

10

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1

GENERAL NOTES

1. THIS DRAWING WAS DEVELOPED IN ACCORDANCE WITH ABS MARINE VESSEL RULES, USCG, IEEE STANDARD 45 REQUIREMENTS, AND REFERENCE 1 ARV PERFORMANCE SPECIFICATIONS.

2. ALL ABBREVIATIONS ARE IN ACCORDANCE WITH ASME Y14.38-1999 AND REFERENCE 1, ARV PERFORMANCE SPECIFICATIONS UNLESS OTHERWISE NOTED.

NON-STANDARD ABBREVIATIONS:

- ADCP – ACOUSTIC DOPPLER CURRENT PROFILER
- BBL – BELOW BASE LINE
- HIPAP – HIGH PRECISION ACOUSTIC POSITIONING
- MBESS – MARINE BIOLOGY ECHO SOUNDERS AND SENSOR
- PEN – PENETRATION
- SES – SCIENTIFIC ELECTRONIC SYSTEMS
- UON – UNLESS OTHERWISE NOTED
- USBL – ULTRA SHORT BASELINE

3. THE SHIP IS CLASSED FOR UNRESTRICTED SERVICE UNDER ABS RULES FOR MARINE VESSELS.

4. THE SHIP IS DESIGNED AND CONSTRUCTED IAW 46CFR, SUBCHAPTER U (OCEANOGRAPHIC RESEARCH VESSELS). IT SHALL BE ISSUED A CERTIFICATE OF INSPECTION (COI) BY THE USCG.

5. ALL SYSTEMS SHOWN ON MAST FOR NAVIGATION AND COMMUNICATION ARE PRIMARILY DEPICTED ON REFERENCE 2, TOPSIDE ARRANGEMENT. REFER TO REFERENCE 2, TOPSIDE ARRANGEMENT, FOR DETAILED INFORMATION.

6. TRANSDUCER CONDUIT SHALL BE 8", SCHEDULE 80 PIPE. THE LAST 1' OF THE RUN SHALL BE 8" SCHEDULE 40 OR SIMILAR PIPE THAT CAN ACCOMMODATE THE INSTALLATION OF A MULTI-CABLE TRANSIT (ITEM 27). EACH CONDUIT SHALL HAVE AN AIR INLET LOCATED WITHIN 18" OF THE UPPERMOST END, THIS INLET WILL HAVE A CUTOFF VALVE (ITEM 25) AND BE ROUTED TO WEATHER. A SEA INLET SHALL BE INSTALLED WITH A CUTOFF VALVE (ITEM 26). ALL LOCATIONS ARE NOTIONAL.

7. COMPARTMENT BACKGROUNDS SHOWN ON THIS DRAWING REFLECT REVISION P4 OF THE GENERAL ARRANGEMENT, REFERENCE 3, WITH THE EXCEPTION OF THE FOLLOWING:

- A. DIMENSIONS OF FUEL OIL STORAGE TANKS 5-53-2-F AND 5-53-1-F ABOVE THE TRANSDUCER SPACE FROM FRAMES 61 TO 69 HAVE BEEN REDUCED TO PROVIDE SUFFICIENT OVERHEAD SPACE TO IMPROVE EQUIPMENT SERVICEABILITY.

8. CONDUITS PASSING THROUGH TANKS SHALL BE INSTALLED AND ARRANGED IN ACCORDANCE WITH MVR 4-8-4/21.1.9.

9. CENTERBOARD AND CENTERBOARD TRUNK ARE FLOODED.

RESERVATIONS

1. EXACT DIMENSIONS OF SES EQUIPMENT RESERVED PENDING VFI FOOTPRINTS SHOWN ARE APPROXIMATE MOUNTING PLATE DIMENSIONS AND TO BE UPDATED AS VFI BECOMES AVAILABLE.

2. NAVIGATION EQUIPMENT IS RESERVED FOR FUTURE DEVELOPMENT.

3. TEMPORARY AND PERMANENT SCIENTIFIC WIREWAYS AND CONDUITS (INCLUDING TRANSDUCER DEDICATED CONDUITS) ARE RESERVED PENDING FUTURE DEVELOPMENT OF REFERENCE 3, GENERAL ARRANGEMENT AND REFERENCE 4, SCIENCE SPACE ARRANGEMENT DRAWINGS.

