







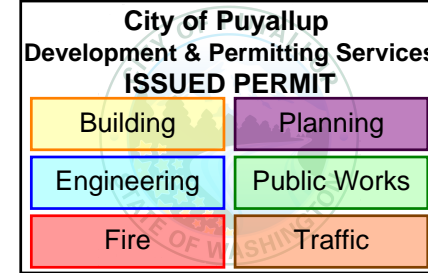
720 3rd Avenue Suite 1500  
Seattle Washington 98104-1878  
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## MECHANICAL DRAWINGS

CENTERS  
VOLTAGE PARK  
NE YARD - FUEL OIL EXPANSION  
1019 39th AVENUE SE  
PUYALLUP, WA 98374



Revision No.	Description	Date
1	COMBINED FUEL OIL PIPING REVISION	03/07/25



Drawn By: RM  
Checked By: JL

## MECHANICAL GENERATOR FUEL GENERAL NOTES AND SCHEDULES

Title

Sheet

### GENERAL NOTES

- THE MECHANICAL PLANS ARE DIAGRAMMATIC IN NATURE AND ARE BASED ON ONE MANUFACTURER'S EQUIPMENT. THEY ARE NOT INTENDED TO SHOW EVERY ITEM IN ITS EXACT LOCATION, THE EXACT DIMENSIONS, OR ALL OF THE DETAILS FOR THE EQUIPMENT. THE MECHANICAL CONTRACTOR SHALL VERIFY THE ACTUAL DIMENSIONS OF THE EQUIPMENT AND ENSURE THAT IT WILL FIT IN THE AVAILABLE SPACE.
- MECHANICAL CONTRACTOR RESPONSIBLE FOR INSTALLATION OF COMPLETED AND OPERATIONAL SYSTEMS WITH DUE RESPECT TO ALL APPLICABLE CODES AND AUTHORITIES HAVING JURISDICTION.
- IT IS THE CONTRACTOR RESPONSIBILITY TO FIELD VERIFY ALL CONNECTION POINTS PRIOR TO INSTALL. NOT ALL CONNECTION SIZES ARE SHOWN, AND THOSE THAT ARE SHOWN ARE APPROXIMATE AND ARE TAKEN FROM EXISTING AS-BUILTS AND FIELD OBSERVATIONS.
- CONTRACTORS TO VERIFY ALL GRADES, DIMENSIONS AND EXISTING CONDITIONS AT THE SITE BEFORE PROCEEDING WITH WORK. NOTIFY PRIME CONSULTANT OF ANY DISCREPANCIES BETWEEN DRAWINGS AND ACTUAL CONDITIONS BEFORE INSTALLATION.
- EQUIPMENT AND SYSTEMS SHALL COMPLY WITH 2021 WASHINGTON STATE ENERGY AND MECHANICAL CODES.
- COORDINATE INSTALLATION OF PIPING AND DUCTWORK WITH ELECTRICAL CONTRACTOR AND OTHER TRADES.
- CONTRACTOR IS RESPONSIBLE FOR ALL PERMITS NEEDED TO CONSTRUCT WORK.
- IF THERE IS A CONFLICT BETWEEN THE CONSTRUCTION DOCUMENTS AND SPECIFICATIONS, THE MOST STRINGENT WILL APPLY.
- ALL EQUIPMENT SHALL BE INSTALLED IN STRICT ACCORDANCE WITH THE EQUIPMENT MANUFACTURERS INSTALLATION INSTRUCTIONS AND GUIDELINES. CONTRACTOR TO PROVIDE ALL FITTINGS, TRANSITIONS, DAMPERS, VALVES, AND OTHER DEVICES REQUIRED FOR A COMPLETE AND OPERATIONAL INSTALLATION.
- SYSTEMS ADHERE TO C405.8 ELECTRIC MOTOR EFFICIENCY (2021 WISC):  
A. ALL ELECTRIC MOTORS, FRACTIONAL OR OTHERWISE, SHALL MEET THE MINIMUM EFFICIENCY REQUIREMENTS OF TABLE C405.8(1) THROUGH C405.8(4) WHEN TESTED IN ACCORDANCE WITH DOE 10 CFR UNLESS OTHER EXCEPTIONS ARE QUALIFIED AND MET BY THIS SECTION.
- PENETRATIONS OF DUCTS, PIPES, CONDUITS, ETC IN WALLS REQUIRING PROTECTED OPENINGS SHALL BE FIRE STOPPED, FIRE STOP MATERIAL, SHALL BE A UL-LISTED ASSEMBLY APPROPRIATE FOR FIRE OR SMOKE PENETRATIONS AS APPLICABLE AND AS APPROVED BY THE FIRE MARSHAL.
- ALL PIPE SHALL BE SUPPORTED FROM STRUCTURE IN A NEAT AND WORKMANLIKE MANNER. THE USE OF WIRE OR METAL STRAPS TO SUPPORT PIPES WILL NOT BE PERMITTED. REFER TO SPECIFICATIONS FOR MINIMUM SPACING OF PIPE SUPPORTS.
- ALL EQUIPMENT TO BE INSTALLED ON MIN 6" THICK CONCRETE HOUSEKEEPING PADS.
- ALL EQUIPMENT, DUCTS PIPING, AND OTHER DEVICES AND MATERIALS INSTALLED OUTSIDE OF THE BUILDING OR OTHERWISE EXPOSED TO THE WEATHER SHALL BE COMPLETELY WEATHERPROOFED.
- MECHANICAL EQUIPMENT, DUCTS AND PIPING ARE TO BE COORDINATED WITH STRUCTURAL JOISTS AND CROSS BRACING.
- ALL EXPOSED PIPING IN OCCUPIED SPACES SUBJECT TO ARCHITECTURAL APPROVAL PRIOR TO INSTALLATION.
- ALL DUCTWORK SHALL BE CONSTRUCTED AND SEALED PER IMC.
- THE HVAC SYSTEMS AND PLUMBING SYSTEMS SHALL BE TESTED AND BALANCED BY AN INDEPENDENT AGENCY, UNDER THE SUPERVISION OF A LICENSED PROFESSIONAL ENGINEER PRIOR TO COMMISSIONING. A SEALED TYPE WRITTEN REPORT SHALL BE SUBMITTED TO THE ARCHITECT/ENGINEER.
- A BUILDING COMMISSIONING PROCESS AND FUNCTIONAL TESTING OF MECHANICAL SYSTEMS SHALL BE CARRIED OUT BY A CERTIFIED COMMISSIONING PROFESSIONAL IN ACCORDANCE WITH 2021 WISC SECTION C408. THE MECHANICAL, ELECTRICAL, PLUMBING, AND CONTROL CONTRACTORS ARE REQUIRED TO PERFORM FUNCTIONAL PERFORMANCE TESTING OF ALL EQUIPMENT PRIOR TO TESTING BY THE COMMISSIONING AGENT. CONTRACTORS SHALL PROVIDE THE NECESSARY ASSISTANCE TO THE COMMISSIONING AGENT TO PERFORM COMMISSIONING DUTIES. THE CONTRACTOR SHALL BE RESPONSIBLE FOR TAKING CORRECTIVE ACTION IF ANY DEFICIENCIES ARE FOUND DURING COMMISSIONING.
- SYSTEMS ADHERE TO 2021 WISC SECTION C408 SYSTEM COMMISSIONING:  
A. A CERTIFIED COMMISSIONING PROFESSIONAL (CCP) SHALL LEAD THE COMMISSIONING PROCESS. A CCP IS AN INDIVIDUAL WHO IS CERTIFIED BY AN ANSI/ISO/IEC 17024:2012 ACCREDITED ORGANIZATION TO LEAD, PLAN, COORDINATE, AND MANAGE COMMISSIONING TEAMS AND IMPLEMENT THE COMMISSIONING PROCESS.  
B. A CERTIFIED COMMISSIONING PROFESSIONAL SHALL PERFORM THE FOLLOWING:  
a. DEVELOP A COMMISSIONING PLAN.  
b. REVIEW BUILDING DOCUMENTATION AND CLOSE-OUT SUBMITTALS.  
c. PROVIDE A COMMISSIONING REPORT.  
d. LIST SPECIFIC EQUIPMENT, APPLIANCES AND SYSTEMS COMMISSIONED.  
C. FUNCTIONAL TESTING SHALL BE COMPLETED FOR THE FOLLOWING SYSTEMS AND THEIR ASSOCIATED CONTROL SYSTEMS:  
a. MECHANICAL SYSTEMS.  
b. SERVICE WATER HEATING SYSTEMS  
c. CONTROLLED RECEPTACLE AND LIGHTING SYSTEMS  
d. EQUIPMENT APPLIANCE AND SYSTEMS  
e. ENERGY METERING  
f. REFRIGERATION SYSTEMS  
D. A COMMISSIONING REPORT SHALL BE DELIVERED TO THE BUILDING OWNER AND INCLUDE:  
a. RESULTS OF THE FUNCTIONAL PERFORMANCE TESTS  
b. LIST OF DEFICIENCIES AND CORRECTIVE MEASURES IMPLEMENTED OR PROPOSED.  
c. FUNCTIONAL PERFORMANCE TEST PROCEDURES.  
d. COMMISSIONING PLAN.  
e. TAB REPORT.
- OWNER TRAINING BY CONTRACTORS FOR EACH PIECE OF EQUIPMENT OR SYSTEM SHALL INCLUDE: SYSTEM/EQUIPMENT OVERVIEW (WHAT IT IS, WHAT IT DOES, AND WHICH OTHER SYSTEMS OR EQUIPMENT DOES IT INTERFACE WITH); REVIEW OF THE AVAILABLE O&M MATERIALS; REVIEW OF THE RECORD DRAWINGS ON THE SUBJECT SYSTEM/EQUIPMENT; HANDS-ON DEMONSTRATION OF ALL NORMAL MAINTENANCE PROCEDURES, NORMAL OPERATING MODES, AND ALL EMERGENCY SHUTDOWN AND START-UP PROCEDURES.

