Mid-Hudson Regional Hospital Patient Room Renovations

Category:	Hospitals, Clinics	Project ID #:	1002462262
Street Address:	241 North Road Poughkeepsie NY 12601	Confirmed Value	$6,400,346.00
County:	Dutchess	Stage:	Low Bids Announced
Bid Date:	3/10/2016 , 02:00PM		
Architect:	Fletcher Thompson Architecture - Somerset Office		
Documents Available:	Plans, Specs, Addenda available in Insight	Plans available from KDF Reprographics	
Last Update:	6/9/2016	Project Details or Scope was Added/Updated	

Personal Notes

User	Note	Update Date	Private?
Adam Sweet	Update from Joe Have low bidder, waiting on which distributor is getting close to close	4/12/2016	False
Adam Sweet	8kgal DW FRP FUEL OIL UST, CSI, Xerxes	3/4/2016	False

Notes

Scope

Renovation of a medical facility in Poughkeepsie, New York. Completed plans call for the renovation of an interior space for medical space. *As of June 8, 2016, the low bidder has not been awarded this project. MID-HUDSON REGIONAL HOSPITAL PATIENT ROOM RENOVATIONS 6TH FLOOR COOKE TOWER Budget Estimate: $6,000,000 - $8,000,000 Separate Bid Packages General Construction Mechanical Plumbing Electrical For additional bidding questions or information, call Designated Contact(s) Rick Dean (914) 493-5881 or Marvin Blanco (914) 493 8610 NOTE- designated contacts are the only ones that can talk to bidders. Bid Results : 11819 (GC) - General Construction Key Construction Services : - $1,980,000.00 11819 (M) - Mechanical DP Wolff Mechanical : - $1,931,468.00 11819(P) - Plumbing DP Wolff Mechanical : - $808,878.00 11819(E) - Electrical J & J Sass Electric inc : - $1,680,000.00

Notes

Development include(s): Renovation Bid Date: 03/10/2016 02:00PM SEALED BIDS will be received and accepted by the Westchester County Health Care Corporation (the "Owner"), Facilities Management Department, at Room E004, Macy Pavilion, Basement Floor, Valhalla, New York 10595 Site Walkthrough: 02/23/2016 10:00AM A Bidders' mandatory conference and walkthrough inspection of the Corporation's Poughkeepsie MHRH Campus will be held on Tuesday February 23, 2016 at 10:00 AM in the 1st Floor Conference Center (one floor below the Lobby) ofthe Atrium Bldg., Poughkeepsie, New York 12601. 810 PROPOSALS WILL NOT BE ACCEPTED FROM THOSE PROSPECTIVE CONTRACTORS WHO DO NOT ATTEND THE CONFERENCE AND WALKTHROUGH INSPECTION

Details

[Division 2]: Building Demolition, Hazardous Material Abatement, Water Systems, Wells, Sewerage & Drainage. [Division 3]: Concrete Formwork, Concrete Reinforcement, Structural Concrete. [Division 4]: Clay Unit Masonry. [Division 5]: Structural Steel, Metal Decking, Metal Fabrications. [Division 6]: Rough Carpentry, Architectural Woodwork. [Division 7]: Insulation, Fireproofing, Firestopping, Manufactured Roofing & Siding. [Division 8]: Metal Doors, Wood Doors, Hardware, Glass & Glazing. [Division 9]: Ceiling Suspension Systems, Lath & Plaster, Drywall/Gypsum, Tile, Acoustical Ceilings, Resilient Flooring, Carpet, Painting. [Division 10]: Louvers & Vents, Wall & Corner Guards, Protective Covers, Partitions, Storage Shelving, Toilet & Bath Accessories. [Division 11]: Fluid Waste Treatment/Disposal Equipment, Food Service Equipment. [Division 12]: Window Treatment, Furniture. [Division 13]: Ground Storage Tanks. [Division 14]: Elevators, Material Handling Systems. [Division 15]: Mechanical Insulation, Fire Protection Systems, Plumbing Piping, Plumbing Fixtures, Water Heaters, Hydronic Piping, Steam & Steam Condensate Piping, Boilers, Furnaces, Cooling Towers, Packaged A/C Units, Air Handling, Ductwork, Testing & Balancing. [Division 16]: Service/Distribution, Interior Lighting, Emergency Lighting, Standby Power Generator Systems, Alarm & Detection Systems.

Additional Details

Listed On:	2/19/2016	Floor Area:	
Contract Type:		Work Type:	Alteration
Stage Comments 1:		Floors Below Grade:	
Stage Comments 2:		Owner Type:	County
Bid Date:	3/10/2016	Mandatory Pre Bid Conference:	
Invitation #:	CMC-11819, SB-163	Commence Date:	5/9/2016
Structures:		Completion Date:	
Single Trade Project:		Site Area:	

Floors:
Parent Project ID:
Parking Spaces:

LEED Certification Intent:
Units:

Project Participants

Company Role	Company Name	Contact Name	Address	Phone	Email	Fax
Mechanical and Electrical Engineer	Cosentini Associates - New York		2 Pennsylvania Plaza Fl. 3, New York, NY 10121		info@cosentini.com	(212) 615-3700
Plans Representative	KDF Reprographics	Eddie Cheung	10 Volvo Drive , Rockleigh, NJ 07647	(201) 784-9991	eddie@kdf-comp.com	(201) 784-9991
Owner	Westchester Medical Center - Facilities Management Department	Frederick Dean	100 Woods Road Macy Pavillion, Room E004, Valhalla, NY 10595	(914) 493-5881	deanf@WCMC.com	(914) 493-1432
Architect	Fletcher Thompson Architecture - Somerset Office	Phil Toussaint	27 Schoolhouse Road , Somerset, NJ 08873	(732) 564-6611	ptoussaint@ftae.com	(732) 907-6801

Bidders

Company Name	Added Date	Address	Phone	Email	Bidding Role	Bid Rank	Bid Value	Fax Number
BCI Construction Inc.	2/27/2016	20 Loudonville Rd Albany , Albany, NY 12204	(518) 426-3200	info@bciinc.com	General Contractor			(518) 426-5205
Verticon, Ltd.	2/27/2016	24 Gilbert Street , Monroe, NY 10950	(845) 774-8500	sbarry@verticon.net	General Contractor			(845) 774-8695
Ashley Mechanical Inc	6/8/2016	27 Emerick Street , Kingston, NY 12401	(845) 331-1652	nniemynski@ashleymechanical.com	General Contractor			(845) 331-2463
J & J Sass Electric Inc	6/8/2016	30 Grand St. PO Box 1910, Kingston, NY 12402	(845) 331-8666	jimsass3@jjsass.com	General Contractor	1	$1,680,000.00	(845) 331-3176
S & L Plumbing & Heating Company	6/8/2016	155 E. Main St , Brewster, NY 10509	(845) 278-2928	salonge@slplumbingheating.com	General Contractor			(845) 278-5208
Southeast Mechanical Corporation	6/8/2016	568 North Main St. , Brewster, NY 10509	(845) 279-3793	smc@southeastmech.com	General Contractor			(845) 279-1350
Key Construction Services	6/8/2016	327 Main St. , Poughkeepsie, NY 12601	(845) 454-1192	tgm@contactkcs.com	General Contractor	2	$1,980,000.00	(845) 454-1193
D.P. Wolff, Inc.	6/8/2016	143 Bedford Road , Katonah, NY 10536	(212) 689-7801	info@dpwolff.com	Subcontractor	1	$2,740,346.00	(914) 767-3596
Nurzia Construction Corp.	2/27/2016	P.O. Box 232 , Fishkill, NY 12524	(845) 897-9400	info@nurziaconstruction.com	General Contractor			(845) 897-9490
Dutchess Mechanical Inc.	6/8/2016	25 Pellbridge Drive , Hopewell Junction, NY 12533	(845) 227-3931		General Contractor			(845) 227-5051

Planholders

Company Name	Address	Phone	Email	Fax
Veith Electric	100 Parker Ave , Poughkeepsie, NY 12601	(845) 485-2900		(845) 485-5506
Frank & Lindy Plumbing & Htg	2 John Walsh Blvd , Peekskill, NY 10566	(914) 737-2373	construction@frankandlindy.com	(914) 737-4531

Buyer Activity Report

Status	Activity Level	Contact	Company Name	Source	Phone	Email	Business Type	Trades	Last Active
		Reade Moorma	Special Testing		(203) 743-	readem@specialtesting.	Engineer	Quality Requirements.	8/2/2016

			n	Laboratories, Inc.		7281	net		Subsurface Investigation, Concrete, Concrete Forming and Accessories, Concrete...	
			Kathy Vairo	Eagle Leasing	CONSTRUCTION DATA	(508) 481-5941	kvairo@eagleleasing.com	Other	General Requirements, Temporary Facilities and Controls, Concrete, Concrete Forming and Accessories,...	6/12/2016
			Denise De Perna	Ne Regional Council Of Carpenters	CONSTRUCTION DATA	(845) 440-1082	ddeperna@northeastcarpenters.org	Other	General Requirements, Existing Conditions, Assessment, Subsurface Investigation, Demolition and Stru...	6/10/2016
			Marino DiLeo	Bruce Electric Equipment	CONSTRUCTION DATA	(63122) 624-2414	marino@brucelectric.com	Supplier	General Requirements, Price and Payment Procedures, Electrical Utilities, Performance Requirements	6/9/2016
			Michelle Dipoalo	Elite Plumbing And Heating	CONSTRUCTION DATA	(845) 778-1921	eliteplumb@yahoo.com	Subcontractor	Plumbing, Plumbing Piping and Pumps, Plumbing Equipment, Plumbing Fixtures, Pool and Fountain Plumbi...	6/9/2016
			Sal Fusaro	Laborers International Union	CONSTRUCTION DATA	(914) 592-3020	salfl235@optonline.net	Other	General Requirements, Summary, Price and Payment Procedures, Administrative Requirements, Survey and...	6/8/2016
			Phil Conti	Fire Security & Sound	CONSTRUCTION DATA		pconti@firesecuritysound.com	Subcontractor	Fire and Smoke Protection, Fire Protection Specialties, Fire Suppression	6/8/2016
			Kyle Fisher	Williams Scotsman	CONSTRUCTION DATA	(800) 782-1500	krfisher@willscot.com	Other	General Requirements, Temporary Facilities and Controls	4/26/2016
			jeff pelletier	instantbath	bidclerk	(518) 862-9906	sundogtbale1@gmail.com	Subcontractor	Toilet, Bath, and Laundry Accessories, Plumbing Fixtures	3/29/2016
			Rob Wyman	Menard Usa	CONSTRUCTION DATA		RWYMAN@MENARDGROUPUSA.COM	Subcontractor	Special Foundations and Load-Bearing Elements, Bored Piles,	2/24/2016

								Driven Piles, Caissons	
		Michael Soderlund	BidPost	Insight	707-479-8559	michael@bidpost.com	Other	General Requirements, Summary, Price and Payment Procedures, Administrative Requirements, Survey and...	7/22/2016
		Mark Sheehan	DM Electric of Dutchess LLC	bidclerk	(845) 546-6518	dmelectricny@gmail.com	Subcontractor	Electrical Utilities	6/10/2016
		Matthew Brown	Mablay Construction	bidclerk	(314) 954-3767	mablayconstruction@yahoo.com	Subcontractor	Equipment, Healthcare Equipment	6/9/2016
		Gabrielle Ingber	Service Scaffold Company, Inc.	Insight	(845)-434-8888	sales@servicescaffold.com	Supplier	Concrete, Concrete Forming and Accessories, Concrete Reinforcing, Cast-in-Place Concrete, Concrete P...	6/9/2016
		Aqil Unia	Visual Citi Inc	Insight	631-482-3030	aqil@visualciti.com	Subcontractor	Utilities, Water Utilities, Wells, Sanitary Sewerage Utilities, Storm Drainage Utilities, Ponds and ...	6/8/2016
		James C Nenni Jr	Nenni Equip. Corp. Site Contractors	bidclerk	(845) 897-4437	NenniEquipmentCo@aol.com	Subcontractor	Existing Conditions, Demolition and Structure Moving, Site Remediation, Earthwork, Site Clearing, Ea...	6/8/2016
		Rider Levett Bucknall	Rider Levett Bucknall-188631625	Insight	(602)-443-4848	phx@us.rlb.com	Other	General Requirements, Summary, Price and Payment Procedures, Administrative Requirements, Survey and...	6/6/2016
		Bernie Hewlett	INTERLINE CREATIVE GROUP	Insight	(847) 358-4848	bernie@interlinegroup.com	Owner	Thermal and Moisture Protection, Dampproofing and Waterproofing, Thermal Protection, Exterior Insula...	4/20/2016
		David Eustace	Maquet Inc	Insight	(908)-938-9426	david.eustace@maquet.com	Other	Specialties, Chalkboards, Markerboards and Tackboards, Display Cases, Directories and Plaques, Traff...	4/5/2016
		Phillip Liu	Dp Wolff Inc		(914) 767-	vpatel@dpwolff.com	Subcontractor	Plumbing, Plumbing	3/23/2016