4. SES TRANSCIEVER EQUIPMENT ARRANGEMENT IS RESERVED FOR FUTURE DEVELOPMENT OF REFERENCE 4, SCIENCE SPACE ARRANGEMENT DRAWINGS.

5. SCIENTIFIC METEOROLOGICAL SYSTEM WIND MEASUREMENT EQUIPMENT IS RESERVED FOR FUTURE DEVELOPMENT.

6. SCIENTIFIC INSTRUMENTATION WATER SAMPLING EQUIPMENT IS RESERVED PENDING FUTURE DEVELOPMENT OF REFERENCE 5, SCIENCE SEAWATER SYSTEM.

7. SES OPERATION STATIONS ARE RESERVED PENDING FUTURE DEVELOPMENT OF REFERENCE 3, GENERAL ARRANGEMENT AND REFERENCE 4, SCIENCE SPACE ARRANGEMENT DRAWINGS.

8. SEA-CHESTS AND TRANSDUCER PROTECTIVE PROVISIONS ARE PENDING FUTURE DEVELOPMENT AND VFI.

9. MODELS AND MANUFACTURERS OF ALL EQUIPMENT ARE RESERVED PENDING FINAL DETAILED DESIGN.

10. MAST ARRANGEMENT IS RESERVED PENDING DEVELOPMENT OF REFERENCE 2, TOPSIDE ARRANGEMENT.

11. CONDUIT AND CENTERBOARD VENTILATION IS RESERVED PENDING FUTURE DEVELOPMENT.

12. EQUIPMENT WITHIN THE TRANSCIEVER ROOM (2-59-1-Q) INCLUDING PROCESSING EQUIPMENT IS RESERVED PENDING DEVELOPMENT.

13. ICE DOOR AT CENTERBOARD TRUNK OPENING IS RESERVED FOR FUTURE DEVELOPMENT.

ZONE

ALL

REV

P0

DESCRIPTION

INITIAL ISSUE

DATE

7/14/22

APPROVED

P. MCGINN

ALL

P1

UPDATED HULL FORM  
UPDATED EQPT PER VFI  
UPDATED NOTES, REFS

9/16/22

P. MCGINN

ALL

P2

UPDATED HULL FORM  
UPDATED EQPT PER VFI  
UPDATED NOTES, REFS  
ADDED VIEWS TO SH 4--9  
ADDED PARTIAL PLAN AND ELEVATION VIEW FOR CENTERBOARD  
REMOVED RESERVATION 7 TO SUIT UPDATED DESIGN PROGRESS  
RENUMBER RESERVATIONS

1/13/23

P. MCGINN

ALL

P3

REDRAWN IN ENTIRETY  
REPLACED ENTIRE GA BACKGROUND  
REPLACED MAJORITY OF EQUIPMENT MODELS  
ADDED MULTIPLE CONDUIT  
ADDED RESERVATIONS 10, 11, 12 & 13  
REMOVED GENERAL NOTE 4 AND RENUMBERED  
ADDED GENERAL NOTES 6, 7, 8 & 9  
ADDED DETAILS AND EQUIPMENT TO HIPAP SYSTEM  
ADDED PRELIMINARY STRUCTURAL ELEMENTS FOR REFERENCE  
REMOVED QTY 2 FORWARD LOOKING SONARS  
REDESIGNED HIPAP TRUNK  
REFORMATTED REVISION HISTORY

8/2/23

P. MCGINN

SHEET INDEX

SH

REV

TITLE

1

P3

TITLE, SHEET INDEX, REVISIONS, GENERAL NOTES, REFERENCES, RESERVATIONS

2

P3

LIST OF MATERIAL

3

P3

INNER BOTTOM PLAN

4

P3

HIPAP & CONDUIT ELEVATION

5

P3

CENTERBOARD ARRANGEMENT & TRUNK LOCK POSITIONS

6

P3

TRANSCIEVER ROOM (2-59-1-Q) ARRANGEMENT

5

SCIENCE SEAWATER SYSTEM

5E1-524-0001

4

SCIENCE SPACE ARRANGEMENT

5E1-601-0001

3

GENERAL ARRANGEMENT

5E1-001-0001

2

TOPSIDE ARRANGEMENT

5E1-002-0101

1

ARV PERFORMANCE SPECIFICATION

-

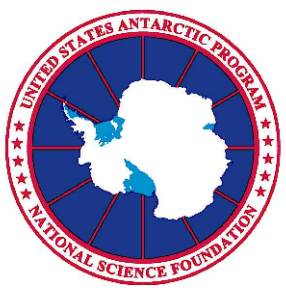
NO.

