Recovery Well RW-3 Installation, OU-1 Groundwater Treatment System Upgrades, and OU-1 and OU-2 Groundwater Treatment System SCADA Upgrades

OU-2 Construction Completion Report

Former Unisys Facility
1111 Marcus Avenue
Lake Success, New York 11020
NYSDEC Site ID #130045

Prepared for:

Lockheed Martin Corporation
6100 Western Place, Suite 700
Fort Worth, TX 76107

Prepared by:

AECOM
1255 Broad Street
Clifton, New Jersey 07013-3398
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February 2019

ENGINEER OF RECORD CERTIFICATION

I, Peter Rich, am currently a registered professional engineer licensed by the State of New York, I had primary direct responsibility for the design of the remedial program activities, and I certify that the OU-2 Groundwater Treatment System SCADA Upgrades were completed and that construction activities were implemented in substantial conformance with the Department-approved OU2 SCADA System Upgrade 100% Design Report.

I certify that documents generated in support of this report have been submitted in accordance with the DER's electronic submission protocols and have been accepted by the Department.

I certify that data generated in support of this report have been submitted in accordance with the Department's electronic data deliverable and have been accepted by the Department.

I certify that information and statements in this certification form are true. I understand that a false statement made herein is punishable as a Class "A" misdemeanor, pursuant to Section 210.45 of the Penal Law. I, Peter Rich, of Tetra Tech at 51 Franklin Street, Suite 400, Annapolis, MD 21401, am certifying as Owner's Designated Site Representative for the site.

Peter Rich

Printed Name of Registered Professional Engineer

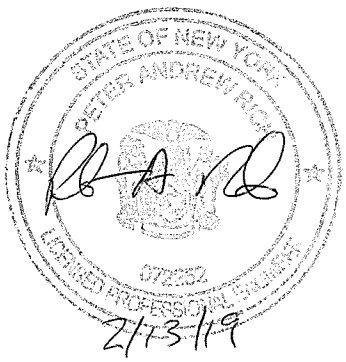
Signature of Registered Professional Engineer

072252

Registration Number

13 February 2019

Date



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List of Acronyms and Abbreviations

AECOM	AECOM Technical Services, Inc.
AROD	Amendment to the Record of Decision
CQC	Construction Quality Control
ECU	emission control unit
FAT	Factory Acceptance Test
gpm	gallons per minute
GWTS	groundwater treatment system
GWTT	Ground/Water Treatment and Technology, LLC
HASP	Health and Safety Plan
Horlick	Horlick Company, Inc.
I/O	Input/Out
lb	pound
LEB	LEB Electric, Ltd.
Lockheed Martin	Lockheed Martin Corporation
Loral	Loral Corporation
MCP	Main Control Panel
NYSDEC	New York Department of Environmental Conservation
OSHA	Occupational Safety and Health Administration
OU-1	Operable Unit 1
OU-2	Operable Unit 2
PLC	Programmable Logic Controller
QA/QC	Quality Assurance/Quality Control
RAO	Remedial Action Objective
ROD	Record of Decision
RTO	Remediation Technical Operations
SCADA	Supervisory Control and Data Acquisition
Sperry	Sperry Gyroscope Company
SSDS	sub-slab depressurization system
Tetra Tech	Tetra Tech, Inc.

UPS	Uninterrupted Power Supply
VAC	volts, alternating current
VDC	volts, direct current
VOC	volatile organic compound
VPGAC	vapor-phase granular activated carbon
VPN	virtual private network

Section 1
Introduction

1.1 PURPOSE

The purpose of this Construction Completion Report is to document the Supervisory Control and Data Acquisition (SCADA) upgrades performed at the Operable Unit-2 (OU-2) Groundwater Treatment System (GWTS) located at 60 Tanners Road in Lake Success, New York (the "Site"). The OU-2 GWTS extracts and treats groundwater associated with a plume of volatile organic compounds (VOCs) migrating from Lockheed Martin's former Unisys Site located at 1111 Marcus Avenue in Lake Success, New York (New York State Department of Environmental Conservation [NYSDEC] Site ID# 130045). The OU-2 GWTS is located off-site to the north of the former Unisys Site between the Northern State Parkway and the Long Island Expressway. This report includes project and site background information, a summary of the OU-2 GWTS upgrades design, a description of the pre-construction and construction activities completed, and deviations from the design. An electronic copy of this Construction Completion Report with supporting documentation is included.

1.2 BACKGROUND

In accordance with the Order on Consent and Administrative Settlement (Index # CO 1-20160426-40) between the NYSDEC and Lockheed Martin Corporation (Lockheed Martin) effective September 15, 2016, the Amendment to the Operable Unit-1 (OU-1) Record of Decision (OU-1 AROD; NYSDEC, 2015), and the OU-2 Record of Decision (OU-2 ROD; NYSDEC, 2014), Lockheed Martin augmented the existing on-site OU-1 GWTS to improve groundwater capture from the basal (lower) Magothy aquifer, increase OU-1 groundwater extraction to a nominal 850 gallons per minute (gpm) from 730 gpm, and treat the increased flow of extracted groundwater at the OU-1 GWTS. The recovery well RW-3 installation and OU-1 GWTS and SCADA upgrades were completed and the upgraded OU-1 GWTS was started up on

March 23, 2018; the OU-1 Construction Completion Report documents the OU-1 Upgrades (Tetra Tech and AECOM, 2018).

Lockheed Martin elected to initiate OU-2 GWTS SCADA system improvements following the OU-1 upgrades to integrate the OU-1 GWTS, OU-2 GWTS, and sub-slab depressurization system (SSDS) SCADA systems. Tetra Tech, Inc. (Tetra Tech) prepared the OU2 SCADA System Upgrade 100% Design Report including the SCADA system and communication upgrades required to integrate the three SCADA systems (Tetra Tech, 2016). AECOM Technical Services Inc. (AECOM) served as the Primary Contractor for the construction of the OU-2 GWTS SCADA upgrades and Tetra Tech served as the Engineer of Record for the construction. The OU-2 GWTS SCADA upgrades allow for more reliable control and monitoring of the OU-2 GWTS. Additionally, the upgrade established internet communications between the OU-1 GWTS, OU-2 GWTS, and the SSDS. With the OU-2 GWTS upgrades, operating data is recorded and archived on a server located at the SSDS. This Construction Completion Report documents the activities that were conducted at the OU-2 GWTS plant.

1.3 SITE HISTORY AND DESCRIPTION

The former Unisys Site is located in the County of Nassau, New York and is identified as Block B18 and Lot 300H on the Lake Success Tax Map #008-B18.0000-300-00H. The former Unisys Site is situated on an approximately 90.5-acre area bounded by Marcus Avenue to the north, Union Turnpike to the south, the Triad Business Park to the east, and Lakeville Road to the west (see Figure 1).

The former Unisys Corporation Facility site was an active manufacturing facility from its startup in 1941 until approximately 1995, when most manufacturing activities ceased. Some limited assembly, integration, prototype development and testing, and/or engineering and administrative activities were still being conducted at the site through early 1999. The former Unisys Facility was originally designed and built by the United States Government and was operated under a contract with the Sperry Gyroscope Company (Sperry) from 1941 to 1951. In 1951, the property was sold to Sperry, which merged with Burroughs in 1986 to form the Unisys Corporation. In 1995, Loral Corporation (Loral) acquired assets of Unisys Defense Systems, a division of Unisys Corporation. In early 1996, Lockheed Martin purchased Loral's electronics and systems integration businesses. The property was sold by Lockheed Martin in early 2000 for commercial

development. Presently, the former Unisys Facility houses multiple tenants that use the leased space for office areas, a small cafeteria, an outpatient hospital, distribution centers, maintenance spaces, and a fitness center.

The former Unisys Facility located at 1111 Marcus Avenue, Lake Success, New York (Nassau County) is located within the Town of North Hempstead. A portion of the facility, including the portion where the existing OU-1 recovery wells are located, is located in the Village of Lake Success, an incorporated village within the Town of North Hempstead. The former Unisys Site is classified as a Class 2 site on the Registry of Inactive Hazardous Waste Disposal Sites in New York State (Site No. 130045) due to the presence of VOCs in soil and groundwater. The former Unisys Site is currently owned by 1111 Marcus Ave Unit 2 Owner, LLC (Northwell Health) and WRD Marcus Avenue A, LLC (Waterstone). In order to facilitate remediation of the site and surrounding area, the NYSDEC divided remedial activities into two operable units: OU-1 (on-site) and OU-2 (off-site). The OU-1 AROD (January 2015) and the OU-2 ROD (December 2014) describe the site and regulatory history and the currently-operating remediation systems in further detail. The OU-2 GWTS is located on Manhasset-Lakeville Water District property, under lease to Lockheed Martin for groundwater recovery and treatment. The OU-2 GWTS recovery well (RW-100) is located on Great Neck Union Free School District property.

1.4 OU-2 GWTS DESCRIPTION

The OU-2 site plan in Appendix A shows the layout of the OU-2 GWTS. The OU-2 GWTS currently consists of one recovery well (RW-100), pumping at approximately 500 gpm. The extracted groundwater is treated via two randomly packed vertical air strippers in series to remove dissolved VOCs from the extracted groundwater. Following stripping, the extracted groundwater is filtered through one filter housing that contains eight 25-micron filter bags (with a standby unit available) prior to discharge back into the aquifer. The treated groundwater is pumped for injection back to the aquifer system through a combination of three diffusion wells identified as: DW-100, DW-101, and DW-102.

The air stripper off-gas is transferred using one push-pull centrifugal blower through a natural gas fired heat exchanger to reduce humidity and then through three 28,000-pound (lb) vapor phase granular activated carbon (VPGAC)-filled emission control units (ECUs), which are arranged in series. The VPGAC-treated air then passes through the two 33,000-lb potassium

permanganate-impregnated zeolite-filled ECUs, which are also arranged in series, to remove vinyl chloride. The Non-Detect Performance Standard in the Great Neck Union Free School District Access Agreement (Lockheed Martin, 2003) requires that the concentrations of site-related compounds in the air stripper off-gas air stream be reduced to below their respective NYSDEC acceptable laboratory detection limits.

Section 2
Summary of OU-2 GWTS Upgrades Design

2.1 REMEDIAL ACTION AND DESIGN OBJECTIVES

2.1.1 Remedial Action Objectives

In accordance with the OU-2 ROD, the following Remedial Action Objectives (RAOs) related to groundwater were identified for this site.

- RAOs for Public Health Protection
    - Prevent ingestion of groundwater with contaminant levels exceeding drinking water standards.
    - Prevent contact with, or inhalation of volatiles, from contaminated groundwater.
- RAOs for Environmental Protection
    - Restore ground water aquifer to pre-disposal/pre-release conditions, to the extent practicable.
    - Prevent the discharge of contaminants to surface water.
    - Remove the source of ground or surface water contamination.

2.1.2 Design Objectives

The design objectives of the OU-2 GWTS SCADA upgrades are to:

- Enhance the existing OU-2 GWTS SCADA such that the OU-1 GWTS, OU-2 GWTS, and SSDS can be operated as a single integrated SCADA system with functionality for all three systems at user interface systems located in any of the three locations.
- Modernize and standardize the SCADA systems between the SSDS, OU-1 GWTS, and OU-2 GWTS.

2.2 DESCRIPTION OF THE OU-2 GWTS UPGRADES DESIGN

Construction works were completed in accordance with the OU2 SCADA System Upgrade 100% Design Report; deviations from the design are noted in Section 4.7. The key components of the design include SCADA system upgrades and testing, and are discussed in Section 4.

2.3 PERMITS AND APPROVALS

No permits were required for this work since no mechanical or intrusive work was performed. NYSDEC approved the shutdown of the OU-2 GWTS for the SCADA upgrades during a conference call with Lockheed Martin on April 19, 2018.

Section 3

Interim Remedial Measures and Remedial Contracts

The OU-2 GWTS SCADA upgrades were performed as a single project, and no interim remedial measures or separate construction contracts were performed.

Section 4
Description of Construction Actions Performed

Construction activities completed at the Site were conducted in accordance with the OU2 SCADA System Upgrade 100% Design Report for the Former Unisys Facility (Tetra Tech, 2016). Deviations from the design are noted.

4.1 PROJECT ORGANIZATION

Presented below are the key companies involved in the OU-2 GWTS SCADA upgrades:

Principal Responsible Party

Lockheed Martin: Former property owner responsible for environmental remediation of the site.

Remediation Technical Operations (RTO)

CDM Smith: Served as Lockheed Martin's Technical Oversight Contractor for overall site remediation.

OU-2 GWTS Property Owner

Manhasset-Lakeville Water District, known as their Parkville Station.

Recovery Well RW-100 Property Owner

Great Neck Union Free School District

Primary Contractor

AECOM: Served as the primary contractor responsible for project construction.

Engineer of Record

Tetra Tech: Peter Rich, P.E.

General Subcontractor

Ground/Water Treatment & Technology, LLC (GWTT)

Electrical Subcontractor

LEB Electric, Ltd. (LEB)

Instrumentation and Controls Hardware Subcontractor

Horlick Company, Inc. (Horlick)

System Integration Subcontractor

Satuit Automation Group

4.2 GOVERNING DOCUMENTS

4.2.1 Construction Quality Control Plan

AECOM prepared a Construction Quality Control (CQC) Plan as a section in the AECOM Comprehensive Work Plan prepared for internal use for the purposes of project logistics, quality, and coordination (AECOM, 2017a). The CQC Plan managed performance of the OU-2 GWTS SCADA upgrades task through designed and documented Quality Assurance/Quality Control (QA/QC) methodologies applied in the field. The CQC Plan provided a detailed description of the observation and testing activities that were used to monitor construction quality and confirm that construction was in conformance with the design objectives and specifications. Field activities were recorded on the field reports provided in Appendix B.

4.2.2 Site Specific Health & Safety Plan and Emergency Response Plan

AECOM prepared the RW-3 Installation, OU-1 GWTS Upgrades, and OU-1 and OU-2 GWTS SCADA System Upgrades Health and Safety Plan (HASP) in March 2017 (AECOM, 2017b). After revisions in response to NYSDEC comments, Revision 3 of the HASP was approved by NYSDEC on March 24, 2017. The HASP includes an Emergency Response Plan including emergency contact information, emergency procedures, and incident reporting procedures.

Construction work performed for the OU-2 GWTS SCADA upgrades was in compliance with the HASP, which includes governmental requirements, including Site and worker safety requirements mandated by Federal Occupational Safety and Health Administration (OSHA).

4.2.3 Waste Management Plan

AECOM prepared a Waste Management Plan including waste handling procedures for the OU-2 GWTS SCADA upgrades construction, as a section of the AECOM Comprehensive Work Plan

prepared for internal use for the purposes of project logistics, quality, and coordination (AECOM, 2017a). The old OU-2 Main Control Panel (MCP) was disposed of as construction and demolition waste. Construction and demolition waste was the only waste generated during the OU-2 GWTS SCADA upgrades.

4.2.4 Community Air Monitoring Plan

No ground-disturbing activities were conducted as a part of the OU-2 GWTS SCADA upgrades; therefore, a Community Air Monitoring Plan was not required.

4.2.5 Storm-Water Pollution Prevention Plan

No ground-disturbing activities were conducted as a part of the OU-2 GWTS SCADA upgrades; therefore, a Soil Erosion and Sediment Control Plan was not required.

4.3 CONSTRUCTION PROGRAM ELEMENTS

4.3.1 Submission of Governing Documents and Submittals

Peter Rich of Tetra Tech as the Engineer of Record reviewed submittals for this project and confirmed that they were in compliance with the design except as noted in Section 4.7. A copy of the submittal log for OU-2 is included in Appendix C.

4.3.2 Contractors and Consultants

AECOM served as the primary contractor for the OU-2 GWTS SCADA upgrades construction and was responsible for the overall success of the project implementation. AECOM was responsible for project management and oversight, preparation of work plans and final reports, and contracting and coordination of subcontractors. The general subcontractor for the project was GWTT. Second-tier subcontractors are included in Section 4.1, Project Organization. Peter Rich of Tetra Tech served as the Engineer of Record for the project and was responsible for preparing the design documents and reviewing and approving submittals and requests for information. CDM Smith served as the RTO contractor for the project and was responsible for providing technical oversight including reviewing deliverables and inspecting and accepting work or deliverables in conjunction with Lockheed Martin.

4.3.3 Site Preparation and Mobilization

A pre-construction meeting was held with AECOM, Lockheed Martin, the RTO, Tetra Tech, and GWTT on January 17, 2017 and an operational readiness review meeting was held with AECOM, the RTO, Tetra Tech, and GWTT on March 8, 2017 prior to field mobilization for the OU-2 GWTS upgrades portion of the project. Field personnel completed a site orientation including review of the AECOM site-specific HASP or site-specific Contractor's HASPs before or upon mobilizing to the site.

The OU-2 GWTS MCP was fabricated at Horlick Company's factory in Randolph, Massachusetts, and after witness-testing and approval, the MCP was shipped to the site in November 2017. GWTT, the Electrical Subcontractor, LEB, and the System Integration Subcontractor, Satuit, mobilized to the site for the OU-2 GWTS electrical, instrumentation, and controls work prior to the startup of the OU-1 GWTS. Site preparation work included tagging wires on the new and existing MCP and cross-referencing wires to the as-built drawings for the OU-2 GWTS prior to OU-2 shut down, to prepare for installation of the MCP.

4.3.4 General Site Controls

AECOM's field services oversight person managed site controls including field documentation, coordination, and waste management. AECOM prepared field reports and documented tailgate health and safety meetings on a daily basis. Tetra Tech informed the Great Neck Union Free School District of OU-2 activities through routine weekly email communications. Construction and demolition wastes generated during construction were managed in accordance with the Waste Management Plan.

4.3.5 Nuisance Controls

Nuisance controls were not required for the OU-2 GWTS SCADA upgrades work. A majority of the work was completed inside the OU-2 GWTS building, and disturbances to the outside of the building and neighbors were minimal, including increased traffic through the adjacent neighborhood.

4.3.6 Reporting

The CQC Plan required the preparation and submittal of daily reports (AECOM, 2017a). Each daily report contains a summary of weather, equipment, work performed, and other pertinent

information. The daily reports were prepared by the AECOM field services oversight person. Daily field reports are included in electronic format in Appendix B.

4.4 OU-2 GWTS UPGRADES CONSTRUCTION COMPONENTS

4.4.1 OU-2 GWTS SCADA Upgrades

LEB completed the electrical portion of the OU-2 GWTS SCADA upgrades and Horlick Company and their subcontractor, Satuit Automation Group, completed the instrumentation and controls portion of the OU-2 GWTS SCADA upgrades. The OU-2 GWTS SCADA upgrades included replacing the OU-2 GWTS MCP and the RW-100 Programmable Logic Controller (PLC), installing a new operator workstation with upgraded software, installing a new uninterruptible power supply (UPS) rack, and upgrading the communications between the OU-2 GWTS, and the OU-1 GWTS and SSDS SCADA systems. The following specific activities were conducted:

1. The OU-2 GWTS primary (A-B SLC5/03) PLC processor and Input/Out (I/O) modules were replaced with Allen Bradley ControlLogix™ processor and I/O modules;
2. The secondary (MicroLogix 1200) PLC was replaced with ControlLogix™ processor and communication cards;
3. The Remote I/O convertors were replaced with Ethernet to fiber convertors at the master control panel and the RW-100 vault;
4. The PLC at the RW-100 vault was replaced with an Allen Bradley CompactLogix™ PLC;
5. The existing HMI software was replaced with FactoryTalk SE with a Workstation license, and updated graphics;
6. A new firewall and internet connection was installed to communicate with OU-1 and the SSDS;
7. A new operator workstation was provided for OU-2 GWTS monitoring and control; and
8. A new UPS rack was provided in the OU-2 GWTS control room.

Horlick fabricated the OU-2 GWTS MCP at their factory and a Factory Acceptance Test (FAT) was conducted on the OU-2 GWTS panels on August 17, 2017 prior to shipment to the site. Representatives from Tetra Tech and the RTO contractor witnessed the FAT and provided comments to Horlick. After Horlick incorporated changes and the panels were accepted by the Engineer of Record, they were delivered to the site on November 20, 2017.

Upon NYSDEC approval, the OU-2 GWTS was shut down on April 30, 2018 for the OU-2 GWTS SCADA upgrades. LEB removed the existing OU-2 GWTS MCP and installed the new MCP. Satuit Automation Group completed the new SCADA system software setup, programming, and integration, including setup of SCADA system cyber-security, PLC programming, setup of alarm interlocks, and calibration of instrumentation and control devices.

The Engineer of Record prepared an OU-2 GWTS Startup and Testing Plan in May 2018 (Tetra Tech, 2018a), and submitted a copy of the plan to NYSDEC prior to beginning startup testing. In accordance with the startup plan, once the new electrical, instrumentation, and controls equipment was installed and programmed, the Satuit Automation Group worked with the OU-2 GWTS operators to complete unwitnessed testing of the new SCADA system. Unwitnessed testing included all critical, primary, and advisory alarms, control and monitoring equipment associated with the OU-2 extraction well and treatment system, and performance testing of components and the full OU-2 GWTS. Following unwitnessed testing, the Engineer of Record was on site for witnessed testing in accordance with the startup plan, and worked with Satuit Automation Group to resolve outstanding issues.

Once all components critical to system startup were functioning as designed (Appendix D), the system was run fully manned for 72-hours. The test began Tuesday, June 12, 2018 and was completed Friday, June 15, 2018. NYSDEC was notified of the start and the successful completion of the 72-hour test. As described in Section 4.4.3, there were several detections in the initial discharge vapor sample collected as part of the system performance sampling; additional samples were collected to verify results and there were no detections in the follow-up samples. No operational issues were observed during the 72-hour test; therefore, the OU-2 GWTS remained in continuous operation since the completion of the 72-hour test on Friday, June 15, 2018.

4.4.2 SCADA Testing

As discussed in Section 4.4.1, a FAT was completed on the new OU-2 GWTS instrumentation and control panels constructed by the Horlick Company prior to shipment to the site. Results of the FAT test are included in Appendix D. Startup testing documentation is included in Appendix D, including a summary of the OU-2 GWTS alarm testing and resolutions.

4.4.3 System Performance Sampling

Tetra Tech, as the system operator and engineer of record, completed system performance sampling in accordance with the OU-2 GWTS Startup and Testing Plan. Water samples were collected from the OU-2 GWTS influent (WSP-1), air stripper 1 effluent (WSP-2), and final OU-2 GWTS effluent (WSP-3). Vapor samples were collected from the carbon bed influent (VSP-1), treated vapor effluent (VSP-8), carbon bed 1 effluent (VSP-2), and carbon bed 3 effluent (VSP-4).

System performance samples were analyzed by TestAmerica Laboratories, Inc. of Burlington, Vermont. Tetra Tech collected the initial system performance samples within 24-hours of system startup. There were several volatile organic compound detections in the system effluent vapor sample, VSP-8. In response, Tetra Tech conducted a second round of sampling on June 21, 2018 to verify results. There were no detections in the system effluent vapor sample in the second round of sampling, indicating that the system was operating as designed. System performance sample laboratory results were presented to NYSDEC and included in the Q3 2018 OU-2 OMM Report (Tetra Tech, 2018b).

4.4.4 Documentation

At the completion of the field work, AECOM submitted documentation including red line drawings, panel specifications, and testing results to Lockheed Martin, the RTO, and the Engineer of Record. In addition, spare parts were provided for the OU-2 GWTS spare part inventory in accordance with the specifications. A copy of the submittal log for OU-2 is included in Appendix C.

4.5 WASTE MANAGEMENT

The old MCP and equipment removed as part of the OU-2 GWTS SCADA upgrades were disposed of as construction and demolition waste. No other wastes were produced during the OU-2 GWTS SCADA upgrades.

4.6 OTHER ENGINEERING CONTROLS

The remedy for the site did not require the construction of any other engineering control systems.

4.7 DEVIATIONS FROM THE DESIGN

Record drawings are included in Appendix E. Deviations from the design are shown on the as-built drawings and are summarized below:

- Voltage drop issue: During unwitnessed testing, a voltage drop was observed along the level switch LSHH-111 circuit, between the secondary system shut down inside the well vault and the MCP in the OU-2 GWTS control room. LEB Electric traced the wires and confirmed that they were continuous runs, and completed megger testing and confirmed that the wiring was in good condition, eliminating these as potential causes for the voltage drop. After additional investigation, it was noted that the existing #10 wires were insufficient for the 120 volts, alternating current (VAC) circuit, and that this could be remedied by converting the circuit to a 24 volts, direct current (VDC) circuit. Therefore, the 120 VAC rated relay at the well vault was replaced with a low voltage, 24VDC relay to convert the circuit.
- Temperature/Humidity Sensor Replacement: During unwitnessed testing, it was identified that the existing Dwyer temperature/humidity sensors for the carbon vessel feed stream were not compatible with the new Allen Bradley PLC input requirement. The new Allen Bradley PLC is set up for singular inputs only. To resolve this issue, an isolator was installed to separate the temperature and humidity sensors from the PLC as they are used for monitoring only.
- Communications: When attempting to setup radio communication per the design, it was observed that heavy traffic over the radio between the OU-1 GWTS, OU-2 GWTS, and the SSDS was interfering with the communication between the systems. To minimize traffic between the three workstations, the OU-2 GWTS operator workstation was licensed and reconfigured to be a standalone FactoryTalk SCADA workstation. This change allows the OU-2 GWTS SCADA to act as a standalone server, storing minimum data and reports and providing the functionality of a server. In addition, the OU-1 GWTS, SSDS, and OU-2 GWTS SCADA systems were reconfigured to communicate through a virtual private network (VPN) connection. The three systems were secured with a Sonicwall TZ400 Wireless Security Appliance Software. These changes allow the three stations to communicate so that the three systems can be monitored from any of the three workstations, and data from the three systems is stored on the SSDS server.

- Cooling Fan Thermostat and Wiring: A Pentair temperature control switch was installed to control operation of the cooling fan in the OU-2 MCP. When the temperature in the MCP exceeds the thermostat set point, the fan switches on to regulate the temperature.

Section 5
References

1. AECOM, 2017a. Comprehensive Work Plan, Recovery Well RW-3 Installation, OU-1 Groundwater Treatment System Upgrades, and OU-1 and OU-2 Groundwater Treatment System SCADA System Upgrades, March 2017.

2. AECOM, 2017b. Health and Safety Plan, RW-3 Installation, OU-1 GWTS Upgrades, and OU-1 and OU-2 GWTS SCADA System Upgrades, Revision 3, March 22, 2017.

3. Lockheed Martin, 2003. Great Neck Union Free School District Access Agreement.

4. NYSDEC, 2015. Amendment to the Record of Decision. Unisys Corporation, Operable Unit Number 01: On-Site Remedial Program, State Superfund Project, Lake Success, Nassau County, Site No. 130045, January 2015.

5. NYSDEC, 2014. Record of Decision. Unisys Corporation, Operable Unit Number 02: Offsite Groundwater, State Superfund Project, Lake Success, Nassau County, Site No. 130045, December 2014.

6. NYSDEC, 2016. Order on Consent and Administrative Settlement, Index No. CO 1-20160426-40, Lockheed Martin Corporation, Site Name: Unisys Corporation, Site No.: 130045. September 16, 2016.

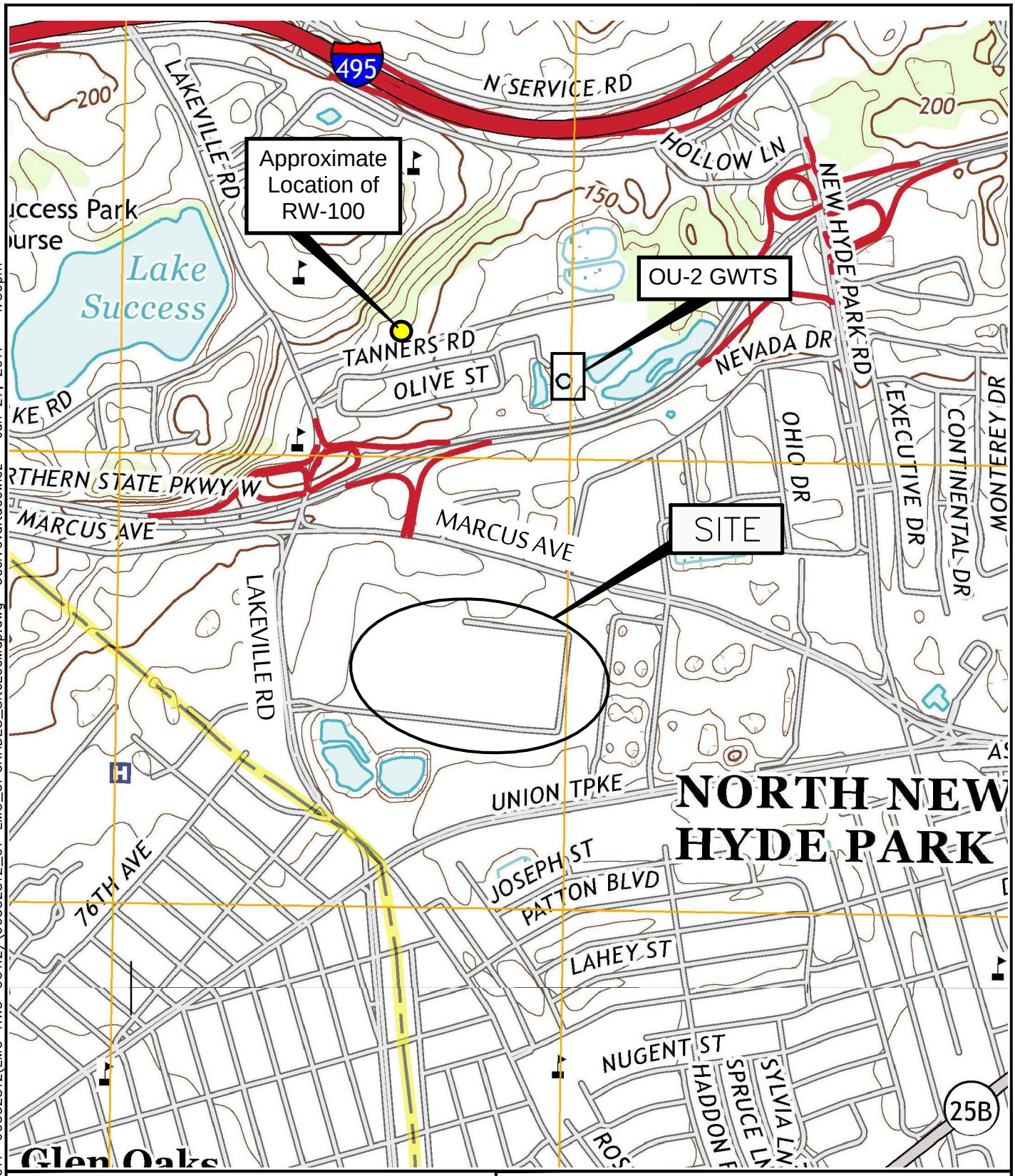
7. Tetra Tech, 2016. Operable Unit No. 2 (OU2) SCADA System Upgrade 100% Design Report, August 2016.

8. Tetra Tech, 2018a. Startup and Testing Plan, Operable Unit 2 Groundwater Treatment System Upgrades. Submitted to NYSDEC May 2018.

9. Tetra Tech, 2018b. Operable Unit 2 Groundwater Treatment System Operations, Maintenance and Monitoring Report, June 1 – August 31, 2018, November 2018.

10. Tetra Tech and AECOM, 2018. OU-1 Construction Completion Report; Recovery Well RW-3 Installation, OU-1 Groundwater Treatment System and SCADA Upgrades. September 2018.

FIGURES



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SCALE (FEET)

N

MAP SOURCE:

U.S.G.S. 7.5 MINUTE SERIES QUADRANGLES OF SEA CLIFF AND LYNBROOK, N.Y., DATED 2013.

SITE LOCATION MAP
RW-3 INSTALLATION AND OU-1/2 UPGRADES
FORMER UNISYS FACILITY
LAKE SUCCESS, NEW YORK

AECOM
CLIFTON, NEW JERSEY

DR. BY	ET	SCALE	AS NOTED	DWG. NO. 60532812.01.LMC.SiteLocMap	PROJ. NO. 60532812
CK'D. BY	EJ	DATE	June 21, 2018	FIG. NO.	1

File Name: K:\Cadd\LMC\2017-60532812(LMC-RW3-OU1.2)\60532812_01-LMC_UPGRADES_SiteLocMap.dwg User: eva.tucewicz Jan 27, 2017 - 4:39pm

APPENDIX A

OU-2 SITE PLAN

CITY:MELVILLE-NY DIVGROUP:ENV DB: LD: PIC: PM: TM: LYR:ON=*;OFF=*REF*
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XREFS: IMAGES: PROJECTNAME: ----
Xref_BDR1c Scott Morris.jpg

HORACE HARDING EXPRESSWAY EXT.

RECONSTRUCTED SERVICE ROAD ENTRANCE (DRAWING C8)

DW-100

DW-101

DW-102

DIFFUSION WELLS (DRAWING C9)

DISCHARGE PIPELINE (DRAWINGS C8)

SHEET C8

RECOVERY WELL RW-100, WELL VAULT, FENCING AND DRIVE IMPROVEMENTS (DRAWING C3)

RW-100

INFLUENT PIPELINE AND ELECTRICAL/FIBER OPTIC CONDUITS (SEE NOTE 5)

SHEET C3

TANNERS ROAD EXTENSION (DRAWING C2)

TANNERS ROAD

SHEET C2

DISCHARGE PIPELINE (FORMER MLWD 5710 LINE)

PRIMARY ELECTRICAL FEED (DRAWINGS C4 AND E1)

INFLUENT PIPELINE AND ELECTRICAL/FIBER OPTIC CONDUITS (DRAWINGS C2 AND C4)

NATURAL GAS LINE (DRAWING C4)

SECONDARY ELECTRICAL FEED (DRAWINGS C4 AND E1)

OLIVE STREET

EXPANDED ASPHALT DRIVEWAY (DRAWING C4)

SHEET C4

MODIFIED WATER TREATMENT PLANT AND AIR STRIPPERS (DRAWINGS P-2 THRU P-5)

CONCRETE FOUNDATION AND VAPOR PHASE GAC AND POTASSIUM PERMANGANATE ZEOLITE VESSELS, (DRAWINGS C4, C6, C7 AND P5)

NORTHERN STATE PARKWAY

RECHARGE BASIN

LEGEND

- REFERENCE AREA BOUNDARY
- INFLUENT PIPELINE AND ELECTRICAL/FIBER OPTICS CONDUITS AND CONDUCTORS
- 12"ø DISCHARGE PIPELINE
- 8"ø DISCHARGE PIPELINE
- PRIMARY ELECTRICAL FEED
- NATURAL GAS LINE
- MLWD WATER MAIN
- STORM WATER PIPE LINE
- FENCE LINE
- NATURAL GAS LINE SHUTOFF VALVE
- DIFFUSION WELL
- GROUNDWATER RECOVERY WELL

NOTES:

1. PROPERTY BOUNDARY INFORMATION BASED ON SURVEY PERFORMED BY SEAR BROWN INC., DECEMBER 2002 AND SIGNED AND SEALED BY JOHN MACDONALD, LICENSE NO. 049774.
2. BASE DRAWING PREPARED FROM RECORD DRAWING INFORMATION FROM ARCADIS DRAWINGS ENTITLED "OFF-SITE INTERIM REMEDIAL MEASURE (IRM) RECORD DRAWINGS, FORMER UNISYS FACILITY, GREAT NECK, NEW YORK, MARCH 2005".
3. SUBSURFACE UTILITY LOCATIONS ARE APPROXIMATE. ACTUAL LOCATIONS MAY VARY.
4. LOCATIONS OF TANNERS ROAD, OLIVE STREET, SCHOOL BUILDING AND TENNIS COURTS ARE APPROXIMATE.
5. NEW ELECTRICAL AND NEW FIBER OPTIC LINES RAN THROUGH EXISTING CONDUIT.

RECORD DRAWING MADE FROM C-1, DESIGNED BY W. W, CHECKED BY L. W. MCBURNEY (NY PE LICENSE No. 066776), DATED MARCH 2006

0 100 200 300
SCALE IN FEET

THIS BAR REPRESENTS ONE INCH ON THE ORIGINAL DRAWING:

USE TO VERIFY FIGURE REPRODUCTION SCALE

No.	Date	Revisions	By	Ckd
3	05/12	GENERAL REVISIONS	KK	SAM
2	03/06	GENERAL REVISIONS	JRM	LWM
1	12/05	DRAFT GENERAL REVISIONS	RJG	LWM

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Professional Engineer's Name: **SCOTT ALAN MORRIS**
Professional Engineer's No.: 083867

State	Date Signed	Project Mgr.
NY	06.29.12	SAM
Designed by	Drawn by	Checked by
WW	AS	KK

STATE OF NEW YORK · SCOTT ALAN MORRIS · 083867 · LICENSED PROFESSIONAL ENGINEER

ARCADIS

ARCADIS OF NEW YORK, INC.

LOCKHEED MARTIN CORPORATION • FORMER UNISYS FACILITY • LAKE SUCCESS, NEW YORK
OFF-SITE INTERIM REMEDIAL MEASURE

SITE PLAN

GENERAL

ARCADIS Project No.
B0038190.0001.00107

Date
JUNE 2012

ARCADIS
2001 MARCUS AVENUE
SUITE N216
NEW HYDE PARK, NY, 11042
TEL. 516.328.0464

C-1

APPENDIX B

FIELD REPORTS

AECOM Daily Log

Date	4/30/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:		Weather	Partly Sunny
GWTT and LEB are onsite to remove the Control Panel at OU-2.		Temp °F	68
The panel was removed from the MCP cabinet.		Tailgate Meeting	
LEB has the wires marked with numbering that is consistent		Topics	Slips & Trips
with the drawing of the existing system.			
LEB will be re-tagging the wires with the number on the		Work Force	ST / OT
drawings for the system upgrade.		Sub POC:	
		Other:	
		GWTT	
		LEB	
Material:	Equipment:		
		Subcontractors:	
		GWTT	
Delays:			
Health and Safety Issues:			
Other:			

Signature below indicates that the party representative agrees that the above information is an acceptable account of the field work conducted for this day.

Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

Date	5/1/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

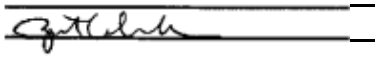
Work Performed:	Weather	Partly Sunny	
LEB has installed the new panel inside the MCP cabinet.	Temp °F	68	
LEB has attached the doors for the cabinet and has started the	Tailgate Meeting		
wire labelling and landing on the terminals.	Topics	Slips & Trips	

Work Force	ST	OT
Sub POC:		
Other:		
GWTT		
LEB		

Material:	Equipment:

	Subcontractors:		
	GWTT		
Delays:			
Health and Safety Issues:			
Other:			

Signature below indicates that the party representative agrees that the above information is an acceptable account of the field work conducted for this day.

Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

Date	5/2/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:		Weather	Partly Sunny
LEB is labelling and landing wires in the control panel.		Temp °F	70
The control panel doors have been installed and wires were		Tailgate Meeting	
connected to the switches.		Topics	Slips & Trips

Work Force	ST	OT
Sub POC:		
Other:		
GWTT		
LEB		

Material:	Equipment:

		Subcontractors:	
		GWTT	
Delays:			
Health and Safety Issues:			
Other:			

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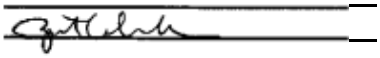
Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

Date	5/3/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Partly Sunny	
LEB continues to work on wire terminations.	Temp °F	67	
The RW-100 vault was accessed. LEB was checking the existing	Tailgate Meeting		
PLC in the vault with the new PLC to be installed.	Topics	Slips & Trips	
LEB has some questions for Todd Farmer (Horlick) on how			
the new PLC should be wired.	Work Force	ST	OT
	Sub POC:		
	Other:		
	GWTT		
	LEB		

Material:	Equipment:

	Subcontractors:		
	GWTT		
Delays:			
Health and Safety Issues:			
Other:			

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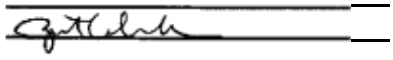
Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

Date	5/4/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Partly Sunny	
LEB is labelling and terminating wire in the control panel at	Temp °F	67	
OU-2. They have also accessed a vault adjacent to the control	Tailgate Meeting		
room the contains pressure transmitters. They are checking	Topics	Slips & Trips	
the wires to confirm the placement/landing in the control			
panel.	Work Force	ST	OT
	Sub POC:		
LEB determined the wire for the auto dialer is not long	Other:		
enough and will require replacement.	GWTT		
	LEB		
LEB is installing conduit for the wires for the UPS and SCADA			
computer. The UPS and SCADA computer are location on the			
opposited side of the room from the control panel.			

Material:	Equipment:

	Subcontractors:		
	GWTT		
Delays:			
Health and Safety Issues:			
Other:			

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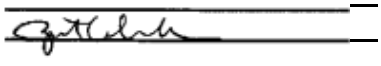
Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

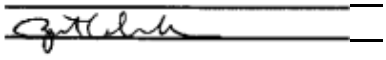
Date	5/7/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Partly Sunny	
Todd Farmer is onsite to check the LEB wiring and to test	Temp °F	57	
parts of the system.	Tailgate Meeting		
Todd provided guidance to LEB on where some wires need	Topics	Slips & Trips	
to be landed that were uncertain and remained from LEB's			
work.	Work Force	ST	OT
	Sub POC:		
	Other:		
	GWTT		
	LEB		
	Horlick		

Material:	Equipment:

	Subcontractors:		
	GWTT		
Delays:			
Health and Safety Issues:			
Other:			

Signature below indicates that the party representative agrees that the above information is an acceptable account of the field work conducted for this day.

Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

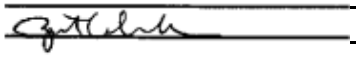
Date	5/8/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Partly Sunny	
Todd Farmer continues to work with LEB to complete the	Temp °F	57	
wiring.	Tailgate Meeting		
Todd has also started to do some of the I/O testing.	Topics	Slips & Trips	
The auto dialer wires are being replaced and extended by			
LEB.	Work Force	ST	OT
	Sub POC:		
	Other:		
	GWTT		
	LEB		
	Horlick		

Material:	Equipment:

	Subcontractors:		
	GWTT		
Delays:			
Health and Safety Issues:			
Other:			

Signature below indicates that the party representative agrees that the above information is an acceptable account of the field work conducted for this day.

Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

Date	5/8/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Partly Sunny	
Todd Farmer continues to work with LEB to complete the	Temp °F	57	
wiring.	Tailgate Meeting		
Todd has also started to do some of the I/O testing.	Topics	Slips & Trips	
The auto dialer wires are being replaced and extended by			
LEB.	Work Force	ST	OT
	Sub POC:		
	Other:		
	GWTT		
	LEB		
	Horlick		

Material:	Equipment:

	Subcontractors:		
	GWTT		
Delays:			
Health and Safety Issues:			
Other:			

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Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

Date	5/10/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Partly Sunny
LEB is tracing wires from the splice box.	Temp °F	59
Todd Farmer has completed the I/O checks at the RW-100	Tailgate Meeting	
vault.	Topics	Electrical Lock Out
LEB will work on disconnecting the wires to the RW-100 in	Work Force	ST / OT
preparation for testing the system with the VFD and isolating	Sub POC:	
the power to the pump.	Other:	
	GWTT	
	LEB	

Material:	Equipment:

	Subcontractors:
	GWTT
Delays:	
Health and Safety Issues:	
Other:	

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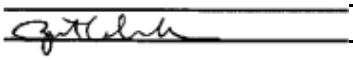
Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

Date	5/11/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Partly Cloudy	
LEB is onsite tracing wires at the splice box at OU-2.	Temp °F	68	
LEB disconnected wires that power RW-100 and the blower	Tailgate Meeting		
and clearwell pumps at OU-2. This is being done so equipment	Topics	Electrical Lock Out	
can be tested without operation of the pumps while the			
carbon change out work is scheduled. On Monday, Todd	Work Force	ST	OT
Farmer will test operations with the VFDs but not with	Sub POC:		
actual operation of the pumps.	Other:		
	GWTT		
	LEB		

Material:	Equipment:

	Subcontractors:	
	GWTT	
Delays:		
Health and Safety Issues:		
Other:		

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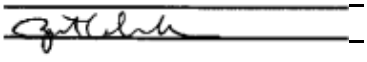
Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

Date	5/15/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Overcast and Rain	
The humidity/temperature sensors installed yesterday are not	Temp °F	60	
working. A electrical polarity reversing unit may need to be	Tailgate Meeting Topics	0700	
installed to make the sensors functional.			
The water levels in the clearwells at OU-2 are reading as	Work Force	ST	OT
shown on the HMI screen.	Sub POC:		
	Other:		
The duct heater temperature switch had to be rewired with	GWTT		
the change in the replacement PLC,	Horlick		
	LEB		
	Prefered Environmental		

Material:	Equipment:

	Subcontractors:		
	GWTT		
Delays:			
Health and Safety Issues:			
Other:			

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Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

Date	5/16/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Overcast and Rain	
The humidity/temperature sensors installed yesterday are not	Temp °F	60	
working. A electrical polarity reversing unit may need to be	Tailgate Meeting Topics	0700	
installed to make the sensors functional.			
The water levels in the clearwells at OU-2 are reading as	Work Force	ST	OT
shown on the HMI screen.	Sub POC:		
	Other:		
The duct heater temperature switch had to be rewired with	GWTT		
the change in the replacement PLC,	Horlick		
	LEB		
	Prefered Environmental		

Material:	Equipment:

	Subcontractors:		
	GWTT		
Delays:			
Health and Safety Issues:			
Other:			

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Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

Date	5/22/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Mostly Cloudy	
Todd Farmer continues to work on I/O testing and interlock	Temp °F	70	
testing.	Tailgate Meeting		
LEB is to be onsite tomorrow to check the voltage drop	Topics	Electrical Lockout	
troubleshooting for the high level switch at OU-2 recovery well.			