					0515			Piping and Pumps, Plumbing Equipment, Plumbing Fixtures, Pool and Fountain Plumbi...	
		Richard McKechnie	Duncan Industries	CONSTRUCTION DATA	(914) 997-2325	duncanindustries@gmail.com	Other	Plumbing, Plumbing Piping and Pumps, Plumbing Equipment, Plumbing Fixtures, Pool and Fountain Plumbi...	3/23/2016
		Steve Vasalka	Ulster County Ironworks	bidclerk	(845) 255-0003	ulstercountyironworks@gmail.com	Subcontractor	Metals, Metal Restoration and Cleaning, Structural Metal Framing, Metal Joists, Metal Decking, Cold-...	3/23/2016
		Sara Jeffris	Tricon Piping Systems, Inc.	iSqFt	(315) 697-8787	sara@triconpiping.com	Supplier	Life Cycle Activities, Vehicle and Pedestrian Equipment, Fire Suppression, Water-Based Fire-Suppress...	3/9/2016
		Penny Hazer	MERIT APPRENTICESHIP ALLIANCE	Insight	315-440-8989	pmhazer@MeritAlliance.org	Other	General Requirements, Summary, Price and Payment Procedures, Administrative Requirements, Survey and...	3/7/2016
		Raymond Walker	Rayben Enterprises	CONSTRUCTION DATA	(518) 426-7643	admin@raybenenterprises.com	Subcontractor	General Requirements, Facility Remediation	3/7/2016
		Rick Wald	Certified Wood Products	Insight	320-963-1500	rick@certifiedwood.net	Supplier	Wood, Plastics, and Composites, Rough Carpentry, Finish Carpentry, Architectural Woodwork, Structura...	3/4/2016
		Eric Moon	Amico (CAN)	Insight	(905)-764-0800	emoon@amico.com	Supplier	Architectural Woodwork, Healthcare Equipment, Gas and Vacuum Systems for Laboratory and Healthcare F...	3/3/2016
		Rick Innella	Schmidt Wholesale Inc.	CONSTRUCTION DATA	(914) 794-5900	rinnella@schmidtswholesale.com	Supplier	Water Remediation, Fire Suppression, Water-Based	2/29/2016

								Fire-Suppression Systems, Fire-Suppression Water St...	
		Martin Bodner	Double Diamond Investment Group	bidclerk	(973) 352-6682	martin.bodner@doubledig.com	Other	General Requirements	7/28/2016
		Frank Cottrell	A-verdi Companies	CONSTRUCTION DATA	(315) 365-2851	frank@averdi.com	Supplier	General Requirements, Summary, Price and Payment Procedures, Administrative Requirements, Survey and...	7/11/2016
		Mitch Lazar	Rapid Door & Trim Corp	CONSTRUCTION DATA	(845) 362-1414	RAPIDDOOR.MITCH@GMAIL.COM	Subcontractor	Finish Carpentry, Openings, Doors and Frames, Specialty Doors and Frames, Access Doors and Panels, P...	6/21/2016
		Joe Raziano	Skyworks Llc	CONSTRUCTION DATA		jraziano@skyworksllc.com	Supplier	General Requirements, Summary, Price and Payment Procedures, Administrative Requirements, Survey and...	6/17/2016
		RJ Merrit	Laborers International Union	CONSTRUCTION DATA	(914) 592-3020	rjl235@optonline.net	Other	General Requirements, Summary, Price and Payment Procedures, Administrative Requirements, Survey and...	6/17/2016
		Angelina Helling	Grice Innovations Inc	CMD Insight	608314-8710	angelina@jgius.com	Subcontractor	Metals, Metal Restoration and Cleaning, Structural Metal Framing, Metal Joists, Metal Decking, Cold-...	6/16/2016
		Andrew Grundman	Grundman Mechanical Systems	CONSTRUCTION DATA	(914) 699-3700	ANDREW.GRUNDMAN@GRUNDMANMECHANICAL.COM	Subcontractor	Plumbing, Heating, Ventilating, and Air-Conditioning (HVAC), Facility Fuel Systems, HVAC Piping and ...	6/11/2016
		Peter Malavenda Sr.	Malcon Industrial Controls Inc	CONSTRUCTION DATA	(914) 666-7146	MALCONBOSS@ATT.NET	Subcontractor	General Requirements, Summary, Price and Payment Procedures, Administrative	6/9/2016

								Requirements, Survey and...	
		Alex,Adam, Jason Frances e	APF Fire Protection Inc	bidclerk	(845) 883-0502	apf120@aol.com	Subcontractor	Fire Suppression, Water-Based Fire-Suppression Systems, Fire Pumps, Fire-Suppression Water Storage	6/8/2016
		Bob Fredericks	Safeco Alarms	CONSTRUCTION DATA	(518) 889-9347	rfredericks@safecoalarms.com	Service Provider	Communications Utilities	6/8/2016
		Max Leo	Lion Construction Supply & Serv Llc	CONSTRUCTION DATA	(315) 481-4249	mleo@lioncss.com	Subcontractor	Existing Conditions, Demolition and Structure Moving, Contaminated Site Material Removal, Facility R...	6/8/2016
		Jeff Abel	Electric Lighting Agencies	CONSTRUCTION DATA		jabel@electriclighting.com	Other	General Requirements	5/23/2016
		Eric Eschbach	Pawling Corporation	CMD Insight	845-373-9300	eeschbach@pawling.com	Other	General Requirements, Summary, Price and Payment Procedures, Administrative Requirements, Survey and...	5/2/2016
		Leroy Nelson Jr	Len J Construction Llc	CONSTRUCTION DATA	(518) 471-5786	lenjconst@hotmail.com	Subcontractor	Concrete, Concrete Cutting and Boring, Metals, Wood, Plastics, and Composites, Plumbing, Heating, Ve...	4/21/2016
		Stew Malcolm	Probuild Company LLC	CMD Insight	845-222-9106	stew.malcolm@probuild.com	Supplier	General Requirements, Summary, Price and Payment Procedures, Administrative Requirements, Survey and...	4/11/2016
		Theresa Gray	Greenmaker Industries	CONSTRUCTION DATA		tgray@protechmarket.com	Supplier	Product Requirements, Metals, Metal Restoration and Cleaning, Structural Metal Framing, Metal Joists...	4/1/2016
		Chad Ingils	Pumpcrete Corporation	CONSTRUCTION DATA	(518) 843-9063	chad.pumpcrete@gmail.com	Other	Concrete, Concrete Forming and Accessories, Concrete Reinforcing, Cast-in-Place Concrete, Concrete P...	3/30/2016
		Scott Enides	Sri Fire Sprinkler Corp	CONSTRUCTION DATA	(518) 459-2776	sfe@srifiresprinkler.com	Subcontractor	Fire Suppression, Water-Based	3/28/2016

								Fire-Suppression Systems, Fire-Extinguishing Systems, Fire Pumps, Fire...	
		Sasha Lerner	IGN Medical	bidclerk	(440) 439-1444	slerner@ignmed.com	Subcontractor	Gas and Vacuum Systems for Laboratory and Healthcare Facilities	3/24/2016
		Michael Girling	Thyssenkrupp Elevator	CONSTRUCTION DATA	(800) 501-0111	Michael.Girling@thyssenkrupp.com	Service Provider	Survey and Photography, Product Requirements, Life Cycle Activities, Structural Metal Framing, Handr...	3/24/2016
		Bruce Lindenbaum	Frank & Lindy Plumbing & Htg	CONSTRUCTION DATA	(914) 737-2373	blindy222@aol.com	Subcontractor	Fire Suppression, Plumbing, Plumbing Piping and Pumps, Plumbing Equipment, Plumbing Fixtures, Pool a...	3/23/2016
		Michelle Squires	Ethan Allen	CONSTRUCTION DATA	(845) 471-9700	michelles@eastaffing.com	Other	General Requirements, Summary, Price and Payment Procedures, Administrative Requirements, Survey and...	3/11/2016
		Pam Gaspar	R & R Window Contr.	CONSTRUCTION DATA	(413) 527-7500	pgaspar@rrwindow.com	Subcontractor	Thermal and Moisture Protection, Thermal Protection, Roofing and Siding Panels, Siding, Roof and Wal...	3/10/2016
		Marty Delaney	Wolberg Electric Supply Co	CONSTRUCTION DATA		mjdelaney@wolberginc.com	Supplier	Utilities, Water Utilities, Wells, Sanitary Sewerage Utilities, Storm Drainage Utilities, Ponds and ...	3/9/2016
		Kevin Collins	Door Control Inc.	bidclerk	(203) 269-8282	collinskp@sbcglobal.net	Subcontractor	Openings, Doors and Frames, Specialty Doors and Frames, Entrances, Storefronts, and Curtain Walls, H...	3/8/2016
		Mike Butler	I T C Services North	CONSTRUCTION DATA	(845) 592-2561	MBUTLER@ITCSERVICES.COM	Subcontractor	Heating, Ventilating, and Air-Conditioning (HVAC),	3/7/2016

								Facility Fuel Systems, HVAC Piping and Pumps, HVA...	
		Admar Albany	Dimarco Const	Insight	(251)-295-2211	mgeren@admarsupply.com	Supplier	Concrete, Concrete Forming and Accessories, Concrete Reinforcing, Cast-in-Place Concrete, Concrete P...	3/4/2016
		JOHN KELLY	WindowRama	Insight	(516) 965-6282	kellyj@windowrama.com	Supplier	General Requirements, Summary, Price and Payment Procedures, Administrative Requirements, Survey and...	3/4/2016
		Rick Kelleher	Ducci Electrical Contractors	CONSTRUCTION DATA	(860) 489-9267	RKELLEHER@DUCCIELECTRICAL.COM	Subcontractor	Electrical Utilities, Communications Utilities, Waterway and Marine Signaling and Control Equipment	3/1/2016
		Margarita Trocino	Recycle Depot	bidclerk	(845) 452-3939	nancy@recycledepotfacility.com	Service Provider	General Requirements, Summary, Price and Payment Procedures, Administrative Requirements, Survey and...	2/26/2016
		Liz Pastore	Prestige Building Company	CONSTRUCTION DATA	(845) 234-8179	prestigebuildingco@yahoo.com	Subcontractor	Demolition and Structure Moving, Concrete Forming and Accessories, Grouting, Masonry, Stone Assembli...	2/24/2016
		Ron Lombardo	Lombardo Plumbing Heating & Cooling of Rockland, Inc	CONSTRUCTION DATA	(845) 357-6537	lilian@josephlombardo.com	Subcontractor	Plumbing, Plumbing Piping and Pumps, Plumbing Equipment, Plumbing Fixtures, Pool and Fountain Plumbi...	2/19/2016
		Steve Alonge	S & L Plumbing Heating Co	CONSTRUCTION DATA	(845) 278-2928	salonge.slplumbing@comcast.net	Other	Plumbing, Plumbing Piping and Pumps, Plumbing Equipment, Plumbing Fixtures, Pool and Fountain Plumbi...	2/19/2016
		Corinne Walker	Armstrong Medical Ind.	bidclerk	(800) 323-4220	cwalker@armstrongmedical.com	Supplier	Healthcare Equipment	2/18/2016
		Lawrence Minei	SCHOOL CONSTRUCTI		(631) 567-	lm@scc-cm.com	Architect	General Requirements.	3/17/2015

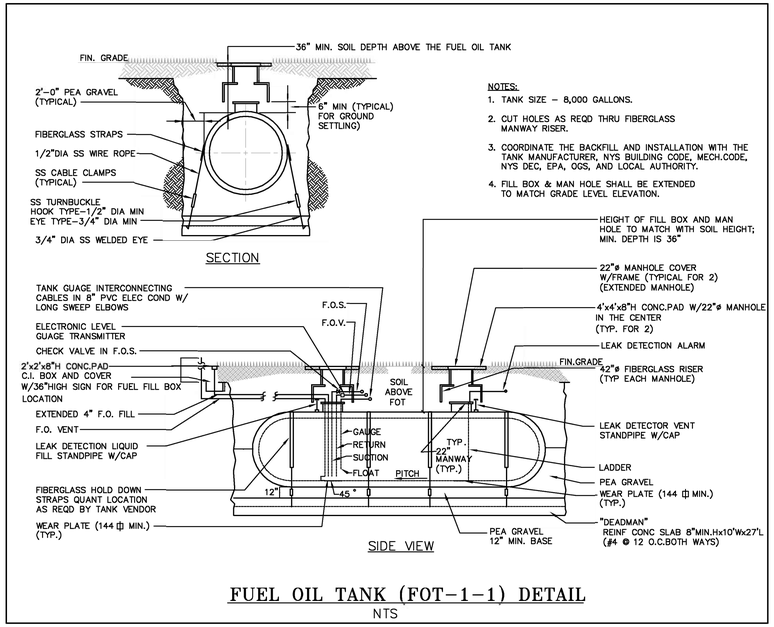
	ON CONSULTANTS, INC.		0200	Summary, Price and Payment Procedures, Administrative Requirements, Survey and...

