#### **ABBREVIATION**

AIR CONDITIONING HEIGHT AIR CONDITIONING UNIT HEAD ACCESS DOOR HOUR ADJUSTABLE FREQUENCY ABOVE FINISHED FLOOR INCH OR INCHES ACCESS PANEL KILOWATT AUTOMATIC TEMPERATURE CONTROL LENGTH

BRAKE HORSEPOWER LEAVING AIR TEMPERATURE BRITISH THERMAL UNIT POUNDS BTU PER HOUR LEAVING WATER TEMPERATURE

CUBIC FEET PER MINUTE MAXIMUM CONDENSATE THOUSAND BTU PER HOUR COND CU FT CUBIC FEET MOTORIZED DAMPER

MECHANICAL EQUIPMENT ROOM DROP MOTOR HORSEPOWER DIAMETER DRAWING EACH MOTOR EXHAUST AIR NORMALLY CLOSED ENTERING AIR TEMPERATURE NOT IN CONTRACT EXHAUST FAN NORMALLY OPEN

NUMBER NET POSITIVE SUCTION HEAD ELECTRIC EQUAL NOT TO SCALE EXHAUST OUTSIDE AIR FILTER OUTSIDE AIR INTAKE DEGREES FAHRENHEIT OUTSIDE DIAMETER PRESSURE DROP FREE AREA (SQ.FT.)

FLEXIBLE CONNECTION POUNDS PER SQUARE INCH FULL LOAD AMPERES RISE ROOM FUEL OIL RETURN REVOLUTIONS PER MINUTE FUEL OIL SUPPLY SUPPLY AIR FUEL OIL TANK STATIC PRESSURE FUEL OIL VENT

SPECIFICATION FINS PER INCH FEET PER MINUTE STAINLESS STEEL FEET TEMPERATURE FACE VELOCITY UNLESS OTHERWISE NOTED

WIDTH GALLONS PER HOUR W/ WITH **GPH** GALLONS PER MINUTE W/O WITHOUT WATER COLUMN WATER GAUGE

VENT VENTILATION AIR

WMS WIRE MESH SCREEN

GC GENERAL CONTRACTOR

LINE REPRESENTATION

- - - NEW PIPING WITH CONTAINMENT SHELL (DOUBLE WALL) ---- EXISTING PIPING -X-X-// EXISTING PIPING OR EQUIPMENT TO BE REMOVED THERMOSTAT/SENSOR WIRING FROM SENSING DEVICE TO CONTROLLED DEVICE

EXISTING EQUIPMENT TO REMAIN

NEW EQUIPMENT

RELOCATED POSITION OF EXISTING EQUIPMENT

EXISTING EQUIPMENT TO BE REMOVED

EXISTING EQUIPMENT TO BE RELOCATED

# **DRAWING NOTATIONS**

DRAWING NOTE TAG

SECTION DESIGNATION ON DRAWING WHERE SECTION IS CUT

B-DRAWING NO.

DETAIL NUMBER SHEET NUMBER

SECTIONS SYMBOL

DETAIL/SECTION NO.

POINT OF NEW CONNECTION TO EXISTING WORK REMOVE AND PATCH EXISTING WORK

SEE NOTE #... EXISTING EQUIPMENT & PIPING TO REMAIN

----- NEW EQUIPMENT, CENTER LINE DIAMETER SQUARE FEET

# **CONTROLS SYMBOLS**

THERMOSTAT

HEAT DETECTOR

SMOKE DETECTOR

DIFFERENTIAL PRESSURE SWITCH

PRESSURE SENSOR

DIFFERENTIAL PRESSURE VALVE

PRESSURE CONTROL VALVE

# **PIPING SYMBOLS**

→ PIPE DROP PIPE RISE

PITCH DOWN IN DIRECTION OF FLOW

\_\_\_\_\_ PITCH UP IN DIRECTION OF FLOW

CONCENTRIC REDUCER ECCENTRIC REDUCER - FLAT BOTTOM

ECCENTRIC REDUCER - FLAT TOP

------ FLANGED END

FLANGED CONNECTION

DEAD END - SCREWED CAP

GATE VALVE

DRAIN VALVE

\_\_\_\_\_\_ THERMOMETER WELL

BUTTERFLY VALVE

ELECTRIC MOTORIZED VALVE OPERATOR

---- AUTOMATED BALL VALVE

THERMOMETER AND WELL

PRESSURE GAUGE

FUEL PUMP

FLOW SWITCH

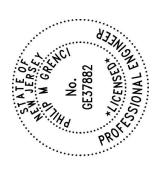
TEMPERATURE TRANSMITTER

----- FOR ----- FUEL OIL RETUR FOS FUEL OIL SUPPLY

----- FOV ----- FUEL OIL VENT

Y" TYPE STRAINER

CONCENTRIC REDUCER 

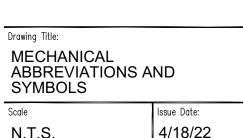


NJ SPORTS & EXPOSITION AUTHORITY PUMP STATION GENERATOR INSTALLATION

50 STATE ROUTE 120 EAST RUTHERFORD, NEW JERSEY

Digitally signed by PHILIP M GRENCI Date: 2022.06.24 12:31:37 -04'00'

6-2-22	ISSUED FOR REVIEW	
6-15-22	ISSUED FOR DCA APPROVAL	
 Date	Issued	Revis
	<b>triad</b>	
	engineer	S



122 Main Street | Madison, NJ 07940 973.984.1919 | triadcei.com

N.T.S. 4/18/22 AMA Project No.:

M-001

CEI215080

Department of Community Affairs
Construction Project Review
Project No: 1054-22
partial release
mechanical
Thomas Williams
Released: 08/05/22
N.J.S.A. 52:27D-119 ET SEQ., AS AMENDED

#### **MECHANICAL SPECIFICATIONS**

#### **PART 1- GENERAL**

- A. THE LATEST EDITION OF GENERAL CONDITIONS OF THE CONTRACT FOR CONSTRUCTION, OR AS REQUIRED BY THE CONSTRUCTION DOCUMENTS AND/OR THE OTHER ENGINEERS DOCUMENTS WHICH ARE PART OF THE CONTRACT.
- B. BIDDERS SHALL VISIT AND CAREFULLY EXAMINE THE AREA AFFECTED BY THIS WORK TO FAMILIARIZE THEMSELVES WITH THE EXISTING CONDITIONS AND THE DIFFICULTIES THAT WILL AFFECT THE EXECUTION OF THIS WORK BEFORE SUBMITTING PROPOSALS. SUBMISSION OF A PROPOSAL WILL BE CONSTRUED AS EVIDENCE THAT SUCH AN EXAMINATION HAS BEEN MADE AND LATER CLAIMS WILL NOT BE RECOGNIZED FOR EXTRA LABOR, EQUIPMENT, OR MATERIALS REQUIRED BECAUSE OF DIFFICULTIES ENCOUNTERED WHICH COULD HAVE BEEN FORESEEN HAD SUCH AN EXAMINATION BEEN MADE. ANY DISCREPANCIES SHALL BE BROUGHT TO THE ENGINEERS ATTENTION PRIOR TO BID. IF DISCREPANCIES ARE NOT RESOLVED TO CONTRACTORS' SATISFACTION, THEY SHALL BE QUALIFIED IN THEIR BID SUBMISSION.
- C. THIS CONTRACTOR SHALL REVIEW ALL CONSTRUCTION DOCUMENTS ASSOCIATED WITH THIS PROJECT INCLUDING GENERAL CONSTRUCTION, DEMOLITION, ARCHITECTURAL, MECHANICAL, ELECTRICAL, PLUMBING AND SPRINKLER PLANS AND SPECIFICATIONS. ALL WORK REQUIRED IN THE BID WHICH IS INDICATED OR IMPLIED TO BE PERFORMED BY THIS TRADE IN OTHER SECTIONS OF THE WORK SHALL BE INCLUDED IN THEIR BID. IF A CONFLICT OCCURS IN THE BID SPECIFICATIONS AND/OR ON THE DRAWINGS, THE MORE STRINGENT SITUATION SHALL APPLY.
- D. COORDINATE ALL WORK OF THE SECTION WITH EXISTING CONDITIONS AND THE WORK OF OTHER TRADES. THE CONTRACTOR SHALL THOROUGHLY ACQUAINT HIMSELF WITH THE WORK INVOLVED AND SHALL VERIFY AT THE BUILDING ALL MEASUREMENTS NECESSARY FOR THE PROPER INSTALLATION OF THE WORK, OBTAINING THE SAME WHEN NECESSARY, FROM THE OTHER CONTRACTORS AND SECTIONS. CONTRACTOR SHALL ALSO BE PREPARED TO PROMPTLY FURNISH TO OTHER CONTRACTORS ANY INFORMATION RELATING TO THE WORK OF THIS SECTION NECESSARY FOR THE PROPER INSTALLATION OF OTHER CONTRACTS AND SHALL COOPERATE TO SECURE THE BEST PROGRESS OF, AND HARMONY BETWEEN, THE WORK OF THE DIFFERENT CONTRACTS AND SECTIONS IN THE INTERESTS OF THE INSTALLATION AS A WHOLE. CONFER WITH OTHER CONTRACTORS AND ENGINEER FOR ADJACENT WORK TO THIS SECTION AND ARRANGE TO HAVE VISIBLE PORTIONS OF WORK FIT AND HARMONIZE IN A MANNER SATISFACTORY TO THE OWNER'S REPRESENTATIVE.
- E. THE SPECIFICATIONS ARE ACCOMPANIED BY DRAWINGS INDICATING THE GENERAL LOCATION OF EQUIPMENT AND CONNECTIONS THERETO. UNLESS SPECIFICALLY DIMENSIONED, LOCATIONS OF EQUIPMENT AND ROUTINGS ARE APPROXIMATE. SCALES ON DRAWINGS ARE INDICATED FOR BIDDING PURPOSES ONLY. DRAWINGS SHALL NOT BE SCALED FOR CONSTRUCTION AND MANUFACTURING DETAILS. CERTAIN SYSTEMS ARE DIAGRAMMATIC AND GIVE THE GENERAL ARRANGEMENT ONLY. NO ADDED COMPENSATION WILL BE PERMITTED FOR VARIATIONS DUE TO FIELD CONDITIONS. EXACT LOCATIONS AND ARRANGEMENTS SHALL BE DETERMINED IN THE FIELD ON THE BASIS OF DETAILS INDICATED ON APPROVED SHOP DRAWINGS, AND SUPPLEMENTARY INFORMATION ISSUED BY THE ENGINEER, AND SHALL PROVIDE FOR OPERATING EFFICIENCY, NEATNESS OF APPEARANCE, AND EASE OF MAINTENANCE.

## F. GUARANTEE:

- THE CONTRACTOR SHALL GUARANTEE AND SERVICE THE ENTIRE INSTALLATION FOR A PERIOD OF ONE YEAR FROM THE DATE OF THE FINAL ACCEPTANCE OF THE INSTALLATION. THE CONTRACTOR SHALL, DURING THE PERIOD OF THE GUARANTEE, REPLACE OR REPAIR AT HIS OWN EXPENSE ANY PIECE OF EQUIPMENT AND/OR MATERIAL WHICH IS FOUND TO BE DEFECTIVE. THE REPLACEMENT OR REPAIR SHALL BE PERFORMED THE SAME DAY OF NOTIFICATION IN AN EMERGENCY FASHION WHEN NOTIFIED BY THE OWNER OR AUTHORIZED REPRESENTATIVE. THE CONTRACTOR SHALL ALSO REPAIR ALL DAMAGE TO SURROUNDING WORK CAUSED BY THE FAILURE, REPAIR OR REPLACEMENT OF DEFECTIVE EQUIPMENT. ALL REFRIGERATION COMPRESSORS SHALL HAVE A FACTORY GUARANTEE INCLUDING PARTS AND LABOR FOR FIVE YEARS TOTAL. THE FINAL ACCEPTANCE WILL BE MADE AFTER THE CONTRACTOR HAS ADJUSTED HIS EQUIPMENT, BALANCED THE VARIOUS SYSTEMS, DEMONSTRATED THAT IT FULFILLS THE REQUIREMENTS OF THE DRAWINGS AND SPECIFICATIONS, AND HAS FURNISHED ALL THE REQUIRED CERTIFICATES OF INSPECTION AND APPROVALS.
- G. EQUIPMENT AND MATERIALS: MOST ITEMS OF MECHANICAL AND ELECTRICAL EQUIPMENT AND MATERIAL ARE NOTED ON THE DRAWINGS OR IN THE SPECIFICATIONS WITH A MANUFACTURER'S NAME AND CATALOG NUMBER. THIS DESIGNATION IS USED TO SET THE STANDARD FOR CONSTRUCTION, PERFORMANCE, OPERATION AND APPEARANCE. PRODUCTS OF OTHER MANUFACTURERS WILL BE CONSIDERED AND RULED UPON BY THE ENGINEER. THE SUBMISSION OF A SUBSTITUTION IMPLIES THAT THE ITEM HAS ALL NECESSARY UNDERWRITERS' LABORATORIES, BOARD OF STANDARDS AND APPEALS, NATIONAL ELECTRICAL CODE, ETC. APPROVALS. SHOULD THE ITEM BE FOUND NOT TO HAVE SUCH APPROVAL, IT SHALL BE REPLACED BY THE CONTRACTOR AT NO ADDITIONAL COST TO THE OWNER
- H. SUBSTITUTIONS: DEVIATIONS FROM CONTRACT DOCUMENTS AND SUBSTITUTION OF MATERIALS OR EQUIPMENT FOR THOSE SPECIFIED SHALL BE REQUESTED INDIVIDUALLY IN WRITING. FURNISH INFORMATION AS REQUIRED TO DEMONSTRATE THAT THE ARTICLE, MATERIAL, APPARATUS, PRODUCT OR PROCESS TO BE USED IS ADEQUATELY COMPARABLE TO THAT SPECIFIED IN QUALITY, FINISH, DESIGN, EFFICIENCY, DURABILITY AND GENERAL APPEARANCE, AND HAS BEEN ELSEWHERE DEMONSTRATED TO BE SERVICEABLE FOR THE PURPOSES FOR WHICH IT IS INTENDED. IF TESTS OR DEMONSTRATIONS ARE REQUIRED BY THE OWNER'S REPRESENTATIVES, THE COST OF SUCH TESTS OR DEMONSTRATIONS SHALL BE BORNE BY THE CONTRACTOR. DESCRIBE REASON FOR CHANGE, CONNECTIONS TO ADJACENT MATERIALS, ELECTRICAL SERVICES, SERVICE ACCESS REQUIREMENTS, DIFFERENCES IN OPERATING CHARACTERISTICS OR CYCLES AND ALL OTHER POINTS OF DEVIATION. CONTRACTOR TO ASSUME FULL RESPONSIBILITY FOR SAFETY, COORDINATION WITH OTHER

TRADES, OPERATION AND PERFORMANCE OF ALTERED

SYSTEM.

- I. THIS CONTRACTOR, WHERE APPLICABLE, IS TO OBTAIN A COPY OF THE SITE RULES AND REGULATIONS PRIOR TO BID SUBMISSION. ALL WORK MUST BE INSTALLED IN ACCORDANCE WITH THE BUILDING RULES AND REGULATIONS. DETERMINE REQUIREMENTS AND THE EXTENT OF PREMIUM TIME WORK REQUIRED BY THE SITE, FOR THE PURPOSE OF THE BID ASSUME CRITICAL WORK (E.G., WELDING, BRAISING, SOLDERING, GENERATOR TRANSFER, ETC.) AND CRITICAL SERVICES INTERRUPTIONS ARE TO BE PERFORMED OUTSIDE NORMAL BUSINESS HOURS.
- REMOVAL, TEMPORARY CONNECTIONS AND RELOCATION OF CERTAIN EXISTING WORK WILL BE NECESSARY FOR THE INSTALLATION OF THE NEW SYSTEMS. ALL EXISTING CONDITIONS ARE NOT COMPLETELY DETAILED ON THE DRAWINGS. THE CONTRACTOR SHALL SURVEY THE SITE AND MAKE ALL NECESSARY CHANGES REQUIRED BASED ON EXISTING CONDITIONS FOR PROPER INSTALLATION OF NEW
- K. ALL NECESSARY CUTTING AND PATCHING IN FLOOR SLABS AND WALLS FOR THE NEW FUEL OIL PIPING AND EQUIPMENT WORK SHALL BE PERFORMED BY THIS CONTRACTOR. PERFORM WORK TO MATCH EXISTING CONDITIONS.
- L. WHERE PIPE AND/OR CONTROLS CONDUITS PENETRATE RATED WALLS, THE SPACE BETWEEN THE INSULATION AND THE WALL SHALL BE CAULKED WITH NON-COMBUSTIBLE MATERIAL IN AN APPROVED MANNER. THE CONTRACTOR SHALL COORDINATE ELEVATIONS WITH EXISTING REMAINING INSTALLATIONS.
- M. ACCESS DOORS IN FINISHED CONSTRUCTION: THE CONTRACTOR SHALL PREPARE A LIST OF ALL ACCESS DOORS (MINIMUM 18"X18") REQUIRED FOR OPERATION AND MAINTENANCE OF ALL CONCEALED EQUIPMENT AND OTHER DEVICES, WHICH SHALL BE SUPPLIED TO THE GENERAL CONTRACTOR FOR INSTALLATION. THE COST TO FURNISH AND INSTALL ACCESS DOORS SHALL BE INCLUDED IN THIS CONTRACTOR'S BID.
- N. NEW DISCHARGE AIR PLENUM SHALL ARRIVE ON THE CONSTRUCTION SITE SEALED AND REMAIN PROTECTED FROM DEBRIS THROUGHOUT CONSTRUCTION PRIOR TO FINAL INSTALLATION. ALL VOLATILE ORGANIC COMPOUND (VOC) LIMITS OF ADHESIVES, SEALANTS AND SEALANT PRIMERS MUST COMPLY WITH CURRENT AIR QUALITY OSHA REQUIREMENTS.

# 1.02 SCOPE OF WORK

- A. PROJECT OBJECTIVES:
- 1. WORK BY E.C., M.C., GC, ETC.:
- DISCONNECT AND REMOVE THE EXISTING GENERATORS. THIS WORK SHALL INCLUDE REMOVING EXISTING EXHAUST AIR LOUVERS AND SHUTTERS ASSOCIATED WITH THE EXISTING GENERATORS AND SEALING THE WALL EXHAUST OPENINGS THAT ARE NOT TO BE RE-USED DURING CONSTRUCTION PHASE.
- THE GENERAL CONTRACTOR SHALL FURNISH AND INSTALL THE NEW POWER GENERATOR IN THE EXISTING SPACE. THE NEW GENERATOR SHALL BE SUPPLIED WITH A NEW DAY TANK BY THE GENERATOR'S VENDOR. REFER TO MECHANICAL EQUIPMENT SCHEDULE FOR MORE DAY TANK INFORMATION.
- 2. WORK BY MECHANICAL CONTRACTOR: - MECHANICAL CONTRACTOR SHALL REMOVE THE EXISTING
- OA INTAKE DAMPERS, EXISTING SUPPLY AIR FAN (SF-1), EXISTING GENERATORS' EXHAUST PIPING WITH SILENCERS. SECTIONS OF EXISTING FUEL PIPING, EXISTING DAY TANKS AND THE ASSOCIATED AUXILIARY SYSTEMS MECHANICAL CONTRACTOR SHALL INSTALL THE NEW DAY TANK (FURNISHED BY THE GENERAL CONTRACTOR AS PART OF THE NEW GENERATOR PACKAGE), DAY TANK CONTROLS, THE NECESSARY SECTIONS OF NEW FUEL OIL PIPING DISTRIBUTION AND AUXILIARY EQUIPMENT. THE NEW WORK SHALL ALSO INCLUDE THE NEW DISCHARGE AIR PLENUM. NEW EXHAUST PIPING WITH A SILENCER. INSULATION, AND CONTROLS, ACCESSORIES AND THE
- MECHANICAL CONTRACTOR SHALL INSTALL ALL NECESSARY NEW PIPING CONNECTIONS BETWEEN THE NEW GENERATOR, THE NEW DAY TANK AND THE MAIN FUEL STORAGE TANK TO CONSTRUCT A COMPLETE FUNCTIONAL FUEL SUPPLY SYSTEM FOR THE NEW GENERATOR. REFER TO "PURCHASE AND INSTALLATION" SPECIFICATIONS FOR A NEW INDOOR STANDBY ENGINE/GENERATOR SYSTEM" DOCUMENT FOR MORE INFORMATION. ALL WORK SHALL BE PERFORMED IN ACCORDANCE WITH THE NEW JERSEY BUILDING CODE, AND REGULATIONS BY ALL NATIONAL, STATE AND LOCAL AUTHORITIES HAVING JURISDICTION, BUILDING MANAGEMENT REQUIREMENTS, CONSTRUCTION DOCUMENTATION DRAWINGS AND THESE SPECIFICATIONS.