REVISION NOTES

1. ADDED X-GENERATORS FUEL PIPING SCOPE TO THE SET TO CREATE A SINGLE FUEL OIL SYSTEM DIAGRAM IN LIEU OF SEPARATE SCHEDULES

### TRANSFER FUEL OIL PUMP CONTROLLER SCHEDULE

MARK	SYSTEM SERVED	MANUFACTURER	UL LISTING	NEMA RATING	POWER	CONTROL POWER	CONTROL LOGIC	BUILDING MANAGEMENT SYSTEM INTEGRATION	CONTROL POSITION SWITCH	GTLC GENERAL ALARM INPUTS [QTY]	GTLC LOW LEVEL TANK ALARM INPUTS [QTY]	GTLC CALL FOR FUEL INPUTS [QTY]	FLOW SENSOR INPUTS [QTY]	LEAK SENSOR INPUTS [QTY]	DUPLEX FUEL FILTER DELTA P SENSOR INPUT [QTY]	PUMP RUN-TIME HOURS OUTPUT TO BMS [QTY]	PUMP COMMAND CIRCUITS (QTY)	PUMP MOTOR CIRCUIT BREAKERS (QTY)	INDICATOR LIGHTS (QTY)	NOTES
FOPC-1	TRANSFER FUEL OIL PUMP SYSTEM- LEAD	OMNITEC	UL 508, UL 508A	4	208V/1P	24VDC - INTEGRAL TRANSFORMER	PLC	MODBUS / BACNET	OFF/AUTO/LOCAL	17	17	17	1	5	1	5	110V (S)	208V/1P (S)	PUMP ON (S)	1,2,3
FOPC-2	TRANSFER FUEL OIL PUMP SYSTEM- LAG	OMNITEC	UL 508, UL 508A	4	208V/1P	24VDC - INTEGRAL TRANSFORMER	PLC	MODBUS / BACNET	OFF/AUTO/LOCAL	17	17	17	1	5	1	5	110V (S)	208V/1P (S)	PUMP ON (S)	1,2,3

- NOTES:  
1. FOPC-1 AND FOPC-2 SHALL HAVE CAPABILITY TO COMMUNICATE BETWEEN EACH OTHER FOR LEAD-LAG CONTROL (SEE SEQUENCE OF OPERATIONS FOR MORE INFORMATION)  
2. FLOW SENSOR INPUTS SHALL BE WIRED IN FIVE (5) SEPARATE PARALLEL CIRCUITS TO RELAY SINGLE OUTPUT SIGNAL FROM RELAY TO FOPC.  
3. BUILDING MANAGEMENT SYSTEM INTEGRATION SHALL BE MATCHED TO EXISTING FUEL OIL CONTROLS (CONTRACTOR TO CONFIRM).

### GENERATOR TANK LEVEL CONTROLLER SCHEDULE

MARK	SYSTEM SERVED	MANUFACTURER	UL LISTING	NEMA RATING	POWER	CONTROL POWER	CONTROL LOGIC	BUILDING MANAGEMENT SYSTEM INTEGRATION	CONTROL POSITION SWITCH	TANK LEVEL INDICATOR INPUTS (QTY)	PUMP STARTER (QTY)	PUMP MOTOR CIRCUIT BREAKERS (QTY)	INDICATOR LIGHTS (QTY)	NOTES
GTLC-1-GEN	1-GEN	OMNITEC	UL 508, UL 508A	4	208V/3P	120VAC - INTEGRAL TRANSFORMER	PLC	N/A	OFF/AUTO/LOCAL	40%, 50%, 90%, 95%, 95% (4)	MAGNETIC STARTER - 1.5 HP (1)	TBD (1)	PUMP ON (1)	1
GTLC-2-GEN	2-GEN	OMNITEC	UL 508, UL 508A	4	208V/3P	120VAC - INTEGRAL TRANSFORMER	PLC	N/A	OFF/AUTO/LOCAL	40%, 50%, 90%, 95% (4)	MAGNETIC STARTER - 1.5 HP (1)	TBD (1)	PUMP ON (1)	1
GTLC-3-GEN	3-GEN	OMNITEC	UL 508, UL 508A	4	208V/3P	120VAC - INTEGRAL TRANSFORMER	PLC	N/A	OFF/AUTO/LOCAL	40%, 50%, 90%, 95% (4)	MAGNETIC STARTER - 1.5 HP (1)	TBD (1)	PUMP ON (1)	1
GTLC-4-GEN	4-GEN	OMNITEC	UL 508, UL 508A	4	208V/3P	120VAC - INTEGRAL TRANSFORMER	PLC	N/A	OFF/AUTO/LOCAL	40%, 50%, 90%, 95% (4)	MAGNETIC STARTER - 1.5 HP (1)	TBD (1)	PUMP ON (1)	1
GTLC-5-GEN	5-GEN	OMNITEC	UL 508, UL 508A	4	208V/3P	120VAC - INTEGRAL TRANSFORMER	PLC	N/A	OFF/AUTO/LOCAL	40%, 50%, 90%, 95% (4)	MAGNETIC STARTER - 1.5 HP (1)	TBD (1)	PUMP ON (1)	1
GTLC-6-GEN	6-GEN	OMNITEC	UL 508, UL 508A	4	208V/3P	120VAC - INTEGRAL TRANSFORMER	PLC	N/A	OFF/AUTO/LOCAL	40%, 50%, 90%, 95% (4)	MAGNETIC STARTER - 1.5 HP (1)	TBD (1)	PUMP ON (1)	1
GTLC-7-GEN	7-GEN	OMNITEC	UL 508, UL 508A	4	208V/3P	120VAC - INTEGRAL TRANSFORMER	PLC	N/A	OFF/AUTO/LOCAL	40%, 50%, 90%, 95% (4)	MAGNETIC STARTER - 1.5 HP (1)	TBD (1)	PUMP ON (1)	1
GTLC-8-GEN	8-GEN	OMNITEC	UL 508, UL 508A	4	208V/3P	120VAC - INTEGRAL TRANSFORMER	PLC	N/A	OFF/AUTO/LOCAL	40%, 50%, 90%, 95% (4)	MAGNETIC STARTER - 1.5 HP (1)	TBD (1)	PUMP ON (1)	1

- NOTES:  
1. HARDWIRED TO TRANSFER FUEL OIL PUMP CONTROLLER (FOPC)