Contracts

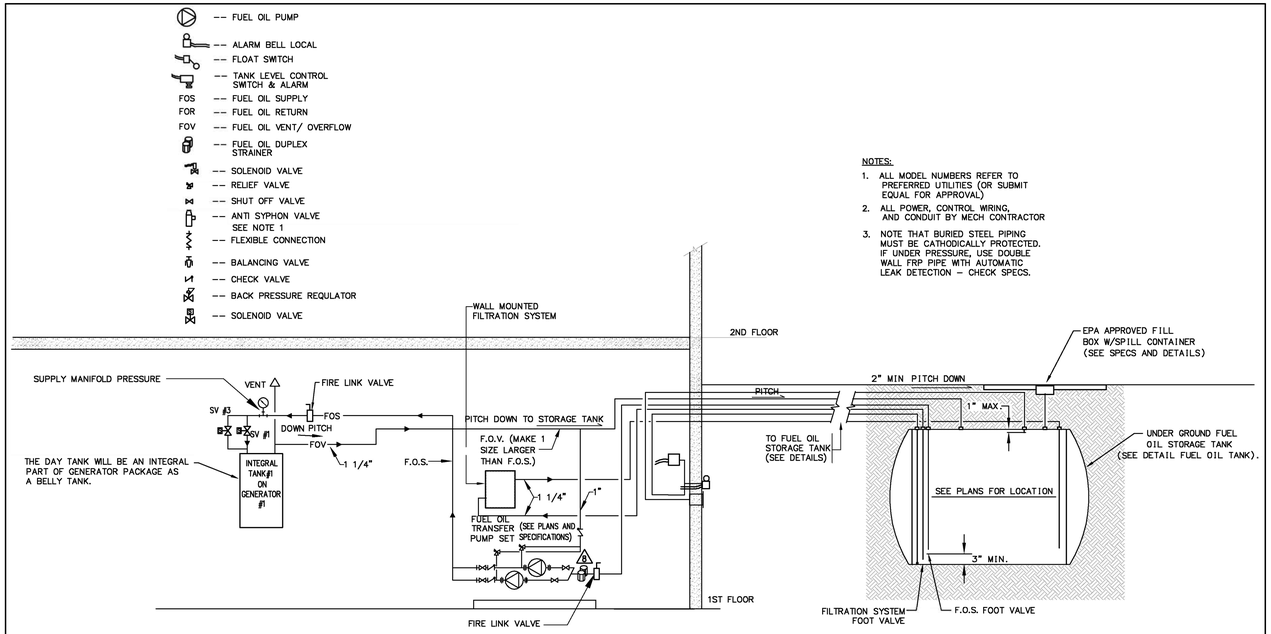
Classification	Conditions	Bonding	Bid Date	Bids To	Bid Type
General Contractor		Perf:100.00%,Pay:100.00%	3/10/2016	Owner	Open Bidding

History

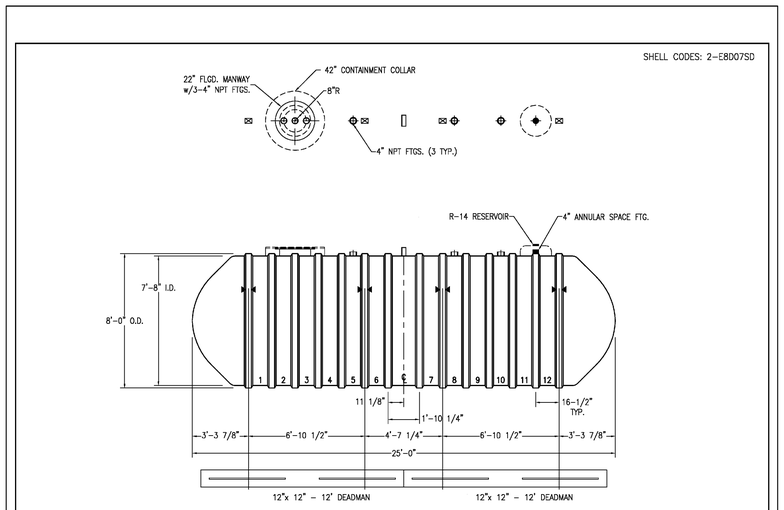
User	Viewed	First Viewed Date	Currently Tracked?	Date Tracked
Bill McIndoo	True	6/10/2016	False	
Adam Sweet	True	3/8/2016	True	3/4/2016



FUEL OIL TANK (FOT-1-1) DETAIL
NTS



EMERGENCY GENERATOR FUEL OIL SYSTEM, STORAGE TANK OUTSIDE OF BUILDING
NOT TO SCALE

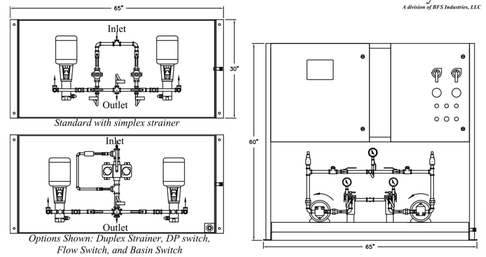


FUEL OIL TANK (FOT-1-1)

Catalog Data-Sheet
CFS-CS-1029
Dated 1/1/11

Model LZ0162 Duplex Pump Set

Critical Fuel Systems
A division of BFS Industries, LLC



The type Z system is provided as a complete mechanical assembly with all piping complete as shown. Unit will be hydrostatically tested and fluorescent leak inspected at the factory. The system includes a motor control panel and PLC based logic control panel mounted and wired as specified below.

Performance Data & Equipment Information

Pump Flow Rate (gph)	162	Motor HP	1/3	Volts *	115	Inlet conn. size	3/4"
Discharge Press. (psig)	50	RPM	1750	Phase	1	Outlet conn. size	1/2"
Estimated System Weight (lbs.)			550	System Full Load Amps @ 115 Volts *			17.2

** All standard single and three phase voltage available upon request.*

Standard Equipment
(2) pumps, (2) ODP motors, (2) permanent alignment brackets with flexible couplings, (2) simplex inlet basket strainers, 1/16" perforated baskets, (2) inlet full port ball valves, (2) 2 1/2" SS case, liquid filled compound gauge with shut-off cock, (2) external relief valves, (2) outlet full port ball valves, (2) check valves, (1) 2 1/2" SS case, liquid filled pressure gauge with shut-off cock. All equipment mounted on formed steel unit base with drip pan.
(1) motor control panel in Nema #4 enclosure complete with (2) magnetic across the line starters, (2) running lights, (2) HOA switches, (2) fused disconnect switches with external operator, (2) fuse blocks, (1) control circuit transformer (if required), (2) pump run time meters, (1) single point alarm system with light and horn. Panel will be mounted on pump set base and wired to motors and accessories.
(1) Logic control panel in NEMA #4 enclosure complete with (1) PLC, (1) 6" touchscreen display/operator interface, (1) ModBus communication module. Panel will be mounted on pump set base and wired.

System Options: Check all that apply

Rupture basin leak switch		4" SS liquid filled gauge ILO 2 1/2"	
Duplex Strainer ILO (2) Simplex		Gauge snubber	
Strainer DP switch/indicator		TEFC motors	
Discharge flow switch		Flex hose conn (suc/disch)	
Discharge pressure switch		Unit vibration isolation mounts	
10" Touchscreen ILO 6"			

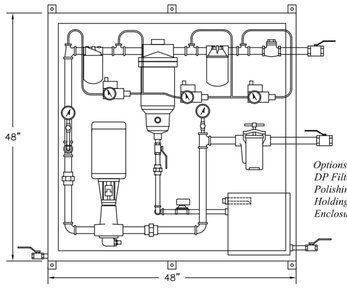
FOP-1 & 2
Model LZ0162 Duplex Pump Set

Catalog Data-Sheet
CFS-CS-1124
Dated 6/1/12

Model FMEZ600 Fuel Maintenance Enclosure

Critical Fuel Systems
A division of BFS Industries, LLC

CONTROL PANEL NOT SHOWN



The type Z system is provided as a complete mechanical assembly with all piping complete as shown. Unit will be hydrostatically tested and flourescent leak inspected at the factory. The system includes motor control panel and PLC based logic control panel mounted and wired as specified below.

Performance Data & Equipment Information

Pump Flow Rate (gph)	600	Motor HP	1	Volts *	460	Inlet conn. size	1"
Discharge Press. (psig)	15	RPM	1750	Phase	3	Outlet conn. size	1"
Estimated System Weight (lbs.)			500 lbs.	System Full Load Amps @ 460 Volts *			2.1

** All standard single and three phase voltage available upon request.*

Standard Equipment
(1) pump, (1) ODP motor, (1) permanent alignment bracket with flexible coupling, (1) internal relief valve, (1) simplex inlet basket strainer, (1) inlet full port ball valve, (1) 10 micron particulate filter, (1) 10 micron coalescing filter, (1) check valve, (1) outlet full port ball valve, (1) 2 1/2" liquid filled pressure gauge, (1) 2 1/2" liquid filled compound gauge. All equipment mounted in a NEMA 4 wall mount enclosure.
(1) combination motor control/logic control panel in Nema #4 enclosure complete with (1) magnetic across line starters, (1) running light, (1) HOA switch, (1) fused disconnect switch with external operator, (1) fuse block, (1) control circuit transformer(if req) (1) pump run time meter, (1) single point alarm system with light and horn. (1) PLC, (1) 6" touchscreen display/operator interface, (1) ModBus communication module. Panel will be mounted on pump set base and wired. Panel will be shipped loose for field mounting and wiring.

System Options: Check all that apply

Filter DP switch/ indicator		Leak Switch	
3 Micron Polishing Filter		Enclosure Drain and Ball Valve	
Vibration Isolation (such/disch)		Waste Holding W/ Solenoid & Drain	
Replacement Filters		Flow Switch	

FILTRATION SYSTEM
Model FMEZ600 Fuel Maintenance Enclosure

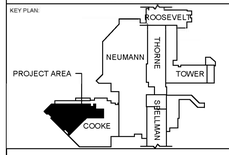
FLETCHER THOMPSON
ARCHITECTURE ENGINEERING INTERIORS

BRIDGEPORT, CONNECTICUT 800 - 201 - 5592
HARTFORD, CONNECTICUT 860 - 249 - 0888
SOMERSET, NEW JERSEY 732 - 907 - 6800

MEP CONSULTANT:
Cosentini ASSOCIATES — NEW YORK, NEW YORK 212 - 615 - 3600

EQUIPMENT PLANNING CONSULTANT:
SM&W WHEN MEN WORK WITH — NEW YORK, NEW YORK 212 - 725 - 6800

KEY PLAN:



Revisions

NO	DATE	DESCRIPTION
	7-31-2015	ISSUED FOR DESIGN DEVELOPMENT
	9-11-2015	OGS PERMIT REVIEW ISSUE
	9-11-2015	ISSUED FOR BID

OGS #: SB-163
CMC-11819 GC,M,P,E

PROGRESS PRINT
NOT FOR CONSTRUCTION

XXX - Project Information

PRINCIPAL IN CHARGE:
PROJECT MANAGER:
DESIGNER:
PROJECT ARCHITECT / ENGINEER
DRAWN BY:
PROJECT:

**MID HUDSON REGIONAL HOSPITAL
COOKE TOWER
INPATIENT UNIT RENOVATION - SIXTH FLOOR**

241 NORTH ROAD, POUGHKEEPSIE, NY 12601

DRAWING TITLE:

MECHANICAL DETAILS SHEET No.4

DATE:
SCALE: NONE
PROJECT NUMBER: 150178
DRAWING NO.: **6-M504**

PART 1 - GENERAL

1.1 RELATED DOCUMENTS

A. Drawings and general provisions of the Contract, including General and Supplementary Conditions and Division 01 Specification Sections, apply to this Section.

1.2 SUMMARY

A. This Section includes fuel-oil and diesel fuel oil distribution systems and includes but is not limited to the following:

1. Piping and fitting
2. Fuel-oil piping specialties
3. Valves
4. Containment Piping
5. Fuel-oil Transfer pump set and piping
6. Cathodic Protection
7. Underground Storage Tank (UST)
8. Liquid Level Control and External Leak Sensor Management System
9. Cathodic Protection System (if required as part of the work of this section)

1.3 SYSTEM PERFORMANCE REQUIREMENTS

A. Minimum Working-Pressure Ratings: Except where otherwise indicated, minimum pressure requirements are as follows:

1. Oil Piping and Fittings: 250 psig (1725 kPa).
2. Underslab, Containment-Conduit Piping: 175 psig (1200 kPa).

B. System shall meet the seismic design requirements as outlined under another section of Division 23; section titled “Vibration and Seismic controls for HVAC.”