TITLE

DWG/DOC NO.

REFERENCES

NATIONAL SCIENCE FOUNDATION  
GEOSCIENCES DIRECTORATE  
OFFICE OF POLAR PROGRAMS  
2415 EISENHOWER AVENUE  
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PREPARED  
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DATE  
06/09/22

CHECKED  
M. CAMILO  
DATE  
07/14/22

MANAGES  
S. VAUGHN  
DATE  
07/14/22

APPROVED  
P. MCGINN  
DATE  
07/14/22

DATE  
06/09/22

DATE  
07/14/22

DATE  
07/14/22

DATE  
07/14/22

SIZE

SWBS

DRAWING NO.

REV

H

301

5E1-301-D101

P3

CONTRACT NO.

NSFDACS1219442

SCALE:

AS NOTED

SHEET

1 OF 6

DWG NO 5E1-301-D101

SH 1

REV 3

10

9

8

7

6

5

4

3

2

1

GENERAL NOTES

RESERVATIONS

SHEET INDEX

SH

REV

TITLE

1

P3

TITLE, SHEET INDEX, REVISIONS, GENERAL NOTES, REFERENCES, RESERVATIONS

2

P3

LIST OF MATERIAL

3

P3

INNER BOTTOM PLAN

4

P3

HIPAP & CONDUIT ELEVATION

5

P3

CENTERBOARD ARRANGEMENT & TRUNK LOCK POSITIONS

6

P3

TRANSCIEVER ROOM (2-59-1-Q) ARRANGEMENT

5

SCIENCE SEAWATER SYSTEM

5E1-524-0001

4

SCIENCE SPACE ARRANGEMENT

5E1-601-0001

3

GENERAL ARRANGEMENT

5E1-001-0001

2

TOPSIDE ARRANGEMENT

5E1-002-0101

1

ARV PERFORMANCE SPECIFICATION

-

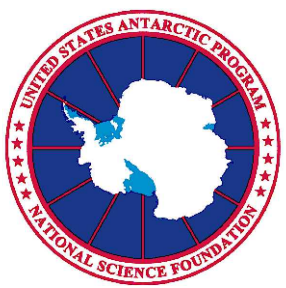
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DWG NO 5E1-301-D101

SH 1

REV 3

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9

8

7

6

5

4

3

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GENERAL NOTES

RESERVATIONS

SHEET INDEX

SH

REV

TITLE

1

P3

TITLE, SHEET INDEX, REVISIONS, GENERAL NOTES, REFERENCES, RESERVATIONS

2

P3

LIST OF MATERIAL

3

P3

INNER BOTTOM PLAN

4

P3

HIPAP & CONDUIT ELEVATION

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P3

CENTERBOARD ARRANGEMENT & TRUNK LOCK POSITIONS

6

P3

TRANSCIEVER ROOM (2-59-1-Q) ARRANGEMENT

5

SCIENCE SEAWATER SYSTEM

5E1-524-0001

4

SCIENCE SPACE ARRANGEMENT

5E1-601-0001

3

GENERAL ARRANGEMENT

5E1-001-0001

2

TOPSIDE ARRANGEMENT

5E1-002-0101

1

ARV PERFORMANCE SPECIFICATION

-

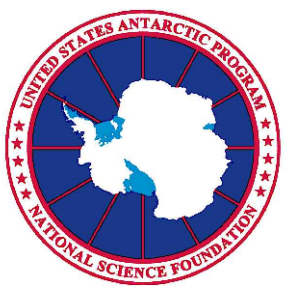
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P3

CONTRACT NO.

