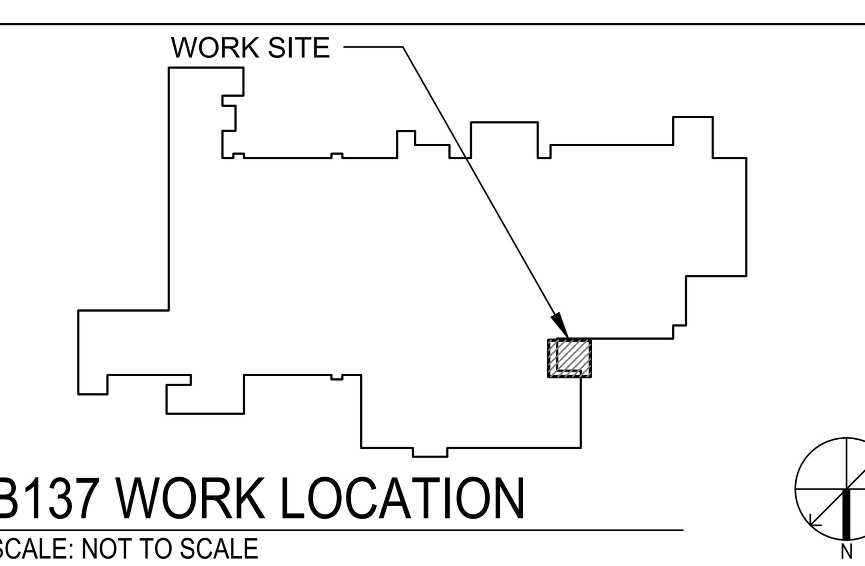
1. VALVE TO BE REPLACED SHALL MATCH EXISTING.
2. LOCATIONS FOR EMERGENCY DOUBLE BLOCK BLEED VALVES.

LEGEND AND ABBREVIATIONS

800 PSI -- HOT	800 H
800 PSI -- COLD	800 C
300 PSI -- HOT	300 H
300 PSI -- COLD	300 C
PIPE CONTINUES	
DIRECTION OF FLOW	
CAP	
PIPE TURN UP	
GATE VALVE	
SILENCER	SLNCR
TERMINATION POINT	



A2 EXTERIOR PARTIAL FLOOR PLAN
SCALE: NOT TO SCALE



B137 WORK LOCATION
SCALE: NOT TO SCALE

REV	DESCRIPTION	DATE	APPR

REVISION HISTORY

FLEET READINESS CENTER EAST

PRELIMINARY NOT FOR CONSTRUCTION

NOT FOR CONSTRUCTION
DIVISION APPROVED WHEN SIGNED
2022DEC21

DESIGNER	W.DOHENY
DRAWN	J.DRUMM
CHECKED	K. WETHERINGTON
REVIEWED	M. CHAPOTON
APPROVED	C. YDE

FLEET READINESS CENTER EAST
U.S. MARINE CORPS AIR STATION, CHERRY POINT, NC

300 PSI AND 800 PSI PIPING WORK
EXTERIOR PARTIAL FLOOR PLAN

DIVISION DWG NO.
PE-22056

BUILDING 137
SHOP: 94400

SIZE	CAGE CODE
D	96916

M-106
SCALE: AS NOTED
WO: XL93928
SHEET 6 OF 6

2-2019