ASSOCIATED AUXILIARY INSTALLATIONS.

B. THE WORK SHALL INCLUDE ALL LABOR, MATERIALS,

- EQUIPMENT, HOISTING AND RIGGING, BREAKDOWN AND SETUP OF EQUIPMENT FOR INSTALLATION, SCAFFOLDING, AND SERVICES TO COMPLETE THE INSTALLATION AND PROVIDE THE OWNER WITH A FULLY OPERATIONAL SYSTEM. ANY EQUIPMENT, PARTS, MATERIALS, ACCESSORIES, OR LABOR THAT IS NECESSARY FOR PROPER PERFORMANCE OF THE MECHANICAL WORK, ALTHOUGH NOT SPECIFICALLY MENTIONED HEREIN OR SHOWN ON THE DRAWINGS, SHALL BE FURNISHED AND INSTALLED WITHOUT ADDITIONAL COSTS. WHEN INSTALLATION OF A PART OF ANY SYSTEM (FUEL DISTRIBUTION, ELECTRICAL OR OTHERWISE) REQUIRES A SHUTDOWN OF ANY OPERATING SYSTEM, CONNECT THE PARTIAL SYSTEM ONLY AFTER NOTIFICATION TO AND WITH APPROVAL OF THE OWNER. COORDINATE ACTIVITIES CLOSELY WITH THOSE OF SUBCONTRACTOR'S SO THE OPERATION IS RESTRICTED TO AS SHORT AN INTERVAL AS POSSIBLE AND "OUT OF SERVICE" TIME OF THESE FACILITIES IS KEPT TO A MINIMUM. ANY SHUTDOWN OF THE ELECTRICAL SYSTEM AFFECTING THE SITE SHALL BE DONE OUTSIDE OF THE SITE OPERATING HOURS AS APPROVED BY OWNER.
- C. THE SITE MANAGEMENT REQUIRES NOT LESS THAN SEVEN DAYS NOTICE FOR SHUTDOWN OF ANY CRITICAL SITE SYSTEMS.
- D. MAKE AN ACCURATE TAKE-OFF ALL EXISTING EQUIPMENT, AIR PLENUMS, PIPING, LOUVERS, DAMPERS, CONDUITS, PANELBOARDS, WIRING DEVICES, AND OTHER ACCESSORIES BEING REMOVED DURING DEMOLITION AND INCLUDE THE COST FOR DISCONNECTING AND REMOVAL OF STATED EQUIPMENT, ETC. INTO THE BASE BID. REMOVALS SHALL BE AS SPECIFIED AND/OR NOTED AS INDICATED ON THE DRAWINGS. IN CERTAIN CASES, EQUIPMENT OR MATERIALS DESIGNATED FOR REMOVAL SHALL REMAIN THE PROPERTY OF THE OWNER AND SHALL BE TURNED OVER AT LOCATIONS ON THE SITE AS DIRECTED BY THE OWNER.

- E. PLAN INSTALLATION OF NEW WORK AND CONNECTIONS TO EXISTING INSTALLATIONS TO ENSURE MINIMUM INTERFERENCE WITH REGULAR OPERATION OF EXISTING FACILITIES. ALL SYSTEM SHUTDOWNS AFFECTING OTHER AREAS SHALL BE COORDINATED WITH PROJECT MANAGEMENT.
- F. THIS OWNER SHALL PROCURE THE SERVICES OF A THIRD-PARTY INSPECTION COMPANY TO PERFORM ALL SPECIAL INSPECTIONS IN ACCORDANCE WITH THE SITE REQUIREMENTS. SECURE ALL REQUIRED PERMITS AND APPROVALS AND TRANSMIT SAME TO THE OWNER. CONTRACTOR SHALL BE RESPONSIBLE FOR ALL FEES.
- . THIS CONTRACTOR SHALL INCLUDE AS PART OF THE CONTRACT DEMOLITION, REMOVAL OR RELOCATION OF EXISTING EQUIPMENT, MATERIALS, APPURTENANCES, ETC. AS INDICATED ON THE DRAWINGS OR AS HEREIN SPECIFIED OR REQUIRED. WHERE ALL PIPING, DUCTS, AND OUTLETS ARE REMOVED, INTERRUPTED OR BROKEN, PROVIDE THE REQUIRED RELOCATION, RECONNECTION OR REPLACEMENT TO RESTORE SERVICE TO ALL ITEMS NOT MADE OBSOLETE BY THIS WORK.
- H. ALL EQUIPMENT, MATERIAL, ETC. REMOVED UNDER THIS CONTRACT AND NOT INTENDED FOR FINAL USE IN THE FINAL INSTALLATION SHALL BE IMMEDIATELY REMOVED FROM THE PREMISES AND TURNED OVER TO OR DISPOSED OF, AS DIRECTED BY THE OWNER.
- ANY DEMOLITION OR MODIFICATION WORK, AS INDICATED ON THE DRAWINGS AND NOT HEREIN SPECIFIED, OR VICE-VERSA, SHALL BE COMPLETED BY THIS CONTRACTOR AND SHALL BE INCLUDED AS PART OF THE CONTRACT.
- J. THE CONTRACTOR SHALL RELOCATE AND RECONNECT ALL NEW AND EXISTING LINES AND EQUIPMENT INTERFERING WITH NEW INSTALLATION. VERIFY ALL EXISTING CONDUITS AND RELATED APPURTENANCE INSTALLATION HEIGHTS WITH THAT OF THE NEW INSTALLATION, MAINTAINING ACCESS TO ALL EXISTING POINTS OF ACCESS.

# 1.03 SHOP DRAWINGS, EQUIPMENT SUBMISSION, MAINTENANCE

- A. SUBMIT ONE (1) REPRODUCIBLE AND ONE (1) PRINT OF THE SHEET METAL AND PIPING SHOP DRAWINGS, 1/4"=1'-0" OR 3/8"=1'-0" SCALE, CERTIFIED BY ALL TRADES THAT COORDINATION HAS BEEN ESTABLISHED.
- B. SUBMIT THREE (3) COPIES OF ALL SHEET METAL AND PIPING SHOP STANDARDS LEAKAGE TEST CERTIFICATIONS AND CERTIFIED EQUIPMENT CUTS WITH CONSTRUCTION WIRING DIAGRAMS, AND AUTOMATIC TEMPERATURE CONTROL SHOP DRAWINGS INCLUDING CONTROL AND POWER WIRING DIAGRAMS, SEQUENCE OF OPERATIONS AND ALL CUTS OF EQUIPMENT AND DEVICES.
- SUBMIT FOUR (4) BOOK BOUND INSTALLATION, OPERATION AND MAINTENANCE (IOM) MANUALS WHICH SHALL INCLUDE COPIES OF ALL AS-BUILT SHOP DRAWINGS FOLDED AND PLACED INTO BINDER POCKETS, AS-BUILT DRAWINGS IN ELECTRONIC FORMAT. COPIES OF REVIEWED EQUIPMENT CUTS FOR INSTALLED EQUIPMENT, COPIES OF EQUIPMENT START-UP CHECKLISTS, LEAK TESTS, FUEL LINES HYDROSTATIC TESTS AND FUEL TREATMENT CERTIFICATION. CONTRACTOR SHALL INSTRUCT OWNERS PERSONNEL ON THE OPERATION OF ALL NEWLY INSTALLED FUEL SUPPLY SYSTEMS.
- AS WORK PROGRESSES AND FOR DURATION OF THE CONTRACTOR, MAINTAIN A COMPLETE SEPARATE SET OF PRINTS OF CONTRACT DRAWINGS AT THE JOB SITE. RECORD WORK COMPLETED AND ALL CHANGES FROM ORIGINAL CONTRACT DRAWINGS CLEARLY AND ACCURATELY, INCLUDING WORK INSTALLED AS A MODIFICATION OR ADDITION TO THE ORIGINAL DESIGN. RECORD VALVE TAGS AS THEY ARE INSTALLED. FINAL SUBMISSION OF REPRODUCIBLE AS-BUILT DRAWINGS ARE TO BE SIGNED AND CERTIFIED BY INSTALLING CONTRACTOR CONFIRMING THE AS-BUILT CONDITION OF THE WORK. AS-BUILT SHOP DRAWINGS SHALL BE SUBMITTED IN DRAWING AND ELECTRONIC FORMAT (AUTOCAD 2007 MINIMUM).

## PART 2- PRODUCT/APPLICATION

- 2.01 DISCHARGE AIR PLENUM A. PROVIDE A NEW DISCHARGE AIR PLENUM TO CONNECT THE NEW GENERATOR RADIATOR DISCHARGE SIDE TO THE OUTDOOR EXHAUST LOUVER WITH ASSOCIATED SERVICE ACCESS DOORS AND SUPPORTS AND PERFORM LEAK TEST PER LATEST SMACNA STANDARDS AND NFPA 37 REQUIREMENTS. ALL DISCHARGE AIR PLENUM JOINTS SHALL BE SEALED AIRTIGHT WITH APPROVED DUCT SEALANT, SIMILAR TO 3M-900, OR BETTER.
- B. CONTRACTOR SHALL ADHERE TO THE FULL INSIDE CROSS SECTIONAL DISCHARGE AIR PLENUM AREAS SHOWN ON THE DRAWINGS AND PROVIDE ALL TRANSITIONS AS REQUIRED TO MEET FIELD CONDITIONS, ACCOMMODATE EQUIPMENT MAINTENANCE REQUIREMENTS AND COORDINATE WITH ALL TRADES. ALL FIELD CONDITIONS WHICH REQUIRE MODIFIED TRANSITIONS SHALL NOT BE APPROVED WITHOUT PRIOR ENGINEERING REVIEW AND APPROVAL THROUGH SHOP DRAWING SUBMITTAL OR RFI.
- C. NEW DISCHARGE AIR PLENUM SHALL MEET PRESSURE CLASSIFICATION, SEALING REQUIREMENTS AND LEAKAGE TESTING AS LISTED BELOW UNLESS OTHERWISE SPECIFIED OR SHOWN ON THE DRAWINGS:
- 1. 4" CLASS: ALL AIR PLENUMS FROM DISCHARGE OF GFNERATOR'S RADIATOR TO OUTDOOR EXHAUST LOUVERS. SEAL CLASS A, LEAKAGE CLASS 6. PROVIDE TDF FLANGE CONNECTIONS FOR ALL SYSTEM 4" PRESSURE CLASS AND ABOVE.

# F. MATERIALS:

CEMENTED SEAMS.

1. SHEETMETAL: HOT-DIPPED GALVANIZED SHEETMETAL WITH G90 COMMERCIAL COATING ACCORDING TO ASTM A653 & A924 FOR ALL DUCTWORK UNLESS OTHERWISE SPECIFIED. 2. FLEXIBLE CONNECTIONS AT FANS SHALL BE NEOPRENE COATED, FLAME RETARDANT GLASS FABRIC (COMPLYING

WITH NFPA 90), 30 OZ./SQ, YD. WITH SEWED AND

G. MOTORIZED DAMPERS LOCATED IN OUTDOOR AIR INTAKES OR EXPOSED TO MOISTURE SHALL CONFORM TO THE FOLLOWING: 1. EXTRUDED ALUMINUM DAMPER FRAME SHALL NOT BE LESS THAN 0.080" (2.03 MM) IN THICKNESS. DAMPER FRAME SHALL BE MIN. 4", WITH DUCT MOUNTING FLANGES ON BOTH SIDES OF FRAME. DAMPER FRAME SHALL HAVE A MIN. 2" (50.8 MM) MOUNTING FLANGE ON THE REAR OF

- THE DAMPER, WHEN INSTALLED AS EXTENDED REAR FLANGE INSTALL TYPE. FRAME TO BE ASSEMBLED USING ZINC-PLATED STEEL MOUNTING FASTENERS. WELDED FRAMES SHALL NOT BE ACCEPTABLE.
- 2. BLADES SHALL BE MAXIMUM 6.4" DEEP EXTRUDED ALUMINUM AIR-FOIL PROFILES WITH A MINIMUM WALL THICKNESS OF 0.06". ALL BLADES SHALL BE SYMMETRICALLY PIVOTED.
- 3. BLADE SEALS SHALL BE EXTRUDED EPDM, SECURED IN AN INTEGRAL SLOT WITHIN THE ALUMINUM BLADE EXTRUSIONS AND SHALL BE MECHANICALLY FASTENED TO PREVENT SHRINKAGE AND MOVEMENT OVER THE LIFE OF THE DAMPER. ADHESIVE OR CLIP-ON TYPE BLADE SEALS WILL NOT BE APPROVED.
- 4. FRAME SEALS SHALL BE EXTRUDED SILICONE, SECURED IN AN INTEGRAL SLOT WITHIN THE ALUMINUM FRAME EXTRUSIONS AND SHALL BE MECHANICALLY FASTENED TO PREVENT SHRINKAGE AND MOVEMENT OVER THE LIFE OF THE DAMPER. METALLIC COMPRESSION TYPE JAMB SEALS WILL NOT BE APPROVED.
- 5. LINKAGE HARDWARE SHALL BE CORROSION-RESISTANT ZINC-PLATED STEEL, INSTALLED TO BE EASILY ACCESSIBLE AFTER INSTALLATION
- REFER TO MECHANICAL EQUIPMENT SCHEDULES FOR THE PROPOSED MOTORIZED DAMPER MANUFACTURER AND MODEL NUMBER SELECTIONS AND FOR ADDITIONAL INFORMATION.

- PROVIDE PIPING WHICH IS SCHEMATICALLY INDICATED AND SIZED ON DRAWINGS. PIPING TO BE INSTALLED TO MEET SPECIFIED HEADROOM OR FIELD CONDITIONS AND SHALL CONFORM TO LATEST ASME CODES FOR FUEL OIL PIPING. PIPE MATERIALS AND FITTING MATERIALS SHALL BE AS PER THE PIPE AND FITTING SCHEDULES SHOWN ON DRAWINGS. ALL NEW INDOOR FUEL PIPING INSTALLATIONS SHALL COMPLY WITH NFPA 37 REQUIREMENTS.
- B. PIPING, FITTINGS, AND ALL PIPE APPURTENANCES SHALL BE SUITABLE FOR THE PRESSURE AND TEMPERATURE OF
- C. PROVIDE DIELECTRIC FITTINGS TO CONNECT DIFFERENT PIPING MATERIALS.
- D. PROVIDE AIR VENTS WITH CAPS AT EACH HIGH POINT AND DRAIN VALVES WITH CAPS AT EACH LOW POINT TO ALLOW FOR FUEL LINES PRIMING AND DRAINING.
- E. SUPPORT PIPING WITH HANGERS EQUIPPED WITH INSULATION SADDLES FROM APPROVED CONCRETE INSERTS, EXPANSION SHIELDS, BEAM CLAMPS, AND/OR SUPPLEMENTARY STEEL ANGLES, PLATES, AND CHANNELS. CONTRACTOR SHALL SUBMIT METHOD OF PIPING SUPPORT SIGNED AND SEALED BY A LICENSED PROFESSIONAL ENGINEER FOR REVIEW.
- F. UNIONS WITH REMOVABLE SECTIONS OF PIPING SHALL BE INSTALLED AT ALL EQUIPMENT TO PERMIT EASE OF DISCONNECTION FOR EQUIPMENT SERVICE/REMOVALS WITHOUT DISMANTLING OF MAJOR PORTIONS OF CONNECTED PIPING.
- G. ALL PIPE SLEEVES SHALL BE SCHEDULE 40 GALVANIZED STEEL. ANNULUS BETWEEN PIPE OR PIPE INSULATION AND SLEEVE SHALL BE CAULKED WITH A NON-COMBUSTIBLE MATERIAL TO WITHIN 1/4" OF WALL FACES AND FILLED WITH CAULKING COMPOUND FOR INTERIOR SLEEVES. EXTERIOR SLEEVES OR WATERPROOF SLEEVES SHALL UTILIZE LINK SEAL (LS) TYPE TO FILL THE ANNULUS.
- H. PROVIDE SECURELY FASTENED LABELING OF ALL PIPING (BOTH EXPOSED AND CONCEALED) IN ACCORDANCE WITH ANSL STANDARDS AND COLOR—CODED AS PER BUILDING MANAGEMENT STANDARDS. LABELING SHOULD BE PROVIDED 20 FEET ON CENTERS AND/OR AT LEAST ONCE IN EACH ENCLOSED SPACE OR ROOM WHERE THE WALLS EXTEND ABOVE THE CEILING.
- I. ALL PIPING SHALL COMPLY WITH THE CURRENT INTERNATIONAL MECHANICAL CODE AND THE PROVISIONS OF THE FOLLOWING:
- 1. ASME B 31.9 "BUILDING SERVICES PIPING" FOR MATERIALS, PRODUCTS AND INSTALLATION. SAFETY VALVES AND PRESSURE VALVES SHALL BEAR THE APPROPRIATE ASME
- 2. ASME "BOILER AND PRESSURE VESSEL CODE", SECTION IX, "WELDING AND BRAZING QUALIFICATION" FOR QUALIFICATIONS FOR WELDING PROCESSES AND OPERATORS.

## J. FUEL OIL PIPING:

- 1. FUEL OIL SUPPLY & RETURN PIPING 3" AND SMALLER TO BE SCHEDULE 40, ASTM A539, BLACK STEEL, THREADED
- 2. FUEL OIL PIPING FITTINGS 3" AND SMALLER TO BE 150# MALLEABLE IRON, THREADED ENDS W/1 BEAD OF WELD TO
- 3. FUEL OIL UNIONS 2-1/2" AND SMALLER TO BE 150#
- MALLEABLE IRON GROUND JOINTS, THREADED. 4. DIELECTRIC UNIONS TO BE THREADED AND CONNECTIONS TO SUIT APPLICATION. UNIONS SHALL BE CONSTRUCTED TO ISOLATE DISSIMILAR METALS, PREVENT GALVANIC ACTION, AND PREVENT CORROSION.
- 5. FUEL OIL PIPING ROUTED OVER AREAS NOT PROTECTED BY FUEL SPILL CONTAINMENT INSTALLATIONS SHALL BE PROTECTED BE A SECONDARY SHELL (DOUBLE WALL PIPING) CAPABLE OF CONTAINING THE LEAKING FUEL. THE SECONDARY SHELL SHALL BE CONSTRUCTED AND INSTALLED TO ALLOW FOR CONTROLLED REMOVAL OF THE COLLECTED FUEL OIL.