NSFDACS1219442

SCALE:

AS NOTED

SHEET

1 OF 6

DWG NO 5E1-301-D101

SH 1

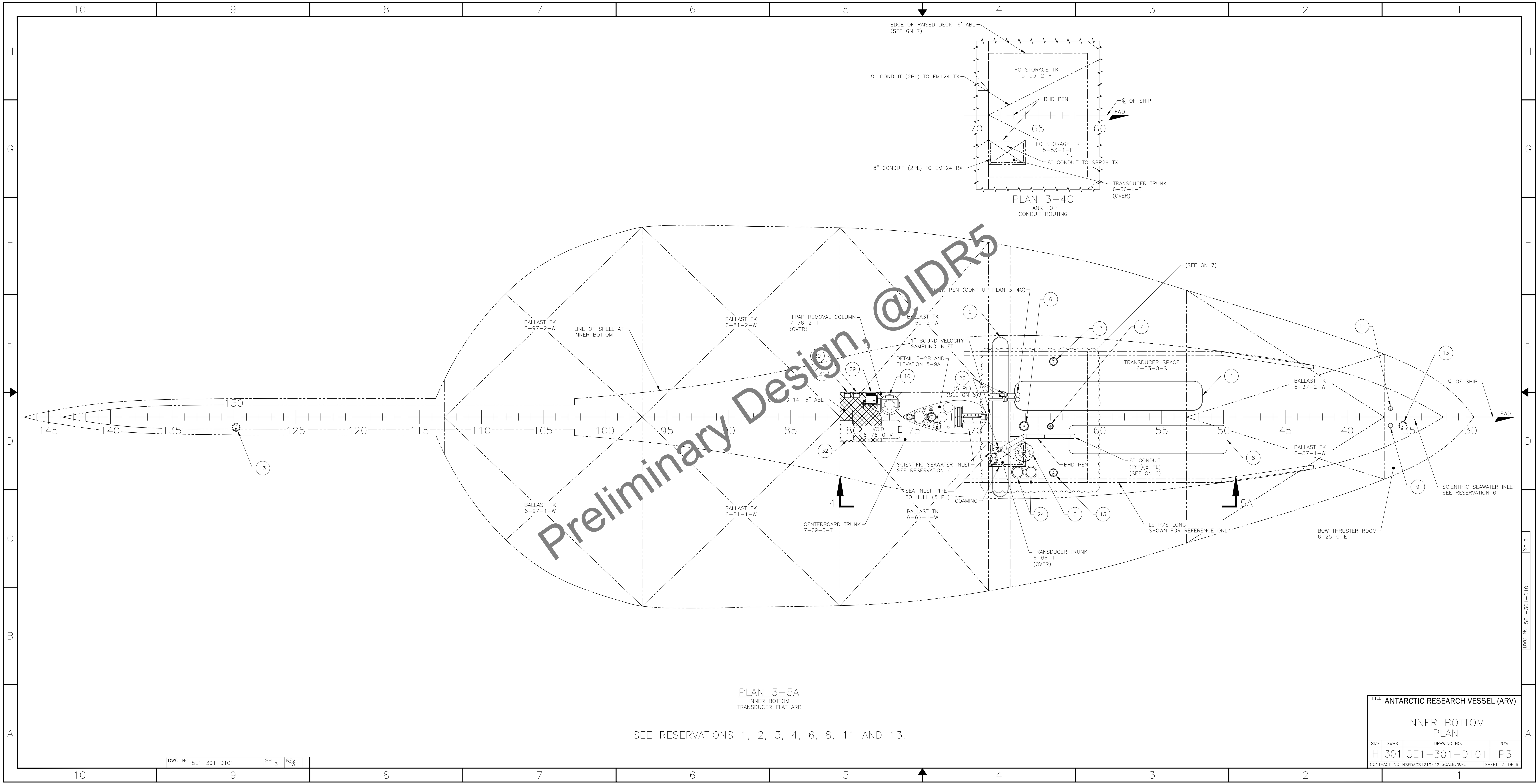
REV 3

Preliminary Design, @IDR5



| 10                                                       |              | 9                 |                                               | 8              |                    | 7                    |                          | 6       |                                                       | 5                                        |              | 4                                                                    |     | 3             |                    | 2                       |        | 1             |         |
|----------------------------------------------------------|--------------|-------------------|-----------------------------------------------|----------------|--------------------|----------------------|--------------------------|---------|-------------------------------------------------------|------------------------------------------|--------------|----------------------------------------------------------------------|-----|---------------|--------------------|-------------------------|--------|---------------|---------|
| LIST OF MATERIAL (QUANTITY FOR ONE SHIP)                 |              |                   |                                               |                |                    |                      |                          |         |                                                       | LIST OF MATERIAL (QUANTITY FOR ONE SHIP) |              |                                                                      |     |               |                    |                         |        |               |         |
| ITEM NO.                                                 | QTY PROVIDED | DESCRIPTION       |                                               | LAST NO. USED  | QTY REQD BY P-SPEC | NSN OR MFGR PART NO. | SOURCE                   | UNIT WT | REMARKS                                               | ITEM NO.                                 | QTY PROVIDED | DESCRIPTION                                                          |     | LAST NO. USED | QTY REQD BY P-SPEC | NSN OR MFGR PART NO.    | SOURCE | UNIT WT       | REMARKS |
| G                                                        | 1            | 1                 | TRANSDUCER: DEEP WATER, MULTI-BEAM, 1"        | N/A            | 1                  | EM 124               | KONGSBERG OR EQUIVALENT  | TBD     | TRANSMITTER                                           | 48                                       | 1            | RECEIVER UNIT                                                        | N/A | 1             | RX UNIT EM 712     | KONGSBERG OR EQUIVALENT | TBD    |               |         |
|                                                          | 2            | 1                 | TRANSDUCER: DEEP WATER, MULTI-BEAM, 1"        | N/A            | 1                  | EM 124               | KONGSBERG OR EQUIVALENT  | TBD     | RECEIVER                                              | 49                                       | 2            | CHASSIS, OCEAN SURVEY                                                | N/A | 2             | 96A-6000           | TELEDYNE OR EQUIVALENT  | TBD    |               |         |
|                                                          | 3            | 1                 | TRANSDUCER: SHALLOW WATER, MULTI-BEAM, 1', TX | N/A            | 1                  | EM 712               | KONGSBERG OR EQUIVALENT  | TBD     | TRANSMITTER                                           | 50                                       | 1            | CHASSIS, OCEAN SURVEY                                                | N/A | 1             | 961-6031           | TELEDYNE OR EQUIVALENT  | TBD    |               |         |
|                                                          | 4            | 1                 | TRANSDUCER: SHALLOW WATER, MULTI-BEAM, 1', RX | N/A            | 1                  | EM 712               | KONGSBERG OR EQUIVALENT  | TBD     | RECEIVER                                              | 51                                       | 1            | CABINET, WIDE BAND TRANSCEIVER, W POWER SUPPLIES AND ETHERNET SWITCH | N/A | 1             | -                  | KONGSBERG OR EQUIVALENT | TBD    | DOC ID 400930 |         |
|                                                          | 5            | 1                 | ACOUSTIC DOPPLER CURRENT PROFILER 38 KHZ      | N/A            | 1                  | RDI ADCP             | TELEDYNE OR EQUIVALENT   | TBD     | OCEAN SURVEYOR                                        | 52                                       | 1            | PROCESSOR UNIT                                                       | N/A | 1             | -                  | KONGSBERG OR EQUIVALENT | TBD    | DOC ID 385609 |         |
