

CITY OF TAMPA

Department of Solid Waste

Office of Environmental Coordination

March 23, 2000

Mr. Joe Kahn, P.E.
Department of Environmental Protection
Bureau of Air Regulation
2600 Blair Stone Road
Tallahassee, Florida 32399-2400

BUREAU OF AIR REGULATION

MAR 29 2000

RECEIVED

RE: Minor Modification of Permit No. 0570127-AC-PSD-FL-086(A)

0570127-003-AC

Dear Mr. Kahn:

The subject permit was issued prior to the selection of the contractor for retrofit construction of the McKay Bay Refuse-to-Energy Facility. The permit specifies Emissions Units 100, 101 and 102 for the Ash Building and Handling System, Lime Silo and Carbon Silo respectively. Enhancements to the facility design have resulted in changes to these sources. Two wet scrubber dust collection systems were added to the ash handling system. One is in the scalper building and one is in the ash building. Both systems are designed to meet a 0.015 grains/acf emissions limit. The scrubber specifications are attached. Two lime silos are being constructed instead of one lime silo. The two lime silos are connected to a common vent filter, which is designed to meet the emission limits in the permit. Two carbon silos are also being constructed and each silo has a separate vent filter which is designed to meet the emission limits in the permit. These are minor emissions sources and should result in decreased emissions as compared to the original design.

These minor modifications are being addressed in the Title V permit process with the Department, however, the new equipment may be constructed prior to the Department's issuance of the Title V permit. Therefore, a minor modification of the existing permit is requested. A site plan is included which shows the revised plant layout. Plans for the ash building and the scalper building are attached showing details of the wet scrubber dust collectors. A check for \$250 is also attached to cover the review fee.

If you have any questions, please contact Greig Grotecloss at 813-242-5408.

Sincerely,

Nancy McCann
Urban Environmental Coordinator

cc: SWD
Hillsboro Co
EPA
NPS



CITY OF TAMPA

Dick A. Greco, Mayor

November 4, 1997

NOV - 4 1997

Dr. Rick Garrity
Department of Environmental Protection of Hillsborough County
3804 Coconut Palm Drive
Tampa, FL 33619

Dear Dr. Garrity:

Please accept this letter as authorization for Nancy McCann, Urban Environmental Coordinator for the City of Tampa's Solid Waste Department to sign permit applications and other related documents pertaining to the McKay Bay Refuse-to-Energy Complex. Ms. McCann is the City's authorized representative for dealing with regulatory agencies on issues concerning the McKay Bay Refuse-to-Energy Complex.

Please contact Ms. McCann if any additional documentation is required. She can be reached at (813)274-8090.

Sincerely,

Dick A. Greco
Mayor

cc: Sam Halter, Chief Administrative Officer
Mike Salmon, Environmental Services/Public Works Projects Coordinator
Wayne Brookins, Director, Solid Waste Department
Nancy McCann, Urban Environmental Coordinator

Rev.	Issued for	Originator's Signature	Date	Proj. Manager's Signature	Date
A	Approval	S. J. Charney	7/21/99	S. Kranz	7/21/99
B	Bid	S. J. Charney	9/3/99	S. Kranz	9/3/99
C	Bid	S. J. Charney	9/28/99	S. Kranz	9/28/99
D	Purchase	<i>S. J. Charney</i>	10/12/99	<i>AK</i>	10/12/99

SPECIFICATION NO. 1588/60

WET SCRUBBER DUST COLLECTION SYSTEM

**WHEELABRATOR McKAY BAY INC.
McKAY BAY RETROFIT PROJECT
Tampa, Florida**

Prepared by:

S/D Engineers, Inc.
Pittsburgh, Pennsylvania

Contract No. 01-0083-00

September 3, 1999

SPECIFICATION NO. 1588/60
WET SCRUBBER DUST COLLECTION SYSTEM

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SPECIFICATION NO. 1588/60

WET SCRUBBER DUST COLLECTION SYSTEM

1.0 INTENT

This Specification accompanies a Purchase Order to supply a wet scrubber dust collection system complete with all accessories for Wheelabrator McKay Bay, Inc. McKay Bay Retrofit Project, Tampa, Florida. The function of the scrubbers are to limit fugitive dust emissions during conveying and truck loading operations of combined fly ash and bottom ash.

2.0 SCOPE OF WORK

The Vendor shall furnish the design, fabrication, and test of two wet scrubbers in accordance with the design and performance requirements of this Specification. Except for those items specifically listed in Section 3.0, Vendor shall supply all materials, engineering, and services required for a functional system.

The Vendor shall perform the work as follows:

- 2.1 Design, fabricate, and test two (2) wet scrubber dust collection systems.
- 2.2 Furnish two (2) exhaust fans for remote mounting per Section 6.5.2 of this Specification.
- 2.3 Furnish all required documentation.

3.0 WORK, EQUIPMENT, AND SERVICES BY OTHERS

- 3.1 Installation
- 3.2 Anchor bolts.
- 3.3 Electrical power.
- 3.4 Piping and ductwork connections.

4.0 APPLICABLE STANDARDS AND CODES

- 4.1 Equipment and materials shall be furnished in accordance with all appropriate Standards and Codes, in effect as of the date of this Specification. These shall include the following:

AISC American Institute of Steel Construction

- ANSI American National Standards Institute
 - ANSI 7-95 Minimum Design Loads for Buildings and Other Structures
 - ANSI B16.5 Pipe Flanges and Flanged Fittings
 - ANSI B16.21 Nonmetallic Gaskets for Pipe Flanges
- ASTM American Society for Testing and Materials (as applicable)
- NEMA National Electrical Manufacturers Association
- OSHA Occupational Safety and Health Act of 1970, as amended

Florida State Building Code

All applicable Local, County, State, and Federal rules, regulations, and codes

- 4.2 Modifications to equipment to meet local, county or state government rules, regulations, and codes, or Purchaser's specification requirements, shall be made only if they exceed the requirements of the above Standards and Codes.
- 4.3 If Specification requirements exceed the requirement of any standard or code, the Specification shall govern.

5.0 SITE DATA

5.1 Site and general data:

5.1.1 DELETED

5.1.2 Ambient temperature range will be from 36°F to 104°F.

5.1.3 Wind load: 130 MPH 3-minute gust or 90 mph sustained wind load. Seismic Zone 0 design requirements apply.

5.1.4 If the loading requirements of the Design Code are more conservative than those stated above, then the Design Code requirements shall govern.

6.0 PROJECT REQUIREMENTS

6.1 General

6.1.1 This Specification represents the minimum requirements for the specified scope of supply. It is the Vendor's responsibility to furnish services and materials to meet the requirements of the Specification as described herein. Exceptions may be taken to any portion of this Specification, but they must be clearly identified in Vendor's proposal. All exceptions are subject to the approval of the Purchaser.

6.2 Description of Service

6.2.1 The wet scrubber dust collection systems will be installed in the Wheelabrator McKay, Inc. McKay Bay Retrofit Project, refuse-to-energy facility located in Tampa, Florida.

6.3 Design and Operating Conditions

6.3.1 Design and Operating Conditions are as follows:

Equipment Number	01-M-5200	01-M-5210
Gas Volume:	10,000ACFM @ 68 °F	10,150 ACFM @ 68 °F
Inlet Air Temperature:	36 °F to 104 °F	36 °F to 104 °F
Air Analysis:	Median diameter of 5 microns with a range of 1.0 to 25 microns	Median diameter of 5 microns with a range of 1.0 to 25 microns
Inlet Dust Loading:	1.0 grains/acf	1.0 grains/acf
Required Outlet Dust Loading:	0.015 grains/acf	0.015 grains/acf
Air Inlet/Discharge Location	Side/Side	Top/Top
Service:	Continuous	Continuous
Location:	Indoors – Unheated Ash Handling Bldg.	Indoors–Unheated Scalper Bldg.
Ambient Temperature:	36 °F to 104 °F	36 °F to 104 °F
Scrubbing Fluid:	Waste Water	Waste Water
Power Supply:	460/3/60	460/3/60
Piping:	Feed line, 10 fps max Drain line, 5 fps max.	Feed line, 10 fps max. Drain line, 5 fps max.