Work Force	ST	OT
Sub POC:		
Other:		
GWTT		
Horlick		

Material:	Equipment:

Subcontractors:			
GWTT			
Delays:			
Health and Safety Issues:			
Other:			

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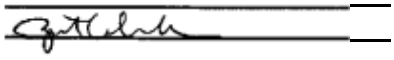
Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

Date	5/23/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Partly Sunny		
Todd Farmer continues to work on interlock testing at OU-2	Temp °F	70		
with David Khan.	Tailgate Meeting			
During the weekly call Bill Glynn asked to add the pressure	Topics	Electrical Lockout		
transmitter be replaced or re-ranged for full pump scale				
pressure. He asked to have this added to the punch list.	Work Force		ST	OT
	Sub POC:			
LEB is onsite testing the wiring between OU-2 and the RW-100	Other:			
pump vault. LEB took megger testing readings on 4 wire pairs.	GWTT			
Two wire pairs readings were acceptable at 20 G-ohms.	Horlick			
The other two wire pairs were below acceptable readings.	LEB			
LEB has traced for the location of the third hand hole box.				
The hand hole was located, contained water and there were				
not splices.				

Material:	Equipment:

Subcontractors:	
GWTT	
Delays:	
Health and Safety Issues:	
Other:	

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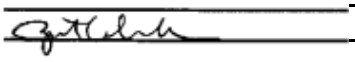
Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

Date	5/24/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Partly Sunny
Todd Farmer is working on the interlock testing at OU-2	Temp °F	72
with David Kahn.	Tailgate Meeting	
The float switch wires from RW-100 to OU-2 have voltage drops	Topics	Electrical Lockout
that make the relays chatter. The replacement of a DC relay		
and DC line voltage may reduce the voltage drop.		
The new relay will be ordered to solve the voltage problem.		

Work Force	ST	OT
Sub POC:		
Other:		
GWTT		
Horlick		
LEB		

Material:	Equipment:

Subcontractors:		
GWTT		
Delays:		
Health and Safety Issues:		
Other:		

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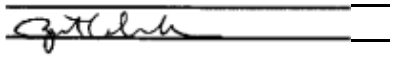
Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

Date	5/31/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Cloudy	
Systematics is onsite to do electrical readings of each of the	Temp °F	67	
OU-2 equipment.	Tailgate Meeting Topics	Electrical Lockout	
	Work Force	ST	OT
	Sub POC:		
	Other:		
	GWTT		
	Systematics		

Material:	Equipment:

	Subcontractors:		
	GWTT		
Delays:			
Health and Safety Issues:			
Other:			

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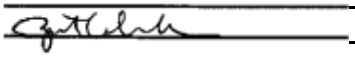
Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

Date	6/4/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Clear	
Todd Farmer is onsite to continue to work on I/O and	Temp °F	60	
functional testing.	Tailgate Meeting		
There is a issue with the OU-2 duct heater. Trane is onsite	Topics	Electrical Lockout	
to troubleshoot the problem. The firing valve will not open			
to heat the unit. The pilot assembly valve/igniter was replaced.	Work Force	ST	OT
The assembly was rusted and was replaced 2 years ago.	Sub POC:		
After the assembly was replaced the duct heater is now	Other:		
operating properly.	GWTT		
	Horlick		
	Trane		

Material:	Equipment:

	Subcontractors:		
	GWTT		
Delays:			
Health and Safety Issues:			
Other:			

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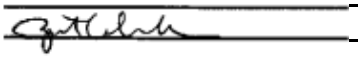
Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

Date	6/5/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Cloudy/light rain
The OU-2 system was tested for alarm conditions. At the	Temp °F	62
recovery well RW-100 the float switches (high/high-high) were	Tailgate Meeting	
tested while the system panel switches were set to manual.	Topics	Electrical Lockout
Lifting the high switch shutdown the RW-100 pump, but		
lifting the high-high switch did not shutdown the system.		
Todd Farmer will work to fix this issue. The 24 volt relay was		
installed for the high-high switch but a dc TVSS will need to be		
installed. The temperature/relativity sensor for the vapor		
lines required using a analog input card that was a spare		
from OU-1. The card was installed and the readings are being		
displayed on the HMI. One of the temperature sensors is		
faulty and will need to be replaced.		

Material:	Equipment:

Work Force	ST	OT
Sub POC:		
Other:		
GWTT		
Horlick		
Tetra Tech		
Subcontractors:		
GWTT		

Signature below indicates that the party representative agrees that the above information is an acceptable account of the field work conducted for this day.

Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

Date	6/6/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Partly Cloudy
Todd Farmer continues to correct some items in the PLC at	Temp °F	60
OU-2 to address some alarm conditions.	Tailgate Meeting	
Some of the crital alarms are being tested such as the	Topics	Electrical Lockout
communication between RW-100 and OU-2 MCP.		
The fiber cable is removed to confirm alarms.		

Material:	Equipment:

Work Force	ST	OT
Sub POC:		
Other:		
GWTT		
Horlick		
TetraTech		
Subcontractors:		
GWTT		

Delays:

Health and Safety Issues:

Other:

Signature below indicates that the party representative agrees that the above information is an acceptable account of the field work conducted for this day.

Subcontractor Representative _____ Date _____

AECOM Representative _____ Date _____

AECOM Daily Log

Date	6/7/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Cloudy		
David Kahn is testing critical alarms at OU-2. The alarms	Temp °F	61		
include clearwell level switches. In addition, the RW-100	Tailgate Meeting			
alarms such as the level switches will be tested while the	Topics	Electrical Lockout		
panel switches are set in AUTO. The switches were tested				
in the MANUAL position earlier.	Work Force		ST	OT
	Sub POC:			
The critical alarm testing is completed at OU-2.	Other:			
The primary alarms will be tested tomorrow.	GWTT			
	Preferred			

Material:	Equipment:

	Subcontractors:		
	GWTT		
Delays:			
Health and Safety Issues:			
Other:			

Signature below indicates that the party representative agrees that the above information is an acceptable account of the field work conducted for this day.

Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

Date	6/8/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Partly Cloudy
David Kahn is testing the primary alarms at OU-2.	Temp °F	63
	Tailgate Meeting Topics	Electrical Lockout

Work Force	ST	OT
Sub POC:		
Other:		
GWTT		
Preferred		

Material:	Equipment:
	PID/5-gas meter
	Calibrated

Subcontractors:		
GWTT		

Delays:

Health and Safety Issues:

Other:

Signature below indicates that the party representative agrees that the above information is an acceptable account of the field work conducted for this day.

Subcontractor Representative _____ Date _____

AECOM Representative _____ Date _____

AECOM Daily Log

Date	6/12/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Sunny	
David Kahn has completed testing of all critical alarms and	Temp °F	73	
advisory alarm at OU-1. Some items have been retested at OU-2.	Tailgate Meeting Topics	Electrical Lockout	
Todd Farmer was working at OU-1 connecting the wireless			
modem. A shutdown alarm occurred as the result of the			
fault. The OU-1 system was restarted.	Work Force	ST	OT
	Sub POC:		
At OU-2 the 72 hour run test was started at 13:55.	Other:		
	GWTT		
	Preferred		

Material:	Equipment:
	PID/5-gas meter
	Calibrated

	Subcontractors:		
	GWTT		
Delays:			
Health and Safety Issues:			
Other:			

Signature below indicates that the party representative agrees that the above information is an acceptable account of the field work conducted for this day.

Subcontractor Representative		Date	
AECOM Representative		Date	

AECOM Daily Log

Date	6/13/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Sunny
The OU-2 system has been running for about 20 hours of 72	Temp °F	73
hour test. There have been no issues.	Tailgate Meeting	
Todd Farmer will work on the punch list items for OU-1.	Topics	Electrical Lockout
Todd removed the radio modem from Fan Room 16S.		
The modem will be reset and re-configured.		

Work Force	ST	OT
Sub POC:		
Other:		
GWTT		
Preferred		

Material:	Equipment:
	PID/5-gas meter
	Calibrated

Subcontractors:		
GWTT		

Delays:

Health and Safety Issues:

Other:

Signature below indicates that the party representative agrees that the above information is an acceptable account of the field work conducted for this day.

Subcontractor Representative _____ Date _____

AECOM Representative _____ Date _____

AECOM Daily Log

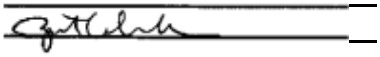
Date	6/20/2018		RW-3 Installation	Page _ of _	
Client	Lockheed Martin	Job Name	& OU-1/2 Upgrades	Job Number	60532812
Location	Great Neck, NY			Attachments?	

Work Performed:	Weather	Sunny
Todd Farmer is onsite and working on uploading screens to the	Temp °F	75
Operator Interface Terminal (OIT).	Tailgate Meeting	
Todd has tested the radio modems for the wireless connection.	Topics	Electrical Lockout
Todd has been able to ping the units when then are close.		

He has accessed the 16S Fan Room at the main building to	Work Force	ST	OT
install the configured modem. He has been testing the modems	Sub POC:		
from three locations (SSDS, OU-1 and OU-2). The OU-1 location	Other:		
has the master radio modem and slave modems are at SSDS	Horlick		
and OU-2. The connections from the master to the slave units			
seem to communicate, but there is an issue when trying to			
connect from a slave to another slave unit.			
Ping connection from OU-2 to OU-1 was only 25% of the time.			
The signal was RSSI -73 dbm.			
Ping connection from SSDS to OU-1 was only 100% of the time.			
Signal was RSSI -46 dBm.			
Ping connection from OU2 to SSDS was 0%.			
The master was then set at the SSDS location and slave modems			
were set at OU-1 and OU-2. OU-1 to SSDS had a 100% ping			
success rate. OU-2 to SSDS had a 25% to 75% rate.			
OU-1 to OU-2 had a 0% ping rate.			
Todd needs to speak with Phoenix Contact to see if the			
signals can be improved with the existing hardware.			

Material:	Equipment:			
		Subcontractors:		
		GWTT		
Delays:				
Health and Safety Issues:				
Other:				

Signature below indicates that the party representative agrees that the above information is an acceptable account of the field work conducted for this day.

Subcontractor Representative		Date	
AECOM Representative		Date	

APPENDIX C

SUBMITTAL LOG

AECOM

LMC - RW-3 Installation/OU-1,2 Upgrades
New Hyde Park / Village of Lake Success, NY

Issue Date: 12/27/2018

SUBMITTALS	Sub. NO..	REV.	TYPE	DESCRIPTION	AECOM DATE RECEIVED	DATE FORWARDED	RETURNED DATE	FORWARDED TO CONTRACTOR	STATUS	COMMENTS
OU- 2 SUBMITTALS										
Division 13				**SPECIAL CONSTRUCTION**						
Section 13410				**Basic Instrumentation, Monitoring and Control Requirements**						
	01	A	I	Supplier Spare Parts	6/28/2018	6/28/2018	7/24/2018	7/24/2018	Approved	
Section 13430				**Control Panels**						
	01	A	D	OU-2 Control Panel Drawings and Data Sheets	6/26/2018	6/26/2018	8/2/2018	8/2/2018	Approved as Noted	
Section 13440				**Remote Telemetry Units**						
	02	A	I	Firewall/VPN Units	9/12/2018	9/12/2018	9/14/2018	9/14/2018	Approved as Noted	
Section 13450				**Programmable Logic Controllers**						
	01	A	D	PLC Shop Drawings	4/7/2017	4/10/2017	4/18/2017	4/18/2017	Revise and Resubmit	Revisions Required
	01	B	D	PLC Shop Drawings	5/25/2017	5/25/2017	6/7/2017	6/7/2017	Approved as Noted	
	02	A	I	PLC Test Procedures	8/1/2017	8/2/2017	8/10/2017	8/10/2017	Approved as Noted	
	02	B	I	PLC Test Procedures	9/12/2017	9/13/2017			Answers to Questions Requested	
	02	C	I	PLC Test Procedures	9/18/2017	9/19/2017	9/20/2017	9/20/2017	Answers to Questions Requested	
	02	D	I	PLC Test Procedures	9/20/2017	9/20/2017	9/27/2017	9/27/2017	Approved as Noted	
	02	E	I	PLC Test Procedures	10/11/2017	10/11/2017	10/11/2017	10/11/2017	Approved	
	03	A	I	OU-2 MCP-200 PLC Panel Photos	11/9/2017	11/9/2017	11/9/2017	11/14/2017	Approved as Noted	
	04	A	I	OU-2 PLC Code	8/9/2018	8/22/2018	9/11/2018	9/11/2018	Approved as Noted	
Section 13700				**Process Monitoring and Control Software and Programming Requirements**						
	01	A	I	Programming Data Sheets, PLC Coding, I/O Lists, HMI Screen Shots and Draft Test Sheets	7/5/2017	7/6/2017	7/14/2017	7/14/2017	Approved as Noted	

Abr.	Description	Abr.	Description	Abr.	Description
D	Drawing	M	Manual	S	Sample
I	Information	P	Plan/Procedure	T	Test

APPENDIX D

SCADA TESTING RESULTS

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

HS_RW100_LAR

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
RW100	1	1	1	I:0101	24VDC+

DESCRIPTION:

RW100 LOCAL ALARM RESET PUSH BUTTON.

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	✓

SIMULATION TYPE: PUSHBUTTON

Actual Test

EQUIPMENT TESTING:

ALARMING: NA

	PILOT LIGHT	ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-1

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Resets AH well House Alarm

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

FI131_RT_TO_PM NON-FUNCTIONAL

PLC CABINET LOCATION:	RACK:	SLOT:	OUTPUT:	TERMINALS	
RW100	1	3	0	FI131+	FI131-

DESCRIPTION:

RW100 ANALOG OUTPUT TO LOCAL PANEL METER

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE

EQUIPMENT TESTING:

ALARMING:

	PILOT LIGHT	ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-1

FUNCTIONAL:

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

TESTING NOT REQUIRED AS IT WASN'T ~~NEVER~~ WORKING IN THE FIRST PLACE

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YC_OU2_CALL

PLC CABINET LOCATION:

	RACK:	SLOT:	OUTPUT:	TERMINALS	
RW100	1	2	0	O:0000	3112

DESCRIPTION:

RW100 CALL TO RUN OUTPUT TO MOTORSTARTER

INPUT DE-ENERGIZED STATE

NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE

Actual Test

EQUIPMENT TESTING:

ALARMING:

	PILOT LIGHT	ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-1

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Output Tested Motor Starter Functional

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YC_OU2_PLANT_OK_PL

PLC CABINET LOCATION:	RACK:	SLOT:	OUTPUT:	TERMINALS	
RW100	1	2	0	O:0002	3112

DESCRIPTION:

RW100 OU2 TREATMENT PLANT OK PILOT LIGHT

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE

Actual Test

EQUIPMENT TESTING:

ALARMING:

	PILOT LIGHT	ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-1

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Temp to [illegible]

NOTES:

Bulb not functional

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YC_OU2_PLANT_OK_PL

PLC CABINET LOCATION:	RACK:	SLOT:	OUTPUT:	TERMINALS	
RW100	1	2	0	O:0003	3112

DESCRIPTION:

RW100 OU2 TREATMENT PLANT NOT OK PILOT LIGHT

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE

Actual Test

EQUIPMENT TESTING:

ALARMING:

	PILOT LIGHT	ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF:

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony La [illegible]

NOTES:

Bulb Not Functional

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YC_P101_RUNNING_PL

PLC CABINET LOCATION:	RACK:	SLOT:	OUTPUT:	TERMINALS	
RW100	1	2	0	O:0006	3112

DESCRIPTION:

RW100 P101 RUNNING PILOT LIGHT

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE

Actual Test

EQUIPMENT TESTING:

ALARMING:

	PILOT LIGHT	ALARM FUNCTIONAL	INTERLOCK?
	Yes		

CONTROL STRATEGY REF: CS-1

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YC_P101_~~RUNNING~~_PL Fault

PLC CABINET LOCATION:	RACK:	SLOT:	OUTPUT:	TERMINALS	
RW100	1	2	0	O:0007	3112

DESCRIPTION:

RW100 P101 FAULT PILOT LIGHT

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE

EQUIPMENT TESTING:

ALARMING:

	PILOT LIGHT	ALARM FUNCTIONAL	INTERLOCK?
	Yes		

CONTROL STRATEGY REF: CS-1

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

HS_RW100_PTT

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
RW100	1	1	0	I:0100	24VDC+

DESCRIPTION:

RW100 PILOT LIGHTS PUSH TO TEST BUTTON.

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	✓
NORMALLY CLOSED	

SIMULATION TYPE: PUSHBUTTON

EQUIPMENT TESTING:

ALARMING:

	PILOT LIGHT	ALARM FUNCTIONAL	INTERLOCK?
PILOT LIGHTS ALL	ALL ✓		

CONTROL STRATEGY REF: CS-1

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YI_HS_P101_AUTO_L

PLC CABINET LOCATION:

	RACK:	SLOT:	INPUT:	TERMINALS	
RW100	1	1	2	I:0102	24VDC+

DESCRIPTION:

RW100 P101 LOCAL HANDSWITCH IN AUTO POSITION

INPUT DE-ENERGIZED STATE

NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE

HANDSWITCH

EQUIPMENT TESTING:

ALARMING:

	PILOT LIGHT	ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-1

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony La Grasta

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YI_HS_P101_HAND_L

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
RW100	1	1	3	I:0103	24VDC+

DESCRIPTION:

RW100 P101 LOCAL HANDSWITCH IN HAND POSITION

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE

HANDSWITCH

EQUIPMENT TESTING:

ALARMING:

	PILOT LIGHT	ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-1

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony La Greca

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YI_P101

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
RW100	1	1	4	I:0104	24VDC+

DESCRIPTION:

RW100 P101 RUN FEEDBACK

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	✓
NORMALLY CLOSED	

SIMULATION TYPE

CONTACTOR/MOTORSTARTER

EQUIPMENT TESTING:

ALARMING:

	PILOT LIGHT	ALARM FUNCTIONAL	INTERLOCK?
	Yes		

CONTROL STRATEGY REF: CS-1

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony La Cascia

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

HS_RW100_H_H2O_ACK ?

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
RW100	1	1	5	I:0105	24VDC+

DESCRIPTION:

RW100 LOCAL VAULT FLOOD ALARM ACKNOWLEDGE PUSH BUTTON.

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	✓
NORMALLY CLOSED	

SIMULATION TYPE: PUSHBUTTON

EQUIPMENT TESTING:

ALARMING:

	PILOT LIGHT	ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: FUNCTIONAL:

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

More Information needed as to the function of this PB

Input works but it doesn't do anything

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

LSH111

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
RW100	1	1	6	I:0106	24VDC+

DESCRIPTION:

RW100 WELL VAULT FLOOD HIGH LEVEL

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	✓
NORMALLY CLOSED	

SIMULATION TYPE: JUMPER WIRE

EQUIPMENT TESTING:

ALARMING:

	PILOT LIGHT	ALARM FUNCTIONAL	INTERLOCK?
ALARMING:	✓		✓ yes

CONTROL STRATEGY REF: CS-1

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony La

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

XSF_ESTOP_RW100

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
RW100	1	1	7	I:0107	24VDC+

DESCRIPTION:

RW100 WELL VAULT LOCAL ESTOP

INPUT DE-ENERGIZED STATE

NORMALLY OPEN	✓
NORMALLY CLOSED	

SIMULATION TYPE

PUSHBUTTON

EQUIPMENT TESTING:

ALARMING:

	PILOT LIGHT	ALARM FUNCTIONAL	INTERLOCK?
ALARMING:			yes

CONTROL STRATEGY REF: CS-1

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo CS [signature]

NOTES:

\# momentary? Latching is performed in software.

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

LSH111 ~~LSHH111~~

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
RW100	1	1	8	I:0108	24VDC+

DESCRIPTION:

RW100 WELL VAULT FLOOD HIGH HIGH LEVEL

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	✓

SIMULATION TYPE

~~JUMPER WIRE~~ Float

EQUIPMENT TESTING:

ALARMING:

	PILOT LIGHT	ALARM FUNCTIONAL	INTERLOCK?
ALARMING:			

CONTROL STRATEGY REF: CS-1

FUNCTIONAL:

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

Voltage Drop Significant enough to make the Relay in OU2 MCP Drop out. - Not Functional

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

LSH141A

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	1	0	I:0100	143

DESCRIPTION:

OU2 INFLUENT VAULT HIGH LEVEL,

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	✓
NORMALLY CLOSED	

SIMULATION TYPE

JUMPER WIRE

Actual Trip

EQUIPMENT TESTING:

ALARMING:

	PILOT LIGHT	ALARM FUNCTIONAL	INTERLOCK?
HIGH		✓	yes
AUTODIALER			
PILOT LIGHT			

CONTROL STRATEGY REF: Critical Alarm

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Critical Alarm - No Control Strategy

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

LSLL211

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	1	1	402	104

DESCRIPTION:

OU2 CLEARWELL #1 EXTREME LOW LOW LEVEL, VIA RELAY CR402

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	✓
NORMALLY CLOSED	

SIMULATION TYPE

~~JUMPER WIRE~~
Bucket Test

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
LOW LOW		✓	Yes
AUTODIALER			
PILOT LIGHT		N/A	

CONTROL STRATEGY REF: CS-4 | CAL

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Critical Alarm.

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

LSHH212

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	1	2	403	104

DESCRIPTION:

OU2 CLEARWELL #1 EXTREME HIGH HIGH LEVEL, VIA RELAY CR403

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	✓
NORMALLY CLOSED	

SIMULATION TYPE

JUMPER WIRE

Bucket Test

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH		✓	YES
AUTODIALER			
PILOT LIGHT			

CONTROL STRATEGY REF: CS-41 CAL

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Critical Alarm

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

LSLL221

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	1	3	405	104

DESCRIPTION:

OU2 CLEARWELL #2 EXTREME LOW LOW LEVEL, VIA RELAY CR405

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	✓
NORMALLY CLOSED	

SIMULATION TYPE: JUMPER WIRE

Bucket Test

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
LOW LOW		✓	yes
AUTODIALER			
PILOT LIGHT			

CONTROL STRATEGY REF: CS-4 | CAL

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Cr.4.Cal Alarm

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

LSHH222

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	1	4	406	104

DESCRIPTION:

OU2 CLEARWELL #2 EXTREAM HIGH HIGH LEVEL, VIA RELAY CR406

INPUT DE-ENERGIZED STATE

NORMALLY OPEN	✓
NORMALLY CLOSED	

SIMULATION TYPE

JUMPER WIRE

EQUIPMENT TESTING: Bucket Test

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
LOW LOW		✓	Yes
AUTODIALER			
PILOT LIGHT			

CONTROL STRATEGY REF: CS-4 | CAL

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Critical Alarm

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

LSH201AB WIRED IN SERIES, BOTH CHECK OUT

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	1	5	408	104

DESCRIPTION:

OU2 AIR STRIPPER BUILDING FLOOD SWITCHES, SWITCHES A & B WIRED IN SERIES*

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE: JUMPER WIRE

Actual Trip

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
FLOOD		✓	yes
AUTODIALER			
PILOT LIGHT			

CONTROL STRATEGY REF: CAL

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony L

NOTES:

Critical Alarm – No Control Strategy

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

PSH121

H4

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	1	6	410	104

DESCRIPTION:

OU2 HI PRESSURE INFLUENT ANNULUS VIA CR410

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	✓

SIMULATION TYPE

~~JUMPER WIRE~~

Breaking the loop.

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
HIGH		✓	
AUTODIALER			
PILOT LIGHT			

CONTROL STRATEGY REF: CAL

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Critical Alarm - No ~~CS~~ control strategy

Site: Lockheed Martin Corp.
New Hyde Park, NY

A H

B H H

Date: May 2018

LOOP IDENTIFICATION NUMBER:

~~PSH121~~ LSH - 141 B

PLC CABINET LOCATION:

	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	1	7	412	104

DESCRIPTION:

OU2 INFLUENT VAULT HIGH HIGH LEVEL

INPUT DE-ENERGIZED STATE

NORMALLY OPEN	✓
NORMALLY CLOSED	

SIMULATION TYPE

JUMPER WIRE

Actual Trip

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH		✓	YES
AUTODIALER			
PILOT LIGHT			

CONTROL STRATEGY REF: CAL

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Critical Alarm - No Control Strategy

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

PSL313

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	1	8	414	104

DESCRIPTION:

OU2 AIR STRIPPER BLOWER LOW PRESSURE, VIA CR414

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	✓

SIMULATION TYPE: JUMPER WIRE

Force Blower ON, turn down VFD.

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
LOW		✓	YES
AUTODIALER			
PILOT LIGHT			

CONTROL STRATEGY REF: CSO2 1PS

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony La

NOTES:

Primary Shutdown

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

TSH503

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	1	9	415	104

DESCRIPTION:

OU2 HIGH HEATER DISCHARGE TEMPERATURE, VIA CR415

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	✓

SIMULATION TYPE

JUMPER WIRE

EQUIPMENT TESTING:

~~Breaking the loop~~
Change set point at switch.

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
HIGH		✓	yes
AUTODIALER			
PILOT LIGHT			

CONTROL STRATEGY REF: CS-03 CAL

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Critical Shutdown

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

PSL404

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	1	10	417	104

DESCRIPTION:

OU2 LOW EFFLUENT WATER PRESSURE, VIA CR417

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE: ~~JUMPER WIRE~~ Actual Run Test

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
LOW		✓	
AUTODIALER			
PILOT LIGHT			

CONTROL STRATEGY REF: CAL

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Critical 8th Alarm

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

FSL642

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	1	11	419	104

DESCRIPTION:

OU2 LOW EFFLUENT VAPOR FLOW, VIA CR419

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE

JUMPER WIRE

EQUIPMENT TESTING: Actual Test, Slow Blower Speed

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
LOW		✓	yes
AUTODIALER			
PILOT LIGHT			

CONTROL STRATEGY REF: CS-02 CAL

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Terylo

NOTES:

Critical Alarm

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

XSF_B310

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	1	12	421	104

DESCRIPTION:

OU2 AIR STRIPPER BLOWER VFD FAULT, VIA CR421

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE

JUMPER WIRE

EQUIPMENT TESTING:

Cut Power to Blower @ MCC.

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
FAULT		✓	
AUTODIALER			
PILOT LIGHT			

CONTROL STRATEGY REF: CS-02

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

* Will Spawn other alarms But maybe should Be a critical Alarm.

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

LSHH111

PLC CABINET LOCATION:

	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	1	13	FR1B	FR1A

DESCRIPTION:

OU2 RW100 WELL VAULT HIGH HIGH , VIA CR429 & TVSS429

INPUT DE-ENERGIZED STATE

NORMALLY OPEN	
NORMALLY CLOSED	✓

SIMULATION TYPE

JUMPER WIRE

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH			
AUTODIALER			
PILOT LIGHT			

CONTROL STRATEGY REF: FUNCTIONAL:

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

*Voltage Drop issue from RW100 Vault

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

XSF_TVSS200

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	1	14	TVSS1.AUX	TVSS1.AUX

DESCRIPTION:

OU2 MCP200 TVSS FAILURE VIA TVSS1

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE

JUMPER WIRE

unplugged it from Tvss

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
FAILURE		✓	
AUTODIALER			
PILOT LIGHT			

CONTROL STRATEGY REF: —

FUNCTIONAL:

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

Informational only

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YI_PB462

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	2	0	143	I:0200

DESCRIPTION:

OU2 MCP200 EFFLUENT WATER PRESSURE RESET PUSHBUTTON

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE

PUSHBUTTON

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: | FUNCTIONAL:

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

PUSHBUTTON FUNCTION TO BE DETERMINED BY ENGINEER

SPARE ?

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YI_PB462 → DELETED

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	2	1	143	I:0201

DESCRIPTION:

OU2 MCP200 EFFLUENT VAPOR FLOW RESET PUSHBUTTON

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE: PUSHBUTTON

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: _____ FUNCTIONAL: _____

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

PUSHBUTTON FUNCTION TO BE DETERMINED BY ENGINEER

SPARE

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YI_HS_B310_HAND

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	2	2	143	I:0202

DESCRIPTION:

OU2 MCP200 BLOWER B-310 HAND SWITCH "IN HAND"

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	✓
NORMALLY CLOSED	

SIMULATION TYPE: HAND SWITCH

EQUIPMENT TESTING: Actual ~~Simulated~~ Test.

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-02

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony La Chance

NOTES:

Works

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YI_HS_B310_AUTO

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	2	3	143	I:0203

DESCRIPTION:

OU2 MCP200 BLOWER B-310 HAND SWITCH "IN AUTO"

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	X
NORMALLY CLOSED	

SIMULATION TYPE

HAND SWITCH

Actual Test.

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-02

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Taylor

NOTES:

Works.

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YI_HS_P211_HAND

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	2	4	143	I:0204

DESCRIPTION:

OU2 MCP200 CLEARWELL #1 PUMP P-211 HAND SWITCH "IN HAND"

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	✓
NORMALLY CLOSED	

SIMULATION TYPE

HAND SWITCH

Actual Test

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-04

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YI_HS_P211_AUTO

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	2	5	143	I:0205

DESCRIPTION:

OU2 MCP200 CLEARWELL #1 PUMP P-211 HAND SWITCH "IN AUTO"

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	✓
NORMALLY CLOSED	

SIMULATION TYPE

HAND SWITCH

EQUIPMENT TESTING: Actual test.

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-04

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YI_HS_P225_HAND

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	2	6	143	I:0206

DESCRIPTION:

OU2 MCP200 CLEARWELL #2 PUMP P-225 HAND SWITCH "IN HAND"

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	X
NORMALLY CLOSED	

SIMULATION TYPE

HAND SWITCH

Actual Test

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-04

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YI_HS_P225_AUTO

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	2	7	143	I:0207

DESCRIPTION:

OU2 MCP200 CLEARWELL #2 PUMP P-225 HAND SWITCH "IN AUTO"

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	X
NORMALLY CLOSED	

SIMULATION TYPE

HAND SWITCH

EQUIPMENT TESTING:

Actual Test

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-04

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YI_HS_RW100_HAND

PLC CABINET LOCATION:

	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	2	8	143	I:0208

DESCRIPTION:

OU2 MCP200 EXTRACTION WELL RW100 PUMP P-100 HAND SWITCH "IN HAND"

INPUT DE-ENERGIZED STATE

NORMALLY OPEN	X
NORMALLY CLOSED	

SIMULATION TYPE

HAND SWITCH

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-61

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony La [illegible]

NOTES:

Functional

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YI_HS_RW100_AUTO

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	2	9	143	I:0209

DESCRIPTION:

OU2 MCP200 EXTRACTION WELL RW100 PUMP P-100 HAND SWITCH "IN AUTO"

INPUT DE-ENERGIZED STATE

NORMALLY OPEN	X
NORMALLY CLOSED	

SIMULATION TYPE: HAND SWITCH

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-01

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony La

NOTES:

C/C

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YI_HS_DH500_HAND

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	2	10	143	I:0210

DESCRIPTION:

OU2 MCP200 DUCT HEATER DH500 HAND SWITCH "IN HAND"

INPUT DE-ENERGIZED STATE

NORMALLY OPEN	X
NORMALLY CLOSED	

SIMULATION TYPE

HAND SWITCH

EQUIPMENT TESTING: Actual Test

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-03

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony La Greca

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YI_HS_DH500_AUTO

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	2	11	143	I:0211

DESCRIPTION:

OU2 MCP200 DUCT HEATER DH 500 HAND SWITCH "IN AUTO"

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	X
NORMALLY CLOSED	

SIMULATION TYPE

HAND SWITCH

EQUIPMENT TESTING: Actual Test

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-03

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

HS_MCP200_ALARM_RESET

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	2	12	143	I:0212

DESCRIPTION:

OU2 MCP200 PANEL MOUNTED ALARM RESET

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	X
NORMALLY CLOSED	

SIMULATION TYPE: PUSHBUTTON

EQUIPMENT TESTING: Actual Test

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF:

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Resets All Alarms

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

XSF_MCP200_ESTOP

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	2	13	143	I:0213

DESCRIPTION:

OU2 MCP200 PANEL MOUNTED EMERGENCY STOP SWITCH ACTIVE

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	X

SIMULATION TYPE: PUSHBUTTON

Actual Test.

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
ESTOP ACTIVE		✓	✓

CONTROL STRATEGY REF: CA1

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Just Software driven only.
No mechanical Interlock
Critical Alarm

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

XSF_BF_ESTOP

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	2	14	143	I:0214

DESCRIPTION:

OU2 BAG FILTER AREA MOUNTED EMERGENCY STOP SWITCH ACTIVE

INPUT DE-ENERGIZED STATE

NORMALLY OPEN	
NORMALLY CLOSED	X

SIMULATION TYPE

PUSHBUTTON

Actual Test.

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
ESTOP ACTIVE		✓	✓

CONTROL STRATEGY REF: CAL

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony La Scala

NOTES:

Just Software driven Only
No mechanical Interlock
critical Alarm

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

XSF_NW_ESTOP

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	2	15	143	I:0215

DESCRIPTION:

OU2 NORTH WALL AREA MOUNTED EMERGENCY STOP SWITCH ACTIVE

INPUT DE-ENERGIZED STATE

NORMALLY OPEN	
NORMALLY CLOSED	X

SIMULATION TYPE

PUSHBUTTON

Actual test

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
ESTOP ACTIVE		✓	✓

CONTROL STRATEGY REF: CAL

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Just Software driven only
No mechanical interlock
Critical Alarm

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

XSF_P211

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	3	0	143	I:0300

DESCRIPTION:

OU2 CLEARWELL #1 PUMP P-211 VFD FAULT FROM VFD.

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE: PUSHBUTTON

EQUIPMENT TESTING: isolating incoming Power

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
FAULT		✓	
FAIL TO RUN		✓	
FAIL TO STOP		✓	
FEEDBACK FAILURE		✓	
TRACKING FAILURE			

CONTROL STRATEGY REF: CS-04 FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony La Fiuda

NOTES:

This failure will spawn other alarms But this may need to be a critical Shutdown.

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YI_P211

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	3	1	143	I:0301

DESCRIPTION:

OU2 CLEARWELL #1 PUMP P-211 VFD RUNNING FROM VFD.

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE

JUMPER WIRE

Actual Test

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-04

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony La Grasta

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

XSF_P225

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	3	2	143	I:0302

DESCRIPTION:

OU2 CLEARWELL #2 PUMP P-225 VFD FAULT FROM VFD.

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE: PUSHBUTTON

EQUIPMENT TESTING: Isolating Incoming Power

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
FAULT light.		✓	

CONTROL STRATEGY REF: CS-04 FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

This alarm will spawn other alarms But this may need to be Added to The Critical alarm List.

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YI_P225

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	3	3	143	I:0303

DESCRIPTION:

OU2 CLEARWELL #2 PUMP P-225 VFD RUNNING FROM VFD.

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE

JUMPER WIRE

EQUIPMENT TESTING: Actual Test.

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-04

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tom to [illegible]

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

YI_B310

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	3	4	143	I:0304

DESCRIPTION:

OU2 AIR STRIPPER BLOWER B-310 VFD RUNNING FROM VFD.

INPUT DE-ENERGIZED STATE

NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE

JUMPER WIRE

Actual Test

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: CS-02

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

PDIS301

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	3	6	FU508	I:0306

DESCRIPTION:

OU2 INLET AIR FILTER DIFFRENTIAL PRESSURE #1, TB143 / FU508

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	X
NORMALLY CLOSED	

SIMULATION TYPE

~~PUSHBUTTON~~

Jumper

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
HIGH		✓	

CONTROL STRATEGY REF: —

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Advisory only

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

PDIS302

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	3	7	FU509	I:0307

DESCRIPTION:

OU2 INLET AIR FILTER DIFFRENTIAL PRESSURE #2, TB143 / FU509

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	X
NORMALLY CLOSED	

SIMULATION TYPE

PUSHBUTTON

Jumper

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
HIGH		✓	

CONTROL STRATEGY REF: —

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tom Lo

NOTES:

Advisory only

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

PDIS303

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	3	8	FU511	I:0308

DESCRIPTION:

OU2 INLET AIR FILTER DIFFRENTIAL PRESSURE #3, TB143 / FU511

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	
NORMALLY CLOSED	

SIMULATION TYPE

PUSHBUTTON

dumper

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?
HIGH		✓	

CONTROL STRATEGY REF: —

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

Advisory only

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

ZSO_V421

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	3	9	FU512	I:0309

DESCRIPTION:

OU2 V-421 FULL OPEN POSITION, TB 143 / FU512

INPUT DE-ENERGIZED STATE

NORMALLY OPEN	X
NORMALLY CLOSED	

SIMULATION TYPE

JUMPER WIRE

Actual Test

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF:

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

OU2

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

ZSC_V421

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	3	10	FU513	I:0310

DESCRIPTION:

OU2 V-421 FULL CLOSED POSITION, TB 143 / FU512

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	X
NORMALLY CLOSED	

SIMULATION TYPE

JUMPER WIRE

Actual Test

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF: —

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony L.

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

ZSO_V411

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	3	11	FU514	I:0311

DESCRIPTION:

OU2 V-411 FULL OPEN POSITION, TB 143 / FU514

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	X
NORMALLY CLOSED	

SIMULATION TYPE

JUMPER WIRE

Actual Test

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF:

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

ZSC_V411

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	3	12	FU515	I:0312

DESCRIPTION:

OU2 V-411 FULL CLOSED POSITION, TB 143 / FU515

INPUT DE-ENERGIZED STATE	
NORMALLY OPEN	✓
NORMALLY CLOSED	

SIMULATION TYPE

JUMPER WIRE

Actual Test

EQUIPMENT TESTING:

ALARMING:

		ALARM FUNCTIONAL	INTERLOCK?

CONTROL STRATEGY REF:

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

PT402

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	7	13	I:0713+	303

DESCRIPTION:

OU2 BAG FILTERS OUTLET PRESSURE INDICATION

TRANSMITTER RANGE	UNITS
MIN: 0 ✓	PSI
MAX: 100 ✓	PSI

SIMULATION TYPE: SIGNAL GENERATOR

Force Mask

EQUIPMENT TESTING:

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	25.00	50.00	75.00	100.00	PSI
RESULTS:	✓				✓	✓

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	NA		
LOW	NA		
LOW LOW	NA		

TOTALIZATION: | TRENDING ✓

CONTROL STRATEGY REF: | FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

THIS VALUE IS COPAIRED TO THE INLET PRESSURE (PT401) TO PRODUCE DIFFRENTIAL PRESSURE ACROSS BAG FILTERS.

High differential alarm ✓

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

PT101

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
RW100	1	3	0	PT101+	PT101-

DESCRIPTION:

EXTRACTION WELL RW-100 PUMP DISCHARGE PRESSURE BEFORE STRAINER. INDICATION ONLY

TRANSMITTER RANGE	UNITS
MIN: 0	PSI
MAX: 100	PSI

SIMULATION TYPE: ~~SIGNAL GENERATOR~~

EQUIPMENT TESTING:

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	25.00	50.00	75.00	100.00	PSI
RESULTS:	0	25	50	75	100	✓

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE	✓	✓	✓

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH			
HIGH			
LOW			
LOW LOW			

TOTALIZATION: N A

TRENDING: ✓

CONTROL STRATEGY REF:

FUNCTIONAL:

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

INDICATION ONLY Analog Value Not Stable Requires Investigation. Possible Grounding Issue

Part of the clean up work required

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

PT102

TO BE ELIMINATED AS NO STRAINER.

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
RW100	1	3	1	PT101+	PT101-

DESCRIPTION:

EXTRACTION WELL RW-100 PUMP DISCHARGE PRESSURE AFTER STRAINER. INDICATION ONLY

TRANSMITTER RANGE	UNITS
MIN: 0	PSI
MAX: 100	PSI

SIMULATION TYPE: SIGNAL GENERATOR

EQUIPMENT TESTING:

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	25.00	50.00	75.00	100.00	PSI
RESULTS:						

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH			
HIGH			
LOW			
LOW LOW			

TOTALIZATION: TRENDING

CONTROL STRATEGY REF: FUNCTIONAL:

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

INDICATION ONLY

Elimated.

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

RH501

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	7	0	I:0700+	303

DESCRIPTION:

OU2 DUCT HEATER DH500 INLET VAPOR HUMIDITY

TRANSMITTER RANGE	UNITS
MIN: 0	%
MAX: 100	%

SIMULATION TYPE: SIGNAL GENERATOR

EQUIPMENT TESTING:

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	25.00	50.00	75.00	100.00	%
RESULTS:						

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH			
LOW	NA		
LOW LOW	NA		

TOTALIZATION: TRENDING

CONTROL STRATEGY REF: FUNCTIONAL:

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

HIGH ALARM ONLY

Polarity issues with existing instrument signal Generator testing Workod

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

TT501

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	7	1	I:0701+	303

DESCRIPTION:

OU2 DUCT HEATER DH500 INLET VAPOR TEMPERATURE

TRANSMITTER RANGE	UNITS
MIN: 32	DEG F
MAX: 212	DEG F

SIMULATION TYPE: SIGNAL GENERATOR

EQUIPMENT TESTING:

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	32.00	77.00	122.00	167.00	212.00	DEG F
RESULTS:						

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	NA		
LOW	NA		
LOW LOW	NA		

TOTALIZATION: TRENDING

CONTROL STRATEGY REF: FUNCTIONAL:

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

INDICATION ONLY

Polarity issues with existing instrument

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

TT502

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	7	3	I:0703+	303

DESCRIPTION:

OU2 DUCT HEATER DH500 OUTLET VAPOR TEMPERATURE

TRANSMITTER RANGE	UNITS
MIN: 0	DEG F
MAX: 200	DEG F

SIMULATION TYPE: SIGNAL GENERATOR

Actual Test

EQUIPMENT TESTING:

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	50.00	100.00	150.00	200.00	DEG F
RESULTS:	✓				✓	

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	Yes	Yes	Yes ✓
LOW	Yes	Yes	Yes ✓
LOW LOW	NA		

TOTALIZATION:

TRENDING: Yes

CONTROL STRATEGY REF: CS-03

FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tuy Le

NOTES:

*Check scale

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

FT313

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	~~8~~	~~10~~	I:0704+	303

DESCRIPTION:

OU2 AIR STRIPPER EFFLUENT FLOW

TRANSMITTER RANGE	UNITS
MIN: 0	CFM
MAX: ~~6490~~ 7418	CFM

SIMULATION TYPE: SIGNAL GENERATOR

Actual Test 7418

EQUIPMENT TESTING:

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	~~1622.50~~	~~3245.00~~	~~4867.50~~	~~6490.00~~	CFM
RESULTS:	✓				✓	

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	NA		
LOW	NA		
LOW LOW	NA		

TOTALIZATION: | TRENDING: ✓

CONTROL STRATEGY REF: | FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Ty Lo Graff

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

PT313

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	7	5	I:0705+	303

DESCRIPTION:

OU2 AIR STRIPPERS EFFLUENT AIR PRESSURE

TRANSMITTER RANGE	UNITS
MIN: 0	INWC
MAX: 50 ✓	INWC

SIMULATION TYPE: SIGNAL GENERATOR

Force MASK

EQUIPMENT TESTING:

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	12.50	25.00	27.50	50.00	INWC
RESULTS:	✓				✓	

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	NA		
LOW			
LOW LOW	NA		

TOTALIZATION: | TRENDING: ✓

CONTROL STRATEGY REF: | FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Taylor Crack

NOTES:

LOW ONLY

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

PT312

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	7	6	I:0706+	303

DESCRIPTION:

OU2 CLEARWELL #2 HEADSPACE AIR PRESSURE

TRANSMITTER RANGE		UNITS
MIN: 0	✓	INWC
MAX: 50	✓	INWC

SIMULATION TYPE: SIGNAL GENERATOR

EQUIPMENT TESTING: Force Mask.