|                                                          | 6            | 1                 | ACOUSTIC DOPPLER CURRENT PROFILER 75 KHZ      | N/A            | 1                  | RDI ADCP             | TELEDYNE OR EQUIVALENT   | TBD     | OCEAN SURVEYOR                                        | 53                                       | 6            | TRANSCEIVER, WIDE BAND                                               | N/A | 6             | -                  | KONGSBERG OR EQUIVALENT | TBD    | DOC ID 388697 |         |
|                                                          | 7            | 1                 | ACOUSTIC DOPPLER CURRENT PROFILER 300 KHZ     | N/A            | 1                  | RDI ADCP             | TELEDYNE OR EQUIVALENT   | TBD     | OCEAN SURVEYOR, USED IN PLACE OF ADCP 150KHZ          | SEE RESERVATION 9.                       |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 8            | 1                 | SUB-BOTTOM PROFILER, 3'                       | N/A            | 1                  | SBP 29               | KONGSBERG OR EQUIVALENT  | TBD     | TRANSMITTER                                           |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
| F                                                        | 9            | 1                 | ACOUSTIC RELEASE TRANSPONDER                  | N/A            | 1                  | 344884A              | KONGSBERG OR EQUIVALENT  | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 10           | 1                 | USBL                                          | N/A            | 1                  | HIPAP 502            | KONGSBERG OR EQUIVALENT  | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 11           | 2                 | SPEED LOG                                     | N/A            | 0                  | 379814A              | KONGSBERG OR EQUIVALENT  | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 12           | 2                 | 19" CENTERBOARD SPARE                         | N/A            | 0                  | TBD                  | TBD                      | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 13           | 5                 | HYDROPHONE                                    | N/A            | 2                  | TC4032               | TELEDYNE OR EQUIVALENT   | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
| E                                                        | 14           | 1                 | FORWARD LOOKING CAMERA                        | N/A            | 1                  | DROPSHOT 20/20 -V90  | SPLASHCAM                | TBD     | SEE RESERVATION 2                                     |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 15           | 1                 | FORWARD LOOKING SONAR                         | N/A            | 1                  | SN 90                | KONGSBERG OR EQUIVALENT  | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 16           | 1                 | MBESS TRANSDUCER 18 KHZ                       | N/A            | 1                  | EK 80                | KONGSBERG OR EQUIVALENT  | TBD     | USED IN PLACE OF 12KHZ SINGLE BEAM SURVEY SYSTEM      |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 17           | 1                 | MBESS TRANSDUCER 38 KHZ                       | N/A            | 1                  | EK 80                | KONGSBERG OR EQUIVALENT  | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 18           | 1                 | MBESS TRANSDUCER 70 KHZ                       | N/A            | 0                  | EK 80                | KONGSBERG OR EQUIVALENT  | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 19           | 1                 | MBESS TRANSDUCER 120 KHZ                      | N/A            | 1                  | EK 80                | KONGSBERG OR EQUIVALENT  | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 20           | 1                 | MBESS TRANSDUCER 200 KHZ                      | N/A            | 1                  | EK 80                | KONGSBERG OR EQUIVALENT  | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 21           | 1                 | MBESS TRANSDUCER 333 KHZ                      | N/A            | 0                  | EK 80                | KONGSBERG OR EQUIVALENT  | TBD     | OPPORTUNITY EQUIPMENT                                 |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 22           | SEE RESERVATION 2 | RACK ENCLOSURE, 19" X 45U, WITH SIDES         | N/A            | N/A                | SR45UB               | TRIPP-LITE OR EQUIVALENT | 307.00  | SEE RESERVATIONS 1 & 4                                |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 23           | SEE RESERVATION 2 | RACK ENCLOSURE, 19" X 45U, WITHOUT SIDES      | N/A            | N/A                | SR45UBEXP            | TRIPP-LITE OR EQUIVALENT | 229.00  | SEE RESERVATIONS 1 & 4                                |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