### FUEL OIL OVERFLOW/RETURN PUMP SCHEDULE

UNIT IDENTIFICATION					PERFORMANCE										ELECTRICAL				OPERATING WEIGHT (LBS)	MANUFACTURER	MODEL NUMBER	NOTES
MARK	SYSTEM SERVED	REDUNDANT	PUMP TYPE	COUPLING TYPE	CONTROL	FLUID TYPE	FLUID TEMP (F)	FLOW (GPM)	PUMP HEAD (FT)	HP	SPEED (RPM)	VOLTS	PHASE	EMERGENCY POWER?								
FOP-A-GEN-1	A-GEN-1	N	POSITIVE DISPLACEMENT - GEAR	SPLIT	FIXED SPEED	FUEL OIL #2	60	31.0	55	1.5	1,750	208	3	YES	60	GORMAN RUPP	GHC 1-1/2 GH 3-B	1,2,3				
FOP-A-GEN-2	A-GEN-2	N	POSITIVE DISPLACEMENT - GEAR	SPLIT	FIXED SPEED	FUEL OIL #2	60	31.0	55	1.5	1,750	208	3	YES	60	GORMAN RUPP	GHC 1-1/2 GH 3-B	1,2,3				
FOP-A-GEN-3	A-GEN-3	N	POSITIVE DISPLACEMENT - GEAR	SPLIT	FIXED SPEED	FUEL OIL #2	60	31.0	55	1.5	1,750	208	3	YES	60	GORMAN RUPP	GHC 1-1/2 GH 3-B	2,3,4,5				
FOP-1-GEN	1-GEN	N	POSITIVE DISPLACEMENT - GEAR	SPLIT	FIXED SPEED	FUEL OIL #2	60	31.0	55	1.5	1,750	208	3	YES	60	GORMAN RUPP	GHC 1-1/2 GH 3-B	1,2,3				
FOP-2-GEN	2-GEN	N	POSITIVE DISPLACEMENT - GEAR	SPLIT	FIXED SPEED	FUEL OIL #2	60	31.0	55	1.5	1,750	208	3	YES	60	GORMAN RUPP	GHC 1-1/2 GH 3-B	2,3,4,5				
FOP-3-GEN	3-GEN	N	POSITIVE DISPLACEMENT - GEAR	SPLIT	FIXED SPEED	FUEL OIL #2	60	31.0	55	1.5	1,750	208	3	YES	60	GORMAN RUPP	GHC 1-1/2 GH 3-B	2,3,4,5				
FOP-4-GEN	4-GEN	N	POSITIVE DISPLACEMENT - GEAR	SPLIT	FIXED SPEED	FUEL OIL #2	60	31.0	55	1.5	1,750	208	3	YES	60	GORMAN RUPP	GHC 1-1/2 GH 3-B	2,3,4,5				
FOP-5-GEN	5-GEN	N	POSITIVE DISPLACEMENT - GEAR	SPLIT	FIXED SPEED	FUEL OIL #2	60	31.0	55	1.5	1,750	208	3	YES	60	GORMAN RUPP	GHC 1-1/2 GH 3-B	2,3,4,5				
FOP-6-GEN	6-GEN	N	POSITIVE DISPLACEMENT - GEAR	SPLIT	FIXED SPEED	FUEL OIL #2	60	31.0	55	1.5	1,750	208	3	YES	60	GORMAN RUPP	GHC 1-1/2 GH 3-B	2,3,4,5				
FOP-7-GEN	7-GEN	N	POSITIVE DISPLACEMENT - GEAR	SPLIT	FIXED SPEED	FUEL OIL #2	60	31.0	55	1.5	1,750	208	3	YES	60	GORMAN RUPP	GHC 1-1/2 GH 3-B	2,3,4,5				
FOP-8-GEN	8-GEN	N	POSITIVE DISPLACEMENT - GEAR	SPLIT	FIXED SPEED	FUEL OIL #2	60	31.0	55	1.5	1,750	208	3	YES	60	GORMAN RUPP	GHC 1-1/2 GH 3-B	2,3,4,5				

- NOTES:  
1. EXISTING, TO BE REUSED. CONTRACTOR SHALL TEST PUMP AND PERFORM MANUFACTURER RECOMMENDED MAINTENANCE BASED ON AGE OF PUMP.  
2. MINIMUM EFFICIENCY OF ALL MOTORS SHALL BE IN ACCORDANCE WITH WISC 2021, SECTION C405.8.  
3. MAGNETIC STARTER IN GENERATOR TANK LEVEL CONTROLLER (GTLC-4)  
4. PROVIDE WITH BALDOR RELIANCE XT30154T 3-PHASE MOTOR (1750 RPM), STANDARD MOUNTING FEET OPTION, AND DRIVE ASSEMBLY # 90351-162 (CONTRACTOR TO CONFIRM ALL ACCESSORIES BASED ON FINAL MOTOR SELECTION)  
5. PROVIDE ALL NECESSARY APPURTENANCES NECESSARY FOR A FULLY OPERATIONAL SYSTEM.