6.3.2 Visible emissions from the scrubber exhaust vents shall not occur more than 5% of the time, except during times of maintenance or repairs of the scrubbers.

6.4 Materials

Materials selection for the wet scrubber systems shall be as specified below:

Scrubbers – Solid polypropylene or Fiberglass Reinforced Plastic (FRP)

DELETED

Pipe nozzles – ASTM D-4101 Polypropylene or FRP

Pipe Flanges – ASTM D-4101 Polypropylene or FRP

Bolts, studs and nuts – ASTM 193, 316 stainless steel Grade B; ASTM A194, 316 stainless steel Grade 8M

Access Door Gaskets – non asbestos type.

Exhaust fans – Housing – Heavy gauge FRP

Where material is not specified, an appropriate material for the application shall be selected by Vendor.

6.5 Design and Construction Features

6.5.1 General Design Requirements

The wet scrubbers shall be designed to operate by mixing the air stream, particulate, and scrubbing liquid and then infusing the particulate with water droplets in a contact chamber. Mixing between the dust-laden airstream and the scrubbing liquid shall take place in the contact chamber.

The scrubbers shall be equipped with mist eliminators designed for 99 percent removal of particulate and 30 micron droplets and larger. The mist eliminator section shall be a fixed chevron blade design.

The scrubbers shall be equipped with electronic level controls connected to a N.C. solenoid valve. The feed shall be adjusted for automatic "Fill on", "Fill Off", "Low Level Alarm", and "High Level Alarm" operation.

The scrubbers shall be the hopper-type solids collector complete with an automatically timed drain down system. The drain down shall be interfaced with an electrical control relay package to open the drain, close the drain, and activate the make-up water feed to assure proper liquid level. All controls including scrubber fan motor starter shall be mounted in a NEMA 4X control panel mounted on the scrubbers.

The scrubbers shall be capable of operating over the full range of operating conditions specified.

DELETED

DELETED

6.5.2 Scrubber Exhaust Fans

Belt-driven centrifugal fan consisting of housing, wheel, fan shaft, bearings, motor and NEMA 4X disconnect switch, drive assembly, and support structure suitable for outdoor installation for fan equipment number 01-F-5210.

Fans shall be sized to provide a maximum of 85 dBA when measured at five feet from the fan.

Fans shall be constructed of fiberglass and shall be AMCA Class I, II, or III.

Fan wheel shall be non-overloading backward inclined blades and shall be statically and dynamically balanced.

Fans shall have inlet and outlet flanges and shall have a bolted cleanout door and housing drain.

Bearings shall be grease lubricated shaft bearings, self-aligning, pillow block type; tapered roller bearings with double locking collars and two piece, cast iron housing. Bearing life shall be AFBMA 9, L-10 of 120,000 hours.

Motor pulley shall be fixed pitch for use with motors larger than 5 horsepower. Select pulley so pitch adjustment is at the middle of the adjustment range at fan design conditions.

Belt guards shall be fabricated to comply with OSHA requirements and shall include provision for adjustments and use of tachometer with guard in place.

Fans shall have adjustable motor mount to adjust belt tensioning.

Motor shall be NEMA MG 1, general purpose, continuous duty, Design B, energy efficient and shall be totally enclosed fan cooled.

The fans shall be designed for the following conditions:

Fan Equipment Number	01-F-5200	01-F-5210
Fan Motor Equipment Number	01-FM-5200	01-FM-5210
Gas Volume:	10,000 CFM	10,150 CFM
Operating Temperature:	36 °F to 104 °F	36 °F to 104 °F
Grade Elevation:	10 FT	10 FT
Total Static Press. Duct + Scrubber:	6+8=14.0 in W.G.	7+8=15.0 in W.G.
Fan Discharge:	Bottom Angular Up	Upblast
Fan Rotation:	CW	CCW
Fan Arrangement:	9	9
Electrical Power:	460/3/60	460/3/60
Location:	Indoors	Outdoors
	Ash Handling Bldg.	Scalper Bldg.

6.5.3 Quality Assurance

The vendor shall employ such quality assurance measures as are necessary to ensure that the work provided conforms to this specification.

6.5.4 Packaging, Shipping and Marking

A nameplate shall be attached to the scrubbers in a clearly visible, easily accessible location.

Vendor shall meet the requirements of WAPC Specification 3838-2315 "Supplemental Requirements for Shipping and Marking."

7.0 **INSTALLATION**

Installation of the scrubbers and exhaust fans will be performed by others.

8.0 **TESTING**

8.1 **Shop Testing**

Vendor's standard shop tests shall be performed on all equipment. As a minimum, fan and motor shall be operated as a unit at design speed to check fan stability. Accessories shall be tested to ensure proper operation. Vendor shall correct all anomalies and defects prior to shipment.

Purchaser reserves the right to witness all shop tests. Vendor shall notify Purchaser of the tests at least 15 days in advance of the dates for the tests.

Certified test reports shall be prepared for all shop tests.

8.2 **Field Tests**

Purchaser will perform field tests on the scrubbers and exhaust fans after installation of the equipment.

The object of these tests will be to check mechanical performance of the units including vibration, noise, overheating of fan bearings, lubricating system, fan and motor driver alignment, and for any indication of unfavorable operating characteristics.

Any deficiencies or faulty conditions determined during these tests shall be corrected by the Vendor at no cost to the Purchaser, after which, additional tests will be run to confirm satisfactory performance and operation.

9.0 **INFORMATION TO BE SUBMITTED**

The equipment and services furnished by Bidder shall be in technical compliance with the latest revision to this Specification, its attachments and all purchasing documents. Any exception or deviation from the Specification must receive prior written approval from the Purchaser or Purchaser's Engineer before proceeding with implementation.

9.1 **Documents required with Bid**

Bidder shall furnish with the bid all documents as required in the RFP, including:

- Catalog cuts and arrangement drawings showing overall dimensions and weights of scrubbers, exhaust fans, and accessories.

9.2 **Documents Required After Award**

Submittal requirements are specified in TABLE A, "Information to be submitted," of this Section of the Specification. Submittal procedure shall conform to WAPC Specification 3838-2310, "Supplemental Requirements for Vendor Documents/Equipment."

TABLE A

**DUST COLLECTION SCRUBBER SYSTEM
Information to be Submitted
For Specification No. 1588/60**

Sheet 1 of 1

Vendor shall submit the following:

Submittal Document	Described in Div, Sec, Para.	Submitted for	Submitted By	Remarks
Outline Drawings	3838-2310	R	15 DAAC	
Foundation Loading and Anchor Bolt Locations	3838-2310	R	15 DAAC	
Installation Drawings	3838-2310	R	15 DAAC	
Certified Shop Test Reports	3838-2310	I	10 DATC	
Recommended Spare Parts	3838-2310	I	30 DAAC	
Storage and Handling Procedures	3838-2310	I	30 DPS	
Instruction Manuals	3838-2310	I	UCW	Final

LEGEND FOR TABLE A (Days identified are calendar days)

R- Submit for Review

DAAC Days after award of Contract

DPT Days prior to test

DATC Days after test completion

I – Submit for Information

DPRF Days prior to release for fabrication

DPS Days prior to shipment

UCW Upon Completion of work

ATTACHMENT AT-1

The following checked "X" Supplemental Requirements documents become a part of this Specification. Other documents also checked "X" hereon are attachments to this Specification. Drawings, charts, lists, sketches, etc., when listed and attached, are specifically applicable to this Specification.

