REVISIONS				
SYMB	REV	DESCRIPTION	CHANGE BY	APPROVAL
A	A	Modified the material list descriptions for the circular connectors in order to allow the vendor more flexibility in finding available parts. The new requirement for all of the connectors is that they be MIL-DTL-5015 series equivalent with either bayonet or reverse bayonet couplings.	/S/ William Donahue 02/26/2016	/S/ Tim Whetsel 02/26/2016

DISTRIBUTION STATEMENT: N/A

A.D.C. REVIEW

	SIGNATURE	DATE
	/S/ William Donahue	11/24/2015

/S/ SIGNATURE ON FILE

APPROVAL

	SIGNATURE	DATE
BRANCH SUPV.	/S/ Jim Byrnes	11/24/2015
CHECKED	/S/ David Dailey	11/24/2015
DRAWN		
DRAWN	/S/ William Donahue	11/24/2015
DESIGNED	/S/ William Donahue	11/24/2015
FILE PATH		

PUGET SOUND NAVAL SHIPYARD

CODE 2370
ENGINEERING DIVISION

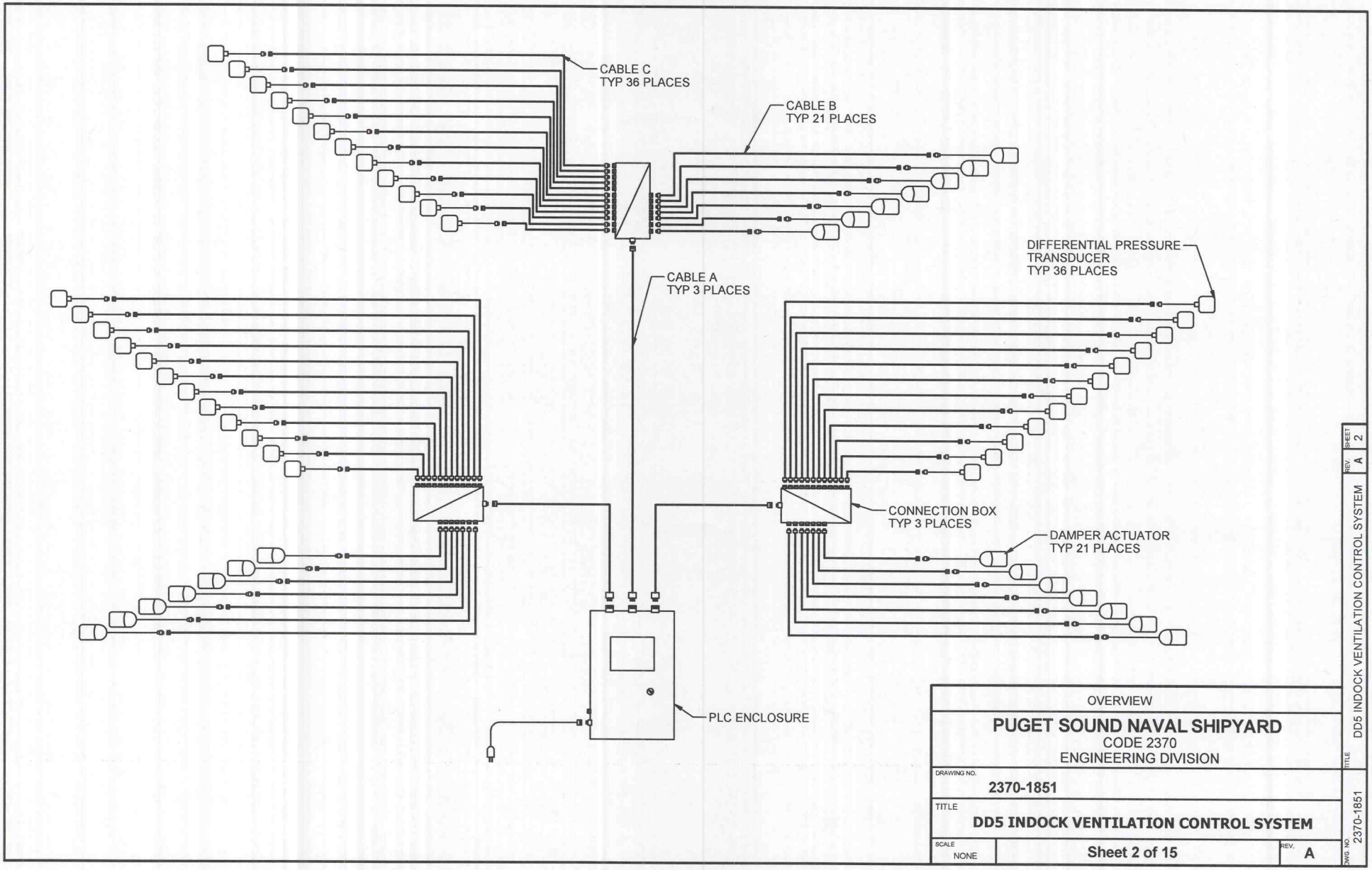
NO DEVIATIONS SHALL BE MADE
WITHOUT CODE 2370 APPROVAL

DRAWING NO.
2370-1851

TITLE
DD5 INDOCK VENTILATION CONTROL SYSTEM

SCALE		REV.
NONE	Sheet 1 of 15	A

SHEET 1
REV. A
TITLE DD5 INDOCK VENTILATION CONTROL SYSTEM
DWG. NO. 2370-1851



OVERVIEW

PUGET SOUND NAVAL SHIPYARD
CODE 2370
ENGINEERING DIVISION

DRAWING NO. **2370-1851**

TITLE **DD5 INDOCK VENTILATION CONTROL SYSTEM**

SCALE NONE | **Sheet 2 of 15** | REV. **A**

TITLE: DD5 INDOCK VENTILATION CONTROL SYSTEM
REV: A
SHEET: 2
DWG. NO.: 2370-1851

GENERAL NOTES

1. This drawing provides the technical requirements for the construction of Qty. 1 Programmable Logic Controller (PLC) based ventilation control system.

2. The control system to be provided per this drawing will include the hardware only. The government will be responsible for programming the control system for its intended application, and field installation. Power service will be provided by the government.

3. All components of the control system are to be installed in accordance with their manufacturer's instructions.

4. Layout locations shown in this drawing are approximate unless otherwise specified.

5. The control system shall be capable of continuous operation in an outdoor, dust laden marine environment. Operational ambient temperature range for the control system shall be 15° F to 100° F up to 95% relative humidity.

6. All materials and parts comprising the system shall be new, of current design and manufacture, and shall not have been in prior service except as required for factory testing. Standard, off-the-shelf components with proven reliability shall be used wherever possible to increase performance, reliability, reduce initial costs, and ensure availability of replacement parts.

7. All replaceable parts shall be manufactured to definite standards, tolerances, and clearances in order that any such parts of a particular type or model may be replaced or adjusted without modification of the equipment.

8. Workmanship of the equipment to be furnished shall be commensurate with the requirements of this specification and of such quality that denotes the performance of skilled and experienced personnel trained in the field of work performed.

9. Supplies being used in the performance of this contract or materials being provided as part of the equipment shall be free of known hazardous materials. Definitions of hazardous materials are specified in the latest version of FED-STD-313. The contractor is required to provide a certification of compliance to specification requirements by providing a signed statement to the effect that the contractor has complied with this requirement.

10. In addition to hazardous materials already identified in FED-STD-313, materials containing asbestos or polychlorinated biphenyls (PCB's) are prohibited. The contractor is required to provide a certification of compliance to specification requirements by providing a signed statement to the effect that the contractor has complied with this requirement.

11. Metallic surfaces exposed to the working environment shall be painted or fabricated of materials that are corrosion resistant (e.g. aluminum or stainless steel). Paint application may be accomplished per the manufacturer's standard practice, provided it results in a highly wear resistant finish which offers continued protection from the operating environment. Prior to painting, surfaces shall be cleaned, prepared, and primed. Lead base or chromium base paints are prohibited. Sufficient metal preparation and paint coats shall be applied to provide five years of use in the specified operating environment without the need for repainting. Gray is the preferred paint color. Yellow and white are prohibited paint colors.

