RESERVATIONS					REVISIONS					REFERENCES		
NO.	ZONE	DESCRIPTION	DATE DD MMM YY	BY|APP	REV	ZONE	DESCRIPTION	DATE DD MMM YY	BY|APP	NO.	DESCRIPTION	DOCUMENT NO.
					0	ALL	ISSUED FOR COMMENT/CLIENT APPROVAL	04 OCT 2016	FG/GJ | DWM	1	GENERAL ARRANGEMENT PLAN	6097-89940-01
										2	TANK ARRANGEMENT PLAN AND CAPACITY PLAN	6097-89940-02
										3	COOLING WATER SYSTEM	6097-25600-01
										4	BLACK, GREY, AND SANITARY FLUSHING SYSTEM	6097-59300-02
										5	COMPRESSED AIR SYSTEM	6097-55100-01
										6	BILGE DRAINAGE AND DEWATERING SYSTEM	6097-52000-01
										7	GENERAL ARR. OF THE FIRE FIGHTING INVENTORY	6094-55500-02
										8	FIRE CONTROL PLAN	6094-55500-04
										9	AS-BUILT WATER FIRE EXTINGUISHING SYSTEM	AF8097-55500-03
										10	ANCHOR AND DECK WASHDOWN SYSTEM	13-68Q-523-01
										11	NEW BREEZEWAY HYDRANT	13-68Q-555-03-02
										12	DECK PENETRATIONS	13-68Q-555-03-03

VALVE MATERIAL

01

ITEM	NPS	DN	VALVE TYPE	CONNECTION / REMARKS	MATERIAL		SYSTEM
					BODY	TRIM	
V555021, V555023	3/4"	8	PRESSURE GAUGE COCK	THREADED	BRONZE	LEVER TYPE, BALL AND STEM 316 S.S., RPTFE SEAT	555
V555025, V555026	3/4"	20	BALL	THREADED, EXISTING RETAINED	BRONZE	BRONZE BALL,STEM:PTFE BALL SEAT&STEM SEAL	555
V555027	1"	25	GLOBE	FLANGED, EXISTING RETAINED	BRONZE ASTM B61 OR B62, 150#	BRONZE DISC AND SEAT, BRASS STEM	555
V555009	1 1/4"	32	GLOBE	FLANGED	BRONZE ASTM B61 OR B62, 150#	BRONZE DISC AND SEAT, BRASS STEM	555
V555003,	1 1/2"	40	GLOBE	FLANGED, EXISTING RETAINED	BRONZE ASTM B61 OR B62, 150#	BRONZE DISC AND SEAT, BRASS STEM	555
V555001, V555002, V555005, V555006, V555011, V555012, V555030,	2"	50	FI-FI VALVE - ANGLE GLOBE	FLANGED / STORZ	BRONZE ASTM B61 OR B62, 150#	NBR DISC AND SEALING RING, BRASS STEM	555
V555007, V555013, V555018	2"	50	FI-FI VALVE - STRAIGHT GLOBE	FLANGED / STORZ	BRONZE ASTM B61 OR B62, 150#	NBR DISC AND SEALING RING, BRASS STEM	555
V555016	2 1/2"	65	STRAINER	FLANGED	BRONZE	BRONZE SINGLE STRAINER BASKET	555
V555019	2 1/2"	65	GLOBE	FLANGED	BRONZE ASTM B61 OR B62, 150#	BRONZE DISC AND SEAT	555
V555015	2 1/2"	65	SWING CHECK	FLANGED	BRONZE ASTM B61 OR B62, 150#	BRONZE DISC AND SEAT, BRASS STEM	555
V555004, V555008, V555010, V555017, V555020	2 1/2"	65	BUTTERFLY	FLANGED	BRONZE ASTM B61 OR B62, 150#, LUG TYPE	AL-BRZ DISC, FIRE SAFE SEATS, LEVER OPERATOR W/ 10 POSITION DETENT	555