### DESCRIPTION OF OPERATIONS

- CONTROLS GENERAL.  
THIS SEQUENCE OF OPERATION IS WRITTEN FOR CONTROLLING THE CENTERIS FUEL YARD FUELING SYSTEMS ON THE BUILDING EXTERIOR AT 1019 39th AVE, PUYALLUP, WA.  
A. THE EXISTING FUELING SYSTEM SHALL BE EXPANDED UPON FOR THE ADDITION OF EIGHT (8) GENERATORS AND ASSOCIATED BELLY TANKS. THE CONTROL SYSTEM SHALL BE PROGRAMMED TO SEQUENCE THE OPERATION DESCRIBED WITHIN THE CONTRACT DOCUMENTS.  
CONTROLS CONTRACTOR SHALL PROVIDE AND INSTALL ALL NECESSARY COMPONENTS AND ACCESSORIES FOR A COMPLETE AND OPERATIONAL SYSTEM INCLUDING, BUT NOT LIMITED TO SENSORS, RELAYS, GATEWAYS, COMMUNICATION WIRING AND CONDUIT, AND ALL NECESSARY ELECTRICAL DEVICES, WIRING, CONTROL PANELS, AND CONDUIT.  
B. ALARMS AND OTHER SYSTEM NOTIFICATIONS REPORT AS CURRENT SYSTEM IS CONFIGURED (CONTRACTOR TO CONFIRM PRIOR TO CONSTRUCTION). EXISTING MODBUS CONNECTIONS TO BMS SYSTEM SHALL BE MAINTAINED AND PRESERVED.  
C. SYSTEMS CONTROLLED  
D. THE CONTROL SYSTEM SHALL EXECUTE CONTROL FUNCTIONS OVER THE FOLLOWING MODIFIED SYSTEMS:  
i. TRANSFER FUEL OIL PUMP CONTROLLER (FOPC-1 & FOPC-2)  
THE FOLLOWING NEW SYSTEMS:  
ii. GENERATOR FUEL TANK LEVEL CONTROL (GTLC-(N) GEN-2, GTLC-(N) GEN-3, GTLC-(N) GEN-4, GTLC-(N) GEN-5, GTLC-(N) GEN-6, GTLC-(N) GEN-7, GTLC-(N) GEN-8).  
iii. GENERATOR OVERFLOW/RETURN PUMP (FOP-(N) GEN-2, FOP-(N) GEN-3, FOP-(N) GEN-4, FOP-(N) GEN-5, FOP-(N) GEN-6, FOP-(N) GEN-7, FOP-(N) GEN-8).
- TRANSFER FUEL OIL PUMP CONTROLLER (FOPC-1 & FOPC-2)  
A. GENERAL  
i. TRANSFER FUEL OIL PUMP CONTROLLERS (PROVIDED BY MECH CONTRACTOR) SHALL CONTROL THE EXISTING TRANSFER FUEL OIL PUMPS (FOP-4).  
a. FOPC-1 SHALL BE LEAD TRANSFER OIL PUMP CONTROLLER INITIALLY.  
b. FOPC-2 SHALL BE LEAD TRANSFER OIL PUMP CONTROLLER INITIALLY.  
c. EACH CONTROLLER SHALL BE CAPABLE OF STARTING AND STOPPING FIVE (5) TRANSFER FUEL PUMPS (FOP-#).  
d. EACH CONTROLLER SHALL MONITOR SEVENTEEN (17) GENERATOR FUEL TANK CONTROLLERS (GTLC-#).  
e. EACH CONTROLLER SHALL UTILIZE MODBUS PROTOCOL FOR COMMUNICATION OF ALARMS AND STATUS TO EXISTING BMS SYSTEM.  
f. UPON LOW LEVEL ALARM FROM GENERATOR: ALARM BMS.  
g. UPON CALL FOR FUEL FROM GENERATOR: START LEAD PUMP ON LEAD TRANSFER FUEL OIL PUMP CONTROLLER.  
i. IF FLOW IS NOT PROVEN AFTER 30 SECONDS (ADJ.) AT THE HEADER: ALARM BMS AND START FIRST STANDBY PUMP ON LEAD TRANSFER FUEL OIL PUMP CONTROLLER (SECOND TANK).  
j. IF FLOW IS NOT PROVEN IN THE SUCCEEDING 30 SECONDS (ADJ): ALARM BMS AND START NEXT STANDBY PUMP ON LEAD TRANSFER FUEL OIL PUMP CONTROLLER (THIRD TANK).  
k. FOLLOW ABOVE SEQUENCE UNTIL ALL STANDBY PUMPS HAVE BEEN CYCLED ON THE LEAD TRANSFER FUEL OIL PUMP CONTROLLER.  
l. IF ALL STANDBY PUMPS ON THE LEAD TRANSFER FUEL OIL PUMP CONTROLLER HAVE CYCLED AND FLOW IS NOT PROVEN: THE LEAD TRANSFER FUEL OIL PUMP CONTROLLER SHALL TRANSFER CONTROL TO THE LAG TRANSFER FUEL OIL PUMP CONTROLLER. LAG TRANSFER FUEL OIL PUMP CONTROLLER SHALL FOLLOW SAME SEQUENCES GIVEN ABOVE FOR THE LEAD TRANSFER FUEL OIL PUMP CONTROLLER.  
a. IF LEAD AND ALL STANDBY PUMPS ON LAG TRANSFER FUEL OIL PUMP CONTROLLER FAIL TO PROVE FLOW: ALARM BMS AND STOP CALL FOR PUMP (MANUAL RESET).  
g. PANEL SHALL BE CONFIGURED AND PROGRAMMED TO ALTERNATE PRIMARY AND LAG CONTROLLERS, AND ALTERNATE LEAD AND STANDBY PUMPS TO EQUALIZE RUN TIME BETWEEN ALL PUMPS AND CONTROLLERS.  
B. ALARMS:  
a. PANEL GENERAL ALARM - GENERATOR (AUTO RESET)  
b. LOW LEVEL ALARM - GENERATOR (AUTO RESET)  
c. PUMP FAILURE - SINGLE (MANUAL RESET)  
d. PUMP FAILURE - ALL (MANUAL RESET)  
C. CONTROL PANEL CONFIGURATION:  
a. MAIN: AUTO-OFF  
b. GENERATOR RETURN PUMP (FOP-(N) GEN-#): HAND-AUTO-OFF
- GENERATOR FUEL TANK LEVEL CONTROL (GTLC-(N) GEN-2, GTLC-(N) GEN-3, GTLC-(N) GEN-4, GTLC-(N) GEN-5, GTLC-(N) GEN-6, GTLC-(N) GEN-7, GTLC-(N) GEN-8)  
A. GENERAL  
a. GENERATOR FUEL TANK LEVEL CONTROLLER (PROVIDED BY MECH CONTRACTOR) SHALL CONTROL THE BELLY TANK FUEL LEVEL AND BE COMPATIBLE WITH FUEL OIL PUMP CONTROLLER (FOPC-1 & FOPC-2).  
b. PLC CONTROLLER SHALL INDEPENDENTLY MONITOR INPUTS (SEE DETAIL FOR INPUTS) AT EACH GENERATOR AND COMMUNICATE DUPLICATE STATUS AND ALARMS TO THE FUEL OIL PUMP CONTROLLER (FOPC-1 & FOPC-2) VIS ISOLATED RELAYS.  
i. 40% TANK LEVEL: SIGNAL LOW LEVEL ALARM  
ii. 50% TANK LEVEL: OPEN N.C. TANK FILL VALVE AND INITIATE CALL FOR FUEL.  
iii. 90% TANK LEVEL: STOP CALL FOR FUEL AND CLOSE N.C. TANK FILL VALVE.  
iv. 95% TANK LEVEL: SIGNAL HIGH LEVEL ALARM. END CALL FOR FUEL. CLOSE N.O. FILL VALVE AND START RETURN PUMP (AT GENERATOR) UNTIL FUEL LEVEL REACHES 90%. GENERATE GENERAL ALARM.  
v. UPON LEAK DETECTION: GENERATE GENERAL ALARM.  
vi. RECEIVE ALARM FROM FACTORY GENERATOR PANEL: GENERATE GENERAL ALARM.  
B. ALARMS:  
a. GENERAL ALARM (MANUAL RESET)  
b. LOW LEVEL ALARM (AUTO RESET)  
C. CONTROL PANEL CONFIGURATION:  
a. MAIN: AUTO-OFF  
b. GENERATOR RETURN PUMP (FOP-(N) GEN-#): HAND-AUTO-OFF
- GENERATOR OVERFLOW/RETURN PUMP (FOP-(N) GEN-2, FOP-(N) GEN-3, FOP-(N) GEN-4, FOP-(N) GEN-5, FOP-(N) GEN-6, FOP-(N) GEN-7, FOP-(N) GEN-8)  
A. GENERAL  
a. GENERATOR OVERFLOW/RETURN PUMP (PROVIDED BY MECH CONTRACTOR) SHALL PROVIDE OVERFLOW PROTECTION FOR THE GENERATOR FUEL TANK LEVEL CONTROL SYSTEM AND BE COMPATIBLE WITH FUEL OIL PUMP CONTROLLER (FOPC-1 & FOPC-2).  
b. PUMP SHALL RUN CONTINUOUSLY UPON CALL FROM GTLC-# (SEE SECTION 2.0 ABOVE).  
i. UPON CALL FROM GTLC-# N.O. CONTROL VALVE AT GENERATOR SHALL CLOSE AND CALL FOR FUEL SHALL CEASE (IF CALL EXISTS).  
ii. PUMP SHALL POWER ON AND RUN CONTINUOUSLY.  
iii. ONCE GENERATOR TANK LEVEL REACHES 90%, PUMP SHALL POWER OFF.  
iv. N.O. CONTROL VALVE AT GENERATOR SHALL OPEN.



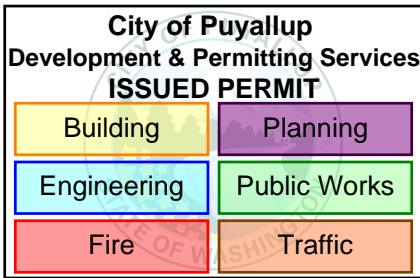


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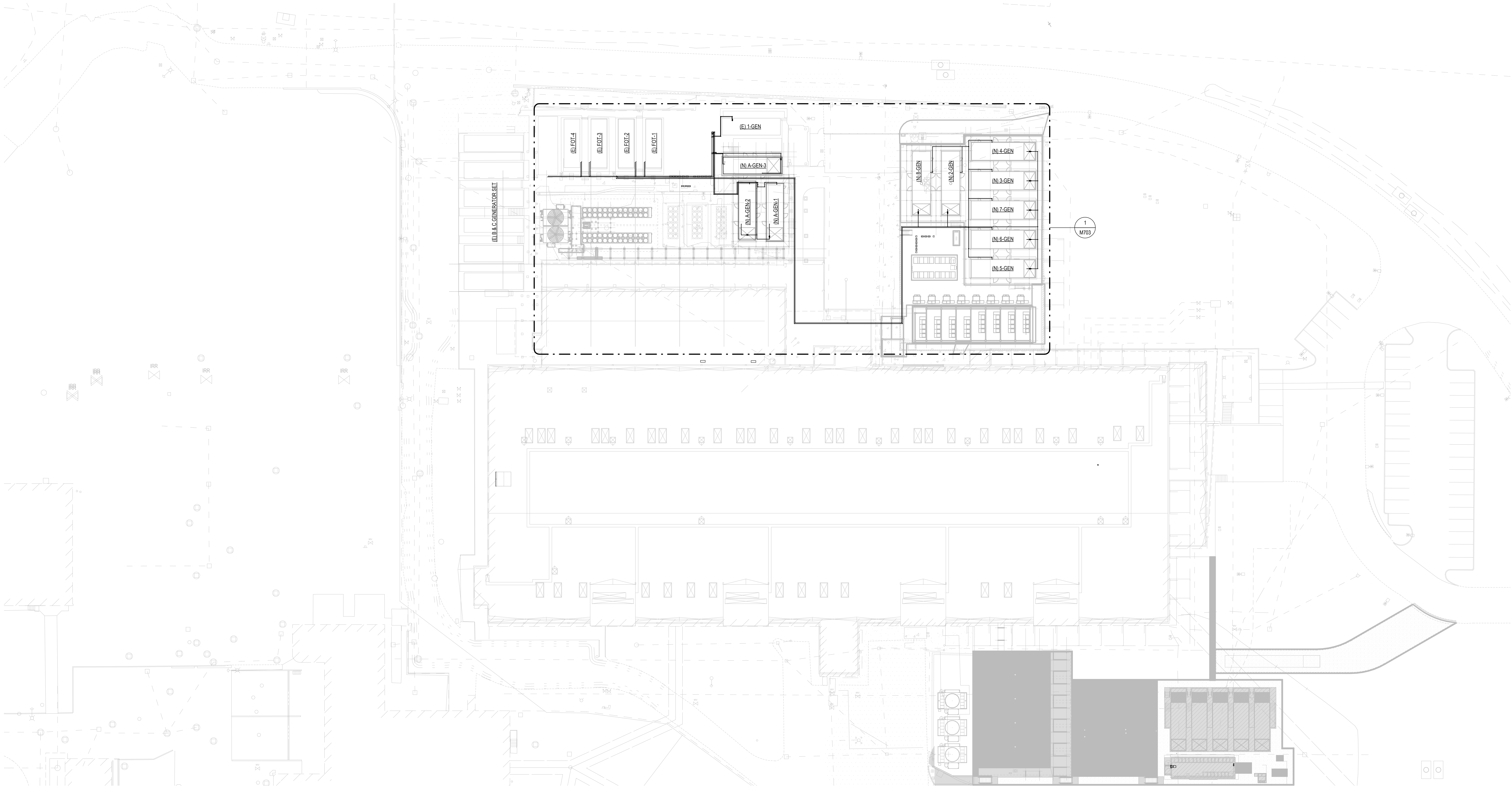