## K. PROVIDE VALVE TAGS AND CHARTS:

- 1. EACH VALVE SHALL HAVE A 2 INCH DIAMETER BRASS TAG WITH 1-INCH-HIGH NUMERAL STAMPED THEREON, SECURED TO THE VALVE BY MEANS OF BRASS S HOOK OR BRASS CHAIN. EACH SYSTEM TO HAVE A LETTER DESIGNATION INDICATING SERVICE.
- 2. THE CONTRACTOR SHALL FURNISH AN APPROVED NEATLY DRAWN VALVE CHART. PROPERLY FRAMED. SHOWING THE USE AND LOCATION OF EACH VALVE THAT IS TAGGED.

## M. VALVES AND STRAINERS:

1. VALVES, STRAINERS, ETC., SHALL NOT CONTAIN ASBESTOS AND HAVE THE NAME OF THE MANUFACTURER AND GUARANTEED WORKING PRESSURE CAST OR STAMPED ON BODIES. VALVES OF SIMILAR TYPE SHALL BE BY A SINGLE MANUFACTURER. ALL VALVES AND FIXTURES SHALL BE FIRE-TESTED TO MEET AMERICAN PETROLEUM INSTITUTE (API) STANDARDS 607 & 608, 4-TH EDITION, AND ASME STANDARD B16.34.

- 2. VALVES SHALL HAVE WORKING PRESSURE AND TEMPERATURE RATINGS SAME AS PIPE FITTINGS SPECIFIED FOR THE SERVICE. REGARDLESS OF SERVICE, VALVES SHALL NOT BE DESIGNED FOR LESS THAN 125 PSI WORKING PRESSURE.
- 3. GATE VALVES THROUGH 2-1/2" SHALL BE BRONZE BODY AND TRIM, NON-RISING STEM, INSIDE SCREW, SCREWED BONNET, SOLID WEDGE, BACK SEATING, SCREWED OR SOLDERED ENDS AS MANUFACTURED BY CRANE. JENKINS, NIBCO, MORRISON BROS OR APPROVED EQUAL
- 4. BALL VALVES THROUGH 2-1/2" SHALL BE BRONZE BODY, SILICONE BRONZE BALL, STEEL HANDLE, TEFLON PACKING, SCREWED OR SWEAT ENDS, 125LB, WSP, 400# WOG, AS MANUFACTURED BY MILWAUKEE, APOLLO, WATTS,
- 5. RELIEF VALVES PROVIDE OVER PRESSURE RELIEF VALVE AS AN INTEGRAL PART OF THE FUEL PUMP ASSEMBLY. RELIEF VALVES AS MANUFACTURED BY MORRISON BROS OR APPROVED EQUAL

NIBCO. MORRISON BROS OR APPROVED EQUAL

- 6. STRAINERS THREADED CAST STEEL FOR 150 PSIG WORKING PRESSURE, Y-PATTERN WITH 1/32 INCH STAINLESS STEEL PERFORATED SCREEN, AS MANUFACTURED BY MORRISON BROS OR APPROVED EQUAL
- 7. EMERGENCY ISOLATION VALVES THREADED CAST STEEL FOR 150 PSIG WORKING PRESSURE, AS MANUFACTURED BY MORRISON BROS OR APPROVED EQUAL.

#### P. PIPING TESTING

- 1. PNEUMATICALLY TEST TANKS IN ACCORDANCE WITH MANUFACTURER'S RECOMMENDATIONS UPON ARRIVAL AT THE PROJECT SITE AND AFTER TANK INSTALLATION TO ASSURE TANK INTEGRITY.
- 2. SUBJECT PIPING SYSTEM TO 1.5 TIMES THE MAX. WORKING PRESSURE FOR MIN. 2 HOURS, THE TEST PRESSURE SHALL NOT EXCEED THE MAXIMUM PRESSURE FOR ANY COMPONENT IN THE SYSTEM UNDER THE TEST. INSPECT THE SYSTEM AND TIGHTEN. REPAIR. OR REPLACE LEAKING COMPONENTS AS NECESSARY, REPEAT TEST UNTIL THERE ARE NO MORE LEAKS. FLUSH SYSTEM THOROUGHLY WITH DIESEL FUEL UNTIL ALL MOISTURE OR DEBRIS IS REMOVED AND DIESEL IS CLEAR. FILL SYSTEM WITH CLEAN DIESEL FUEL, CLOSE END VALVES AND ALLOW SYSTEM TO REMAIN FILLED. LEGALLY DISPOSE OF FLUSH DIESEL.
- 3. SECONDARY CONTAINMENT PIPING TEST SEAL SECONDARY CONTAINMENT PIPING TO PRIMARY PIPING AT BOTH ENDS WITH CONCENTRIC TERMINATION FITTINGS AS RECOMMENDED BY THE MANUFACTURER. PROVIDE TEST GAUGE AND PIPE CONNECTION AT THIS POINT FOR PNEUMATIC TESTING. PNEUMATICALLY TEST SYSTEM AT 15 PSI FOR TEN (10) MINUTES, THEN SOAP ALL JOINTS AND CHECK FOR LEAKS. RETEST UNTIL THERE ARE NO LEAKS AND SYSTEM IS PROVEN TIGHT
- 4. NO TESTING SHALL BE CONDUCTED UNTIL PIPE CLEANING AND PRETREATMENT HAS BEEN COMPLETED AND RECORDED
- 5. ALL TESTING SHALL BE COORDINATED BY THE CONTRACTOR AND SHALL BE WITNESSED BY A BUILDING OWNER'S REPRESENTATIVE. ALL SYSTEMS WHICH FAIL THE PRESSURE TESTS SHALL BE FIXED AND RETESTED AT NO EXPENSE TO
- 6. ISOLATE ALL EQUIPMENT WHICH IS TO BE EXCLUDED FROM THE PRESSURE TEST AND PROVIDE ALL TEMPORARY PIPING CONNECTIONS, FITTINGS, VALVES, EQUIPMENT, LABOR, ETC., TO PRESSURE TEST ALL SYSTEMS.

#### 2.04 INSULATION REQUIREMENTS

- Q. INSULATION SHALL BE APPLIED TO EXHAUST PIPING AND SILENCER CONSTRUCTED OF MATERIALS AS SPECIFIED HEREIN. INSULATION SHALL HAVE A FLAME SPREAD RATING NOT EXCEEDING 25 AND A SMOKE DEVELOPED INDEX OF 50 OR LESS AND SHALL MEET THE REQUIREMENTS OF ASTM,
- R. WHERE INSULATION IS SPECIFIED FOR PIPING, INSULATE SIMILARLY ALL CONNECTIONS, FLANGES AND FITTINGS AND OTHER PARTS OF THE SYSTEM PREVENT EXCESSIVE HEAT DISSIPATION TO SPACE.
- S. ALL EQUIPMENT, FITTINGS, DEVICES, ETC REQUIRING SERVICING OR INSPECTION SHALL HAVE REMOVABLE INSULATION WHICH CAN BE REPLACED WITHOUT DAMAGE.
- T. ALL LEAK AND PRESSURE TESTS SHALL BE COMPLETED PRIOR TO THE INSTALLATION OF ANY INSULATION.

## U. EXHAUST PIPE INSULATION:

- 1. INSULATION SHALL BE COMPOSED OF 100% TYPE "E" GLASS FIBERS NEEDLED TOGETHER INTO MAT FORM, ENCAPSULATED WITH 304 SS MESH AND COVERED WITH 32 OZ/SG. YD SILICONE FABRIC. IT SHALL BE NON-RESPIRABLE, INCOMBUSTIBLE, ASBESTOS FREE AND SHALL CONTAIN NO RESINOUS OR INORGANIC BINDERS. INSULATION MATERIAL SHALL CONFORM TO ASTM E84, RATED FOR 1200°F TEMPERATURE AND MIN. 2" THICKNESS WITH THERMAL CONDUCTIVITY "K" FACTOR OF 0.60 BTU/INCH/HR./FT2/F AT 700°F. INSULATION TO BE PROVIDED WITH REINFORCED FOIL FACED, FLAME RESISTANT, ALUMINUM METAL BARRIER. ALL INSULATION SHALL BE SECURED AND SEAMS SEALED BY TWO-INCH SEALING LIP WITH ADHESIVE AND FASTENED WITH 16 GAUGE RUST RESISTANT WIRE OR FIBERGLASS CORD ON 12" CENTERS. ON VESSELS OVER 24" WIDE, WELDED PINS AND CLIPS SHALL BE USED ON THE UNDERSIDE FOR FASTENING INSULATION. THE INSULATION SHALL LIMIT THE SURFACE TEMPERATURE TO APPROXIMATELY 400°F.
- F. CONNECTIONS: TACKS; TEMPERATURE RESISTANT COLOR MATCHING TAPE.
- G. INSTALLATION, EXAMINATION AND PREPARATION:
- VERIFY THAT ALL PIPING HAS BEEN LEAK TESTED PER THE SPECIFICATIONS BEFORE APPLYING COVERING MATERIALS. - VERIFY THAT ALL SURFACES ARE CLEAN, DRY AND FREE OF FOREIGN MATERIAL.
- INSTALL MATERIALS IN ACCORDANCE WITH MANUFACTURERS RECOMMENDATIONS, BUILDING CODES AND INDUSTRY STANDARDS.

- LOCATE COVER SEAMS IN LEAST VISIBLE LOCATIONS.

AND INTERRUPTIONS. - FOR PIPES (OTHER THAN EXHAUST) EXPOSED TO ABUSE IN FINISHED SPACES OR EXPOSED TO OUTDOOR SUN AND WIND ACTION, PROVIDE JOHNS MANVILLE ZESTON 2000 PVC JACKET AND FITTING COVERS OR ALUMINUM JACKET. JACKET SEAMS SHALL BE LOCATED ON SIDE OF

NEATLY FINISH INSULATION AT SUPPORTS, PROTRUSIONS,

## 2.05 SEISMIC RESTRAINTS

A. GENERAL: ALL EQUIPMENT, AND PIPING SHALL BE ADEQUATELY RESTRAINED TO RESIST SEISMIC FORCES. THIS SPECIFICATION IS IN ADDITION TO THE SPECIFIED VIBRATION

FITTINGS AND HORIZONTAL PIPE RUNS.

ISOLATION FOR THIS PROJECT. RESTRAINT DEVICES SHALL BE DESIGNED AND SELECTED TO MEET SEISMIC REQUIREMENTS AS DEFINED IN THE LATEST ISSUE OF THE STATE AND LOCAL CODE HAVING JURISDICTION.

#### B. SEISMIC-RESTRAINT PERFORMANCE CRITERIA:

- PIPING 1" IN DIAMETER EXPOSED IN GENERATOR ROOMS DO NOT REQUIRE SEISMIC RESTRAINT. - PIPING 2 1/2" AND LESS IN ALL OTHER AREAS DO NOT REQUIRE SEISMIC RESTRAINT.
- REQUIRE SEISMIC RESTRAINT 2. NON-STANDARD PIPING: ALL OTHER PIPING. OTHER THAN LISTED ABOVE REQUIRES SEISMIC RESTRAINT TO BE

- PIPING WITH HANGERS LESS THAN 12" LONG DO NOT

SELECTED BASED ON THE FOLLOWING REQUIREMENTS: - COMPONENT SEISMIC COEFFICIENT: 0.67. PERFORMANCE CRITERIA FACTOR: 1.0. ATTACHED AMPLIFICATION FACTOR: 1.0.

- WC = WEIGHT DISTRIBUTED TO EACH HANGER.

# 2.06 VIBRATION ISOLATION SYSTEMS

- A. ALL ROTATING, REVOLVING OR RECIPROCATING EQUIPMENT, INCLUDING PIPING CONNECTIONS TO THIS EQUIPMENT SHALL BE ACOUSTICALLY ISOLATED TO PREVENT THE TRANSMISSION OF OBJECTIONABLE NOISES, SOUND OR VIBRATIONS TO THE OCCUPIED SPACES AND TO THE BUILDING STRUCTURES. ALL VIBRATION ISOLATION PRODUCTS SHALL BE SPECIFICALLY DESIGNED FOR THEIR INTENDED USE.
- B. STATIC DEFLECTION OF ISOLATORS SHALL BE A MINIMUM OF 90% EFFICIENT.
- C. MANUFACTURER OF VIBRATION ISOLATION EQUIPMENT SHALL DETERMINE VIBRATION ISOLATOR SIZES AND LOCATIONS, PROVIDE SUITABLE PIPING AND EQUIPMENT VIBRATION ISOLATION SYSTEMS, GUARANTEE SPECIFIED ISOLATION SYSTEM ATTENUATION AND DEFLECTION, AND PROVIDE INSTALLATION INSTRUCTIONS, DRAWINGS AND FIELD SUPERVISION TO ASSURE PROPER INSTALLATION AND PERFORMANCE.

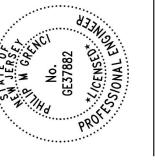
## D. MOUNTING TYPES:

- 1. FLOOR SUPPORTED PIPING ISOLATORS (TYPE SLR). 2. VERTICAL RISER PIPING ANCHOR AND GUIDES (TYPE ADA).
- 3. CEILING SUPPORTED PIPING ISOLATORS (TYPE 30N). E. PROVIDE FLEXIBLE CONNECTIONS BETWEEN FAN OUTLET AND DISCHARGE AIR PLENUM INLET AS PER AIR PLENUM SPECIFICATION SECTION.
- F. FLEXIBLE HOSE CONNECTORS SHALL BE INSTALLED AT INLET AND DISCHARGE CONNECTIONS TO ALL POWERED EQUIPMENT.
- G. SPRING TYPE 30N HANGERS SHALL BE PROVIDED FOR PIPING FOR A DISTANCE OF 50 FEET OR 50 PIPE DIAMETERS, WHICHEVER IS GREATER, UP AND DOWNSTREAM OF ALL POWER-DRIVEN EQUIPMENT. THE HANGER SHALL PROVIDE 1" OF STATIC DEFLECTION FOR PIPES 4" OF OUTSIDE DIAMETER AND LARGER AND 1/2" STATIC DEFLECTION FOR PIPES SMALLER THAN 4" w/ OUTSIDE
- H. VIBRATION ISOLATORS FOR FLOOR OR CEILING SUPPORTED EQUIPMENT SHALL HAVE A MAXIMUM LATERAL MOTION UNDER EQUIPMENT START-UP OR SHUT-DOWN CONDITIONS OF 1/4" AND MOTIONS IN EXCESS SHALL BE RESTRAINED BY SPRING TYPE MOUNTINGS.
- I. VIBRATION ISOLATOR SHALL BE PROVIDED BY MASON INDUSTRIES, VIBRATION ELIMINATOR CO., CONSOLIDATED KINETICS CO., OR APPROVED EQUAL



Department of Community Affair Construction Project Review Project No: 1054-22

N.J.S.A. 52:27D-119 ET SEQ., AS AMENDED



NJ SPORTS & EXPOSITION **AUTHORITY** PUMP STATION GENERATOR INSTALLATION

50 STATE ROUTE 120 EAST RUTHERFORD, NEW JERSEY

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Drawing Title: **MECHANICAL SPECIFICATIONS** 

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Issue Date: N.T.S. 4/18/22 Proj. Manager AMA Project No.:

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#### MECHANICAL SPECIFICATIONS CONTINUED

#### 2.07 EQUIPMENT A. GENERAL

- 1. THE MECHANICAL CONTRACTOR SHALL BE RESPONSIBLE FOR TRANSPORTING EQUIPMENT TO JOB SITE, RIGGING, BREAKDOWN AND SET-UP OF EQUIPMENT AS REQUIRED FOR LOCATION OF EQUIPMENT, INSTALLATION AND ALL GUARANTEES AND WARRANTIES OF EQUIPMENT AND WORKMANSHIP. DELIVERY OF EQUIPMENT SHOULD BE COORDINATED WITH OWNER, MANUFACTURER AND SITE
- MANAGEMENT. 2. PROVIDE ALL EQUIPMENT AND ACCESSORIES OF THE SIZES
- AND CAPACITIES AS INDICATED ON THE DRAWINGS. 3. INSTALL EQUIPMENT IN ACCORDANCE WITH APPROVED SHOP DRAWINGS, MANUFACTURERS INSTRUCTIONS AND REGULATIONS WHICH APPLY.
- 4. ALL EQUIPMENT POWER SUPPLY SHALL BE WIRED BY ELECTRICAL TRADE, IN ACCORDANCE WITH MANUFACTURERS INSTRUCTIONS AND REGULATIONS WHICH APPLY.
- 5. PROVIDE AND INSTALL ALL EQUIPMENT AND ACCESSORIES OF THE SIZES AND CAPACITIES AS SCHEDULED AND AS INDICATED ON THE DRAWINGS AND IN ACCORDANCE WITH APPROVED SHOP DRAWINGS AND MANUFACTURER'S RECOMMENDATIONS. PROVIDE ALL MOTOR STARTERS AS REQUIRED, MOTOR STARTERS WILL BE INSTALLED BY THIS CONTRACTOR AND WIRED BY ELECTRICAL TRADE.
- 6. MECHANICAL CONTRACTOR INSTALLING EQUIPMENT IS RESPONSIBLE FOR MAINTAINING ALL REQUIRED CLEARANCES FOR SERVICING AND MAINTENANCE. COORDINATE REQUIREMENTS WITH ALL TRADES.
- B. RECTANGULAR SIMPLEX STS DOUBLE WALL FUEL STORAGE TANK (DAY TANK SUPPLIED WITH GENERATOR).
- 1. PROVIDE AND INSTALL A SIMPLEX DAY TANK, MODEL STS, THERMALLY INSULATED, RECTANGULAR DOUBLE-WALL STEEL CONSTRUCTION
- 2. THE TANK SHALL BE DESIGNED FOR OPEN SPACE STORAGE OF FLAMMABLE AND COMBUSTIBLE LIQUIDS AT ATMOSPHERIC PRESSURE. TANK SHALL INCLUDE INTEGRAL STEEL SECONDARY CONTAINMENT AND THERMAL INSULATION THAT PROVIDES A MINIMUM TWO-HOUR FIRE RATING.
- 3. THE TANK SHALL BE DELIVERED AS A COMPLETE UL-LISTED ASSEMBLY WITH TWO FACTORY SUPPLIED, WELDED-ON SADDLES. SIZE AND LOCATION OF SADDLES SHALL BE AS REQUIRED BY EQUIPMENT MANUFACTURER. SADDLES TO BE SET LEVEL ON A SOLID FOUNDATION.
- 4. TANK SHALL BE DESIGNED FOR POSSIBLE RELOCATION AT A FUTURE DATE

#### C. STS DAY TANK OPTIONS

- 1. DAY TANK SHALL BE CONSTRUCTED IN COMPLIANCE WITH UL142, SECONDARY CONTAINMENT TANK (DOUBLE WALL CONSTRUCTION) OF REQUIRED CAPACITY, WITH FACTORY STANDARD PIPE FITTINGS.
- 2. THE TANK SHALL BE FACTORY EQUIPPED WITH THE FOLLOWING:
- TANK LEAK SENSOR - UL508A LEVEL CONTROLLER WITH POINT SENSING FLOAT SWITCH ARRAY - DUPLEX FILL PUMP, 2 GPM, 120VAC, SINGLE PHASE, 60
- HFRT7 - SIMPLEX RETURN PUMP, 7 GPM, 120VAC, SINGLE PHASE,
- 60 HERTZ FILL CHECK VALVE
- PACKAGED FOR INDOOR INSTALLATION 3. TANK FINISH: COATED SIMPLEX CAROLINA VERMILLION 4. CONTROLLER FINISH: COATED SIMPLEX COASTAL HAZE