NOTE: ALL VALVE ENTRIES MARKED IN RED ARE NOT APPLICABLE FOR THIS WORK

PIPE DIMENSIONS - WELDED OPTION

02

NPS	DN	PIPE CODE	SCH/CLASS	STANDARD	MATERIAL	REMARKS	TAKEDOWN JOINTS	FITTINGS
3/4"	20	20CN	CL 200	MIL-T-16420K	CU-NI 90-10		SW UNION (THREADED)	SOCKET OR BUTT WELDED FITTINGS
1"	25	25CN	CL 200	MIL-T-16420K	CU-NI 90-10		ASME B16.5 FLANGES	SOCKET OR BUTT WELDED FITTINGS
1 1/4"	32	32CN	CL 200	MIL-T-16420K	CU-NI 90-10		ASME B16.5 FLANGES	SOCKET OR BUTT WELDED FITTINGS
1 1/2"	40	40CN	CL 200	MIL-T-16420K	CU-NI 90-10		ASME B16.5 FLANGES	BUTT WELDED FITTINGS
2"	50	50CN	CL 200	MIL-T-16420K	CU-NI 90-10		ASME B16.5 FLANGES	BUTT WELDED FITTINGS
2 1/2	65	65CN	CL 200	MIL-T-16420K	CU-NI 90-10		ASME B16.5 FLANGES	BUTT WELDED FITTINGS

TESTS TABLE

ITEM	DESIGN PRESSURE (bar)	ON WORKSHOP (bar)	ON BOARD (bar)
PIPES	3	-	TIGHTNESS TEST FOR LEAKAGE UNDER OPERATIONAL CONDITIONS TO BE CONDUCTED IN THE PRESENCE OF L.R. SURVEYOR
VALVES (1)	X(2)	6	

(1) = TEST MADE BY THE VALVE SUPPLIER
(2) = TO BE TESTED BY HYDRAULIC PRESSURE TO 1.5 TIMES THE NOMINAL PRESSURE RATING OF THE VALUE AT AMBIENT TEMPERATURE

EQUIPMENT TABLE

ITEM	DESCRIPTION	CHARACTERISTICS	REMARKS
E555001	EMERGENCY FI FI SELF PRIMING PUMP	Q=25 m³/h, H=3 bar, P=4.6 KW	EXISTING TO BE REUSED. PUMP BODY AND IMPELLER TO BE REPLACED WITH ASTM B62 C83600 BRONZE 03
E555002 E555004	FIRE HOSE BOX	FIRE HOSE 2", L=10M, 18MM SPRAY/JET NOZZLE SIZE	EXISTING TO BE REUSED
E555010	FIRE HOSE BOX	FIRE HOSE 2", L=10M, 18MM SPRAY/JET NOZZLE SIZE	EXISTING TO BE REUSED
E555003	FIRE HOSE BOX	FIRE HOSE 2",L=18M,18MM SPRAY/ JET NOZZLE SIZE,PORTABLE ISC	EXISTING TO BE REUSED
E555005 E555008	FIRE HOSE BOX	FIRE HOSE 2", L=18M, 18MM SPRAY/JET NOZZLE SIZE	EXISTING TO BE REUSED
E555006 E555007	FIRE HOSE BOX	FIRE HOSE 2", L=18M, 18MM SPRAY/JET NOZZLE SIZE	EXISTING TO BE REUSED
E555009	FIRE HOSE BOX	FIRE HOSE 2", L=18M, 18MM SPRAY/JET NOZZLE SIZE	EXISTING TO BE REUSED
E520001	FIRE/BILGE/GEN. SERVICE SELF PRIMING PUMP	Q=25 M³/H, H=2.7 BAR, P=6.4 KW	EXISTING TO BE REUSED. PUMP BODY AND IMPELLER TO BE REPLACED WITH ASTM B62 C83600 BRONZE 03
E520002	BILGE/FIRE SELF PRIMING PUMP	Q=25 m³/h, H=2.7 bar, P=6.4 KW	EXISTING TO BE REUSED. PUMP BODY AND IMPELLER TO BE REPLACED WITH ASTM B62 C83600 BRONZE
E555011 E555012	BRONZE NOZZLE	Q=30 l/min	NEW
E555013	FIRE HOSE BOX	FIRE HOSE 2", L=18M, 18MM SPRAY/JET NOZZLE SIZE	NEW 04

Note: All equipment entries in red are not applicable for this work

BHD PENETRATIONS:

1. ALL BULKHEAD PENETRATIONS TO BE MADE USING ROXTEC RS STYLE AISI316 SEALS OR EQUIVALENT. ALTERNATIVELY, L.R. APPROVED WELDED PENETRATION DETAILS CAN BE USED.