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MECHANICAL  
GENERATOR FUEL SITE  
PLAN

M702

Sheet



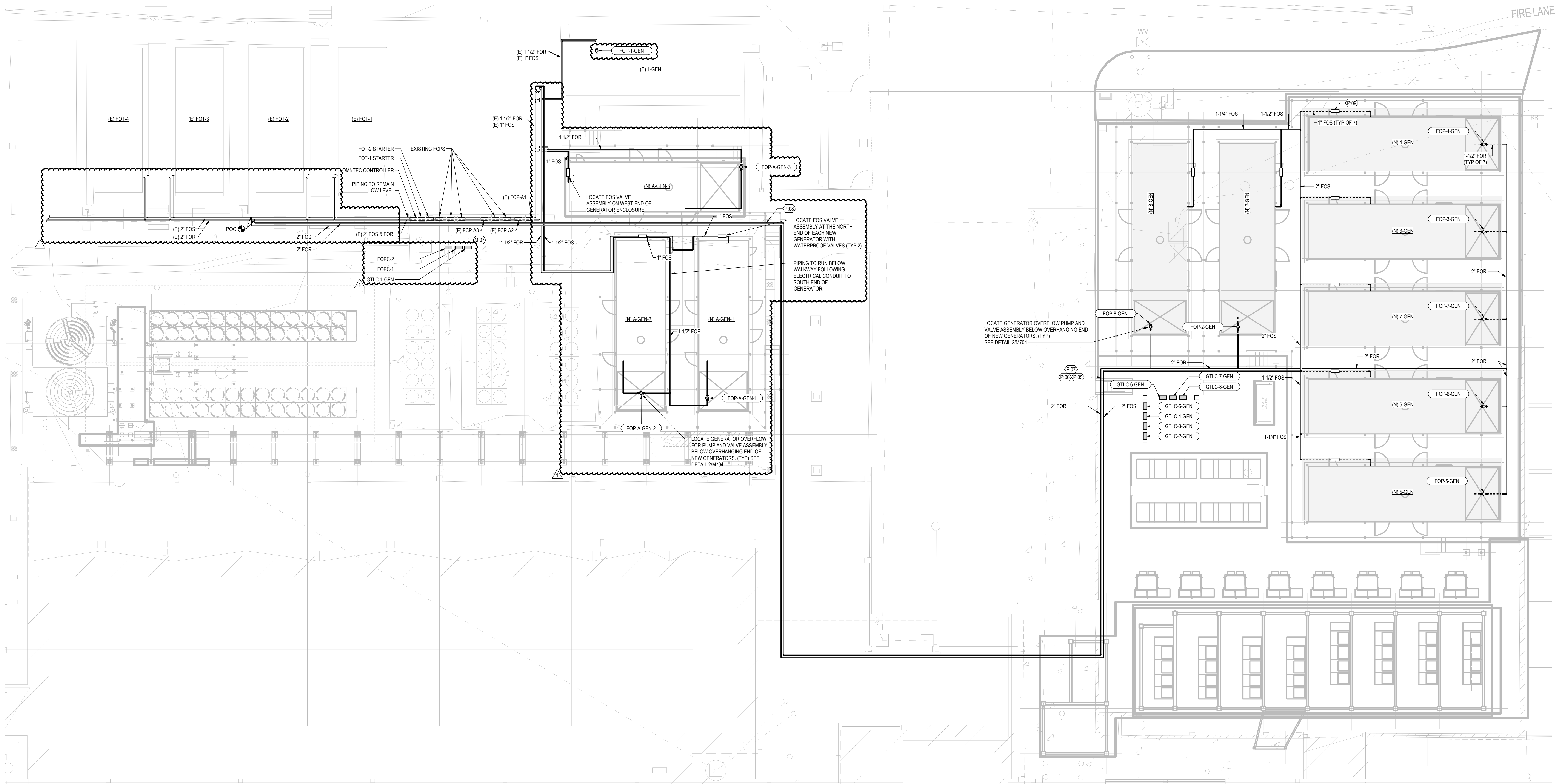
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M702

MECHANICAL GENERATOR FUEL SITE PLAN

1" = 30'-0"





**MECHANICAL GENERATOR FUEL ENLARGED PLAN**

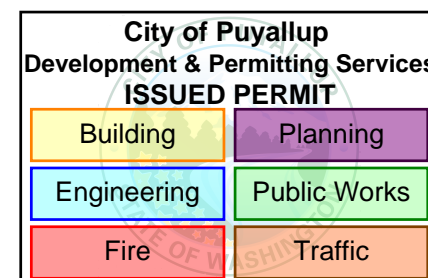


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1 COMBINED FUEL OIL PIPING 03/07/25  
REVISION



Drawn By: RM  
Checked By: JL

GENERATOR FUEL  
PIPING DIAGRAM  
NORTH YARD

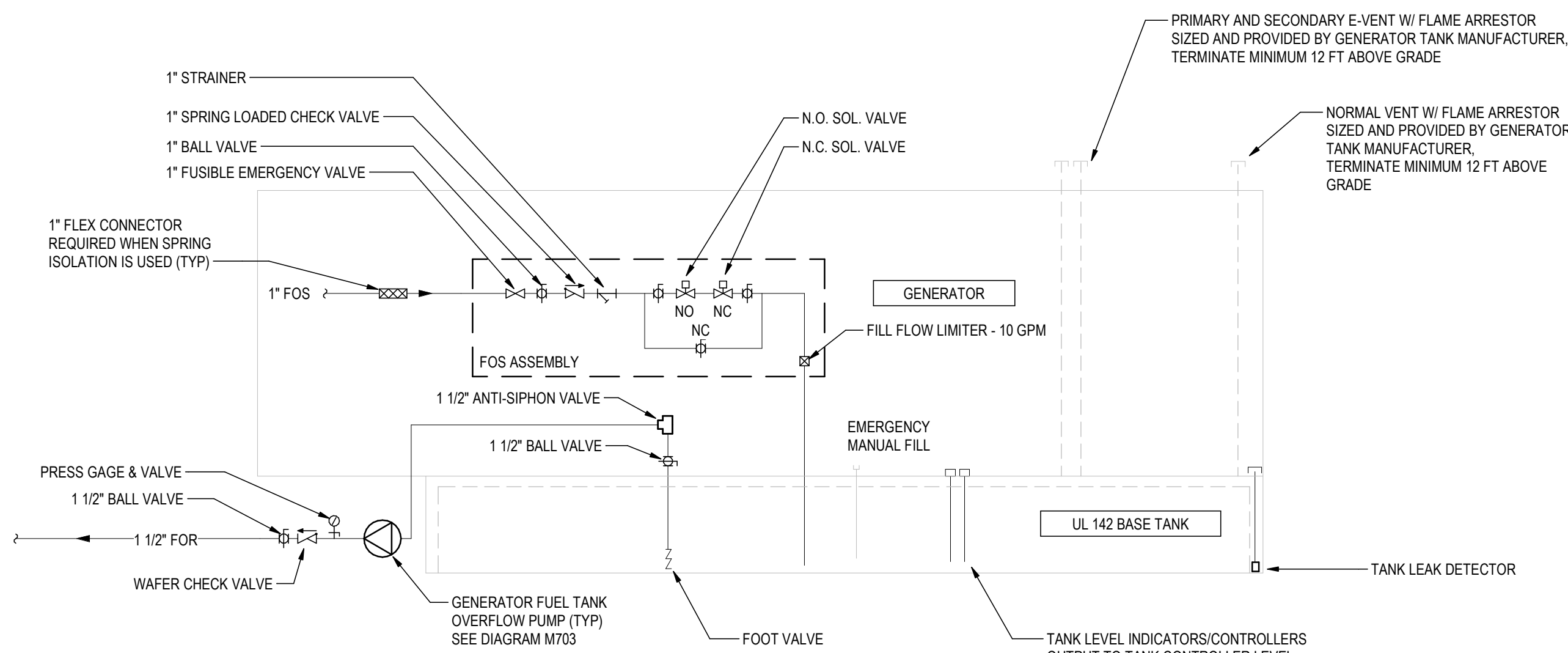
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M704