## D. STS DAY TANK FUEL LEVEL CONTROLLER (INDOOR)

1. THE CONTROLLER SHALL BE PACKAGED IN TYPE 1

- ENCLOSURE WITH HINGE-OPEN AND LOCKABLE FRONT DOOR CONSTRUCTED IN COMPLIANCE WITH UL508A 2. THE CONTROLLER SHALL BE EQUIPPED WITH THE FOLLOWING
- **FUNCTIONS:** - AUTO-OFF-MANUAL CONTROL SWITCH
- PRESS-TO-TEST PUSHBUTTON - TANK FILL AUTOMATIC DIFFERENTIAL LEVEL
- OVERFILL CONTROL BACKUP LEAK DETECTION
- 3. STS CONTROLLER INDICATION FUNCTIONS (LED) SHALL INCLUDE:
- FUEL LEVEL - POWER AVAILABLE
- NOT IN AUTO (FLASHING) TANK FILLING
- LOW LEVEL ALARM
- HIGH LEVEL ALARM - TANK LEAK
- 4. STS CONTROLLER OUTPUT FUNCTIONS SHALL INCLUDE: - FILL START-STOP
- LOW LEVEL ALARM
- HIGH LEVEL ALARM TANK LEAK
- NOT IN AUTO 5. TANK CONSTRUCTION SHALL COMPLY WITH THE LATEST EDITION OF NATIONAL FIRE PROTECTION ASSOCIATION NFPA 30 FLAMMABLE AND COMBUSTIBLE LIQUIDS CODE. THE TANK'S SECONDARY CONTAINMENT MUST BE TESTED FOR TIGHTNESS IN THE FACTORY AND IN THE FIELD BEFORE COMMISSIONING. TANK SHALL BE SUPPLIED WITH EMERGENCY VENTS FOR THE PRIMARY AND THE SECONDARY

CONTAINMENT TANKS. EMERGENCY VENTING BY "FORM OF

- CONSTRUCTION" IS NOT EQUAL AND WILL NOT BE PERMITTED. 6. INNER AND OUTER TANK SHALL BE MANUFACTURED IN ACCORDANCE WITH UL-142 STANDARD FOR STEEL ABOVEGROUND TANKS FOR FLAMMABLE AND COMBUSTIBLE LIQUIDS. ENTIRE TANK SHALL BE LABELED FOR UNDERWRITERS LABORATORIES UL 2085 STANDARD FOR INSULATED SECONDARY CONTAINMENT ABOVEGROUND TANK FOR FLAMMABLE LIQUIDS. THE TANK SHALL BE TESTED FOR BALLISTICS, IMPACT, HOSE STREAM, AND POOL FIRE
- UL-2085 PERFORMANCE STANDARDS. 7. TANK SHALL BE MANUFACTURED AND LABELED IN STRICT ACCORDANCE WITH STEEL TANK INSTITUTE (STI) THERMALLY INSULATED, DOUBLE WALL STEEL ABOVEGROUND STORAGE TANK STANDARDS AS APPLIED BY A LICENSEE OF THE STI. TANK SHALL BE SUBJECT TO THE STI'S QUALITY ASSURANCE PROGRAM AND SHALL BE BACKED BY THE STI 30 YEAR LIMITED WARRANTY.

## E. FUEL DAY TANK CONSTRUCTION

- 1. TANK SHALL BE FABRICATED PER UL-142 OF MILD CARBON STEEL WITH SHELL SEAMS OF CONTINUOUS LAP WELD CONSTRUCTION.
- 2. TANK SHALL BE OF DOUBLE WALL CONSTRUCTION AND PROVIDE COMPLETE SECONDARY CONTAINMENT OF THE PRIMARY STORAGE TANK'S CONTENTS BY AN IMPERVIOUS STEEL OUTER WALL.

#### F. DIESEL ENGINE EXHAUST SYSTEM

- 1. THE EXHAUST SYSTEM SHALL BE CONSTRUCTED AND INSTALLED IN FIELD BY THE CONTRACTOR. PIPE ASSEMBLY & COMPONENTS SHALL BE LISTED BY THE UNDERWRITERS' LABORATORIES, INC. FOR USE WITH STATIONARY ENGINES BURNING GAS OR LIQUID FUELS, AS DESCRIBED IN NFPA 37 CHAPTER 8.1. WHICH PRODUCE EXHAUSTED FLUE GASES AT A TEMPERATURE NOT EXCEEDING 1000° UNDER CONTINUOUS
- OPERATING CONDITIONS. 2. THE EXHAUST PIPING ROUTE BETWEEN THE SILENCER AND THE OUTDOORS SHALL BE AS SHORT AND AS STRAIGHT AS POSSIBLE. THE EXHAUST DISCHARGE SHALL BE LOCATED MIN. 36" FROM THE WALL. ANY TURNS AND OFFSETS SHALL BE CONSTRUCTED WITH LONG RADIUS ELLS. UNDER NO CIRCUMSTANCES THE EXHAUST GAS STATIC PRESSURE INSIDE THE EXHAUST PIPE SHALL EXCEED THE ENGINE BACK-PRESSURE
- 3. THE DOUBLE WALL (INSULATED) EXHAUST PIPING SHALL BE INSTALLED INSIDE THE GENERATOR ROOM AND SHALL HAVE AN OUTER JACKET OF ALUMINUM COATED STEEL .025" THICK IN 6" THROUGH 24" DIAMETERS AND .034" THICK FOR LARGER DIAMETERS. THERE SHALL BE MINIMUM 2-1/2" INSULATION BETWEEN THE WALLS. THE INNER GAS CARRYING
- PIPE SHALL BE SCHEDULE 40 BLACK STEEL 4. ALL FITTINGS AND APPURTENANCES OUTSIDE THE GENERATOR'S ENCLOSURE SHALL BE CONSTRUCTED WITH SCHEDULE 40 BLACK STEEL. THE OUTDOOR SECTIONS SHALL
- BE OF SINGLE WALL CONSTRUCTION. 5. CONNECTIONS TO SILENCERS AND EXPANSION JOINTS SHALL BE MADE WITH MATCHING FLANGES. MATCHING FLANGES SHALL BE OF THE SAME SIZE, THICKNESS, BOLT HOLE SPACING AND PRESSURE RATING AS THE FLANGES TO WHICH
- 6. ALL FLANGED CONNECTIONS SHALL BE GASKETED. GASKETS SHALL BE SUITABLE FOR TEMPERATURES UP TO 1200°F, MINIMUM 1/16" THICK.

THE CONNECTIONS ARE MADE.

- 7. EACH EXPANSION JOINT SHALL BE WRAPPED WITH AN INSULATION BLANKET SIMILAR TO BLANKETS MANUFACTURED BY MIRATECH CORP (TULSA, OK), OR EQUAL. THE OUTER JACKET SHALL BE WOVEN FIBER GLASS WITH SILICONE RUBBER IMPREGNATION. THE INSULATION SHALL BE SIMILAR TO MIRATECH CORP (TULSA, OK) TYPE-2 FIBERGLASS INSULATION BLANKET ENCAPSULATED IN 304 SS MESH, SUITABLE FOR TEMPERATURES OF UP TO 1200°F, OR EQUAL. G. INSTALLATION
- 1. THE STACK SYSTEM SHALL BE INSTALLED ACCORDING TO AND SHALL COMPLY WITH THE FOLLOWING ADDITIONAL CODES OR STANDARDS:

- NFPA-37 - CHAPTERS 8.2 AND 8.3

- 2. INNER PIPE JOINTS SHALL BE WELDED ACCORDING TO ASME B31 CODE (HIGH TEMPERATURE GAS APPLICATION).
- 3. THE PIPING AND ITS SUPPORTING SYSTEM SHALL RESIST SIDE LOADS (WHETHER SYSTEM IS HORIZONTAL OR VERTICAL) AT LEAST 1.5 TIMES THE WEIGHT PER FOOT OF THE PIPING. THE PIPING SHALL BE REINFORCED AND INSTALLED TO WITHSTAND THE SEISMIC AND WIND FORCES, AS REQUIRED BY LOCAL AUTHORITY HAVING JURISDICTION.
- 4. PROVIDE ALL HANGERS, SUPPORTS, EXPANSION JOINTS, ANCHORS, ETC. AND APPURTENANCES THERETO FOR A COMPLETE SYSTEM.

#### PART 3- EXECUTION

#### 3.01 CONTRACTORS RESPONSIBILITIES

- A. PROVIDE AND INSTALL ALL EQUIPMENT AND ACCESSORIES OF THE SIZES AND CAPACITIES AS SCHEDULED AND AS INDICATED ON THE DRAWINGS AND IN ACCORDANCE WITH APPROVED SHOP DRAWINGS AND MANUFACTURERS RECOMMENDATIONS. PROVIDE ALL MOTOR STARTERS AS REQUIRED; MOTOR STARTERS WILL BE INSTALLED BY THIS CONTRACTOR AND WIRED BY ELECTRICAL TRADE.
- B. CONTRACTOR IS RESPONSIBLE FOR MAINTAINING ALL REQUIRED CLEARANCES FOR SERVICING AND MAINTENANCE. COORDINATE REQUIREMENTS WITH ALL TRADES.
- C. IDENTIFICATION OF EQUIPMENT AND CONTROLS:
- 1. ALL EQUIPMENT SHALL BE STENCILED OR LABELED WITH LAMACOID PLATES SCREWED THEREON WHICH SHALL INDICATE SYSTEMS SERVICE
- 2. MOTOR STARTERS SHALL BE PROVIDED WITH LAMACOID PLATES WHICH INDICATE SYSTEM SERVED.
- 3. CONTRACTOR TO SUBMIT LIST OF EQUIPMENT TO RECEIVE LABELS AND THE COORDINATED DESIGNATIONS, SIZE OF LABEL LETTERING, PLATE SIZE AND COLOR FOR REVIEW PRIOR TO INSTALLATION.
- D. FOR ALL FLOOR MOUNTED EQUIPMENT PROVIDE A 4" HIGH CONCRETE HOUSE-KEEPING PAD; WHERE FLOOR STANDS ARE INDICATED PROVIDE FLOOR STAND OF STRUCTURAL STEEL OR STEEL PIPES AND FITTINGS AND BOLT TO PAD; FOR ROOF MOUNTED, OR SURFACE MOUNTED EQUIPMENT PROVIDE SUPPORTS WITH APPROVED ANCHORS DIRECTLY FROM BUILDING STEEL STRUCTURE. PROVIDE SUPPLEMENTARY STEEL AS REQUIRED TO ADEQUATELY SUPPORT THE LOAD.

## 3.02 FUEL DAY TANK INSTALLATION

- A. TANK SHALL BE INSTALLED ON A REINFORCED CONCRETE BASE CONSTRUCTED BY G.C. INSTALLATION AND TESTING SHALL BE IN STRICT ACCORDANCE WITH STEEL TANK INSTITUTE (STI) INSTALLATION AND TESTING INSTRUCTIONS FOR THERMALLY INSULATED, LIGHTWEIGHT, DOUBLE WALL ABOVEGROUND STORAGE TANKS.
- B. APPROVED MANUFACTURER: TANK SHALL BE MANUFACTURED BY SIMPLEX, INC., OR EQUAL.
- C. THE DAY TANK SHALL BE POSITIONED AND INSTALLED ACCORDING TO THE MAIN FUEL STORAGE TANK AND ENGINE LOCATION. IN GENERAL LOCATE THE DAY TANK AS CLOSE TO THE ENGINE AS POSSIBLE CONSISTENT WITH APPLICABLE LOCAL AND NATIONAL PLUMBING AND ELECTRICAL CODES. POSITION THE DAY TANK SO THAT THE HIGHEST FUEL LEVEL IN THE TANK IS LOWER THAN THE ENGINE INJECTORS. THE DAY TANK SHALL BE LOCATED NOT FARTHER THAN 200' FROM THE MAIN FUEL TANK. THE DAY TANK SHALL NOT BE MORE THAN 18 FEET HIGHER THAN THE LOWEST FUEL LEVEL IN THE MAIN FUEL TANK. DAY TANK LOCATION IN A CONFINED SPACE SHALL CONSIDER ACCIDENTAL FUEL SPILLAGE AND USE A RUPTURE BASIN WHEN NECESSARY. DO NOT LOCATE THE DAY TANK NEAR A SURFACE OR OBJECT WHICH MAY BE ADVERSELY AFFECTED BY FUEL OIL.
- D. CLEAN AND FLUSH DAY TANKS PRIOR TO DELIVERY TO THE PROJECT SITE. SEAL UNTIL PIPE CONNECTIONS ARE MADE.
- E. PROVIDE PIPING CONNECTIONS TO TANKS WITH UNIONS AND

#### SWING JOINTS. PROVIDE VENTING AS PER CODE.

#### 3.03 FUEL PIPING INSTALLATION

INVERTED.

- A. INSTALLATION SHALL MEET OR EXCEED ALL APPLICABLE FEDERAL, STATE AND LOCAL REQUIREMENTS, REFERENCED STANDARDS AND CONFORM TO CODES AND ORDINANCES OF AUTHORITIES HAVING JURISDICTION.
- B. ALL INSTALLATION SHALL BE IN ACCORDANCE WITH MANUFACTURER'S PUBLISHED RECOMMENDATIONS.
- C. PIPING CONNECTIONS: USE COMPATIBLE SEALANT WHEN ASSEMBLING ALL THREADED JOINTS AND FITTINGS.
- D. ROUTE PIPING IN ORDERLY MANNER AND MAINTAIN GRADIENT.
- E. INSTALL PIPING TO CONSERVE BUILDING SPACE AND NOT
- INTERFERE WITH USE OF SPACE. F. INSTALL PIPING TO ALLOW FOR EXPANSION AND CONTRACTION
- WITHOUT STRESSING PIPE, JOINTS, OR CONNECTED EQUIPMENT. G. PROVIDE CLEARANCE FOR ACCESS TO VALVES AND FITTINGS.
- H. PROVIDE ACCESS WHERE VALVES AND FITTINGS ARE NOT EXPOSED.
- I. IDENTIFY PIPING SYSTEMS W/ METAL TAGS OR APPROVED J. INSTALL VALVES WITH STEMS UPRIGHT OR HORIZONTAL, NOT
- K. PROTECT PIPING SYSTEMS FROM ENTRY OF FOREIGN MATERIALS DURING CONSTRUCTION BY INSTALLING TEMPORARY COVERS, COMPLETING SECTIONS OF THE WORK THAT CAN BE ISOLATED AND ISOLATING PARTS OF COMPLETED SYSTEM.
- L. INSTALLATION OF PIPING SHALL CONFORM TO NFPA 31 OR NFPA 37, AS APPLICABLE, AND THE FOLLOWING:
- 1. INSTALL PIPING IN AS SHORT AND DIRECT ARRANGEMENT AS POSSIBLE TO MINIMIZE PRESSURE DROP.
- 2. INSTALL PIPING FOR MINIMUM NUMBER OF JOINTS USING AS FEW ELBOWS AND OTHER FITTINGS AS POSSIBLE TO MINIMIZE
- 3. USE FITTINGS FOR ALL CHANGES IN DIRECTION AND ALL BRANCH CONNECTIONS
- 4. INSTALL DIELECTRIC UNIONS TO JOIN DISSIMILAR METALS. 5. INSTALL EXPOSED PIPING AT RIGHT ANGLES OR PARALLEL TO BUILDING WALLS. DIAGONAL RUNS ARE NOT PERMITTED, UNLESS EXPRESSLY INDICATED.
- 6. INSTALL PIPING FREE OF SAGS OR BENDS AND WITH ALL AMPLE SPACE BETWEEN PIPING TO PERMIT PROPER INSULATION APPLICATIONS.
- 7. LOCATE GROUPS OF PIPE PARALLEL TO EACH OTHER, SPACED TO PERMIT APPLYING INSULATION AND SERVICING OF VALVES.
- 8. INSTALL FUEL PIPING WITH ADEQUATE SLOPING TO ALLOW
- GRAVITY FUEL DRAINING TOWARDS THE NEAREST FUEL TANK. 9. SECONDARY PIPING (DOUBLE WALL PIPING INSTALLATIONS) SECONDARY CONTAINMENT PIPE SHALL BE POSITIONED OVER PRIMARY PIPE PRIOR TO BONDING. THE SECONDARY PIPING SHALL BE ASSEMBLED FROM COMPONENTS THAT CAN BE DIS-ASSEMBLED AND RE-ASSEMBLED FOR SERVICING OF THE PRIMARY PIPE. THE SECONDARY PIPE DIAMETER SHALL ALLOW FOR INSTALLATION OF THE REQUIRED SPACERS (IN PLACE OF THE PRIMARY PIPING INSULATION). AFTER TESTING THE PRIMARY PIPE THE CONTAINMENT FITTINGS SHALL BE ASSEMBLED. THE CONTAINMENT SYSTEM SHALL THEN BE TESTED FOR LEAKS.

## 3.04 CLEANING AND PRETREATMENT

- M. CLEANING OF PIPING SHALL BE PERFORMED IN THE PRESENCE OF A BUILDING REPRESENTATIVE.
- N. CHECK EACH SYSTEM FOLLOWING FLUSHING TO ENSURE CLEANING MEDIUM HAS BEEN REMOVED FROM EACH SYSTEM AND TEST TO ENSURE THAT THERE ARE NO CONTAMINANTS REMAINING.

## 3.05 EQUIPMENT START-UP AND TESTING

- A. UPON COMPLETION OF THE INSTALLATION, THE INSTALLING CONTRACTOR SHALL ENSURE THAT ALL EQUIPMENT AND SYSTEMS ARE TESTED AND ADJUSTED UNDER FIELD OPERATING CONDITIONS TO DEMONSTRATE ITS COMPLIANCE WITH SPECIFICATION REQUIREMENTS.
- B. SHOULD ANY PART OF THE EQUIPMENT OR SYSTEM FAIL TO MEET THE CONTRACT REQUIREMENTS, THIS CONTRACTOR SHALL ADJUST, REPAIR OR REPLACE ALL DEFECTIVE OR INOPERATIVE PARTS AND AGAIN CONDUCT THE COMPLETE START-UP TEST.
- C. SUBMIT SYSTEM START UP SHEETS AND TEST RESULTS TO THE OWNER AND ENGINEER.