DOCUMENTATION DELIVERABLES

12. Prior to fabrication, the contractor shall submit the respective manufacturer's drawing and material list of all components to be used in the building of the control system to the government for approval.

13. The Government's Cognizant Technical Code will review the literature and provide approval or comments within 5 working days.

14. Upon receipt of review comments from the Contracting Officer, the contractor will have a maximum of 5 working days to incorporate comments and resubmit the revised design to the Contracting Officer for review by the Cognizant Technical Code.

15. The Cognizant Technical Code will review the revised design.

16. If there are any unresolved design issues, after review of the revised design, the contractor shall schedule a final design review meeting with the Contracting Officer to review the proposed design and to achieve agreement with the Cognizant Technical Code on the actions needed to meet the functional objectives and requirements.

17. Upon completion of construction the contractor shall submit an NRTL Report provided by a Nationally recognized 3rd party to the shipyard certifying that the control system has been constructed in accordance with this specification and is acceptable per CFR 1910.399.

GENERAL NOTES

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TITLE **DD5 INDOCK VENTILATION CONTROL SYSTEM**

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TITLE DD5 INDOCK VENTILATION CONTROL SYSTEM | REV A | SHEET 3

DWG. NO. 2370-1851

PLC ENCLOSURE MATERIAL

PC #	QTY	DESCRIPTION	SHT #	REMARKS
P1	1	ELECTRICAL ENCLOSURE, NEMA TYPE 4 WITH WELDED ON MOUNTING FEET, SIZE 36" H x 30" W X 12" D, LOCAKABLE HANDLE	6	HOFFMAN CATALOG # A36H30DLP3PT OR EQUIVALENT
P2	1	HUMAN MACHINE INTERFACE (HMI)	6	ALLEN BRADLEY PART # 2711P-T12C4D8
P3	1	SELECTOR SWITCH, 2 POSITION, MAINTAINED, KEY OPERATED, DPDT	6	SCHNIEDER ELECTRIC PART # 9001KS11K1 OR EQUAL
P4	1	PROGRAMMING INTERFACE, UL TYPE 4, WITH 120VAC OUTLET, 3 AMP BREAKER, CAT 5E ETHERNET PORT, LOCKABLE FLIP OPEN COVER	6	GRACEPORT PART # P-R2-H3R3 OR EQUIVALENT
P5	3	CONNECTOR, BOX MOUNT RECEPTACLE, MIN 31 SOCKET, MIL-DTL-5015 SERIES EQUVALENT, WITH BAYONET OR REVERSE BAYONET COUPLING	6	MUST MATE WITH THE MALE END OF CABLE A
P6	3	GASKET FOR PC 5	6	
P7	3	LABEL PLATE, PLASTIC, ENGRAVED, 3/4" X 1-1/2", ADHESIVE MOUNTED, WHITE BACKGROUND BLACK LETTERING	6	
P8	1	PLC 13 SLOT CHASSIS	7	ALLEN BRADLEY PART # 1756-A13
P9	1	PLC POWER SUPPLY	7	ALLEN BRADLEY PART # 1756-PA75
P10	1	PLC PROCESSOR	7	ALLEN BRADLEY PART # 1756-L61
P11	1	PLC COMMUNICATION CARD	7	ALLEN BRADLEY PART # 1756-ENBT
P12	5	PLC ANALOG INPUT	7	ALLEN BRADLEY PART # 1756-IF16
P13	3	PLC ANALOG OUTPUT	7	ALLEN BRADLEY PART # 1756-OF8
P14	1	PLC DISCRETE INPUT	7	ALLEN BRADLEY PART # 1756-IB16
P15	2	PLC SLOT FILLER MODULE	7	ALLEN BRADLEY PART # 1756-N2
P16	21	END CLAMP, 35mm DIN RAIL MOUNT	7	PHOENIX CONTACT UT6 SERIES OR EQUIVALENT
P17	8	INTERFACE MODULE FOR USE WITH ALLEN BRADLEY 1756 SERIES ANALOG MODULES	7	ALLEN BRADLEY PART # 1492-AIFM8-3 OR EQUIVALENT
P18	1	INTERFACE MODULE FOR USE WITH ALLEN BRADLEY 1756 SERIES DISCRETE MODULES	7	ALLEN BRADLEY PART # 1492-IFM20F OR EQUIVALENT
P19	1	24 VOLT DC POWER SUPPLY, 120 VAC INPUT	7	SOLA PART # SDN 10-24-100P OR EQUIVALENT
P20	1	ETHERNET SWITCH, UNMANAGED	7	MOXA PART # EDS-205 OR EQUAL
P21	5	CIRCUIT PROTECTOR	7	RATING AND STYLE (FUSE OR BREAKER) AS RECOMMENDED BY THE MANUFACTURERS LITERATURE OF THE EQUIPMENT BEING PROTECTED
P22	20	TERMINAL BLOCK, FEED THROUGH TYPE	7	PHOENIX CONTACT UT6 SERIES OR EQUIVALENT
P23	4	TERMINAL BLOCK, GROUNDING TYPE	7	PHOENIX CONTACT UT6 SERIES OR EQUIVALENT
P24	3	TWIST ON COVER AND CHAIN FOR PC 5	7	
P25	3	PRE-WIRED CABLE, LENGTH TO SUIT, WIRED FOR SINGLE ENDED mA ANALOG INPUT	7	ALLEN BRADLEY PART # 1492-ACABLE__UB OR EQUIVALENT
P26	2	PRE-WIRED CABLE, LENGTH TO SUIT, WIRED FOR SINGLE ENDED VOLTAGE ANALOG INPUT	7	ALLEN BRADLEY PART # 1492-ACABLE__UA OR EQUIVALENT
P27	3	PRE-WIRED CABLE, LENGTH TO SUIT, WIRED FOR SINGLE ENDED VOLTAGE ANALOG OUTPUT	7	ALLEN BRADLEY PART # 1492-ACABLE__WA OR EQUIVALENT
P28	1	PRE-WIRED CABLE, LENGTH TO SUIT, DISCRETE INPUT	7	ALLEN BRADLEY PART # 1492-CABLE__X OR EQUIVALENT

CONNECTION BOX MATERIAL

PC #	QTY	DESCRIPTION	SHT #	REMARKS
C1	3	ELECTRICAL ENCLOSURE, NEMA 4X, ALUMINUM, CONTINUOUS HINGE, SCREW CLAMP CLOSURE, 24"H x 20" W x 6" D	12	HOFFMAN PART # A24H2006LLP OR EQUIVALENT
C2	36	CONNECTOR, BOX MOUNT RECEPTACLE, MIN 3 SOCKET, MIL-DTL-5015 SERIES EQUIVALENT WITH BAYONET OR REVERSE BAYONET COUPLING	12	MUST MATE WITH MALE END OF CABLE C
C3	21	CONNECTOR, BOX MOUNT RECEPTACLE, MIN 5 SOCKET, MIL-DTL-5015 SERIES EQUIVALENT WITH BAYONET OR REVERSE BAYONET COUPLING	12	MUST MATE WITH MALE END OF CABLE B
C4	3	CONNECTOR, BOX MOUNT RECEPTACLE, MIN 31 PIN, MIL-DTL-5015 SERIES EQUIVALENT WITH BAYONET OR REVERSE BAYONET COUPLING	12	MUST MATE WITH FEMALE END OF CABLE A
C5	24	END CLAMP, 35mm DIN RAIL MOUNT	12	PHOENIX CONTACT UT6 SERIES OR EQUIVALENT
C6	57	TERMINAL BLOCK, FUSIBLE, FOR 1/4 x 1-1/2" FUSES	12	PHOENIX CONTACT UT6 SERIES OR EQUIVALENT
C7	156	TERMINAL BLOCK, FEED THROUGH TYPE	12	PHOENIX CONTACT UT6 SERIES OR EQUIVALENT
C8	36	GASKET FOR PC C2	12	
C9	36	TWIST ON COVER AND CHAIN FOR PIECE C2	12	
C10	21	GASKET FOR PC C3	12	
C11	21	TWIST ON COVER AND CHAIN FOR PIECE C3	12	
C12	3	GASKET FOR PC C4	12	
C13	3	TWIST ON COVER AND CHAIN FOR PIECE C4	12	
C14	60	LABEL PLATE, PLASTIC, ENGRAVED, 3/4" X 1-1/2", ADHESIVE MOUNTED, WHITE BACKGROUND BLACK LETTERING	12	