- () BID EVALUATION DATA SHEETS
- () DATA SHEETS
- () MANUFACTURER'S DATA SHEETS
- () NOISE LEVEL DATA REQUEST SHEET

DOCUMENT IDENTIFICATION

(x) SUPPLEMENTAL REQUIREMENTS FOR:

- | | | |
|-----|---|-------------|
| (x) | VENDOR DOCUMENTS/EQUIPMENT | 3838-2310 |
| () | VENDOR SURVEILLANCE | SR-VS |
| () | COUPLINGS AND MECHANICAL DRIVES | SR-CMD |
| () | VIBRATION PARAMETERS FOR ROTATING EQUIPMENT | SR-VPRE |
| (x) | ELECTRIC MOTORS BELOW 2300V, AC | SR-EM-2300V |
| (x) | SPARE PARTS | 3838-SRSP |
| () | ASME CODE DOCUMENTATION | SR-ASME |
| (x) | EQUIPMENT/MATERIAL SHIPPING AND MARKING | 3838-2315 |
| () | <u>DRAWINGS/SKETCHES</u> | |

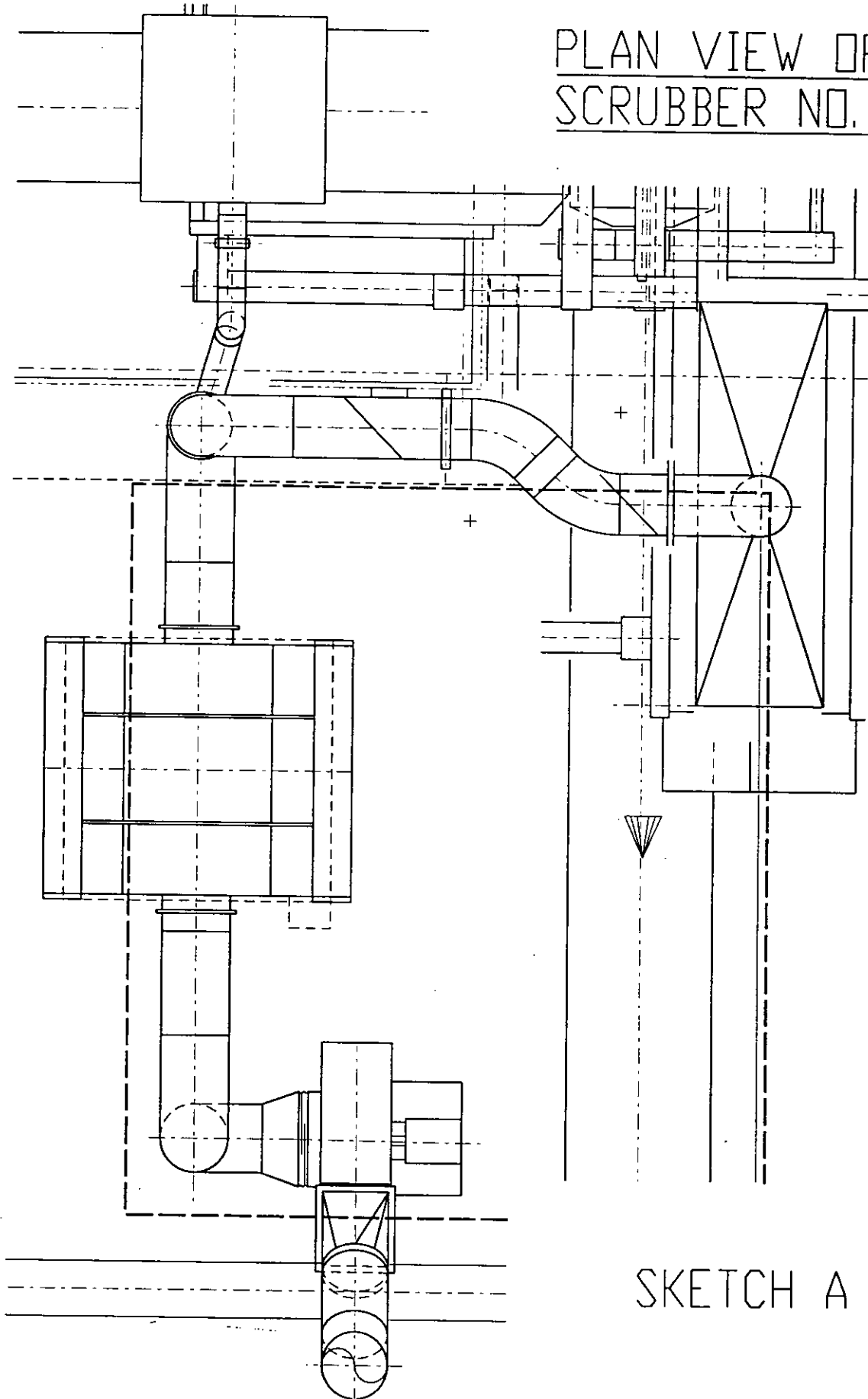
() OTHER REQUIREMENTS

NONE

DRAWING LIST

<u>Drawing No.</u>	<u>Title/Description</u>	<u>Revision/Date</u>
Sketch A	Plan View of Scrubber No. 1	Rev 1 / 10/12/99
Sketch B	Side View of Scrubber No. 1	Rev 1 / 10/12/99
Sketch C	Plan View of Scrubber No. 2	Rev 1 / 10/12/99
Sketch D	Side View of Scrubber No. 2	Rev 1 / 10/12/99