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	12.50	25.00	27.50	50.00	INWC
RESULTS:	✓				✓	

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	yes	yes	yes
LOW	yes	yes	yes
LOW LOW	NA		

TOTALIZATION: | TRENDING: ✓

CONTROL STRATEGY REF: CS-02 | FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	[signature]

NOTES:

Primary Alarm

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

~~PT311~~ PT311

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	7	7	I:0707+	303

DESCRIPTION:

OU2 AIR STRIPPER BLOWER VACUUM PRESSURE

TRANSMITTER RANGE	UNITS
MIN: 0 ✓	INWC
MAX: 20 ✓	INWC

SIMULATION TYPE: SIGNAL GENERATOR

EQUIPMENT TESTING: Force Mask

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	5.00	10.00	15.00	20.00	INWC
RESULTS:	✓				✓	

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	NA		
LOW	NA		
LOW LOW	NA		

TOTALIZATION: | TRENDING ✓

CONTROL STRATEGY REF: | FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

INDICATION ONLY

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

LIT211

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	7	8	I:0000+	303

704

DESCRIPTION:

OU2 CLEARWELL #1 LIQUID LEVEL

TRANSMITTER RANGE	UNITS
MIN: 0 ✓	FT.
MAX: 7.25 ✓	FT.

SIMULATION TYPE: SIGNAL GENERATOR

WITH water level

EQUIPMENT TESTING: Manually ~~SF~~ Check Probe

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	1.81	3.63	5.44	7.25	FT.
RESULTS:	✓				✓	

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK? PA
HIGH HIGH	yes	yes	yes ~~PA~~
HIGH	yes	yes	ADV
LOW	yes	yes	ADV
LOW LOW	yes	yes	yes PA

TOTALIZATION: | TRENDING ✓

CONTROL STRATEGY REF: | FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

level matches probe read out

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

PT211

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	7	9	I:0709+	303

DESCRIPTION:

CLEARWELL #1 PRESSURE TRANSMITTER EFFLUENT

TRANSMITTER RANGE	UNITS
MIN: 0	PSI
MAX: 35	PSI

SIMULATION TYPE: SIGNAL GENERATOR

EQUIPMENT TESTING: Actual Run Test

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	8.75	17.50	26.25	35.00	PSI
RESULTS:						

ALARMING: Indication in HMI Matches GAUGE

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	Yes	Yes	RDU
LOW	Yes	Yes	ADU
LOW LOW	NA		

TOTALIZATION: | TRENDING: ✓

CONTROL STRATEGY REF: CS-04 | FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

LIT221

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	7	10	I:0710+	303

DESCRIPTION:

OU2 CLEARWELL #2 LIQUID LEVEL

TRANSMITTER RANGE	UNITS
MIN: 0 ✓	FT.
MAX: 7.25 ✓	FT.

SIMULATION TYPE: SIGNAL GENERATOR

EQUIPMENT TESTING:

Manually check with water level probe

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	1.81	3.63	5.44	7.25	FT.
RESULTS:	✓				✓	

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	yes	yes	yes PA
HIGH	yes	yes	yes - ADU
LOW	yes	yes	yes - ADU
LOW LOW	yes	yes	yes PA

TOTALIZATION: | TRENDING: ✓

CONTROL STRATEGY REF: | FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	[signature]

NOTES:

level matches probe readout

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

PT225

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	7	11	I:0711+	303

DESCRIPTION:

CLEARWELL #2 PUMP DISCHARGE PRESSURE TRANSMITTER EFFLUENT

TRANSMITTER RANGE	UNITS
MIN: 0 ✓	PSI
MAX: 100 ✓	PSI

SIMULATION TYPE: SIGNAL GENERATOR

EQUIPMENT TESTING: Force Mask

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	25.00	50.00	75.00	100.00	PSI
RESULTS:	✓				✓	✓

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	yes	yes	PADV
LOW	yes	yes	ADV
LOW LOW	NA		

TOTALIZATION: ____ TRENDING: ✓

CONTROL STRATEGY REF: ____ FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

PT401

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	7	12	I:0712+	303

DESCRIPTION:

OU2 BAG FILTERS INLET PRESSURE INDICATION

TRANSMITTER RANGE	UNITS
MIN: 0 ✓	PSI
MAX: 100 ✓	PSI

SIMULATION TYPE: SIGNAL GENERATOR

EQUIPMENT TESTING: Force Mask

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	25.00	50.00	75.00	100.00	PSI
RESULTS:	✓				✓	

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	NA		
LOW	NA		
LOW LOW	NA		

TOTALIZATION: | TRENDING ✓

CONTROL STRATEGY REF: | FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

FIT401

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	7	14	I:0714+	303

DESCRIPTION:

OU2 EFFLUENT FLOW TRANSMITTER

TRANSMITTER RANGE	UNITS
MIN: 0 ✓	GPM
MAX: 1300 ✓	GPM

SIMULATION TYPE: SIGNAL GENERATOR

Force Mask

EQUIPMENT TESTING:

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	325.00	650.00	975.00	1300.00	GPM
RESULTS:	✓				✓	✓

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	NA		
LOW	yes	yes	yes PA
LOW LOW	NA		

TOTALIZATION: | TRENDING:

CONTROL STRATEGY REF: CS-04 | FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Taylo Rachs

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

FIT131

PLC CABINET LOCATION:

	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	7	15	I:0715+	303

DESCRIPTION:

OU2 INFLUENT FLOW TRANSMITTER

TRANSMITTER RANGE

	UNITS
MIN: 0 ✓	GPM
MAX: 1300 ✓	GPM

SIMULATION TYPE: SIGNAL GENERATOR

EQUIPMENT TESTING:

Force Mask

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	325.00	650.00	975.00	1300.00	GPM
RESULTS:	✓				✓	✓

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	NA		
LOW	yes	yes	yes ADV
LOW LOW	NA		

TOTALIZATION: | TRENDING: ✓

CONTROL STRATEGY REF: | FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

RH621

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	8	0	I:0800+	303

DESCRIPTION:

OU2 VPGAC INLET VAPOR HUMIDITY

TRANSMITTER RANGE	UNITS
MIN: 0	%
MAX: 100	%

SIMULATION TYPE: SIGNAL GENERATOR

EQUIPMENT TESTING:

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	25.00	50.00	75.00	100.00	%
RESULTS:						

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	NA		
LOW	NA		
LOW LOW	NA		

TOTALIZATION: TRENDING

CONTROL STRATEGY REF: FUNCTIONAL:

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

Polarity issues with existing instrument

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

TT621

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	8	1	I:0801+	303

DESCRIPTION:

OU2 VPGAC INLET VAPOR TEMPERATURE

TRANSMITTER RANGE	UNITS
MIN: 0	DEG F
MAX: 100	DEG F

SIMULATION TYPE: SIGNAL GENERATOR

EQUIPMENT TESTING:

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	32.00	77.00	122.00	167.00	212.00	DEG F
RESULTS:						

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	NA		
LOW	NA		
LOW LOW	NA		

TOTALIZATION: TRENDING

CONTROL STRATEGY REF: FUNCTIONAL:

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

Polarity issues with existing instrument

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

RH633

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	8	2	I:0802+	303

DESCRIPTION:

OU2 VPGAC OUTLET VAPOR HUMIDITY

TRANSMITTER RANGE	UNITS
MIN: 0	%
MAX: 100	%

SIMULATION TYPE: SIGNAL GENERATOR

EQUIPMENT TESTING:

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	25.00	50.00	75.00	100.00	%
RESULTS:						

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	NA		
LOW	NA		
LOW LOW	NA		

TOTALIZATION: TRENDING

CONTROL STRATEGY REF: FUNCTIONAL:

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

Polarity issues with existing instrument

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

TT633

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	8	3	I:0803+	303

DESCRIPTION:

OU2 VPGAC OUTLET VAPOR TEMPERATURE

TRANSMITTER RANGE	UNITS
MIN: 0	DEG F
MAX: 100	DEG F

SIMULATION TYPE: SIGNAL GENERATOR

EQUIPMENT TESTING:

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	32.00	77.00	122.00	167.00	212.00	DEG F
RESULTS:						

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	NA		
LOW	NA		
LOW LOW	NA		

TOTALIZATION: TRENDING

CONTROL STRATEGY REF: FUNCTIONAL:

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

Polarity issues with existing instrument

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

FIT631

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	8	4	I:0804+	303

DESCRIPTION:

OU2 VAPOR DISCHARGE FLOW

TRANSMITTER RANGE	UNITS
MIN: 0 ✓	CFM
MAX: ~~6491~~ 8831	CFM

SIMULATION TYPE: SIGNAL GENERATOR

Force Mask 8831 CFM

EQUIPMENT TESTING:

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	~~1622.75~~	~~3245.50~~	~~4868.25~~	~~6491.00~~	~~GPM~~
RESULTS:	✓				✓	

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	NA		
LOW	yes	yes	yes PA
LOW LOW	NA		

TOTALIZATION: | TRENDING: ✓

CONTROL STRATEGY REF: CS-02 | FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	

NOTES:

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

PT131

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	8	5	I:0805+	I:0805-

DESCRIPTION:

OU2 INFLUENT FORCE MAIN PRESSURE

TRANSMITTER RANGE	UNITS
MIN: 0 ✓	PSI
MAX: ~~50~~ 30	PSI

SIMULATION TYPE: SIGNAL GENERATOR

Force Mask

EQUIPMENT TESTING:

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA (30)	UNITS
INDICATION EXPECTED:	0.00	12.50	25.00	27.50	~~50.00~~ ✓	PSI
RESULTS:	✓					✓

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	yes	yes	yes PA
LOW	yes	yes	yes
LOW LOW	NA		

TOTALIZATION: | TRENDING: ✓

CONTROL STRATEGY REF: | FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

Field verified to be in 1-30 PSI range.

Site: Lockheed Martin Corp.
New Hyde Park, NY

Date: May 2018

LOOP IDENTIFICATION NUMBER:

PT121

PLC CABINET LOCATION:	RACK:	SLOT:	INPUT:	TERMINALS	
MCP200	2	8	6	I:0806+	I:0806-

DESCRIPTION:

FORCE MAIN SECONDARY CONTAINMENT ANULAR SPACE PRESSURE

TRANSMITTER RANGE	UNITS
MIN: 0 ✓	PSI
MAX: 30 ✓	PSI

SIMULATION TYPE: SIGNAL GENERATOR

EQUIPMENT TESTING:

RANGE TESTING:	4 mA	8 mA	12 mA	16 mA	20 mA	UNITS
INDICATION EXPECTED:	0.00	7.50	15.00	22.50	30.00	PSI
RESULTS:	✓				✓	✓

ALARMING:

	<4 Ma	>20 Ma	HMI Works
OUT OF RANGE			

	SETPOINT	ALARM FUNCTIONAL	INTERLOCK?
HIGH HIGH	NA		
HIGH	yes	yes	yes PA
LOW	NA		
LOW LOW	NA		

TOTALIZATION: | TRENDING ✓

CONTROL STRATEGY REF: | FUNCTIONAL: ✓

SIGN-OFF	
ENGINEER	
GENERAL CONTRACTOR	Tony Lo

NOTES:

OU2					
Alarm	**Tag**	**Scheduled Testing**	**Date Tested**	**Notes**	**Sign-Off**
Critical Alarms					
Remote Autodialer Shutdown	NA	September	6/6/2018	OK	OK T.L.
RW-100 Communications Failure	NA	September	6/6/2018	OK	OK T.L.
North Flood Switch	LSH-201A	September	6/6/2018	OK	OK T.L.
South flood Switch	LSH-201B	September	6/6/2018	OK	OK T.L.
RW-100 E Stop	NA	October	6/7/2018	OK - Need alarm notification programmed into alarm control page 2 - Resolved 6-12-18	OK T.L.
RW-100 LSH	LSH-111	October	6/7/2018	OK - Need alarm notification programmed into alarm control page 2 - Resolved 6-12-18	OK T.L.
RW-100 LSHH	LSHH-111	October	6/7/2018	OK - Need alarm notification programmed into alarm control page 2 - Resolved 6-12-18	OK T.L.
Duct Heater TSH	TSH-502	November	6/7/2018	OK	OK T.L.
System vapor low flow	FSL-642	December	6/7/2018	OK	OK T.L.
Effluent water PSL	PSL-404	January	6/7/2018	OK	OK T.L.
Blower PSL	PSL-313	February	6/7/2018	OK - Change "CW#1 Low Pressure" to "Blower Discharge Low Pressure Switch" - Resolved 6-12-18	OK T.L.
CW220 LSLL	LSLL-220	March	6/7/2018	OK - Plant start/stop no notification; LSLL 211 to be changed to LSLL 221 on vapor screen - Resolved 6-12-18	OK T.L.
CW220 LSHH	LSHH-220	April	6/7/2018	OK - LSHH 212 on vapor screen - should be LSHH 222 - Resolved 6-12-18	OK T.L.
CW210 LSLL	LSLL-210	May	6/7/2018	OK - Plant start/stop - CW#2 Extreme low came up also - Resolved 6-12-18	OK T.L.
CW210 LSHH	LSHH-210	June	6/5/2018	OK	OK T.L.
Inf Vault LSH	LSH-141	July	6/7/2018	OK	OK T.L.
Inf Vault LSHH	LSHH-141	July	6/7/2018	OK	OK T.L.
Inf Vault pipe PSH	PSH-121	July	6/7/2018	OK	OK T.L.
Control Room E-Stop	NA	August	6/7/2018	OK - Notification on Alarm Control Page 2 needed if possible - Resolved 6-12-18	OK T.L.
SCADA E-Stop	NA	August	6/7/2018	OK - Notification on Alarm Control Page 2 needed if possible - Resolved 6-12-18	OK T.L.
Process Room E Stop	NA	August	6/7/2018	OK	OK T.L.
Blower E-Stop	NA	August	6/7/2018	OK - No Autodialer Call out - Retest 6-12-18 - OK	OK T.L.
Primary Alarms					
BF High Diff pressure	PIT-401/402	September	6/8/2018	OK - Adjust time delay to trip alarm to 1 minute - OK	OK T.L.
Duct Heater TSL	TT-502	November	6/8/2018	Shut system down with no notifications; Shut down all equipment at one time, needs to shut down in sequence - Retest 6-12-18 OK	OK T.L.
Duct Heater TSH	TT-502	November	6/8/2018	OK	OK T.L.
System low eff air flow	FIT-641	December	6/8/2018	OK - Shut down all equipment at one time, needs to shut down in sequence- Retest 6-12-18 OK	OK T.L.
System Eff low water flow	FQIT-401	January	6/8/2018	No system shutdown - Retest 6-12-18 OK	OK T.L.
Sys Eff PSL	PT-402	January	6/8/2018	OK	OK T.L.
Sys Eff PSH	PT-402	January	6/8/2018	OK	OK T.L.
Blower discharge PSL	PIT-312	February	6/8/2018	OK - Shut down all equipment at one time, needs to shut down in sequence- Retest 6-12-18 OK	OK T.L.
Blower discharge PSH	PIT-312	February	6/8/2018	OK - Shut down all equipment at one time, needs to shut down in sequence- Retest 6-12-18 OK	OK T.L.
CW220 LSLL	LIT-220	March	6/8/2018	OK - Shut down all equipment at one time, needs to shut down in sequence- Retest 6-12-18 OK	OK T.L.
CW 220 LSHH	LIT-220	April	6/8/2018	OK - Shut down all equipment at one time, needs to shut down in sequence- Retest 6-12-18 OK	OK T.L.
CW210 LSLL	LIT-210	May	6/8/2018	OK - Shut down all equipment at one time, needs to shut down in sequence- Retest 6-12-18 OK	OK T.L.
CW 210 LSHH	LIT-120	June	6/8/2018	OK - Shut down all equipment at one time, needs to shut down in sequence; No autodialer call out- Retest 6-12-18 OK	OK T.L.
Low Influent Water Pressure	PT-131	July	6/8/2018	No System Shutdown - Retest 6-11-18 OK	OK T.L.
High Influent water pressure	PT-131	July	6/8/2018	No System Shutdown - Retest 6-11-18 OK	OK T.L.
Conveyance piping PSH	PT-121	July	6/8/2018	OK - Change notifications on bottom dialogue box to "Annulus High Pressure", PT 131 flashing on liquid control screen - Resolved 6-12-18	OK T.L.
Advisory Alarms					
Duct Heater TSL (Advisory)	TT-502	November		No Alarm Currently Programmed - Programmed and Tested 6-12-18 - OK	OK T.L.
CW220 LSL (Advisory)	LIT-220	March	6/11/2018	Shut down Clearwell Pumps only - Retest 6-11-18 OK	OK T.L.
CW 220 pump PSL (Advisory)	PT-225	April	6/11/2018	OK	OK T.L.
CW 220 Pump PSH (Advisory)	PT-225	April	6/11/2018	OK	OK T.L.
CW 220 LSH (Advisory)	LIT-220	April	6/11/2018	OK	OK T.L.
CW210 LSL (Advisory)	LIT-210	May	6/11/2018	OK	OK T.L.
CW 210 pump PSL (Advisory)	PT-211	June	6/11/2018	OK	OK T.L.
CW 210 Pump PSH (Advisory)	PT-211	June	6/11/2018	OK	OK T.L.
CW 210 LSH (Advisory)	LIT-210	June	6/11/2018	OK	OK T.L.
Bag Filter Switch (Advisory)	BF410 / 420	September	6/12/2018	OK	OK T.L.
Low influent water flow rate (Advisory)	FIT-131	July	6/11/2018	OK	OK T.L.

SHOP DRAWING REVIEW

Project	Operable Unit No. 2 Groundwater Treatment System Upgrade		
Owner	Lockhead Martin	Location	Lake Success, NY
Tt No.	200-01297-16018	Contractor No.	WFT-SD-13450-I-02-A
Comments By	Amal Yelkur	Date	8/17/2017
Tt Log No.	N/A	Vendor	GWTT
Spec Section	I&C	Vendor No.	11-3205 Sub. No.15
Description	OU-2 Witness Factory Testing Review Comments		

☐ APPROVED
☒ APPROVED AS NOTED
☐ AMEND AND RESUBMIT
☐ REJECTED

No.	Reference	Comment/Action
1	Complete submittal	Engineer's Note: These comments are in reference to Contractors Submittal SD-13450-I-02-A, the Witness Factory Test (WFT) was conducted on OU-2 system control panels at Horlick Company, Inc. 91 Pacella Park Drive Randolph MA 02368 Phone 781-963-0090 Fax 781-986-1540 Test Date – 08/17/2017 (8-5pm) & 08/18/2017 (8-5pm) If above location/schedule changes, please inform the Engineer immediately.
2	Complete submittal	*The results of the WTF has been determined as approved as per the comments noted below. The Control System's Integrator (Satuitag's) has been informed to address the comments noted below and per the markups on the attached drawings and submit to Engineer for approval. This submittal shall include updated drawings to indicate corrective actions performed (clouded).* *<u>Upon approval of the WFT submittal the panels can be shipped to the site.</u>*
3	Compete submittal	Contractor to note that an OU-2 corrective action has been implemented. Attached report details the actions performed. Contractor to perform changes to proposed OU-2 MCP 200 and RW-100 panels before shipping the panel to the site.

4	Submittal Pg.7 of 91, pdf	Confirm that all previous submittal comments (listed below are few) are addressed. 1. SD-13450-D-01-B 2. SD-13700-I-01-A
5	Submittal Pg.7 of 91, pdf	PLC Programming FAT shall include review and testing of Control Strategies (where applicable) per specification section 13600. Include as part of this submittal, a control strategy test form for each strategy for Contractors check list and Engineer's sign off at the Witnessed Site Acceptance Testing.
7	Complete Submittal	As noted in specification section 13600 and requested here, Contractor to provide all resources, document and equipment for a successful site acceptance testing so as to mitigate re-testing (at no additional cost to Engineer) and schedule extension requests.
8	Plant Startup and Shutdown Control Native Hand written notes Daft FAT 8/18/17	Plant ready = Output Signal from OU-2 PLC to RW-100 PLC • No faults • Plant in Auto Program Plant ready button. Indicate status as Green, Red (not ready), Yellow -alarms If the operators hits the "Plant Ready" button the system shall automatically and sequence equipment starts per the control narrative. Pop up for confirmation if the following: "Confirm if all the values are in there respective positions to run the plant" Ability to hit "confirm" then start the plant checklist for all running Signals/Status Follow the sequence as detailed in CS-5
12	Control Native Hand written meeting notes Daft FAT 8/18/17	Tags /labels on network cables
13	Control Native Hand written meeting notes Daft FAT 8/18/17	Labels on panel - too small

14	Control Native Hand written meeting notes Daft FAT 8/18/17	Engineer to confirm if all spares need to be wired.
15	Control Native Hand written meeting notes Daft FAT 8/18/17	Panel door shall have drawing holder sleeve.
16	Control Native Hand written meeting notes Daft FAT 8/18/17	RTU- COMM- Shall be shown on screen and network screen.
17	Control Native Hand written meeting notes Daft FAT 8/18/17	All alarming designations shall include instrument tags/designations as per SSDS program.
18	Control Native Hand written meeting notes Daft FAT 8/18/17	Engineer to provide report generation requirements/samples.
19	SOP OU2-03-System Check Prior to Start-Up	No comments
20	Attachment OU2-03-1-Valve Tag Schedule	No comments
21	SOP OU2-01-System Start-Up Page 1 of 4 Paragraph 4	Engineer to check if pressing “Eff Airflow Reset” button” on the panel front is required.
22	SOP OU2-01-System Start-Up Page 2 of 4 Paragraph 6	No comments
23	Attachment SOP OU2-01-1-Typical Operating Parameters	No comments

24	SOP OU2-02-System Shutdown	No comments
26	Code Issues hand written notes CS-01 Daft FAT 8/18/17	Descriptions of physical locations of switches to be added to program.
27	Code Issues hand written notes CS-01 Daft FAT 8/18/17	Add E-Stop to pump and for plant shutdown. Pop up window for Operator Authorization to shut down.
28	Code Issues hand written notes CS-01 Daft FAT 8/18/17	Engineer (process) to check if strainer pressure inlet/outlet height allowance requires pump shut down.
29	Specification Section 13500-1.01-A-6	Feedback Failure alarm needs to be programmed.
30	Specification Section 13500-1.01-A-6	Field Verify Force Override of equipment failures.
31	Specification Section 13500-1.01-A-6	Tracking Failure alarm needs to be programmed.
32	Specification Section 13500-1.01-A-6	Add time delay to “Power Outage” Forced Stop Alarm.
33	Specification Section 13500-1.01-A-6	Alarms to be assigned priority levels.
34	Section 13500 Extraction well Strategy No. 01	Interlock “plant ready” signal
35	Section 13500 Extraction well Strategy No. 01	Item 6 Alarm FIT-131 low flow Alarm to be programmed in.
36	Section 13500 Tower Air Stripper Strategy No. 02	Item 1 Overview – (Typical Comment) Change blowers notes control pop up to match SSDS.

37	Section 13500 Duct Heater Strategy No. 03	Item 2 Monitor Engineer to provide info for: • Duct heater signal running • Fault status on the display • Running status on the display "TSH503 Duct Temperature Switch High" to match existing program.
38	Section 13500 Duct Heater Strategy No. 03	Item 3 Control Program Fault and Interlocks
39	Section 13500 Clear Wells #1 & #2 Strategy No. 04	Item 1 Overview Under Clear well #1 add bullet points: • Fix pump running display on the graphic. • Reprogram control variable display to correct the errors. • Pump control popup to match SSDS.
40	Section 13500 Clear Wells #1 & #2 Strategy No. 04	Item 1 Overview Under Clear well #2 add bullet points: • Fix pump running display on the graphic. • Pump control popup to match SSDS.
41	Section 13500 Clear Wells #1 & #2 Strategy No. 04	Item 3 Overview Show pump running status via the pump graphics.
42	Section 13500 Plant Startup and Shutdown Sequence Strategy No. 05	Needs to be programmed.

The following are comments from Owner's Representative – CDM – Eric Silverman (attendee of WFT) that need to be addressed. Please ignore the duplicates, if any.

OU2 WFT

Thursday, August 17, 2017
9:21 AM
Alex (GWTT), Amal (Tetra Tech), Todd Farmer (Stuitags), Nathan (CDM), John

9am-5:30

Panel Walkthrough and I/O Checkout General Comments

- Need to determine IP addressing scheme
- Network cables to be labeled before shipping
- Disable unused ports on switches
- Need to change port numbers on drawings as they do not match what is wired
- PanelView is new and not programmed yet
- UPS mounting needs to be resolved - Suggest adding receptacle to outside of panel enclosure and need to add dedicated fused terminal blocks for UPS inside enclosure.
- Add labels to rack "on-off" selector switches in panel
- Swap out GFCI receptacles per Amal
- Add low level switch from change order to autodialer which will cause a pump shutdown. Being processed now.
- Only TVSS1 is wired to PLC input card, should also monitor TVSS429 and TVSS554? TVSS429 circuit is failsafe however TVSS554 is unclear. Need to reference RW-100 drawings for both circuits and make sure final direction is clear for final corrective action approved by DEP.
- Need to add all ranges for existing instrumentation into program.
- In general, appears that submittal comments were not addressed
- RTU-2 is not built yet.
- Check software licensing at SSDS - Todd thinks copies of licensing are illegal
- No PanelView, no RTU-02 testing, doors not connected to PLC panel, RW-100 PLC not tested.
- Need to update SOPs to match new logic
- Add cable labels

Graphic Review

- Tie instruments to pipelines with lines
- Add descriptors to any "bubbles" that are on the graphic screen that are not tied to pipelines (i.e., PDIS-301, PDIS-302, and PDIS-303)
- Show actual instrumentation on overview (i.e., ultrasonic and not pressure transducer)
- Change PI to PT, LT to LIT, etc.
- Show box around vault extents
- Need to add animation to pumps and motors
- Need to match SSDS graphics for look and feel of symbols, colors, etc. Todd to re-do graphic pieces like pop-ups, hand switches, colors, etc. Not followed to date.
- Check on controls for Bag Filters. Amal said there was RFI
- Change color of software selector switches to differentiate from field switches.
- Need to add PID "Feedback Failure" alarm.
- Need to field verify "Force Override" functionality
- Need to add "Tracking Failure"

- Need to add UPS status, bypass, fault to PLC for Phoenix and MCP-100 systems
- Alarm priorities not programmed yet
- OU-2 liquid screen - correct spelling to "partially"
- OU-1 Vapor System Overview - Add [illegible]

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APPENDIX E

RECORD DRAWINGS

LOCKHEED MARTIN CORPORATION
OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

51 FRANKLIN STREET, SUITE 400
ANNAPOLIS, MD 21401
PH: (410) 990-4607 FAX: (410) 990-4749
www.tetratech.com

TETRA TECH

PROJECT LOCATION:
FORMER UNISYS FACILITY GREAT NECK
LAKE SUCCESS, NEW YORK. NYSDEC SITE ID#130045

CLIENT INFORMATION:
LOCKHEED MARTIN CORPORATION

Tt PROJECT No.:
200-01297-16018

CLIENT PROJECT No.:

PROJECT DESCRIPTION / NOTES:

ISSUED:

AS-BUILTS 10/11/2018

AS-BUILTS PREPARED AND SUBMITTED ARE A PRODUCT OF OR COMPILATION OF INFORMATION AND/OR DOCUMENTATION PROVIDED BY OTHERS.

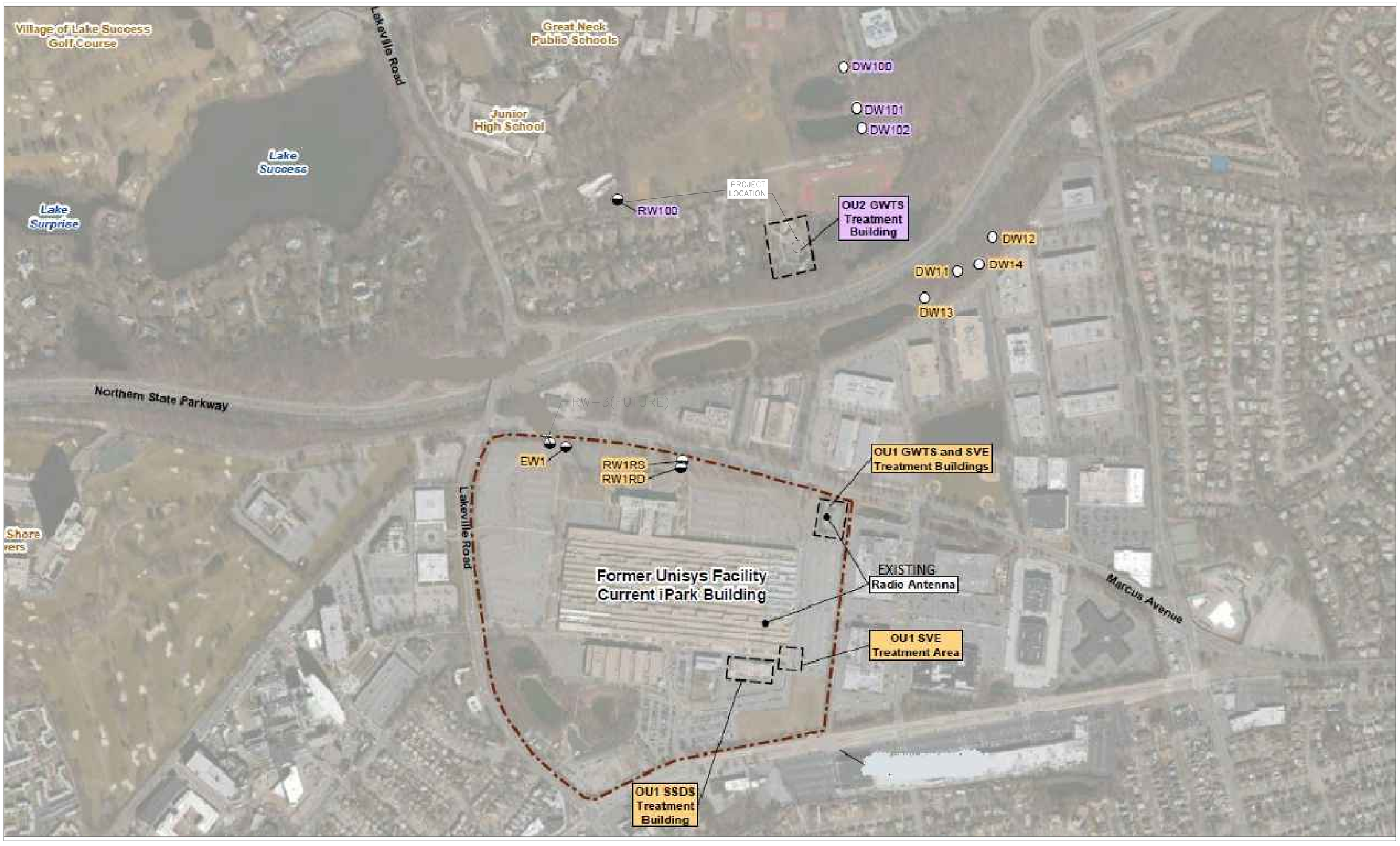
DRAWING INDEX

REFERENCE BASE MAP USGS 7.5 MINUTE QUADRANGLE.,
SEA CLIFF, NEW YORK, 1968 (PHOTO REVISED 1979)

LOCATION MAP

0 4000' 8000'
SCALE IN FEET

VICINITY MAP:



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ANNAPOLIS, MD 21401
PH: (410) 990-4607 FAX: (410) 990-4749

MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

SITE PLAN

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

C-100

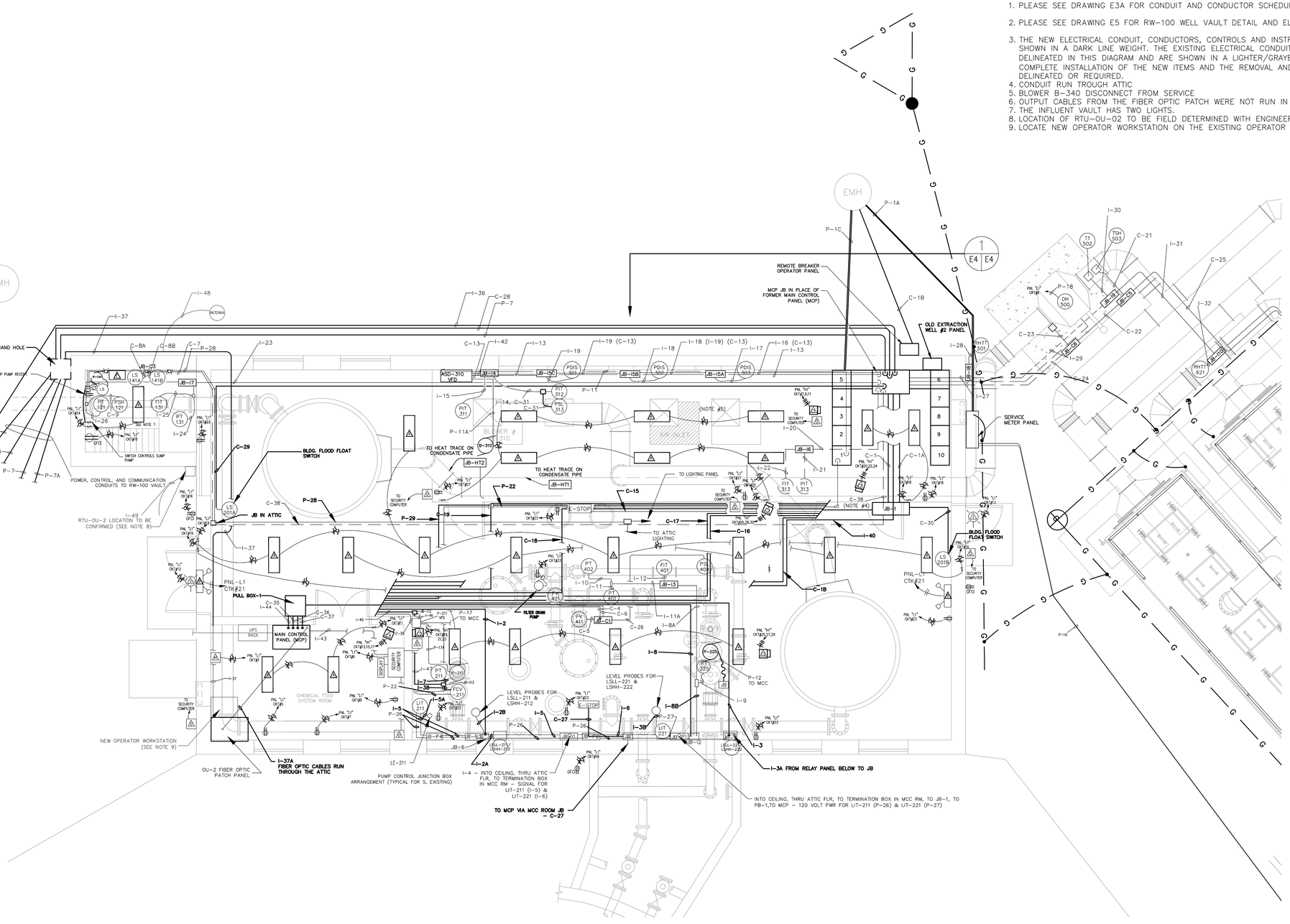
Bar Measures 1 inch

Copyright Tetra Tech

1/4/2019 2:57:09 PM - \\TTS227FS1\PROJECTS\ER\012999200-01299-16001\CAD\SHEETFILES\OU-2\C-100 SITE PLAN.DWG - MARSH, JUSTIN

NOTES:

1. PLEASE SEE DRAWING E3A FOR CONDUIT AND CONDUCTOR SCHEDULE FOR ITEMS DEPICTED ON THIS DRAWING.
2. PLEASE SEE DRAWING E5 FOR RW-100 WELL VAULT DETAIL AND ELECTRICAL LAYOUT.
3. THE NEW ELECTRICAL CONDUIT, CONDUCTORS, CONTROLS AND INSTRUMENTATION ARE DELINEATED IN THIS DIAGRAM AND ARE SHOWN IN A DARK LINE WEIGHT. THE EXISTING ELECTRICAL CONDUIT, CONDUCTORS, CONTROLS AND INSTRUMENTATION ARE DELINEATED IN THIS DIAGRAM AND ARE SHOWN IN A LIGHTER/GRAYED BACK LINE WEIGHT. THE CONTRACTOR SHALL COMPLETE INSTALLATION OF THE NEW ITEMS AND THE REMOVAL AND/OR MODIFICATIONS OF EXISTING MATERIALS AS DELINEATED OR REQUIRED.
4. CONDUIT RUN TROUGH ATTIC
5. BLOWER B-340 DISCONNECT FROM SERVICE
6. OUTPUT CABLES FROM THE FIBER OPTIC PATCH WERE NOT RUN IN CONDUIT TO THE MCP
7. THE INFLUENT VAULT HAS TWO LIGHTS.
8. LOCATION OF RTU-OU-02 TO BE FIELD DETERMINED WITH ENGINEERS APPROVAL.
9. LOCATE NEW OPERATOR WORKSTATION ON THE EXISTING OPERATOR TABLE.



MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

TETRA TECH
www.tetratech.com
51 FRANKLIN STREET, SUITE 400
ANNAPOLIS, MD 21401
PH: (410) 990-4607 FAX: (410) 990-4749

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

TREATMENT SYSTEM ELECTRICAL CONDUIT LAYOUT

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

E-100

Copyright: Tetra Tech

Bar Measures 1 inch

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GREAT NECK OU-2 GROUNDWATER TREATMENT SYSTEM CONDUIT/CONDUCTOR SCHEDULE

