SECTION 11407 - DIGESTER GAS COMPRESSOR

City of San Diego, CWP Guidelines

PART 1 -- GENERAL

1.1 WORK OF THIS SECTION

A. The WORK of this Section includes the packaged gas compressor including all controls and appurtenances necessary to make the package operable, safe and conform to all applicable codes and standards. The package shall be mounted on one common structural steel base and be anchored on an insulated concrete foundation block as indicated. All internal surfaces in contact with the gas shall be resistant to the corrosive effect of hydrogen sulfide in approximate concentrations of 1,000 parts per million. The package shall be designed and built for outdoor installation.

1.2 RELATED SECTIONS

A. The WORK of the following Sections applies to the WORK of this Section. Other Sections of the specifications, not referenced below, shall also apply to the extent required for proper performance of this WORK.

1. Section 11370 Blowers, Compressors and Vacuum Pumps, General

1.3 SHOP DRAWINGS AND SAMPLES

A. The following shall be submitted in compliance with Section 01300:

1. Information on at least one successfully performing installation of comparable size and complexity constructed in the recent past including contact name, addresss, and telephone number.

1.4 OWNER'S MANUAL

A. In addition to the requirements of Section 11370, the following shall be submitted in the OWNER'S MANUAL in compliance with Section 01300:

1. Results of base and package compressor tests (using air) in the factory.

2. Results of cylinder(s) hydrostatic test at 225 psig minimum pressure.

3. Results of gas and cooling water piping hydrostatic test.

1.5 QUALIFICATIONS

$# _____

NTS: In the paragraph below, define the terms "comparable size and complexity" for the equipment or system specified. Requiring experience of more than one successful project requires sound justification and prior written approval from the City Project Manager.

_____ #$

A. **Manufacturer**: Company specializing in digester gas compressors with minimum one successfully performing installation of comparable size and complexity constructed in the recent past. Equipment of comparable size and complexity shall have the following characteristics: [ ].

PART 2 --PRODUCTS

2.1 GENERAL

A. **General:** Only products certified as complying with the indicated requirements and with the provisions of NFPA 820 shall be provided.

B. **Gas Compressors**: Compressors shall be heavy duty, horizontal, reciprocating type, of non-lube cylinder(s), water cooled, electric motor driven and suitable for continuous operation 24 hours per day.

1. Operating Conditions:

Service	Saturated digester gas
Elevation above sea level	[ ]
Capacity at 14.7 psia and 68EF, suction (scfm)	[ ]
Inlet temperature, max., (EF)	100
Inlet temperature, min., (EF)	60
Discharge pressure (psig)	[ ]
Compressor speed, max., (rpm)	[ ]
Motor speed, max., (rpm)	[ ]
Motor size, min., (hp)	[ ]
Suction flange size, min., (in)	[ ]
Discharge flange connection, min., (in)	[ ]

The sludge gas shall be approximately of the composition as follows:

Methane (CH_4)	[ ] percent
Carbon Dioxide (CO_2)	[ ] percent
Nitrogen (N_2)	[ ] percent
Hydrogen Sulfide (H_2)	[ ] ppm

Moisture Content	Saturated
Specific Gravity	0.8
Density (lb/cu ft)	0.074

2. Materials and Construction:

Crankcase	Cast iron
Crankshaft	Forged Steel
Crosshead	Cast iron
Cylinder (s)	Cast iron
Cylinder Liners	Stainless steel
Cylinder valves	Stainless steel
Piston(s)	Cast iron
Piston rods(s)	Forged stainless steel
Packings and rings	To suit operating conditions
Crankcase lubrication	Forced feed
Cooling system	Closed loop, water
Anchor Bolts	Stainless steel
Cooling water temperature, EF	[ ]
Bearings	Anti-friction type, L-10, life of 100,000 hours

3. Drive: V-belt drive with heavy-duty electric motor, [480] volt, 3-phase, 60-Hz supply, explosion proof, suitable for outdoor installation.

C. **Accessories**: Each gas compressor package shall include the following:

1. Automatic 3-step (0-50-100 percent) capacity control system using inlet valve unloaders, with control/annunciator panel.

2. Shell and tube aftercooler, water cooled, [15E]F approach, stainless steel tubes, designed and stamped according to ASME code standards, complete with coalescer and condensate removal system.

3. Shell and tube intercooler (for 2-stage compressors), same specifications as the aftercooler.

4. Combination purifier/pulsation dampener for compressor inlet, designed and built to conform with the requirements of ASME VIII Division I.

5. Structural steel base with four (4) lift lugs.

6. Galvanized anchor bolts and nuts.

7. Nonsparking "V" belt drive guard, designed according to OSHA standards.

8. Flexible connectors, stainless steel.

9. Safety relief valves shall relieve pressure to the compressor suction piping and shall not vent to the atmosphere.

10. Pressure alarm and shutdown safety switches.

11. Temperature alarm and shutdown safety switches.

12. Oil pressure and level gauges.

13. Cooling water temperature regulating valve.

14. Cooling water thermometers

15. Other controls and appurtenances needed for a complete and operable compressor system.

2. TOOLS AND SPARE PARTS

A. Tools and spare parts shall be provided in accordance with Section 11370.

B. The following spare parts shall be provided for each digester gas compressor unit:

1. Gasket kit

2. Valve kit

3. Crankcase kit

5. Set of cylinder liners

6. Set of V-belts

7. A one-year supply of replacement filters, where applicable.

2.3 MANUFACTURERS

A. **Manufacturers**: Products shall be manufactured by one of the following (or equal):

1. Gardner-Denver Compressors, Model [ ], Size [ ]

2. Ingersoll-Rand Co., Model [ ]

PART 3 -- EXECUTION

3.1 INSTALLATION

A. **General**: Products and equipment shall be installed in accordance with the manufacturer's written installation instructions. The CONTRACTOR shall note that the piping, wiring, and utility support facilities indicated correspond to the [ ], model [ ]. The CONTRACTOR shall be responsible for design modifications to piping, wiring, and other utilities, as required for installation of the compressor units actually supplied. Any modifications required to accommodate other equipment shall be at no additional cost to the OWNER.

** END OF SECTION **