C. HVAC Contractor shall provide in conjunction with tank manufacturer design of anchor and restraint for UST.

1.4 DEFINITIONS

A. FRP: Glass-fiber-reinforced plastic

B. UST: Underground Storage Tank

1.5 SUBMITTALS

A. General: Submit each item in this Article according to the Conditions of the Contract and Division 01 Specification Sections.

B. Product Data including size, dimensions, rated capacity, pressure rating, settings, and operating characteristics of selected models, for the following:

1. Each type and size of fuel oil transfer pump.

2. Each fuel oil system specialty.

3. Special-duty valves.

4. Containment-conduit piping system.

5. Fuel oil tanks - size, construction data, tapping connections and locations, details of anchoring and hold down straps.

6. Fuel oil leak detection system, all components, wiring diagrams and manufacturer's literature.

7. Liquid Level Control and External Leak Sensor Management System

8. Cathodic Protection System (if required as part of the work of this section)

9. Fuel-oil Appurtenances required for fully operational system

C. Coordination Drawings for fuel oil piping, storage tanks, including required clearances and relationship to other services for same work areas.

D. Wiring diagrams detailing wiring for power, signal, and control systems for each item of equipment with electric power supply and differentiating between manufacturer-installed and field-installed wiring.

E. Test reports specified in "Field Quality Control" Article in Part 3.

F. Maintenance data for fuel oil specialties and special-duty valves to include in the operation and maintenance manual specified in Division 01 Section "Contract Closeout."

1.6 QUALITY ASSURANCE

A. Comply with NFPA 30, "Flammable and Combustible Liquids Code," and NFPA 31, "Installation of Oil Burning Equipment," for fuel oil piping materials, components, installations, inspection, and testing.

B. Comply with NFPA 70, "National Electrical Code," for electrical connections between wiring and electrically operated control devices.

C. Provide listing/approval stamp, label, or other marking on equipment made to specified standards.

D. Listing and Labeling: Provide equipment and accessories specified in this Section that are listed and labeled.

1. Terms "Listed" and "Labeled": As defined in National Electrical Code, Article 100.

2. Listing and Labeling Agency Qualifications: A "Nationally Recognized Testing Laboratory" (NRTL) as defined in OSHA Regulation 1910.7.

E. Product Options: Drawings indicate size, profiles, connections, dimensional requirements, and characteristics of fuel oil piping equipment, specialties, and accessories and are based on specific types and models indicated. Other manufacturers' equipment and components with equal performance characteristics may be considered. Refer to Division 01 Section "Substitutions."

F. Steel Support Welding Qualifications: Qualify procedures and personnel according to AWS D1.1/D1.1M, "Structural Welding Code - Steel."

G. Pipe Welding Qualifications: Qualify procedures and operators according to ASME Boiler and Pressure Vessel Code.

H. Comply with ASME B31.9, "Building Services Piping," for fuel-oil piping materials, installation, testing, and inspecting.

I. Comply with requirements of the EPA and of state and local authorities having jurisdiction. Include recording of fuel-oil storage tanks and monitoring of tanks and piping.

1.7 SEISMIC DESIGN

A. This project is located within a seismic zone requiring special provisions for the support and restraint of equipment, components and piping. See Division 23; Section titled “Vibration and Seismic Controls for HVAC.

1.8 PRODUCT DELIVERY, STORAGE AND HANDLING

A. Comply with manufacturer’s recommendations for handling and storing tanks.

B. All shipping and transportation permit costs shall be borne by this contractor.

C. Lift and support fuel-oil storage tanks only at designated lifting or supporting points, as shown on Shop Drawings. Do not move or lift tanks unless empty.

D. Deliver pipes and tubes with factory-applied end caps. Maintain end caps through shipping, storage, and handling to prevent pipe end damage and to prevent entrance of dirt, debris, and moisture.

E. Store pipes and tubes with protective PE coating to avoid damaging the coating and to protect from direct sunlight.

F. Store PE pipes and valves protected from direct sunlight.

1.9 CLOSEOUT SUBMITTALS

A. Operation and Maintenance Data: For fuel-oil equipment and accessories to include in emergency, operation, and maintenance manuals.

PART 2 - PRODUCTS

2.1 MANUFACTURERS

A. Manufacturers: The following vendors will be reviewed for approval providing they meet all the performance requirements of the specifications.

1. Gate, Globe, and Check Valves:

a. Conbraco Industries, Inc.; Apollo Div.

b. Grinnell Corp.

c. Milwaukee Valve Co., Inc.

d. Stockham Valves & Fittings, Inc.

2. Ball and Butterfly Valves:

a. DeZurik.

b. Neles-Jamesbury, Inc.

3. Fuel Oil Transfer Pumps:

a. Preferred Utilities Manufacturing Corp.

b. Viking Pump, Inc.

c. Webster Heating.

d. Tuthill Corporation

4. Horizontal FRP Underground Storage Tank (UST)

a. Containment Solutions, Inc.

b. Xerxes Corporation.

5. Specialty Valves

a. Preferred Utilites

b. Webester Fuel Pumps & Valves

c. OPW

6. Tank Management System

a. Pneumercator Inc

b. OPW

c. Incon. Inc

7. Tank Gaging Probes

a. Pneumercator Inc

b. Highland Tank

c. Preferred Utilities

8. Leak Detection

a. Pneumercator Inc

b. Preferred Utilities

9. Hydrostatic Leak Detection

a. Pneumercator Inc.

10. Fuel-oil Secondary Containment Conduit

a. Tricon

b. Perma-pipe

2.2 FUEL-OIL PIPE

A. All piping shall be steel with welded fittings (galvanized pipe and fittings are not permitted).

B. Steel Pipe: ASTM A 53; Type S, seamless; Grade B; or ASTM A106, Grade B Schedule 40; black (above ground.)

C. Steel Pipe: ASTM A 53; Type S, seamless; Grade B; or ASTM A106, Grade B Schedule 80; black (above ground.)

D. Steel Pipe: ASTM A-53, Schedule 80 ERW (underground piping).

E. Pipe Protection:

1. All underground piping shall be field painted with asphaltum or a factory applied coating equal to X-TRU coat as manufactured by General Steel Industries

2. In addition to protecting underground piping as described above, provide a cathodic protection system as described in a subsequent paragraph in this Section.

2.3 PIPE FITTINGS

A. Underground Fittings:

1. Extra heavy galvanized malleable screwed (2 ½ inch and smaller)

2. Extra heavy welded fittings (3 inch and larger)

B. Aboveground Fittings:

1. Wrought-steel welding fittings: ASTM 234/ 234M for butt welding (Class of fitting suitable for system pressure but not less than Class 150); All pipe sizes.

C. Unions:

1. Malleable iron with brass-to-iron ground, joints and threaded ends conforming to ASME B1.20.1 (Class of fitting suitable for system pressure but not less than Class 300)

D. Forged-Steel Flanges and Flanged Fittings:

1. ASME B16.5 (Class of fitting suitable for system pressure but not less than Class 150) including bolts, nuts, and gaskets of the following material group, end connections, and facings

2. End Connections: Threaded or butt welding to match pipe.

a. Butt weld to match pipe

3. Gasket Materials: Bolts and Nuts: ASME B18.2.1, cadmium-plated steel.

E. Transition Fittings

1. Type, material and end connections to match piping being joined

F. All piping connections to equipment shall be made with ground joint unions or flanges to facilitate connection and disconnecting.

2.4 JOINING MATERIALS

A. Common Joining Materials: See Division 23 Section titled "Hydronic Piping" for joining materials not included in this Section.

B. Gaskets for Flanged Joints: Full faced for cast-iron flanges and ring type for steel flanges. Select materials that suit service of piping in which gasket is installed and is not detrimentally affected by chemical and thermal conditions of fuel oil. Gaskets for projects in New York City shall be rated for 1000°F. Temperature rating for gaskets for projects outside of New York City shall meet the requirements of State or Local codes having jurisdiction.

2.5 PIPING SPECIALTIES

A. Pipe Connectors: UL 567, swivel or compression type for connection to equipment.

B. Strainers: Y pattern

1. Pressure Rating: As required for system working pressure but in no case less than 250 psig

2. Strainer Screen: Stainless steel with 3/64 inch perforations

3. Inlet/outlet Connection: Full size of connecting pipe

4. Pressure Rating: 250-psig (1725-kPa) WOG working pressure.

5. 2-Inch NPS and Smaller: Bronze body.

6. 2-1/2-Inch NPS and Larger: Cast-iron body.

7. Screwed screen retainer with centered blow-down and pipe plug.

8. Strainer shall produce less than ½ psi pressure drop through a clean strainer basket at the maximum flow in the suction line.

C. Duplex Strainer

1. General: Continuous flow (no interruption) through only one basket at a time; UL listed; Handle design prevents inadvertent opening of active side; suitable for installation on suction side of pump set or discharge side for discharge pressures up to 200 psig

2. Constuction: One piece cast iron (ASTM A-126) bodies hydrostatically tested to 300 psig

3. Covers: Removable; gasketed with O rings to prevent air leakage and quick-opening eyebolts

4. Handle Movement: 180° movement to switch basket

5. Basket: 3/16 perforation

6. Connections: threaded ends or flanged

D. See Division 23; Section titled "Vibration and Seismic Controls for HVAC" or "Vibration Controls for HVAC" for flexible connectors

2.6 VALVES

A. General: Working pressure for all valves shall be as required for system working pressure but in no case less than 250 psig

B. Valves shall be suitable and compatible for fuel-oil systems and in general comply with the requirements in Division 23; Section titled "General Duty Valves for HVAC Piping"

2.7 SPECIALTY VALVES

A. Oil Safety Valve

1. UL 842 listed for flammable or volatile

2. Valve Operation: Closed on development of a vacuum condition

3. Working Pressure: As required for the system design but in no case less than 250 psig

4. Operating Temperature: 550°F

5. ASTM B 61 bronze body, bronze bases and disc

6. Springs: Cadmium-plated, field-adjustable carbon steel

B. Tank Foot Valve

1. Bronze double- poppet
2. Bronze Construction
3. Metal to metal with flat poppets that close on shape raised metal seats
4. Poppets and seats lapped-in seats for tight closure
5. Poppets stem guided for positive alignment
6. 20 mesh monel screen
7. Foot valve extractor fitting

C. Anti-Syphon Valve

1. Heavy Bronze construction
2. Oil-proof gasketing
3. Spring loaded poppet
4. Composition seat and dashpot
5. Resilient seat
6. Spring Range
   a. 1 - 5 feet
   b. 5 - 10 feet
   c. 10 - 15 feet
   d. 15 - 20 feet
   e. HVAC Contractor to determine spring range based on final field installation

D. Oil-Lever Gate Valve (fusible link)

1. Valve Design; Lever-operated; quarter turn (open to close);spring action quick closing; thermally/manually actuated
2. Valve Construction; 125 lb bronze
3. Discs; Bronze
4. Lever; Zinc-plated malleable iron
5. Spring; Cadmium-plate steel

6. Hand-lapped seats and discs

7. Stem Packing; Suitable length to eliminate suction line air leaks

8. Two (2) 165°F fusible links with 25 coil of wire

9. Automatic fuel shut-off limit switch assembly

10. HVAC Contractor shall provide all wiring required from automatic fuel shut- off limit switch assembly and tank management panel

11. HVAC Contractor shall installed fusible link and restraint wire to allow valve to close in the event of a fire.

E. Relief Valve

1. Valve Design: System pressure relief spring operated; field adjustable set point

2. Construction: One piece bronze body suitable for operating pressure up to 300psig and temperatures up to 300°F

3. Connections: Threaded ends

4. Ball: Stainless steel

5. Loading Spring: Cadmium-plated steel

6. Spring Housing: Bronze

2.8 FUEL OIL TRANSFER PUMP SET

A. Description:

1. Provide a factory assembled, piped and wired duplex fuel-oil pump sets as scheduled on the drawings. The pump sets shall include but not be limited to pumps, piping, valves, starters, controls, containment base, etc. for a fully operational pump set.

2. Pump set shall be mounted on ¼ inch steel plate with 4inch sides continuously welded to steel plate encompassing the entire perimeter and all components of the duplex pump sets. Base support shall be fabricated with a 2 ¾ inch over flow lip that forms containment basin that extends beyond any fitting, valve pump, strainer, selector valve or pump set component. Containment basin shall include a ½ inch drain connection with plug and a welded boss sized to allow for the insertion of a containment basin leak detector.

3. Base shall be anchored and grouted to housekeeping pad to minimize vibration and movement.

4. Base shall include a support structure to mount transfer pumps set electrical power and control panel

B. Fuel Oil Pumps

1. Pump Capacities; Capacity, discharge pressure, motor horsepower, electrical requirements as scheduled on drawing.

2. Pump shall be capable of pumping No.2 fuel oil or Diesel as indicated on drawings.

3. Pump and Motor; Mounted structural steel channel of adequate thickness to support and the motor connected to pump with a shaft and a flexible coupling.