| D                                                        | 24           | 2                 | 19" TRANSDUCER FLAT SPARE                     | N/A            | 2                  | TBD                  | TBD                      | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 25           | 5                 | VALVE, AIR INLET                              | N/A            | N/A                | TBD                  | TBD                      | TBD     | GENERAL NOTE 6                                        |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 26           | 5                 | VALVE, SEA INLET                              | N/A            | N/A                | TBD                  | TBD                      | TBD     | GENERAL NOTE 6                                        |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 27           | 5                 | MULTI-CABLE TRANSIT, ROUND, 120X120           | N/A            | N/A                | R 200 AISI 316       | ROXTEC OR EQUIVALENT     | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 28           | 180               | MODULE, 20X20, CABLE RANGE 4.0-14.5MM         | N/A            | N/A                | RM 20                | ROXTEC OR EQUIVALENT     | TBD     | USE WITH ITEM 27                                      |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
| C                                                        | 29           | 1                 | TRANSCEIVER, HIPAP                            | N/A            | N/A                | TRANSCEIVER XB2      | KONGSBERG OR EQUIVALENT  | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 30           | 1                 | CONTROL UNIT, HOIST                           | N/A            | N/A                | TBD                  | KONGSBERG OR EQUIVALENT  | TBD     | HIPAP COMPONENT                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 31           | 1                 | CONTROL UNIT, GATE VALVE                      | N/A            | N/A                | TBD                  | KONGSBERG OR EQUIVALENT  | TBD     | HIPAP COMPONENT                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 32           | 1                 | POWER PACK, GATE VALVE                        | N/A            | N/A                | TBD                  | KONGSBERG OR EQUIVALENT  | TBD     | HIPAP COMPONENT                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 33           | 2                 | SENSOR, SOUND VELOCITY                        | N/A            | 1                  | TBD                  | TBD                      | TBD     | QTY 1 REPRESENTED AS 1" SOUND VELOCITY SAMPLING INLET |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 34           | 1                 | DESK                                          | N/A            | N/A                | TBD                  | TBD                      | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 35           | 1                 | SHELF                                         | N/A            | N/A                | TBD                  | TBD                      | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 36           | 1                 | CHAIR                                         | N/A            | N/A                | TBD                  | TBD                      | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