PLAN VIEW OF
SCRUBBER NO. 1



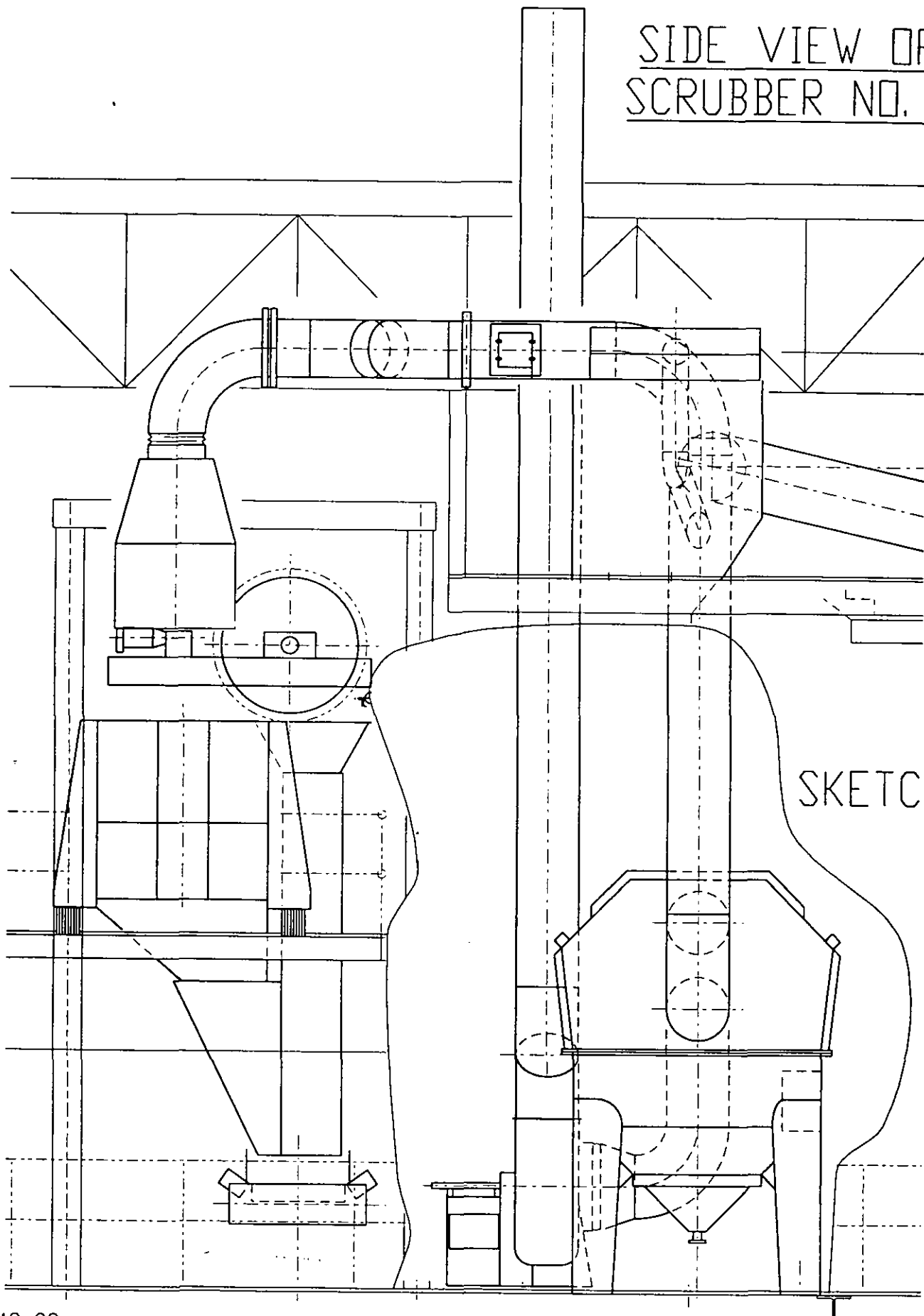
SKETCH A

10-12-99

REV. 1

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SIDE VIEW OF
SCRUBBER NO. 1



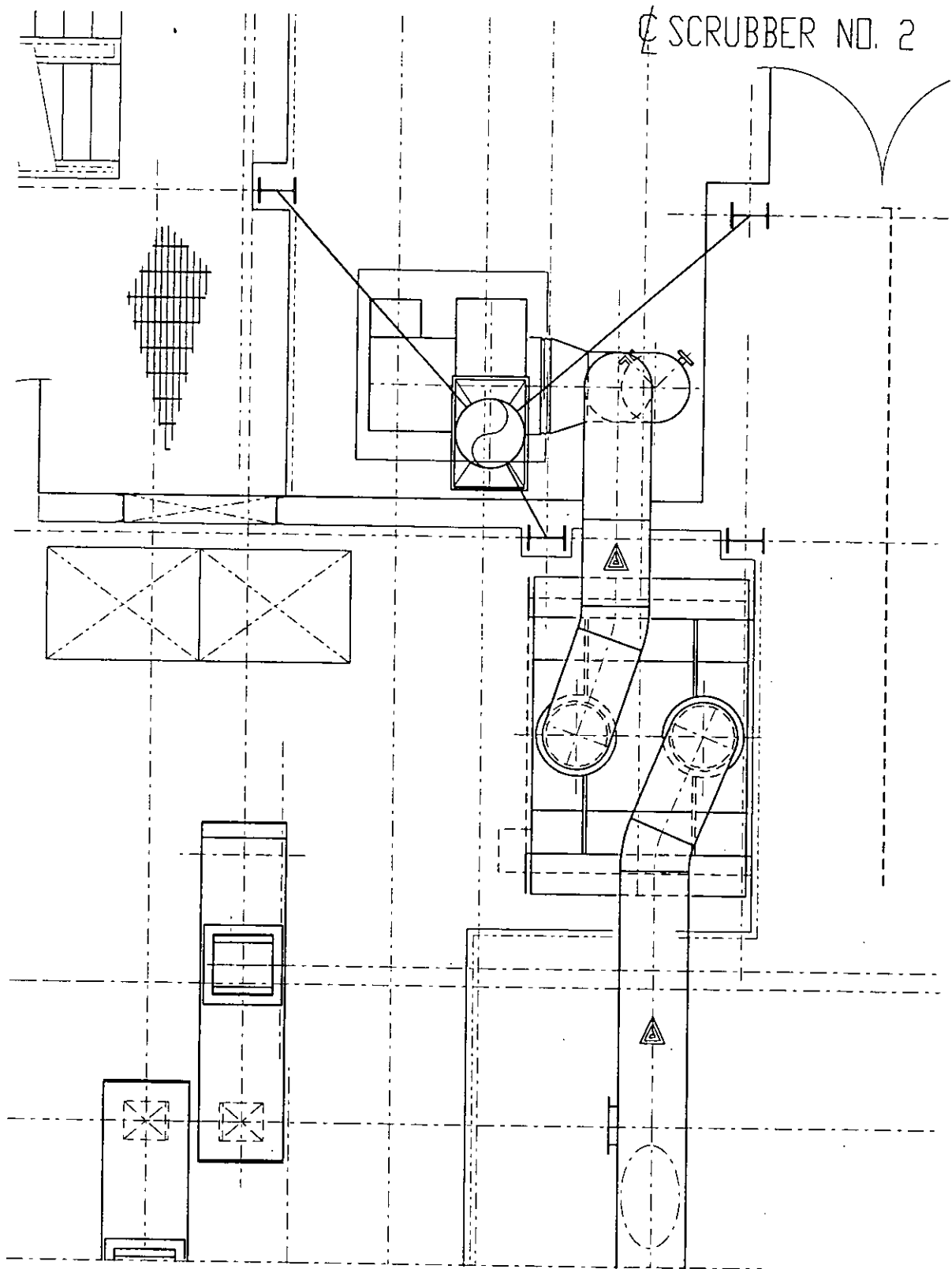
SKETCH B

10-12-99

REV. 1

\\01000300\card\hvac\01310020.dwg Oct. 12 1999 14:27:19

PLAN VIEW OF SCRUBBER NO. 2



SCRUBBER NO. 2

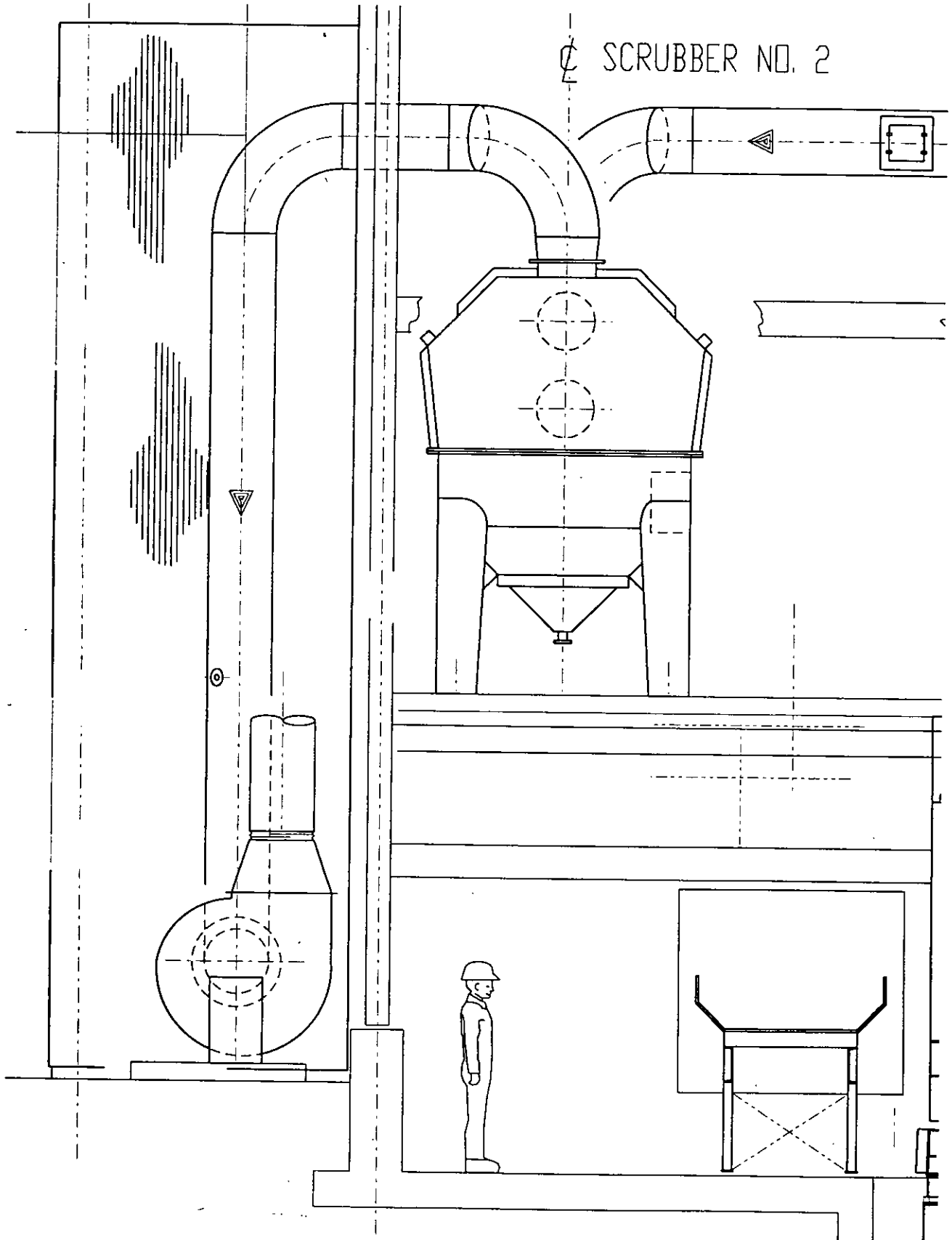
SKETCH C

10-12-99

REV. 1

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SIDE VIEW OF SCRUBBER NO. 2



SKETCH D

8-23-99

REV. 0

\\01083001\cad\hvac\01310024.dwg Oct 13 1999 12:31:35

If necessary logo in light gray tone is not present on back of document - Do not cash.

WHEELABRATOR MCKAY BAY
PH. 813-241-1457
107 NORTH 34TH ST.
TAMPA, FL 33605

1720

63-751/631
00460

PAY TO THE ORDER OF Florida Department of Environmental Protection \$ 250.00

-----Two Hundred Fifty & 00/100----- DOLLARS



First Union National Bank
of Florida
Tampa, Florida
24 Hour Information Service
1-800-735-1012

FOR Air Const. Permit Mod

Frank Leub

⑈001720⑈ ⑆083107513⑆ 2090001409029⑈

CLARKE AND BURNETT, INC.

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RECEIVED

MAR 27 2000

BUREAU OF AIR REGULATION

WHEELABRATOR MCKAY BAY, INC.
A WASTE MANAGEMENT COMPANY

107 North 34th Street
Tampa, Florida 33605
(813) 248-1457
(813) 247-2052 Fax

March 9, 2000

Florida Department of Environmental Protection
Southwest District Office
3804 Coconut Palm Drive
Tampa, Florida 33619
RE: Air Construction Permit 050127-AC, PSD-FL-086(A)

MAR 13 2000

Dear Sir:

Section III B.4 of the subject permit requires submittal of technical data pertaining to the selected emission control systems, including guaranteed efficiency, emission rates and major design parameters.

In order to comply with this permit requirement, we have attached the following data sheets:

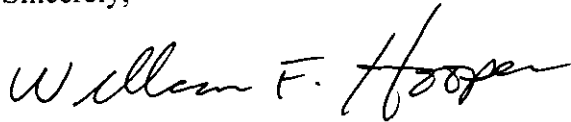
- 1) Overall APC System Emission Guarantees
- 2) Acid Scrubbing Equipment
- 3) Boiler Fabric Filter
- 4) Carbon Injection System Equipment
- 5) Nitrogen Oxide Control Equipment
- 6) Pebble Lime Silo Bin Vent
- 7) Powdered Activated Carbon Silo Bin Vent
- 8) Ash Handling System Fugitive Emission Vent Scrubbers

Page 2 of 2

Air Construction Permit 050127-AC, PSD-FL-086(A)

If you have any questions, please call.

Sincerely,



William F. Hooper
Director of Environmental
Compliance, Health and Safety

Attachments

Cc: Sterlin Woodard – Hillsborough County Environmental Protection Commission –