MATERIAL LIST

PUGET SOUND NAVAL SHIPYARD
CODE 2370
ENGINEERING DIVISION

DRAWING NO.
2370-1851

TITLE
DD5 INDOCK VENTILATION CONTROL SYSTEM

SCALE NONE | **Sheet 4 of 15** | REV. **A**

TITLE: DD5 INDOCK VENTILATION CONTROL SYSTEM
REV. A | SHEET 4
DWG. NO. 2370-1851

ACTUATOR AND DPT MATERIAL

	PC #	QTY	DESCRIPTION	SHT #	REMARKS
	A1	21	DAMPER ACTUATOR, 24VDC POWER, 2-10 VDC COMMAND AND FEEDBACK SIGNALS, MIN 160 IN-LB TORQUE, EXTERNAL MANUAL OVERRIDE, NEMA 4X ENCLOSURE, UL LISTED	14	BELIMO MODEL AMB24-SR-T N4 OR EQUIVALENT
A	A2	21	CONNECTOR, INLINE RECEPTACLE, MIN 5 PIN, MIL-DTL-5015 SERIES EQUIVALENT WITH BAYONET OR REVERSE BAYONET COUPLING	14	MUST MATE WITH THE FEMALE END OF CABLE B
	A3	21	CABLE, 1 FOOT LENGTH, PLTC, EXPOSED RUN RATED, OUTDOOR RATED, 18 AWG, MIN 2 CONDUCTOR, OVERALL SHIELD	14	LAKE CABLE PART # T182S OR EQUIVALENT
	D1	36	DIFFERENTIAL PRESSURE TRANSDUCER, MULTI RANGE, FIELD SELECTABLE RANGES INCLUDING 0.5 AND 1.0 INCHES OF WATER COLUMN, MIN ACCURACY OF + OR - 1% OF FULL SCALE, 4 DIGIT LCD DISPLAY, EXTERNALLY MOUNTED 3/16" BARBED PRESSURE FITTINGS	14	SETRA MODEL MRGSA OR EQUIVALENT
A	D2	36	CONNECTOR, INLINE RECEPTACLE, MIN 2 PIN, MIL-DTL-5015 SERIES EQUIVALENT WITH BAYONET OR REVERSE BAYONET COUPLING	14	MUST MATE WITH THE FEMALE END OF CABLE C
	D3	36	CABLE, 1 FOOT LENGTH, PLTC, EXPOSED RUN RATED, OUTDOOR RATED, 18 AWG, MIN 4 CONDUCTOR, OVERALL SHIELD	14	LAKE CABLE PART # T184S OR EQUIVALENT

CABLE MATERIAL

	PC #	QTY	DESCRIPTION	SHT #	REMARKS
			CABLE A		
	CA1	3	CONNECTOR, INLINE PLUG, MIN 31 SOCKET, ENVIORNMENTALLY RATED, MIL-DTL-5015 SERIES EQUIVALENT WITH BAYONET OR REVERSE BAYONET COUPLING	15	MUST MATE WITH PIECE C4
A	CA2	3	CONNECTOR, INLINE PLUG, MIN 31 PIN, ENVIORNMENTALLY RATED, MIL-DTL-5015 SERIES EQUIVALENT WITH BAYONET OR REVERSE BAYONET COUPLING	15	MUST MATE WITH PIECE P5
	CA3	3	CABLE, 100 FOOT LENGTH, TC, EXPOSED RUN RATED, OUTDOOR RATED, 18 AWG, MIN 30 CONDUCTOR, OVERALL SHIELD	15	LAKE CABLE PART # T1830S OR EQUIVALENT
			CABLE B		
	CA4	21	CONNECTOR, INLINE PLUG, MIN 4 SOCKET, ENVIORNMENTALLY RATED, MIL-DTL-5015 SERIES EQUIVALENT WITH BAYONET OR REVERSE BAYONET COUPLING	15	MUST MATE WITH PIECE A2
A	CA5	21	CONNECTOR, INLINE PLUG, MIN 5 PIN, ENVIORNMENTALLY RATED, MIL-DTL-5015 SERIES EQUIVALENT WITH BAYONET OR REVERSE BAYONET COUPLING	15	MUST MATE WITH PIECE C3
	CA6	21	CABLE, 100 FOOT LENGTH, PLTC, EXPOSED RUN RATED, OUTDOOR RATED, 18 AWG, MIN 4 CONDUCTOR, OVERALL SHIELD	15	LAKE CABLE PART # T184S OR EQUIVALENT
			CABLE C		
	CA7	36	CONNECTOR, INLINE PLUG, MIN 2 SOCKET, ENVIORNMENTALLY RATED, MIL-DTL-5015 SERIES EQUIVALENT WITH BAYONET OR REVERSE BAYONET COUPLING	15	MUST MATE WITH PIECE D2
A	CA8	36	CONNECTOR, INLINE PLUG, MIN 3 PIN, ENVIORNMENTALLY RATED, MIL-DTL-5015 SERIES EQUIVALENT WITH BAYONET OR REVERSE BAYONET COUPLING	15	MUST MATE WITH PIECE C2
	CA9	36	CABLE, 100 FOOT LENGTH, PLTC, EXPOSED RUN RATED, OUTDOOR RATED, 18 AWG, MIN 2 CONDUCTOR, OVERALL SHIELD	15	LAKE CABLE PART # T182S OR EQUIVALENT

MATERIAL LIST CONTINUED

PUGET SOUND NAVAL SHIPYARD
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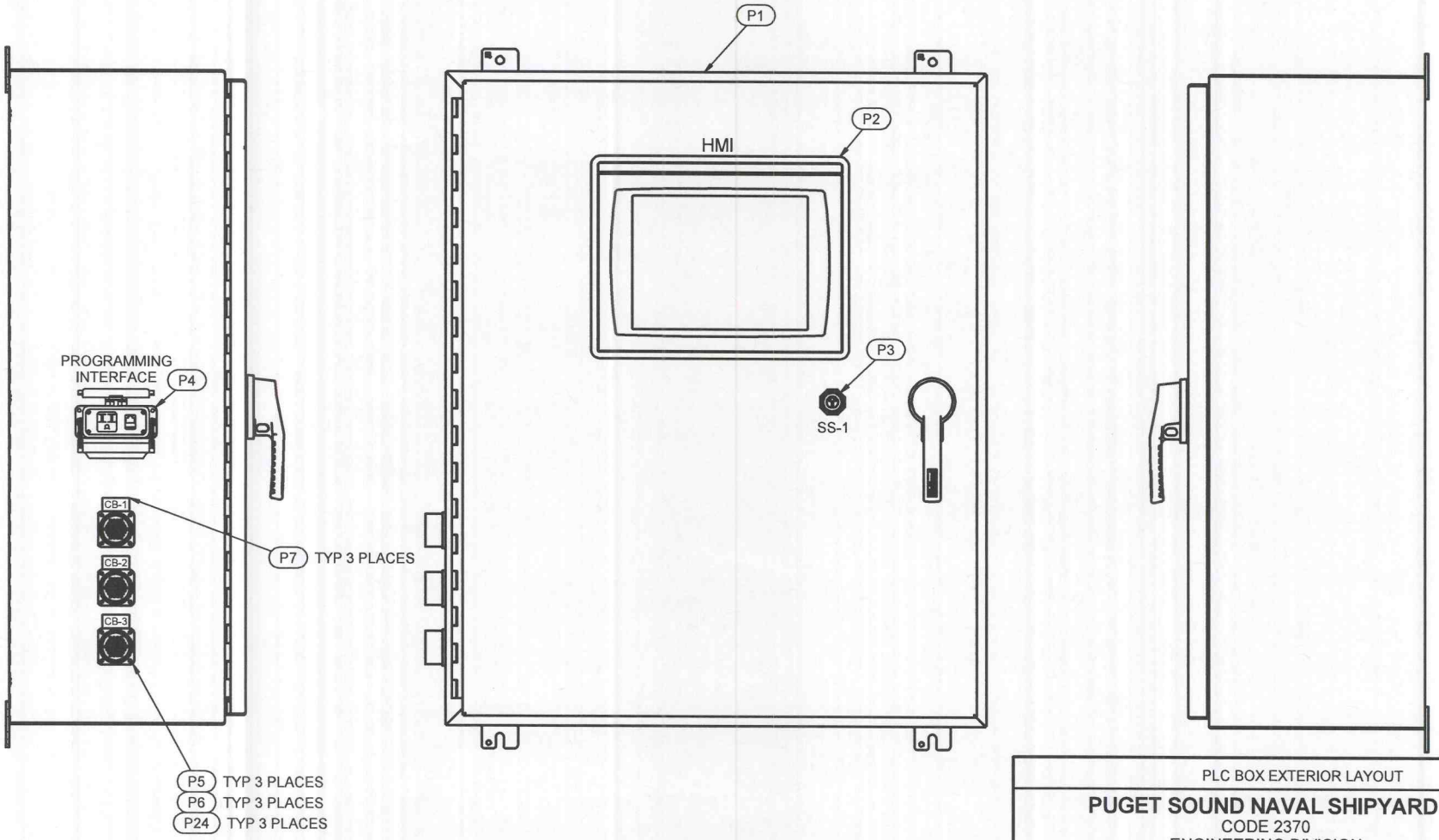
TITLE **DD5 INDOCK VENTILATION CONTROL SYSTEM**