# 3.06 PERFORMANCE TESTS AND COMMISSIONING

- A. COMMISSIONING IS MORE DETAILED THAN EQUIPMENT START-UP TESTING AND SHALL BE PERFORMED ON THIS PROJECT TO DEMONSTRATE TO THE COMMISSIONING AUTHORITY (CXA) A COMPLETE AND SUCCESSFUL WORKING INSTALLATION IN ALL OPERATIONAL MODES AS OUTLINED IN THE SEQUENCE OF OPERATIONS. THIS CONTRACTOR SHALL:
- 1. ATTEND ALL PRE-COMMISSIONING AND ANY SUBSEQUENT COMMISSIONING MEETINGS WITH ASSOCIATED SUB-CONTRACTORS AND MANUFACTURERS REPRESENTATIVES THAT ARE REQUIRED TO COMPLETE THE COMMISSIONING OF THE EQUIPMENT AND SYSTEMS PROVIDED.
- 2. REVIEW THE COMMISSIONING PLAN TYPICALLY PREPARED AND ISSUED BY THE CXA 3. COMPLETE PRE-STARTUP AND STARTUP ON ALL INSTALLED
- EQUIPMENT PRIOR TO ALL COMMISSIONING ACTIVITIES. 4. COMPLETE AND SUBMIT A PRE-FUNCTIONAL CHECKLIST DISTRIBUTED BY THE CXA FOR EACH PIECE OF EQUIPMENT AND SYSTEM TO BE COMMISSIONED. ANY ISSUES
- COMMENT SECTION. 5. PERFORM FUNCTIONAL PERFORMANCE TESTING OUTLINED IN THE COMMISSIONING PLAN.
- 6. WORK CLOSELY WITH THE CXA IN IDENTIFYING ALL OPERATING, MAINTENANCE, FAILURE MODES THAT MUST BE DEMONSTRATED AS PART OF THE COMMISSIONING PROCESS. 7. COORDINATE, SCHEDULE, AND COMPLETE COMMISSIONING

ENCOUNTERED DURING START-UP SHOULD BE LISTED IN THE

- TASKS WITH THE CXA. 8. BE RESPONSIBLE FOR ALL COSTS FOR TESTING, INCLUDING RE-TESTING DUE TO DEFICIENCIES/NON-COMPLIANCE WITH THE SPECIFICATIONS. RE-TESTING COSTS SHALL BE THE RESPONSIBILITY OF THE CONTRACTOR AND SHALL NOT CONSTITUTE JUSTIFICATION FOR ADDITIONAL COSTS TO THE
- 9. INCLUDE OVERTIME LABOR AS NEEDED FOR TESTING.

#### 10. RESPONSIBLE TO SUPPLY AND CONNECT ALL TESTING EQUIPMENT REQUIRED FOR ANY PART OF THE COMMISSIONING PROCESS (I.E. LOAD BANKS, CABLES, INFRARED SCANNING, TEMPORARY COOLING MEANS, TESTING

- MATERIALS AND CHEMICALS, ETC. 11. SUBMIT MANUFACTURER ACCEPTANCE TESTING DOCUMENTATION (STARTUP AND MANUAL DOCUMENTS) TO
- THE COMMISSIONING AUTHORITY. B. FUNCTIONAL PERFORMANCE TESTING:
- 1. START UP OF SYSTEMS AND COMPONENTS SHALL BE PERFORMED BY CONTRACTORS AND MANUFACTURER TECHNICIANS AS APPLICABLE PRIOR TO FUNCTIONAL PERFORMANCE TESTING (FPT) IN THE PRESENCE OF THE CXA. ALL POWER, SAFETIES AND CONTROL INTERLOCKS SHALL BE MADE OPERATIONAL. PRE-TEST VERIFICATION BY THE CONTRACTOR OF COMPONENTS AND SYSTEMS IS MANDATORY TO VERIFY OPERATION BEFOREHAND AND AVOID LAST MINUTE CORRECTIVE WORK OR REPEAT TESTING. SUBMISSION OF PRE-FUNCTION CHECKLISTS SHALL COMMUNICATE THAT SUCH PROCESS HAS OCCURRED
- 2. ONCE PRE-FUNCTION CHECKLISTS HAVE BEEN SUBMITTED TO AND REVIEWED BY THE CXA, FUNCTIONAL TESTING CAN BE SCHEDULED BY THE CXA.
- 3. THE CXA MUST BE KEPT INFORMED OF THE CONSTRUCTION SCHEDULE AND GIVEN TWO (2) WEEKS NOTICE OF THE ANTICIPATED FUNCTIONAL TESTING TIMEFRAME WINDOW.
- 4. FUNCTIONAL TESTING SHOULD FOLLOW THE SYSTEMS TESTING AND BALANCING PROCESS. 5. PERFORMANCE TEST PROCEDURES ARE INTENDED TO
- DEMONSTRATE AND RECORD THE PERFORMANCE OF EQUIPMENT AND SYSTEMS UNDER SAFETY AND OPERATIONAL SCENARIOS AS APPLICABLE INCLUDING:
- E) RESPONSE TO SAFETIES IN MANUAL AND AUTOMATIC MODE F) SIGNALS TO FIRE ALARM, SECURITY AND USER ALARM
- G) SEQUENCE OF OPERATION, STEP BY STEP H) INTERLOCK WITH OTHER PIECES OF EQUIPMENT (E.G.,
- VALVES, FUEL LEAK DETECTORS, ETC.) I) CONTROL SYSTEM RESPONSE AND ANNUNCIATION OF SENSOR/MONITOR POINTS 6. THE FUNCTIONAL TESTING PROCEDURES ARE EXECUTED BY
- THE CONTRACTORS, UNDER THE DIRECTION OF, AND RECORDED BY THE CXA. THE CONTRACTOR SHALL PROVIDE A FIELD TECHNICIAN AND A REPRESENTATIVE FROM THE AUTOMATIC TEMPERATURE CONTROLS CONTRACTOR TO OPERATE EQUIPMENT AND CONFIRM RESPONSES IN THE PRESENCE OF THE CXA AND OWNER'S APPOINTED REPRESENTATIVE 7. ANY NON-COMPLIANCE ITEMS FOUND SHALL BE LISTED IN A

COMMISSIONING ISSUES LOG PREPARED BY THE CXA.

LISTED DEFICIENCIES IS IMPLEMENTED AND SHALL RESPOND UPON COMPLETION OF SUCH TO THE CXA VIA THE PROVIDED AREAS IN THE COMMISSIONING ISSUES LOG. 8. ITEMS OF NON-COMPLIANCE IN MATERIAL, INSTALLATION OR

CONTRACTORS SHALL ENSURE THAT CORRECTIVE ACTION OF

SETUP ARE CORRECTED AT THE CONTRACTOR'S EXPENSE. 9. ONCE THE CONTRACTOR INDICATES THAT ALL DEFICIENCIES HAVE BEEN ADDRESSED, THE SYSTEMS SHALL BE RETESTED.

DAMPERS (D-1 FOR SAL-1, SAL-2)

C. SYSTEMS TO BE COMMISSIONED: 1. FUEL DAY TANK (DT-1) WITH FUEL TRANSFER PUMP MODULE 2. EXHAUST FAN (EF-1) WITH ASSOCIATED OA INTAKE

3. GENERATOR

3.07 ELECTRICAL WORK A. ELECTRICAL CONTRACTOR SHALL BE RESPONSIBLE FOR POWER WIRING UNDER A SEPARATE DIVISION OF CONTRACT WORK. AUTOMATIC TEMPERATURE, SAFETY AND INTERLOCKING CONTROLS FOR MOTORS MOTOR STARTERS AND OTHER ELECTRICAL APPARATUS AND DEVICES SHALL BE PROVIDED BY THE MECHANICAL CONTRACTOR. CONTROL WIRING SHALL INCLUDE BUT NOT LIMITED TO ALL 12-, 24-, AND 120-VOLT

# 3.08 CONTROLS WIRING

- A. MECHANICAL CONTRACTOR SHALL COORDINATE ALL CONTROL AND INTERLOCK WIRING INCLUDING CONDUITS, WITH THE ELECTRICAL CONTRACTOR'S INSTALLATION. ALL WORK SHALL BE IN COMPLIANCE WITH ALL APPLICABLE CODES. SUBMIT POINT TO POINT WIRING DIAGRAM, AND ALL CONTROLS COMPONENTS FOR REVIEW AND APPROVAL. INCLUDING ALL SWITCHES, RELAYS, THERMOSTATS CONTROL PANELS, SAFETIES, TRANSFORMERS, CONTROLLERS INSTRUMENTATION AND PROGRAMMING AND ALL DEVICES FOR A FULL OPERATIONAL SYSTEM. THIS CONTRACTOR SHALL VERIFY PROPER SYSTEM OPERATION.
- B. PROVIDE ALL CONTROL, POWER, AND INTERLOCK WIRING INCLUDING CONDUITS AND INSTALL PER NATIONAL ELECTRIC CODE. SUBMIT TERMINAL TO TERMINAL WIRING DIAGRAM, SEQUENCE OF OPERATION AND CUTS OF ALL COMPONENTS FOR APPROVAL. PROVIDE ALL RELAYS, SWITCHES, DAMPERS AND ACTUATORS, PILOT POSITIONERS, THERMOSTATS, PANELS, LIMIT SAFETIES, TRANSFORMERS, TIME CLOCKS, CONTROL VALVES AND OTHER DEVICES TO ACCOMPLISH THE DESIRED SEQUENCE OF OPERATION.
- C. ALL TEMPERATURE CONTROL SYSTEMS AND COMPONENTS ARE TO BE FULLY MODULATING TYPE, EXCEPT WHERE NOTED OTHERWISE.
- D. ALL CONTROLS SHALL BE THE PRODUCT OF ONE MANUFACTURER. ALL AUTOMATIC CONTROL VALVES AND DAMPER OPERATORS SHALL BE MANUFACTURED BY THE TEMPERATURE CONTROL MANUFACTURER.
- E. THE MANUFACTURER OF THE AUTOMATIC CONTROL EQUIPMENT SHALL SUBMIT THE FOLLOWING FOR APPROVAL: A SCHEMATIC DIAGRAM OF OPERATION AND RANGE OF THE CONTROLS FOR ALL CYCLES, PROVIDE TERMINAL POINT TO TERMINAL POINT ELECTRICAL WIRING DIAGRAMS FOR APPROVAL, A COMPLETE DESCRIPTION OF THE AUTOMATIC OPERATION OF EACH SYSTEM WHERE THE DESCRIPTION INCLUDES THE DUTY OF EACH THERMOSTAT, VALVE, SWITCH, ETC., INCORPORATED IN THE CONTROL SYSTEM WITH A SCHEDULE AND ILLUSTRATION OF ALL CONTROL INSTRUMENTS AND EQUIPMENT INCLUDING
- F. SPECIFIC WIRING DIAGRAMS OF FACTORY INSTALLED EQUIPMENT WIRING SHALL ALSO BE SUBMITTED FOR APPROVAL AND FURNISHED TO THE ELECTRICAL CONTRACTOR FOR HIS INSTALLATION REQUIREMENTS AND OTHER USES.

CONTROL PANELS AND DEVICES FOR EACH SYSTEM.

G. MECHANICAL CONTRACTOR SHALL MAINTAIN ALL EXISTING CONTROL CONNECTIONS FOR STARTERS TO BE REUSED. CONTRACTOR SHALL COORDINATE EXISTING CONDITIONS AND PROVIDE ALL CONTACTS AND RELAYS REQUIRED FOR EXISTING STARTERS TO BE REPLACED WITH NEW.

# PART 4 - SEQUENCE OF OPERATIONS

#### 4.01 SEQUENCE OF OPERATIONS

THE INTENT IS TO CREATE AN AUTONOMOUS FUEL SUPPLY SYSTEM TO THE NEW BACK-UP POWER GENERATOR WHICH CAN OPERATE WITHOUT DIRECT HUMAN INVOLVEMENT. THE HUMAN OPERATORS SHALL HAVE CAPABILITY TO MONITOR SYSTEM'S OPERATION FROM A SEQUENCE OF OPERATION SHALL BE IN ACCORDANCE WITH BUT NOT

#### A. DAY TANK (DT-1)

PUMPS USAGE.

LIMITED TO THE FOLLOWING:

- 1. THE DAY TANK FUEL LEVEL CONTROLS SHALL BE ENERGIZED AND MAINTAIN MINIMUM 50% (ADJ.) FUEL LEVEL AT ALL
- 2. THE DAY TANK FUEL PUMPS SHALL BE ENERGIZED AND READY TO RUN AT ALL TIMES. THE POWER SUPPLY SYSTEM POWERING THE DAY TANK CONTROLS AND PUMPS SHALL AUTOMATICALLY TRANSFER TO THE GENERATOR POWER UPON GENERATOR'S START. THE PUMPS' POWER SHALL AUTOMATICALLY TRANSFER BACK TO THE NETWORK POWER WHEN GENERATOR STOP.
- 3. UPON DEPLETING FUEL LEVEL TO 50% (ADJ.) OF TANK CAPACITY. THE DAY-TANK CONTROLS. BASED ON LOW LEVEL FLOAT SWITCH SIGNAL, SHALL ACTIVATE ONE (1) SUPPLY FUEL OIL PUMP TO TRANSFER ADDITIONAL FUEL FROM THE MAIN FUEL STORAGE TANK (ST-1).
- 4. UPON RISING FUEL LEVEL OF 90% (ADJ.) OF TANK CAPACITY, THE DAY-TANK CONTROLS, BASED ON HIGH LEVEL FLOAT SWITCH SIGNAL, SHALL STOP THE FUEL OIL SUPPLY PUMP OPERATION.
- 5. THE TWO (2) FUEL SUPPLY PUMPS SHALL OPERATE IN LEAD-LAG SETTING. UPON SENSING FALL OF DAY TANK FUEL LEVEL BELOW 50% (ADJ.), THE DAY TANK CONTROLS SHALL DISPLAY A "LEAD PUMP FAILURE" ALARM AND THE "LAG" SUPPLY PUMP SHALL ACTIVATE AND MAINTAIN OPERATION UNTIL THE FUEL LEVEL RISE TO 70% (ADJ.) OF DAY TANK CAPACITY. THE CONTROLS SHALL ROTATE PUMPS' LEAD-LAG FUNCTION PERIODICALLY TO ENSURE UNIFORM
- 6. UPON ACTIVATION OF "OVERFLOW" ALARM, THE FUEL RETURN PUMP SHALL ACTIVATE AND TRANSFER FUEL OUT OF THE DAY TANK TO MAIN STORAGE TANK UNTIL THE DAY TANK FUEL LEVEL FALLS TO 70% (ADJ.) LEVEL. UPON REACHING THE FUEL LEVEL SETPOINT, THE FUEL RETURN PUMP SHALL
- 7. WHEN FUEL TEMPERATURE INSIDE TANK REACHES 140°F (ADJ.), THE DAY TANK CONTROLS SHALL ACTIVATE ONE (1) SUPPLY AND ONE (1) RETURN FUEL PUMP TO CYCLE FUEL BETWEEN DAY TANK AND THE STORAGE TANK (ST-1) UNTIL THE FUEL TEMPERATURE FALLS TO ACCEPTABLE LEVEL (120°F, ADJ.). UPON FURTHER TEMPERATURE RISE TO 145°F (ADJ.), DESPITE FUEL CYCLING, THE FUEL COOLER FAN SHALL ACTIVATE, BOTH PUMPS AND THE FUEL COOLER FAN SHALL STOP UPON REACHING THE DESIRED FUEL TEMPERATURE SETPOINT.

#### B. GENERATOR OUTDOOR AIR INTAKE DAMPERS (D-1)

1. THE OA INTAKE DAMPERS (D-1, ASSOCIATED WITH SAL-1)SHALL ENERGIZE AND OPEN UPON GENERATOR(S) ACTIVATION. THE OA INTAKE DAMPERS SHALL CLOSE WHEN GENERATOR IS POWERED DOWN. EACH DAMPER ACTUATOR SHALL BE NORMALLY OPEN (N.O.) TYPE, HELD CLOSED WHEN GENERATOR IS NOT RUNNING. WHENEVER POWER IS APPLIED, THE DAMPER ACTUATORS SHALL CLOSE AND REMAIN IN CLOSED POSITION. WHENEVER POWER IS REMOVED, THE ACTUATORS SHALL OPEN UNDER RETURN SPRING POWER AND REMAIN IN OPEN POSITION UNTIL POWER SUPPLY IS

RESTORED.

- C. COOLING EXHAUST FAN (EF-1) 1. THE EXHAUST FAN EF-1 SHALL BE ENGAGED AND READY TO RUN AT ALL TIMES. WHEN THE SPACE TEMPERATURE EXCEEDS THE SETPOINT OF 85°F (ADJ.) BASED ON SPACE THERMOSTAT READINGS, ONE OF THE OUTDOOR AIR DAMPERS (D-1), LOCATED FURTHEST AWAY FROM THE EXHAUST FAN. SHALL OPEN AND THE EXHAUST FAN (EF-1) SHALL RUN. THE FAN SHALL SHUT-OFF AND THE OA DAMPER SHALL CLOSE WHEN THE SPACE TEMPERATURE
- D. ELECTRIC SPACE HEATERS (EH-1, EH-2)

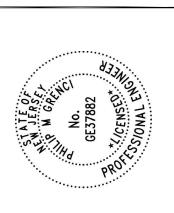
FALLS BELOW THE 85°F (ADJ.) SETPOINT.

- 1. THE ELECTRIC HEATERS (EH-1, EH-2) SYSTEM SHALL BE ENGAGED & READY TO OPERATE AT ALL TIMES. WHEN THI SPACE TEMPERATURE FALLS BELOW THE SETPOINT OF 55°F (ADJ.) THE SPACE HEATER SHALL ACTIVATE. THE HEATER SHALL SHUT-OFF WHEN THE SPACE TEMPERATURE REACHES

60°F (ADJ) SETPOINT.

SYSTEM

- E. FUEL OIL WATER SEPARATOR FILTER SET 1. FUEL OIL WATER SEPARATOR FILTER SET SHALL BE INSTALLED FOLLOWING GENERATOR ENGINE MANUFACTURER'S RECOMMENDATIONS. THE FILTER SET SHALL BE DESIGNED TO ALLOW FILTER REPLACEMENT WHILE THE ENGINE IS RUNNING.
- F. ADD/ALTERNATE: MAIN TANK (ST-1) FUEL LEVEL MONITORING
- 1. FUEL LEVEL SENSOR SHALL MONITOR MAIN FUEL STORAGE TANK (ST-1) CAPACITY AT ALL TIMES AND DISPLAY CURRENT FUEL LEVEL VIA A DIGITAL TANK GAUGE SYSTEM. WHEN THE TANK REACHES 25% (ADJ.) CAPACITY, THE SYSTEM SHALL GENERATE A "FUEL LOW LEVEL" ALARM. WHEN THE TANK REACHES 95% (ADJ.) CAPACITY, THE SYSTEM SHALL GENERATE AN "OVERFILL" ALARM. WHEN THE SYSTEM DETECTS HIGH FUEL LEVEL LOSS IN TANK IDLE CONDITION (WHEN GENERATOR IS NOT RUNNING), THE SYSTEM SHALL GENERATE "FUEL LOSS" ALARM. THE SYSTEM SHALL ALSO HAVE ABILITY TO VERIFY FUEL DELIVERY CAPACITY AND LOG THE ACTUAL FUEL QUANTITY DELIVERED TO THE TANK.