CONDUIT #	SERVICE	PURPOSE	SIZE	CONDUIT TYPE	CONDUCTOR SIZE & TYPE	RUN LOCATION (FROM)	RUN LOCATION (TO)	LOCATION	COMMENT
P-01A	480V MAIN	MAIN UTILITY SERVICE ENTRANCE	(2) 4"	PVC	(3) 500 KCMIL + (1)500 KCMIL NEUTRAL EACH CONDUIT	UTILITY TRANSFORMER	METERING CABINET	SITE (DWG. E-5)	
P-01B	480V MAIN	MAIN UTILITY SERVICE ENTRANCE	(2) 4"	PVC	(3) 500 KCMIL+ (1) 500 KCMIL NEUTRAL EACH CONDUIT	METERING CABINET	ELECTRICAL HAND HOLE	SITE (DWG. E-5)	
P-01C	480V MAIN	MAIN UTILITY SERVICE ENTRANCE	(2) 4"	PVC	(3) 500 KCMIL + (1) 500 KCMIL NEUTRAL EACH CONDUIT	ELECTRICAL HAND HOLE	SERVICE ENTRANCE CIRCUIT BKR	SITE & MCC ROOM (DWG. E-4)	SERV. ENTR. CB IN N. MCC. NEUT. BONDED TO MCC GRD BUS
P-01D	480V FEEDER	SOUTH MCC FEEDER	-	-	(3) #3/0 + 1#2 GRD	NORTH MCC FEEDER BREAKER	SOUTH MCC MAIN BREAKER	MCC ROOM (DWG. E-4)	CONDUCTOR RUN THROUGH INTERCONNECTING WIREWAYS
P-02	480V FEEDER	WELL #2 BUILDING FEED	4"	PVC	(3) #4/0 + (1) #4/0 GRD	NORTH MCC	WELL #2 VAULT	SITE (DWG. E-4)	EXISTING MANHASSET LAKEVIEW SYSTEM
P-03	480V POWER	BLOWER B-320 POWER FEED	NA	NA	NA	NA	NA		EQUIPMENT REMOVED - SPARE
P-04	480V POWER	BLOWER B-330 POWER FEED	NA	NA	NA	NA	NA		EQUIPMENT REMOVED - SPARE
P-05	480V POWER	TRANSFER PUMP P-224 POWER FEED	1"	EMT	(3) #8 + (1) #8 GND	NORTH MCC	PUMP P-224	PROCESS AREA (DWG. E-4)	DISCONNECTED AT STARTER IN MCC, PUMP REMOVED
P-06	480V POWER	TRANSFER PUMP P-213 POWER FEED	1"	EMT	(3) #8 + (1) #8 GND	NORTH MCC	PUMP P-213	PROCESS AREA (DWG. E-4)	DISCONNECTED AT STARTER IN MCC, PUMP REMOVED
P-07	480V FEEDER	RW-100 VAULT POWER FEED	3"	PVC/R.G.S	(3) #1/0 + (1) #1/0 GND	NORTH MCC	RW-100 VAULT DSC-RW100	RW-100 VAULT (DWG. E-5)	
P-07A	-	SPARE RW-100 VAULT POWER FEEDER CONDUIT	3"	PVC	EMPTY	NORTH MCC	RW-100 VAULT	RW-100 VAULT (DWG. E-5)	
P-08	480V POWER	RW-100 PUMP TVSS	3/4"	FLEX	(3) #6 + (1) #6 GND	RW-100 STARTER	RW-100 TVSS	RW-100 VAULT (DWG. E-5)	FROM LOAD SIDE OF RW-100 STARTER BREAKER
P-09	480V POWER	TRANSFER PUMP P-212 POWER FEED	1"	EMT	(3) #8 + (1) #8 GND	SOUTH MCC	PUMP P-212	PROCESS AREA (DWG. E-4)	DISCONNECTED AT STARTER IN MCC, PUMP REMOVED
P-10	480V FEEDER	BLOWER B-340 POWER FEED	NA	NA	NA	NA	NA	BLOWER ROOM (DWG. E-4)	DISCONNECTED AT BREAKER SOUTH MCC, MOTOR REMOVED
P-11	480V FEEDER	BLOWER B-310 POWER FEED TO LOCAL VFD	2"	R.G.S.	(3) #1/0 + (1) #1/0 GND	SOUTH MCC	ASD-310 VFD	BLOWER ROOM (DWG. E-4)	
P-11A	480V POWER	BLOWER B-310 POWER FEED	2"	R.G.S./FLEX	(3) #1/0 + (1) #1 GND	ASD-310 VFD	B-310	BLOWER ROOM (DWG. E-4)	
P-12	480V POWER	TRANSFER PUMP P-225 POWER FEED	1"	EMT	(3) #6 + (1) #6 GND	SOUTH MCC VFD	P-225	PROCESS AREA (DWG. E-4)	VFD IN SOUTH MCC
P-13	120V POWER	CONTROL ROOM VENT FAN	3/4"	FLEX/EMT	(2) #12 + (1) #12 GND	SOUTH MCC	VENT FAN VF-1	CONTROL ROOM (DWG. E-4)	FROM STARTER IN 208V SECTION OF SOUTH MCC
P-14	480V FEEDER	RW-100 VAULT LOCAL POWER FEED	3/4"	R.G.S.	(2) #12 + (1) #12 GND	RW-100 VAULT DSC-RW100	RCP	RW-100 VAULT (DWG. E-5)	FROM LOAD SIDE OF RW-100 STARTER BREAKER
P-15	480V FEEDER	RW-100 WELL PUMP STARTER POWER FEED	1 1/2"	FLEX/R.G.S	(3) #2 + (1) #8 GND	RW-100 VAULT DSC-RW100	RW-100 STARTER	RW-100 VAULT (DWG. E-5)	
P-16	480V POWER	RW-100 WELL PUMP POWER FEED	1 1/2"	R.G.S./FLEX	(3) #2 + (1) #8 GND	RW-100 STARTER	RW-100	RW-100 VAULT (DWG. E-5)	
P-17	480V FEEDER	TRANSFER PUMP P-211 POWER FEED	1"	EMT	(3) #8 + (1) #8 GND	SOUTH MCC	PUMP P-211 VFD	PROCESS AREA (DWG. E-4)	
P-17A	480V POWER	TRANSFER PUMP P-211 POWER FEED	3/4"	R.G.S./FLEX	(3) #8 + (1) #8 GND	PUMP P-211 VFD	PUMP P-211	PROCESS AREA (DWG. E-4)	
P-18	120V FEEDER	DUCT HEATER DH-500 POWER FEED	1"	R.G.S.	(2) #12 + (1) #12 GND	PNL-L1	DUCT HEATER DH-500	SITE (DWG. E-4)	
P-19	120V FEEDER	CONDENSATE HEAT TRACE POWER FEED	3/4"	R.G.S.	(2) #10 + (1) #10 GND	PNL-L1	JB-HT1	ATTIC (DWG. E-4)	
P-20	120V POWER	MCC ROOM VENT FAN	3/4"	FLEX/EMT	(2) #12 + (1) #12 GND	SOUTH MCC	VENT FAN VF-2	MCC ROOM (DWG. E-4)	FROM STARTER IN 208V SECTION OF SOUTH MCC
P-22	120V FEEDER	MODULATING VALVE FCV-P1 POWER	3/4"	R.G.S.	(2) #12 + (1) #12 GND	PNL-L1	FCV-211	PROCESS AREA (DWG. E-4)	
P-23	480V MAIN	RW-100 SUMP PUMP TRANSFORMER	3/4"	FLEX	(2) #12 + (1) #12 GND	RW-100 VAULT DSC-RW100	RW-100 SUMP TRANSFORMER	RW-100 VAULT (DWG. E-5)	VIA FUSE MTD IN RW-100 VAULT DSC-RW100
P-24	120V FEEDER	RW-100 SUMP PUMP RECEPTICAL	3/4"	R.G.S.	(2) #12 + (1) #12 GND	RW-100 SUMP TRANSFORMER	RW-100 SUMP PUMP RECEPT.	RW-100 VAULT (DWG. E-5)	
P-25	120V POWER	COMMON POWER FOR LIT-211 & LIT-221	1"	EMT	(9) #14 + (1) #14GND	JB-P1	TERMINATION BOX IN MCC ROOM	PROCESS AREA, ATTIC, MCC-ROOM	ONLY 2#14 & 1#14 GND ARE USED IN THE PUMP AND TREAT SYS
P-26	120V POWER	CLEARWELL #1 LEVEL TRANSMITTER (LIT-211)	3/4"	R.G.S./FLEX	(2) #12 + (1) #12 GND	BREAKER-324CB IN MCP	LIT-211	PROC. AREA, MCC RM., CONT. RM. (DWG. E-4)	VIA JB-P4, JB-P2,JB-OUTSIDE MCC RM., JB-1, JB-AT CONT.RM
P-27	120V POWER	CLEARWELL #1 LEVEL TRANSMITTER (LIT-221)	3/4"	R.G.S./FLEX	(2) #12 + (1) #12 GND	BREAKER-324CB IN MCP	LIT-221	PROC. AREA, MCC RM., CONT. RM. (DWG. E-4)	VIA, JB-P1, JB-P2,JB-OUTSIDE MCC RM., JB-1, JB-AT CONT.RM
P-28	120V POWER	INFLUENT VAULT LIGHTING AND RECEPTACLES	3/4"	R.G.S./EMT	(4) #12 + (1) #12 GND	LP-1 CKT 12 & 24	INFLUENT VAULT	INF, VAULT, PROCESS AREA, ATTIC, MCC ROOM	CIRCUITS RUN THROUGH ATTIC
P-30	120V POWER	INFLIUENT VAULT SUMP PUMP AND HEATER	3/4"	R.G.S./EMT	(2) #12 + (1) #12 GND	LP-1 CKT 22	INFLUENT VAULT	INF, VAULT,BLOWER ROOM, ATTIC, MCC ROOM	
CONDUIT #	**SERVICE**	**PURPOSE**	**SIZE**	**CONDUIT TYPE**	**CONDUCTOR SIZE & TYPE**	**RUN LOCATION (FROM)**	**RUN LOCATION (TO)**	**LOCATION**	**COMMENT**
C-1	120V CONTROL	CONTROL WIRING FROM TERMINATION BOX IN MCC ROOM TO JB-1	2"	EMT	(73) #14	TERMINATION BOX IN MCC ROOM	JB-1	MCC RM/PROCESS AREA	TERMINATION BOX ABOVE WHERE OLD MCP WAS LOCATED
C-1A	120V CONTROL	CONTROL WIRING FROM TERMINATION BOX IN MCC ROOM TO JB-1	2"	EMT	(8) #10 + (1)#10GND, (16) #12 +(2) #12 GND, (31) # 14	TERMINATION BOX IN MCC ROOM	JB-1	MCC RM/PROCESS AREA	TERMINATION BOX ABOVE WHERE OLD MCP WAS LOCATED
C-1B	120V CONTROL	CONTROL WIRING BETWEEN JB-1 AND PB-1	2"	EMT	(8) #10 + (1)#10GND, (10) #12 +(1) #12 GND, (10) # 14	JB-1	PB-1	PROCESS AREA	PB-1 IS OUTSIDE OF CONTROL ROOM
C-1D									
C-1E	120V CONTROL	CLEARWELL PUMP P-225 CONTROLS	NA	NA	NA	NA	NA	NA	DISCONNECTED
C-2A	120V CONTROL	CLEARWELL PUMP P-211 CLA-VAL CONTROLS	NA	NA	NA	NA	NA	NA	DISCONNECTED
C-2B		REMOVE							
C-2D		REMOVE							
C-2E	120V CONTROL	CLEARWELL PUMP P-225 CLA-VAL CONTROLS	NA	NA	NA	NA	NA	NA	DISCONNECTED
C-3A	120V CONTROL	CLEARWELL PUMP P-211 PRESSURE SWITCH	NA	NA	NA	NA	NA	NA	DISCONNECTED
C-3B		REMOVE							
C-3D		REMOVE							
C-3E	120V CONTROL	CLEARWELL PUMP P-225 PRESSURE SWITCH	NA	NA	NA	NA	NA	NA	
C-4	120V CONTROL	FILTER CONTROL VALVES	3/4"	EMT	(16) #14	PB-1	JB-C1	PROCESS AREA	CONTAINS C-5 & C-6
C-5	120V CONTROL	FLOW CONTROL VALVE V-412	3/4"	FLEX	(7) #14	JB-C1	V-421	PROCESS AREA	
C-6	120V CONTROL	FLOW CONTROL VALVE V-422	3/4"	FLEX	(7) #14	JB-C1	V-411	PROCESS AREA	
C-7	120V CONTROL	INFLUENT VAULT LSH-141A & LSH-141B	1"	R.G.S	(7) #14 (3 SPARE)	JB IN ATTIC	JB-C3	INFLUENT VAULT/ATTIC	
C-8A	120V CONTROL	INFLUENT VAULT HIGH LEVEL SWITCH LSH-	3/4"	FLOAT CABLE	(2) #14 + 1#14 GND	JB-C3	LSH-141A	INFLUENT VAULT	
C-8B	120V CONTROL	INFLUENT VAULT HIGH-HIGH LEVEL SWITCH	3/4"	FLOAT CABLE	(2) #14 + 1#14 GND	JB-C3	LSH-141B	INFLUENT VAULT	
C-9	120V CONTROL	SECONDARY CONTAINMENT PRESSURE SWITCH PSH-121	3/4"	FLEX	(3) #14	TERMINATION BOX IN MCC ROOM	PSL-121	INFLUENT VAULT/BLOWER ROOM/MCC ROOM	FLEX TO CONDULET FOR PT-121, I-26 TO JB-17, I-23
C-10	120V CONTROL	RW-100 SOL-101	3/4"	FLEX/R.G.S.	(2) #14	RW-100 RCP	SOV-101	RW-100 VAULT	
C-11	120V CONTROL	RW-100 VAULT FLOOR SWITCH	NA	NA	NA	NA	NA	NA	DISCONNECTED
C-12	120V CONTROL	RW-100 PUMP MOTOR CONTROLS	3/4"	R.G.S.	(2) #14	RW-100 RCP	MS-RW100	RW-100 VAULT	
C-13	120V CONTROL	BLOWER VFD-310 CONTROLS	3/4"	EMT	(6) #14	TERMINATION BOX IN MCC ROOM	BLOWER 310 VFD	BLOWER ROOM/MCC ROOM	VIA JB-15C, JB-15B & JB-15A
C-15	120V CONTROL	E-STOP IN PROCESS AREA ON BLOWER RM WALL	3/4"	EMT	(2) #14	JB-1	E-STOP #1	PROCESS AREA	E-STOP ON WALL NEAR STAIRS TO ATTIC
C-16	120V CONTROL	CONTROL FROM JB-1 TO PB-1	1"	EMT	(28) #14	JB-1	PB-1	PROCESS AREA	
C-17	120V CONTROL	CONTROL FROM JB-1 TO PB-1	1"	EMT	(28) #14	JB-1	PB-1	PROCESS AREA	
C-18	120V CONTROL	CONTROL FROM JB-1 TO PB-1	3/4"	EMT	(17) #14	JB-1	PB-1	PROCESS AREA	
C-19	120V CONTROL	CONTROL FROM JB-1 TO PB-1	1"	EMT	(17) #14	JB-1	PB-1	PROCESS AREA	
C-21	120V CONTROL	EXTREME HIGH DUCT HEATER OUTLET TEMP TSH-503	3/4"	R.G.S	(2) #14	JB-C5	TSH-503	SITE - DISCHARGE OF DH-500	
C-22	120V CONTROL	AIR STREAM CONTROLS TSH-503 & FSL-641	3/4"	R.G.S	(6) #14 + (1) #14 GND	JB-C6	JB-C5	SITE NEAR DH-500	CONTAINS C-21 & C-25
C-23	120V CONTROL	DH-500 CONTROL	3/4"	R.G.S	(2) #14 + (1) #14 GND	JB-C6	DH-500	SITE AT DH-500	
C-24	120V CONTROL	AIR STREAM CONTROLS	1"	R.G.S	(8) #14 + (2) #14 GND	TERMINATION BOX IN MCC ROOM	JB-C6	SITE/MCC ROOOM	CONTAINS C-21, C-23 & C-25
C-25	120V CONTROL	AIR FLOW SWITCH FSL-642 PWR & CONTROL	3/4"	R.G.S	(4) #14 + (1) #14 GND	JB-C5	FSL-642	SITE BETWEEN PPZ UNITS	
C-26	120V CONTROL	EFF. WATER LOW FLOW SWITCH PSL-404	3/4"	R.G.S	(2) #14	JB-C1	PSL-404	PROCESS AREA	
C-27	120V CONTROL	E-STOP	3/4"	R.G.S	(2) #14	TERMINATION BOX IN MCC ROOM	E-STOP #2	PROCESS AREA	VIA ATTIC
C-28	120V CONTROL	RW-100 VAULT LEVEL & PUMP CONTROL	2"	R.G.S	(8) #10	RW-100 RCP	TERMINATION BOX IN MCC ROOM	SITE - UNDERGROUND FROM RW-100 VAULT	
C-29	120V CONTROL	BLDG. FLOOD SWITCH LS-201A NORTH END	3/4"	R.G.S	(2) #14	TERMINATION BOX IN MCC ROOM	LS-201A	PROCESS AREA, BLOWER ROOM, MCC ROOM	
C-30	120V CONTROL	BLDG. FLOOD SWITCH LS-201B	3/4"	R.G.S	(2) #14	JB-1	LS-201B	PROCESS AREA	
C-31	120V CONTROL	BLOWER B-310 LOW PRESSURE SWITCH	3/4"	R.G.S	(2) #14	TERMINATION BOX IN MCC ROOM	PSL-313	BLOWER AREA/MCC ROOM	RUN WITH I-14, I-13 VIA JB-I4
C-32	120V CONTROL	RW-100 VAULT HIGH LEVEL FLOAT	-	CABLE	(2) #14 + 1#14 GND CABLE	RW-100 RCP	LSH-111	RW-100 VAULT	
C-33	120V CONTROL	RW-100 VAULT HIGH HIGH LEVEL FLOAT	-	CABLE	(2) #14 + 1#14 GND CABLE	RW-100 RCP	LSHH-111	RW-100 VAULT	
C-34	120V CONTROL	MANHASSET/LAKEVIEW WELL #2 VAULT	2"	PVC	(27)#12 + (1) #12 GND; (1) PR#18 TWISTED/SHIELD	ML WELL #2 VAULT	TERMINATION BOX IN MCC ROOM	SITE WEST END OF CARBON TANKS	WIRING ENDS IN TERMINATION BOX IN MCC ROOM
C-35	120V CONTROL	CONTROL	2"	EMT	(8) #10 + (1) #10 GND, (30) #12, (21) #14	MCP	PB-1	PROCESS AREA/CONTROL ROOM	
C-36	120V CONTROL	CONTROL & SIGNAL	2"	EMT	(46) #14, (1) PR #20 TWISTED/SHIELD	MCP	PB-1	PROCESS AREA/CONTROL ROOM	
C-37	120V CONTROL	CONTROL & POWER	2"	EMT	(5) #12, (35) #14	MCP	PB-1	PROCESS AREA/CONTROL ROOM	
C-38	120V CONTROL	INFLUENT VAULT LSH-141A & LSH-141B	3/4"	EMT	(7) #14 (3 SPARE)	TERMINATION BOX IN MCC ROOM	PULL BOX IN ATTIC	ATTIC/MCC ROOM	
C-39	120V CONTROL	P-211 VFD CONROL	3/4"	R.G.S	(6) #14 (3 SPARE)	PB-1	P-211 VFD	PROCESS AREA	
CONDUIT #	**SERVICE**	**PURPOSE**	**SIZE**	**CONDUIT TYPE**	**CONDUCTOR SIZE & TYPE**	**RUN LOCATION (FROM)**	**RUN LOCATION (TO)**	**LOCATION**	**COMMENT**
I-1									
I-2	120V	LEVEL SWITCHES LSLL-211, LSHH-212	1"	R.G.S.	(10) #14, (1) #20 TWISTED/SHIELDED	PB-1	JB-6	PROCESS AREA	
I-2A	120V	LEVEL SWITCHES LSLL-211, LSHH-212	1"	R.G.S.	(9) #14	JB-6	INDUCTION RELAY BOX	PROCESS AREA (CLEARWELL #1)	CONDUCTION PROBE & INDUCTION RELAY PWR & CONT. WIRING
I-2B	120V	LEVEL SWITCHES LSLL-211, LSHH-212	3/4"	R.G.S./FLEX	(3) #14	INDUCTION RELAY BOX	LSLL-211 &LSHH-212 PROBES	PROCESS AREA (CLEARWELL #1)	VIA JB-6
I-3	120V	LEVEL SWITCHES LSLL-221, LSHH-222	3/4"	R.G.S.	(5) #14	JB-3	PB-1	PROCESS AREA	
I-3A	120V	LEVEL SWITCHES LSLL-221, LSHH-222	3/4"	R.G.S.	(9) #14	JB-3	INDUCTION RELAY BOX	PROCESS AREA (CLEARWELL #2)	CONDUCTION PROBE & INDUCTION RELAY PWR & CONT. WIRING
I-3B	120V	LEVEL SWITCHES LSLL-221, LSHH-222	3/4"	R.G.S./FLEX	(3) #14	INDUCTION RELAY BOX	LSLL-221 &LSHH-222 PROBES	PROCESS AREA (CLEARWELL #2)	VIA JB-3
I-4	4-20mA	CLEARWELL INSTRUMENATION	1"	EMT	(6) #20 TWISTED/SHEILDED PAIRS	TERMINATION BOX IN MCC ROOM	JB-I1	PROCESS AREA	CONTAINS I-5 & I-6
I-5	4-20 mA	CLEARWELL 1 LEVEL TRANSMITTER LIT-211	3/4"	EMT/FLEX	(2) #20TWISTED/ SHEILDED PAIRS	LEVEL XMTR LIT-211	JB-I1	PROCESS AREA CLEARWELL 1	VIA JB-P4 & JB-P3
I-5A	-	CLEARWELL 1 LEVEL SENSOR LE-211	3/4"	EMT/FLEX	MANUFACTURER'S CABLE	LEVELSENSOR LE-211	LIT-211	PROCESS AREA CLEARWELL 1	
I-6	4-20 mA	LEVEL TRANSMITTER LT-221	3/4"	EMT/FLEX	(2) #20 TWISTED/SHEILDED PAIRS	LEVEL XMTR LIT-221	JB-I1	PROCESS AREA C LEARWELL 2	
1-6A	-			EMT/FLEX	MANUFACTURER'S CABLE	LEVELSENSOR LE-221	LIT-221	PROCESS AREA C LEARWELL 2	
I-7	4-20 mA	PRESSURE TRANSMITTER PT-211	3/4"	R.G.S/FLEX	(2) #20TWISTED/ SHEILDED PAIRS	JB-I13 ('T' CONDULET)	PT-211	PROCESS AREA	VIA I-38
I-8	4-20 mA	PT-401, PT-402 & FIT-401	1"	EMT	(5) #20 TWISTED/SHEILDED PAIRS	PB-1	JB-I2	PROCESS AREA	
I-8A	4-20 mA	PT-401, PT-402 & FIT-401	1"	R.G.S.	(3) #20 TWISTED/SHEILDED PAIRS	"T" CONDULET AT P-225	JB-I3	PROCESS AREA	
I-8B	4-20 mA	PT-401, PT-402, FIT-401 & PT-225	1"	R.G.S.	(4) #20 TWISTED/SHEILDED PAIRS	JB-I2	T' CONDULET AT P-225	PROCESS AREA	
I-9	4-20 mA	CLEARWELL PUMP P-225 PRESS. XMITTER PT-225	3/4"	R.G.S./FLEX	(1) #20 TWISTED/SHEILDED PAIR	T' CONDULET AT P-225	PT-225	PROCESS AREA	
I-10	4-20 mA	PRESSURE TRANSMITTER PT-401	3/4"	FLEX	(1) #20 TWISTED/SHEILDED PAIR	T' BETWEEN PT-401 & PT-402	PT-401	PROCESS AREA	
I-11	4-20 mA	PRESSURE TRANSMITTER PT-402	3/4"	R.G.S./FLEX	(1) #20 TWISTED/SHEILDED PAIR	T' BETWEEN PT-401 & PT-402	PT-402	PROCESS AREA	
I-11A	4-20mA	PRESSURE TRANSMITTERS PT-401 & PT-402	3/4"	R.G.S.	(2) #20 TWISTED/SHEILDED PAIRS	T' BETWEEN PT-401 & PT-402	JB-I3	PROCESS AREA	JB-I3 IS A 'T' CONDULET
I-12	4-20 mA	FLOWMETER FIT-401	3/4"	FLEX	(2) #20 TWISTED/SHEILDED PAIR	JB-I3	FIT-401	PROCESS AREA	
I-13	4-20 mA	PIT-311, P-T-312, PSL-313, ASD-310 VFD	1"	R.G.S	(5) #20 TWISTED/SHEILDED PAIRS	TERMINATION BOX IN MCC ROOM	JB-I4	BLOWER ROOM/MCC ROOM	CONTAINS I-14, I-15, C-31, I-42
I-14	4-20 mA	PIT-312	3/4"	EMT/FLEX	(2) #20 TWISTED/SHEILDED PAIRS	JB-I4	PIT-312	BLOWER ROOM	CONTAINS C-31 FROM CONDULET AT PIT-312 TO JB-I4
I-15	4-20 mA	PIT-311	3/4"	EMT/FLEX	(2) #20 TWISTED/SHEILDED PAIRS	JB-I4	PIT-311	BLOWER ROOM	
I-16	120V	DPIS-301, DPIS-302, DPIS-303	3/4"	EMT	(6) #14	TERMINATION BOX IN MCC ROOM	JB-I5A	BLOWER ROOM/MCC ROOM	CONTAINS C-13, I-17, I-18, I-19
I-17	120V	INLET AIR FILTER DIFF. PRESS INDICATIOR/ SWITCH DPIS-303	3/4"	EMT/FLEX	(2) #14	JB-15C	PDIS-303	BLOWER ROOM	
I-18	120V	INLET AIR FILTER DIFF. PRESS INDICATOR/ SWITCH DPIS-302	3/4"	EMT/FLEX	(2) #14	JB-15B	PDIS-302	BLOWER ROOM	
I-19	120V	INLET AIR FILTER DIFF. PRESS INDICATOR/SWITCH PDIS-301	3/4"	R.G.S./FLEX	(2) #14	JB-15A	PDIS-301	BLOWER ROOM	
I-20	4-20 mA	AIRSTRIPPER #1 EFFLUENT AIR FLOW & PRESSURE TRANSMITTERS	3/4"	R.G.S	(4) #20 TWISTED/SHEILDED PAIRS	TERMINATION BOX IN MCC ROOM	JB-I6	ATTIC/MCC ROOM	
I-21	4-20 mA	AIRSTRIPPER #1 EFFLUENT AIR PRESSURE TRANSMITTER	3/4"	EMT/FLEX	(2) #20 TWISTED/SHEILDED PAIRS	JB-I6	PIT-313	ATTIC	
I-22	4-20 mA	AIRSTRIPPER #1 EFFLUENT AIR FLOW TRANSMITTER	3/4"	EMT/FLEX	(2) #20 TWISTED/SHEILDED PAIRS	JB-I6	FIT-313	ATTIC	
I-23	4-20mA/120V	INFLUENT VAULT INSTRUMENTATION	1"	R.G.S	(6) #20 TWISTED/SHEILDED PAIRS, (2) #14	TERMINATION BOX IN MCC ROOM	JB-I7	INFLUENT VAULT/ATTIC/MCC ROOM	CONTAINS C-9 (PS-121)VIA CONDLET BETWEEN PT-121 & PSH-121
I-24	4-20 mA	INFLUENT VAULT PRESSURE XMITTER PT-131	3/4"	R.G.S./FLEX	(1) #20 TWISTED/SHEILDED PAIRS	JB-I7	PT-131	INFLUENT VAULT	VIA CONDULET BETWEEN PT-131 & FIT-131
I-25	4-20mA	INFLUENT VAULT WATER FLOW XMITTER FIT-131	3/4"	R.G.S./FLEX	(2) #20 TWISTED/SHEILDED PAIRS	JB-I7	FIT-131	INFLUENT VAULT	VIA CONDULET BETWEEN PT-131 & FIT-131
I-26	4-20 mA	CONTAINMENT PRESSURE TRANSMITTER PT-121	3/4"	R.G.S./FLEX	(1) #20 TWISTED/SHEILDED PAIRS	JB-I7	PT-121	INFLUENT VAULT	VIA CONDULET BETWEEN PT-121 & PSH-121 ; CONTAINS C-9
I-27	4-20 mA/120v	VAPOR PHASE OUTDOOR RHTT-501, 621, 633; TT-502; FIT-631	1"	R.G.S	(10) #20 TWISTED/SHEILDED PAIRS, 3#14	TERMINATION BOX IN MCC ROOM	JB-I8	SITE OUTSIDE MCC SOUTH WALL	CONTAINS I-28, I-30, I-32, I-34, I-35 & PWR FOR FIT-631
I-28	4-20 mA	PRE-HEATER VAPOR RH/TEMP TRANSMITTER RHTT-501	3/4"	R.G.S.FLEX	(2) #20 TWISTED/SHEILDED PAIRS	JB-I8	RHTT-501	SITE OUTSIDE MCC ROOM SOUTHEAST CORNER	
I-29	4-20mA/120V	VAPOR PHASE OUTDOOR RHTT-621, 633; TT-502; FIT-631	3/4"	R.G.S.	(8) #20 TWISTED/SHEILDED PAIRS, 3#14	JB-I8	JB-I9	SITE NORTHWEST END OF CARBON UNITS	CONTAINS I-30, I-32, I-34, I-35
I-30	4-20 mA	POST-HEATER VAPOR TEMP TRANSMITTER TT-502	3/4"	R.G.S./FLEX	(1) #20 TWISTED/SHEILDED PAIR	JB-I9	TT-502	SITE OUTPUT END OF HEATER	
I-31	4-20mA/120V	VAPOR PHASE OUTDOOR RHTT-621, 633; FIT-631	3/4"	R.G.S.	(6) #20 TWISTED/SHEILDED PAIRS, 3#14	JB-I9	JB-I10	SITE NORTHWEST END OF CARBON UNITS	CONTAINS I-32, I-34, I-35
I-32	4-20 mA	INLET TO CARBON UNIT 2 VAPOR RH/TEMP TRANSMTTER RHTT-621	3/4"	R.G.S./FLEX	(2) #20 TWISTED/SHEILDED PAIRS	JB-I10	RHTT-621	SITE NORTHWEST END OF CARBON UNIT 2	
I-33	4-20mA/120V	VAPOR PHASE OUTDOOR RHTT- 633; FIT-631	3/4"	R.G.S.	(4) #20 TWISTED/SHEILDED PAIRS, 3#14	JB-I10	JB-I11	SITE LENGTH BETWEEN CARBON UNITS 1 & 2	CONTAINS I-34, I-35
I-34	4-20 mA	EFFLUENT END OF CARBON UNITS VAPORRH/TEMP XMTR RHTT-633	3/4"	R.G.S./FLEX	(2) #20 TWISTED/SHEILDED PAIRS	JB-I11	RHTT-633	SITE SOUTHEAST END OF CARBON UNIT 1	
I-35	4-20mA/120V	EFFLUENT VAPOR FLOW XMITTER FIT-631	3/4"	EMT/FLEX	(2) #20 TWISTED/SHEILDED PAIRS, 3#14	JB-I11	FIT-631	SITE INLET TO PPZ UNIT 2	ALSO CONTAINS POWER FOR FLOW METER
I-36	4-20 mA	RW-100 INSTRUMENTATION	2"	PVC/R.G.S	(4) #20 TWISTED/SHEILDED PAIRS	TERMINATION BOX IN MCC ROOM	RW-100 VAULT	MCC ROOM/SITE/RW-100 VAULT	NO LONGER USED
I-37	FIBER	RW-100 RCP COMMUNICATION WITH PLANT MAIN PLC	3"	PVC/R.G.S	FIBER OPTIC CABLE	PATCH PANEL	RW-100 RCP	RW-100 VAULT/SITE/PROCESS AREA/CONT. RM	VIA FIBER OPTIC PATCH PANEL IN CONTROL RM.
I-37A	FIBER	RW-100 RCP COMMUNICATION WITH PLANT MAIN PLC	-	-	FIBER OPTIC PAIR OF CABLES	MCP	PATCH PANEL	CONTROL ROOM/ATTIC/CONTROL ROOM	PAIR FIBER OPTIC CABLES TO FIBER/ETHERNET CONVERTER
I-38	4-20 mA	FCV-211 CONTROL VALVE INPUT SIGNAL	3/4"	R.G.S./FLEX	(2) #20 TWISTED/SHEILDED PAIRS	JB-I13 ('T' CONDULET)	FCV-211	PROCESS AREA	
I-40	4-20 mA	SIGNAL FROM OLD TOO NEW MCP LOCATION	2"	EMT	(39) 1-PR #18 TWISTED/SHEILDED PAIRS	TERMINATION BOX IN MCC ROOM	PB-1	MCC RM/PROCESS AREA	
I-41	4-20 mA	RW-100 STRAINER PRESSURE TRANSMITTERS PT-101 & PT-102	3/4"	R.G.S.	(4) #20 TWISTED/SHEILDED PAIRS	RW-100 RCP	CONDULET	RW-100 VAULT	CONTAINS I-41A & I-41B
I-41A	4-20 mA	RW-100 STRAINER INLET PRESSURE SIGNAL PT-101	3/4"	R.G.S./FLEX	(2) #20 TWISTED/SHEILDED PAIRS	CONDULET	PT-101	RW-100 VAULT	
I-41B	4-20 mA	RW-100 STRAINER OUTLET PRESSURE SIGNAL PT-102	3/4"	R.G.S./FLEX	(2) #20 TWISTED/SHEILDED PAIRS	CONDULET	PT-102	RW-100 VAULT	
I-42	4-20 mA	BLOWER B-310 VFD SPEED CONTROL AND FEEDBACK SIGNALS	3/4"	R.G.S./FLEX	(2) #20 TWISTED/SHEILDED PAIRS	TERMINATION BOX IN MCC ROOM	VFD-310	BLOWER ROOM/MCC ROOM	VIA JB-I4
I-43	ETHERNET	ETHERNET COMMUNICATION TO CAMERA COMPUTER	3/4"	PVC	ETHERNET CABLE	MCP	SECURITY COMPUTER PANEL	CONTROL ROOM	
I-44	4-20 mA	SIGNALS FORM PB-1	2"	EMT	(49) #18 TWISTED/SHEILDED PAIRS	MCP	PB-1	PROCESS AREA/CONTROL ROOM	
I-45	4-20 mA	SIGNALS FOR P-211 VFD, PCV-211 & PT-211	1"	EMT	(5) #20 TWISTED/SHEILDED PAIRS	PB-1	JB-I12 ('T' CONDULET)	PROCESS AREA	
I-46	4-20 mA	CONTROL & FEEDBACK SIGNALS FOR P-211 VFD	3/4"	EMT	(2) #20 TWISTED/SHEILDED PAIRS	JB-I12 ('T' CONDULET)	P-211 VFD	PROCESS AREA	
I-47	4-20 mA	SIGNALS FOR FCV-211 & PT-211	3/4"	R.G.S./EMT	(3) #20 TWISTED/SHEILDED PAIRS	JB-I12 ('T' CONDULET)	JB-I13	PROCESS AREA	
I-48	COAXIAL	RADIO COMMUNICATIONS CABLE FROM ANTENNA TO RTU-OU2	3/4"	R.G.S./FLEX	(1) PFP 400 RF COMMUNICATIONS CABLE	ANTENNA	RTU-OU2	ROOF TOP/ BUILDING ENTRANCE	ANTENNA & RTU-OU2 LOCATION TO BE FIELD DETERMINED
I-49	ETHERNET	ETHERNET COMMUNICATION FROM RTU-OU2 TO MCP-PLC	3/4"	PVC	EHTERNET CABLE	RTU-OU2	MCP	BUILDING ENTRANCE/ MCP	RTU-OU2 LOCATION TO BE FIELD DETERMINED

BASE DRAWING PREPARED FROM DRAWING INFORMATION FROM HORLICK COMPANY INC.

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	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

TREATMENT SYSTEM CONDUIT/CONDUCTORS SCHEDULE

Project No.: 200-01297-16018
Designed By: AY
Drawn By: AY
Checked By: JFC

E-101

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LEGEND

- FIBER OPTIC (FO)
- DH+ SIGNAL
- ETHERNET SIGNAL (E-NET)
- TELEPHONE SIGNAL (T)
- ELECTRONIC SIGNAL
- CONTROL PANEL INPUT/OUTPUT
- AMBIENT AIR
- FLOW DIRECTION
- CHECK VALVE
- FLANGED CHECK VALVE
- GATE VALVE
- FLANGED GATE VALVE (NORMALLY OPEN)
- FLANGED GATE VALVE (NORMALLY CLOSED)
- BALL VALVE (NORMALLY OPEN)
- BALL VALVE (NORMALLY CLOSED)
- FLANGED BALL VALVE (NORMALLY OPEN)
- BUTTERFLY VALVE (NORMALLY OPEN) (N.O.)
- BUTTERFLY VALVE (NORMALLY CLOSED) (N.C.)
- FLANGED BUTTERFLY VALVE
- GLOBE VALVE
- HYDRAULICALLY OPERATED VALVE (H)
- MOTOR OPERATED VALVE (M)
- MOTORIZED BUTTERFLY VALVE (M)
- FLANGED STRAINER (SINGLE BASKET)
- STRAINER
- CARTRIDGE FILTER VESSEL
- FLANGED CONNECTION
- CONNECTION BLANKED
- SAMPLE PORT
- FLEXIBLE COUPLING
- UNION
- FLEXIBLE HOSE
- COUPLING
- DUCT TRANSITION
- REDUCER (CONCENTRIC)
- BACKFLOW PREVENTER (BFP)
- AIR RELEASE VALVE
- PRESSURE RELIEF VALVE
- VACUUM SAFETY VALVE
- AUTOMATIC CONTROL VALVE
- PLUG VALVE
- FLANGED PLUG VALVE
- PRESSURE REGULATING VALVE
- DRAIN
- LEVEL SWITCH
- PUMP
- BLOWER – CENTRIFUGAL (WITH VIV)
- CARTRIDGE FILTER
- MAGENETIC FLOW METER
- PIPE DESIGNATION CHANGE: (PVC – DIP)

PVC – POLYVINYL CHLORIDE
DI – DUCTILE IRON
CI – CAST IRON
CS – CARBON STEEL
SS – STAINLESS STEEL
AL – ALUMINUM

- IN–LINE INSTRUMENT
- INSTRUMENT CONNECTED TO PROCESS LINE
- PORTABLE INSTRUMENT NOT CONNECTED
- INSTRUMENT FIELD MOUNTED
- INSTRUMENT MAIN CONTROL PANEL
- LOCAL CONTROL PANEL
- HAND SWITCH (HS #) — 1–0–1 = (ON/OFF/AUTO)/3 POSITION
- PUSH BUTTON (PB #) — 0–1 = (OFF/ON)/2 POSITION
- INDICATOR LIGHT (YL)
- ALARM COMMUNICATION FUNCTION (FAL 500)
- SHARED CONTROL/ALARM INTERLOCK (AD)
  - AP: PRIMARY ALARM
  - AS: SECONDARY ALARM
  - AL: PRIMARY ALARM W/ LOCALIZED RESPONSE
  - AD: ADVISORY
- PROGRAMMABLE LOGIC CONTROL (PID)
  - PID: PROPORTIONAL, DERIVATIVE, INTEGRAL CONTROLLER
  - PLC: PROGRAMMABLE LOGIC CONTROLLER
- CONTROL/ALARM INTERLOCK (1)
  - 1: SECONDARY ALARM INPUT TO RELAY (PLC, AND AUTODIALER)
  - 2: PLC INPUT
  - 3: PLC OUTPUT
  - 4: PLC OUTPUT (CRITICAL ALARM SHUTDOWN)
  - 5: ALARMS GENERATED FROM PLC THEN TO AUTO DIALER INPUT
  - 6: ALARM TO AUTODIALER + ANNUNCIATOR
- CROSS HATCHING INDICATES DEMOLITION

ABBREVIATIONS

DCU	DISTRIBUTED CONTROL UNIT
DIP	DUCTILE IRON PIPE
I/O	INPUT/OUTPUT
LAN	LOCAL AREA NETWORK
LCP	LOCAL CONTROL PANEL
MCC	MOTOR CONTROL CENTER
MOV	MOTOR OPERATED VALVE
NC	NORMALLY CLOSED
NO	NORMALLY OPEN
PGW	PARTIALLY TREATED GROUNDWATER
RIO	REMOTE INPUT / OUTPUT
TGW	TREATED GROUNDWATER
TH	THERMAL TYPE FLOW METER SWITCH
VFD	VARIABLE FREQUENCY DRIVE
VSP	VAPOR SAMPLING PORT
WAN	WIDE AREA NETWORK
WSP	WATER SAMPLING PORT

IDENTIFICATION LETTERS

	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		ADVISORY
C	USER'S CHOICE COMMUNICATION	CONTROL			
D	USER'S CHOICE	DIFFERENTIAL			
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			FAILURE
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
P	PRESSURE (VACUUM)		POINT (TEST) CONNECTION		
Q	QUANTITY	INTEGRATE, TOTALIZE			
R	REMOTE				
RH	RELATIVE HUMIDITY				
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	
V	VIBRATION, MECHANICAL ANALYSIS			VALVE, DAMPER, LOUVER	
W	WEIGHT, FORCE, TORQUE			WELL	
X	USER'S CHOICE			EXTREME	
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACTUATOR, UNCLASSIFIED FINAL CONTROL ELEMENT	

DISCRETE INPUT AND OUTPUT IDENTIFICATION

SUFFIX	STATUS	COMMAND	ANALOG	DESCRIPTION
A	X			RUNNING; ON; ENERGIZED
B	X			AVAILABLE; READY TO RUN
C	X			CLOSED POSITION
D	X			DE–ENERGIZED OR LOCKED–OUT
E	X			EMERGENCY STOP
F	X			FAULT; ALARM (OVERLOAD)
G	X			RUNNING FORWARD; LOW SPEED
H	X			RUNNING REVERSE; LOW SPEED
I		X		STOP MOTOR OR CLOSE VALVE
J		X		START–STOP MOTOR OR OPEN CLOSE VALVES
J1	X			START PUSHBUTTON OR SELECTOR SWITCH POSITION
J2	X			STOP PUSHBUTTON OR SELECTOR SWITCH POSITION
K		X		START (FORWARD OR LOW SPEED OR OPEN VALVE)
K1	X			START (FORWARD OR LOW SPEED OR OPEN)
L		X		START (REVERSE OR HIGH SPEED OR CLOSE)
L1	X			START (REVERSE OR HIGH SPEED OR CLOSE)
M				
N				
O	X			OPEN POSITION
P			X	VALVE POSITION INDICATOR
Q				
R				SPEED INDICATOR
S	X			STOPPED
SI			X	SPEED INDICATOR
SC			X	SPEED CONTROL
T				
U				
V				
W	X			(HOR) OR (LR) SWITCH IN (R) POSITION OR (HOA) IN (A) POSITION
X				
Y				
Z			X	VALVE POSITION CONTROL

NOTES:

1. CONTRACT DRAWINGS ARE PREPARED BY TETRA TECH USING THE REVISED RECORD DRAWINGS (ISSUED BY ARCADIS, MAY 2012) FOR OPERABLE UNIT - 2 OFF-SITE INTERIM REMEDIAL MEASURE PREPARED BY AMEC IN OCTOBER 2014. CONTRACT SHALL FIELD VERIFY ALL NECESSARY COMPONENTS, SUBMIT SHOP DRAWINGS FOR ENGINEERS APPROVAL BEFORE ANY PURCHASES AND WORK IMPLEMENTATION.
2. THE SYMBOLS SHOWN ON THIS SHEET ARE STANDARD DESIGNATIONS. NOT ALL SYMBOLS ARE APPLICABLE TO THE INCLUDED DIAGRAMS AND INSTRUMENT TAG NUMBERING SYSTEM.
3. NOT ALL PIPING, FITTINGS, AND TANK DETAILS ARE SHOWN. REFER TO PROCESS DRAWINGS FOR ACTUAL DETAILS.
4. FOR INTERLOCKS REFER TO CONTROL DESCRIPTION SPECIFICATION SECTION 13500.

GENERAL INSTRUMENT OR FUNCTION SYMBOLS

DISCRETE INSTRUMENTS	PRIMARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR **	FIELD MOUNTED	AUXILIARY LOCATION NORMALLY ACCESSIBLE TO OPERATOR **
DISCRETE INSTRUMENTS	1 IPI *	2	3
SHARED DISPLAY, SHARED CONTROL	4	5	6
COMPUTER FUNCTION	7	8	9
PROGRAMMABLE LOGIC CONTROL	10	11	12

* ABBREVIATIONS OF THE USER'S CHOICE SUCH AS IPI (INSTRUMENT PANEL # 1), IC2 (INSTRUMENT CONSOLE #2) CC3 (COMPUTER CONSOLE #3), ETC. MAY BE USED WHEN IT IS NECESSARY TO SPECIFY INSTRUMENT OR FUNCTION LOCATION.

** NORMALLY INACCESSIBLE OR BEHIND–THE–PANEL DEVICES OR FUNCTIONS MAY BE DEPICTED BY USING THE SAME SYMBOLS BUT WITH DASHED HORIZONTAL BARS, I.E.

*** THE LETTER A BELOW AN ALARM LIGHT MEANS ADVISORY ONLY.

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LOCKHEED MARTIN CORPORATION
OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

PROCESS AND INSTRUMENTATION DIAGRAMS NOTES AND LEGEND

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-001

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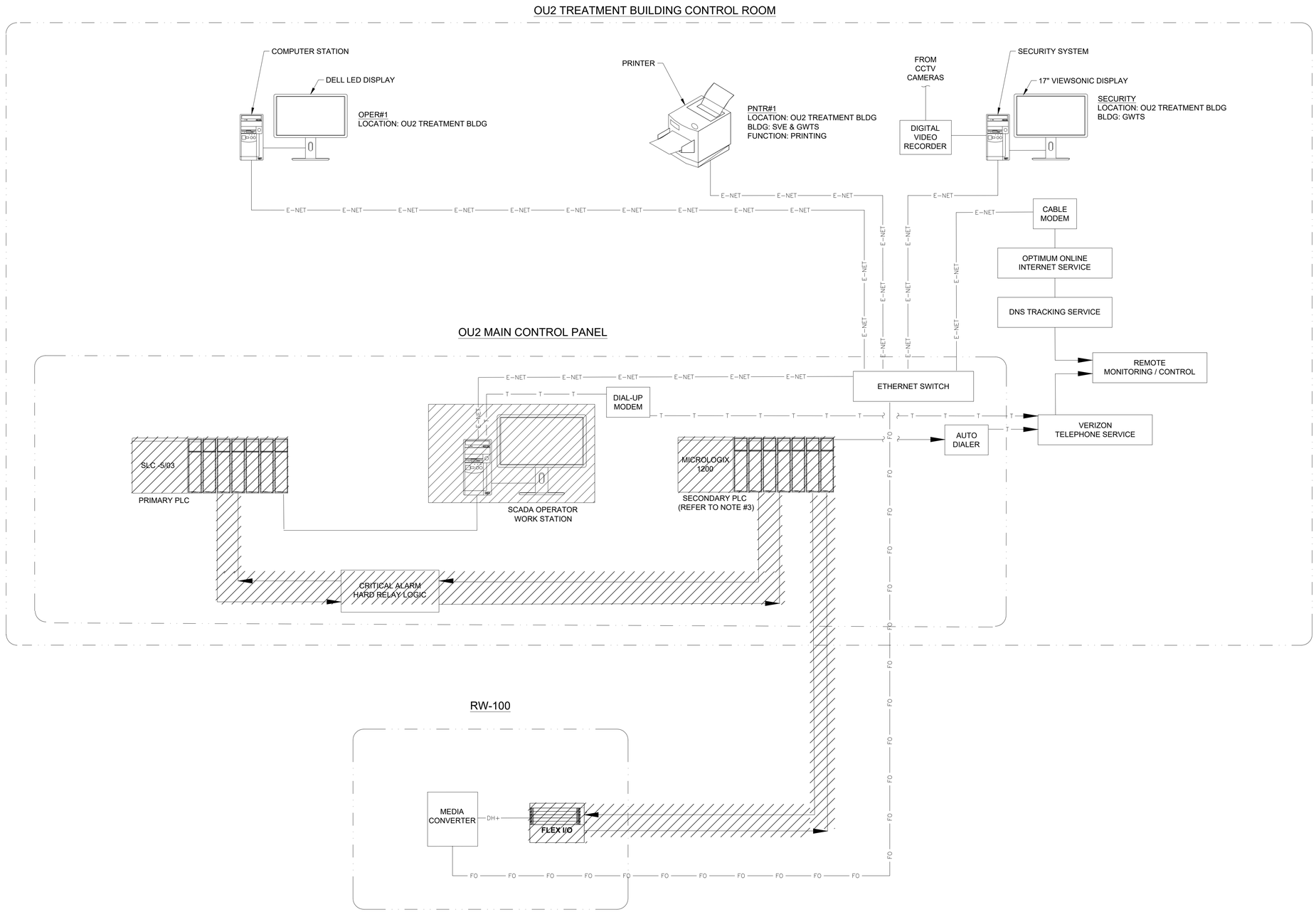

NOTES:

1. EXISTING OU-2 SYSTEM ARCHITECTURE INCLUDING PROPOSED DEMOLITION IS SHOWN ON THIS DRAWING. REFER TO ELECTRICAL DRAWINGS FOR THE LOCATION OF THE PANELS.
2. REFER TO SHEET I-003 FOR PROPOSED OU-2 SYSTEM ARCHITECTURE.
3. REROUTE THE SIGNALS TO THE NEW MCP PANEL. INSTALL NEW TERMINAL BLOCKS AND EXTEND WIRES TO THE NEW MCP PANEL. REFER TO SPECIFICATION SECTION 13430 FOR ADDITIONAL DETAILS.
4. DEMOLISHED HARDWARE COMPONENTS SHALL BE REMOVED FOR SALVAGE AND DELIVERED TO OWNER.