SCALE NONE | **Sheet 5 of 15** | REV. **A**

TITLE: DD5 INDOCK VENTILATION CONTROL SYSTEM | REV: A | SHEET: 5

DWG. NO: 2370-1851



PLC BOX EXTERIOR LAYOUT

PUGET SOUND NAVAL SHIPYARD
CODE 2370
ENGINEERING DIVISION

DRAWING NO. **2370-1851**

TITLE **DD5 INDOCK VENTILATION CONTROL SYSTEM**

SCALE		REV.
NONE	**Sheet 6 of 15**	**A**

TITLE: DD5 INDOCK VENTILATION CONTROL SYSTEM
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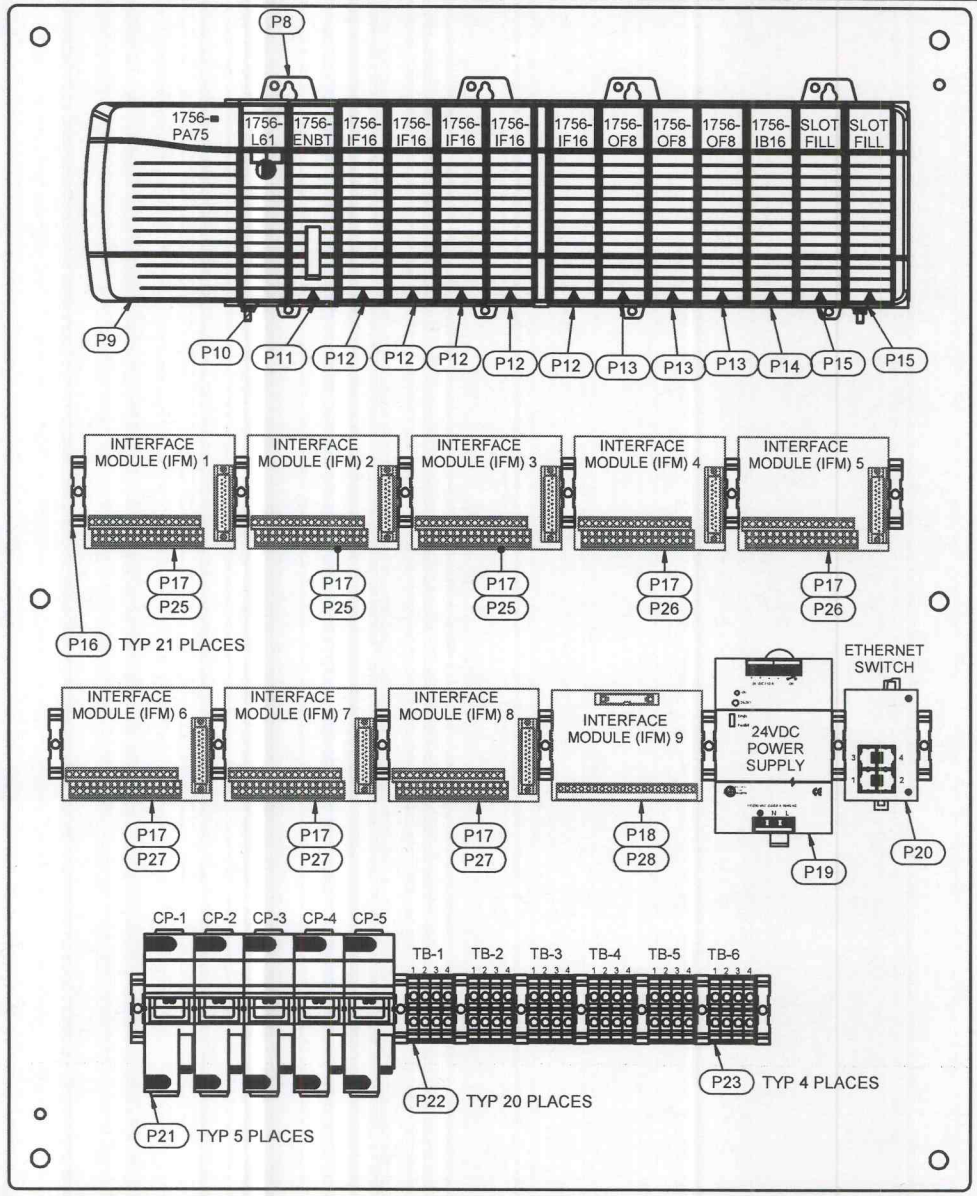