Department of Community Affairs Construction Project Review Project No: 1054-22

N.J.S.A. 52:27D-119 ET SEQ., AS AMENDED

NJ SPORTS & EXPOSITION **AUTHORITY** PUMP STATION GENERATOR INSTALLATION

50 STATE ROUTE 120 EAST RUTHERFORD, NEW JERSEY

Digitally signed by PHILIP M GRENC Date: 2022.06.24

12:31:59 -04'00'

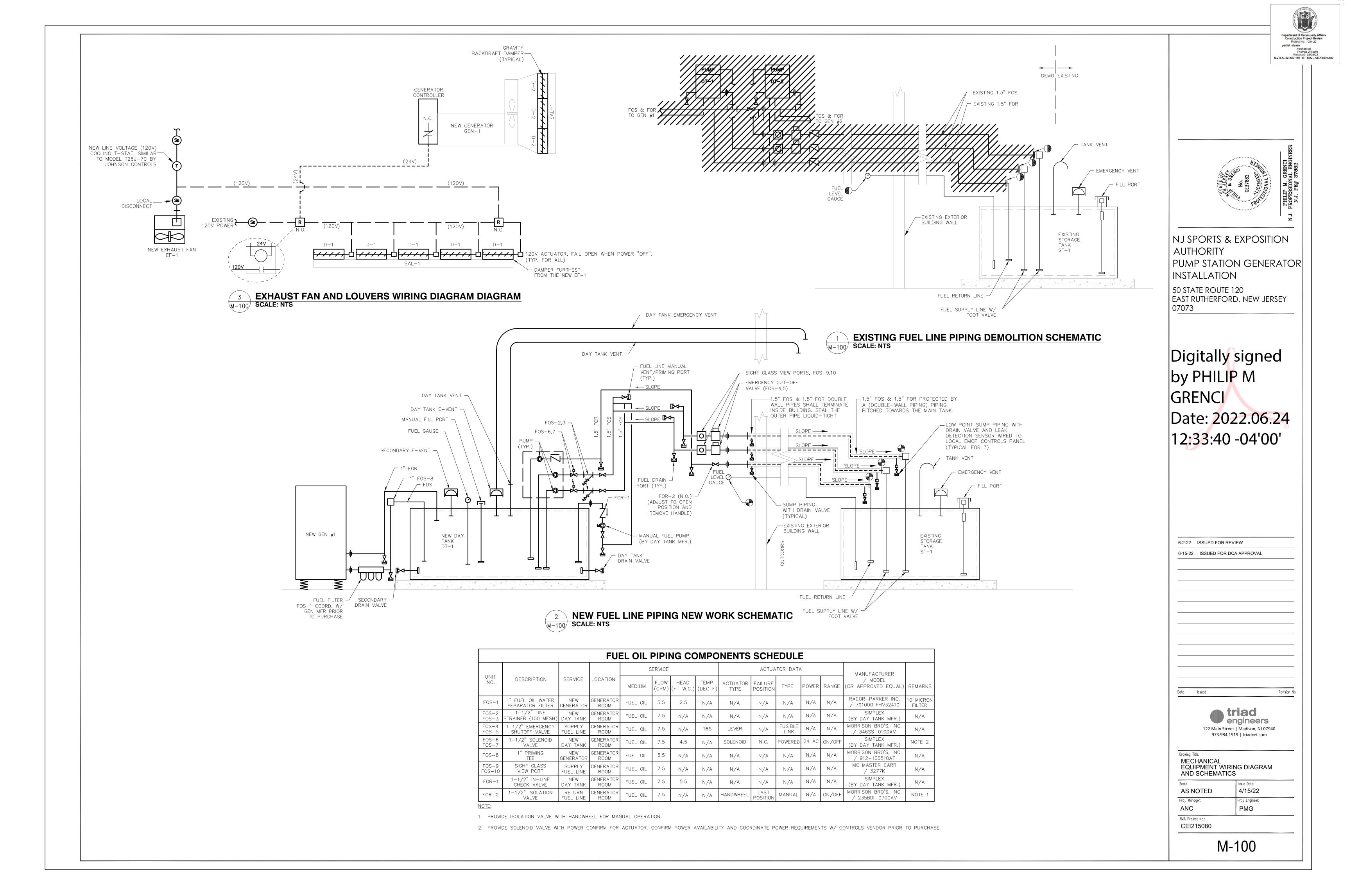
6-2-22	ISSUED FOR REVIEW	
6-15-22	ISSUED FOR DCA APPROVAL	

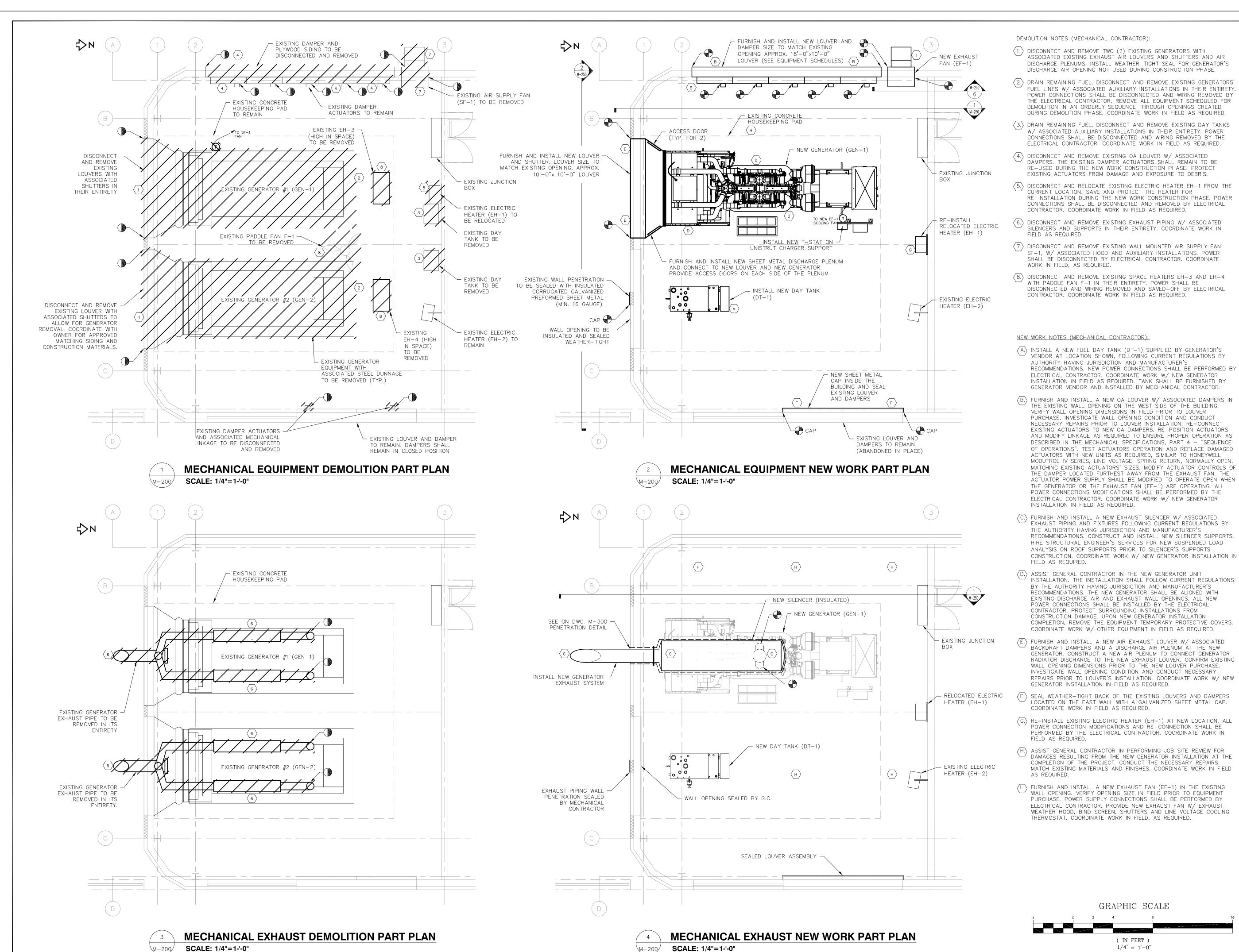


Drawing Title: **MECHANICAL** SPECIFICATIONS

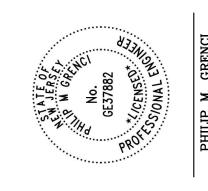
N.T.S. 4/18/22 AMA Project No.: CEI215080

Issue Date:





Department of Community Affairs
Construction Project Review
Project No: 1054-22
partial release
mechanical
Thomas Williams
Released: 08/05/22
N.J.S.A. 52:27D-119 ET SEQ., AS AMENDED



NJ SPORTS & EXPOSITION
AUTHORITY
PUMP STATION GENERATOR
INSTALLATION

50 STATE ROUTE 120 EAST RUTHERFORD, NEW JERSEY 07073

Digitally signed by PHILIP M GRENCI Date: 2022.06.24

12:33:24 -04'00'

6-2-22	ISSUED FOR REVIEW	
6-15-22	2 ISSUED FOR DCA APPROVAL	
Date	Issued	Revision No

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Drawing Title:

MECHANICAL
EQUIPMENT DEMOLITION AND
NEW WORK PART PLANS

Scale
AS NOTED

Proj. Manager:

Proj. Engineer:

Proj. Manager:

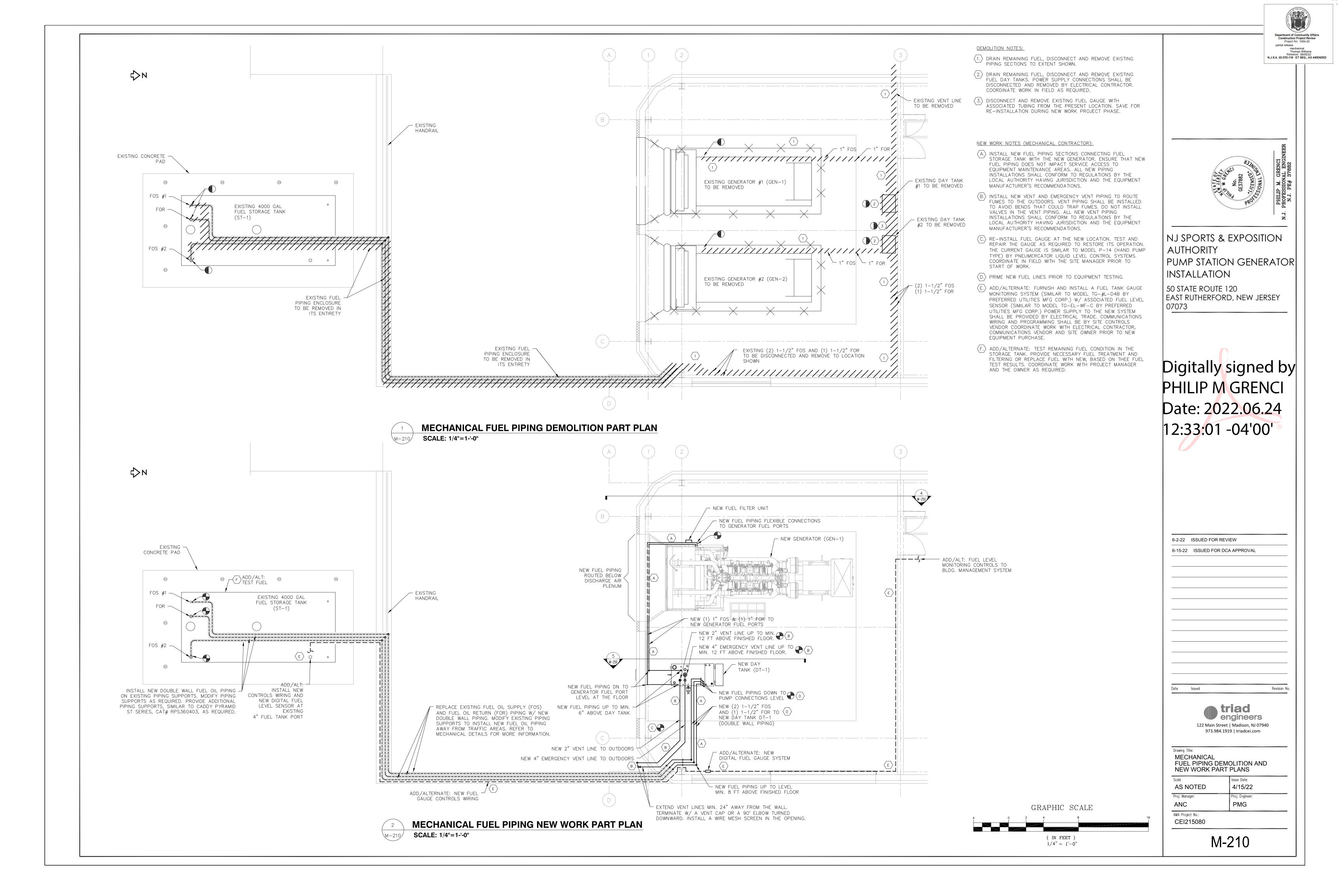
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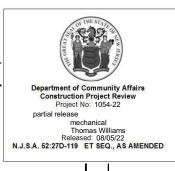
PMG

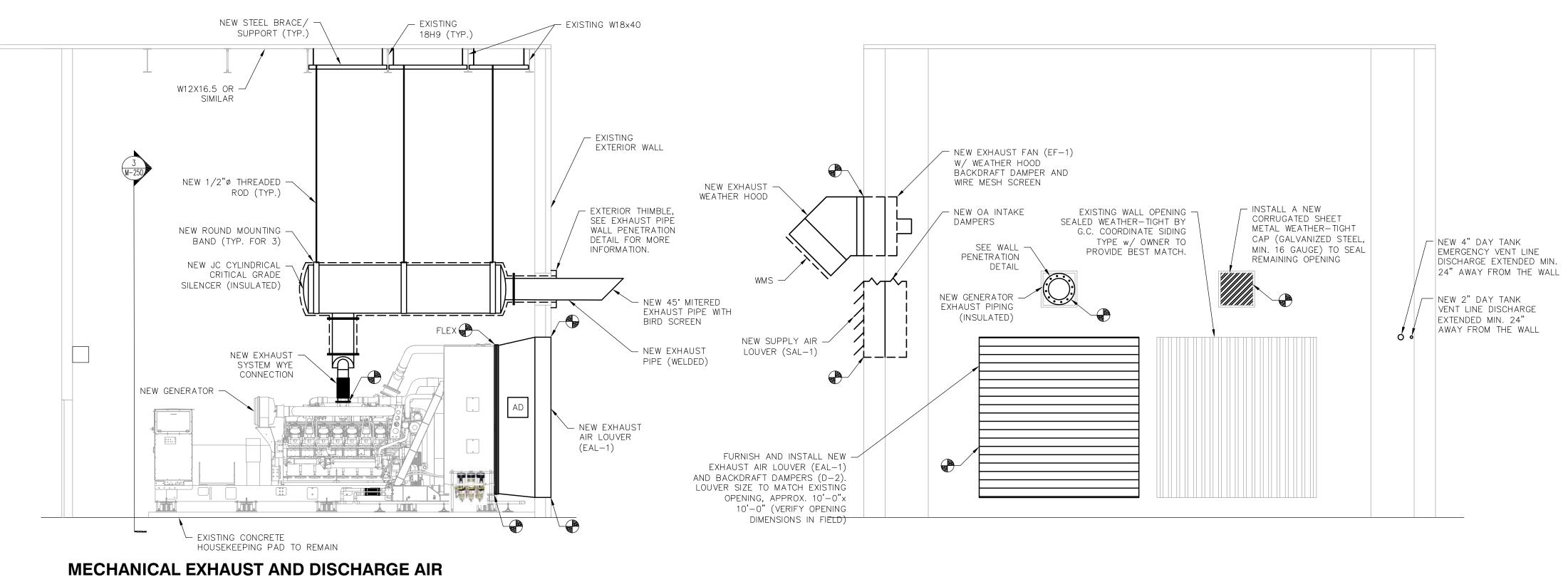
AMA Project No.:

CEI215080

M-200







NEW 1/2" THREADED ROD (TYP.)

NEW ROUND MOUNTING BAND (TYP. FOR 3)

MIN. NEW JC CYLINDRICAL CRITICAL GRADE SILENCER (INSULATED)

NEW EXHAUST SYSTEM WYE CONNECTION

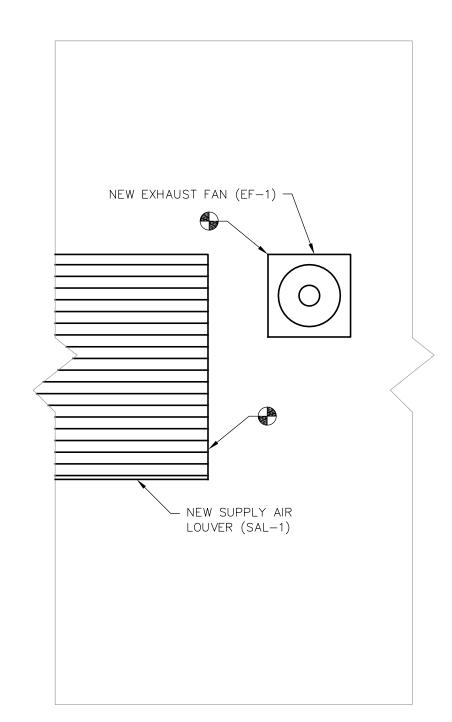
NEW GENERATOR

EXISTING CONCRETE HOUSEKEEPING PAD TO REMAIN

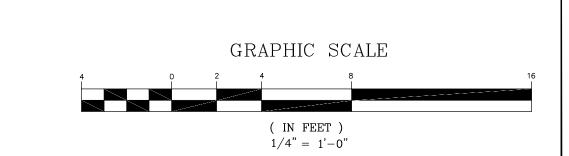
MECHANICAL EXHAUST SYSTEM
NEW WORK SECTION
SCALE: 1/4"=1-'-0"

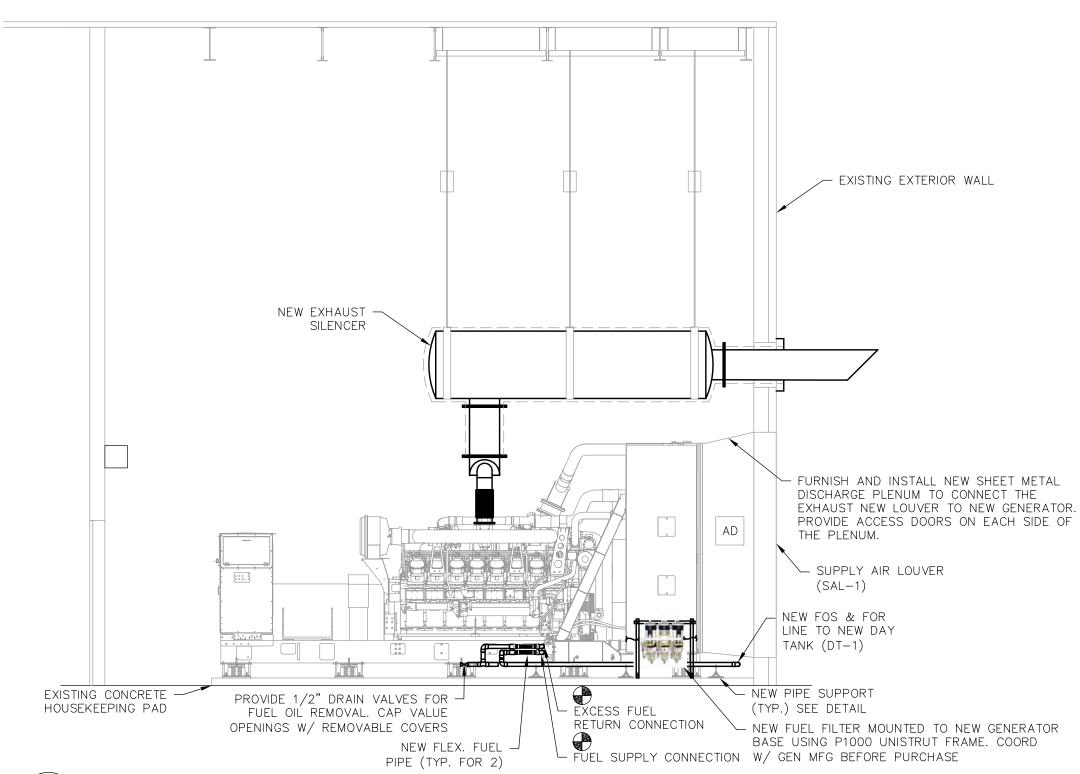
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GRENCI

Date: 2022.06.24 12:32:35 -04'00'



6 MECHANICAL NEW EF-1 DETAIL
M-250 SCALE: 1/4"=1-'-0"



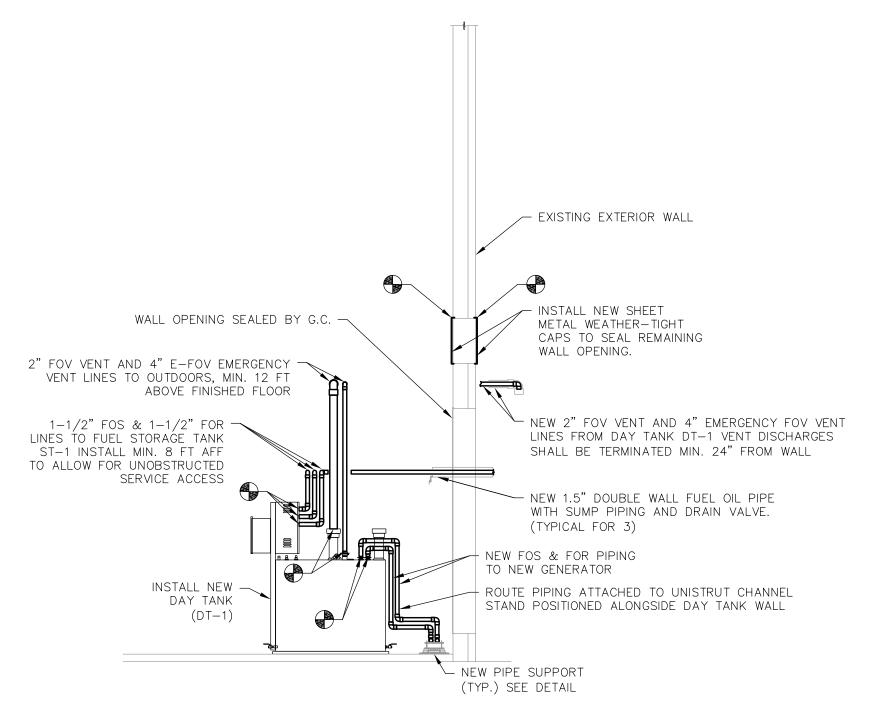


PLENUM CONNECTION NEW WORK ELEVATION

SCALE: 1/4"=1-'-0"

MECHANICAL FUEL PIPING CONNECTION NEW WORK SECTION

SCALE: 1/4"=1-'-0"



MECHANICAL EQUIPMENT EXTERIOR NEW WORK ELEVATION

SCALE: 1/4"=1-'-0"

MECHANICAL DAY TANK PIPING
NEW WORK ELEVATION
SCALE: 1/4"=1-'-0"

NJ SPORTS & EXPOSITION
AUTHORITY
PHILLIP M. GRENCI
INSTALLATION
50 STATE ROUTE 120
EAST RUTHERFORD, NEW JERSEY
07073

6-2-22 ISSUED FOR REVIEW
6-15-22 ISSUED FOR DCA APPROVAL

Date Issued Revision No.