w/ attachments
G. Grotecloss – City of Tampa w/ attachments
L. Koon
L. Rettura
M. Killeen
T. White

A. A. Rinero FDEP
-JK 3/21/00

City of Tampa

AQCS System Design Parameters

Wheelabrator McKay Bay Refuse to Energy Facility Retrofit Project

March 7, 2000

Table 1.0 Air Pollution Control System Emission Guarantees	
Parameter	Limit*
MWC Organics (as measured as total mass dioxin/furans)	13 nanograms/dscm
Particulate Matter (PM)	24 mg/dscm (9.910 gr/dscf)
Opacity	10 percent (6-minute average)
Cadmium (Cd)	0.020 mg/dscm
Lead (Pb)	0.20 mg/dscm
Mercury (Hg)	70 μ g/dscm or 85% reduction in Hg emissions (whichever is less stringent)
Sulfur Dioxide (SO ₂)	29 ppmv or 80% reduction in SO ₂ emissions (whichever is less stringent)
Hydrogen Chloride (HCL)	25 ppmv or 95% reduction in HCL emissions (whichever is less stringent)
Nitrogen Oxides (NO _x)	180 ppmv during the first year of operation and 150 ppmv thereafter
Fluoride (F)	1.5 lb/hr
Beryllium (Be)	0.000115 lb/hr
Fugitive Ash Emissions (for the Facility)	Visible emissions less than 5% of the observation period (i.e., 9 minutes per 3-hour period) from the Process Residue transfer system except for maintenance and repair activities
* - Dry Gas Basis corrected to 7% O ₂	

City of Tampa AQCS System Design Parameters
 Wheelabrator McKay Bay Refuse to Energy Facility Retrofit Project March 7, 2000

TABLE 2 ACID GAS SCRUBBING EQUIPMENT

1. Number of Units:	Four (4)
2. Manufacturer (& License if applicable):	Wheelabrator Air Pollution Control
3. Flue Gas Data (Per Unit):	
a. Maximum Flow (ACFM):	110% MCR - 66,440
b. Maximum Velocity (Ft/Sec):	7.
c. Maximum Temperature (°F):	550°F
d. Flange to Flange Pressure Drop (In W.C.):	2.5
e. Flue Gas Residence Time (s)	11 sec. @ MCR
4. TYPE	Two Fluid Nozzle Spray Dryer Absorber
5. Chemical Used for Neutralization:	Pebble Lime Supplied (CAO) Calcium Hydroxide (Ca(OH) ₂) used in SDA
6. Atomization System:	
a. Type:	Two Fluid Nozzle (Compressed Air)
b. Manufacturer:	Wheelabrator Air Pollution Control
c. Number:	One Operating & One Spare / Boiler
7. Materials of Construction and Item Description:	
a. Lime Storage:	2 - 75 Ton, Carbon Steel
b. Lime Slaker:	2 - 2000 lb/hr Carbon Steel
c. Lime Pump:	2 - Nihard Impeller & Casing Liner
d. Chemical/Water Solution Percent at Atomizer:	2-5 wt %

City of Tampa **AQCS System Design Parameters**
Wheelabrator McKay Bay Refuse to Energy Facility Retrofit Project **March 7, 2000**