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LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

EXISTING OU-1 SYSTEM ARCHITECTURE

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

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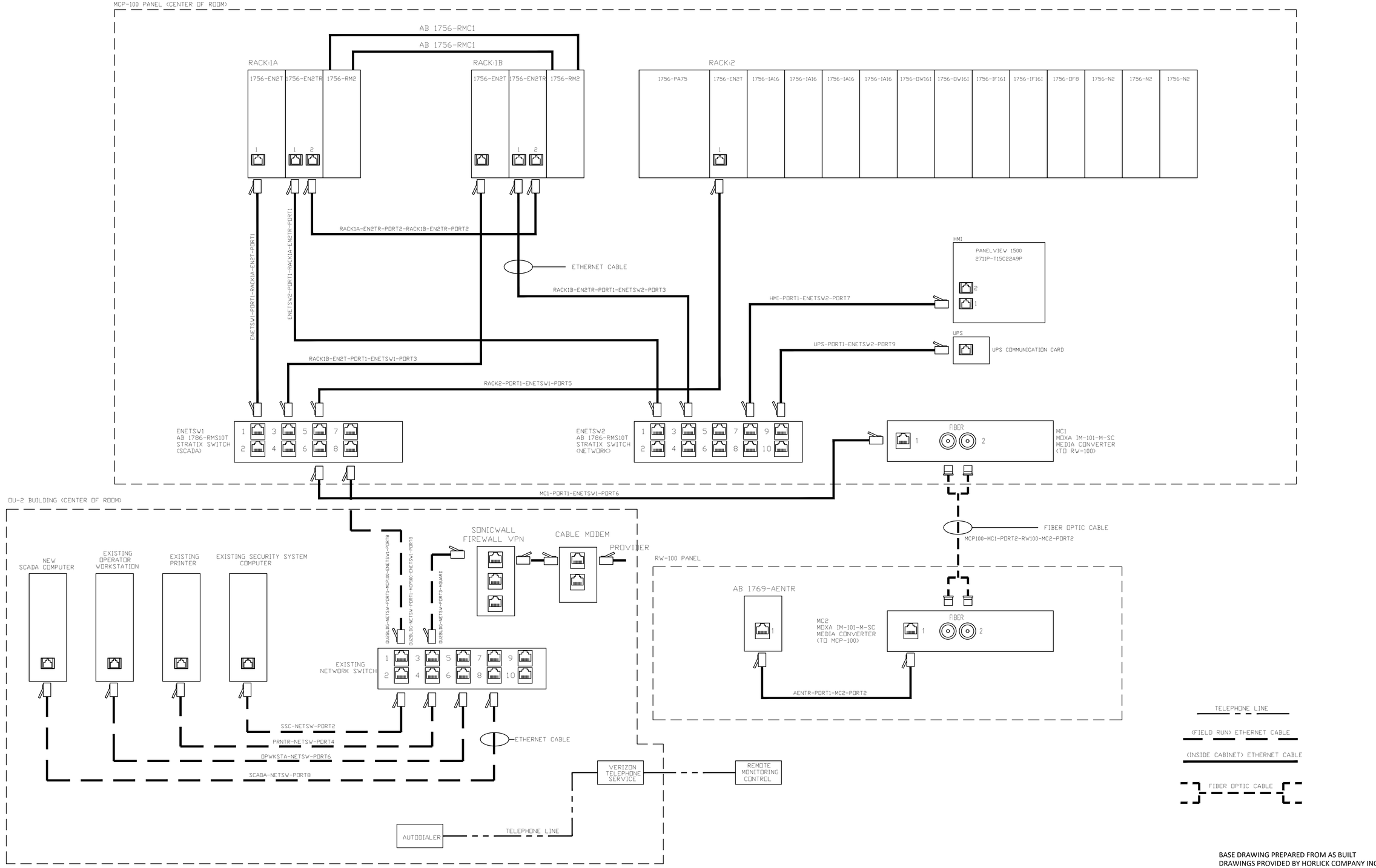

BASE DRAWING PREPARED FROM AS BUILT
DRAWINGS PROVIDED BY HORLICK COMPANY INC.

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LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

PROPOSED OU-2 SYSTEM ARCHITECTURE

Project No.:	200-01297-16018
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ANNUNCIATOR

AUTO DIALER

SHARED CONTROL (HMI)

MAIN CONTROL PANEL

FIELD

SS 6

LAH 111 — PAHH 121 — LAHH 142 — PLCA 001 — PLC FAIL — I/O — LALL 211 — LAHH 212

RUN YL 100A — FAIL YL 100D — H YL 100B — A YL 100B — PI 101 — PI 102

LAH 111A AP — LAH 111B AP

PAHH 121 AC — PAH 121 AP — PI 121

FQ 131 — FI 131 — FAL 131 AD — PAL 131 AP — PAH 131 AP — PI 131 — LAH 141A AC — LAH 141B AC

H YL 211A — A YL 211A — RUN YL 211A — FAIL YL 211D — ST 211

SC 211 — PAL 211 AD — PAH 211 AD — PI 211 — LIC 211

LAL 211 AP — LAH 211 AP — LALL 211 AP — LAHH 211 AP — LALL 211 AC — LAHH 212 AC

RUN YL 100Q — FAULT YL 100W — HOA SS 100B

FIBER-OPTIC DATA COMMUNICATION

PLC FAILURE — PLC 001 — LIGHT TEST PB 1

HOA SS 211 — RUN YL 211A — FAIL YL 211D

TYPICAL FOR ALL ALARM INPUTS — PLC 003 — XY 003

E-STOP PB 2 — ALARM RESET PB 3

ALARM CLEAR YL 1 — ALARM ADVISORY YL 2 — ALARM ENGAGED YL 3

OPTIONAL (SEE NOTE 1) — LIC 211

ALARM RESET PB 100 — TEST PB 100

RUN YL 100A — FAIL NORMAL YL 100F — NOT READY YL 100 — E-STOP YL 100 — PB 100 — HOA SS 100A — REMOTE — FI 131A — PLC 002 — LAH 111A — LAHH 111B

LIMITS OF RW-100 PUMPING REMOTE CONTROL PANEL

SS-100K — PMP100A — FAIL TO START

LIMITS OF STARTER & PUMP — MOTOR STARTER

RW-100 SUBMERSIBLE WELL PUMP P-101
TYPE: SUBMERSIBLE TURBINE
MAKE: GRUNDFOS
MODEL: 625S400-2
MOTOR: FRANKLIN, 460V, 40HP, 3450 RPM
RATED: 600 GPM/200 TDH
MAX OPERATING: 600 GPM/195 TDH

RW-100

V-102 — 2" — PT 101 — PI 101 0-100 PSIG — PT 102 — PI 102 0-100 PSIG — 1/4" — V-103 — 1" — V-101 — 12" — 2"

PI 103 0-60 PSIG — 1/4" — UGW 6" N-DIP IN — LSH 111 — LSHH 111 — VAULT HIGH LEVEL FLOATS

V-106 8" x 6" — UGW 8" x 12" N-PE — 8"ø HDPE SDR-11 CARRIER AND 12"ø HDPE SDR-17 CONTAINMENT

PUMPING WELL VAULT — TRENCH

PSH 121 — PT 121 — PI 121 0-60 PSIG — 1/4" — V-107 — 8" x 6" — 1" — 1/4" WSP-1

FIQT 131 — FIT 131 — FE 131 — UGW 6" N-DIP IN — 6"ø DUCTILE IRON PIPE W/ INSULATION, VAPOR SEAL AND PVC COVER

PI 131 0-30 PSIG — PT 131 — 1/4" — V-108 — V-109

LSH 141A — LSH 141B — INFLUENT VAULT LEAK DETECTION LEVEL SWITCHES — P-141

ENTRANCE VAULT TO TREATMENT BUILDING

SS-211W — PMP211S — PMP211A

UTGW 10" E-DIP — V4 NC — V7 NO — PGW 10" E-DIP — PARTIALLY TRTD GROUND WATER TO DWG. I-102

MS. AUX SIC 211 — VFD FAULT YL 211A — FAULT YL 211C — PANEL POWER YL 211A — RUN YL 211B

STOP PB 211A — START PB 211B — HOA SS 211A — LIGHT TEST PB 211B — BY PASS SS 211C — MOTOR STARTER

P-211 VFD PANEL

TOWER AIR STRIPPER #1 AS-210

10" x 12" — V3 NC — V2 NO — V1 NO — 10" x 12"

8" x 10" — V5 — 4" x 8" — M — V6 NC — FCV 211 — V-211 — 4" x 8" — PDS 211 — PI 211 — PT 211

LIT 211 — LE 211 — LSLL 211 — LSHH 212

CLEAR WELL #1 CW-210 — M — P-211 TRANSFER PUMP
TYPE: SUBMERSIBLE TURBINE
MAKE: CHRISTENSEN
MODEL: 11CLC
RATED: 600 GPM/50' TDH @ 84% EFF.
MOTOR: 1800 RPM; 460V, 10 HP
STATUS: TRANSFER PUMP #1

TREATMENT BUILDING

NOTES:

1. ALL ITEMS ADDED IN THIS CONTRACT ARE SHOWN BOLD FOR CLARITY PURPOSES. ITEMS SHOWN IN GRAY ARE EXISTING.
2. REFER TO DIV.13 SPECIFICATIONS FOR HMI UPGRADES TO BE PERFORMED IN THIS CONTRACT.
3. IF VFD FAILS TO OPERATE THEN FCV-211 VALVE WILL BE ABLE TO CONTROL FLOW IN CLEAR WELL #1.

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LOCKHEED MARTIN CORPORATION
OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

PROCESS AND INSTRUMENTATION DIAGRAM - PROCESS

Project No.:	200-01297-16018
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Checked By:	JFC

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Bar Measures 1 inch

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ANNUN-CIATOR

AUTO DIALER

SHARED CONTROL (HMI)

MAIN CONTROL PANEL

FIELD

LAH 201A/B
PAL 313
TAH 503
FAL 642
I/O
6

LSH 201A AC
PDA 301 AD
PDA 302 AD
PDA 303 AD
LAH 201B AC
RUN YI 310A
FAIL YI 310F
HAND AUTO YI 310B YI 310A
SPEED SC 310
SPEED SI 310
PAL 313 AC
PAH 312 AP
PAH 312 AP
PI 312
FI 313
TI 501
RHI 501
RHAH 502 AD
TAL 502 AP
TAH 502 AP
TI 502
TAH 503 AC
HAND YL 500
AUTO YL 500
TI 621
RHI 621
FAL 642 AC
FAULT YI 500
RUN YL 500
TI 633
RHI 633
FI 631
FAL 631 AP

RUN YL 310A
FAIL YL 310D
HOA SS 310
PLC 001
FAULT YL 500F
RUN YL 500A
TC 500
HOA SS 500
PLC 003
XY 003
TYPICAL FOR ALL ALARM INPUTS

TREATMENT BUILDING EXTERIOR
BLOWER ROOM INTERIOR
PDIS 301
PDIS 302
PDIS 303
EXISTING BLOWER INLET AREA
E-STOP SOUTH WALL NEAR BAG FILTER
PIT 311
TOWER AIR STRIPPER #2 AS-220
90" SCH. 10 ALUMINUM INLET DUCTWORK WITH 26" x 26" SQUARE OPENING WITH FLANGE-MOUNTED STAINLESS STEEL 20-MESH SCREEN ON EXISTING SQUARE FLOOR SLEEVE
CLEAR WELL #2 CW-220
SS-310/K
SC-310A0
ST-310M
PMP310A
PMP310F
STOP PB 310B
START PB 310A
SPEED SC 310
L/O/R SS 310C
SPEED ST 310
VFD
B-310 BLOWER
VSP-6
LSH 201A
LSH 201B
BUILDING FLOOD FLOOR FLOATS
FIT 313
PIT 313
TI 313
PIT 312
PSL 313
TOWER AIR STRIPPER #1 AS-210
CLEAR WELL #1 CW-210
TREATMENT BUILDING

RHTT 501
V-501
DUCT HEATER DH-500
TT 502
TSH 503
PI 502
VSP-1
NATURAL GAS FROM KEYSPAN
GAS METER
PI 611
TI 611
V-602
VPGAC #1 VG-610
V-612
V-621
RHTT 621
PI 621
VPGAC #2 VG-620
V-611
V-622
PI 631
VSP-3
VPGAC #3 VG-630
V-601
V-632
V-631
PI 634
RHTT 633
TI 635
V-633
PI 636
VSP-4
PPZ #1 PP-640
V-634
FE 631
FSL 642
FIT 631
PI 643
VSP-7
PPZ #2 PP-650
VPGAC
PI 651
TI 651
VSP-8
TO ATMOSPHERE
TA 18" N-AL

NOTES:

1. ALL ITEMS ADDED IN THIS CONTRACT ARE SHOWN BOLD FOR CLARITY PURPOSES. ITEMS SHOWN IN GRAY ARE EXISTING.
2. REFER TO DIV.13 SPECIFICATIONS FOR HMI UPGRADES TO BE PERFORMED IN THIS CONTRACT.
3. DW-101 VOV WAS REMOVED, NOT IN USE

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MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

PROCESS AND INSTRUMENTATION DIAGRAM - AIR SYSTEM

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-101

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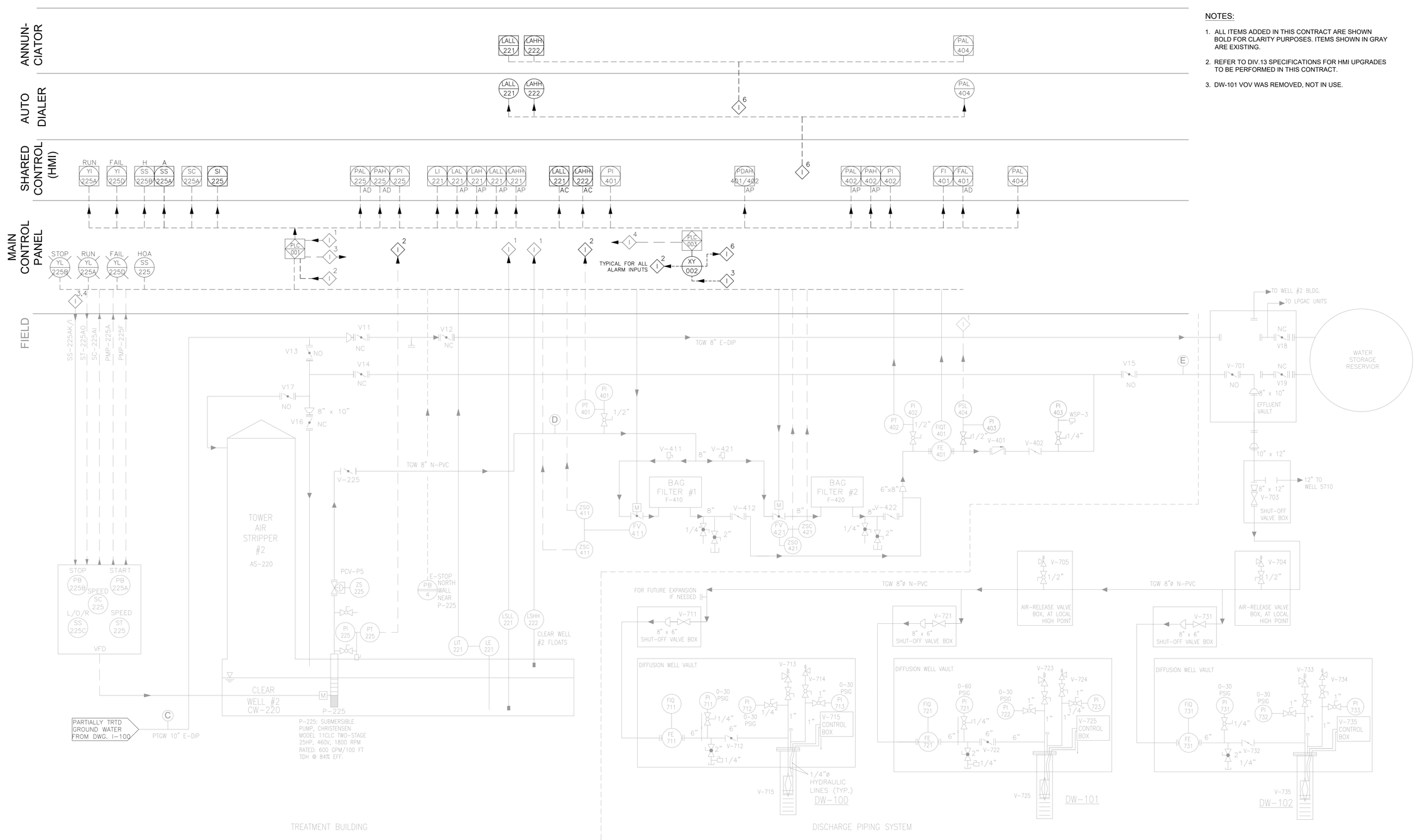
Bar Measures 1 inch

1/4/2019 2:57:35 PM - \\TTS227FS1\PROJECTS\ER\01299\200-01299-16001\CAD\SHEETFILES\OU-2\I-101 PROCESS AND INSTRUMENTATION DIAGRAM - AIR SYSTEM.DWG - MARSH, JUSTIN



NOTES:

1. ALL ITEMS ADDED IN THIS CONTRACT ARE SHOWN BOLD FOR CLARITY PURPOSES. ITEMS SHOWN IN GRAY ARE EXISTING.
2. REFER TO DIV.13 SPECIFICATIONS FOR HMI UPGRADES TO BE PERFORMED IN THIS CONTRACT.
3. DW-101 VOV WAS REMOVED, NOT IN USE.

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	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

PROCESS AND INSTRUMENTATION DIAGRAM - PROCESS 2

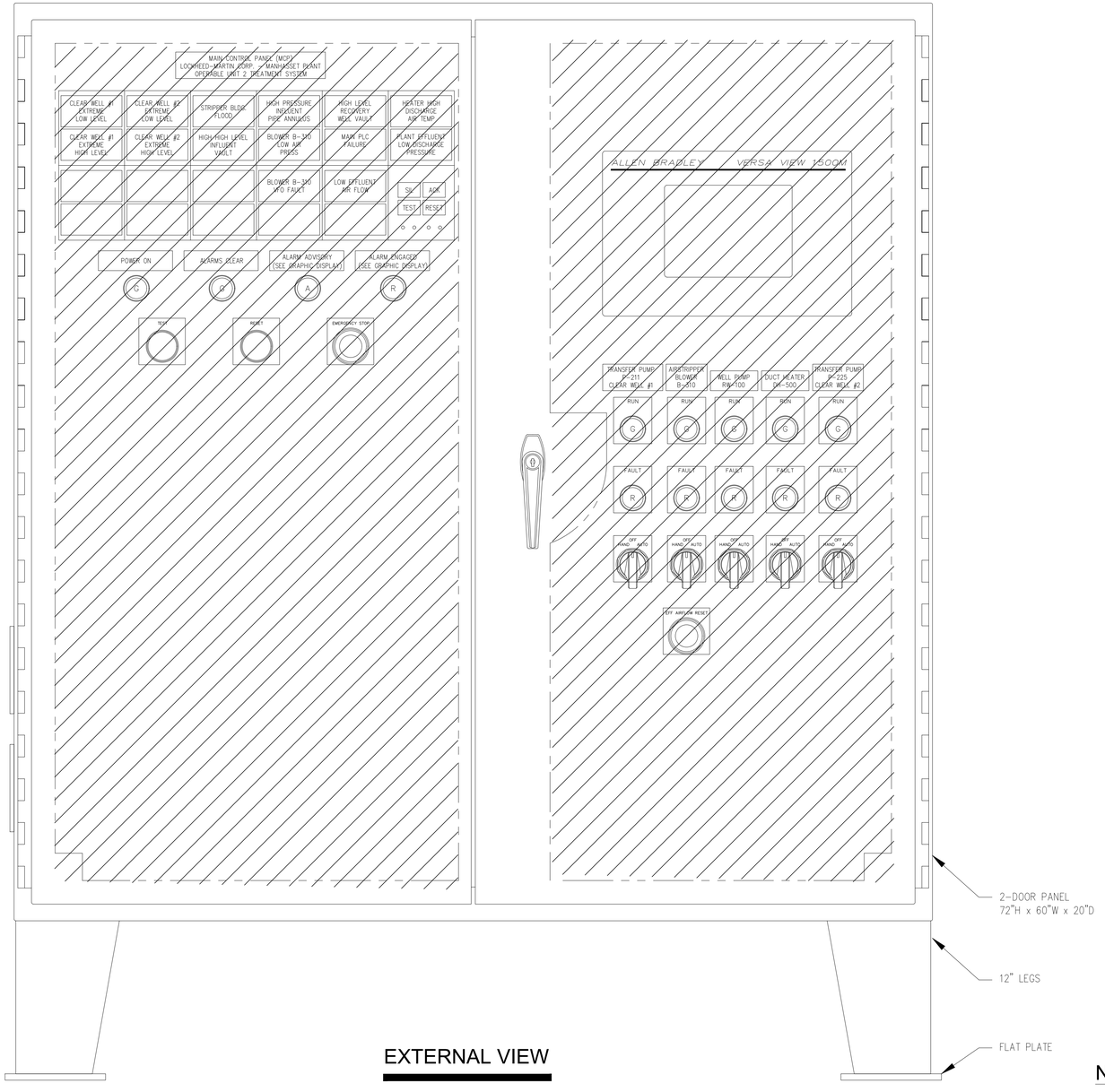
Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-102

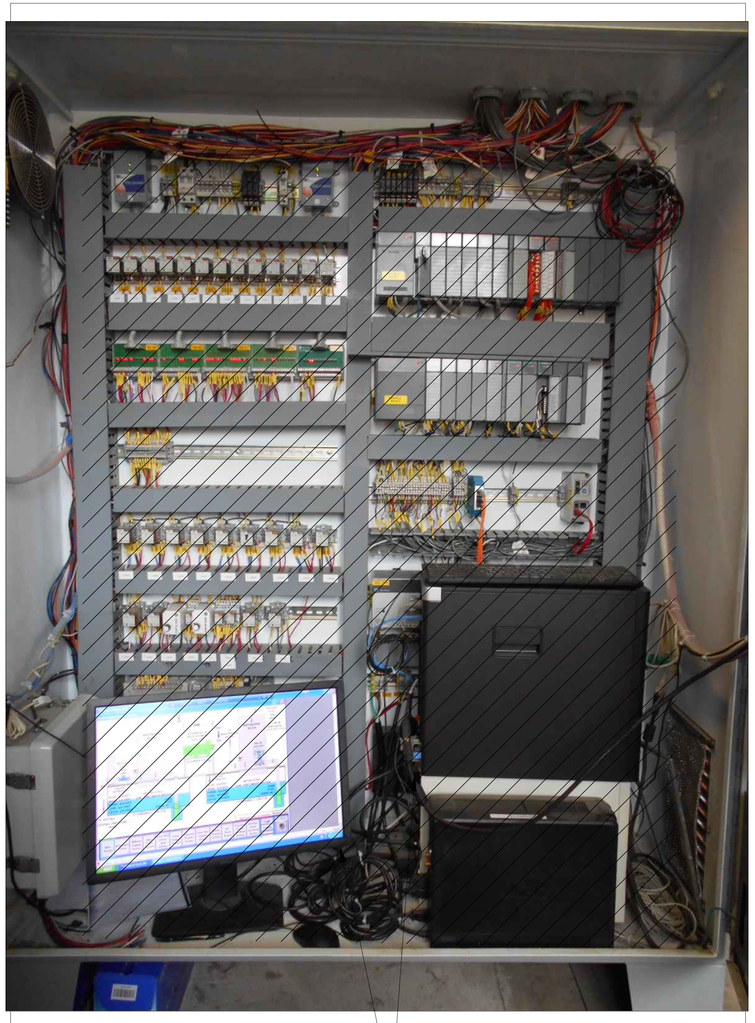
Copyright: Tetra Tech

Bar Measures 1 inch

1/4/2019 2:57:38 PM - \\TTS227FS1\PROJECTS\IER\01299\200-01299-16001\CAD\SHEETFILES\OU-2\I-102 PROCESS AND INSTRUMENTATION DIAGRAM - PROCESS 2.DWG - MARSH, JUSTIN



EXTERNAL VIEW



INTERNAL VIEW

NOTES:

1. CONTRACTORS TO PERFORM BASELINE SURVEY OF THE EXISTING MAIN CONTROL PANEL INCLUDING ALL WIRING AND COMPARE EXISTING PANEL WIRING DIAGRAMS ARE PROVIDED FOR REFERENCE ONLY. SHOP DRAWINGS SHALL BE PROVIDED PER SPECIFICATION SECTION 13430.

2. EXISTING PANEL FRONT DOORS SHALL BE REMOVED AND SALVAGED TO THE OWNER. NEW PANEL FRONT DOORS AND BACK PANEL SHALL BE INSTALLED WITHOUT ANY DAMAGE TO THE INTEGRITY OF THE PANEL. THE RETROFIT OF THE NEW PANEL FRONT DOORSDOORS SHALL BE PERFORMED TO PROVIDE A NEAT, SEAMLESS JOB. ALL WIRING SHALL BE DRESSED IN A NEATLY MANNER.

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	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION
OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE
MAIN CONTROL PANEL (MCP) - DEMOLITION

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-200

Bar Measures 1 inch

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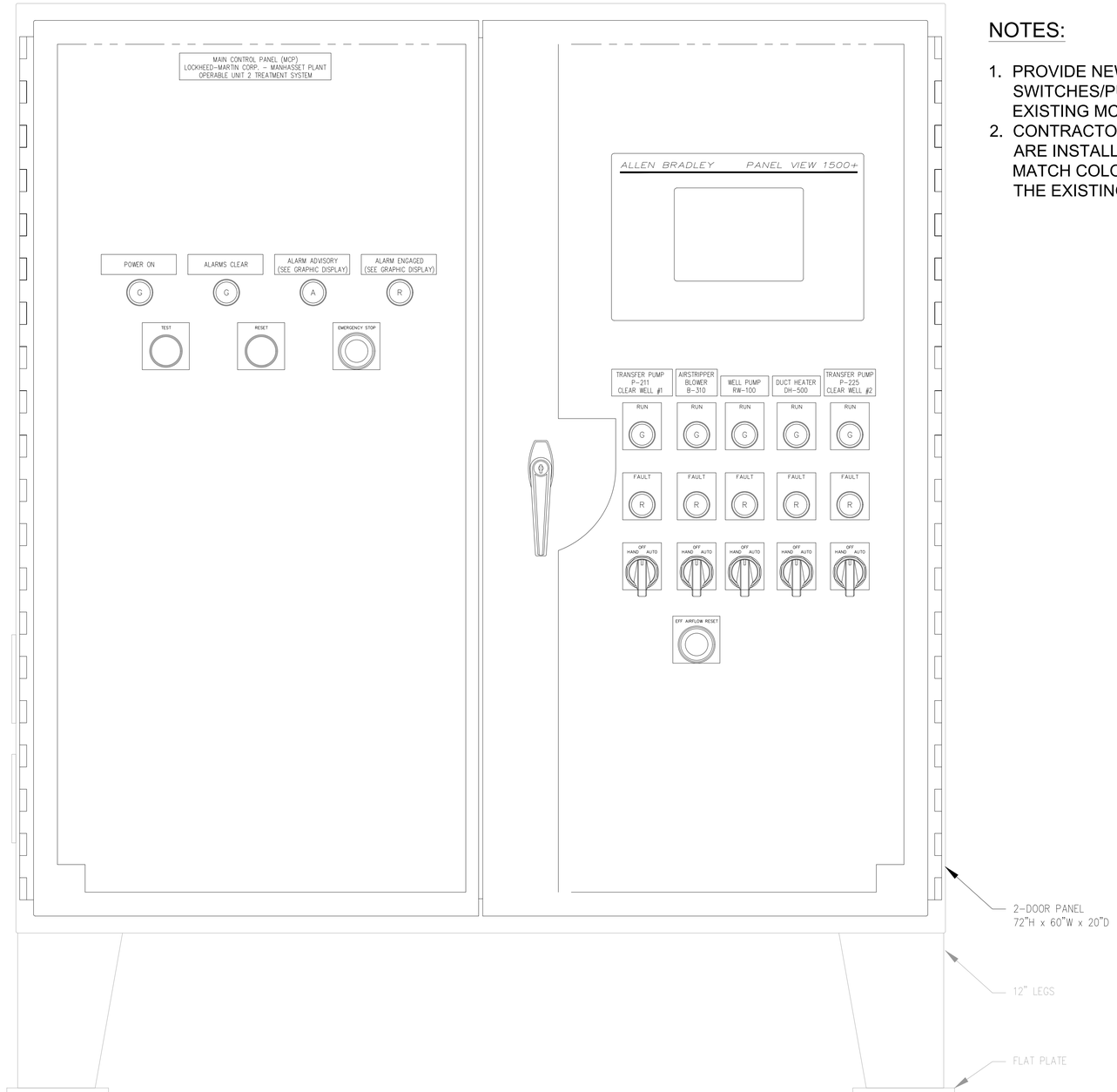
1/4/2019 2:57:41 PM - \\TTS227FS1\PROJECTS\IER\01299\200-01299-16001\CAD\SHEETFILES\OU-2\I-200 MAIN CONTROL PANEL (MCP) - DEMOLITION.DWG - MARSH, JUSTIN



NOTES:

1. PROVIDE NEW PANEL FRONT DOORS WITH NEW SWITCHES/PUSH BUTTONS, TAGS AND HMI. REUSE EXISTING MCP PANEL.
2. CONTRACTOR TO ENSURE NEW PANEL FRONT DOORS ARE INSTALLED SEAMLESSLY ON THE EXISTING PANEL. MATCH COLOR OF THE NEW PANEL FRONT DOORS TO THE EXISTING MCP.

BASE DRAWING PREPARED FROM DRAWING INFORMATION FROM HORLICK COMPANY INC.

EXTERNAL VIEW

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LOCKHEED MARTIN CORPORATION
OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE
MAIN CONTROL PANEL (MCP) - INTERNAL & EXTERNAL LAYOUT

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-201

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Bar Measures 1 inch

1/4/2019 2:57:44 PM - \\TTS227FS1\PROJECTS\IER\01299\200-01299-16001\CAD\SHEETFILES\OU-2\I-201 MAIN CONTROL PANEL (MCP) - INTERNAL & EXTERNAL LAYOUT.DWG - MARSH, JUSTIN

COMPONENT LIST

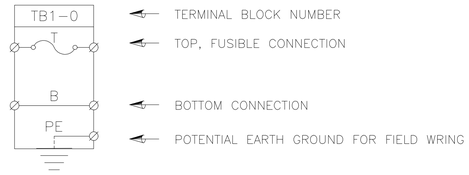
NO.	LABEL	DESCRIPTION	PART NO.	MANUF'R
1	ENCL	NEMA Type 12 72"x60"x20"	SCE-726020FSD	SAGINAW
2	BP	BACKPLATE 60" X 56"	SCE-72P60F1	SAGINAW
3	ES/LO	EMERGENCY STOP PUSH-PULL OPERATOR	800FP-MT44-E112	A-B
		22.5MM NO LATCH, SCREW CONTACT BLOCK, 1NC	800F-X01	A-B
		PLASTIC LATCH	800F-ALP	A-B
4	OIT	PANELVIEW PLUS	2711P-RDT15AG	A-B
5	CPS	85-265 VAC POWER SUPPLY	1756-PA72	A-B
6	ERED	CONTROLLOGIX ENHANCED REDUNDACY MODULE	1756-RM	A-B
7	ENET	ETHERNET REDUNDANT INTERFACE MODULE	1756- ENET	A-B
8	CPU	CONTROLLOGIX 5563 PROCESSOR	1756-L63	A-B
9	EIM	EHTERNET INTERFACE MODULE	1756-EN2T	A-B
10	CIM	CONTROLNET INTERFACE MODULE	1756-CN2	A-B
11	DI32	CONTROLLOGIX 120VAC DIGITAL 32PT INPUT	1756-IA32	A-B
12	DI16	CONTROLLOGIX 120VAC ISOLATED 16PT INPUT	1756-IA16I	A-B
13	DO16	CONTROLLOGIX 120VAC ISOLATED 16PT OUTPUT	1756-OA16I	A-B
14	AI16	CONTROLLOGIX 24VDC ANALOG 16PT INPUT	1756-IF16	A-B
15	AO8	CONTROLLOGIX 24VDC ANALOG 8PT OUTPUT	1756-OF8	A-B
16	FC	FIBER CONNECTORS (BY OTHERS)	-	A-B
17	EH	EXTENDED HOUSING	1756-TBE	A-B
18	TB36P	36 PIN SCREW CLAMP W/ EXTENDED HOUSING	1756-TBCH	A-B
19	TB20P	20 PIN SCREW CLAMP W/ EXTENDED HOUSING	1756-TBNH	A-B
20	RED	REDUNDANCY MODULE 1M FIBER CABLE	1756-RMC1	A-B
21	-	NOT USED	1786-RPA	A-B
22	MC	IGNORE	IM-101-M	PHOENIX
23	-	NOT USED	-	-
24	-	NOT USED	-	-
25	SFIL	EMPTY SLOT FILLER	1756-N2	A-B
26	CHX-17	CONTROLLOGIX CHASSIS - 17 SLOTS	1756-A17	A-B
27	CHX-4	CONTROLLOGIX CHASSIS - 4 SLOTS	1756-A4	A-B
28	SP	SURGE PROTECTOR	STV 25K-10S	SOLA
29	PSIA, PSIB	24VDC POWER SUPPLY	SDN 10-24-100P	SOLA
30	PS-RED	24VDC POWER SUPPLY REDUNDANT MODULE	SDN 2.5-20RED	SOLA
31	CB1	CIRCUIT BREAKER, 15A	1489-A1C150	A-B
32	CB2~7	CIRCUIT BREAKER, 2A	1489-A1C020	A-B
33	FB1~FB11	FUSIBLE TERMINAL BLOCK, 120 VAC	1492-H4	A-B
34	FC1~FC3	FUSIBLE TERMINAL BLOCK, 24 VDC	1492-H5	A-B
35	TBH~1,TBN	TERMINAL BLOCK, SINGLE, GREY, M4/6	115 116.07	ENTRELEC
36	TB1~TB8	FUSIBLE DOUBLE STACK TERMINAL BLOCK	9802760001	WEIDMULLER
37	TB9~TB13	FUSIBLE DOUBLE TERMINAL BLOCK W/ GROUND	9158350001	WEIDMULLER
38	ENST	END STOP, BAM	0103 002.26	ENTRELEC
39	CO1	GFCI CONVENIENCE OUTLET, DUPLEX, 20A	56 02 51 9	PHOENIX
40	FL	FLUORESCENT LAMP	SCE-LF16D18	SAGINAW
41	DR	DIN RAIL	OMEGA 3AF	IBOCO
42	WD2	WIRE DUCT 2 1/4 " x 4"	T1-2240G	IBOCO
43	WD4	WIRE DUCT 4 " x 4"	T1-4040G	IBOCO
44	CR1~16	CONTROL RELAY, SPDT	700-HK36A1	A-B
		RELAY BASE	700-HN121	A-B
45	MOD	PROSOFT TECH. MODBUS TCP/IP COMM. MOD.	MVI56-MCMR	PROSOFT
46	ET.SW.	16-PORT ETHERNET SWITCH	RS2-16M	HIRSCHMANN
47	SA	SYSTEM AUTODIALER W/ MODBUS RTU OPTION	DIALOG ELITE	ANTX
48	GB	GROUND BAR	PK9GTA	SQUARE D
49	BAC	BACNET COMMUNICATION CARD	PS56-BAS-073	PROSOFT
50	SP	SIDE PLATE 60" X 14"	SCE-72SMP14	SAGINAW
51	CS	CENTER SUPPORT	SCE-72FSCS	SAGINAW
52	FAN	ENCLOSE FAN AND FILTER	SCE-N12FA44	SAGINAW
53	F/L	FILTER	SCE-FLT43	SAGINAW
		LOUVER	SCE-AVK43	SAGINAW
54	--	FUSES FOR TERMINAL BLOCKS	-	LITTLEFUSE
55	--	FUSES FOR TERMINAL BLOCKS W/ GROUND	-	LITTLEFUSE
56	0&24VDC	TERMINAL BLOCK, SINGLE, BLUE, M4/6.N	125 116.01	ENTRELEC
57	TSH	THERMOSTAT, 10A RESISTIVE & 1A INDUCTIVE LOAD	SCE-TEMNO	SAGINAW
58	--	AC CONTROL WIRING-#16 RED	364-2	OLYMPIC
59	--	DC(+) CONTROL WIRING-#16 BLUE	364-10	OLYMPIC
60	--	AC POWER WIRING-#12 BLACK	366-0	OLYMPIC
61	--	AC POWER WIRING-#12 WHITE	366-9	OLYMPIC
62	--	GROUND-#12 GREEN	366-5	OLYMPIC
63	--	TWISTED SHIELDED CABLE #16	3142	OLYMPIC
64	--	DC(-) CONTROL WIRING-#16 WHITE w/ BLUE STRIPE	16 MTW-96	OLYMPIC
65	MC	MEDIA CONVERTER	IM-101-M-SC	MOXA

NOTES:

1. COMPONENTS LIST SHALL BE USED FOR GENERAL UNDERSTANDING PURPOSES ONLY. CONTRACTOR SHALL USE ALL NECESSARY COMPONENTS TO INSTALL AND PROVIDE A FULLY FUNCTIONAL SYSTEM.
2. CONTRACTOR TO PERFORM BASELINE SURVEY OF THE EXISTING MAIN CONTROL PANEL INCLUDING THE WIRING IN ORDER TO INSTALL THE NEW PANEL OU-2 MCP - 100. SHOP DRAWINGS SHALL BE PROVIDED AS PER THE SPECIFICATION SECTION 13430.
3. PANEL WIRING DIAGRAMS SHOWN ARE PROVIDED FOR GENERAL UNDERSTANDING AND FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL FIELD SURVEY, CHECK EXISTING I/O WIRING AND PROVIDE SHOP DRAWING SUBMITTALS PER THE SPECIFICATIONS FOR ENGINEERS APPROVAL. CONTRACTOR IS RESPONSIBLE TO PROVIDE A FULLY FUNCTIONAL SYSTEM.

FUSIBLE DOUBLE TIER TERMINAL BLOCK FOR DISCRETE SIGNAL

FUSIBLE DOUBLE TIER TERMINAL BLOCK W/ GROUND FOR ANALOG SIGNAL



BASE DRAWING PREPARED FROM DRAWING INFORMATION FROM HORLICK COMPANY INC.

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MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION
OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE
MAIN CONTROL PANEL (MCP)
COMPONENTS LIST

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-202

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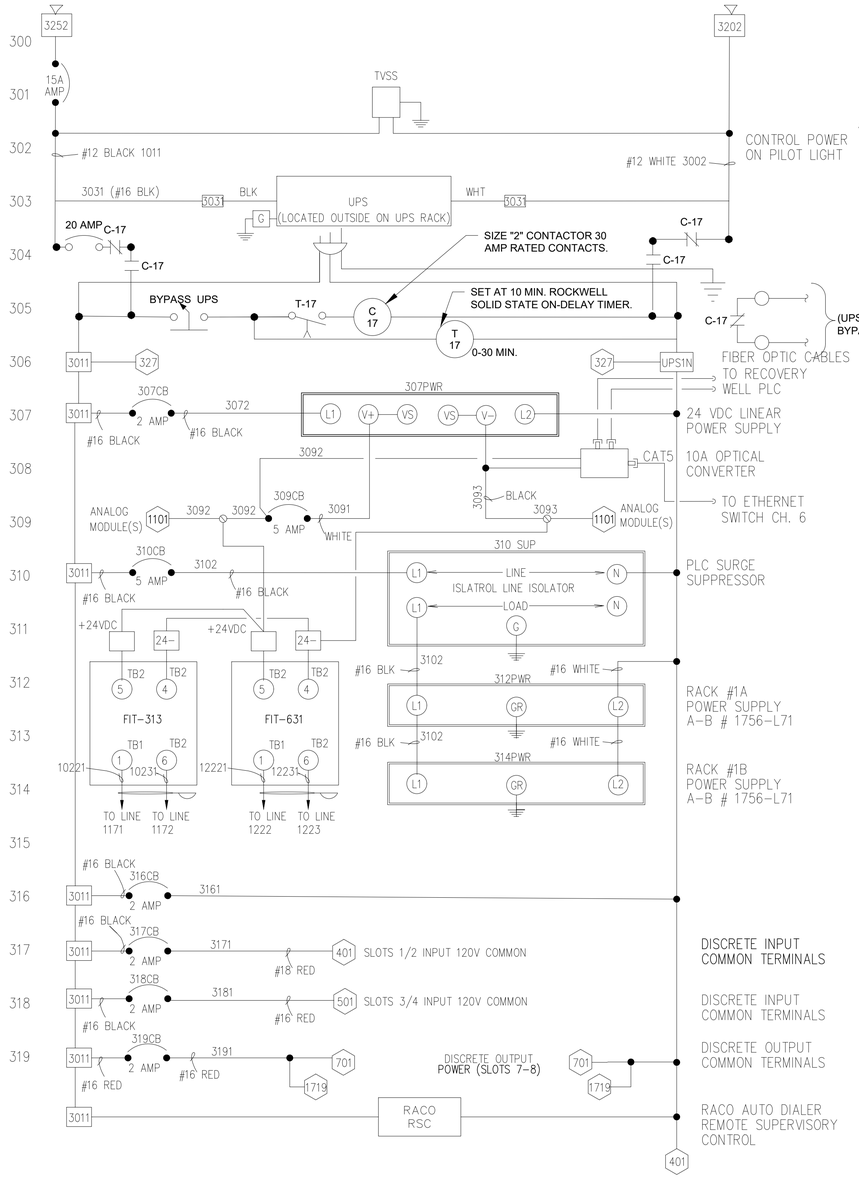
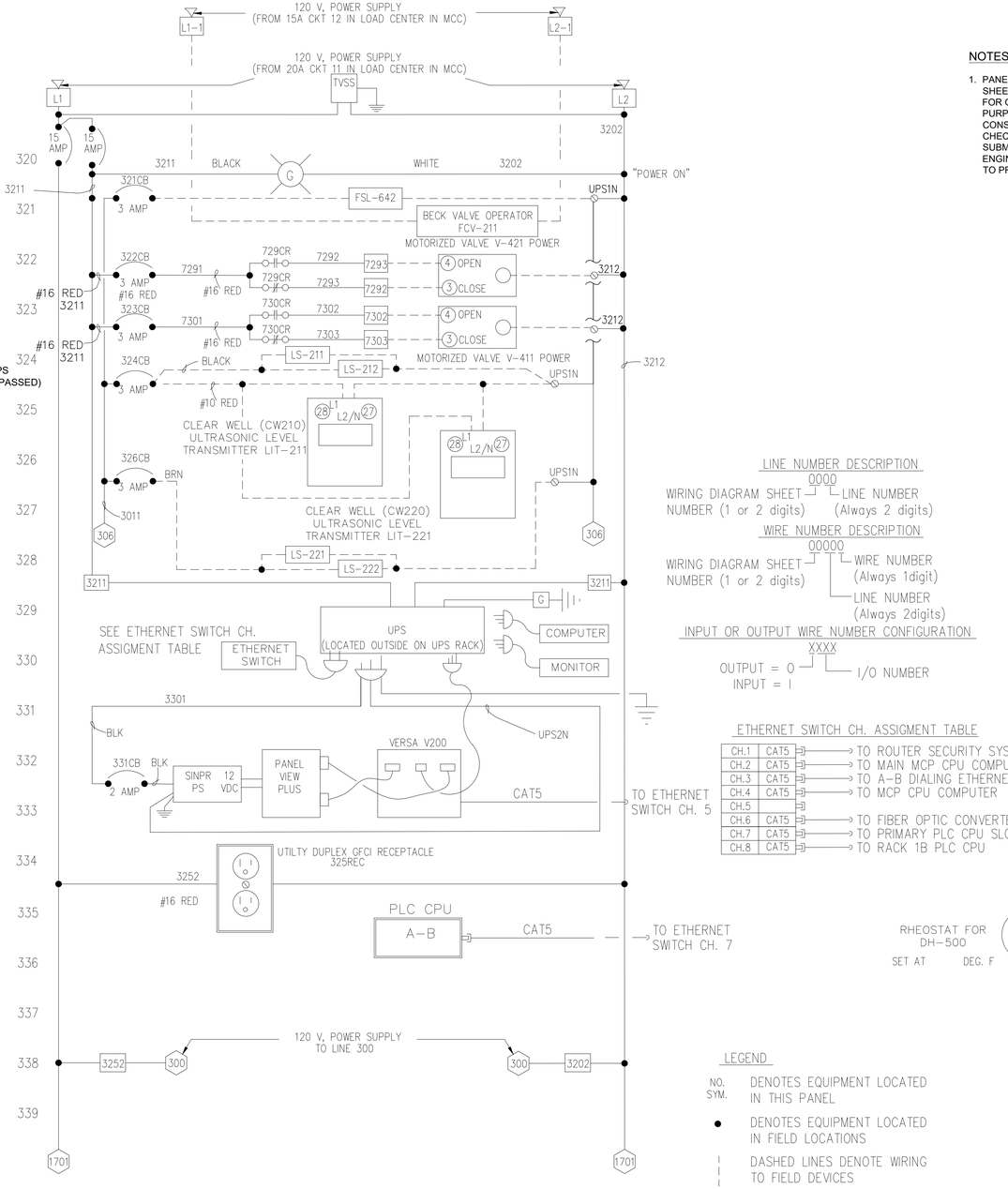
Bar Measures 1 inch

1/4/2019 2:57:47 PM - \\TTS227FS1\PROJECTS\IER\012990200-01299-16001\CAD\SHEETFILES\OU-2\I-202 MAIN CONTROL PANEL (MCP) - COMPONENT LIST.DWG - MARSH, JUSTIN





NOTES:

1. PANEL WIRING DIAGRAMS SHOWN ON DRAWING SHEETS I-203 TO I-214 AND I-300 TO I-305 ARE PROVIDED FOR GENERAL UNDERSTANDING AND FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL FIELD SURVEY, CHECK EXISTING I/O AND PROVIDE SHOP DRAWING SUBMITTALS PER THE SPECIFICATIONS FOR ENGINEERS APPROVAL. CONTRACTOR IS RESPONSIBLE TO PROVIDE A FULLY FUNCTIONAL SYSTEM.