PLC BOX INTERIOR LAYOUT

PUGET SOUND NAVAL SHIPYARD
CODE 2370
ENGINEERING DIVISION

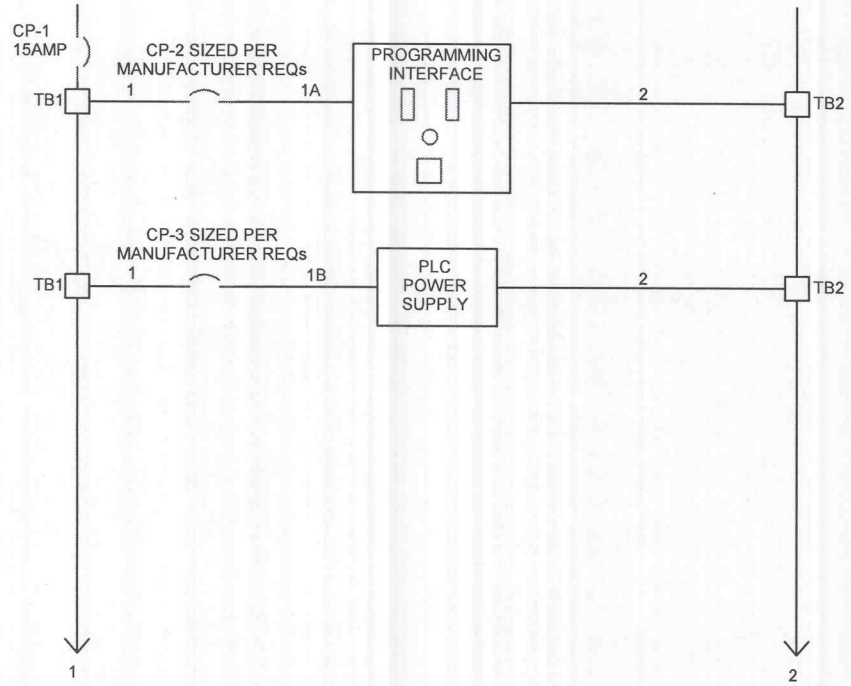
DRAWING NO. **2370-1851**

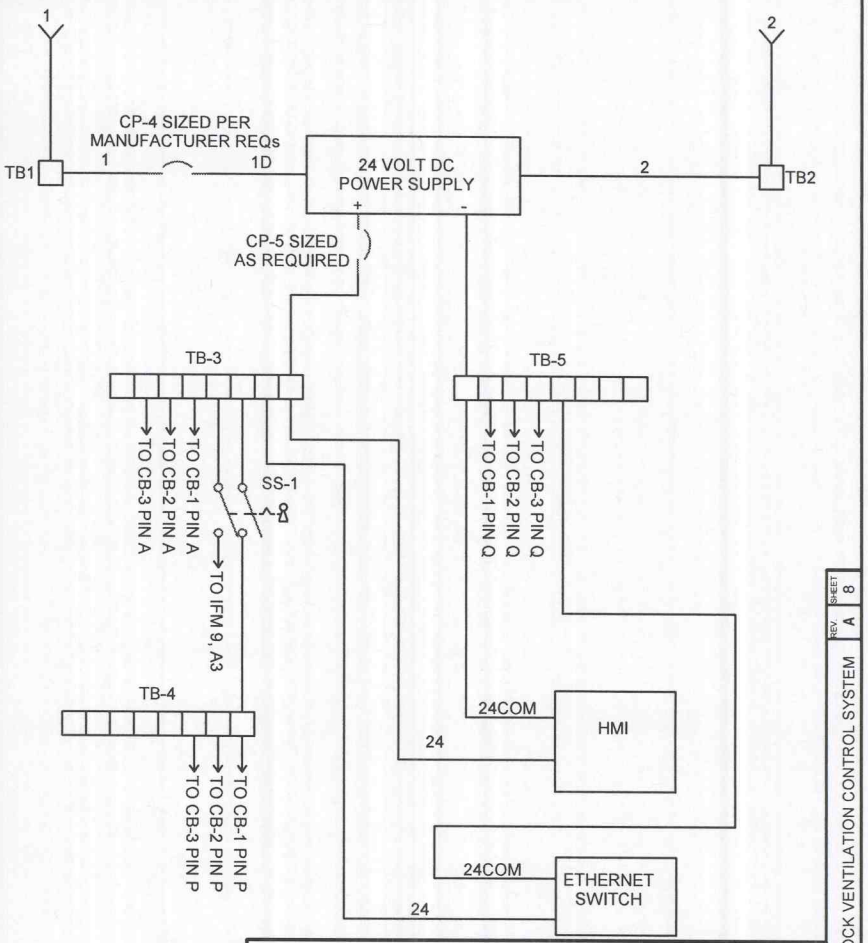
TITLE **DD5 INDOCK VENTILATION CONTROL SYSTEM**

SCALE NONE | **Sheet 7 of 15** | REV. **A**

DD5 INDOCK VENTILATION CONTROL SYSTEM | REV. A | SHEET 7

DWG. NO. 2370-1851





PLC BOX WIRING

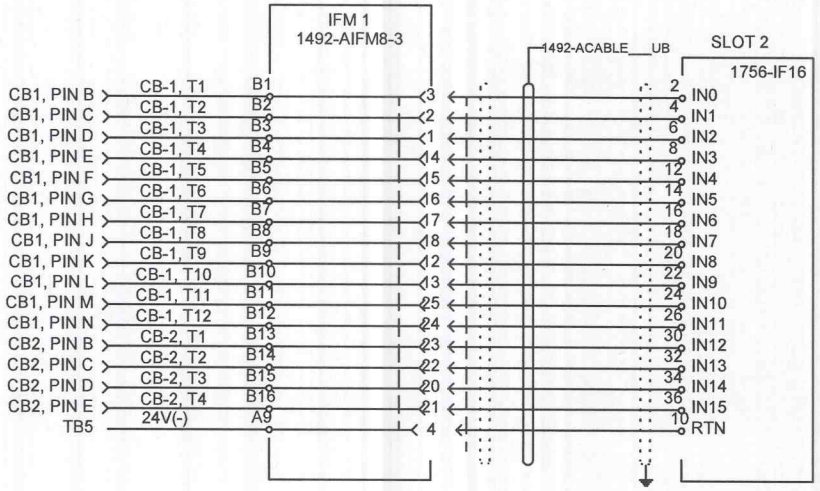
PUGET SOUND NAVAL SHIPYARD
CODE 2370
ENGINEERING DIVISION

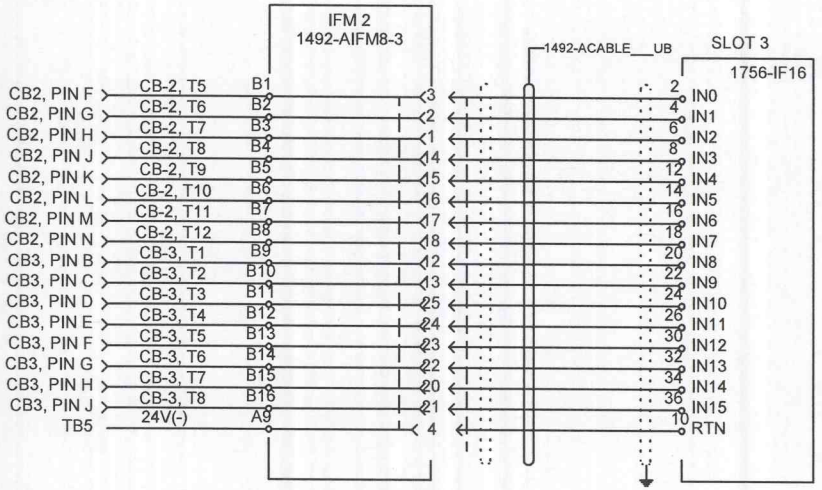
DRAWING NO.
2370-1851

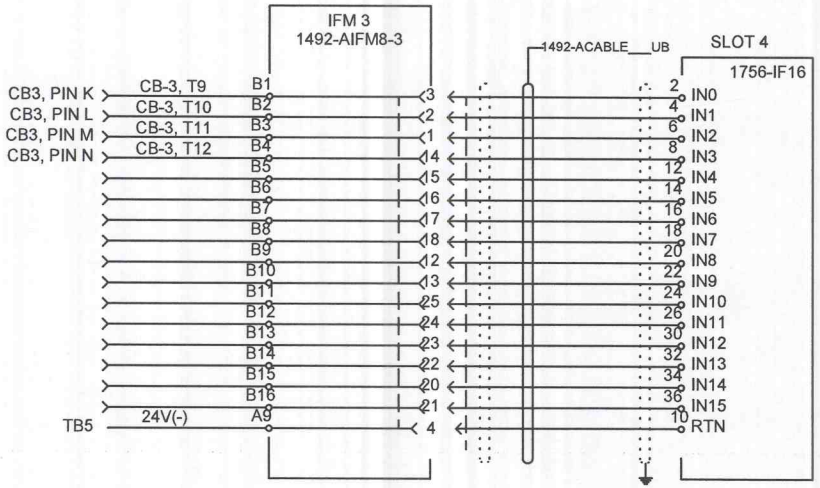
TITLE
DD5 INDOCK VENTILATION CONTROL SYSTEM

SCALE		REV.
NONE	**Sheet 8 of 15**	**A**

DD5 INDOCK VENTILATION CONTROL SYSTEM
REV A
SHEET 8
DWG. NO. 2370-1851







PLC I/O WIRING 1

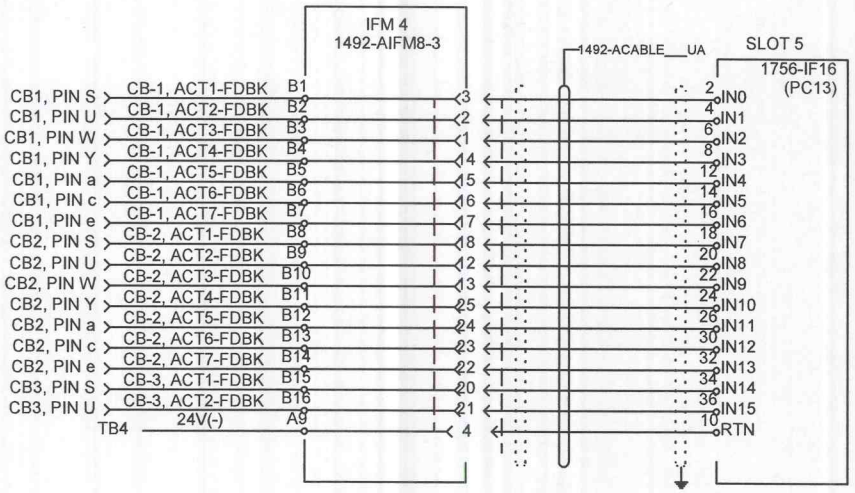
PUGET SOUND NAVAL SHIPYARD
CODE 2370
ENGINEERING DIVISION