PIPE SUPPORTS:

BUILDER TO CONFIRM THAT MINIMUM DISTANCES BETWEEN PIPE SUPPORTS FOR COPPER-NICKEL PIPING SHALL NOT EXCEED THE FOLLOWING SPAN LENGTHS:

DN65: 4.15m
DN50: 3.90m
DN40: 3.55m
DN32: 3.40m
DN25: 3.10m
DN20: 2.85m

REVISIONS

REV	TAG	DESCRIPTION
0	01	VALVE LIST ADDED (REPLACING GENERAL VALVE MATERIALS LIST).
0	02	PIPE DIMENSIONS (WELDED) TABLE ADDED.
0	03	FIRE/BILGE PUMP BODIES AND IMPELLERS BEING REPLACED WITH B62 BRONZE. DESCRIPTIONS UPDATED.
0	04	NEW FIRE HOSE BOX ADDED TO EQUIPMENT TABLE.
0	05	ADDITIONAL NOTES ADDED TO ENCOMPASS SCOPE OF NEW WORK.
0	06	HOSE BOX DESCRIPTION CHANGED TO INCLUDE "AFT" TO DIFFERENTIATE FROM NEW FWD BOX, POSITION UNCHANGED.
0	07	FIRE HOSE BOX MOVED FROM MAIN DECK PASSAGEWAY TO MAIN DECK STBD BREEZEWAY NEAR EMERG. GEN. ROOM.
0	08	NEW HYDRANT AND HOSE BOX ADDED TO FWD BRIDGE DECK STBD SIDE.
0	09	EXISTING HYDRANTS ON FWD MAIN DECK RETAINED BUT TIED INTO NEW PIPING.
0	10	VALVE CHANGED FROM GLOBE TO BUTTERFLY.
0	11	HYDRANT V555018 MOVED FROM MAIN DECK PASSAGEWAY TO STBD BREEZEWAY OUTSIDE EMERGENCY GEN ROOM.
0	12	RISER THROUGH MAIN DECK TO BE REMOVED. EXISTING DECK PENETRATION TO BE BLANKED OFF. FIRE MAIN PIPING NOW RUNS ABOVE DECK ALONG STBD BREEZEWAY.
0	13	FIRE MAIN CONTINUES ALONG FWD MAIN DECK AND USES EXISTING PENETRATION INTO BOW THRUSTER COMPARTMENT.
0	14	V555007 CONNECTED TO FIRE MAIN VIA NEW PENETRATION THROUGH BHD AT FR. 17.
0	15	EXISTING SS ACCOMMODATION PIPING CAPPED OFF AND RETAINED.
0	16	NOT APPLICABLE FOR THIS WORK.

GENERAL NOTES:

1. VALVES IN AMR AND MMR MUST BE GROUPED AND PLACED IN ACCESSIBLE POSITIONS.
2. PIPING MUST BE PROTECTED AGAINST MECHANICAL AND VIBRATION DAMAGE.
3. PIPING MUST BE INSTALLED TENSION FREE AND CLEAN.
4. NO FLUID PIPE SYSTEM WILL PASS OVER ELECTRICAL COMPONENTS AND IN GENERAL, FLANGE JOINTS WILL BE AVOIDED IN THESE AREAS.
5. MECHANICAL JOINTS SHALL BE AVOIDED. WELDED FLANGES MUST BE USED
6. ALL VALVES SHALL HAVE BILINGUAL BRASS LABEL PLATES SECURELY ATTACHED TO THEM IN ACCORDANCE WITH ASTM F992-86(2006) STANDARD SPECIFICATION FOR VALVE LABEL PLATES.
7. 10 M LENGTH FIRE HOSES ARE LOCATED IN MMR, AMR, AND BOWTHRUSTER ROOM.