Triad engineers

122 Main Street | Madison, NJ 07940
973,984.1919 | triadcei.com

Drowing Title:

MECHANICAL
EQUIPMENT NEW WORK
ELEVATIONS AND SECTIONS

4/15/22

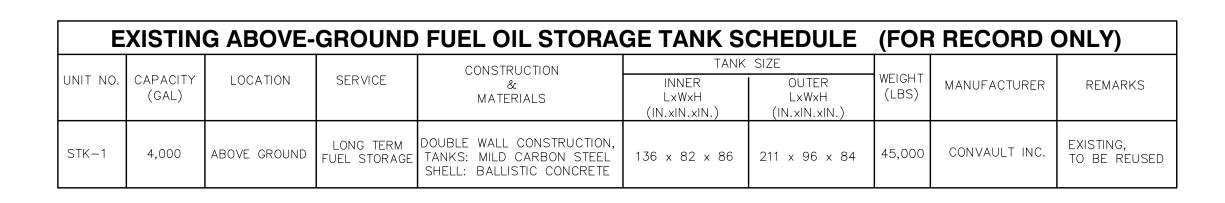
PMG

M-250

AS NOTED

ANC

AMA Project No.: CEI215080



					D	AMP	ER S	CHED	ULE		
UNIT NO.	QTY.	SERVICE	AIRFLOW (CFM)	MIN. FREE AREA (SQ. FT.)	SECTION QTY.		N FRAME HEIGHT (IN)		SP (IN WG)	MANUFACTURER & MODEL NO. (OR APPROVED EQUAL)	REMARKS
D-1	1	SA LOUVER	99,000	121.0	10	42	60	CONTROL DAMPER	0.05	DOWCO/SAFE-AIR MODEL 604	W/ MECHANICAL LINKAGE, FLANGE CONNECTIONS, FINISH: ANODIZED
D-2	1	EA LOUVER	82,500	78.0	6	40	60	CONTROL DAMPER	0.05	DOWCO/SAFE-AIR MODEL BRL	W/ COUNTERBALANCE WEIGHTS (ASSIST) FLANGE CONNECTIONS, FINISH: ANODIZED

1. PROVIDE SA DAMPERS (D-1) WITH MECHANICAL LINKAGE TO BE CONNECTED TO EXISTING ELECTRICAL ACTUATORS IN FIELD.

2. PROVIDE EA DAMPERS (D-2) WITH COUNTERBALANCE WEIGHT, ADJUSTED TO ASSIST DAMPER OPENING.

				SUF	PPL	Y AIF	R LOUVE	ER SO	CHEDULE	
UNIT NO.	AIRFLOW (CFM)	MINIMUM OPENING FREE AREA (SQ. FT.)	MIN. WALL OPENING W x H (IN X IN)		SECTIO WIDTH (IN)	NS HEIGHT (IN)	TYPE	SP (IN WG)	MANUFACTURER & MODEL NO. (OR APPROVED EQUAL)	REMARKS
SAL-1	99,000	106.32	210 x 120	2	72 66	120 120	DRAINABLE	0.12	DOWCO/SAFE-AIR MODEL EA 403	w/ WIRE MESH SCREEN, DAMPER SECTION(S) (D-1) TO COVER LOUVER FACE FINISH: BAKED ENAMEL. RATED FOR MARINE DUTY

NOTE: VERIFY EXISTING WALL OPENING SIZE IN FIELD PRIOR TO EQUIPMENT PURCHASE

			E	XH	AUS	ST A	IR LOUV	/ER S	CHEDULE	
UNIT NO.	AIRFLOW (CFM)	MINIMUM OPENING FREE AREA (SQ. FT.)	MIN. WALL OPENING W x H (IN X IN)		SECTIC WIDTH (IN)	NS HEIGHT (IN)	TYPE	SP (IN WG)	MANUFACTURER & MODEL NO. (OR APPROVED EQUAL)	REMARKS
EAL-1	82,500	51.20	120 x 120	2	120	60	DRAINABLE	0.25	DOWCO/SAFE-AIR LEC-04	W/ WIRE MESH SCREEN, DUCT SLEEVE, INTEGRAL SHUTTER SECTION(S) TO COVER LOUVER FACE FINISH: BAKED ENAMEL

NOTE: VERIFY EXISTING WALL OPENING SIZE IN FIELD PRIOR TO EQUIPMENT PURCHASE

								EXHAU	JST F	AN SC	CHEDULE		
UNIT			SP				١	MOTOR DATA	\ 	WEIGHT	•	SELECTION OVED EQUAL)	
NO.	LOCATION	CFM	(IN WG)	RPM	BHP	DRIVE	HP	V/PH/HZ	AMPS	(LBS)	MANUFACTURER	MODEL	REMARKS
EF-1	WALL	10,449	0.25	860	1.11	DIRECT	1.0 VG	115/1/60	12.6	130	GREENHECK	SE2-36-611-C10	W/ BACKDRAFT DAMPER, 45° WEATHER HOOD, OSHA FAN GUARD,

		I	DAY TA	NK F	UEL	STO	DRAGE	SCH	HED	ULE	(SUP	PLIE	D B	Y GENE	<b>ERA</b>	ΓOR	<b>VEN</b>	DOR)		
						FUEL	SUPPLY PU	MP					FUEL	RETURN PU	MP			DRY	BASIS OF	
UNIT NO.	SERVICE	LOCATION	CAPACITY (GAL.)	CONFIG.	FLOW	٨	MOTOR DATA		INLET	OUTLET	CONFIC	FLOW	N	MOTOR DATA		INLET	OUTLET	WEIGHT	SELECTION	NOTES
			(0/12.)	CONFIG.	(GPM)	HP	V/PH/HZ	RPM	(IN)	(IN)	CONFIG.	(GPM)	HP	V/PH/HZ	RPM	(IN)	(IN)	(LBS)	(OR APPROVED EQUAL)	
																			SIMPLEX	
DT-1	DAY TANK	GENERATOR ROOM	300	DUPLEX	7.5	1/3	115/1/60	1,750	0.75	0.75	SIMPLEX	7.5	1/3	115/1/60	1,750	0.75	0.75	890	TECHNOLOGY SERIES STS-300	SEE NOTES BELOW

- 1. PROVIDE DAY TANK SET w/ FOLLOWING FEATURES: (1x) AUXILIARY HAND PUMP
- (1x) DUPLEX FUEL STRAINER
- (1x) VENT CAP • (1x) EMERGENCY VENT w/ FLANGE + VENT CAP
- (1x) DRAIN HAND VALVE • (3x) CHECK VALVE
- (2x) SOLENOID VALVE • (1x) CONTAINMENT DRAIN HAND VALVE
- (1x) SIMPLEX RETURN PUMP w/ TEFC MOTOR
- (1x) DUPLEX SUPPLY PUMP w/ TEFC MOTOR
- (1x) BASIC PLC BASED LEVEL AND DUPLEX PUMP CONTROLLER
- (1x) MANUAL PRIMING PUMP • (1x) FUEL OIL COOLER
- (2x) RUNNING TIME METER • (3x) SINGLE PHASE MAGNETIC MOTOR STARTER
- OPERATION MODE SELECTOR LOSS OF FLOW ALARM

DIGITAL CONTROLLER

DISCONNECT SWITCH

• MECHANICAL DIAL LEVEL GAUGE

• CRITICAL HIGH LEVEL CUT-OUT

 CONTROLS POWER TRANSFORMER • "POWER AVAILABLE" GREEN LIGHT AUXILIARY RELAY

2. PROVIDE DAY TANK w/ FOLLOWING CONTROL OPTIONS:

• FLOAT SWITCH IN RUPTURE BASIN W/ ALARM

 "LOW FUEL LEVEL" RED LIGHT "CRITICAL LOW FUEL" ALARM

LINTEL — (TYP. FOR ALL NEW

BACKDRAFT DAMPER -

M-300 SCALE: NTS

SEALING AND ANCHORING COLLAR -

CENTER PIPE IN SLEEVE

PIPE SLEEVE OF SIZE TO PASS PIPE

AND INSULATION, POURED IN PLACE

STANDARD WEIGHT STEEL

OPENINGS IN THE WALLS)

WEATHER HOOD -

PROVIDED BY

EXHAUST FAN

BIRD SCREEN ANGLE WELDED -TO DUCT AS

REQUIRED

MANUFACTURER

- ANGLE IRON ON

- 18 GAUGE SHEET METAL

- SEAL SLEEVE WITH

TIGHTLY PACKED OAKUM

AND APPROVED SEALANT

COAT EXTERIOR SURFACES

WITH TAR COMPOUND

IN A SMOKE-MANNER

- MOTOR MOUNTED ON VIBRATION

ISOLATORS

→ AIR FLOW

PLENUM TO EXTEND

THROUGH WALL

- SPECIFIED FAN

**EXHAUST FAN w/ WEATHER HOOD DETAIL** 

EXTERIOR WALLS

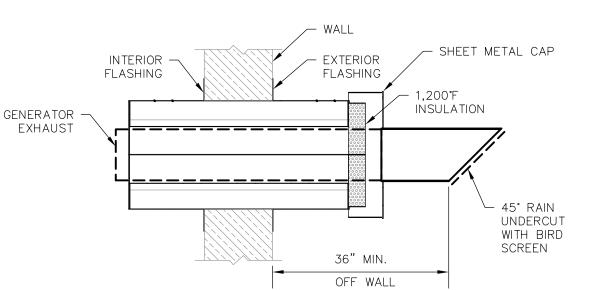
M-300 SCALE: NTS

**WALL SLEEVE DETAILS** 

OPENING SIZE

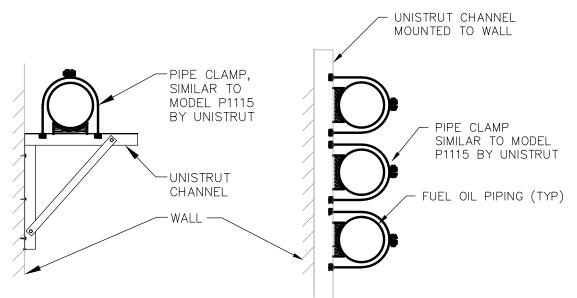
ALL SIDES

- ALARM HORN "RUNNING PUMP" AMBER LIGHT MANUAL RESET NORMALLY OPEN SOLENOID VALVE
- ANTI—SIPHON VALVE FUEL OIL COOLER CONTROLS AUTOMATIC DUPLEX PUMP CONTROLLER (OPTION 345)
- AUTOMATIC PUMP—OUT CONVERSION • FUEL RISE PUMP-OUT CONTROLS (OPTION 390)

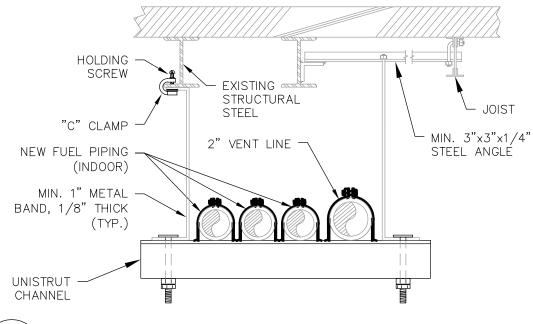


REFER TO SPECIFICATIONS DRAWING M-575, SECTION "DIESEL ENGINE BREECHING AND STACK" FOR MORE INFORMATION

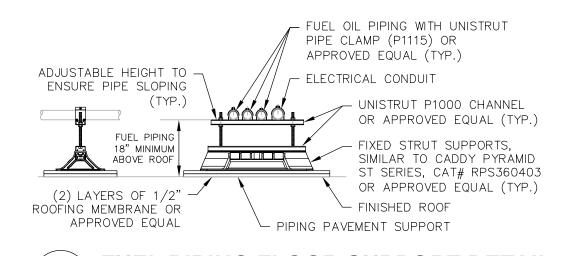




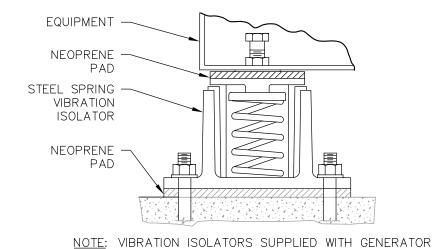




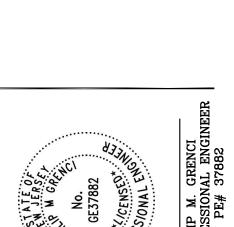
**FUEL PIPING HANGING SUPPORT DETAIL** M-300 SCALE: NTS



 ${f /}$   $_9$   ${f /}$  FUEL PIPING FLOOR SUPPORT DETAIL M-300 SCALE: NTS



**VIBRATION ISOLATOR DETAIL** M-300 SCALE: NTS



SEE EQUIPMENT SCHEDULE

-----"W"-----

FRONT ELEVATION

- MOUNTING LAG BOLTS, SIZE AND QUANTITY BY MECHANICAL

CONTRACTOR, BASED ON SUPPORTED LOAD (TYPICAL)

1. ALL LOUVERS SHALL BE MINIMUM 50% FREE AREA AND A BIRD SCREEN

MOTORIZED LOUVER DAMPER

LEGEND:

--- PIPING BY GENERATOR

CONTRACTOR

PIPING BY MECHANICAL

CONTRACTOR

ON THE DAY TANK (MIN. 2" DIA).

> TO GENERATOR

— CRITICAL HIGH LEVEL ALARM

ROUTE TO OUTSIDE, DISCHARGE MIN.

---- HIGH LEVEL ALARM

— LOW LEVEL ALARM

— TANK RUPTURE ALARM

---- PUMP ON

COLLECTING PAN

PUMP OFF (BY DAY TANK MFR.)

3'-0" ABOVE ENCLOSURE ROOF OR MIN. 2'-0" AWAY FROM WALLS

2. ALL INTAKE LOUVERS SHALL BE PROVIDED WITH 45 DEGREE BLADES AND

HANGER ROD

SUSPENDED

FROM BEAM

4"×4"×1/4"

STEEL ÁNGLE

BLADE ROD

ABOVE

- DAMPER

/ INTER-LINK

\_ LINKAGE

- INTER-LINK

ANGLE SUPPORT

EXHAUST LOUVER SHALL BE O DEGREE BLADES.

SHALL BE PROVIDED.

M-300 SCALE: NTS

CHECK VALVE ---

3. ALL LOUVER SHALL BE DRAINABLE.

WITH ACTUATOR

EXISTING WALL ---

CAUKING BETWEEN -

EXISTING WALL &

LOUVER DAMPER

(TYPICAL)

WINDOW 3/4" ---

DIAMOND MÉSH SCREEN GUARD

1/2" DIAMOND MESH SCREEN

EXISTING WALL —

PUMP PRIMING TEE

LINE PRIMING TEE ---

STEEL PLUG -

MAIN STORAGE TANK

(BY TANK MFR.)

(BY TANK MFR.)

FUEL OIL SUPPLY PUMP ---(BY DAY TANK MFR.) FUEL OIL RETURN PUMP-(BY DAY TANK MFR.)

DAY TANK DRAIN-

(BY DAY TANK MFR.)

RUPTURE BASIN DRAIN -

(BY DAY TANK MFR.)