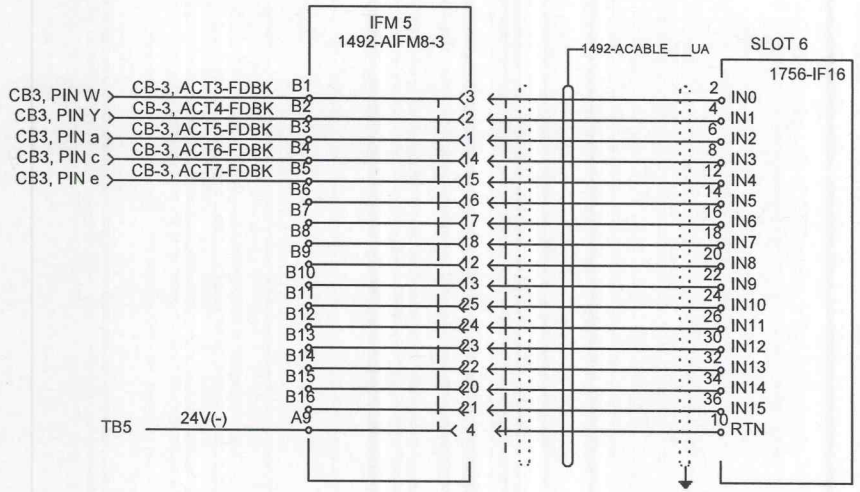
DRAWING NO. **2370-1851**

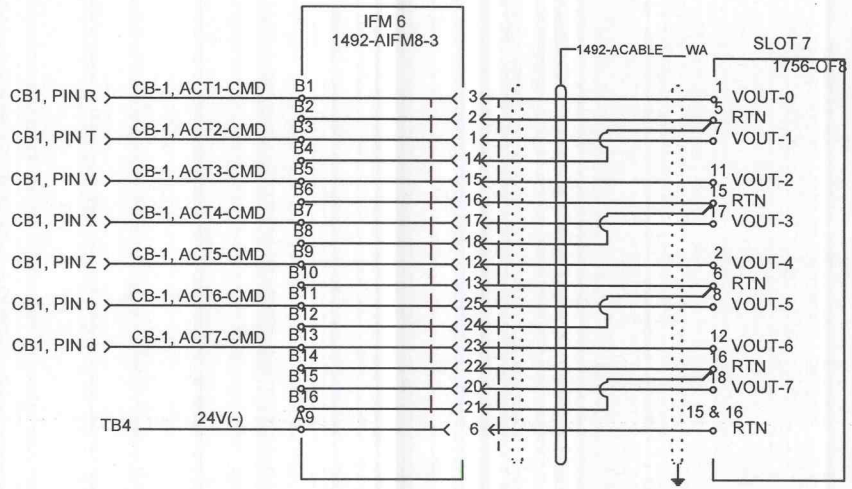
TITLE **DD5 INDOCK VENTILATION CONTROL SYSTEM**