CRITERIA FOR FUEL TANK STORAGE AND FILL

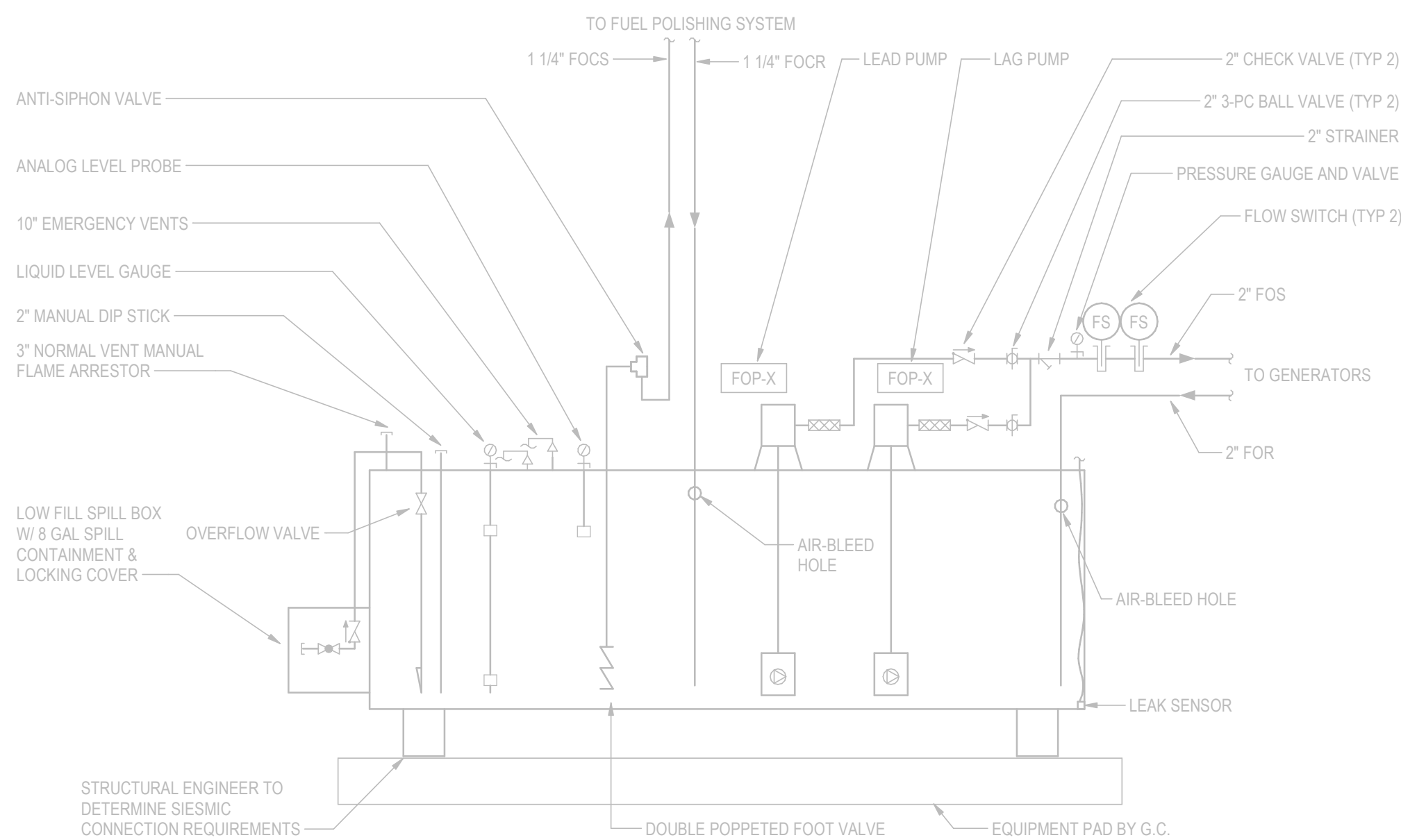
- OVERFILL PREVENTION: PROTECTED ABOVEGROUND TANKS SHALL NOT BE FILLED IN EXCESS OF 95 PERCENT OF THEIR CAPACITY. AN OVERFILL PREVENTION SYSTEM SHALL BE PROVIDED FOR EACH TANK. DURING TANK FILLING OPERATION, THE SYSTEM SHALL:
  - PROVIDE AN INDEPENDENT MEANS OF NOTIFYING THE PERSON FILLING THE TANK THAT THE FLUID LEVEL HAS REACHED 90 PERCENT OF TANK CAPACITY, OR OTHER APPROVED MEANS, AND
  - FOR RIGID HOSE FUEL DELIVERY SYSTEMS, PROVIDE A SPILL CONTAINMENT ENCLOSURE AT POINT OF FUELING AND AN APPROVED MEANS SHALL BE PROVIDED TO EMPTY THE FILL HOSE (ADDITIVE ALTERNATE) AUTOMATICALLY SHUT OFF THE FLOW OF FUEL TO THE TANK WITH IN THE QUANTITY OF LIQUID IN THE TANK REACHES 95 PERCENT OF TANK CAPACITY VIA OVERFILL PREVENTION DEVICE INSIDE THE TANK.A PERMANENT SIGN SHALL BE PROVIDED AT THE FILL POINT FOR THE TANK DOCUMENTING THE FILLING PROCEDURE AND THE TANK CALIBRATION CHART. THE FILLING PROCEDURE SHALL REQUIRE THE PERSON FILLING THE TANK TO DETERMINE THE VOLUME REQUIRED TO FILL IT TO 95 PERCENT OF CAPACITY BEFORE COMMENCING THE FILL OPERATION.
- FILL PIPE CONNECTIONS: THE FILL PIPE SHALL BE PROVIDED WITH A MEANS FOR MAKING A DIRECT CONNECTION TO THE TANK VEHICLE'S FUEL-DELIVERY HOSE SO THAT THE DELIVERY OF FUEL IS NOT EXPOSED TO THE OPEN AIR DURING THE FILLING OPERATION. WHEN ANY PORTION OF THE FILL PIPE EXTERIOR TO THE TANK EXTENDS BELOW THE LEVEL OF THE TOP OF THE TANK, A CHECK VALVE SHALL BE INSTALLED IN THE FILL PIPE NOT MORE THAN 12 INCHES (304.8MM) FROM THE FILL HOSE CONNECTION. FUEL OIL CONNECTION SHALL HAVE A SPILL CONTAINMENT ENCLOSURE WITH A MINIMUM OF 5 GALLONS STORAGE.