4. Pump and Motor; Mounted to structural steel channel with threaded bolts for easy pump maintenance. Bolts shall not penetrate containment basin. Provide elastomeric vibration isolator between pump and motor and base plate.

5. Pump Design; Positive displacement internal gear rotary type with mechanical face type seal, outboard sleeve bearings and a two bolt flange mounted foot. Pump design to meet requirements of UL 343.

6. Motors shall be TEFC type with rigid base and standard NEMA frames

7. Rotor and Shaft Assembly: Machine steel with hardened carbon steel idler pin. Rotor assembly shall be hydraulic axial balanced to eliminated end thrust.

8. Seals: Mechanical face type with carbon rotating ring, a ni-resist stationary seat and a elastomer seal suitable for fluid pumped.

9. Pump Housing: Gray cast iron including housing cover and mounting foot. Housing design shall permit disassembly without breaking piping connections.

10. Flexible Coupling: The pumps shall be connected to the motor by an elastomeric jaw type flexible coupling that does not require lubrication. The coupling wear member shall be replaceable without disturbing the alignment of either the pump or motor. Sizing of the flexible coupling shall be based on motor horsepower and rpm. Materials of construction: The coupling body shall be sintered iron and case iron. The elastomeric wear member shall be NBS rubber. Provide full OSHA approved coupling guard.

11. Factory Testing: Pump suction tested at 25inches Hg at 0 psig. Pump discharge tested at 1.2 times scheduled discharged pressure. Manufacturer to submit, as part of shop drawing submission, letter certifying pump complied with requirements above.

C. Piping and Fuel Oil Specialties

1. Provide the following piping and fuel oil specialties as described as part of the work of this section or other applicable sections of Division 23:

   a. Isolation valves at pump suction and discharge of each pump and suction connection upstream of strainer

   b. Duplex fuel-oil strainer at suction side of pump set size for a maximum pressure drop of ½ psi at full flow through a clean strainer basket.

c. Relief Valve (adjustable pressure range) on the discharge of each pump size to relieve full flow of pump without causing pump motor to overload or any component of pump set to be exceeded. Relief valve shall be external to pump. Internal fuel-oil pump relief will not be acceptable.

d. 4 inch dial type compound gauge at inlet to strainer with isolation cock. Gauge range; 30"Hg to 15 psig; gauge to include pulsation damper

e. 4 inch dial type pressure gauge on discharge of each pump with isolation cock. Gauge range; discharge pressure at midpoint of range; gauge to include pulsation damper

f. Connect each pump to piping in the pump set with stainless steel flexible metallic metal jackets. Minimum working pressure of connection equal to1.2 times discharge pressure.

g. Containment basin leak detector

(i) Cast iron constructed to NEMA 4 standards

(ii) Lever float operated

(iii) Magnetically activated

(iv) Switch actuation SPST N.O. or N. C. as determined based on installation

(v) 3 ¼ inch nominal insertion depth

(vi) Switch redundantly sealed for vapors and fluids

(vii) Electrical rating 8 VA @ 120 VAC

h. Time delay flow sensing switch on common discharge pipe of pump set to activate lag pump in the event lead pump failure and signal alarm to Fuel-oil Pump Control Panel of lead pump failure.

i. Complete (piped and mounted) pump set fuel oil piping system configured for a single connection suction and discharge piping.

D. Fuel Oil Pump Control Center

1. General: Control center shall be factory mounted on the pump set and designed to power, control and monitor fuel oil delivery system in response to demand. Control center shall be prewired and factory tested as an integrated system.

2. Enclosure: NEMA 4 rated with lockable fully gasketed door interlocked to disconnect power when door is open. Enclosure shall include but not be limited to:

a. Control center shall be factory wired for dual electric power feed. See drawing for electrical requirements

b. Unfused disconnect switch for each pump. See Division 23; Section titled “Enclosed Controller” for requirements

c. Magnetic Starter with overload protection and Hand-Off- Auto selector switch for each pump. See Division 23; Section titled "Enclosed Controller" for requirements

d. Control transformer

e. Control System: Control strategy shall be factory configured and tested and shall include but not limited to the following

(i) Pump set shall be activated by a signal from Building Management System (BMS), System Demand, Fuel Oil Day Tank, Operator Interface or other control strategies as defined in Division 23

(ii) Lead/lag pump operation with Auto/manual selector switch. Lead pump alternator logic for normal operation and pump failure. Activation of lag pump in the event of lead pump failure to maintain system pressure.

f. Manual reset push-button

g. Alarm Bell

h. Alarm Bell Silence Push-button

i. Containment Pipe Leak Detectors ??

j. Dry Contacts (factory set) to interface with the Fuel-oil Facility Management System and/or Building Management System

(i) Pump Failure

(ii) Pump Set Containment Basin leak

(iii) Containment Pipe leak ?? (if required)

(iv) Day Tank High Level (if required)

(v) Day Tank Low Level (if required)

(vi) Day Tank Rupture Basin Fuel-Oil Leak

k. Indicator lights

(i) Electric power "ON Light"

(ii) Pump No.1 Running

(iii) Pump No.2 Running

(iv) Pump No, 1 Failure

(v) Pump No. 2 Failure

(vi) Pump Set Containment Basin Leak

(vii) Day Tank "Hi" Level

(viii) Day Tank "Low " Level

(ix) Day Tank Rupture Basin Leak

2.9 OIL FILL LINES & VENT TERMINALS

A. Tank "Brick" Vent

1. Design to meet requirements of NFPA 30 & NFPA 31

2. Design for installation as an flush, integral part of outside surface of a building's exterior wall. Physical size (2-1/8 x 8 x 3 inches) of tank vent equal to a standard masonry brick.

3. Design to accept 2 or 3 inch threaded vent pipe

4. One piece cast aluminum construction

B. Tank Vent Protector

1. Design to meet requirements of NFPA 30 & NFPA 31

2. Design for mounting on top of fuel-oil vent pipe

3. Design to accept 1 ¼, 1 ½, 2, 3 or 4 inch threaded vent pipe

4. Iron construction for sizes 1 ¼ and 1 ½ inch; aluminum construction for sizes 2, 3 and 4 inch

C. Emergency Vents

1. A tank emergency relief vent pipe and normal vent pipe shall be combined and terminate outside building with a protected vent.

D. Fuel-oil Containment Fill Box (Grade)

1. Fill box shall be approved by EPA, New York City and all State and Local Codes having jurisdiction.

2. Outer Shell: Heavy construction flexible (bellows design) polyethylene with gravel guard. Design to allow for easy removable to allow for soil testing if required.

3. Base: Cast iron

4. Deflector Ring: Heavy duty cast iron

5. Cover: Lockable cast iron

6. Drain: Drain valve to provide for containment shell to drain to fuel-oil tank

7. Highway Rating: Designed to meet H20 highway requirements.

8. Provide wall mounted overfill alarm horn and alarm light console to activate at 95% tank volume. See subsequent paragraph in this Section for overfill console

9. Provide tank fuel oil level (float type) sensor/switch to activate alarm bell alarm at 95% tank volume

E. Provide approved identification (Tank No.) for each fill box and vent termination.

F. Weatherproof Vent Cap; Cast- or malleable-iron increaser fitting with corrosion-resistance screen, with free area equal to cross-sectional area of connecting pipe.

2.10 CATHODIC PROTECTION FOR THE UNDERGROUND FUEL OIL PIPING AND STEEL DOUBLE-WALLED FUEL-OIL STORAGE TANKS

A. General:

1. Provide cathodic protection system for underground fuel-oil piping and underground double-walled steel fuel-oil storage in accordance with National Association of Corrosion Engineering RP-01-69 "Recommended Practice for Control of Underground Submerged System".

2. See Division 23; Section titled " Cathodic Protection System" for system requirements

CONTAINMENT SOLUTION, INC FIBERGLASS TANK SIZES

Tank Model	Nominal Capacity (gallons)	Actual Capacity (gallons)	Number of 22" Manways	Minimum Number of 4" NPT Fittings	Nominal Weight (lbs) (#/tank)	Approx. Cavity Volume	Overall Length (gallons)	Tank Diameter
DWT-6 TYPE II	8,000	7,796	2	6	5,000	540	25'-0"	8'

2.11 FUEL OIL TANKS - OIL STORAGE BURIED

A. Furnish and install Double-Wall Fiberglass Underground Fuel Storage Tank.

B. The tanks shall be constructed, tested and installed in accordance with NFPA recommendations and shall be furnished with Underwriters' label.

1. The tank manufacturers statement that this tank conforms with 6 NYCRR part 614 New York State Dept. of Environmental Conservation must be permanently displayed.

2. Underwriters Laboratories Inc. Standard 1316, Glass-Fiber Reinforced Plastic Underground Storage Tanks for Petroleum Products, Alcohols, and Alcohol-Gasoline Mixtures.

3. Underwriters Laboratories of Canada standard ULC-S615, Reinforced Plastic Underground Tanks for Flammable & Combustible Liquids.

4. National Fire Protection Association codes and standards:

   a. NFPA 30 Flammable and Combustible Liquids Code

   b. NFPA 30A Motor Fuel Dispensing Facilities and Repair Garages Code

   c. NFPA 31 Installation of Oil-Burning Equipment Standard

5. State and Local Codes having jurisdiction.

C. The excavation, backfill and foundation will be furnished under another section of the specification. This contractor shall furnish enclosures, covers and frames. The tank shall be tested and installed with pea gravel of approved alternate backfill material according to the current installation instructions provided with the tank.

D. Loading Conditions - Tank shall meet the following design criteria:

1. External hydrostatic pressure. Buried in ground 7' of overburden over the top of the tank. The hole fully flooded and a safety factor of 5:1 against general buckling.

2. Surface loads: When installed according to manufacturer's installation instructions and a review by project structural engineer, tanks will withstand surface H-20 axle loads (32,000 lbs/axle). Note: For non traffic areas, a minimum of 4' of overburden over the top of the tank shall be required.

3. Internal load: Primary tank and annular space shall withstand pressure test of 5 psi. Resulting in a 5 to 1 safety factor.

4. Tanks shall be designed to support accessory equipment such as heating coils, ladders, drop tubes, etc. when installed according to manufacturer's recommendations and limitations.

E. Product Storage Requirements:

1. All primary tanks must be vented. Tanks are designed for operation at atmospheric pressure only, except for use with vapor recovery systems providing the pressure or vacuum does not exceed 1 psi.

2. Tanks shall be capable of storing liquids with specific gravity up to 1:1.

3. Maximum temperature. Tanks shall be capable of storing diesel fuel at temperatures not to exceed 150 deg. F. at the tank interior surface.

4. Tanks shall be chemically inert to petroleum products.

5. Tank, containment collar and tank sump shall be warranted for 30 years against failure due to internal/external corrosions and against structural failure when installed in accordance with manufacturers recommendations.

F. Materials

1. The tank shall be manufactured as a matrix of premium resin, glass fibers and silane-treated silica that together result in a composite providing improved corrosion protection.

2. Tank inner wall shall be fabricated against a mold to produce a non-air inhibited and high gloss laminate to provide a fully cured inner surface without the need for wax coats, a low coefficient of friction and a natural resistance to the build-up of algae or other contamination on the surface. Wax and wax resin coatings cannot be used to achieve full surface cure on tank shells and endcaps.

G. Dimensional Requirements

1. Nominal capacity of the tank shall be 8,000 gallons.

2. Nominal outside diameter of the tank shall be 8 feet.

3. Nominal overall length of the tank shall be 25 feet; 0 inches.

H. Monitoring Capabilities

1. Double-wall tanks shall have a monitoring space between the walls to allow for the free flow and containment of leaked product from the primary tank. The primary function of a tank monitor is to detect a breach in the inner or outer tank under all circumstances. A pressure type system fulfills this criteria, and a continuous leak detector system, which works on the principle of liquid head pressure, shall be furnished for each tank.

2. In the event of an inner tank leak, the liquid media in the cavity (the space between the two walls of the tank) flows into the inner tank, thereby preventing any stored product from escaping from the inner tank, into the cavity. In event of outer wall breech, system liquid media flows to tank excavation.

3. The following continuous monitoring conditions shall be compatible with the cavity between the inner and outer tanks:

   a. Vented to atmosphere

   b. Vacuum – 5 psig maximum

   c. Positive air pressure (5 psig maximum)

   d. External hydrostatic pressure – 7’ maximum groundwater head pressure over tank top

4. Tanks 6 feet diameter and larger shall have an integrally mounted annular space reservoir installed on the tank for factory-installed brine and continuous hydrostatic monitoring. The reservoir shall be constructed of fiberglass reinforced plastic materials and be included in the tank warranty.

5. The monitoring fitting for the monitoring space shall be a 4" NPT fitting.

6. The monitoring system shall be capable of detecting a breach in the inner and outer tank under the following installed conditions:

   a. When the primary tank is empty.

   b. When the primary tank is partially or completely full and the ground water table is below tank bottom.

   c. When the primary tank is partially or completely full and the tank is partially or completely submerged in groundwater.