LINE NUMBER DESCRIPTION

0000

WIRING DIAGRAM SHEET NUMBER (1 or 2 digits) — LINE NUMBER (Always 2 digits)

WIRE NUMBER DESCRIPTION

00000

WIRING DIAGRAM SHEET NUMBER (1 or 2 digits) — WIRE NUMBER (Always 1digit); LINE NUMBER (Always 2digits)

INPUT OR OUTPUT WIRE NUMBER CONFIGURATION

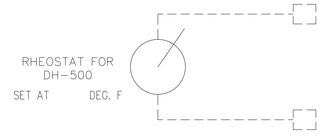
XXXX

OUTPUT = 0
INPUT = I

I/O NUMBER

ETHERNET SWITCH CH. ASSIGMENT TABLE

CH.1	CAT5	TO ROUTER SECURITY SYSTEMS
CH.2	CAT5	TO MAIN MCP CPU COMPUTER
CH.3	CAT5	TO A-B DIALING ETHERNET SWITCH (NOT USED)
CH.4	CAT5	TO MCP CPU COMPUTER
CH.5		
CH.6	CAT5	TO FIBER OPTIC CONVERTER
CH.7	CAT5	TO PRIMARY PLC CPU SLC 5/05
CH.8	CAT5	TO RACK 1B PLC CPU



LEGEND

NO. SYM. DENOTES EQUIPMENT LOCATED IN THIS PANEL

● DENOTES EQUIPMENT LOCATED IN FIELD LOCATIONS

DASHED LINES DENOTE WIRING TO FIELD DEVICES

BASE DRAWING PREPARED FROM DRAWING INFORMATION FROM HORLICK COMPANY INC.

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MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

MAIN CONTROL PANEL (MCP) - POWER DISTRIBUTION WIRING DIAGRAM

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-203

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Bar Measures 1 inch

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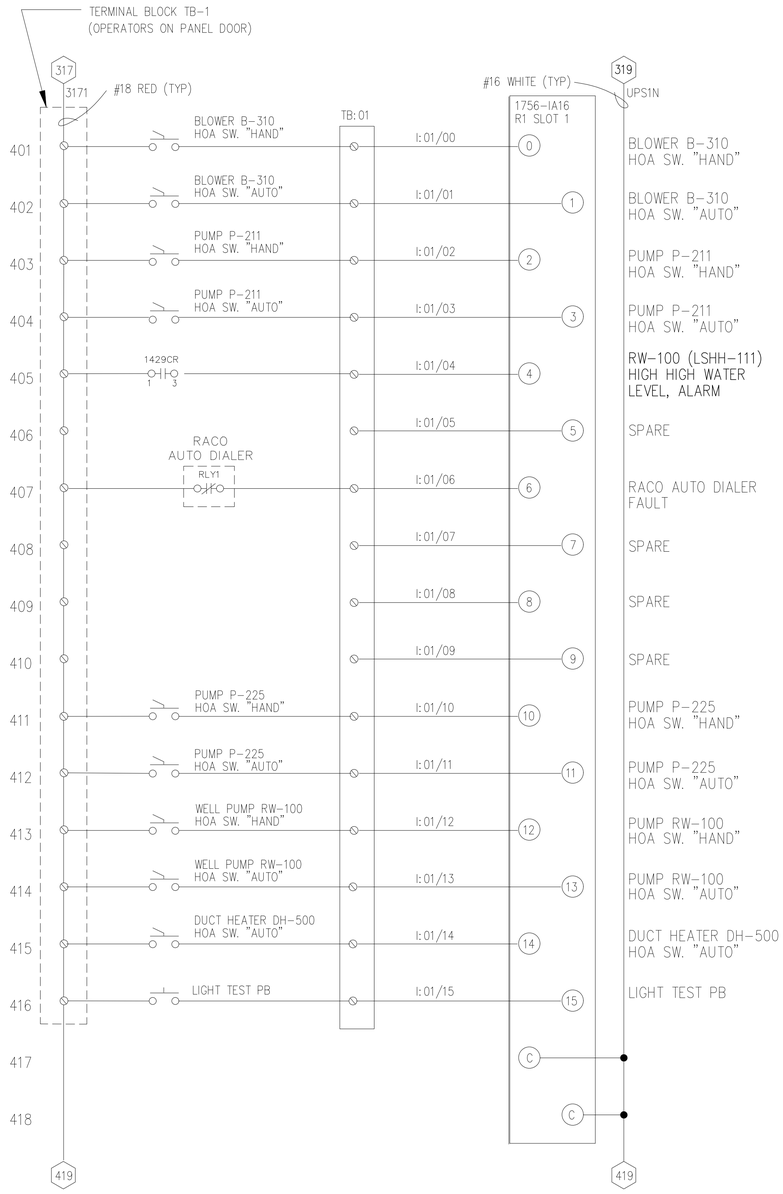

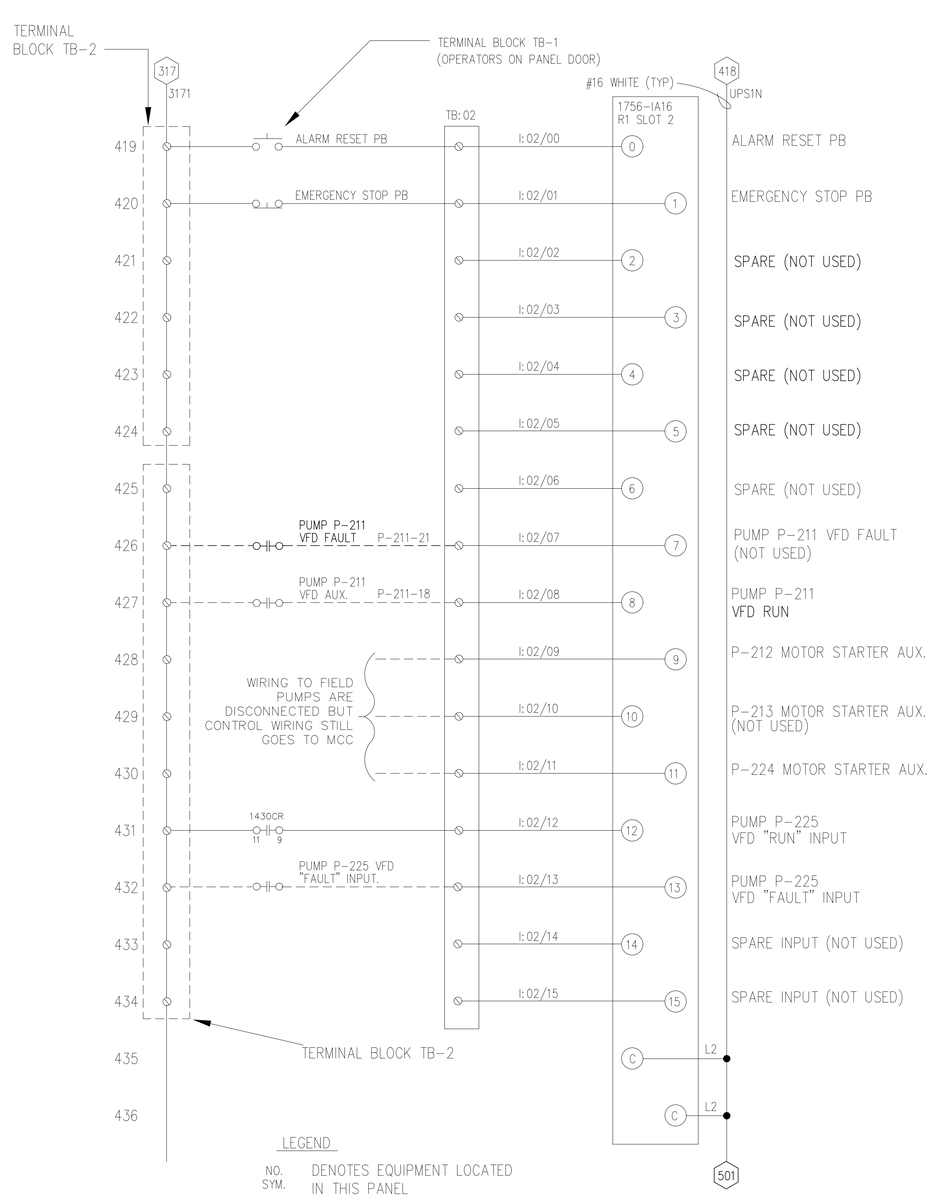

NOTES:

1. PANEL WIRING DIAGRAMS SHOWN ON DRAWING SHEETS I-203 TO I-214 AND I-300 TO I-305 ARE PROVIDED FOR GENERAL UNDERSTANDING AND FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL FIELD SURVEY, CHECK EXISTING I/O AND PROVIDE SHOP DRAWING SUBMITTALS PER THE SPECIFICATIONS FOR ENGINEERS APPROVAL. CONTRACTOR IS RESPONSIBLE TO PROVIDE A FULLY FUNCTIONAL SYSTEM.

LEGEND

NO. SYM. DENOTES EQUIPMENT LOCATED IN THIS PANEL

● DENOTES EQUIPMENT LOCATED IN FIELD LOCATIONS

DASHED LINES DENOTE WIRING TO FIELD DEVICES

✳ DENOTES HAZARDOUS LOCATION (CL 1, DIV. 1) DEVICE

BASE DRAWING PREPARED FROM DRAWING INFORMATION FROM HORLICK COMPANY INC.

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MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

MAIN CONTROL PANEL (MCP) - RACK 1 INPUT SLOTS 1 & 2 WIRING DIAGRAM

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-204

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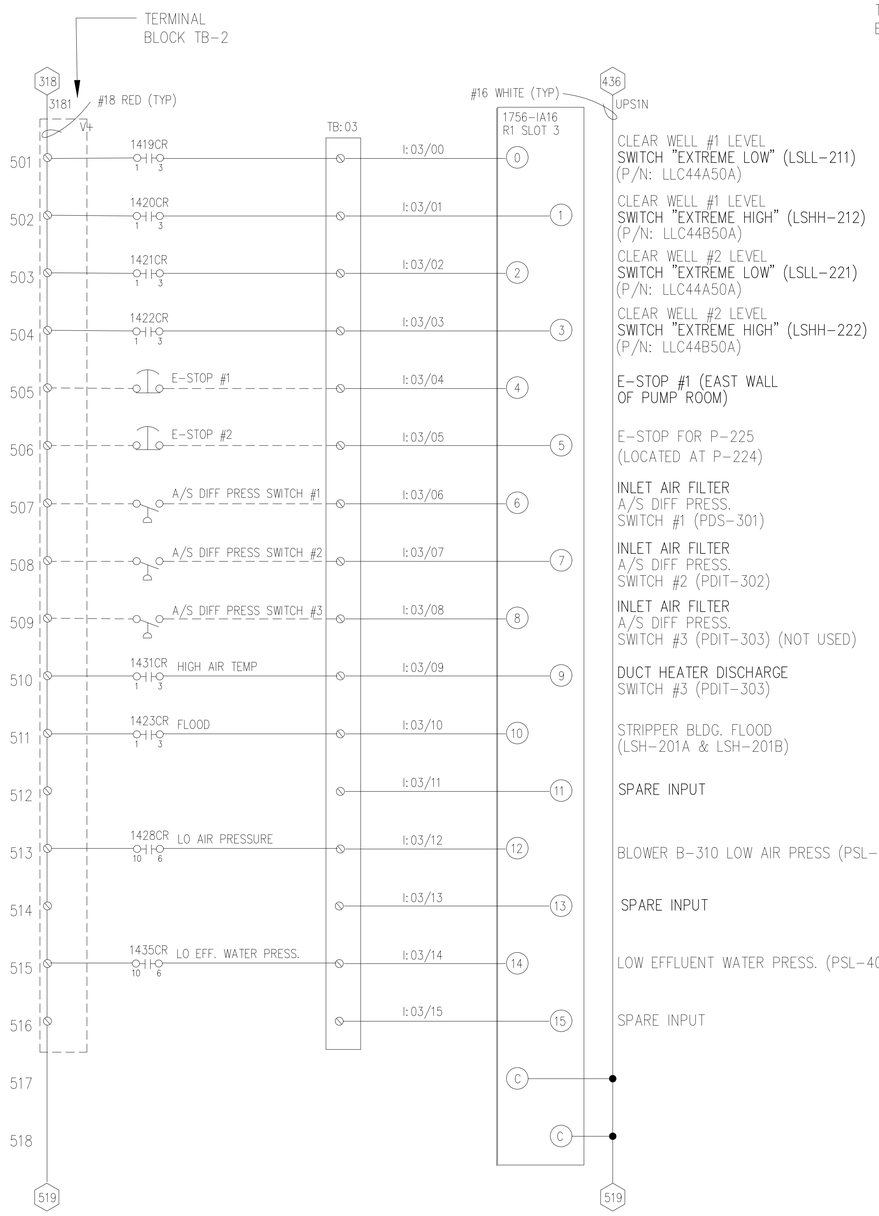
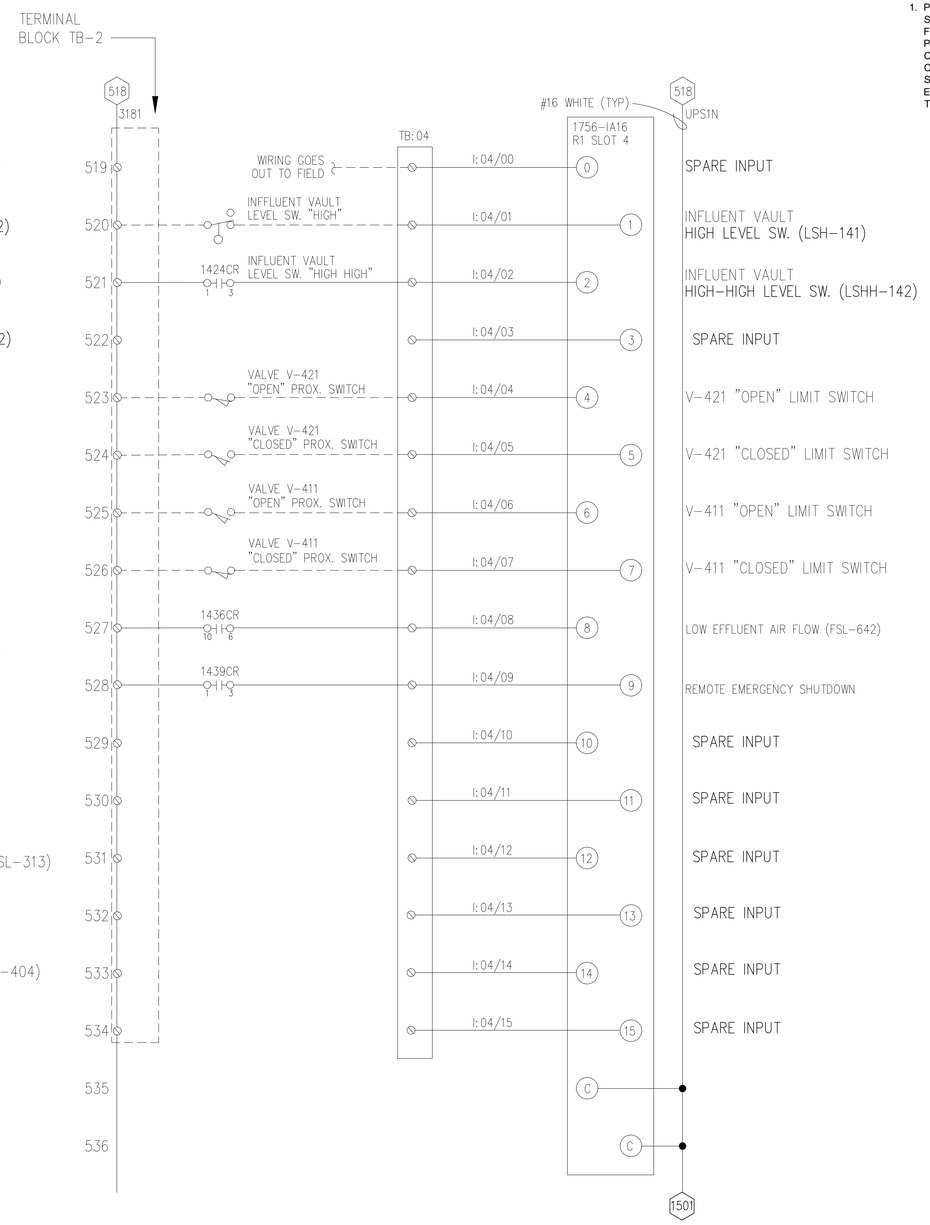
Bar Measures 1 inch

1/4/2019 2:57:54 PM - \\TTSZ2FS1\PROJECTS\ER\01299\200-01299-16001\CAD\SHEETFILES\OU-2\I-204 MAIN CONTROL PANEL (MCP) - RACK 1 INPUT SLOTS 1 & 2 WIRING DIAGRAM.DWG - MARSH, JUSTIN





NOTES:

1. PANEL WIRING DIAGRAMS SHOWN ON DRAWING SHEETS I-203 TO I-214 AND I-300 TO I-305 ARE PROVIDED FOR GENERAL UNDERSTANDING AND FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL FIELD SURVEY, CHECK EXISTING I/O AND PROVIDE SHOP DRAWING SUBMITTALS PER THE SPECIFICATIONS FOR ENGINEERS APPROVAL. CONTRACTOR IS RESPONSIBLE TO PROVIDE A FULLY FUNCTIONAL SYSTEM.

LEGEND

NO. SYM.	
	DENOTES EQUIPMENT LOCATED IN THIS PANEL
●	DENOTES EQUIPMENT LOCATED IN FIELD LOCATIONS
¦ ¦	DASHED LINES DENOTE WIRING TO FIELD DEVICES
✳	DENOTES HAZARDOUS LOCATION (CL 1, DIV. 1) DEVICE

BASE DRAWING PREPARED FROM DRAWING INFORMATION FROM HORLICK COMPANY INC.

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MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

MAIN CONTROL PANEL (MCP) - RACK 1 INPUT SLOTS 3&4 WIRING DIAGRAM

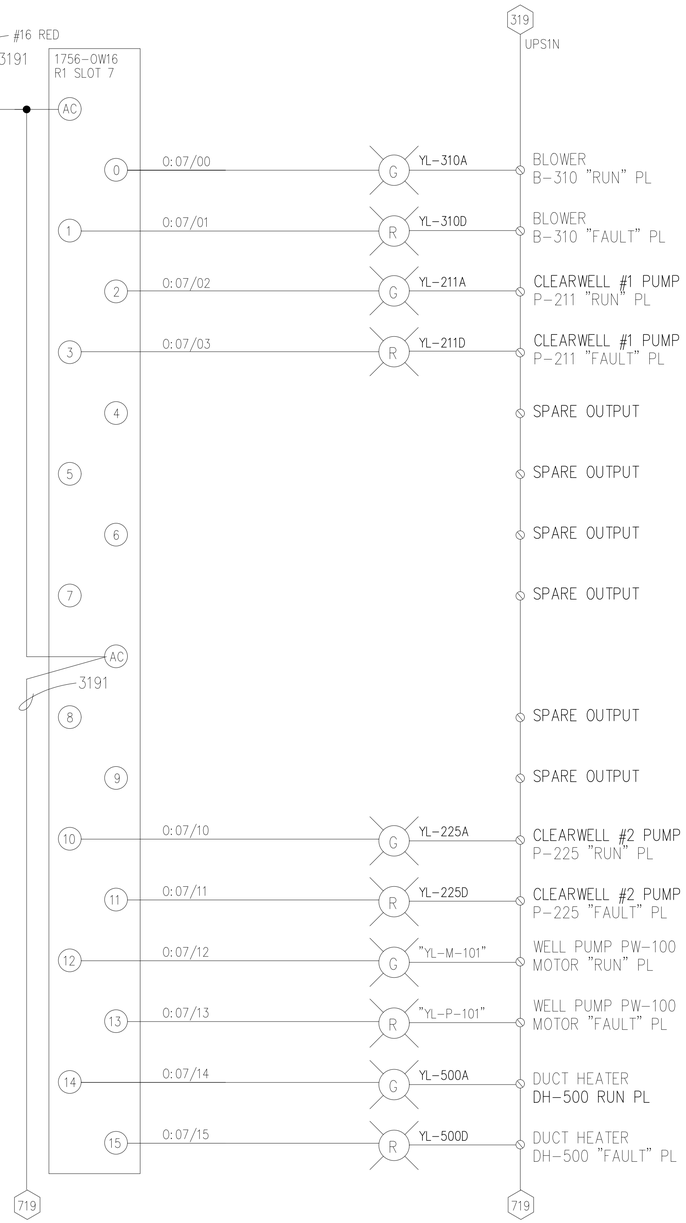
Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

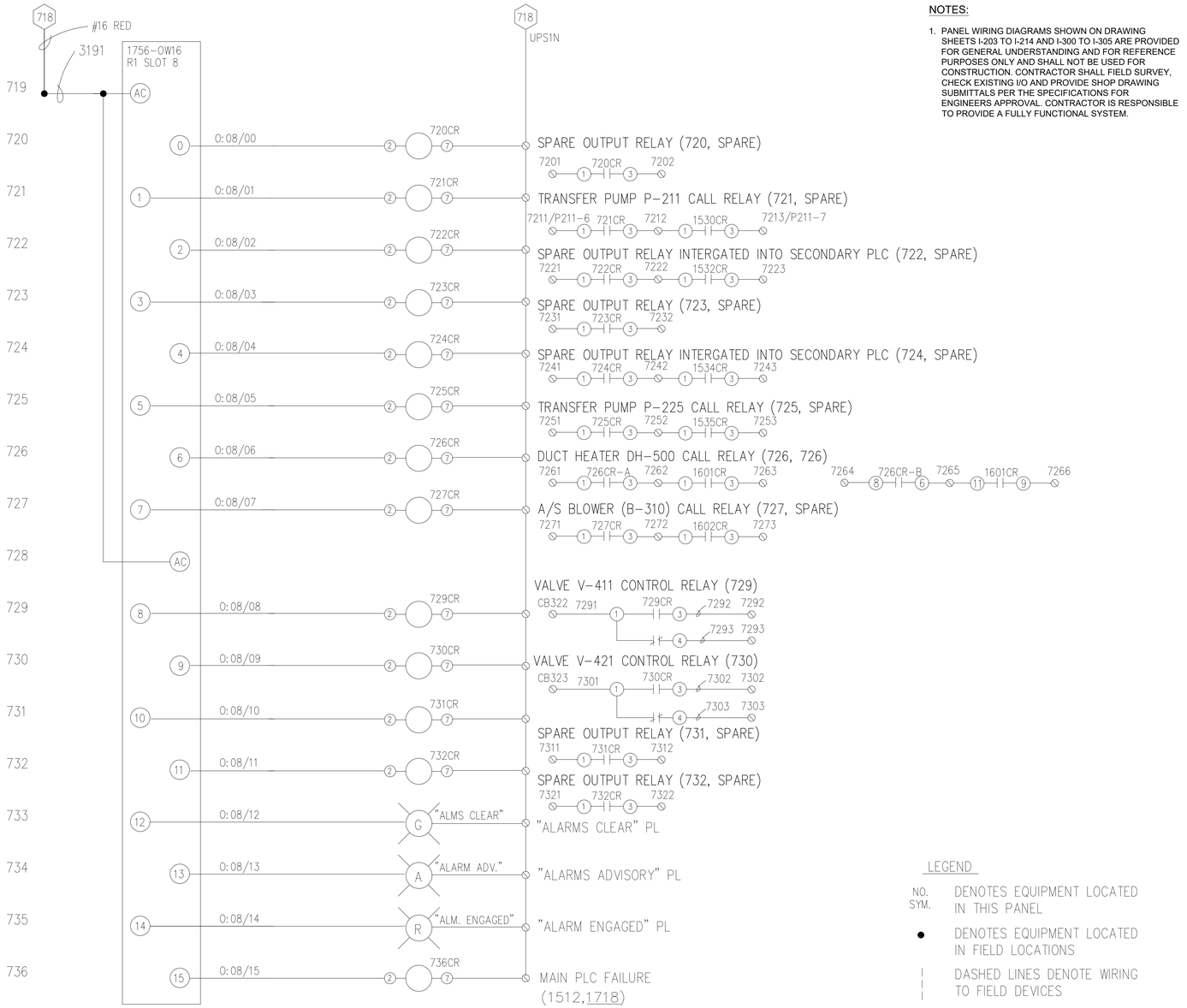
I-205

Copyright: Tetra Tech

Bar Measures 1 inch

1/4/2019 2:57:57 PM - \\TTS227FS1\PROJECTS\IER\01299\200-01299-16001\CAD\SHEETFILES\OU-2\I-205 MAIN CONTROL PANEL (MCP) - RACK 1 INPUT SLOTS 3 & 4 WIRING DIAGRAM.DWG - MARSH, JUSTIN





NOTES:

1. PANEL WIRING DIAGRAMS SHOWN ON DRAWING SHEETS I-203 TO I-214 AND I-300 TO I-305 ARE PROVIDED FOR GENERAL UNDERSTANDING AND FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL FIELD SURVEY, CHECK EXISTING I/O AND PROVIDE SHOP DRAWING SUBMITTALS PER THE SPECIFICATIONS FOR ENGINEERS APPROVAL. CONTRACTOR IS RESPONSIBLE TO PROVIDE A FULLY FUNCTIONAL SYSTEM.

LEGEND

NO. SYM.	
	DENOTES EQUIPMENT LOCATED IN THIS PANEL
●	DENOTES EQUIPMENT LOCATED IN FIELD LOCATIONS
¦ ¦	DASHED LINES DENOTE WIRING TO FIELD DEVICES

BASE DRAWING PREPARED FROM DRAWING INFORMATION FROM HORLICK COMPANY INC.

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MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

MAIN CONTROL PANEL (MCP) - RACK 1 INPUT SLOTS 7 & 8 WIRING DIAGRAM

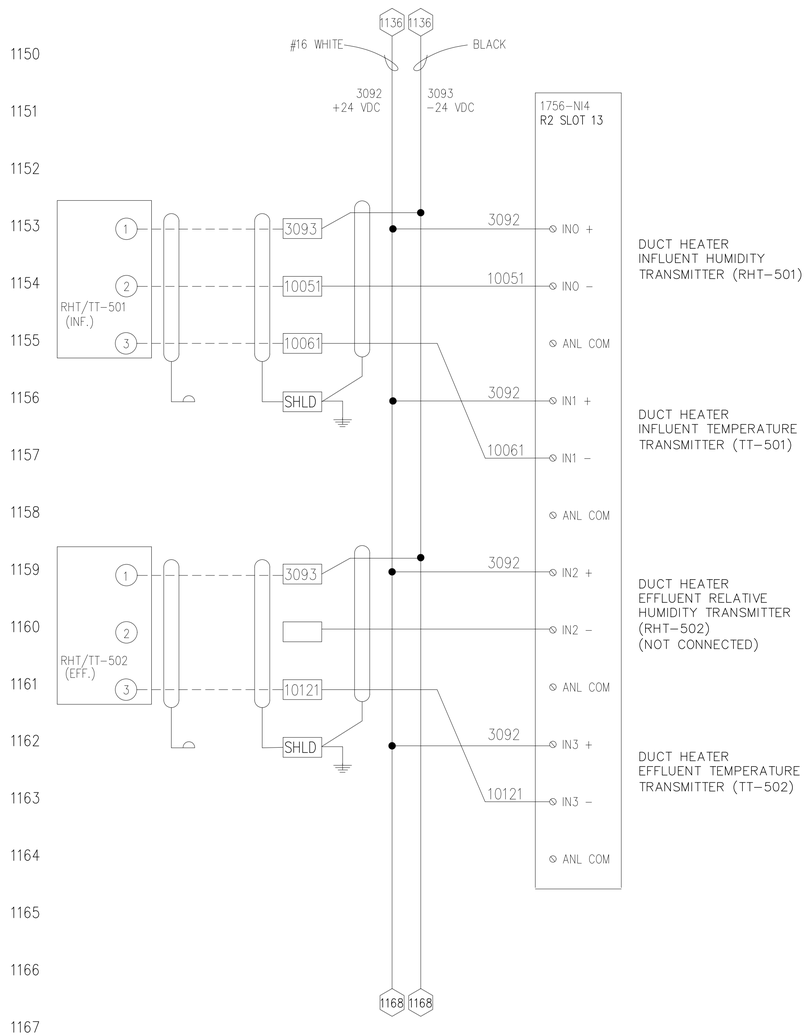
Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

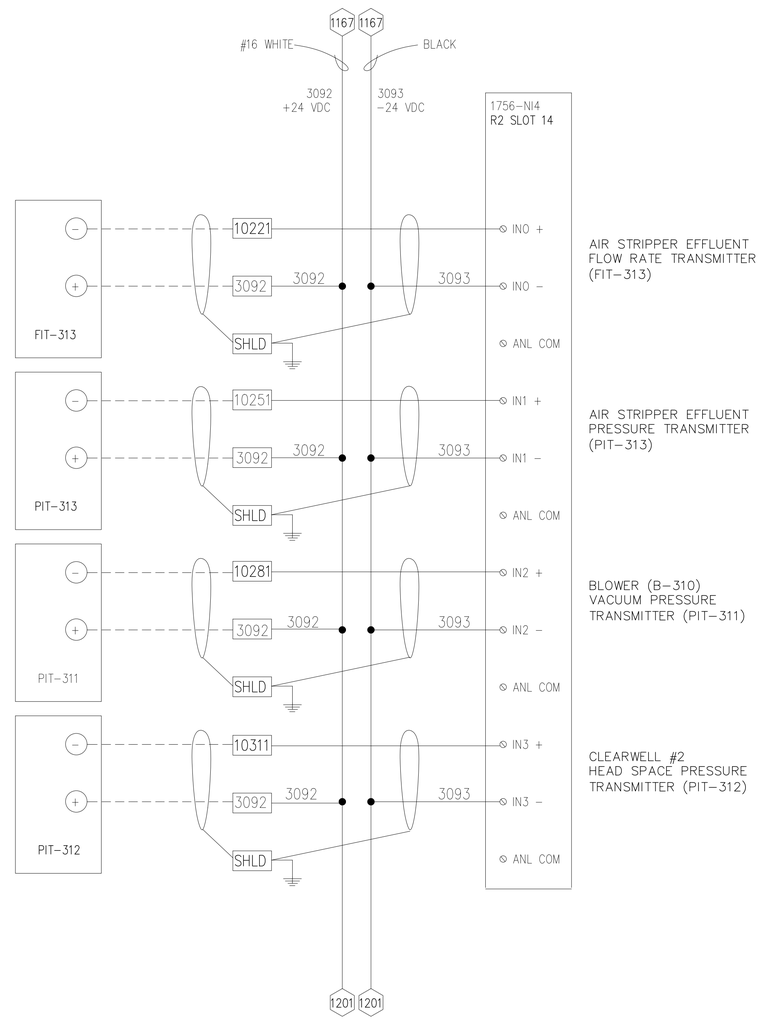
I-206

Bar Measures 1 inch

Copyright: Tetra Tech

1/4/2019 2:58:00 PM - \\TTS227FS1\PROJECTS\IER\01299\200-01299-16001\CAD\SHEETFILES\OU-2\I-206 MAIN CONTROL PANEL (MCP) - RACK 1 INPUT SLOTS 7 & 8 WIRING DIAGRAM.DWG - MARSH, JUSTIN





NOTES:

1. PANEL WIRING DIAGRAMS SHOWN ON DRAWING SHEETS I-203 TO I-214 AND I-300 TO I-305 ARE PROVIDED FOR GENERAL UNDERSTANDING AND FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL FIELD SURVEY, CHECK EXISTING I/O AND PROVIDE SHOP DRAWING SUBMITTALS PER THE SPECIFICATIONS FOR ENGINEERS APPROVAL. CONTRACTOR IS RESPONSIBLE TO PROVIDE A FULLY FUNCTIONAL SYSTEM.

LEGEND

NO. SYM.	DENOTES EQUIPMENT LOCATED IN THIS PANEL
●	DENOTES EQUIPMENT LOCATED IN FIELD LOCATIONS
¦ ¦	DASHED LINES DENOTE WIRING TO FIELD DEVICES
✳	DENOTES HAZARDOUS LOCATION (CL 1, DIV. 1) DEVICE

LINE NUMBER DESCRIPTION

0000 — WIRING DIAGRAM SHEET NUMBER (1 or 2 digits); LINE NUMBER (Always 2 digits)

WIRE NUMBER DESCRIPTION

00000 — WIRING DIAGRAM SHEET NUMBER (1 or 2 digits); WIRE NUMBER (Always 1digit); LINE NUMBER (Always 2digits)

INPUT OR OUTPUT WIRE NUMBER CONFIGURATION

XXXX — OUTPUT = 0, INPUT = I; I/O NUMBER

BASE DRAWING PREPARED FROM DRAWING INFORMATION FROM HORLICK COMPANY INC.

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MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

MAIN CONTROL PANEL (MCP) - RACK 2 INPUT SLOTS 13 & 14 WIRING DIAGRAM

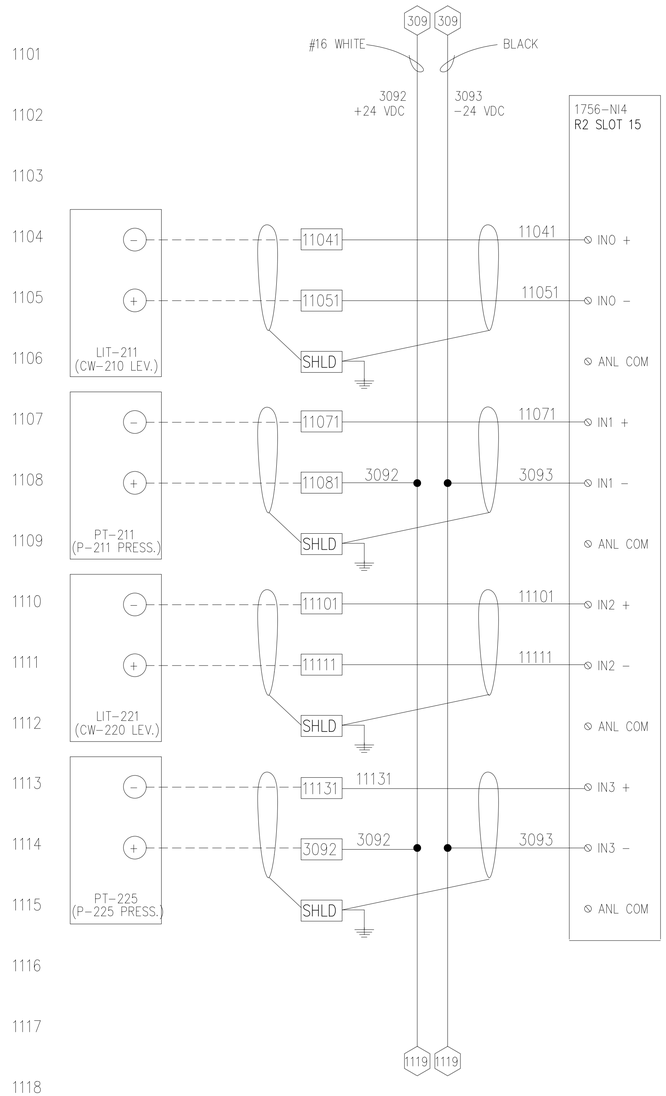
Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-207

Copyright Tetra Tech

Bar Measures 1 inch

1/4/2019 2:58:03 PM - \\TTS227FS11\PROJECTS\IER\01299\200-01299-16001\CAD\SHEETFILES\OU-2\I-207 MAIN CONTROL PANEL (MCP) - RACK 2 INPUT SLOTS 13 & 14 WIRING DIAGRAM.DWG - MARSH, JUSTIN

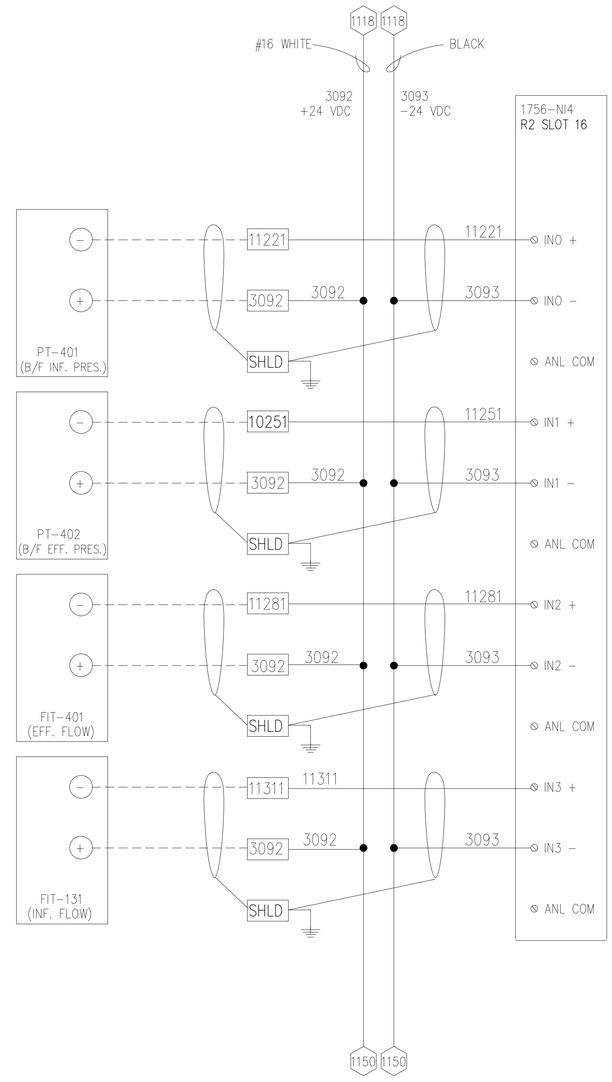


CLEARWELL #1 (CW210)
UTRASONIC
LEVEL TRANSMITTER (LE/LIT−211)

CLEARWELL #1 (PT−211)
PRESSURE TRANSMITTER
EFFLUENT

CLEARWELL #2 (CW220)
UTRASONIC
LEVEL TRANSMITTER (LE/LIT−221)

CLEARWELL #2 PUMP (PT−225)
EFFLUENT PRESSURE TRANSMITTER



BAG FILTER ASSEMBLY
INFLUENT PRESSURE TRANSMITTER
(PT−401)

BAG FILTER ASSEMBLY
EFFLUENT PRESSURE TRANSMITTER
(PT−402)

OU−2 EFFLUENT
FLOW TRANSMITTER
(FIT−401)

OU−2 INFLUENT
FLOW TRANSMITTER
(FIT−131)

NOTES:

1. PANEL WIRING DIAGRAMS SHOWN ON DRAWING SHEETS I-203 TO I-214 AND I-300 TO I-305 ARE PROVIDED FOR GENERAL UNDERSTANDING AND FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL FIELD SURVEY, CHECK EXISTING I/O AND PROVIDE SHOP DRAWING SUBMITTALS PER THE SPECIFICATIONS FOR ENGINEERS APPROVAL. CONTRACTOR IS RESPONSIBLE TO PROVIDE A FULLY FUNCTIONAL SYSTEM.

LEGEND

NO. SYM. DENOTES EQUIPMENT LOCATED IN THIS PANEL

● DENOTES EQUIPMENT LOCATED IN FIELD LOCATIONS

DASHED LINES DENOTE WIRING TO FIELD DEVICES

✳ DENOTES HAZARDOUS LOCATION (CL 1, DIV. 1) DEVICE

LINE NUMBER DESCRIPTION

0000
WIRING DIAGRAM SHEET NUMBER (1 or 2 digits) — LINE NUMBER (Always 2 digits)

WIRE NUMBER DESCRIPTION

00000
WIRING DIAGRAM SHEET NUMBER (1 or 2 digits) — WIRE NUMBER (Always 1digit); LINE NUMBER (Always 2digits)

INPUT OR OUTPUT WIRE NUMBER CONFIGURATION

XXXX
OUTPUT = 0, INPUT = I — I/O NUMBER

BASE DRAWING PREPARED FROM DRAWING INFORMATION FROM HORLICK COMPANY INC.

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MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

MAIN CONTROL PANEL (MCP) - RACK 2 INPUT SLOTS 15 & 16 WIRING DIAGRAM

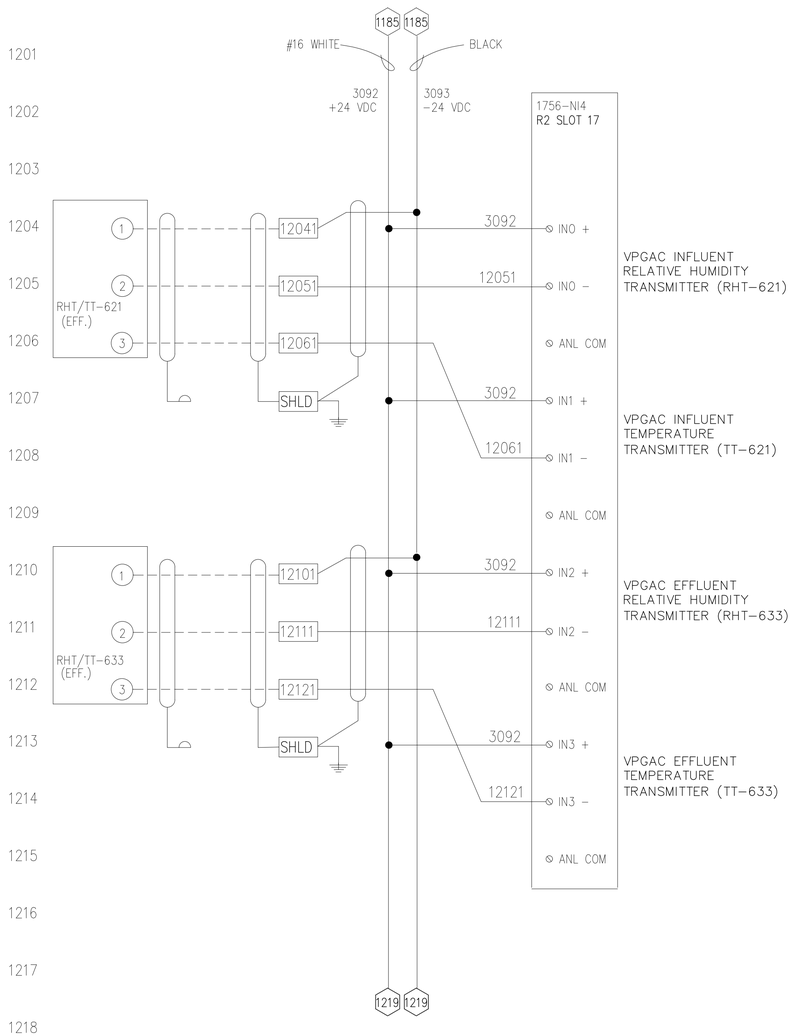
Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

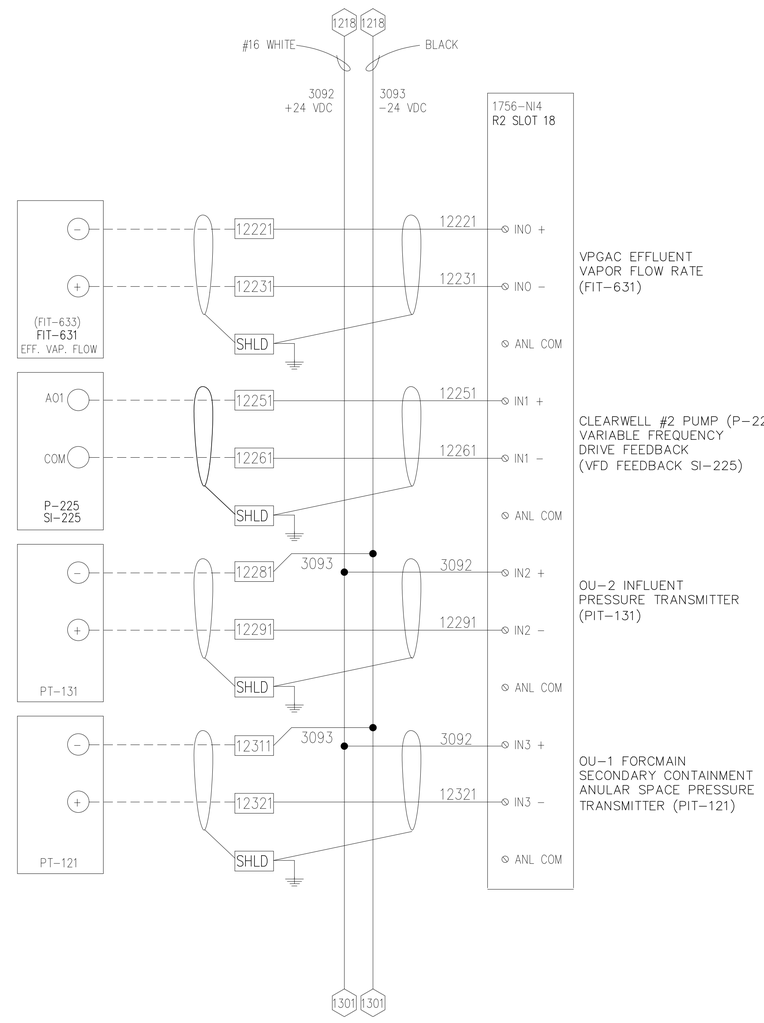
I-208

Copyright: Tetra Tech

Bar Measures 1 inch

1/4/2019 2:58:06 PM - \\TTS227FS1\PROJECTS\IER\01299\200-01299-16001\CAD\SHEETFILES\OU-2\I-208 MAIN CONTROL PANEL (MCP) - RACK 2 INPUT SLOTS 15 & 16 WIRING DIAGRAM.DWG - MARSH, JUSTIN





NOTES:

1. PANEL WIRING DIAGRAMS SHOWN ON DRAWING SHEETS I-203 TO I-214 AND I-300 TO I-305 ARE PROVIDED FOR GENERAL UNDERSTANDING AND FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL FIELD SURVEY, CHECK EXISTING I/O AND PROVIDE SHOP DRAWING SUBMITTALS PER THE SPECIFICATIONS FOR ENGINEERS APPROVAL. CONTRACTOR IS RESPONSIBLE TO PROVIDE A FULLY FUNCTIONAL SYSTEM.