SCALE NONE | **Sheet 9 of 15** | REV. **A**

SHEET 9 | REV. A | TITLE DD5 INDOCK VENTILATION CONTROL SYSTEM | DWG. NO. 2370-1851







PLC I/O WIRING 2

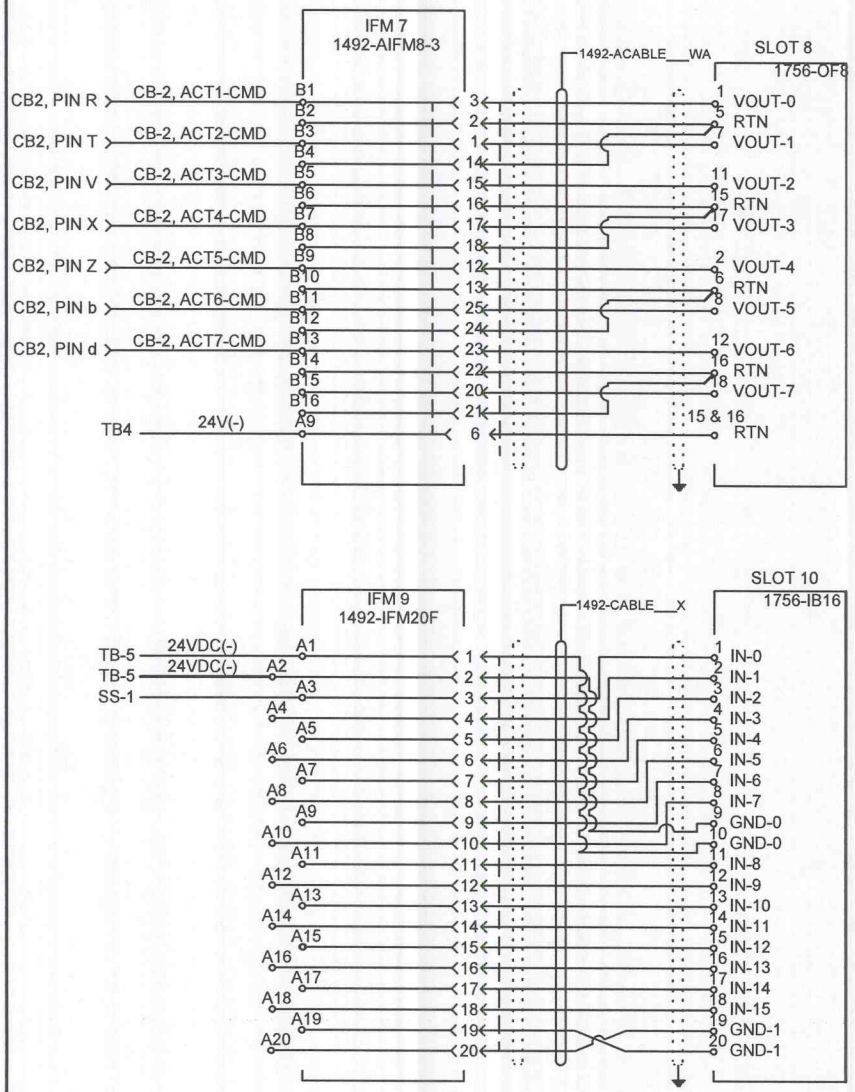
PUGET SOUND NAVAL SHIPYARD
CODE 2370
ENGINEERING DIVISION

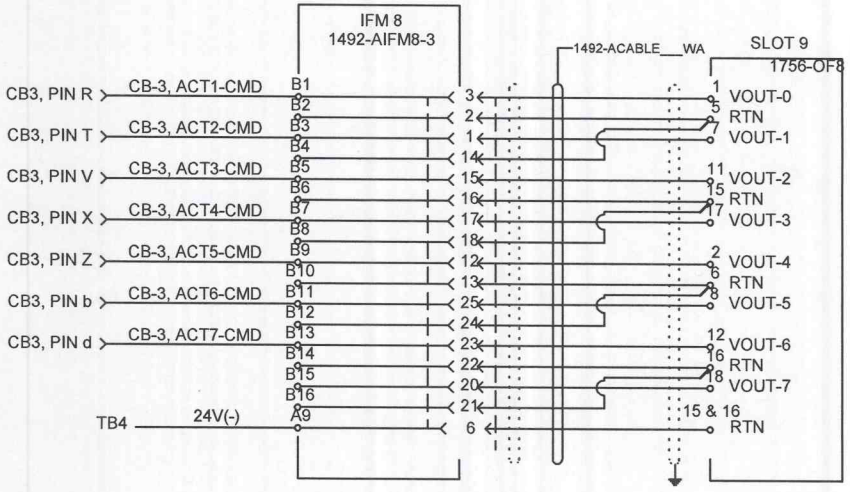
DRAWING NO.
2370-1851

TITLE
DD5 INDOCK VENTILATION CONTROL SYSTEM

SCALE NONE | **Sheet 10 of 15** | REV. **A**

DWG. NO. 2370-1851 | TITLE DD5 INDOCK VENTILATION CONTROL SYSTEM | REV. A | SHEET 10





PLC I/O WIRING 3

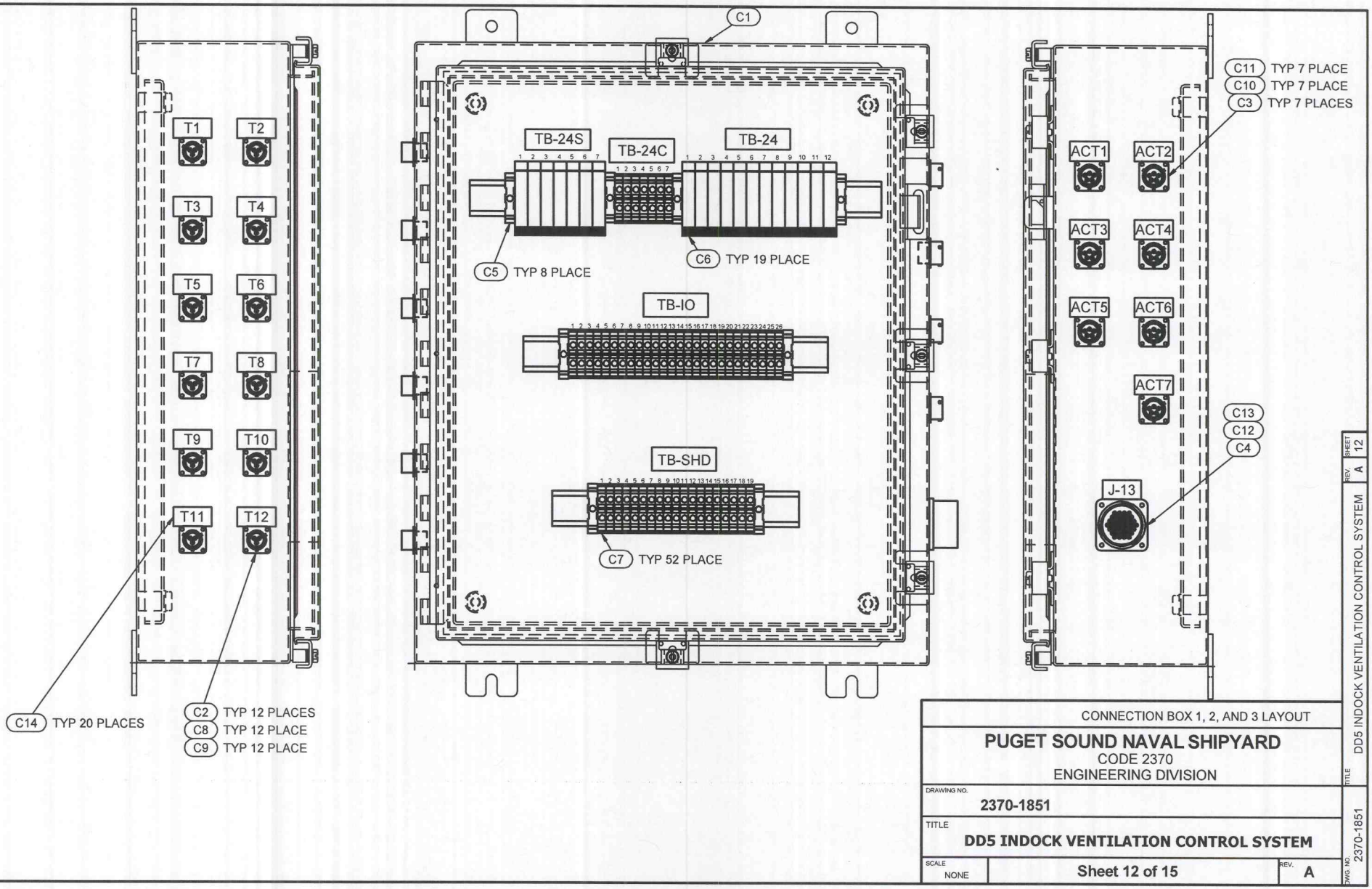
PUGET SOUND NAVAL SHIPYARD
CODE 2370
ENGINEERING DIVISION

DRAWING NO. **2370-1851**

TITLE **DD5 INDOCK VENTILATION CONTROL SYSTEM**

SCALE NONE | **Sheet 11 of 15** | REV. **A**

DD5 INDOCK VENTILATION CONTROL SYSTEM | REV. A | SHEET 11 | DWG. NO. 2370-1851



CONNECTION BOX 1, 2, AND 3 LAYOUT

PUGET SOUND NAVAL SHIPYARD
CODE 2370
ENGINEERING DIVISION

DRAWING NO. **2370-1851**

TITLE **DD5 INDOCK VENTILATION CONTROL SYSTEM**

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TITLE: DD5 INDOCK VENTILATION CONTROL SYSTEM
REV. A
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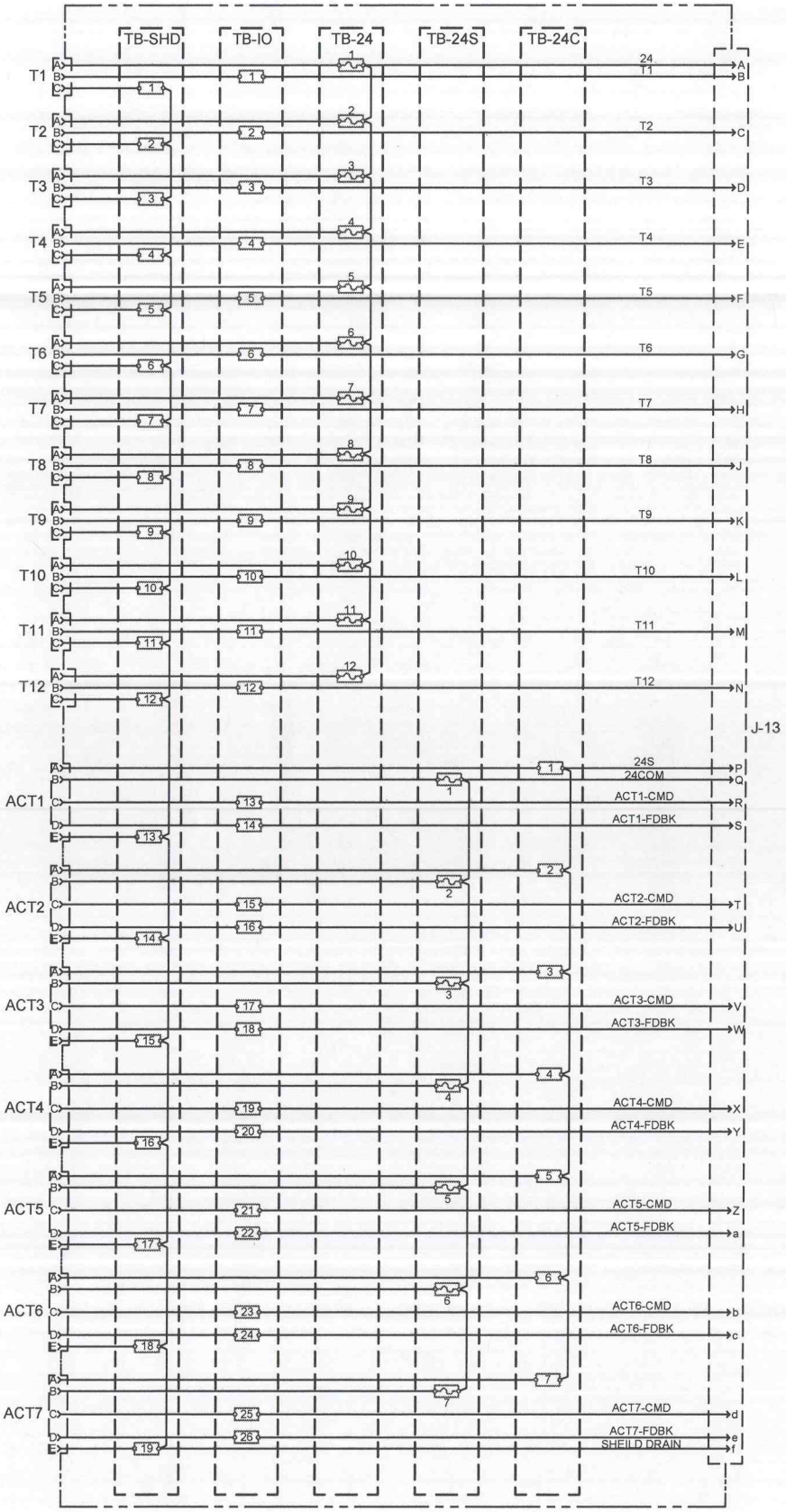