7. The leak detection performance of the monitoring system shall be tested and verified by a qualified independent consultant to detect leaks in the primary or secondary tank walls as small as 0.10 gallons per hour within one-month.

8. The hydrostatic monitoring system shall be capable of a precision tank test that is listed by the National Work Group on Leak Detection Evaluations (NWGLDE) and be listed as a continuous interstitial monitoring method (liquid filled) by NWGLDE.

9. If hydrostatically monitored, any solution used in the monitoring space shall be compatible with the tank and be of a contrasting color to the tank.

I. Annular Space

1. Tank shall have a space between the primary and secondary walls to allow for the free flow and containment of all leaked product from the primary tank.

2. Tank shall be designed to provide monitoring capability as noted:

   a. Accessibility to the tank bottom between the primary and secondary walls at both ends of the tank.

   b. Tank shall be compatible with a liquid head pressure-type monitor to continuously monitor the primary and secondary tanks. Maximum head pressure is seven feet over tank top.

   c. Liquid media under pressure (contractor provided) shall be used to monitor the interstitial space for tightness.

   d. A mixture of water and anti-freeze agent shall be selected by the tank Owner's representative.

J. Accessories

1. Flanged Manways

   a. The standard manway is 22" I.D. and will be furnished with UL listed gaskets and covers.

   b. Manway extensions shall be provide to for access from grade. Material of manway extensions shall fiberglass and length of manway extension shall be determined by HVAC Contractor based on final grade.

c. Provide three (3) manways for each tank

2. Supply (suction), sounding, gage, etc. of appropriate design shall be provided by HVAC Contractor.

3. Hydrostatic Monitor Accessories

a. Brine monitoring fluid shall be a calcium chloride solution. The tank shall be supplied by the tank manufacturer with a brine solution in the annular space blended to provide freeze protection to -40□F. In event that the reservoir totally drains, the control panel alarm will be activated - the warning light will illuminate, the alarm horn will sound and the transmission contacts will activate any accessory alarm devices. The alarm horn can be temporarily silenced by pressing the reset button. Under this condition, the ALEAK@ light is illuminated. After refilling the reservoir, the ALEAK@ light is off and the control panel is restored to the operational mode.

b. Double float reservoir sensor shall be provided by the HVAC Contractor shall be designed specifically for reservoirs furnished by the underground fuel-oil storage tank manufacturer. The components of the sensor shall be compatible with brine and provide two alarm points positioned 10" apart.

(i) Tank shall be continuously monitored hydrostatic leak monitoring system

(ii) The continuous monitoring system shall be designed to detect a leak in either the primary or secondary wall at all times, regardless of the water table conditions at the installation site.

(iii) Tank shall be continuously monitored hydrostatic leak monitoring system

(iv) The monitoring system shall be recognized by the National Work Group on Leak Detection Evaluations (NWGLDE) as continuous leak detection and as a precision tank test.

(v) The monitoring system shall be independently tested by a qualified third-party and verified to be capable of detecting leaks as small as .05 per hour when proper tank tightness test procedures are followed.

(vi) The interstice of the tank shall be designed for a 5:1 safety factor beyond normal hydrostatic operating pressure to ensure structural integrity and to prevent false leak alarms

4. Secondary Containment Collar

a. UL label shall be affixed to collar.

b. The collar shall be fiberglass reinforced plastic, 42" or 48" in diameter and shall be factory-installed in accordance with drawings.

c. The collar shall include an internal adhesive channel.

d. The collar shall be included in the 30-year tank warranty.

5. Adhesive Kit (Kit AD)

   a. UL Listed and alcohol compatible adhesive kit shall provide a watertight seal at the tank sump and containment collar joint to prevent the ingress of water or egress of fuel. The adhesive kit includes resin, catalyst, mixing stick, putty knife, sandpaper, grout bag, and installation instructions.

6. Tank Sumps

   a. UL label shall be affixed to tank sump components.

   b. Tank sumps & collars shall be listed by Underwriters Laboratories for petroleum fuels and all blends of alcohol (same as tank). Collar and sump shall be tested and listed as a complete sump system.

   c. Tank sump components shall be constructed of fiberglass reinforced plastic. The tank sump shall be 42" or 48" in diameter and must mount to the secondary containment collar. Standard tank sump shall consist of an octagon shaped base or optional round base, round body extension and enclosure top.

   d. The octagon base shall be 24" in height and provide 19" high panels for piping entry points. The base must be capable of joining to the collar with an internal adhesive channel.

   e. A 34" O.D. watertight lid shall be provided at the submersible and fill/vapor end of the tank and provide a watertight seal to the sump enclosure with12" of water above the lid and remain leak free.

7. Ladders

   a. Ladders shall be supplied by the tank manufacturer (carbon steel, stainless steel, aluminum).

8. Anchor Straps

   a. Straps shall be supplied by the tank manufacturer.

   b. Number and location of straps shall be as specified by manufacturer.

   c. Each strap shall be capable of withstanding a maximum load of 25,000 lbs.

9. Liquid Sensor Drawstring

   a. Galvanized steel drawstring shall be factory installed at the monitoring fitting to facilitate field insertion of sensor.

10. Fittings Threaded NPT

   a. All threaded fittings shall be located on a manway cover or within 12" of the tank top center line. Fittings to be supplied with temporary thread protectors or threaded plugs.

   b. All standard fittings shall be 4" diameter NPT half couplings.

c. Internal piping shall be terminated at least 4" from the tank bottom (6" for 12' diameter tanks).

11. Wear plates shall be provided at base of all internal piping and base of ladder. Each wear plate must be constructed of 10 gauge or thicker steel and must cover an area of at least 144 square inches.

12. Provide "Deadmen Tank Anchors" engineered to American Concrete Institute standards designed to prevent tanks from floating when ground water is present. Deadmen tank anchors shall be of sufficient size and weight to prevent empty tank from floating out of the ground. Anchors shall include anchor eyebolts sized to allow connection of anchor straps and a slot to allow for the adjustment of eyebolt locations. HVAC Contractor shall furnish necessary site information including ground water conditions to allow tank manufacturer to properly size deadmen tank anchors.

13. Certification Plate - Underwriters' Laboratory label shall be permanently affixed to each tank.

K. Leak Detector Monitor:

1. A Hydrostatic Pressure Monitor which continuously monitors both the inner and outer walls of this Double Wall Tank shall be furnished. A fiberglass reservoir, integrally constructed with the tank, shall be surface mounted on the tank top.

L. The tanks shall be set on concrete foundations and anchored with fiberglass hold down straps as recommended by the manufacturer. Each strap shall be capable of withstanding the buoyancy load for the tank diameter.

M. Performance Warranty:

1. Tank manufacturer shall furnish a warranty stating as follows:

a. We warrant that our underground tanks if installed underground with proper backfill and otherwise installed in accordance with our instructions:

(i) Will meet our published specifications and will be free from material defects in materials and workmanship for a period of one (1) year following date of original shipment;

(ii) Will not fail for a period of thirty (30) years from date of original shipment due to external corrosion;

(iii) Will not fail for a period of thirty (30) years from date of original shipment due to internal corrosion, provided the tank is used solely for oil at temperatures not to exceed 150°F.

(iv) Will not leak for a period of thirty (30) years from date of original purchase due to structural failure (defined as breaking or collapse) provided the installation is performed and validated by a qualified installation contractor and the tank is used as stated above.

N. Underground Installation

1. Replace all excavated native soil with approved backfill per manufacturers installation instructions.

2. Underground tanks shall be set on an 8" reinforced concrete slab covered with 12" of pea gravel as shown on drawings. The use of saddles or "chock blocks" or any sort is not permitted. The excavation shall be de-watered during installation and backfill operations. The backfill shall be placed in 6" layers, each layer tamped with hand-guided power equipment. Excavation material used for backfill must be capable of being 95% compacted.

3. Tanks shall be covered as shown on drawings but not less than a minimum of 3 feet of dirt and pea gravel as shown.

4. Tanks shall not be filled or partially filled during their installation.

5. Precautions shall be observed to anchor the tank in place.

6. Excavation shall include the removal of all materials such as rock, boulders, concrete and any other materials encountered in the installation of the work under the contract. Excess material shall be removed from the premises.

7. All necessary sheeting and shoring for, and pumping of water from excavation for this work shall be done and after inspection and approval of the work installed, all sheeting and shoring shall be removed, and excavations shall be refilled with clean earth, thoroughly tamped.

O. Level Gauging:

1. Provide and install a Storage Tank Liquid Level Management System. Third party tested 0.1 gph In-Tank and or external 0.2 gph Out-of-Tank Detection capabilities which meet and exceed the current standard EPA required protocols. Console shall include integral printer.

2.12 TANK MANAGEMENT SYSTEM (ONE INSTALLATION)

A. Provide a precision in-tank liquid level control and external leak sensor EPA compliant management system for Underground (UST) and aboveground (AST) tanks.

B. The tank management system shall meet all of the applicable performance specifications and regulatory agency requirements of the following but not limited to organizations:

1. American Petroleum Institute (API)

2. American Society for Testing and Materials (ASTM)

3. Environmental Protection Agency (EPA)

4. Federal Communications Commission (FCC)

5. National Electric Code (NEC)

6. National Fire Protection Agency (NFPA)

7. Underground Storage Tank: Subpart D, 40 CFR Part 280

8. Underwriters Laboratories (UL)

9. State, City and local codes and authorities having jurisdiction

C. Controller:

1. The controller shall be microprocessor-based, and shall be designed and constructed with modular architecture easily permitting either factory or field upgrades and servicing.

2. Configuration and set-up data shall be maintained in non-volatile memory having a minimum fifty (50) year data retention without requiring power of any kind.

3. Replacement or substitution of any controller plug-in card shall not require system re-configuration.

4. Real-Time clock and non-critical log data, such as inventory, delivery, alarm, theft, error, and leak reports shall be maintained in battery backed non-volatile memory with a minimum data retention of from (5)-(10) years in the event of a power outage. System shall include digital display for viewing tank information and LED indicators for the alarm conditions.

5. System shall have the capability to continuously monitor up to two (2) dual-float magnetostrictive in-tank level probes and up to eight (8) secondary containment leak or point-level sensors. Leak and point-level sensor inputs shall support a means to detect sensor open-circuit and short-circuit wiring faults as a standard feature when used in conjunction with fault-reporting sensors.

6. The system shall provide hardcopy 24 column environmental compliance reports, which exit the front panel or are stored internally with optional autowinder take-up spool.

7. The RS-232 serial port shall be standard for communications with a local PC computer.

8. System shall operate on switch selectable 115/230 VAC (+/- 10%), 50/60 Hz. Maximum power consumption shall be 20 watts.

9. Provide all necessary components to allow Tank Management System to communicate tank volumes and alarms to Building Management System (BMS)

D. Console:

1. The console shall be housed in a lockable wall mounted NEMA 4X enclosure

2. The console shall include microprocessor board, probe/sensor card, power supply, control I/O and communications interfaces.

3. Front panel display shall include audible and visual alarms, user-friendly membrane pushbutton controls, and impact printer. The display shall be nine digit, seven segment, quasi-alphanumeric sunlight-readable LED type, with LED alarm annunciators for five (5) alarm conditions; leak, three (3) tank product setpoints, and one (1) bottom water setpoint per tank. LED alarm lights shall be visible from at least 60 feet and the seven-segment display data shall be readable from no less than twenty (20) feet. Displays shall include product gross or net, percent of capacity, 90/95/100% ullage, product and water level, product temperature, and product type.

4. Console shall include two (2) programmable relay outputs and two (2) contact closure inputs plus a modular card containing an additional four (4) relays and four (4) contact closure inputs.

5. All relays and contact closure inputs shall be user-programmable for activation by the following event types; Theft, Power Fail Recovery, System Error, Tank Leak, Product Setpoints, Water Setpoints, Leak/Point Level Sensors, Contact Closure inputs and Line Leak.

6. The system shall include three (3) industrial quality front panel sealed membrane pushbuttons labeled MODE, TANK SELECT, and TEST. Membrane pushbuttons shall be utilized in conjunction with the display screen to select tank quantities, view, set, acknowledge alarm conditions; set/review configuration data, initiate system tests, view inventory and other logged data.

7. The system shall provide hardcopy environmental compliance and status reports via front panel 24-column printer or with optional autowinder take-up spool.

8. The RS-232 serial port shall be provided as standard for two-way communications with a PC computer.

9. Microsoft Windows 95 thru XP compatible software shall be provided to retrieve and display current tank statuses, remotely read, write and initialize system setup, clock, and configuration data.

10. An RS-485 port shall be included.

E. External Passive Leak Sensors: Dry contacts switch leak sensor shall be included for liquid detection in interstitial spaces, containment areas, sumps, brine reservois, dispenser pans and piping locations

F. The system shall be independently third party certified for UST petroleum storage tanks and have the capability to automatically or manually conduct a static volumetric tank tightness test to an accuracy of 0.2 GPH for monthly monitoring and 0.1 GPH for annual precision testing, with minimum test times of two hours and eight hours respectively. System shall be capable of performing both tests with as little as 20% of tank capacity.