2 NEW GENERATOR PIPING DETAIL

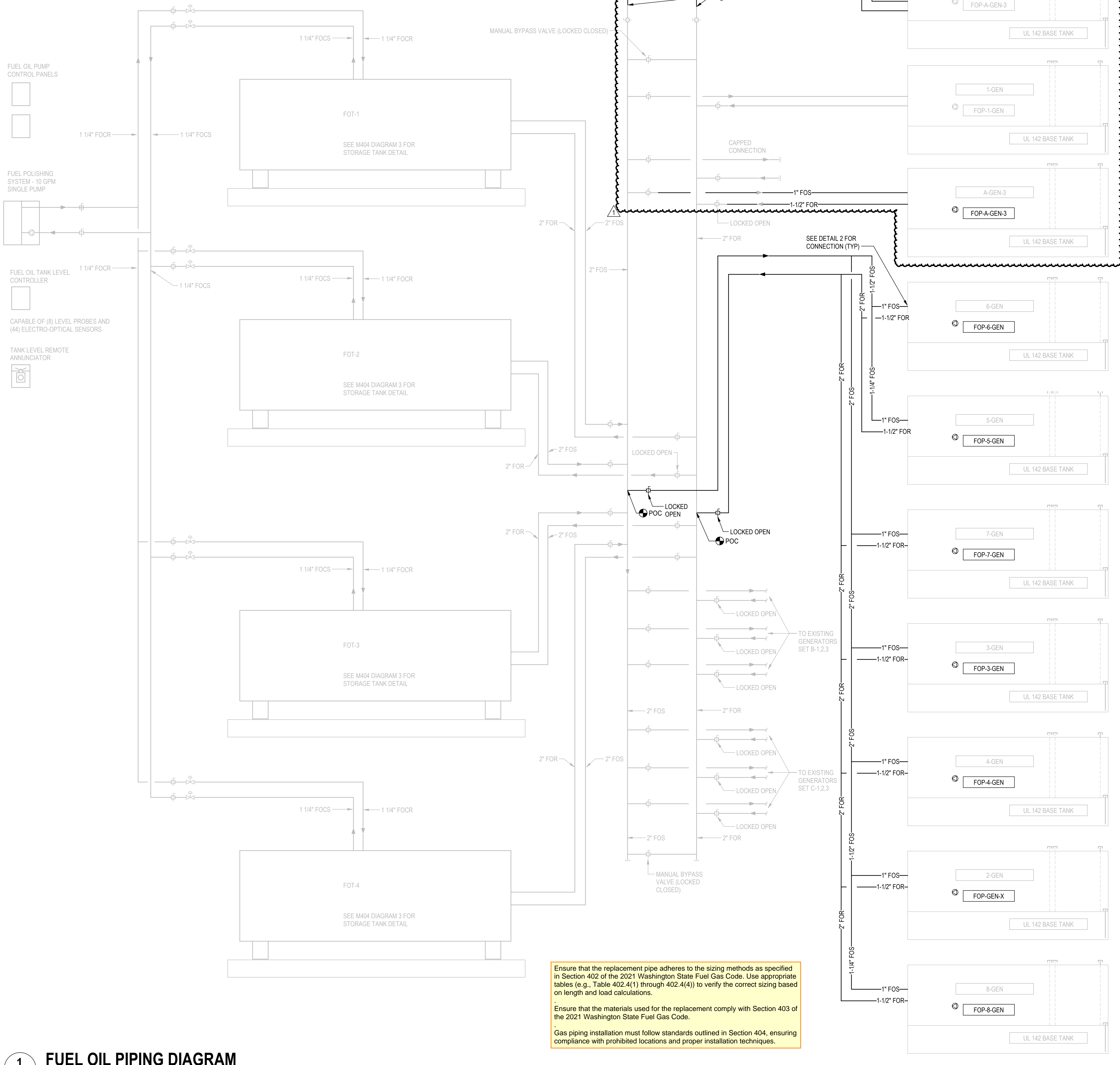
M704 N.T.S.

PIPING SYSTEM APPLICATION SCHEDULE																			
SYSTEM	PIPE SIZE (IN)	LOCATION	MATERIAL								JOINTS							NOTES	
			COPPER TYPE K	COPPER TYPE L	A33 BS ERW SCH 40	CARBON STEEL A33 BS ERW STD	SCH 10 TYPE 316 STAINLESS STEEL	SCH 10 TYPE 304 STAINLESS STEEL	DOUBLE CONTAINED FLEXIBLE PIPING ULTRATED	HDPE	PEX-A	SOLDERED	BRAZED	THREADED	WELDED	SCREWED	PRESSURE FITTINGS		GROOVED
FUEL OIL	2 AND LESS	CONCEALED				X								X	X				
		EXPOSED				X								X	X				
		MECHANICAL ROOM				X								X	X				
	2-1/2 - 3	OUTDOOR												X	X				
		UNDERGROUND						X									X		
		CONCEALED				X										X			
NOTES:		EXPOSED				X									X				
		MECHANICAL ROOM				X									X				
		OUTDOOR				X									X				
		UNDERGROUND						X									X		



3 EXISTING FUEL OIL TANK PIPING DIAGRAM

M704 N.T.S.



1 FUEL OIL PIPING DIAGRAM

M704 N.T.S.

Ensure that the replacement pipe adheres to the sizing methods as specified in Section 402 of the 2021 Washington State Fuel Gas Code. Use appropriate tables (e.g., Table 402.4(1) through 402.4(4)) to verify the correct sizing based on length and load calculations.

Ensure that the materials used for the replacement comply with Section 403 of the 2021 Washington State Fuel Gas Code.

Gas piping installation must follow standards outlined in Section 404, ensuring compliance with prohibited locations and proper installation techniques.

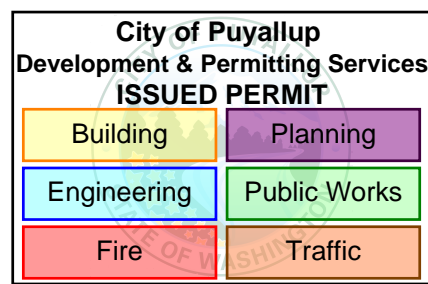


MECHANICAL  
DRAWINGS

CENTERS  
VOLTAGE PARK  
NE YARD - FUEL OIL EXPANSION  
1019 39th AVENUE SE  
PUYALLUP, WA 98374



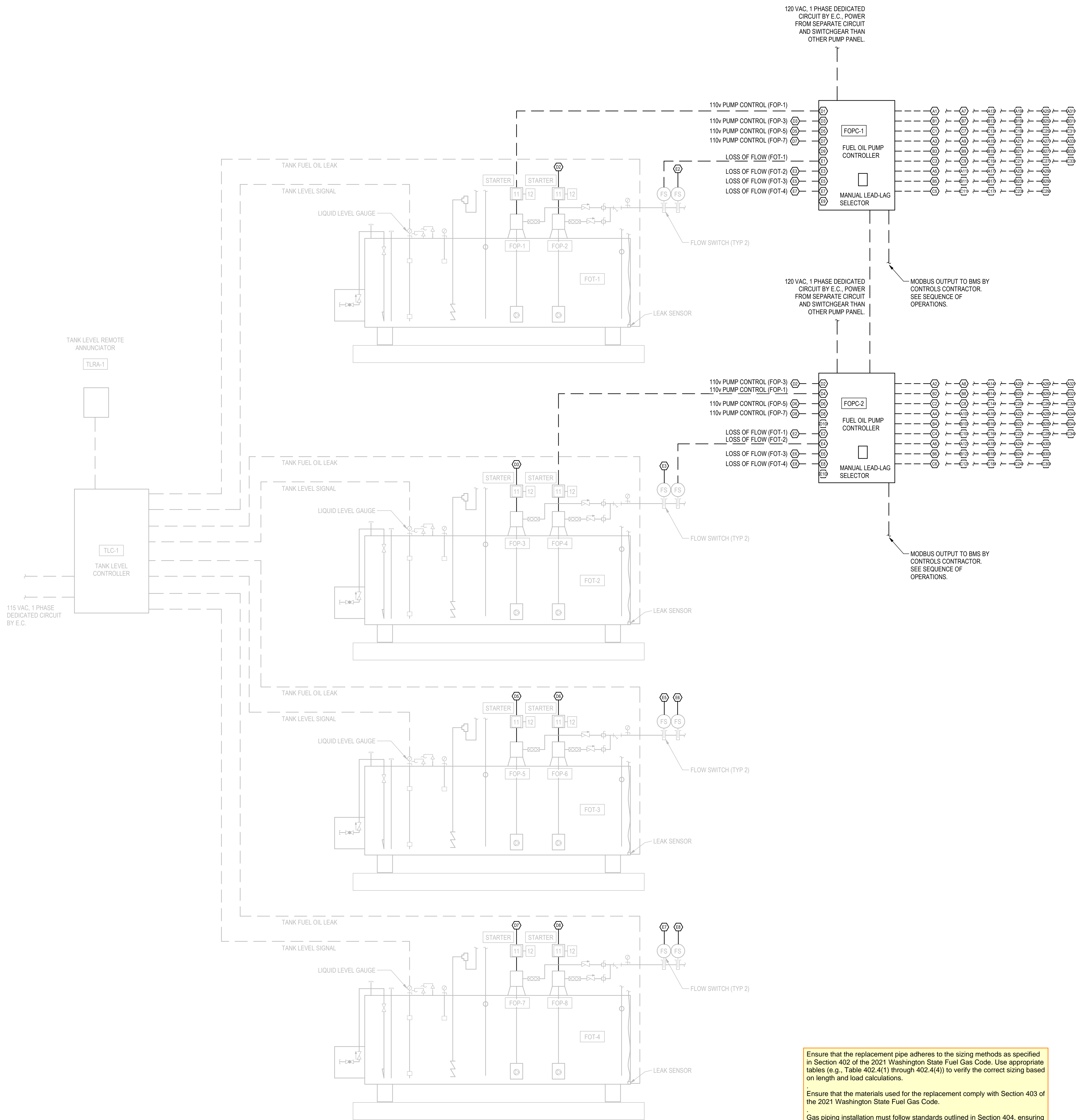
Revision No.	Description	Date
1	COMBINED FUEL OIL PIPING REVISION	03/07/25