8. 18 M LENGTH FIRE HOSES ARE LOCATED ON DECKS AND NEAR MMR DOOR.
9. FIRE HOSES TO BE OF AN APPROVED NON-PERISHABLE MATERIAL.
10. FIFI HAND NOZZLE SHALL BE OF DUAL-PURPOSE TYPE (SPRAY/JET TYPE) INCORPORATING A SHUTOFF.
11. MINIMAL PRESSURE AT ANY HYDRANT WILL BE SUFFICIENT TO PRODUCE A JET THROW AT ANY NOZZLE OF NOT LESS THAN 12M ACC. TO L.R. PART 17, CHAPTER 2, 2.14.6 AND C.R.C.,C. 1422, SCHEDULE II, 1.1.D.
12. FOR PIPE PENETRATIONS SEE DRAWING NUMBER 13-68D-555-03-03.
13. PIPING SYSTEMS SHALL BE IDENTIFIED IN ACCORDANCE WITH THE COLOUR CODING STANDARD FOR PIPING SYSTEMS CCGS 30-000-000-ES-TE-001.
14. FIREMAIN SYSTEM SHALL NORMALLY BE DRY AND INSTALLED TO ENSURE THE SYSTEM CAN BE DRAINED.
15. VALVE V555020 AND V555017 TO BE KEPT LOCKED OPEN.
16. FIRE HOSES TO BE OF AN APPROVED NON-PERISHABLE MATERIAL
17. VALVES WHICH ARE TO BE NORMALLY OPEN SHALL BE LOCKED IN THE OPEN POSITION. (NOTE:WORDING ADJUSTED FROM AS FITTED DWG - REV.0).
18. REV 0 REV CLOUDS ON THIS DRAWING DENOTE CHANGES IN ARRANGEMENT RELATIVE TO EXISTING SYSTEM (REF 9)
19. JOINTS WHERE DISSIMILAR METALS ARE IN CONTACT SHALL BE INSTALLED WITH ISOLATION KITS TO MINIMIZE RISK OF GALVANIC CORROSION.
20. VALVE NUMBERS TO FOLLOW EXISTING WHEREVER POSSIBLE. VALVE MATERIAL TO FOLLOW MATERIAL LIST.
21. ALL UNUSED STAINLESS STEEL (S.S.) FIRE MAIN PIPING SHALL BE REMOVED IN ACCESSIBLE AREAS. PRIOR TO DISPOSAL OF REMOVED MATERIALS, RECORDINGS OF REMOVED MATERIAL WEIGHT SHALL BE REPORTED TO CCG. FURTHERMORE, PRIOR TO INSTALLATION, RECORDINGS OF ADDED MATERIAL WEIGHT SHALL BE REPORTED. DECOMMISSIONED S.S. PIPING IN WAY OF ACCOMMODATION SPACES SHALL BE THOROUGHLY AIR DRIED AND CAPPED OFF WATERTIGHT BY THREADED CONNECTIONS.
22. ALL PIPING ABOVE DECK AND EXPOSED TO THE ENVIRONMENT SHALL BE HEAT TRACED TO PREVENT FREEZING.
23. ALL NEW PIPE HANGERS SHALL BE CONNECTED TO SHIP'S STRUCTURE VIA CAPACITOR DISCHARGE STUD WELDING. HANGERS SHALL HAVE INSULATED SADDLES TO PREVENT GALVANIC CORROSION.
24. DRAIN VALVES AND PLUGS ARE TO BE ADDED AT LOW POINTS IN PIPING TO PREVENT POOLING OF WATER