2.13 TANK GAUGING PROBES

A. Probe shall be designed for both UST applications and shall have performance characteristics permitting 0.1 GPH or better in-tank leak test with continuous gauging accuracy of +/- 0.0005 inches for product, +/- 0.001 for water and +/- 0.001 degrees F for (relative) temperature.

B. Probe design shall utilize Magnetostrictive Technology.

C. Probe shall contain an array of at least six (6) (five in shaft; one in probe head) temperature sensors along its length for accurate volumetric temperature compensation.

D. Probe to console communication shall employ digital transmission techniques carried over standard, readily available two-conductor, shielded cable, with a maximum cable length restriction of no less than 4000 feet.

E. Probe operating temperature and pressure shall be -40 to +175 degrees F and 150 PSIG respectively.

F. Probes shall be supplied with a dual product float, water float, six (6) foot leader cable with watertight connector, and centering rings for riser mounted applications. Floats shall be 316 stainless steel. Shaft shall be 316 stainless steel.

G. Probe shall be UL/CSA approved for use in Class I, Division I, Group C & D hazardous locations.

H. Third party approved for EPA Compliant for in-tank leak testing

2.14 SECONDARY CONTAINMENT LEAK SENSORS

A. Non-discriminating and product/water¬ discriminating leak sensors shall designed for monitoring/alarming liquid detection in interstitial spaces, containment areas, sumps, brine reservoirs, dispenser pans and piping locations. Design of sensors shall allow for wiring for fault detection.

B. Non-Discriminating Type Liquid Sensors

1. Applications: Fiberglass double-wall tank

2. Technology: Magnet float sealed reed switch; sensor design suitable for horizontal mounting in dry annular space.

3. Sensor shall be a 2-wire type consisting of a horizontally-oriented magnetic float encased within a fabricated PVC outer housing

4. Sensor shall pass through a fiberglass double-wall tank annular space tank opening.

5. Conductor: Twenty-five (25) feet of 2-conductor wire with PVC jacket. Wire gage per manufacturers standard

6. Operating Parameter: Temperature range -40°F to 150°F; Pressure range full vacuum to 100 psi

7. Sensor accuracy of 1/2-inch of liquid.

8. Sensor shall include wiring and sensor fault detection.

2.15 OVERFILL ALARM CONSOLE

A. Description: Weatherproof wall mounted enclosure consisting of alarm light (one per input relay), alarm horn, test buttons, silence button, four (4) input relays, output relays and automatic silence timer.

1. Enclosure: NEMA 4X weather tight/corrosion resistance fiberglass reinforced plastic (FRP).

2. Electric Power: 120 VAC,± 10%: 60 Hz

3. Alarm Light: Bright Red LED (one per input relay); alarm light shall remain illuminated until condition is clear.

4. Alarm Horn: Mounted in enclosure cover; Sound level 85 dbA minimum; manual silencing pushbutton; adjustable (30 seconds to 3 minutes) silencing timer.

5. Input Relay: Intrinsically safe for Hazardous; energy output to level sensor 12VDC @ 15mA: safe for Class I, Division 1, Groups A, B, C, D; Class II, Division 1, Group E,G

6. Output Relay: Dry contact type Form "C"; Single pool, double throw (SPDT); selectable normally open, normally closed; totally separated from input sensors; relay rating 120VAC @ 3amps

7. Terminal Blocks (field wiring): Pressure type enclosed under metal barriers to separate power from intrinsically safe wiring

8. Sensor Cable: Two (2) conductor; wire gage as per manufacturers recommendations; maximum length 5000 feet; HVAC Contractor shall provide sensor cable; each sensor cable shall be run in a dedicated metallic conduit

9. Overfill alarm console shall be located within sight of fill box.

2.16 FUEL INFORMATION CABINET SYSTEM TECHNICAL SYSTEMS

A. Major elements of the Fuel Tank Information Cabinet System shall be furnished by a single source vendor to assure design, installation, and service interface, and to provide in-warranty and post-warranty unified responsibility for training of personnel, and supply of replacement parts to Owner and consulting engineer.

B. System vendor shall coordinate product data presented by Fuel Tank Information Cabinet System manufacturer and fuel storage tank manufacturer to provide a comprehensive set of interfaced drawings which will serve as the basis for system evaluation by consulting engineer, and installation by trade contractor designated by Owner.

C. Fuel Tank Information Cabinet System vendor service organization shall employ senor service technicians, having experience in all aspects of trouble shooting, corrective service and preventive maintenance.

2.17 FUEL-OIL SECONDARY CONTAINMENT CONDUIT

A. General: All Horizontal and vertical fuel-oil piping inside and outside building shall be encased in a secondary containment piping system. Secondary containment piping systems shall be an engineered and totally factory fabricated double-pipe type containment system. The system supplier shall have at least five (5) years of experience in the manufacture of secondary contained pipe systems. All straight sections, fittings and other accessories shall be prefabricated to job dimensions and designed to minimize the number of field connections. Fuel-oil piping shall include but not be limited to the following

1. Fuel-oil supply lines
2. Fuel-oil return lines
3. Fuel-oil fill lines
4. Fuel-oil drain lines

B. Fuel oil Carrier Pipe:

1. Fuel-oil carrier pipe and fittings shall be as specified in a previous paragraph of this Section of the specification.
2. Provide carrier pipe in lengths to minimize field joints and with a minimum 6 inches exposed at each end for field joint fabrication
3. Carrier pipe shall be factory hydrostatically tested at 1.5 maximum working pressure of piping PSI and the pressure shall be maintain pressure for duration of one (1) hour. In the event test fails, repair leaks and repeat test until pressure is maintain.
4. Conduit/pipe Coating (inside building); Red Oxide Primer, factory coated up to 3-4 mils dry film thickness.

C. Secondary Containment Conduit (Metallic)

1. Outer conduit; Minimum 10 gauge smooth wall, spiral welded steel conforming to ASTM Specification A-139 or electric resistance electric resistance welded, Grade A steel pipe conforming to ASTM Specification A-135 with a minimum wall thickness equal to 0.1345 inches.
2. Closure conduit; Section of conduit or pipe for field installation at field joint fabrication points to complete outer conduit. Closure conduit shall be field welded to complete secondary containment conduit.
3. Each section of containment conduit shall be factory air tested at 15 PSI and the pressure shall maintain pressure for duration of one (1) hour. In the event test fails, repair leaks and repeat test until pressure is maintain.
4. Conduit/pipe Coating (inside building); Red Oxide Primer, factory coated up to 3-4 mils dry film thickness.

5. Conduit/pipe Coating (outside building); Exterior surfaces shall be shot blasted and then coated with a fusion bonded epoxy. Fusion bonded epoxy shall be approved by NACE & NACPA for corrosion coating.

D. Secondary Containment Conduit (Non-Metallic)(Underground Only)

1. Outer Conduit; Non-metallic fiberglass conforming to ASTM 2310 standard classification TRP-11CX and ASTM D2996 specification RTRP 11CF1-5430, RTRP-11AF1-2214, RTRP-11AF1-2216.

2. UL / ULC Rated and Listed for Non-metallic underground containment piping for petroleum products, alcohols and alcohol gasoline mixtures.

E. HVAC Contractor shall coordinate with secondary containment conduit manufacturer requirements for leak detectors, fuel-oil specialties and appurtenances for inclusion into carrier pipe and secondary containment conduit at the factory.

2.18 LABELING AND IDENTIFYING

A. Detectable Warning Tape: Acid- and alkali-resistant, PE film warning tape manufactured for marking and identifying underground utilities, a minimum of 6 inches (152 mm) wide and 4 mils (0.1 mm) thick, continuously inscribed with a description of utility, with metallic core encased in a protective jacket for corrosion protection, detectable by metal detector when tape is buried up to 30 inches (762 mm) deep; colored yellow.

2.19 SOURCE QUALITY

A. Pressure test and inspect fuel-oil storage tanks, after fabrication and before shipment, according to applicable ASME, Underwriters Label (UL) and Steel Tank Institute (STI as required by State and Local Codes and Authorities having jurisdiction.

B. Affix standards organization's code stamp.

PART 3 – EXECUTION

3.1 EXAMINATION

A. Examine roughing-in for fuel-oil piping system to verify actual locations of piping connections before equipment installation.

B. Proceed with installation only after unsatisfactory conditions have been corrected.

3.2 EARTHWORK

A. Comply with requirements in Division 31; Section titled "Earth Moving" for excavating, trenching, and backfilling.

3.3 OUTDOOR PIPING INSTALLATION

A. Install underground fuel-oil piping below finished grade in accordance with the requirements NFPA-30 or pipe manufacturer's recommendations if greater than NFPA. Comply with requirements in Section 31 20 00 "Earth Moving" for excavating, trenching, and backfilling.

B. If fuel-oil piping is installed with less than 12 inches of cover to finished grade, install in containment piping.

C. Steel Piping with Protective Coating:

1. For underground piping with factory applied protective coating, apply joint cover kits to pipe after joining, to cover, seal, and protect joints.

2. Prior to backfilling underground piping, inspect installation for defects in factory-applied protective coating. Review protective coating damage with Architect prior to repair.

3. Repair damage to protective coating on pipe as recommended in writing by protective coating manufacturer. Review protective coating repair with Architect and protective coating manufacturer.

4. If underground piping is provided without a factory applied protective coating, provide field applied coating as required for in Part 2 of this Section of the specification.

5. After completing inspection and defects repair, complete backfilling of underground pipe installation.

D. Cathodic Protection for Underground Piping:

1. Provide cathodic protection system for all underground piping as required in Part 2 of this Section of the specification.

E. Install fuel-oil piping at a minimum slope of 1 percent downward toward fuel-oil storage tank.

F. Install vent pipe at a minimum slope of 2 percent downward toward fuel-oil storage tank.

G. For underground storage tanks (UST), install fuel-oil fill box and piping between fill box and storage tank.

H. Make final connections of fuel-oil piping to aboveground storage tanks (AST) and underground storage tanks (UST).

I. Install fittings for changes in direction in rigid pipe.

J. Install all fuel-oil piping and piping appurtenances required for a complete and operational system.

3.4 INDOOR PIPING INSTALLATION

A. Contract Documents are diagrammatic indicating general location and arrangement of piping systems. Prepare and coordinate final location and routing of fuel-oil piping with other trades. Submit shop and coordination drawings based on final coordination.

B. Arrange for pipe spaces, chases, slots, sleeves, and openings in building structure during progress of construction, to allow for mechanical installations.

C. Install piping in concealed locations unless otherwise indicated and except in equipment rooms and service areas.

D. Install piping at right angles or parallel to building walls. Diagonal runs are prohibited unless specifically indicated otherwise.

E. Install piping above accessible ceilings to allow sufficient space for ceiling panel removal.

F. Install piping free of sags and bends.

G. Install fittings for changes in direction and branch connections.

H. Verify final equipment locations for roughing-in.

I. Installed, where called for on drawings, all fuel-oil piping in a secondary containment conduit in accordance with manufacturer's recommendations. Provide secondary containment conduit manufacturer with final coordination drawing indicating the final routing of fuel-oil piping through building for manufacturer of containment conduit. Make all welded connections of carrier pipe at each field joint of containment system. Field test carrier pipe per requirements in subsequent paragraph of this specification. After carrier piping has passed field testing, complete containment conduit with closure conduit at each field joint in accordance with manufacturer's recommendation.

J. Install leak detectors, where called for on the Drawings or Specifications, in secondary containment conduit or other locations called for.

K. Use eccentric reducer fittings to make reductions in pipe sizes. Install fittings with level side down.

L. Connect branch piping from top or side of horizontal piping.

M. Install unions in pipes NPS 2 1/2 (DN 63) and smaller at final connection to each piece of equipment and elsewhere as indicated. Unions are not required on flanged devices.

N. Install strainers on supply side of each control valve, pressure-regulating valve, oil burner connection, and elsewhere as indicated. Install 3/4-inch NPS (DN20) pipe nipple and ball valve in blow-down connection of strainers 2-inch NPS (DN50) and larger. Use same size nipple and valve as blow-off connection of strainer.

O. Install dielectric fittings (unions and flanges) with ferrous and brass or bronze end connections, separated by insulating material, where piping of dissimilar metals is joined.

P. Install fuel-oil piping pitched downward toward fuel-oil storage tank.

Q. Install fuel-oil supply piping from discharge at fuel-oil transfer pump set throughout building as shown on drawings.

R. Install fuel-oil return piping as shown on drawings to fuel-oil storage tank.

S. Install fuel-oil suction piping from storage tank to connection at fuel-oil transfer pump set.

T. For fuel-oil storage tank inside building and underground storage tanks, extend vent pipe to termination shown on Drawings and terminate with approved vent cap. Install vent pipe pitch downward toward fuel-oil storage tank.