- e. Scrubber Shell Material & Thickness: A-36 / 0.25 in.
- f. Dry Particulate Removal Equipment: Pulse Jet Fabric Filter
8. Description of Instrumentation/Control System for HCl & SO₂ Emission Control: Temperature feedback to control total slurry flow; SO₂ feedback to control ratio concentrated slurry and dilution water.
Minimum lime/dilution water setting to maintain HCl compliance.
9. Description of Control for Temperature of Outlet Gases from Dry Scrubber: Outlet temperature feedback to control total slurry flow control valve
10. Outlet Gas Temperature Design / Maximum(degrees F): 285 / 300

City of Tampa AQCS System Design Parameters
 Wheelabrator McKay Bay Refuse to Energy Facility Retrofit Project March 7, 2000

TABLE 2.0 BOILER FABRIC FILTER

1. Number of Units and Type:	Four (4)	
2. Manufacturer:	Wheelabrator Air Pollution Control	
3. Flue Gas Data (per unit):		
a. Maximum Flow (ACFM):	58,080 (Design - 52,800) @285°F	
b. Maximum Temperature (°F):	525	
c. Flange to Flange Pressure Drop (In W.C.):	8	
d. Air-to-Cloth Ratio:	Design	Maximum
Full Mode Operation:	2.65:1	2.92:1
One Module Out of Service:	3.18:1	3.50:1
Two Modules Out of Service:	3.98:1	4.39:1
4. (Not Used)		
5. Number of Modules per Unit:	6	
a. Number of Bags per Module:	132	
6. Materials of Construction and Items Description:		
a. Bags (including diameter & length of bag):	6" dia. x 192" long glass fiber	
b. Bag Frames:	Snap ring tube sheet (carbon steel)	
c. Shells:	0.25 in. carbon steel	
d. Hoppers:	0.25 in. carbon steel	
7. Description of Bag Cleaning System:	on line and off line cleaning pressure loss, timer or manual initiation	

City of Tampa

AQCS System Design Parameters

Wheelabrator McKay Bay Refuse to Energy Facility Retrofit Project

March 7, 2000

TABLE 3.0 CARBON INJECTION SYSTEM EQUIPMENT

- | | |
|--|--|
| 1. Description of Carbon Injection System: | Dry Powdered Activated Carbon (PAC)
<hr/> Injection System. PAC is metered to a
<hr/> venturi/eductor using a screw feeder
<hr/>
<hr/> High pressure air from a dedicated blower
<hr/> pneumatically transports PAC to SDA inlet.
<hr/> Nominal feed is 5 lb/hr per operating boiler.
<hr/>
<hr/> |
| 2. Number of Units: | Four operating/One spare /4 Boilers.
<hr/> |
| 3. Carbon Grade Used for Reagent: | <u>Noritt Darco FGD or Calgon Flupac A or B</u> |

City of Tampa

AQCS System Design Parameters

Wheelabrator McKay Bay Refuse to Energy Facility Retrofit Project

March 7, 2000

TABLE 4.0 NITROGEN OXIDES CONTROL EQUIPMENT

1. Description of NO _x Control System:	The SNCR process offered employs the controlled injection of an aqueous solution containing a proprietary urea based reagent into the combustion gases. The reagent reacts chemically with the NO _x in the combustion gas to form molecular nitrogen and water.
2. Number of Units:	4
3. Manufacturer (& License if applicable):	Wheelabrator APC - (Fuel Tech, Inc.)
4. Flue Gas Data (per unit):	
a. Maximum Flow (ACFM):	60,395 @ 485°F
b. Maximum Velocity (Ft/Sec):	--
c. Maximum Temperature (°F):	485°F
5. [Not used]	50% By Weight
6. Chemical Used for Reagent:	NO _x Out A (Urea based reagent)
7. Description of Instrumentation/Controls for NO _x Emission Control:	NO _x Emissions will be controlled by using the CEMS signal to DCS to adjust the quantity of reagent injected flows and pressures from all pumps will be monitored.

City of Tampa AQCS System Design Parameters
 Wheelabrator McKay Bay Refuse to Energy Facility Retrofit Project March 7, 2000

TABLE 5.0 PEBBLE LIME SILO BIN VENT

<u>General Information</u>	<u>Proposer-Specific Information</u>
Name of Equipment/System	Lime Silo Bin Vent
Manufacturer	Wheelabrator Air Pollution Control
Identification/Model No.	Size 22, Model 36
Number of Units	One (1)
Guaranteed Outlet Emission	0.015 gr/ACF
<u>Design/Operational Parameters(2)</u>	<u>Proposer-Specific Information(3)</u>
Capacity	1600 CFM
<u>Materials of Construction(4)</u>	<u>Proposer-Specific Information(5)</u>
Casing: Carbon Steel painted	Rating 1600 ACFM
Filter Elements: Polyester Felt	Expected Flow 500 ACFM
	4 Filter Elements @ 50 FT ² each
	A/C Ratio = 8.0:1 max.
	4.0:1 expected
<u>Other Features: Automatic Pulse Cleaning on Pressure Loss Signal.</u>	

City of Tampa **AQCS System Design Parameters**
Wheelabrator McKay Bay Refuse to Energy Facility Retrofit Project **March 7, 2000**

TABLE 6.0 PAC SILO BIN VENT

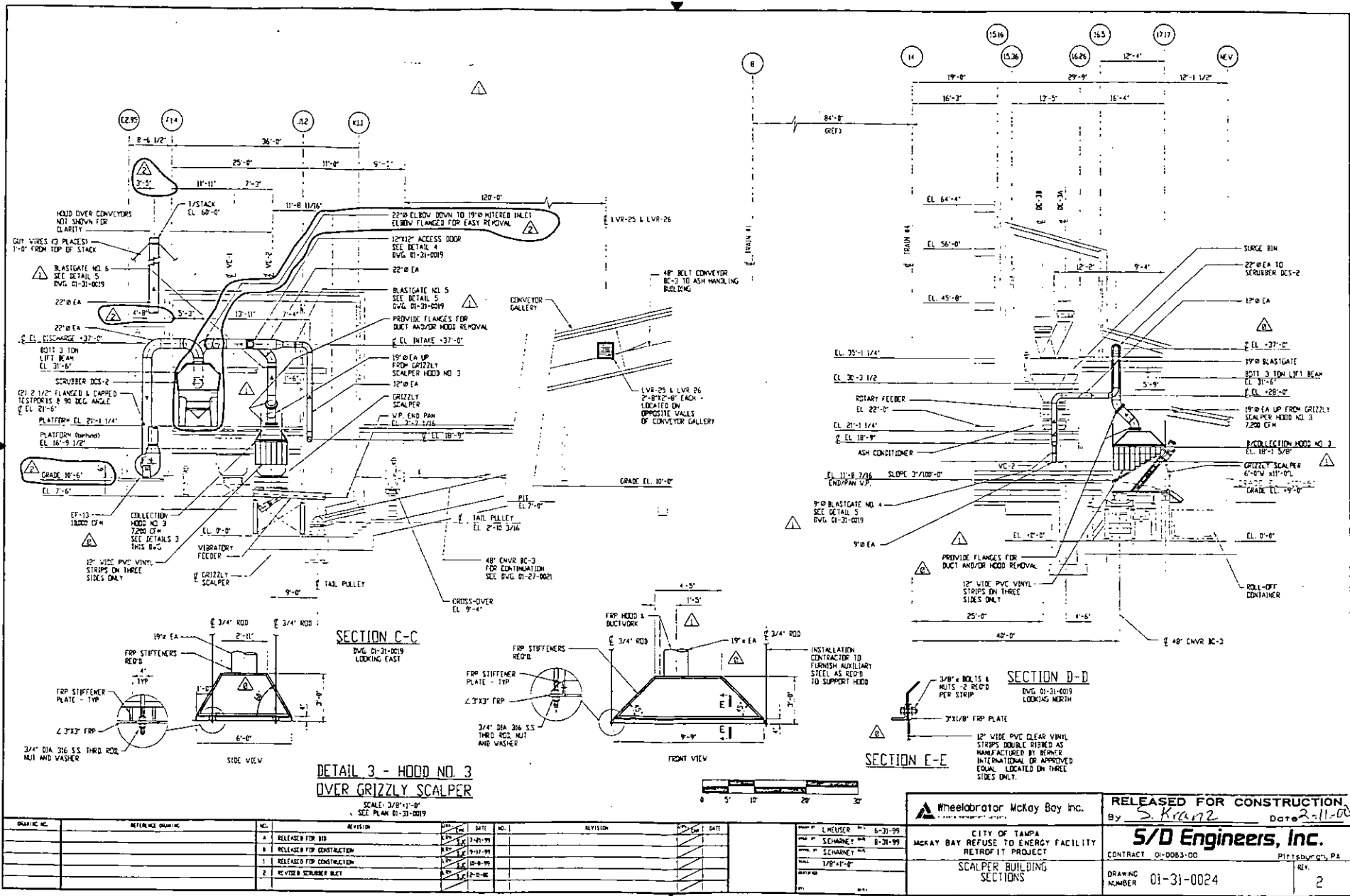
<u>General Information</u>	<u>Proposer-Specific Information</u>
Name of Equipment/System	PAC Silo Bin Vent
Manufacturer	Wheelabrator Air Pollution Control
Identification/Model No.	Size 22, Model 36
Number of Units	Two
Guaranteed Outlet Emission	0.015 gr/ACF
<u>Design/Operational Parameters(2)</u>	<u>Proposer-Specific Information(3)</u>
Capacity	1600 CFM
<u>Materials of Construction(4)</u>	<u>Proposer-Specific Information(5)</u>
Casing carbon steel painted	Rating 1600 ACFM
filter elements: Polyester felt	Expected flow 800 ACFM
	4 filter elements @ 50 ft ² each
	A/C Ratio = 8.0:1 max.
	4.0:1 expected
<u>Other Features</u>	Automatic Pulse Cleaning on Pressure Loss Signal