05

FIREMAIN CALCULATION REPORT

PUMP CAPACITY (2.14.2, PART 17, CH.2 OF THE L.R. Rules and Regulations

for the Classification of Special Service Craft):

$$Q=(0.15\sqrt{L\times(B+D)}+2.25)=(0.15\sqrt{39.7\times(7.31+3.77)}+2.25)=29.11\ [m^3/h]$$
$$Q\leq 25\ [m^3/h]$$
$$\Rightarrow Q=25[m^3/h]$$

Flow at any FiFi hand nozzle (size 12) supplied by any hydrant is abt.9.5 m³/h.
Nozzle flow from any ammo. locker will be capable of delivering 30 l/m2/min(1.8 m³/m²/h).
The necessary flow for concurrent spraying of the ammo. lockers and for supplying any hydrant provided with FiFi hand nozzle:

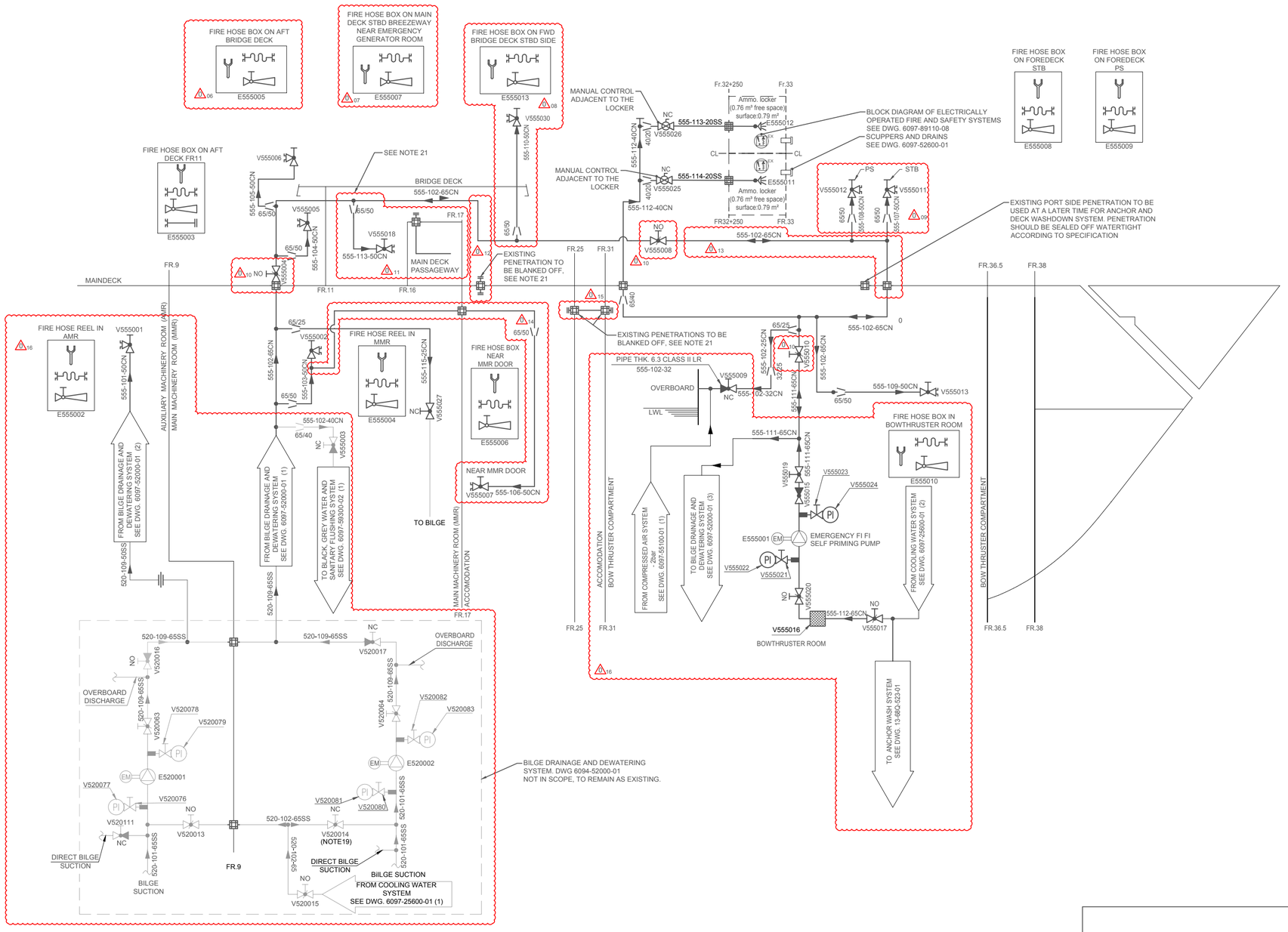
Q=(2 x ammo.locker surface x 1.8m³/h) + 9.5 m³/h = 13.1 m³/h < 25 m³/h (fire pump flow rate)

3GA MARINE LTD.
208 - 1497 Admirals Road
Victoria, BC
V9A 2P8
Canada

PROJECT: HERO CLASS PIPING
CLIENT: CANADIAN COAST GUARD - PUBLIC WORKS AND GOVERNMENT SERVICES CANADA
TITLE: FIREMAIN SYSTEM
SYSTEM DIAGRAM

DRAWN BY	DATE DD MMM YY	CHECKED BY	DATE DD MMM YY	PROJECT NO.
GJ/FG	04 OCT 2016	DWM	04 OCT 2016	13-68Q

SCALE	DRAWING NO.	SHEET NO.	REV
NTS	13-68Q-555-03-01	1 OF 2	0



LEGEND:

	PUMP		PRESSURE GAUGE COCK		PIPE CROSSOVER		PIPE PLUG
EM	ELECTRIC MOTOR		FIRE FIGHTING HAND NOZZLE		PIPE BRANCH		BLANKED FLANGE
	STRAINER		REDUCTION PIECE		PIPE BREAK		VACUUM BREAKER
	GLOBE VALVE		PIPE PENETRATION		PIPE FLOW DIRECTION		
	BALL VALVE		PIPE SOCKET	SX	SMOKE DETECTOR		
	BUTTERFLY VALVE		NOZZLE	PI	PRESSURE INDICATOR		
	FIRE FIGHTING VALVE (STRAIGHT PATERN)		DRAIN PLUG		FIRE HOSE SPANNER		
	FIRE FIGHTING VALVE (ANGLE)		VENTED CAP		REMOTE CONTROL		
	SDNR GLOBE VALVE		HOSE WITH QUICK ACTING CONNECTORS	NO	NORMALLY OPEN		
	CHECK VALVE		PORTABLE INTERNATIONAL SHORE CONNECTION	NC	NORMALLY CLOSED		

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SCALE	DRAWING NO.	SHEET NO.	REV
NTS	13-68Q-555-03-01	2 OF 2	0