Drawn By: RM  
Checked By: JL

GENERATOR FUEL  
CONTROL DIAGRAM  
- TANKS

M705



Ensure that the replacement pipe adheres to the sizing methods as specified in Section 402 of the 2021 Washington State Fuel Gas Code. Use appropriate tables (e.g., Table 402.4(1) through 402.4(4)) to verify the correct sizing based on length and load calculations.

Ensure that the materials used for the replacement comply with Section 403 of the 2021 Washington State Fuel Gas Code.

Gas piping installation must follow standards outlined in Section 404, ensuring compliance with prohibited locations and proper installation techniques.

NOTES

- LEVEL PROBE CABLE BY E.C. (MULTIPLE)
- PUMP CONTROL WIRING BY E.C.
- N.O. SOL. VALVE 110V INSTALLED BY M.C. WIRING BY E.C.
- N.C. SOL. VALVE 110V INSTALLED BY M.C. WIRING BY E.C.
- GTLC HAS INTEGRAL DISCONNECT.
- TANK LEVEL INDICATOR. INSTALLED BY M.C., WIRING BY E.C.
- TANK LEAK SENSOR. INSTALLED BE M.C., WIRING BY E.C.
- GENERATOR GENERAL ALARM OUTPUT (DRY CONTACT) TO GENERATOR TANK LEVEL CONTROLLER.
- GENERATOR LOW FUEL OIL SHUTDOWN TANK LEVEL INDICATOR - BY GENERATOR MFR. / E.C.
- WIRING OF GENERATOR LOW FUEL OIL SHUTDOWN TANK LEVEL INDICATOR - BY GENERATOR MFR. / E.C.
- EXISTING PUMP STARTERS WITH DEDICATED POWER FROM DIFFERENT PANELS / SWITCHGEAR - 208/230V - WITH DRY RUN PROTECTION. STARTERS REMOTE.
- EXISTING PUMP STARTER DISCONNECTS 208/230V BY E.C. PUMP PAIRS POWERED FROM SEPARATE CIRCUIT / SWITCHGEAR TO CORRESPOND WITH PUMP PANELS.

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M705  
FUEL OIL CONTROL LEGEND  
N.T.S.

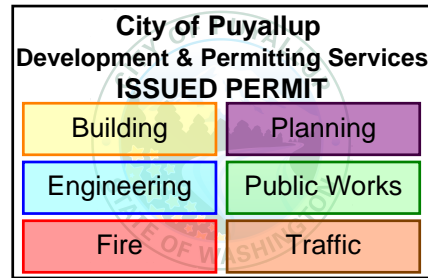
1  
M705  
TANK FUEL OIL CONTROL DIAGRAM  
N.T.S.

MECHANICAL  
DRAWINGS

CENTERIS  
VOLTAGE PARK  
NE YARD - FUEL OIL EXPANSION  
1019 39th AVENUE SE  
PUYALLUP, WA 98374



Revision No.	Description	Date
1	COMBINED FUEL OIL PIPING REVISION	03/07/25



Drawn By: RM  
Checked By: JL

GENERATOR FUEL  
CONTROL DIAGRAM  
- GENERATORS

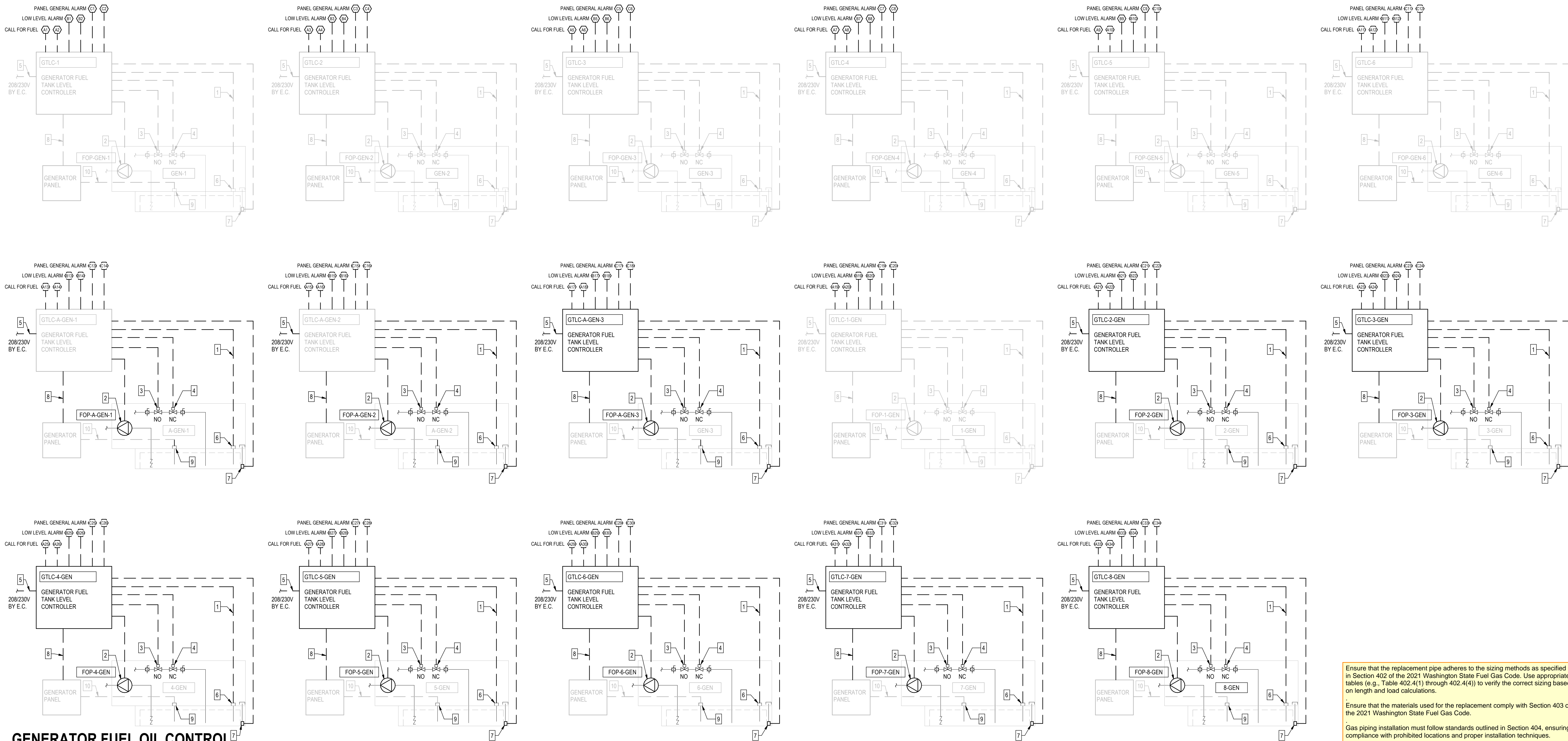
M706

NOTES

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- 2 PUMP CONTROL WIRING BY E.C.
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2 FUEL OIL CONTROL LEGEND

M706 N.T.S.



GENERATOR FUEL OIL CONTROL

DIAGRAM

1 M706 N.T.S.

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