| B                                                        | 37           | 1                 | MONITOR                                       | N/A            | N/A                | TBD                  | TBD                      | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 38           | 1                 | KEYBOARD                                      | N/A            | N/A                | TBD                  | TBD                      | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 39           | 1                 | MOUSE                                         | N/A            | N/A                | TBD                  | TBD                      | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 40           | 2                 | PROCESSOR UNIT                                | N/A            | 2                  | -                    | KONGSBERG OR EQUIVALENT  | TBD     | DOC ID 385422                                         |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 41           | 2                 | WORKSTATION, HYDROGRAPHIC                     | N/A            | 2                  | MP8200H HWS          | KONGSBERG OR EQUIVALENT  | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 42           | 2                 | KIT, 19" RACK MOUNTING                        | N/A            | 2                  | -                    | KONGSBERG OR EQUIVALENT  | TBD     | DOC ID 445723, USE WITH ITEM 35                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 43           | 2                 | REMOTE BOX                                    | N/A            | N/A                | K-REM                | KONGSBERG OR EQUIVALENT  | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
| A                                                        | 44           | 1                 | TRANSMITTER UNIT                              | N/A            | 1                  | TX UNIT EM 304/124   | KONGSBERG OR EQUIVALENT  | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 45           | 1                 | TRANSMITTER UNIT                              | N/A            | 1                  | TX UNIT SBP 29       | KONGSBERG OR EQUIVALENT  | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 46           | 1                 | TRANSMITTER UNIT                              | N/A            | 1                  | TX UNIT EM 712       | KONGSBERG OR EQUIVALENT  | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
|                                                          | 47           | 1                 | RECEIVER UNIT                                 | N/A            | 1                  | RX UNIT EM 124       | KONGSBERG OR EQUIVALENT  | TBD     |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
| SEE RESERVATION 9.                                       |              |                   |                                               |                |                    |                      |                          |         |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
| 10                                                       |              | 9                 |                                               | 8              |                    | 7                    |                          | 6       |                                                       | 5                                        |              | 4                                                                    |     | 3             |                    | 2                       |        | 1             |         |
| DWG NO 5E1-301-D101                                      |              | SH 2              |                                               | REV 3          |                    |                      |                          |         |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
| TITLE ANTARCTIC RESEARCH VESSEL (ARV)                    |              |                   |                                               |                |                    |                      |                          |         |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
| LIST OF MATERIAL                                         |              |                   |                                               |                |                    |                      |                          |         |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
| SIZE H 301                                               |              | SWBS 5E1-301-D101 |                                               | DRAWING NO. P3 |                    | REV                  |                          |         |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |
| CONTRACT NO. NSFDACS1219442   SCALE: NONE   SHEET 2 OF 6 |              |                   |                                               |                |                    |                      |                          |         |                                                       |                                          |              |                                                                      |     |               |                    |                         |        |               |         |