U. Install fuel-oil relief vent from pressure relief valves on fuel-oil transfer pump set to fuel-oil return line.

V. For fuel-oil storage tank located inside building, extend fuel-oil fill line and fill box drain from sidewalk or wall fill box to storage tank.

W. Make final connections of fuel-oil piping to aboveground storage tanks (AST) and underground storage tanks (UST).

X. Install all fuel-oil piping appurtenances required for a complete and operational system

Y. Install fittings for changes in direction in rigid pipe.

Z. Anchor piping to ensure proper direction of piping expansion and contraction. Install expansion joints, expansion loops, and pipe guides as indicated.

AA. Install sleeves for piping penetrations of walls, ceilings, and floors. Comply with requirements for sleeves specified in Division 23; Section titled "Sleeves and Sleeve Seals for HVAC Piping."

BB. Install sleeve seals for piping penetrations of concrete walls and slabs. Comply with requirements for sleeve seals specified in Division 23; Section 23 05 17 "Sleeves and Sleeve Seals for HVAC Piping."

CC. Install pipe hangers and supports for all fuel-oil piping. Comply with requirements for hangers and supports in Division 23; Section titled “Hangers and Supports for HVAC piping and Equipment.”

DD. Install escutcheons for piping penetrations of walls, ceilings, and floors. Comply with requirements for escutcheons specified in Section 23 05 18 "Escutcheons for HVAC Piping."

EE. Install all fuel-oil piping and piping appurtenances required for a complete and operational system.

3.5 VALVE INSTALLATION

A. Install anti-siphon valves at high points of fuel-oil suction line.

B. Install oil-lever gate valve (fusible link) at fuel-oil piping penetrations of foundation wall from fuel-oil storage tanks and other locations in the building required by State and Local codes having jurisdictions.

C. Install foot valve and foot valve extractor in fuel-oil suction line 6 above bottom of tank

D. Install oil safety valves at all oil fired equipment

E. Install shut-off, check valves, drains as shown or specified or where required for maintenance and operation.

F. Install manual fuel-oil shutoff valves on branch connections to fuel-oil appliance.

G. Install valves in accessible locations.

H. Install metal tag attached with metal chain indicating fuel-oil piping systems. Identify valves as specified in Division 23, Section titled "Identification for HVAC Piping and Equipment."

I. Install valves at each branch connection to supply mains and elsewhere.

J. Install drain valves at low points in mains, risers, branch lines, and elsewhere as required for system drainage.

3.6 FUEL-OIL UNDERGROUND STORAGE TANK (UST) INSTALLATION

A. Coordinate final location, size and depth of excavation necessary for the installation of storage tank with the Contractor responsible for the work of Division 31. Provide Contractor for Division 31the recommendations of the tank manufacturer for proper setting bed for setting of storage tank and backfilling of the excavation. Backfilling shall be limited to 12 inch lifts unless manufacturer requires smaller lifts. Contractor of Division 03 to tamp each lift.

B. Install deadman tank anchoring system at bottom of excavation in accordance with manufacturer's recommendation.

C. Coordinate size and depth of concrete pad (pad dimension not less than 4 inches in both direction of equipment dimensions) required to anchor fuel-oil storage tank in ground with Contractor responsible for the work of Division 03. Provide Contractor for Division 03 with template for location of anchoring points for tank hold down straps and furnish to the Contractor the anchor devices for embedment in the concrete pad. HVAC Contractor shall review and approved location of anchoring devices prior to pouring of concrete pad.

D. Install underground storage tank on setting bed in accordance with manufacturer's recommendations.

E. Install anchor hold down straps in accordance with manufacturer's recommendations.

F. Connect fuel-oil suction and return piping to storage tank.

G. If suction pipe and foot valve not provide by the tank manufacturer, install suction pipe within tank and install foot valve and foot valve extractor.

H. Connect vent pipe described in a previous paragraph of this Section to storage tank.

I. Connect fuel-oil fill pipe and drain described in a previous paragraph of this Section to storage tank.

J. Install tank gauging probes and other tank fuel-oil accessories

K. Install all components required for a "hydrostatic" leak detection system.

L. If anti-freeze solution is not provided by tank manufacturer, fill annular space with brine or glycol anti-freeze solution suitable for a minimum of -20°F.

M. Fill underground storage tank with fuel-oil.

3.7 FUEL-OIL TRANSFER PUMP SET INSTALLATION

A. Coordinate final size and location concrete housekeeping pad (pad dimension not less than 4 inches in both direction of equipment dimensions) with Contractor responsible for the work of Division 03. Provide Contractor for Division 03 template for pump set anchor devices and furnish anchoring devices for embedment in concrete pad.

B. Grout pump set to concrete pad.

C. Coordinate electric power requirements with the Contractor responsible for the work of Division 26

D. Connect fuel-oil suction line to suction connection on transfer pump set.

E. Connect fuel-oil supply pipe to discharge connection on transfer pump set.

F. Connect fuel-oil relief line described in previous subparagraph of this Section to relief valve outlets

G. Install leak detector in containment basin provided as part of transfer pump set if not furnished as part of transfer pump set.

H. For aboveground storage tank located in the building if transfer pump set is located in a room separate from storage tank, install leak detector on floor of transfer pump room.

3.8 CONNECTIONS

A. Install piping adjacent to equipment to allow service and maintenance.

B. Install unions, in piping NPS 2-1/2 (DN 63) and smaller, adjacent to each valve and at final connection to each piece of equipment having threaded pipe connection.

C. Install flanges, in piping NPS 3 (DN 75) and larger, adjacent to flanged valves and at final connection to each piece of equipment having flanged pipe connection.

D. Connect piping to equipment with ball valve and union. Install union between valve and equipment.

3.9 MISCELLANEOUS FUEL-OIL SYSTEMS

A. Install miscellaneous fuel-oil systems in accordance with manufacturer's recommendations. Miscellaneous fuel-oil systems shall include but not be limited to

1. Tank Management System

2. Overfill Alarm Console

3. Wall or Sidewalk Containment Fill Box

4. Overfill Tank Sensor (Set at 95% tank capacity)

5. Leak detectors where called for on Drawings or in Specifications

3.10 ELECTRICAL REQUIREMENTS

A. HVAC Contractor shall provide all 120 volt electric power to components of the fuel-oil system as required for a fully operational system.

B. HVAC Contractor shall provide all control wiring (low voltage and/or 120volts) between all components of the fuel-oil system as required for a fully operational system.

C. Install all power and control wiring for fuel-oil system in metallic conduit.

D. Power and control wiring and electrical appurtenances shall comply with requirements specified in Division 26.

E. Coordinate electrical power requirements for fuel-oil transfer pump set with Contractor responsible for the work of Division 26.

3.11 LABELING AND IDENTIFYING

A. Nameplates, pipe identification, and sig ns are specified in Division 23; Section titled "Identification for HVAC Piping and Equipment."

B. Install detectable warning tape directly above fuel-oil piping, 12 inches (304 mm) below finished grade, except 6 inches (152 mm) below subgrade under pavements and slabs. Terminate tracer wire in an accessible area, and identify as "tracer wire" for future use with plastic-laminate sign.

1. Piping: Over underground fuel-oil distribution piping.

2. Fuel-Oil Storage Tanks: Over edges of each UST.

3.12 FIELD QUALITY CONTROL

A. Perform tests and inspections.

1. Manufacturer's Field Service: Engage a factory-authorized service representative to inspect components, assemblies, and equipment installations, including connections, and to assist in testing.

B. Tests and Inspections

1. Tanks: If recommended by Tank Manufacturer, perform a compressed-air test pressures on fuel-oil storage tanks. All aboveground (AST) and underground (UST) storage tanks shall be factory tested and bear the ASME code stamp or a listing mark acceptable to authorities having jurisdiction as required in previous paragraph of this Section.

a. Single-Wall Tanks: Minimum 3 psig (20.7 kPa) and maximum 5 psig (34.5 kPa).

b. Double-Wall Tanks:

(i) Inner Tanks: Minimum 3 psig (20.7 kPa) and maximum 5 psig (34.5 kPa).

(ii) Interstitial Space: Minimum 3 psig (20.7 kPa) and maximum 5 psig (34.5 kPa), or 5.3-in. Hg (18-kPa) vacuum.

c. Where vertical height of fill and vent pipes is such that the static head imposed on the bottom of the tank is greater than 10 psig (69 kPa), hydrostatically test the tank and fill and vent pipes to a pressure equal to the static head thus imposed.

d. Maintain the test pressure for one hour.

2. Fuel-oil Piping

a. Perform pneumatic test in accordance with the latest edition of ASME B31.1 Power Ping Code. For piping in secondary containment conduit, test piping prior to completing conduit closure at field joints. Pneumatic test shall be generally as follows:

(i) Test Medium- Gas used as test medium shall be non-flammable and non-toxic

(ii) Check test equipment and connections to before pressure is applied to system.

(iii) Isolate fuel-oil storage tank from system prior to piping test.

(iv) Perform preliminary pneumatic test on the fuel-oil supply and return to locate major leaks in piping. Charge piping to 25 psig.

(v) After major leaks have been fixed, perform required pneumatic test. Piping shall be test to 1.2 to 1.5 times design pressure of the system. Pneumatic pressure shall be gradually increased to one-half of the test pressure and then increase the pressure in steps of approximately 1/10 of the test pressure until test pressure is reached. Maintain test pressure for a minimum of 10 minutes. Then the pressure shall be reduced to the design pressure or a minimum of 100 psig if design pressure is less than 100 psig and maintain pressure for such time as it necessary to inspect entire piping system but not less than one hour.

(vi) Inspect fuel-oil piping for leaks, using a soap bubble test or equivalent method at all joints and connections. Piping system with exception of possible localize instances at pump or valve packing shall show no evidence of leaking.

(vii) Upon successful completion of piping test, the pneumatic pressure shall be gradually relieved.

b. Fuel-oil suction pipe

(i) Test suction line to 25 inches of vacuum and hold vacuum for a minimum of one hour.

(ii) Inspect fuel-oil suction for leaks at all joints and connections.

(iii) Upon successful completion of piping test, vacuum shall be gradually relieved.

3. Inspect and test fuel-oil piping according to NFPA 31, "Tests of Piping" Paragraph; and according to requirements of authorities having jurisdiction.

4. Test liquid-level gage for accuracy by manually measuring fuel-oil levels at not less than three different depths while filling tank and checking against gage indication.

5. Test Tank Management System for accuracy by manually operating sensors and checking against alarm panel indication.

6. Test leak-detection and monitoring system for accuracy by manually operating sensors and checking against alarm panel indication.

7. Test overfill sensor and overfill alarm console by manually operating sensor.

8. Start fuel-oil transfer pumps to verify for proper operation of pump and check for leaks.

9. Test and adjust controls and safeties. Replace damaged and malfunctioning controls and equipment.

10. Bleed air from fuel-oil piping using manual air vents.

11. Fuel-oil piping and equipment will be considered defective if it does not pass tests and inspections.

C. Prepare test and inspection reports. Submit test results, inspection reports and an affidavit certifying the successful completion of the tests.

3.13 PROTECTION OF FUEL-OIL SYSTEM

A. In event the fuel-oil system or portions of the fuel-oil system is not going is not going to be filled with fuel-oil for periods over two weeks, the system shall be charged nitrogen. The procedure shall be as follows:

1. At the conclusion of fuel-oil piping system tests, the system shall have all open ends capped and the system fill with a holding charge of dry nitrogen to 25 psig.

2. Install a pressure gage with isolation valve in a readily observable portion of the system with a tagged sign with a minimum 2 inch red letters stating “CAUTION-PIPE UNDER PRESSURE”

3. Record pressure on daily basis until system is filled with fuel-oil

4. In the event that the pressure falls below 10 psig, the HVAC Contractor shall investigate and remedy the cause of the loss/leak and demonstrate to Owner authorized representative. Recharge system to 25 psig and continue daily recording of pressure.

5. Pressure log shall be kept on Site and submit to Owners authorized representative during the close-out phase of the project.

3.14 DEMONSTRATION

A. Train Owner's maintenance personnel to adjust, operate, and maintain liquid-level gage systems, leak-detection and monitoring systems, fuel-oil pumps, Tank Management System and other appurtenances of the fuel-oil system.

B. Review data in the operation and maintenance manuals. Refer to Division 01 Section "Contract Closeout."

C. Review data in the operation and maintenance manuals. Refer to Division 01 Section "Operation and Maintenance Data."

D. Schedule training with Owner with at least 7 days' advance notice.

3.15 START-UP

A. Perform these steps before activating system:

1. Open valves to fully open position and close bypass valves.

2. Remove and clean strainer screens.

3. Fully prime system.

4. Energize pump and check for proper direction of rotation.

5. Check operating controls of fuel-oil appliances.

6. Check operation at automatic bypass valves.

7. Check prime. Reprime, as required.

END OF SECTION 23 11 13

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