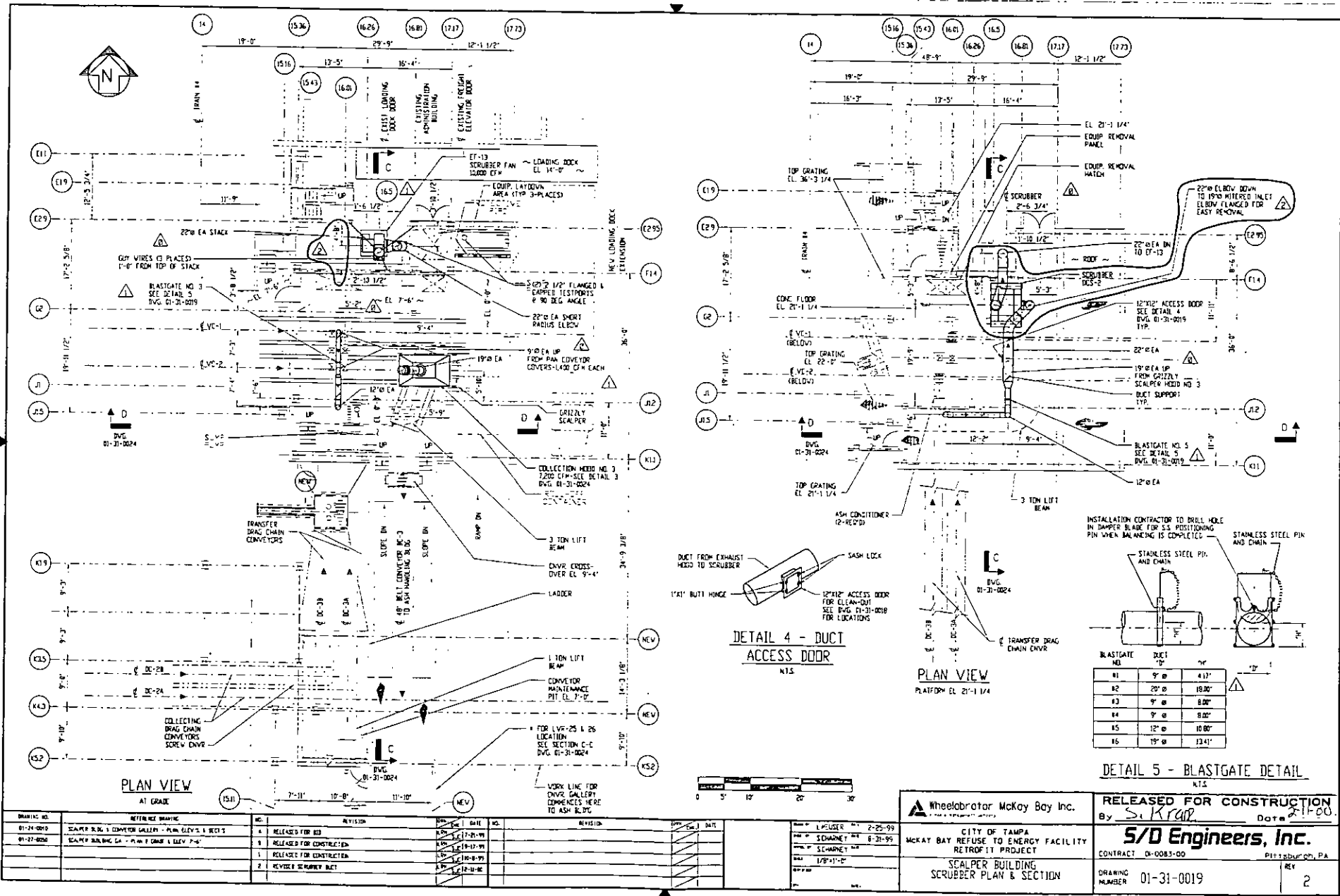
City of Tampa
 Wheelabrator McKay Bay Refuse to Energy Facility Retrofit Project

AQCS System Design Parameters
 March 7, 2000

TABLE 7.0 ASH HANDLING SYSTEM FUGITIVE EMISSION VENT SCRUBBERS

<u>General Information</u>	<u>Proposer-Specific Information</u>
Name of Equipment/System	Ash System Wet Scrubbers
Manufacturer	Tri-Mer
Identification/Model No.	Size 100, Model H
Number of Units	Two
Guaranteed Outlet Emission	0.015 gr/ACF
<u>Design/Operational Parameters(2)</u>	<u>Proposer-Specific Information(3)</u>
Capacity	10,000 / 10.150 ACFM @ 68°F
Type:	
<u>Materials of Construction(4)</u>	<u>Prepares-Specific Information(5)</u>
FRP / Polypropylene	Rating 10,000 / 10,150 ACFM
	<u>Pressure Loss:</u> 14/15.4 in. W.G.