LEGEND

NO. SYM.	DENOTES EQUIPMENT LOCATED IN THIS PANEL
●	DENOTES EQUIPMENT LOCATED IN FIELD LOCATIONS
¦ ¦	DASHED LINES DENOTE WIRING TO FIELD DEVICES
✳	DENOTES HAZARDOUS LOCATION (CL 1, DIV. 1) DEVICE

LINE NUMBER DESCRIPTION

0000
- WIRING DIAGRAM SHEET NUMBER (1 or 2 digits)
- LINE NUMBER (Always 2 digits)

WIRE NUMBER DESCRIPTION

00000
- WIRING DIAGRAM SHEET NUMBER (1 or 2 digits)
- WIRE NUMBER (Always 1digit)
- LINE NUMBER (Always 2digits)

INPUT OR OUTPUT WIRE NUMBER CONFIGURATION

XXXX
- OUTPUT = O
- INPUT = I
- I/O NUMBER

BASE DRAWING PREPARED FROM DRAWING INFORMATION FROM HORLICK COMPANY INC.

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MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

MAIN CONTROL PANEL (MCP) - RACK 2 INPUT SLOTS 17 & 18 WIRING DIAGRAM

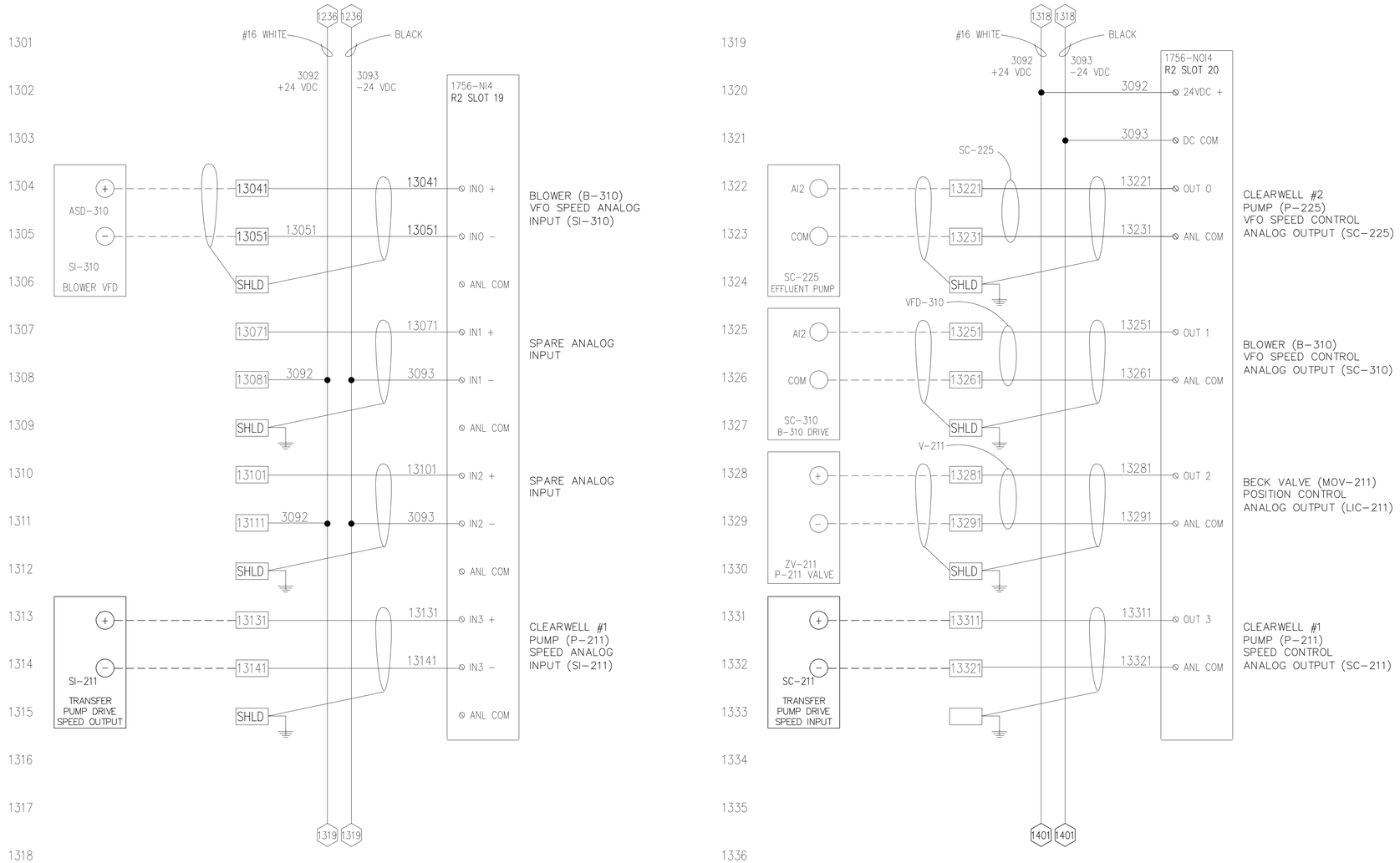
Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-209

Bar Measures 1 inch

Copyright: Tetra Tech

1/4/2019 2:58:09 PM - \\TTS227FS1\PROJECTS\ER\01299\200-01299-16001\CAD\SHEETFILES\OU-2\I-209 MAIN CONTROL PANEL (MCP) - RACK 2 INPUT SLOTS 17 & 18 WIRING DIAGRAM.DWG - MARSH, JUSTIN



NOTES:

1. PANEL WIRING DIAGRAMS SHOWN ON DRAWING SHEETS I-203 TO I-214 AND I-300 TO I-305 ARE PROVIDED FOR GENERAL UNDERSTANDING AND FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL FIELD SURVEY, CHECK EXISTING I/O AND PROVIDE SHOP DRAWING SUBMITTALS PER THE SPECIFICATIONS FOR ENGINEERS APPROVAL. CONTRACTOR IS RESPONSIBLE TO PROVIDE A FULLY FUNCTIONAL SYSTEM.

LEGEND

NO. SYM.	DENOTES EQUIPMENT LOCATED IN THIS PANEL
●	DENOTES EQUIPMENT LOCATED IN FIELD LOCATIONS
¦ ¦	DASHED LINES DENOTE WIRING TO FIELD DEVICES
✳	DENOTES HAZARDOUS LOCATION (CL 1, DIV. 1) DEVICE

LINE NUMBER DESCRIPTION

0000
WIRING DIAGRAM SHEET NUMBER (1 or 2 digits) — LINE NUMBER (Always 2 digits)

WIRE NUMBER DESCRIPTION

00000
WIRING DIAGRAM SHEET NUMBER (1 or 2 digits) — WIRE NUMBER (Always 1digit); LINE NUMBER (Always 2digits)

INPUT OR OUTPUT WIRE NUMBER CONFIGURATION

XXXX
OUTPUT = 0
INPUT = I
I/O NUMBER

BASE DRAWING PREPARED FROM DRAWING INFORMATION FROM HORLICK COMPANY INC.

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MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

MAIN CONTROL PANEL (MCP) - RACK 2 INPUT SLOTS 19 & 20 WIRING DIAGRAM

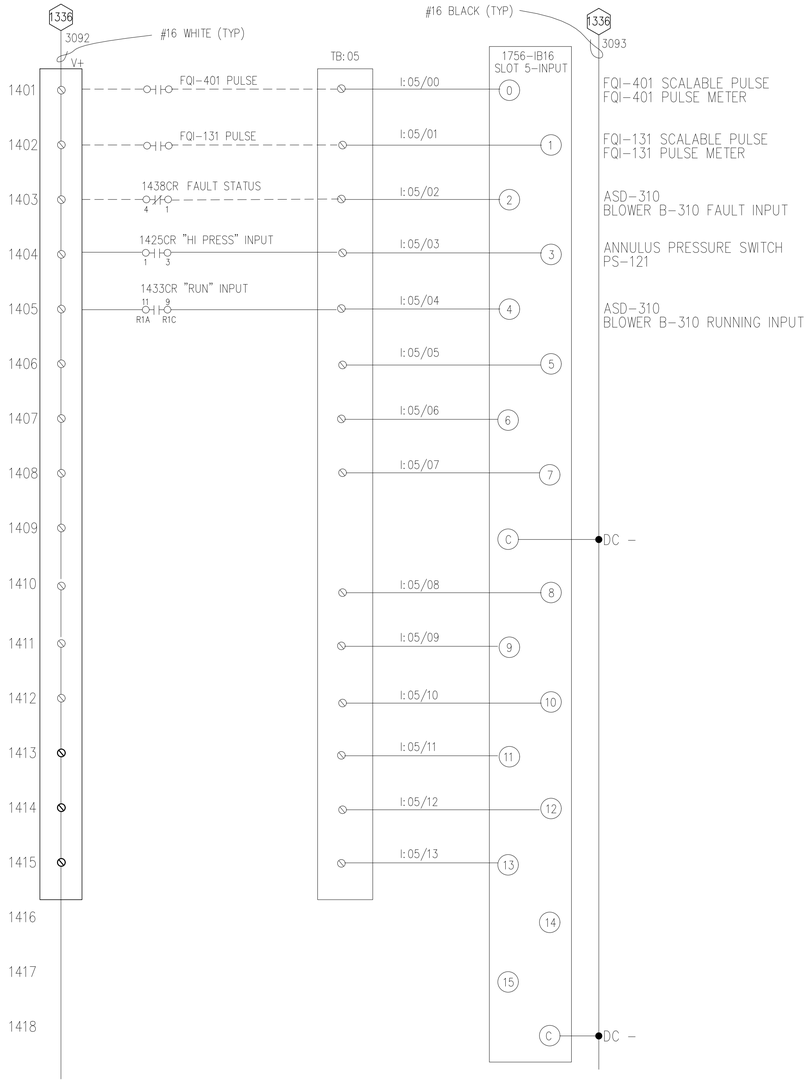
Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

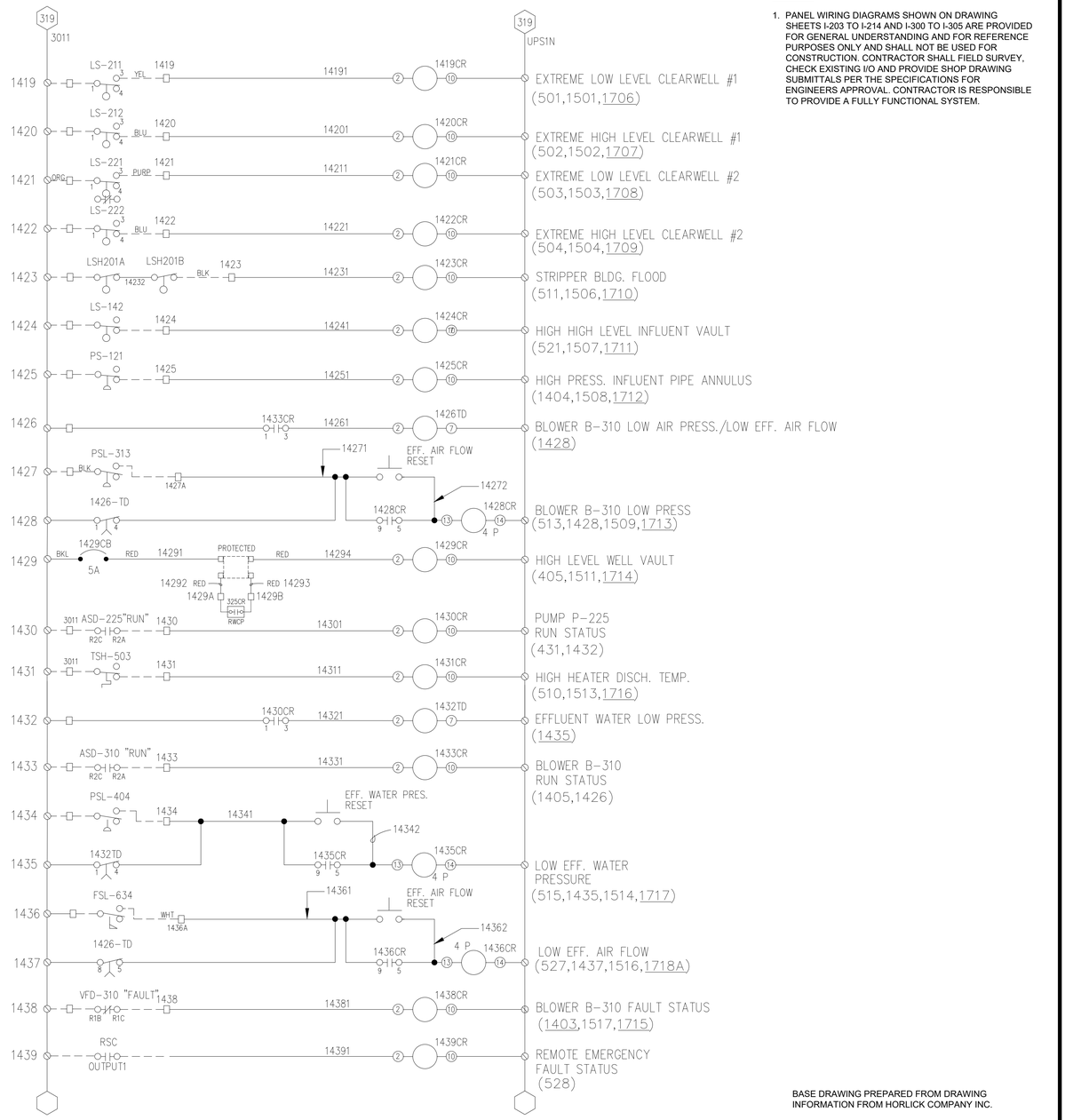
I-210

Copyright: Tetra Tech

Bar Measures 1 inch

1/4/2019 2:58:12 PM - \\TTS227FS1\PROJECTS\IER\01299\200-01299-16001\CAD\SHEETFILES\OU-2\I-210 MAIN CONTROL PANEL (MCP) - RACK 2 INPUT SLOTS 19 & 20 WIRING DIAGRAM.DWG - MARSH, JUSTIN





NOTES:

1. PANEL WIRING DIAGRAMS SHOWN ON DRAWING SHEETS I-203 TO I-214 AND I-300 TO I-305 ARE PROVIDED FOR GENERAL UNDERSTANDING AND FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL FIELD SURVEY, CHECK EXISTING I/O AND PROVIDE SHOP DRAWING SUBMITTALS PER THE SPECIFICATIONS FOR ENGINEERS APPROVAL. CONTRACTOR IS RESPONSIBLE TO PROVIDE A FULLY FUNCTIONAL SYSTEM.

BASE DRAWING PREPARED FROM DRAWING INFORMATION FROM HORLICK COMPANY INC.

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MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

MAIN CONTROL PANEL (MCP) - INPUT & OUTPUT SLOT WIRING DIAGRAM

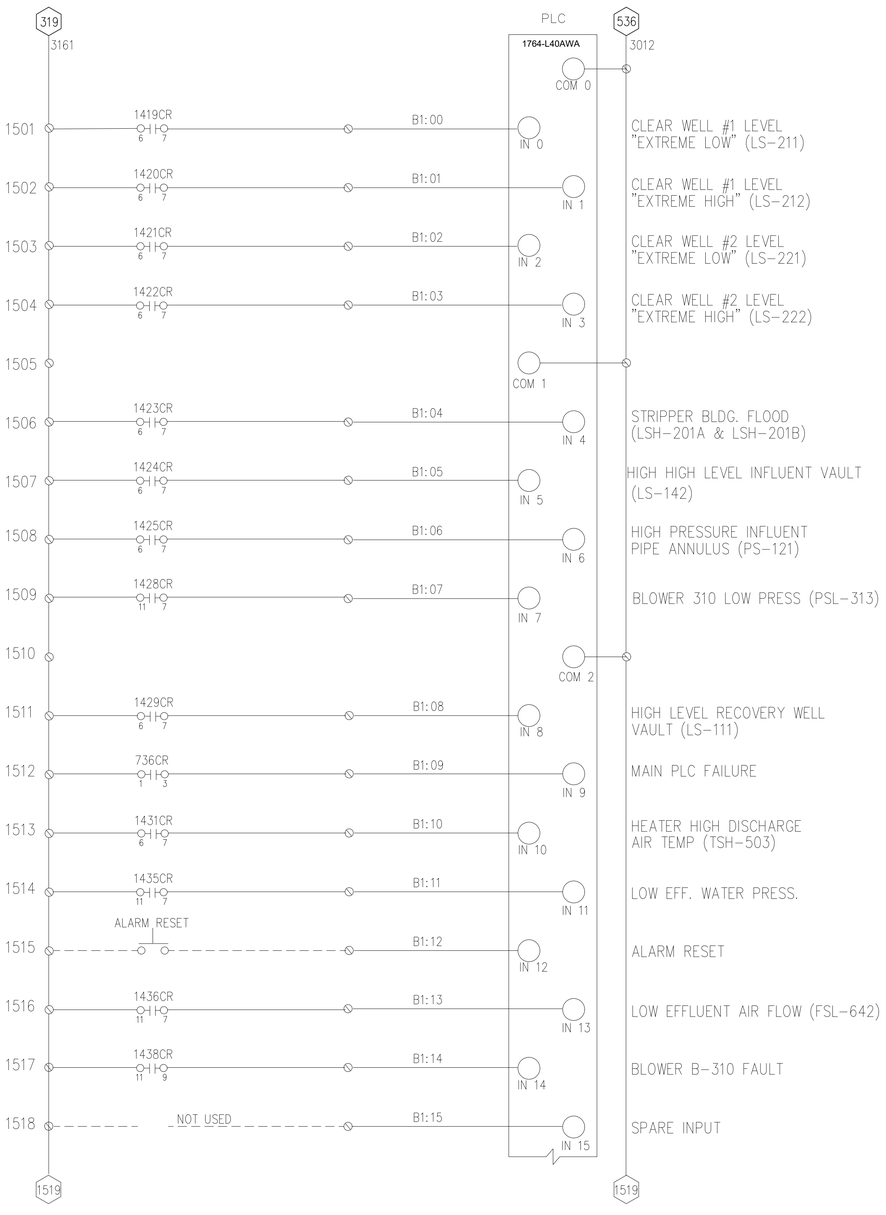
Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

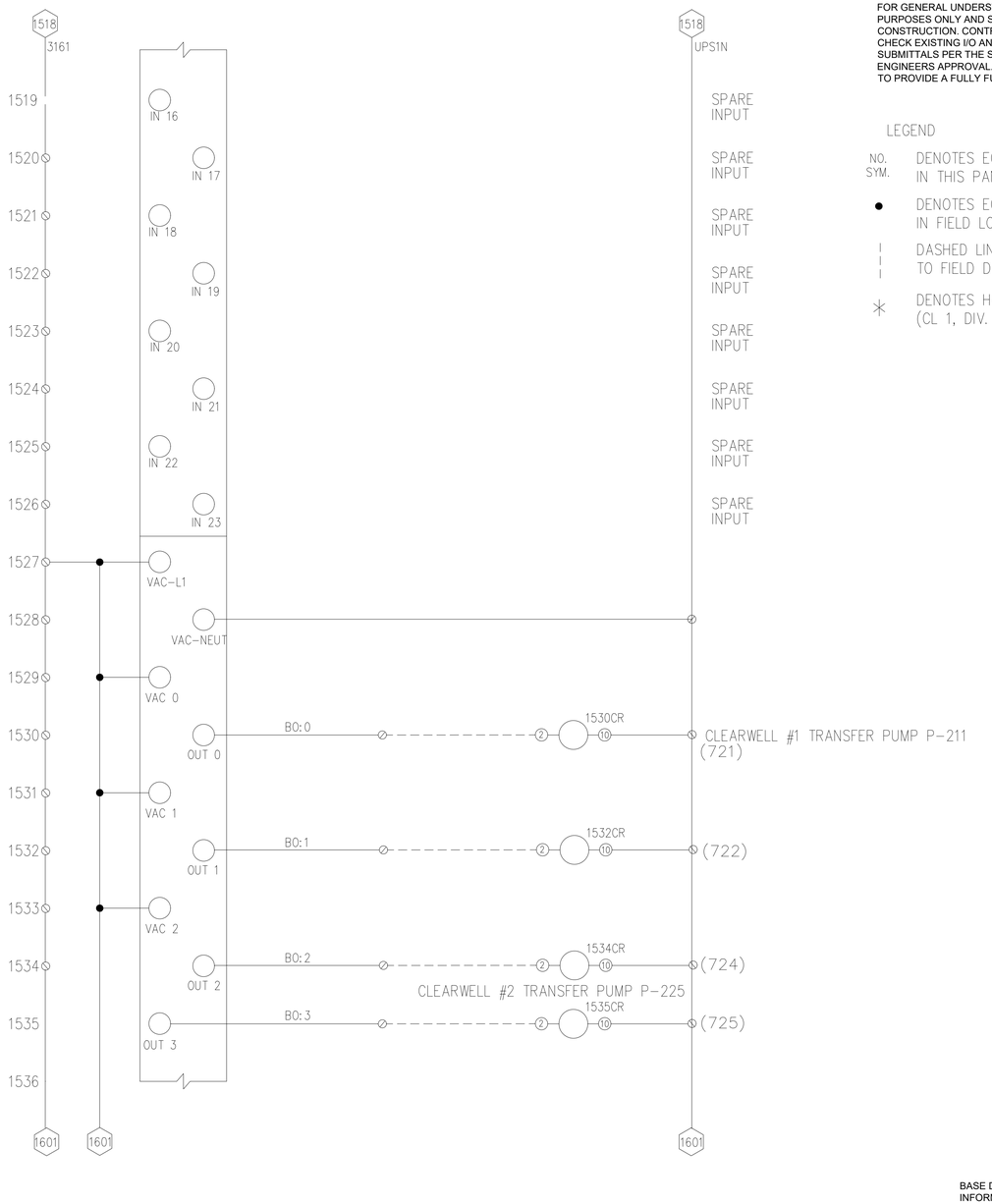
I-211

Copyright: Tetra Tech

Bar Measures 1 inch

1/4/2019 2:58:15 PM - \\TTS227FS1\PROJECTS\IER\01299\200-01299-160011\CAD\SHEETFILES\OU-2\I-211 MAIN CONTROL PANEL (MCP) - SLOT 21 WIRING DIAGRAM & SECONDARY RELAY LOGIC.DWG - MARSH, JUSTIN





NOTES:

1. PANEL WIRING DIAGRAMS SHOWN ON DRAWING SHEETS I-203 TO I-214 AND I-300 TO I-305 ARE PROVIDED FOR GENERAL UNDERSTANDING AND FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL FIELD SURVEY, CHECK EXISTING I/O AND PROVIDE SHOP DRAWING SUBMITTALS PER THE SPECIFICATIONS FOR ENGINEERS APPROVAL. CONTRACTOR IS RESPONSIBLE TO PROVIDE A FULLY FUNCTIONAL SYSTEM.

LEGEND

NO. SYM.	
	DENOTES EQUIPMENT LOCATED IN THIS PANEL
●	DENOTES EQUIPMENT LOCATED IN FIELD LOCATIONS
⁞	DASHED LINES DENOTE WIRING TO FIELD DEVICES
✳	DENOTES HAZARDOUS LOCATION (CL 1, DIV. 1) DEVICE

BASE DRAWING PREPARED FROM DRAWING INFORMATION FROM HORLICK COMPANY INC.

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MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

MAIN CONTROL PANEL (MCP) - INPUT & OUTPUT SLOT WIRING DIAGRAM

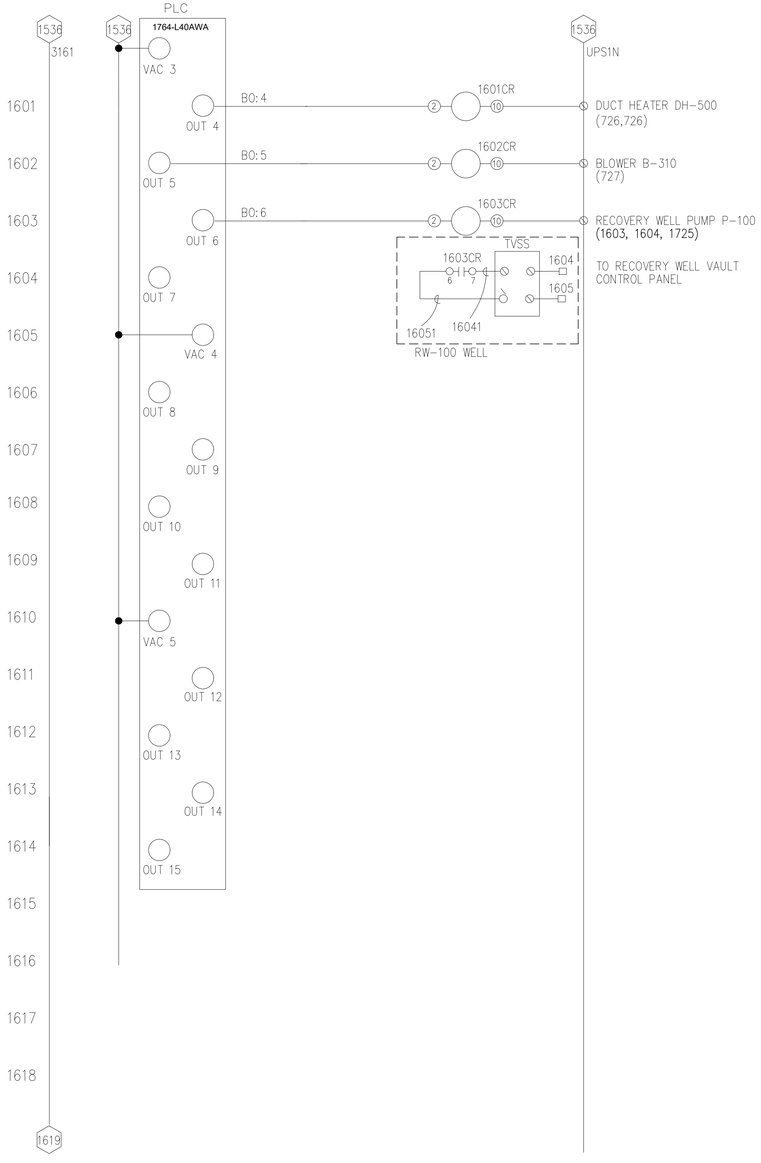
Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

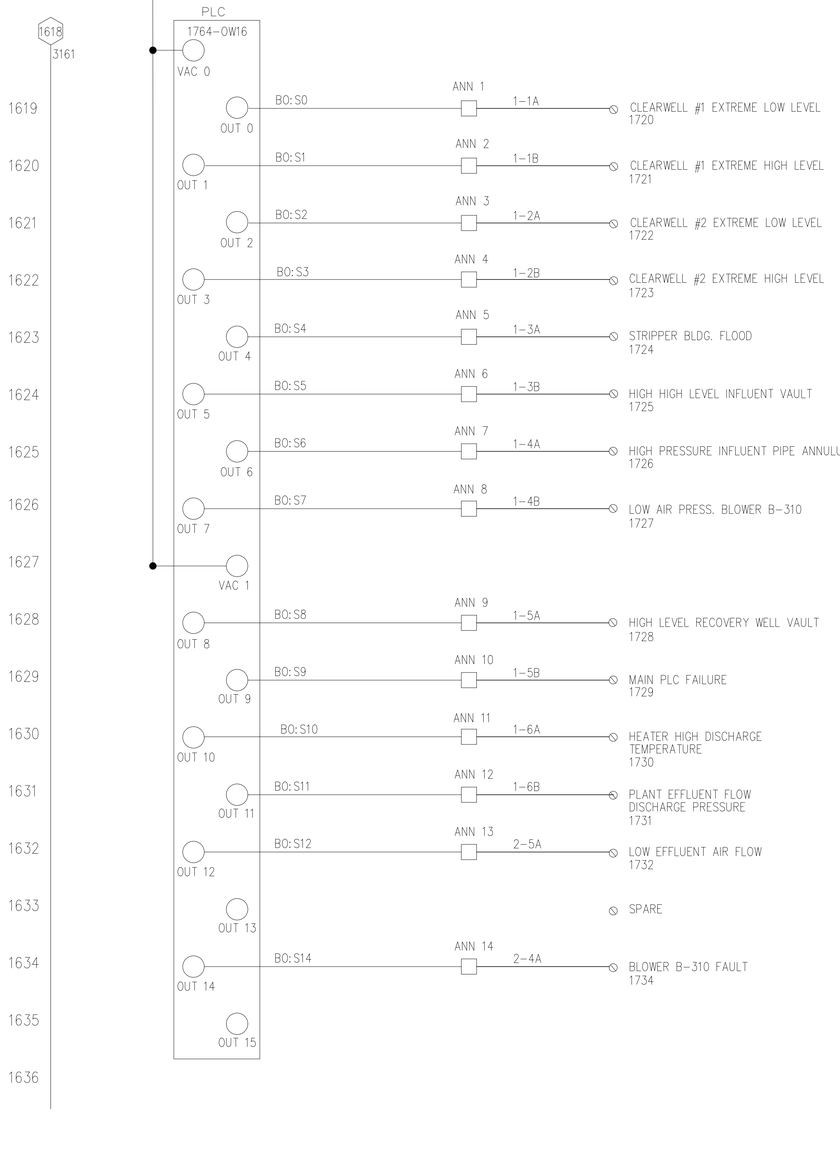
I-212

Copyright: Tetra Tech

Bar Measures 1 inch

1/4/2019 2:58:19 PM - \\TTS227FS1\PROJECTS\ER\01299\200-01299-16001\CAD\SHEETFILES\OU-2\I-212 MAIN CONTROL PANEL (MCP) - INPUT & OUTPUT SLOT WIRING DIAGRAM.DWG - MARSH, JUSTIN





NOTES:

1. PANEL WIRING DIAGRAMS SHOWN ON DRAWING SHEETS I-203 TO I-214 AND I-300 TO I-305 ARE PROVIDED FOR GENERAL UNDERSTANDING AND FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL FIELD SURVEY, CHECK EXISTING I/O AND PROVIDE SHOP DRAWING SUBMITTALS PER THE SPECIFICATIONS FOR ENGINEERS APPROVAL. CONTRACTOR IS RESPONSIBLE TO PROVIDE A FULLY FUNCTIONAL SYSTEM.

LEGEND

NO. SYM.	DENOTES EQUIPMENT LOCATED IN THIS PANEL
●	DENOTES EQUIPMENT LOCATED IN FIELD LOCATIONS
¦ ¦ ¦	DASHED LINES DENOTE WIRING TO FIELD DEVICES
✳	DENOTES HAZARDOUS LOCATION (CL 1, DIV. 1) DEVICE

BASE DRAWING PREPARED FROM DRAWING INFORMATION FROM HORLICK COMPANY INC.

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MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

MAIN CONTROL PANEL (MCP) - SECONDARY PLC OUTPUT SLOTS 15 & 16 WIRING DIAGRAM

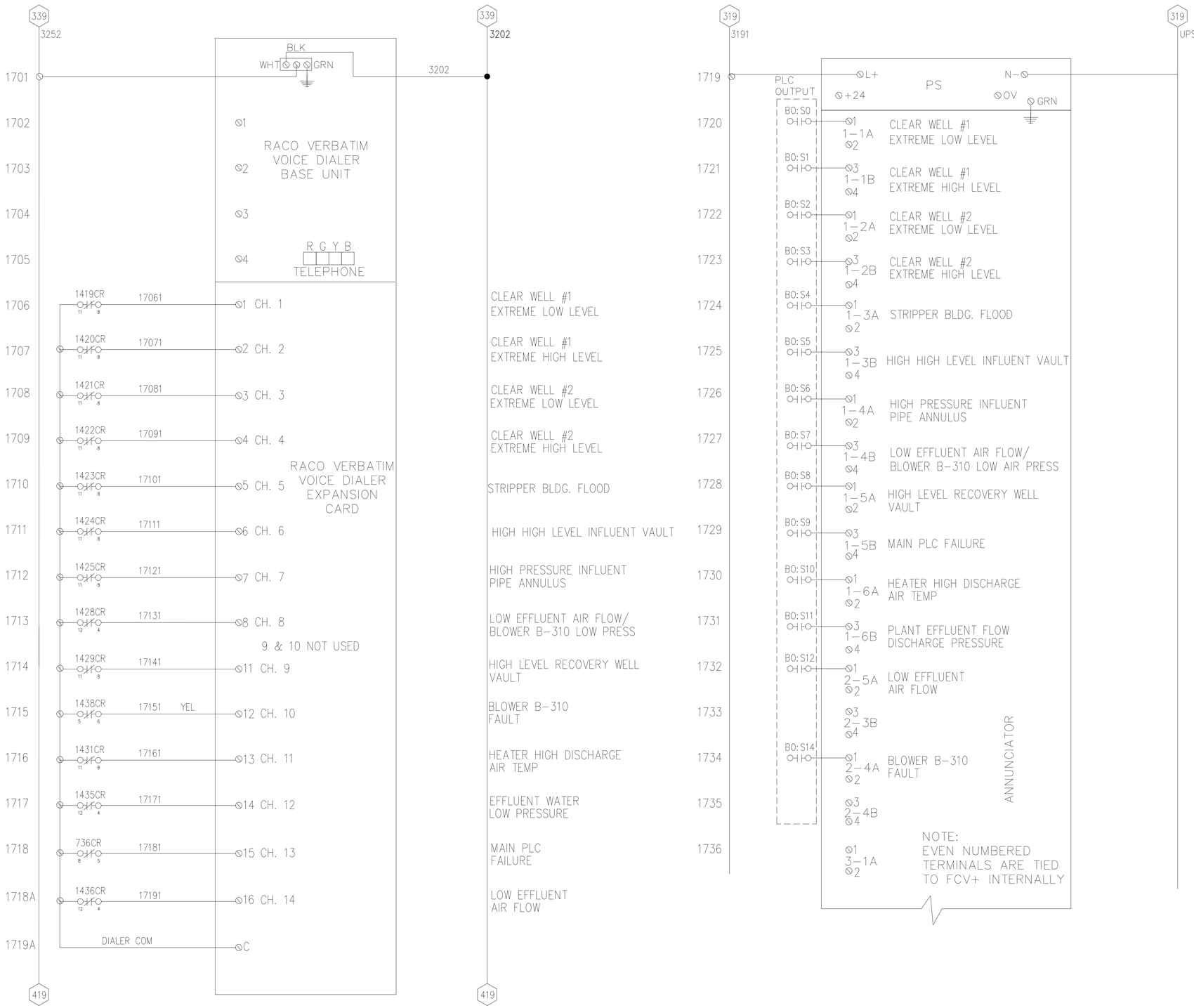
Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-213

Copyright: Tetra Tech

Bar Measures 1 inch

1/4/2019 2:58:22 PM - \\TTS227FS1\PROJECTS\IER\01299\200-01299-16001\CAD\SHEETFILES\OU-2\I-213 MAIN CONTROL PANEL (MCP) - SECONDARY PLC OUTPUTS SLOTS 15 & 16 WIRING DIAGRAM.DWG - MARSH, JUSTIN



NOTES:

1. PANEL WIRING DIAGRAMS SHOWN ON DRAWING SHEETS I-203 TO I-214 AND I-300 TO I-305 ARE PROVIDED FOR GENERAL UNDERSTANDING AND FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL FIELD SURVEY, CHECK EXISTING I/O AND PROVIDE SHOP DRAWING SUBMITTALS PER THE SPECIFICATIONS FOR ENGINEERS APPROVAL. CONTRACTOR IS RESPONSIBLE TO PROVIDE A FULLY FUNCTIONAL SYSTEM.

LEGEND

NO. SYM.	DENOTES EQUIPMENT LOCATED IN THIS PANEL
●	DENOTES EQUIPMENT LOCATED IN FIELD LOCATIONS
¦ ¦ ¦	DASHED LINES DENOTE WIRING TO FIELD DEVICES
✳	DENOTES HAZARDOUS LOCATION (CL 1, DIV. 1) DEVICE

BASE DRAWING PREPARED FROM DRAWING INFORMATION FROM HORLICK COMPANY INC.

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ANNAPOLIS, MD 21401
PH: (410) 990-4607 FAX: (410) 990-4749

MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

MAIN CONTROL PANEL (MCP)- AUTO DIALER

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-214

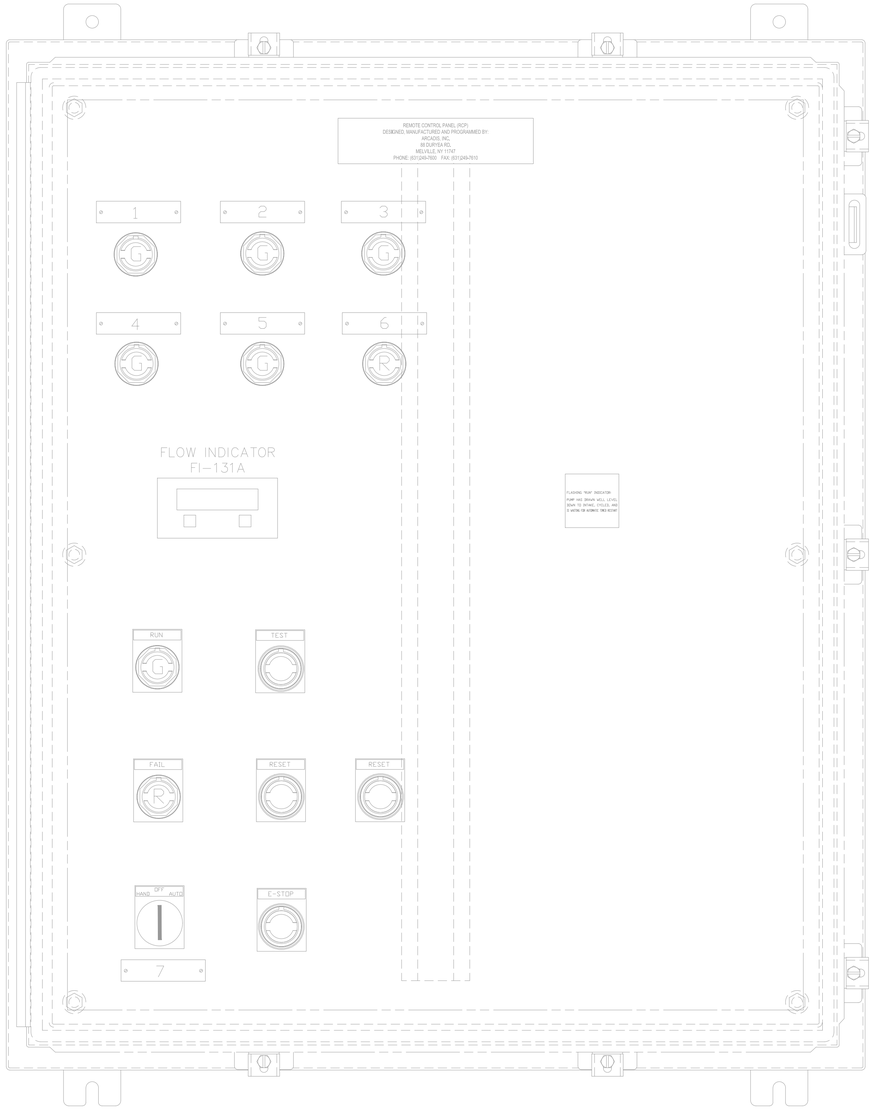
Bar Measures 1 inch

Copyright: Tetra Tech

1/4/2019 2:58:25 PM - \\TTS227FS1\PROJECTS\IER\01299200-01299-16001\CAD\SHEETFILES\OU-2\I-214 MAIN CONTROL PANEL (MCP) - AUTO DIALER.DWG - MARSH, JUSTIN

NOTES:

1. PANEL WIRING DIAGRAMS SHOWN ON DRAWING SHEETS I-203 TO I-214 AND I-300 TO I-305 ARE PROVIDED FOR GENERAL UNDERSTANDING AND FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL FIELD SURVEY, CHECK EXISTING I/O AND PROVIDE SHOP DRAWING SUBMITTALS PER THE SPECIFICATIONS FOR ENGINEERS APPROVAL. CONTRACTOR IS RESPONSIBLE TO PROVIDE A FULLY FUNCTIONAL SYSTEM.