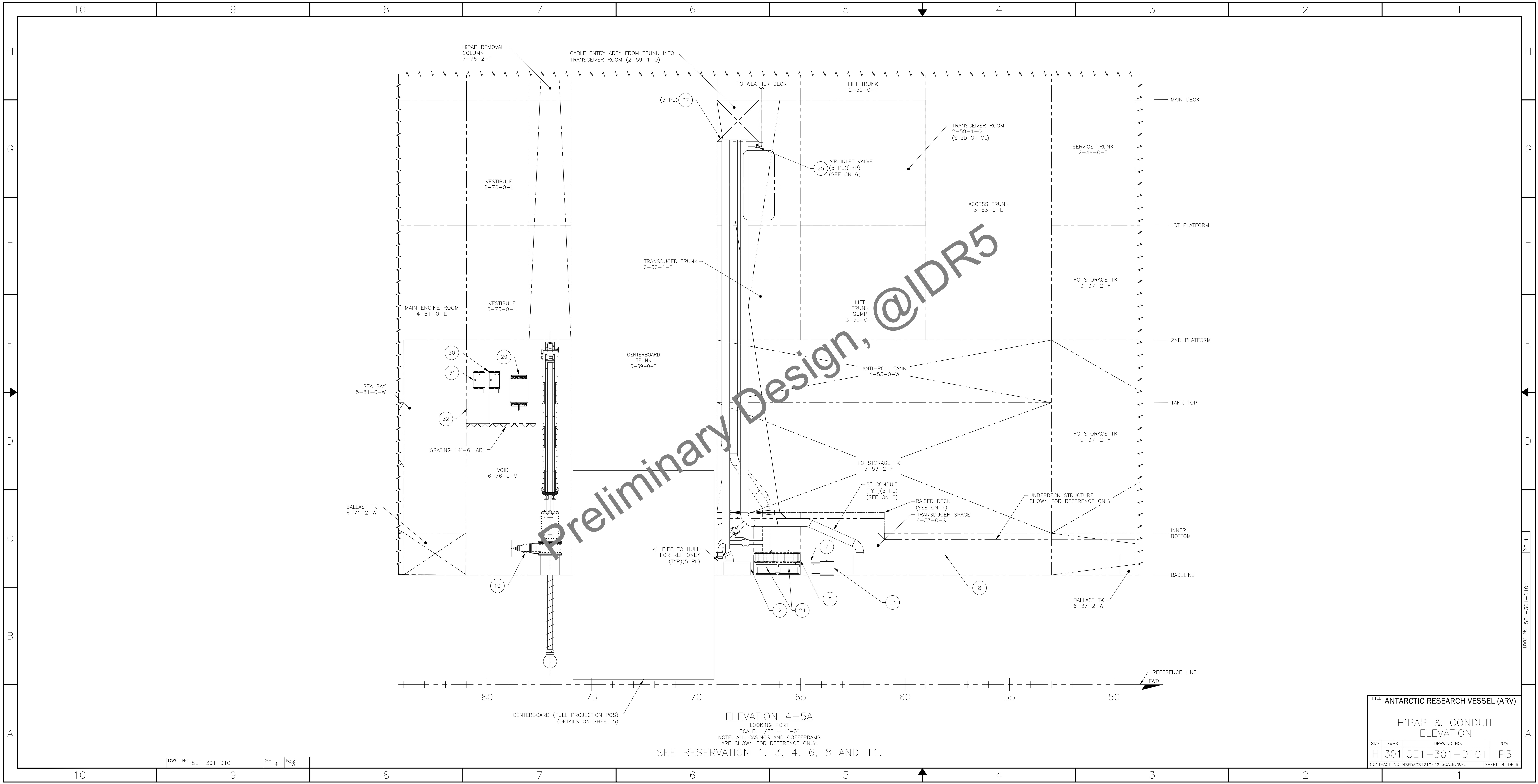
PLAN 3-5A  
INNER BOTTOM  
TRANSDUCER FLAT ARR

SEE RESERVATIONS 1, 2, 3, 4, 6, 8, 11 AND 13.

|                                          |      |              |              |
|------------------------------------------|------|--------------|--------------|
| TITLE<br>ANTARCTIC RESEARCH VESSEL (ARV) |      |              |              |
| INNER BOTTOM<br>PLAN                     |      |              |              |
| SIZE                                     | SWBS | DRAWING NO.  | REV          |
| H                                        | 301  | 5E1-301-D101 | P3           |
| CONTRACT NO. NSFDCS1219442               |      | SCALE: NONE  | SHEET 3 OF 6 |

LAST PLOT DATE: 8/2/2023 3:17:38 PM





DWG NO 5E1-301-D101 SH 4 REV 3

| TITLE ANTARCTIC RESEARCH VESSEL (ARV)               |      |              |     |
|-----------------------------------------------------|------|--------------|-----|
| HiPAP & CONDUIT ELEVATION                           |      |              |     |
| SIZE                                                | SWBS | DRAWING NO.  | REV |
| H                                                   | 301  | 5E1-301-D101 | P3  |
| CONTRACT NO. NSFDCS1219442 SCALE: NONE SHEET 4 OF 6 |      |              |     |