— FOS — **— M M M** 

OVERFLOW-

M-300 SCALE: NTS

CRITICAL ALARM SHUT-OFF SOLENOID,

CRITICAL ALARM SHUT-OFF SOLENOID,-

SOLENOID CLOSED AT PUMP "OFF" LEVEL

SOLENOID CLOSED AT PUMP "OFF" LEVEL

VALVE #1

VALVE #2

M-300 SCALE: NTS

STEEL CAP

FRONT -

THIS ASSEMBLY SHALL BE SPECIFIED, INSTALLED, OPERATED AND MAINTAINED BY TRAINED AND CERTIFIED PERSONNEL

- VENT PROTECTOR (OUTDOORS)

TYPICAL FUEL PRIMING PIPING ASSEMBLY

DAY

TANK

RETURN —

TYPICAL DAY TANK FLOW DIAGRAM

PUMP ON

← RETURN

DAY TANK & RUPTURE BASIN & ASSOCIATED CONTROLS SHOWN SHALL BE FURNISHED BY DAY TANK MANUFACTURER AND INSTALLED BY MECHANICAL CONTRACTOR, FOLLOWING CODE REQUIREMENTS AND MFR'S RECOMMENDATIONS

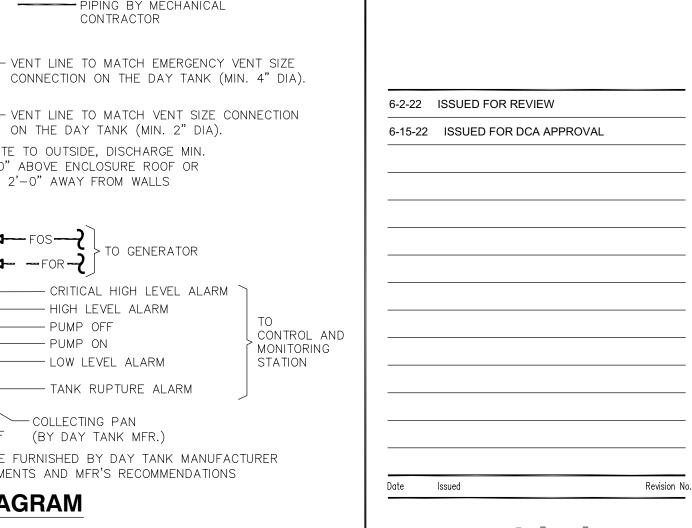
Department of Community Affairs
Construction Project Review
Project No: 1054-22
partial release
mechanical
Thomas Williams
Released: 08/05/22
N.J.S.A. 52:27D-119 ET SEQ., AS AMENDED

NJ SPORTS & EXPOSITION **AUTHORITY** PUMP STATION GENERATOR INSTALLATION

50 STATE ROUTE 120 EAST RUTHERFORD, NEW JERSEY

by PHILIP M GRENCI

Date: 2022.06.24 12:32:48 -04'00'





**MECHANICAL** SCHEDULES AND DETAILS Issue Date: 4/15/22 AS NOTED Proj. Manager oj. Engineer

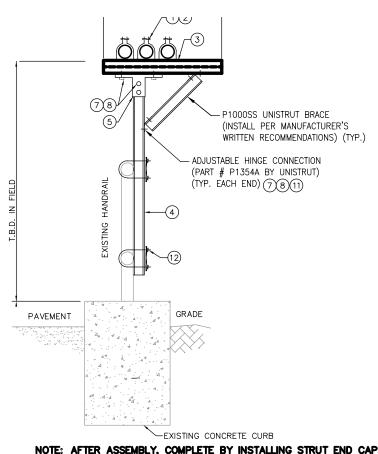
Drawing Title:

ANC

AMA Project No.:

CEI215080 M-300

PMG



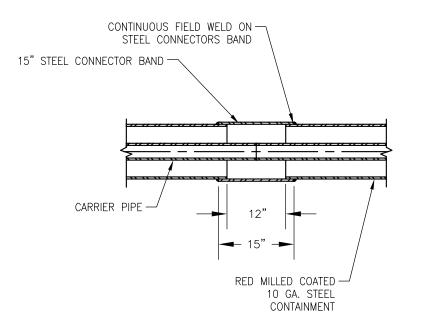
#### NOTE: AFTER ASSEMBLY, COMPLETE BY INSTALLING STRUT END CA CAT.# <u>EC-6153-1 WHI</u> (APPLE FASTENERS, INC.)

		TYPICAL MATERIAL LIST		
	ΙT	DESCRIPTION	UNISTRUT No.	GLOBE No.
	1	CARRIER PIPE		
*	2	4" PIPE CLAMP ASSEMBLY	P1113SS	G7004SS
*	3	1 5\8"x 3 1\4" CHANNEL, COMBINATION	P1001SS	G5812ASS
*	4	1 5\8" X 1 5\8" CHANNEL	P1000SS	G5812SS
*	5	5 13\32" x 3 7\8" WING SHAPE FITT.	P2346SS	G3084SS
*	6	6" Ø POST BASE FITTING	P2072ASS	G5105SS
*	7	1\2" - 13 X 1 3\16" CAP SCREW	HHCS050119SS	G1815SS
*	8	[1\2]" - 13 NUT WITH SPRING	P1010SS	G1035SS
*	9	5\8" RD. FLAT WASHER	HFLW062SS	G1878SS
*	10	5\8" - 11 HEX NUT	HHXN062SS	G1846SS
*	11	UNISTRUT ADJUSTABLE HINGE	P1354A	G3204SS
*	11	NATIONAL HARDWARE U-BOLT W/ PLATE	-	N222-463 2193

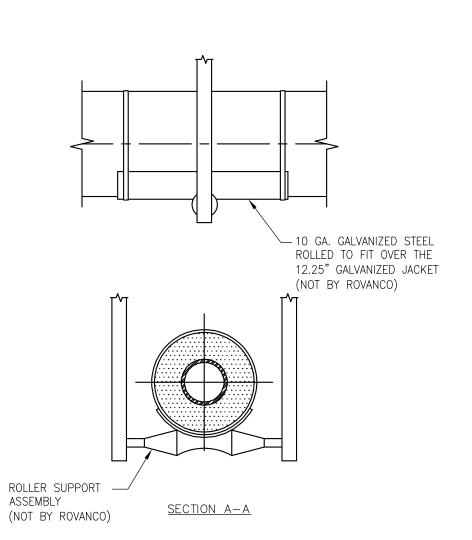
\* STAINLESS STEEL

\*\* SIZE TO MATCH EXISTING RAILS. PROVIDE WITH ADEQUATE MOUNTING HARDWARE.

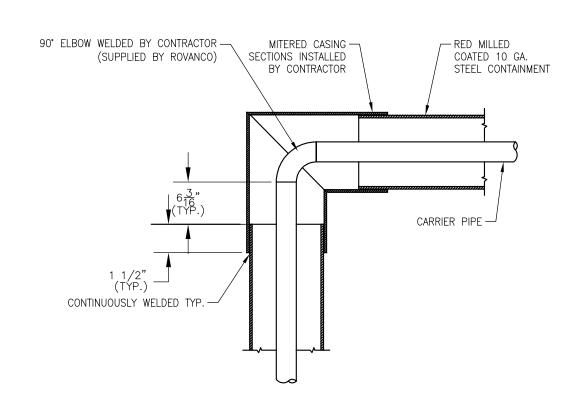
1 SUPPORTING COLUMN DETAIL SCALE: N.T.S.



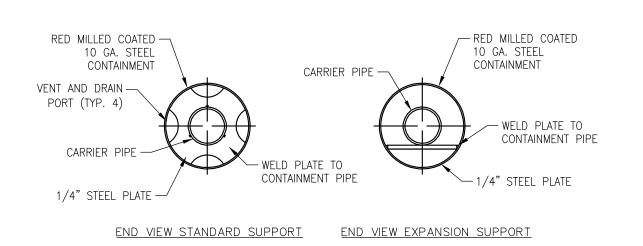
# 4 STEEL CONTAINMENT FIELD JOINT DETAIL SCALE: N.T.S.

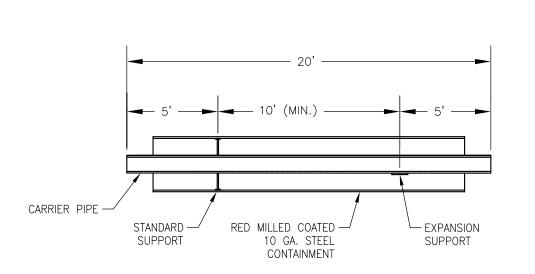




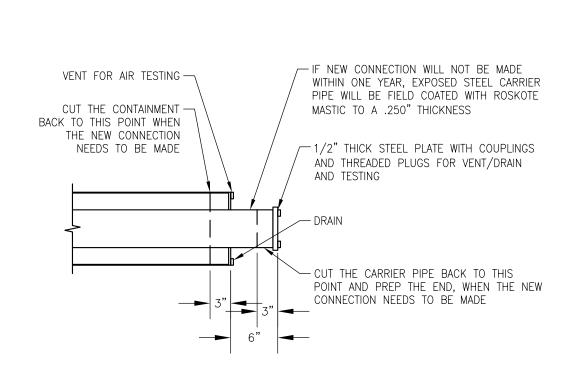


# QUICK FIT CONTAINMENT ELBOW DETAIL SCALE: N.T.S.

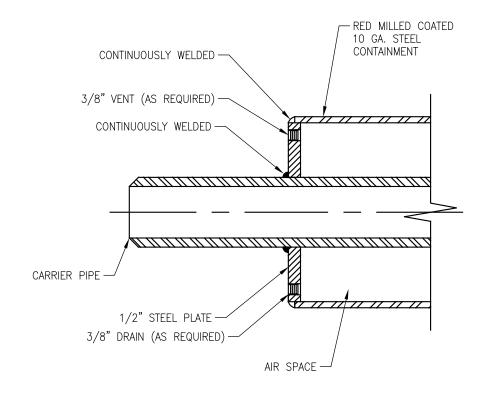






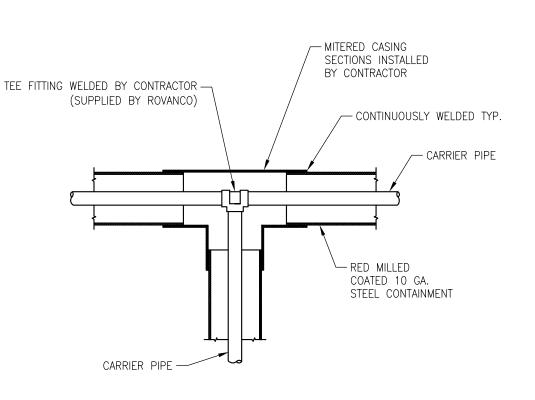




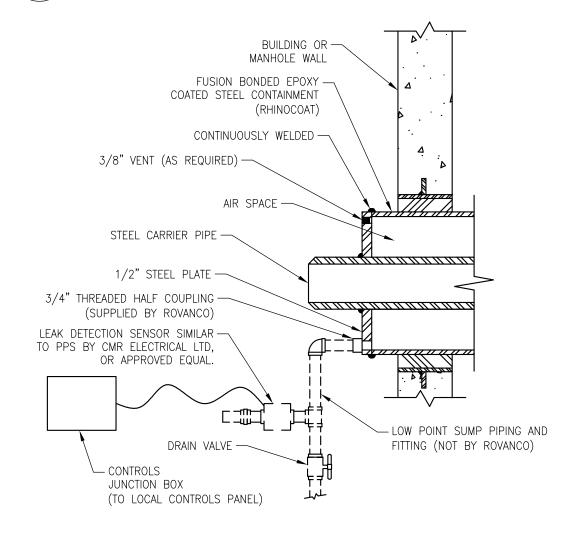


ALL OF OUR DIMENSIONS ARE TAKEN FROM END OF CARRIER PIPE AT WALL PENETRATIONS.

# STEEL CONTAINMENT END SEAL DETAIL SCALE: N.T.S.



# 6 QUICK FIT CONTAINMENT TEE DETAIL SCALE: N.T.S.





# **DOUBLE WALL PIPING GENERAL NOTES**

CARRIER PIPE:
A53B BLACK STEEL PIPE, SEAMLESS OR ERW, IN PRE-CUT LENGTHS. PIPE 10-INCH AND
SMALLER SHALL BE SCHEDULE 40. PIPE 12-INCH AND LARGER SHALL BE .375 WALL.
(SCHEDULE 80) OTHER PIPING MATERIALS AND THICKNESS ALSO AVAILABLE.

INNER PIPE SUPPORTS:
ALL PIPE SHALL BE ALIGNED AND SUPPORTED WITHIN THE CASING WITH CENTERING SUPPORTS SPACED ON APPROXIMATELY 10—FT. THE INNER PIPE SHALL BEAR DIRECTLY ON THE SUPPORT. THE SUPPORT SHALL BE DESIGNED AS TO PERMIT DRAINAGE AND FREE AIR PASSAGE. CONCRETE TYPE PIPE SUPPORTS WILL NOT BE ALLOWED.

OUTER CONTAINMENT CASING: OUTER CASING SHALL BE BLACK STEEL. CASING UP THROUGH 24-INCH SHALL BE 10 GAUGE. THE INTERIOR SURFACE SHALL BE SMOOTH TO PERMIT FREE MOISTURE DRAINAGE AND REMOVABILITY OF THE INNER ASSEMBLY. THE OUTER CASING SHALL BE SIZED TO PROVIDE AN ADEQUATE ANNULAR SPACE BETWEEN THE OUTER SURFACE OF THE PIPE MATERIAL AND THE INTERIOR SURFACE OF THE CASING. THE EXTERIOR SURFACE WILL BE COATED WITH 4-6 MILS OF RED MIL PRIMER. RED MIL PRIMER MUST BE CORROSION RESISTANT AND MEET CLASS A FOR SLIP COEFFICIENT. IT MUST ALSO MEET PERFORMANCE COMPARABLE TO PRODUCTS FORMULATED TO FEDERAL SPECIFICATIONS: MIL-P-23377 AND MIL-P-53022. STEEL SURFACE MUST BE CLEAN, DRY PRIMED. NO ASPHALT, COAL TAR COATING, FRP CASING OR ANY OTHER TYPE WILL BE ALLOWED. OUTER CASING CLOSURES SHALL CONSIST OF 10 GAUGE STEEL SUITABLY RUST-PROOFED AND IN CYLINDRICAL FORM WITH A SINGLE HORIZONTAL SPLIT AND SHALL BE FIELD WELDED OVER ADJACENT UNITS. AFTER TESTS ALL EXPOSED CLOSURES SHALL BE PAINTED WITH RED MIL PRIMER. FOR ABOVE GROUND APPLICATIONS, THE STEEL CASING, FITTING COVERS AND CLOSURE JOINTS CAN BE RED MIL PRIMED.

TEST METHOD

ABRASION RESISTANCE	ASTM D4060, CS17 WHEEL, 1000 CYCLES, 1KG LOAD	200 MG LOSS
ACCELERATED WEATHERING - QUV1	ASTM D4587, QUV-A, 5,000 HRS	PASSES
ADHESION	ASTM D4541	1050 PSI
CORROSION WEATHERING D714	ASTM D5894, 13 CYCLES,	RATING 10 PER ASTM
RATING 7	4,368 HOURS	FOR BLISTERING; PER ASTM D610 FOR RUSTING
DIRECT IMPACT RESISTANCE	ASTM D2794	160 IN. LBS
DRY HEAT RESISTANCE	ASTM D2485	250°F (DISCOLORATION)
FLEXIBILITY	ASTM D522, 180° BEND, 1-INCH MANDREL	PASSES
MOISTURE CONDENSATION RESISTANCE	ASTM D4585, 100°F (38°C), 2000 HOURS	PASSES, NO CRACKING OR DELAMINATION
PENCIL HARDNESS	ASTM D3363	ЗН
SALT FOG RESISTANCE	ASTM B117, 5,600 HOURS	PASSES, NO CRACKING OR DELAMINATION
SLIP COEFFICIENT, RED OXIDE	AISC SPECIFICATIONS FOR STRUCTURAL JOINTS USING ASTM A325 OR ASTM A490 BOLTS	CLASS A, 0.50

WELD FITTINGS:
ALL CHANGES IN DIRECTION SHALL BE MADE WITH BENT OR WELD FITTINGS. WHERE TEE
BRANCHES ARE SMALLER THAN THE MAINS THEY JOINT, WELD-O-LETS MAY BE USED.
ALL FITTINGS SHALL BE SAME WALL THICKNESS AS ADJACENT PIPING.

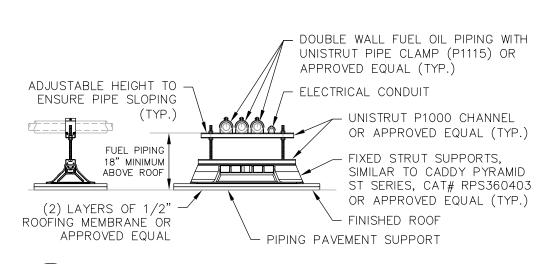
ANCHOR:
ANCHORS SHALL BE PRE—FABRICATED ONTO THE PIPING UNITS AND SHALL BE EQUIPPED
WITH DRAINAGE AND VENT OPENINGS AT THE TOP AND BOTTOM OF THE ANCHOR PLATE.
ANCHOR PLATES SHALL BE MADE OF 0.5—INCH STEEL PLATE. ANCHOR SHALL BE RED MIL

END SEAL:
TERMINAL ENDS INSIDE MANHOLES, PITS, OR BUILDING WALLS SHALL BE EQUIPPED WITH END SEALS CONSISTING OF A STEEL BULKHEAD PLATE WELDED TO THE PIPE CONDUIT. END SEALS SHALL BE MADE OF A 0.5-INCH STEEL PLATE WITH DRAIN OR VENT OPENINGS LOCATED DIAMETRICALLY OPPOSITE ON THE VERTICAL CENTER LINE OF THE MOUNTING PLATE AND SHALL BE SHIPPED TO THE JOBSITE WITH PLUGS IN PLACE. TERMINATE CONTAINMENT 2 INCHES BEYOND THE INSIDE FACE OF BUILDING WALLS TO PROTECT ANY EXPOSED PIPING FROM DAMP WALL CONDENSATION. END SEALS SHALL BE RED MIL PRIMED.

THE INNER PIPE OF THE SYSTEM SHALL BE TESTED HYDROSTATICALLY TO 1-1/2 TIMES THE WORKING PRESSURE OF THE LINE. IF A LEAK IS FOUND, IT SHALL BE REPAIRED AND THE TEST REPEATED. THE OUTER CASING SHALL BE TESTED WITH AIR AT 15 PSIG AND A SOAP SOLUTION SHALL BE APPLIED TO THE FIELD JOINTS TO LOCATE LEAKS. IF LEAKS OCCUR, THEY SHALL BE REPAIRED AND THE TEST REPEATED. AFTER APPROVED BY TEST ALL FIELD JOINTS SHALL BE COATED BY THE CONTRACTOR. THE CONTRACTOR SHALL TEST THE CONTAINMENT COATING WITH AN ELECTRIC HOLIDAY DETECTOR. ANY BREAKS IN THE COATING SYSTEM SHALL BE REPAIRED AND THE TEST REPEATED BY THE CONTRACTOR.

INSTALLATION:
THE INSTALLATION SHALL BE MADE IN ACCORDANCE WITH PLANS AND SPECIFICATIONS,
AND MANUFACTURERS INSTALLATION INSTRUCTIONS. THE CONTRACTOR SHALL REPAIR ANY
DAMAGE TO EXTERNAL PIPING COATING WITH TOUCH—UP PAINT TO ENSURE INTEGRITY OF
THE PROTECTIVE LAYER ON THE PIPING SURFACE EXPOSED TO ELEMENTS. THE TOUCH—UP
PAINT PROPERTIES SHALL MATCH THE RED MIL PRIMER PROPERTIES. MANUFACTURER WILL
PROVIDE A FIELD SERVICE INSTRUCTOR ON—SITE TO TRAIN THE CONTRACTOR IN ALL
PHASES OF INSTALLATION AND MAINTENANCE.

APPROVED VENDORS:
RED MIL STEEL CONTAINMENT SYSTEM BY ROVANCO, JOLIET, ILLINOIS OR APPROVED
EQUAL. ANY ALTERNATE SUPPLIER MUST SUBMIT THEIR TECHNICAL DATA TO THE SITE
ENGINEER TEN DAYS PRIOR TO BID DATE TO BE APPROVED IN WRITING AS AN EQUAL.



10 FUEL DOUBLE WALL PIPING SUPPORT DETAIL SCALE: NTS



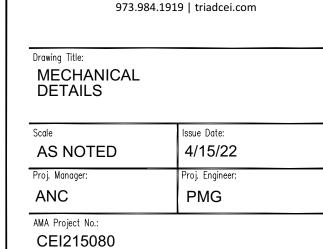
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NJ SPORTS & EXPOSITION
AUTHORITY
PUMP STATION GENERATOR
INSTALLATION

50 STATE ROUTE 120 EAST RUTHERFORD, NEW JERSEY 07073

Digitally signed by PHILIP M GRENCI Date: 2022.06.24 12:33:13 -04'00'

6-2-22	ISSUED FOR REVIEW	
6-15-22	ISSUED FOR DCA APPROVA	AL.
Date	Issued	Revision



122 Main Street | Madison, NJ 07940

M-301