CONNECTION BOX 1, 2, AND 3 WIRING

PUGET SOUND NAVAL SHIPYARD
CODE 2370
ENGINEERING DIVISION

DRAWING NO. 2370-1851

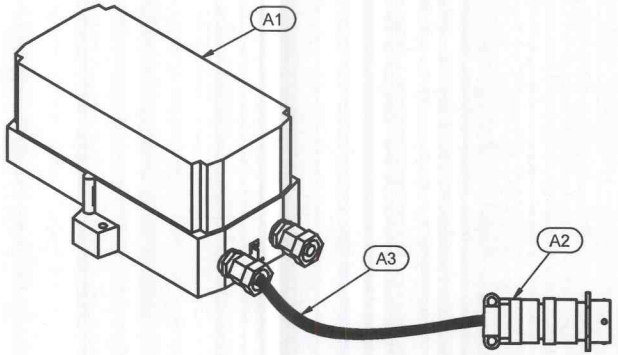
TITLE **DD5 INDOCK VENTILATION CONTROL SYSTEM**

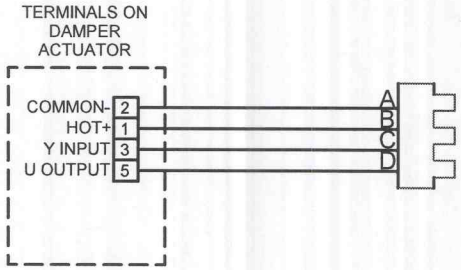
SCALE NONE

Sheet 13 of 15

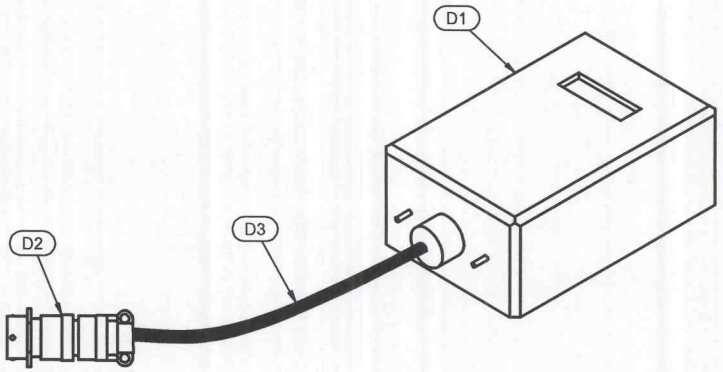
REV. A

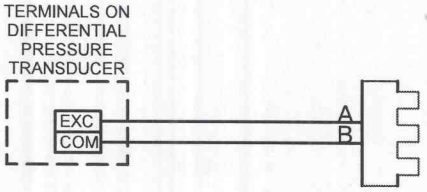
DWG. NO.	TITLE	REV.	SHEET
2370-1851	DD5 INDOCK VENTILATION CONTROL SYSTEM	A	13





DAMPER ACTUATOR VIEW AND SCHEMATIC

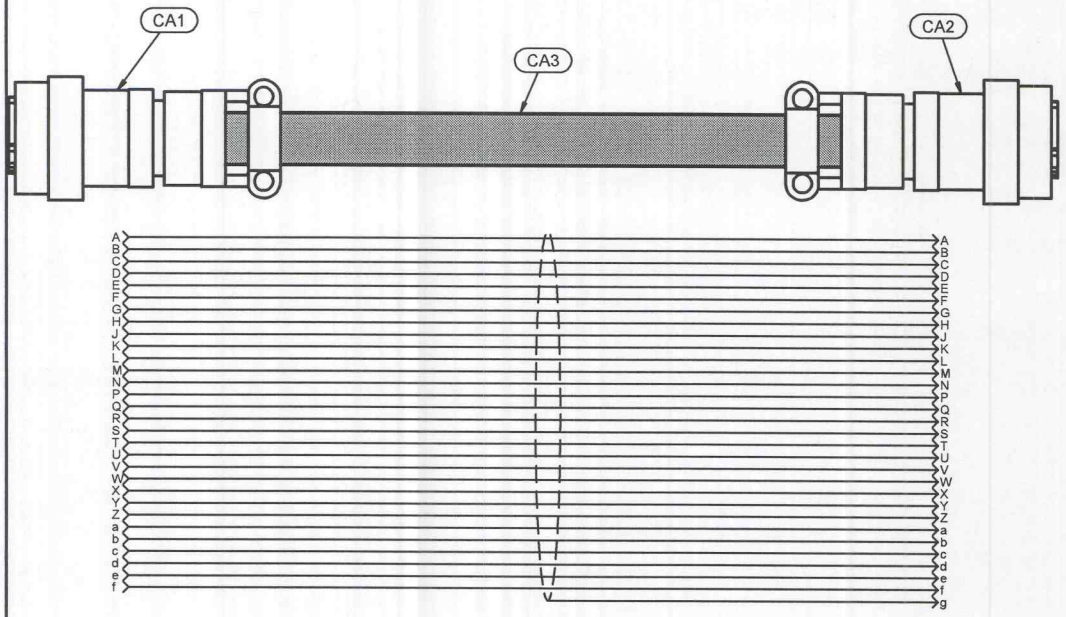




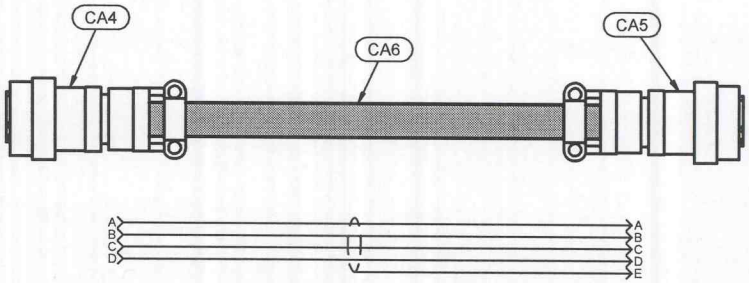
DIFFERENTIAL PRESSURE TRANSDUCER VIEW AND SCHEMATIC

ACTUATOR AND DPT		
PUGET SOUND NAVAL SHIPYARD CODE 2370 ENGINEERING DIVISION		
DRAWING NO. 2370-1851		
TITLE DD5 INDOCK VENTILATION CONTROL SYSTEM		
SCALE NONE	Sheet 14 of 15	REV. A

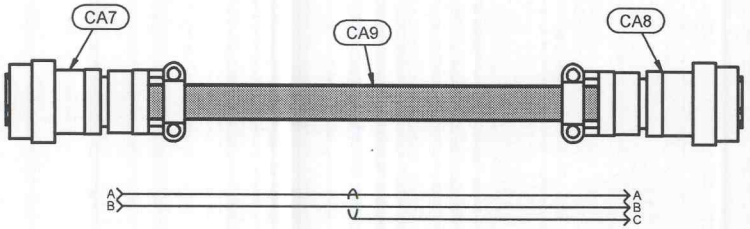
TITLE: DD5 INDOCK VENTILATION CONTROL SYSTEM
REV: A
SHEET: 14
DWG. NO.: 2370-1851



CABLE A



CABLE B



CABLE C

CABLE LAYOUT

PUGET SOUND NAVAL SHIPYARD
CODE 2370
ENGINEERING DIVISION

DRAWING NO. **2370-1851**

TITLE **DD5 INDOCK VENTILATION CONTROL SYSTEM**

SCALE NONE | **Sheet 15 of 15** | REV. **A**

TITLE: DD5 INDOCK VENTILATION CONTROL SYSTEM
REV. A | SHEET 15
DWG. NO. 2370-1851