WARNING:
ALTERNATE POWER SOURCE PRESENT.
TO BE CHECKED, PUT ALL DISCONNECT
SWITCHES AT MCC-1 TO THE OFF POSITION

LABEL SCHEDULE

	FIRST LINE	SECOND LINE	THIRD LINE
1		POWER ON	
2	TREATMENT SYSTEM	OPERATION NORMAL	
3	TREATMENT SYSTEM	NOT READY	
4	FLOW CONTROL VALVE	ZS-101	IN "OPEN" POSITION
5	FLOW CONTROL VALVE	ZS-101	FAILURE ALARM
6	PW-100 VAULT	HIGH LEVEL ALARM	LAH-111
7		WELL PUMP PW-100	
8			
9			
10			
11			
12			
13			
14			
15			

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MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION
OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE
RW-100 REMOTE CONTROL PANEL (RCP)

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-300

Bar Measures 1 inch

Copyright: Tetra Tech

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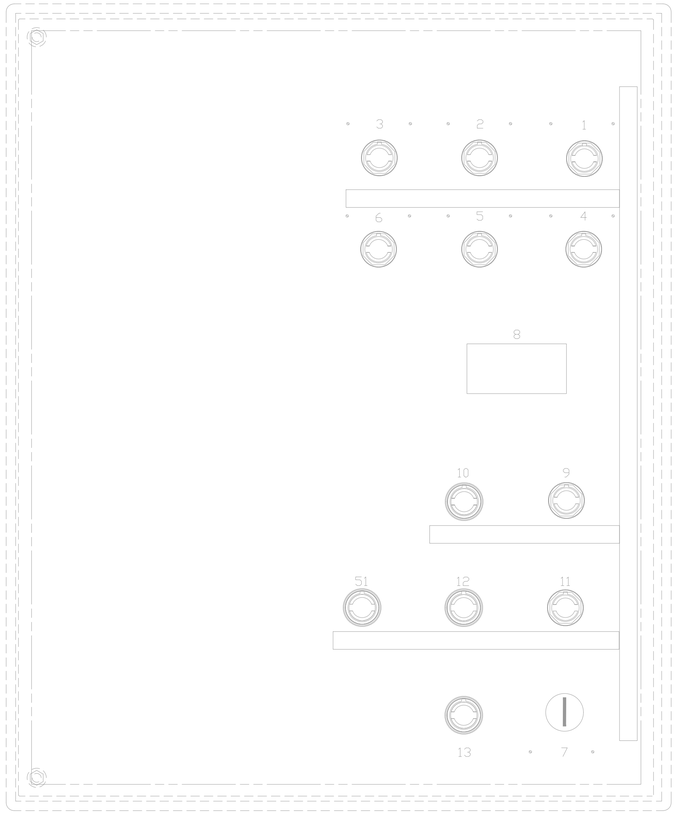
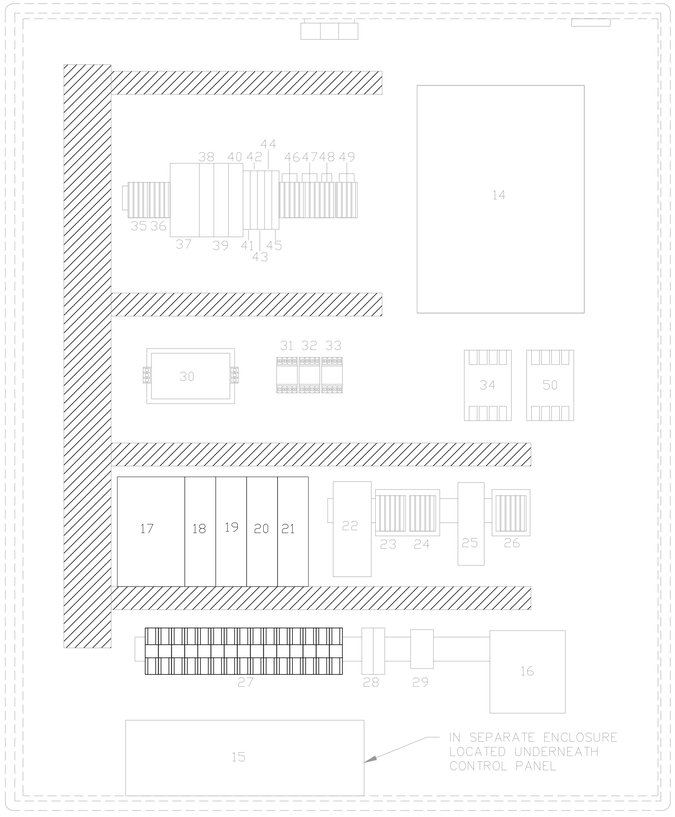
COMPONENT SCHEDULE

ITEM#	DEVICE #	DESCRIPTION	
1	308PL	PILOT LIGHT INDICATOR	
2	508PL	PILOT LIGHT INDICATOR	
3	510PL	PILOT LIGHT INDICATOR	
4	512PL	PILOT LIGHT INDICATOR	
5	514PL	PILOT LIGHT INDICATOR	
6	321PL	PILOT LIGHT INDICATOR	
7	404HS	HAND/OFF/AUTO SWITCH	
8	FI-131A	DIGITAL INDICATOR	
9	516PL	PILOT LIGHT INDICATOR	
10	402PL	PUSH BUTTON SWITCH	
11	518PL	PILOT LIGHT INDICATOR	
12	403PL	PUSH BUTTON SWITCH	
13	409PB	PUSH BUTTON SWITCH	
14	302 T	TRANSFORMER 3KVA	
15	309 UPS	UPS POWER SUPPLY	
16	307 HTR	ENCLOSURE HEATER	
17	**317 PWR**	**PLC +24V PWR. SUP.**	**A-B #1746-P2**
18	**337 CPU**	**PLC MAIN CPU**	**A-B COMPACTLOGIX**
19	**SLOT 1-INPUT**	**INPUT MODULE**	**A-B #1746-IB8**
20	**SLOT 2-OUTPUT**	**OUTPUT MODULE**	**A-B #1746-OW8**
21	**SLOT 3-INPUT/OUTPUT**	**INPUT/OUTPUT MODULE**	**A-B #1746-NIO4I**
22	330 PWR	+24V LOOP PWR. SUP.	SOLA #SDN 2.5-24-100P
23	TB-+24V	TERMINAL BLOCKS FOR +24V LOOP PWR.	
24	TB--24V	TERMINAL BLOCKS FOR -24V LOOP PWR.	
25	**333 E/FO**	**ETHERNET/FIBER OPTIC CONVERTER**	**PHOENIX CONTACT MODEL # FL-MC-EF-1300-MM-ST**
26	TB-TVSS	TVSS PWR.	
27	TB	TERMINAL BLOCKS	
28	TB	TERMINAL BLOCKS	
29	325CR	DPDT RELAY	
30	312 SUP	ISATROL	
31	503CR	DPDT RELAY	
32	505CR	DPDT RELAY	
33	324CR	DPDT RELAY	
34	325 TVSS	LINE FILTER	
35	TB-3111	TERMINAL BLOCKS	
36	TB-3112	TERMINAL BLOCKS	
37	302CB	2-POLE BRKR 15A	
38	303CB	1-POLE BRKR 10A	
39	304CB	1-POLE BRKR 10A	
40	310CB	1-POLE BRKR 6A	
41	310FU	FUSE 3A	
42	321FU	FUSE 2A	
43	322FU	FUSE 4A	
44	327FU	FUSE 2A	
45	328FU	FUSE 4A	
46	TB-3043	TERMINAL BLOCKS	
47	TB-3031	TERMINAL BLOCKS	
48	TB-3071	TERMINAL BLOCKS	
49	TB-3030	TERMINAL BLOCKS	
50	328 TVSS	325CR FIELD WIRES LINE FILTER	
51		PUSH BUTTON SWITCH	



DOOR REAR VIEW



INSIDE VIEW

NOTES:

1. ALL ITEMS SHOWN AS BOLD SHALL BE USED FOR GENERAL UNDERSTANDING PURPOSES ONLY. CONTRACTOR SHALL USE ALL NECESSARY COMPONENTS TO INSTALL AND PROVIDE A FULLY FUNCTIONAL SYSTEM.

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	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

RW-100 REMOTE CONTROL PANEL (RCP) - EXTERNAL & INTERNAL LAYOUT

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-301

Copyright: Tetra Tech

Bar Measures 1 inch

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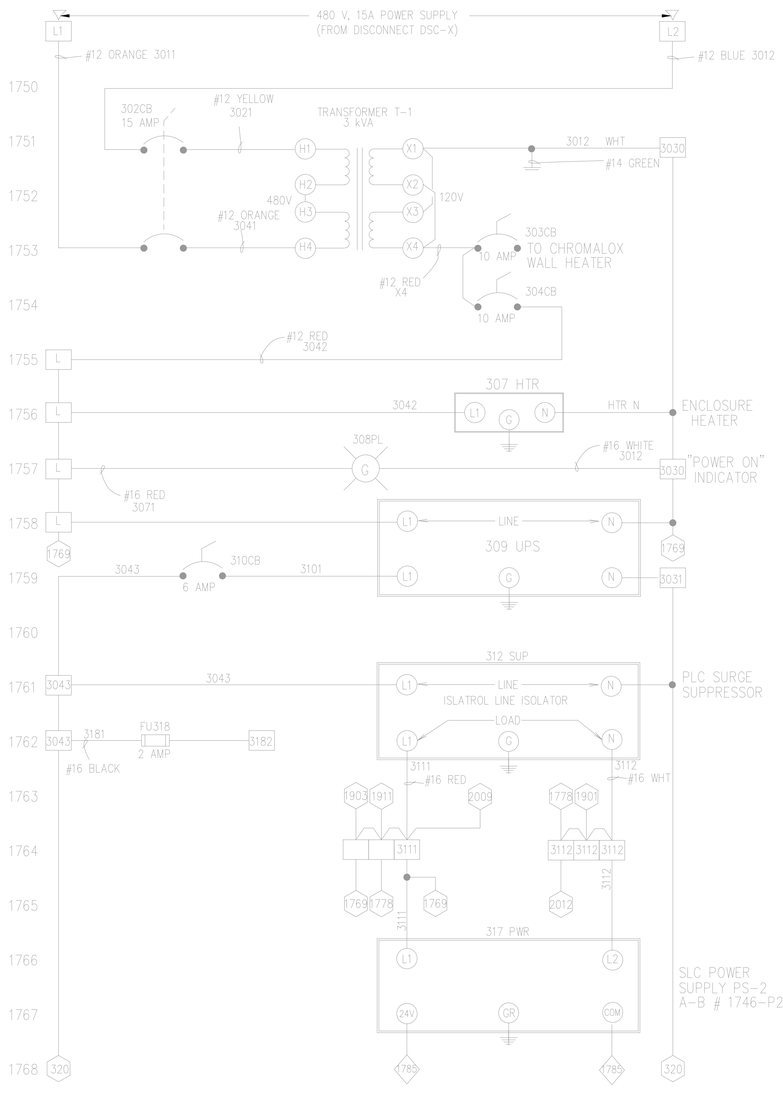

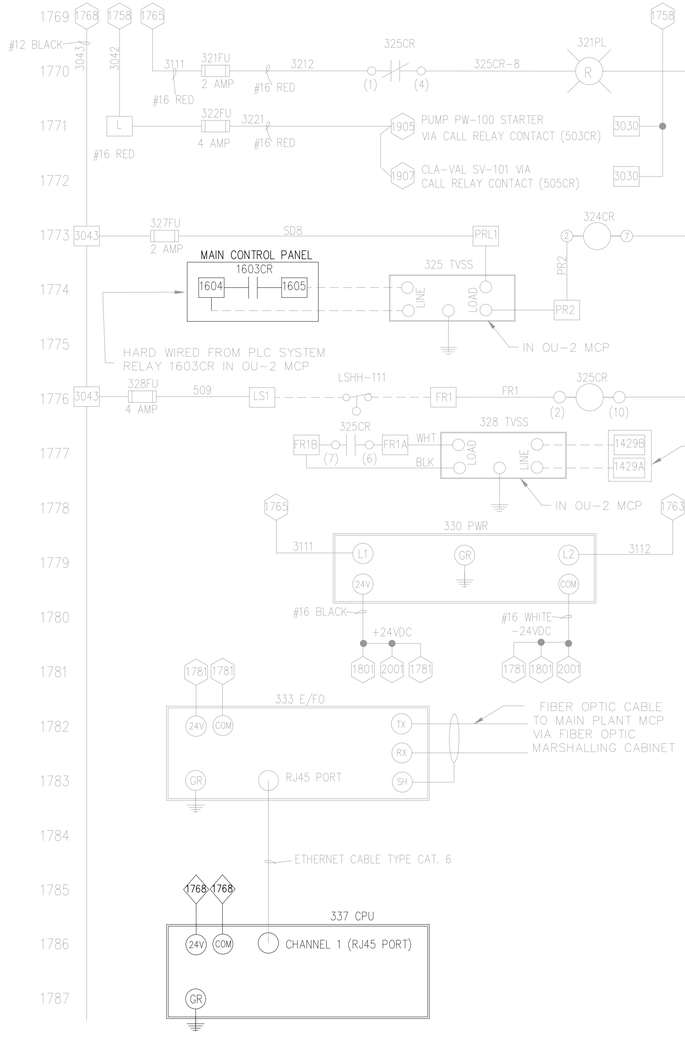

NOTES:

1. PANEL WIRING DIAGRAMS SHOWN ON DRAWING SHEETS I-203 TO I-214 AND I-300 TO I-305 ARE PROVIDED FOR GENERAL UNDERSTANDING AND FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL FIELD SURVEY, CHECK EXISTING I/O AND PROVIDE SHOP DRAWING SUBMITTALS PER THE SPECIFICATIONS FOR ENGINEERS APPROVAL. CONTRACTOR IS RESPONSIBLE TO PROVIDE A FULLY FUNCTIONAL SYSTEM.

LINE NUMBER DESCRIPTION

0000
WIRING DIAGRAM SHEET NUMBER (1 or 2 digits) — LINE NUMBER (Always 2 digits)

WIRE NUMBER DESCRIPTION

00000
WIRING DIAGRAM SHEET NUMBER (1 or 2 digits) — WIRE NUMBER (Always 1digit); LINE NUMBER (Always 2digits)

INPUT OR OUTPUT WIRE NUMBER CONFIGURATION

XXXX
OUTPUT = O, INPUT = I — I/O NUMBER

LEGEND

NO. SYM. DENOTES EQUIPMENT LOCATED IN THIS PANEL

DENOTES EQUIPMENT LOCATED IN FIELD LOCATIONS

DASHED LINES DENOTE WIRING TO FIELD DEVICES

000 FROM/TO WIRING DIAGRAM
LINE NUMBER (ALWAYS 2 DIGITS)
WIRING DIAGRAM SHEET NUMBER (1 OR 2 DIGITS)

DENOTES TERMINAL BLOCK

DENOTES MAIN +24V DEDICATED PWR. SUP. PART OF PLC SYSTEM

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	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION
OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

RW-100 REMOTE CONTROL PANEL (RCP) - POWER DISTRIBUTION WIRING DIAGRAM

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-302

Bar Measures 1 inch

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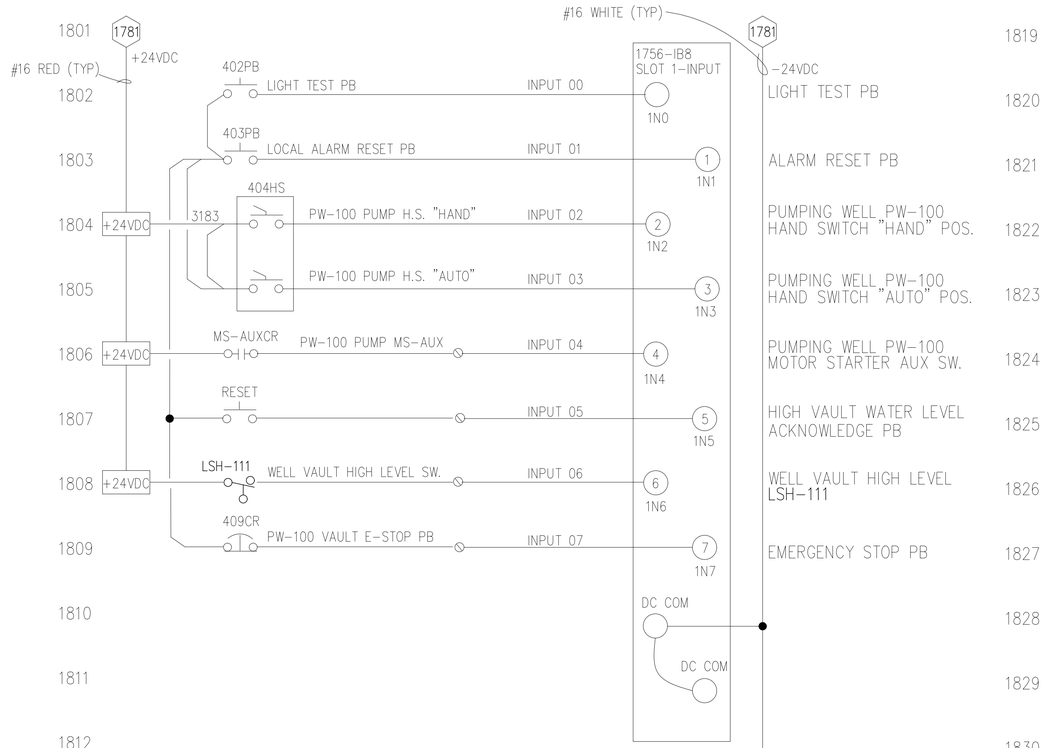
NOTES:

1. PANEL WIRING DIAGRAMS SHOWN ON DRAWING SHEETS I-203 TO I-214 AND I-300 TO I-305 ARE PROVIDED FOR GENERAL UNDERSTANDING AND FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL FIELD SURVEY, CHECK EXISTING I/O AND PROVIDE SHOP DRAWING SUBMITTALS PER THE SPECIFICATIONS FOR ENGINEERS APPROVAL. CONTRACTOR IS RESPONSIBLE TO PROVIDE A FULLY FUNCTIONAL SYSTEM.



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LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

RW-100 REMOTE CONTROL PANEL (RCP) - SLOT 1 - INPUT MODULE WIRING DIAGRAM

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-303

Bar Measures 1 inch

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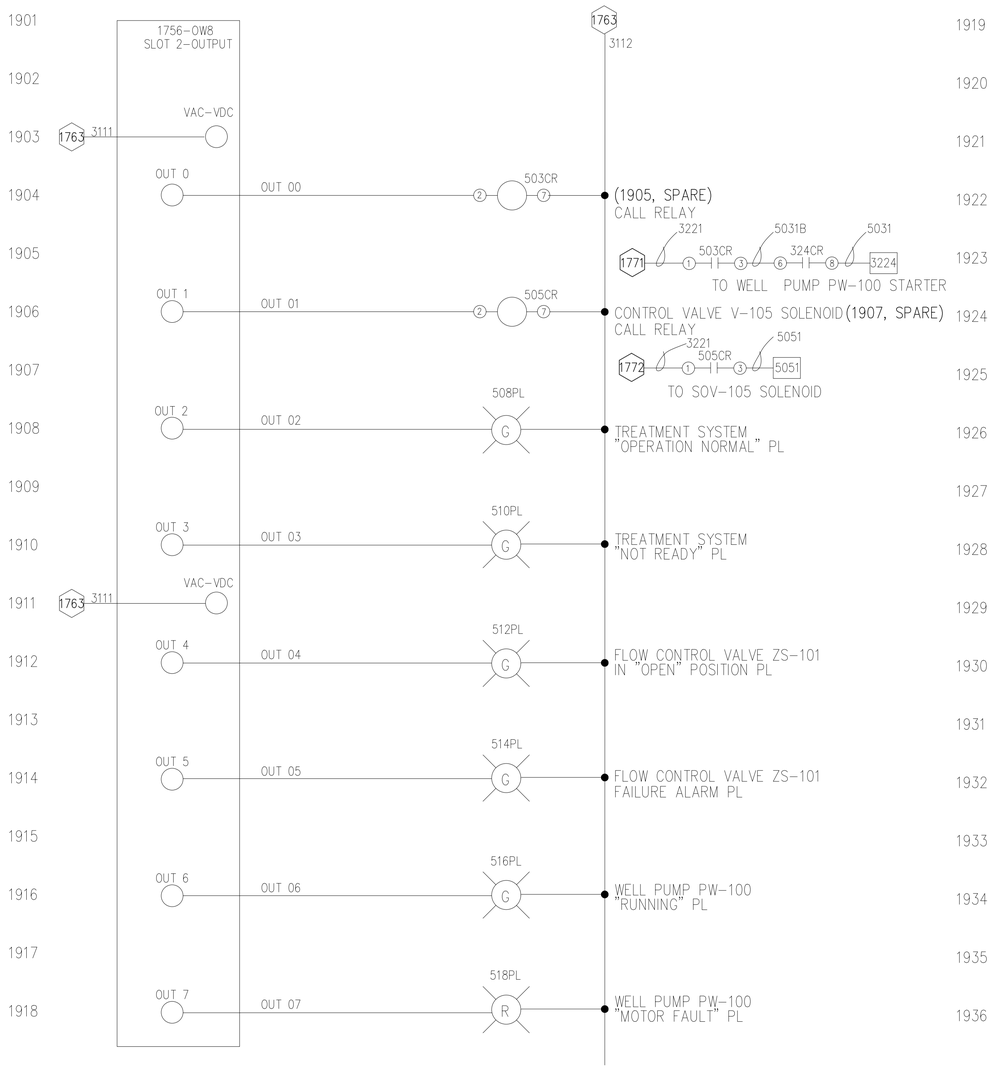
NOTES:

1. PANEL WIRING DIAGRAMS SHOWN ON DRAWING SHEETS I-203 TO I-214 AND I-300 TO I-305 ARE PROVIDED FOR GENERAL UNDERSTANDING AND FOR REFERENCE PURPOSES ONLY AND SHALL NOT BE USED FOR CONSTRUCTION. CONTRACTOR SHALL FIELD SURVEY, CHECK EXISTING I/O AND PROVIDE SHOP DRAWING SUBMITTALS PER THE SPECIFICATIONS FOR ENGINEERS APPROVAL. CONTRACTOR IS RESPONSIBLE TO PROVIDE A FULLY FUNCTIONAL SYSTEM.



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LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

RW-100 REMOTE CONTROL PANEL (RCP) - SLOT 2 OUTPUT MODULE WIRING DIAGRAM

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

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Bar Measures 1 inch

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NOTES:

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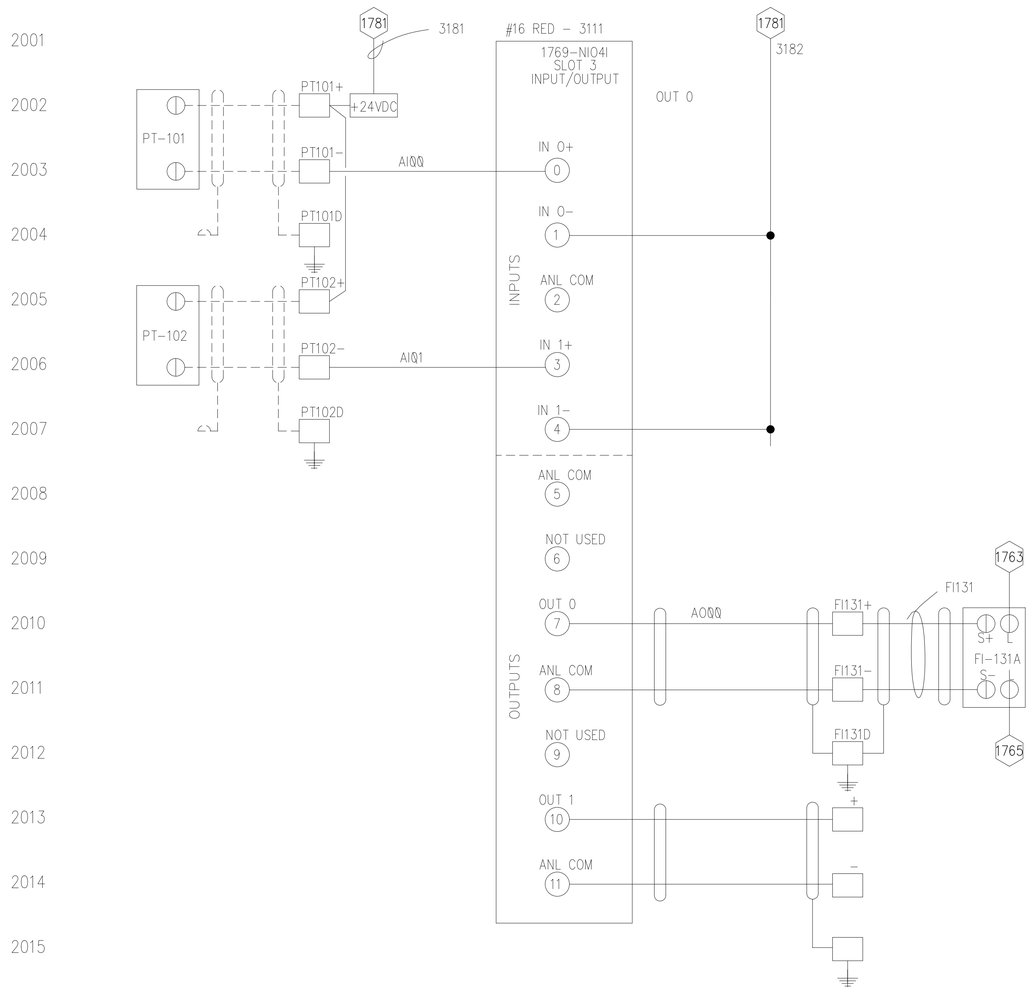

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OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

RW-100 REMOTE CONTROL PANEL (RCP) - SLOT 3 OUTPUT MODULE WIRING DIAGRAM

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-305

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Bar Measures 1 inch

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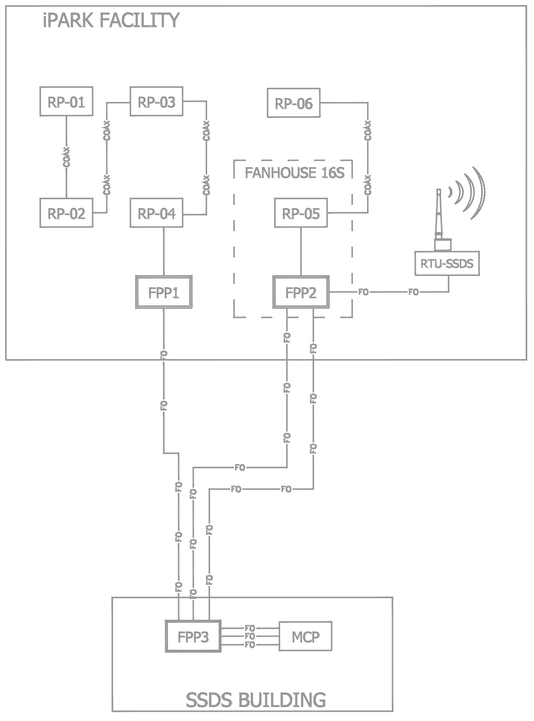
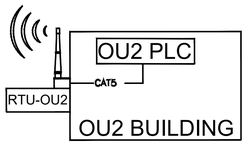
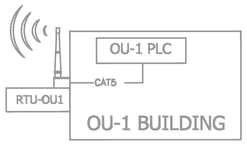


RADIO TELEMETRY ARCHITECTURE

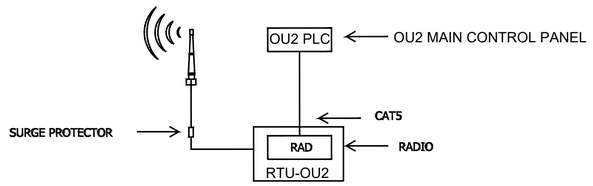




900MHZ RF
(FREQ. HOPING SPREAD SPECTRUM)

NOTES:

1. REFER TO SITE PLAN FOR PANEL LOCATIONS.
2. REFER TO DIV.13 SPECIFICATIONS FOR RTU-OU-2 AND SSDS COMMUNICATION UPGRADES DETAILS.
3. CONTRACTOR TO PROVIDE ALTERNATE PRICING FOR INTERNET SERVICE CONNECTION, FIREWALL, NETWORKING COMPONENTS, AND ASSOCIATED HARDWARE AND INTEGRATION. BEFORE COMMISSION OF OU-2 RADIO COMMUNICATION WITH RTU-3303.
4. FOLLOWING COMMISSIONING OF NEW CONTROLLERS AND HMI OPERATOR STATION UPDATES, COMMUNICATIONS OVER RADIO NETWORK ARE TO BE EVALUATED FOR SYSTEM PERFORMANCE TO DETERMINE IF ALTERNATE COMMUNICATIONS OVER INTERNET ARE REQUIRED.



OU-2 RADIO NETWORK DIAGRAM

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OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE
RADIO TELEMETRY ARCHITECTURE

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-400

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Bar Measures 1 inch

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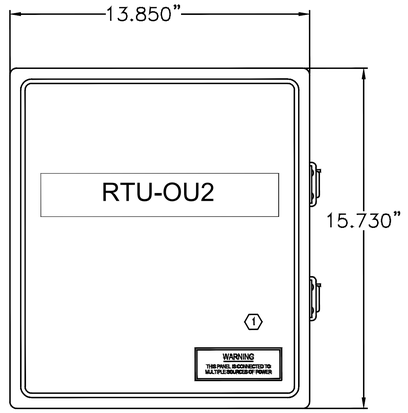
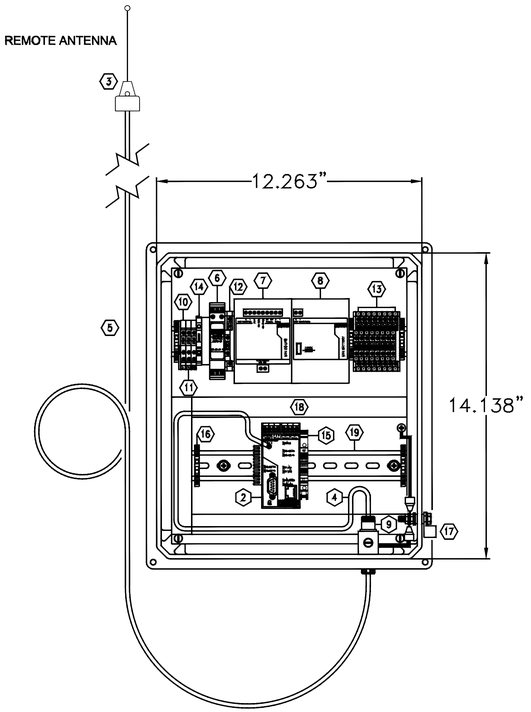
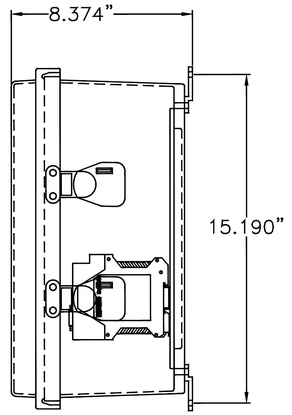


FRONT VIEW



BACKPLATE LAYOUT



SIDE VIEW

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LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

REMOTE TELEMETRY UNIT (RTU-OU-2) PANEL LAYOUT

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-401

Bar Measures 1 inch

Copyright: Tetra Tech

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COMPONENT LIST

NO.	SYMBOL	DESCRIPTION	PART NO.	MANUF'R
1		NEMA 4X ENCLOSURE WITH UPS DC, 14.1"x12.3"x6.1"	2917188	PHOENIX
2		WIRELESS TRANSCEIVER	2900016	PHOENIX
3		OMNIDIRECTIONAL ANTENNA	2885579	PHOENIX
4		ADAPTER CABLE, LENGTH: 120CM.	2867717	PHOENIX
5		ANTENNA EXTENSION CABLE, LENGTH: **FIELD DETERMINED**	2867380	PHOENIX
6		SURGE PROTECTOR, PT 2-PE/S-20AC-ST	2839347	PHOENIX
7		POWER SUPPY, MINI-DC-UPS/24DC/2	2866640	PHOENIX
8		BACK-UP BATTERY, MINI-BAT/24DC-0.8AH	2866666	PHOENIX
9		SURGE ARRESTOR (FOR ANTENNA), CN-UB-280DC-SB	2818148	PHOENIX
10	TBL	TERMINAL BLOCK, SINGLE	–	PHOENIX
11	TBN	TERMINAL BLOCK, SINGLE	–	PHOENIX
12	TB3	TERMINAL BLOCK, DOUBLE	–	PHOENIX
13	TB4	TERMINAL BLOCK, DOUBLE	–	PHOENIX
14		FUSE, 3A FAST-BLOW, 5x20mm	–	PHOENIX
15	FC1	FUSIBLE TERMINAL BLOCK, LED	1492-H5	A-B
16		END STOP	–	PHOENIX
17		GROUND-EARTH LUG	–	PHOENIX
18		WIRE DUCT	–	PHOENIX
19		DIN RAIL	–	PHOENIX

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MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

REMOTE TELEMETRY UNIT
(RTU-OU-2) COMPONENTS LIST

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-402

Bar Measures 1 inch

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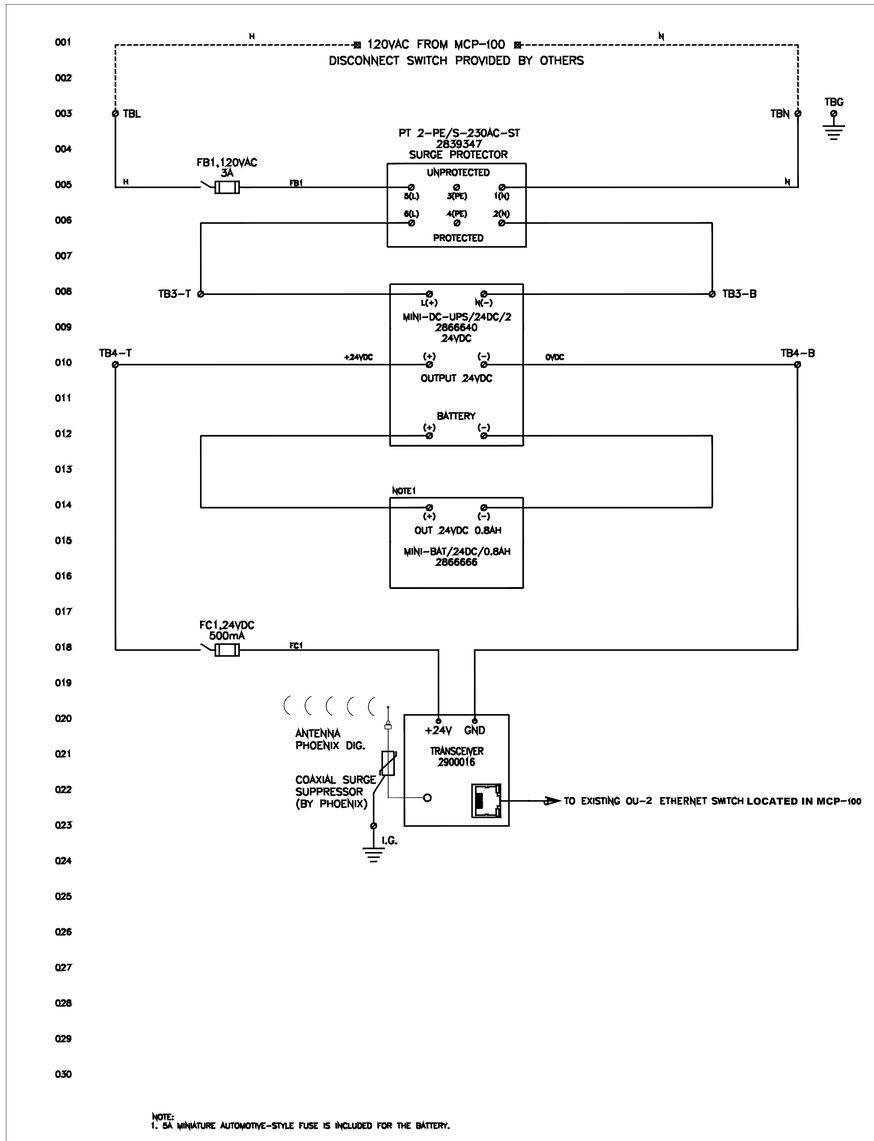

NOTE:
1. 5A MINIATURE AUTOMOTIVE-STYLE FUSE IS INCLUDED FOR THE BATTERY.

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MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION

OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE

REMOTE TELEMETRY UNIT (RTU-OU-2) PANEL WIRING DIAGRAM

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-403

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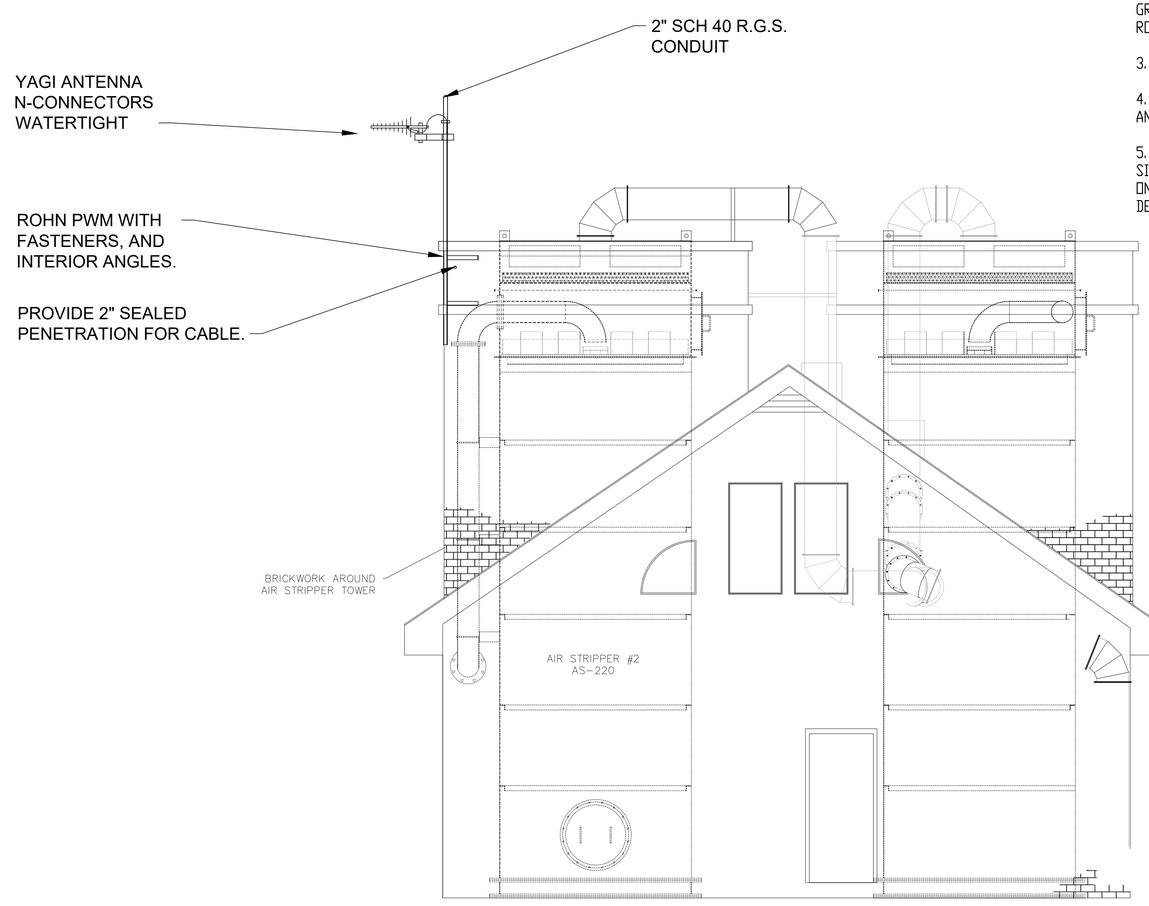
Bar Measures 1 inch

1/4/2019 2:58:56 PM - \\TTS227FS1\PROJECTS\ER\01299\200-01299-16001\CAD\SHEETFILES\OU-2\I-403 REMOTE TELEMETRY UNITE (RTU-OU-2) PANEL WIRING DIAGRAM.DWG - MARSH, JUSTIN



1 / I-404 ANTENNA DETAIL, WEST VIEW OF OU-2 BUILDING
NTS

NOTES:
1. FIELD LOCATE ANTENNA SUPPORT STRUCTURE BY ESTABLISHING RADIO PATH CONNECTIVITY AS DESCRIBED IN THE SPECIFICATIONS. THE CONTRACTOR IS RESPONSIBLE TO FINALIZE DETAILS FOR ANTENNA INSTALLATION AT THE SITE BASED ON FIELD OBSERVATIONS AND PATH CONNECTIVITY MEASUREMENTS.

2. PROVIDE GROUND IMPULSE SUPPRESSER ON ANTENNA CABLE ADJACENT TO EACH RADIO FURNISHED. GROUND METALLIC ANTENNA SUPPORT STRUCTURES AND GROUND IMPULSE SUPPRESSERS TO NEW GROUND RODS. USE #4 GROUND WIRE TO EACH GROUND ROD LOCATION.

3. REFER TO E-101 CABLE AND CONDUIT SCHEDULE FOR ANTENNA CABLE.

4. SUPPORT EXPOSED ANTENNA RUNS EVERY 10' IN ACCORDANCE WITH THE RECOMMENDATIONS OF THE ANTENNA CABLE MANUFACTURER.

5. CONTRACTOR TO SET THE ANTENNA HEIGHT APPROPRIATELY TO ACHIEVE A FUNCTIONAL COMMUNICATION SIGNAL BETWEEN OU2 AND SSDS. RADIO SURVEY TEST RESULTS INDICATE A 20FT OT ANTENNA MOUNTED ON THE ROOF TOP OF OU-2 BUILDING MAY BE ANTICIPATED. EXACT LOCATION OF ANTENNA SHALL BE DETERMINED AND INSTALLED WITH APPROVAL OF OWNER/ENGINEER.

NOTES:
1. CONTRACTOR TO SET THE ANTENNA HEIGHT APPROPRIATELY TO ACHIEVE A FUNCTIONAL COMMUNICATION SIGNAL BETWEEN OU2 AND SSDS. FOUND ON RADIO SURVEY TEST RESULTS A 20FT OT ANTENNA MOUNTED ON THE ROOF TOP OF OU-2 BUILDING IS ANTICIPATED. EXACT LOCATION OF ANTENNA SHALL BE DETERMINED AND REINSTALLED WITH APPROVAL OF OWNER/ENGINEER.

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MARK	DATE	DESCRIPTION	BY
	10/15/18	AS-BUILT	ADY

LOCKHEED MARTIN CORPORATION
OPERABLE UNIT NO. 2 (OU2)
INSTRUMENTATION & CONTROLS UPGRADE
ANTENNA INSTALLATION DETAILS

Project No.:	200-01297-16018
Designed By:	AY
Drawn By:	AY
Checked By:	JFC

I-404

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Bar Measures 1 inch

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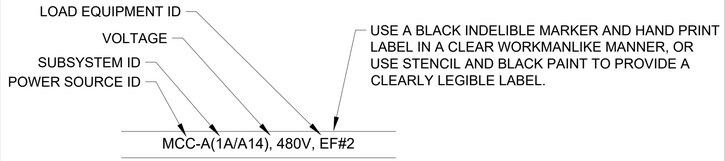
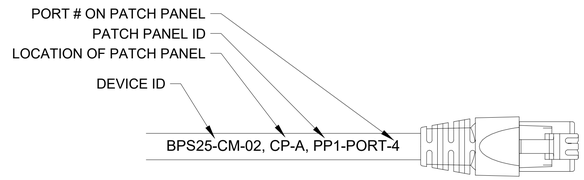
FEEDER & BRANCH CIRCUIT RACEWAY LABELS



NOTE:
1. NO LABELING REQUIRED FOR RACEWAYS WITH READILY IDENTIFIABLE TERMINATIONS WITHIN THE SAME ROOM
2. IN ACCESSIBLE CEILING SPACES AND EXPOSED IN UNFINISHED AREAS, LABEL CONDUIT WITH PANEL AND CIRCUIT NUMBERS OF CONDUCTORS ROUTED THROUGH THE CONDUIT. LABEL CONDUIT AT WALL PENETRATIONS AND CONNECTIONS TO ALL PANELS, JUNCTION BOXES, AND EQUIPMENT SERVED.

DETAIL 2 — SCALE: NTS — I-500

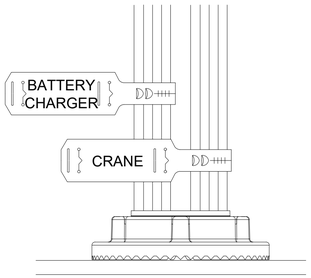
FIELD ETHERNET CABLE



NOTE:
1. BLACK LETTERING ON WHITE BACKGROUND
2. DEPENDING ON PATCH PANEL STYLE AND/OR END DEVICE, ENDS MAY OR MAY NOT BE REQUIRED.

DETAIL 3 — SCALE: NTS — I-500

WIRE/CABLE BUNDLE TAG



NOTE:
1. BLACK LETTERING ON WHITE BACKGROUND (POWER)
2. BLACK LETTERING ON YELLOW BACKGROUND (SIGNAL)
3. BUNDLE AND LABEL WIRES/CABLES GOING TO A COMMON PANEL/EQUIPMENT/DEVICE
4. LABEL IN PANELS, MCC, MANHOLES, HAND HOLES, AND BOXES OVER 0.227 CUBIC METERS (8 CUBIC FEET).

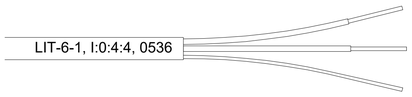
DETAIL 4 — SCALE: NTS — I-500

PANEL TAG PUSH BUTTON/SWITCH

NOTE:
1. BLACK LETTERING ON WHITE BACKGROUND

DETAIL 5 — SCALE: NTS — I-500

TWO CONDUCTOR CABLE



NOTE:
1. BLACK LETTERING ON WHITE BACKGROUND

DETAIL 6 — SCALE: NTS — I-500

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OPERABLE UNIT NO. 2 (OU2)
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MISCELLENEOUS DETAILS

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