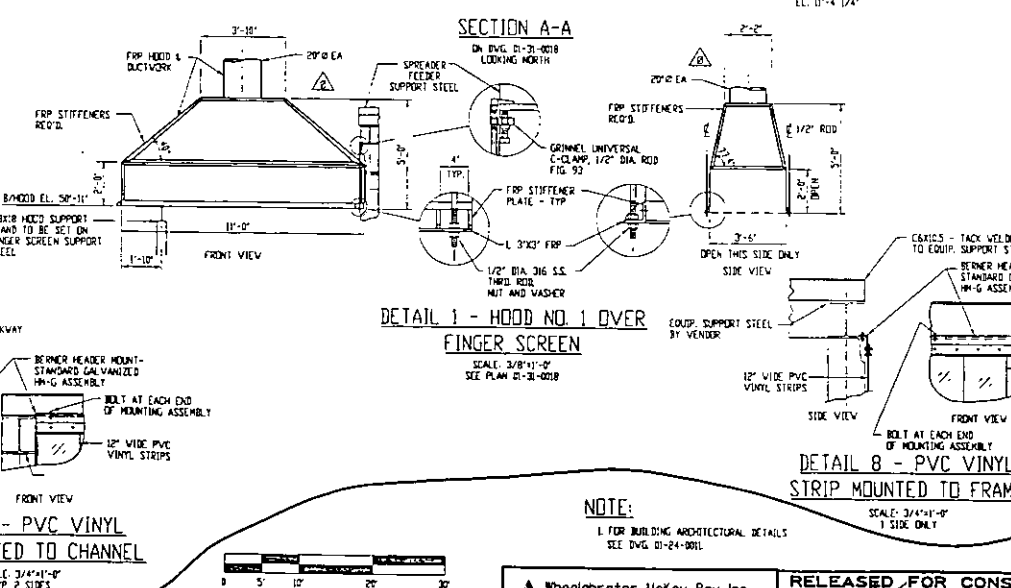
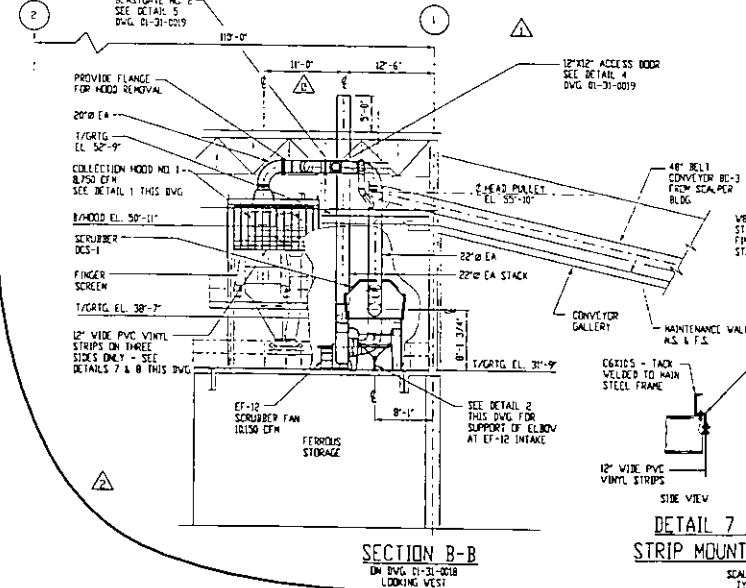
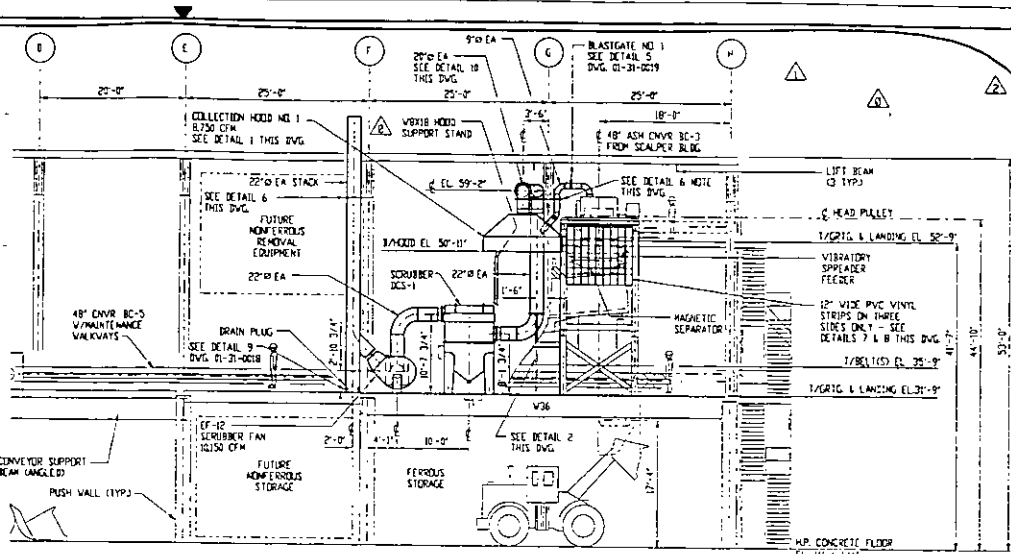
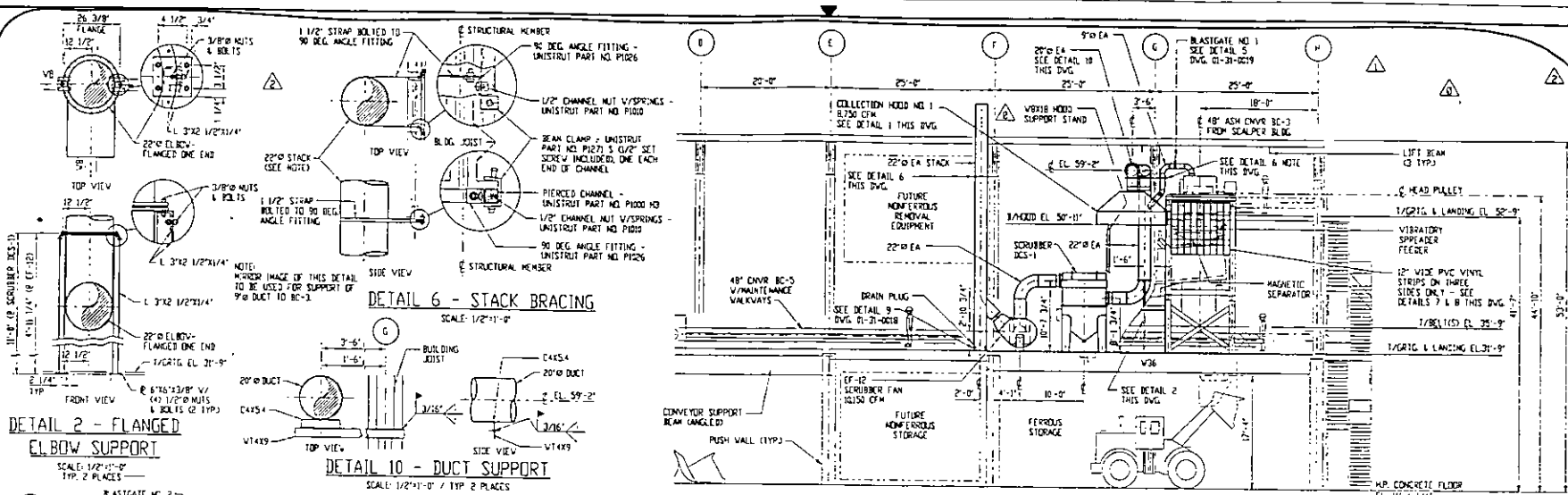




DRAWING NO.	REFERENCE DRAWING	NO.	REVISION	DATE	NO.	REVISION	DATE
01-24-0019	SCALPER BLDG. & CONVEYOR GALLERY - PLAN ELEV. 1 & RECT. 5	4	RELEASED FOR BID	01-24-99			
01-27-0026	SCALPER BUILDING CA - PLAN 7 CORNER & ELEV. 7-4	1	RELEASED FOR CONSTRUCTION	01-27-99			
		1	RELEASED FOR CONSTRUCTION	01-28-99			
		2	REVISED SECURITY BACT	01-28-99			

Wheelabrator McKay Bay Inc. CITY OF TAMPA MCKAY BAY REFUSE TO ENERGY FACILITY RETROFIT PROJECT SCALPER BUILDING SCRUBBER PLAN & SECTION		RELEASED FOR CONSTRUCTION By <i>S. Krapp</i> Date <i>2-11-00</i> S/D Engineers, Inc. CONTRACT 01-0083-00 PITTSBURGH, PA DRAWING NUMBER 01-31-0019	
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BLASTGATE NO.	DUCT "Ø"	"H"	"L"
B1	9"	412"	
B2	20"	1020"	
B3	9"	820"	
B4	9"	820"	
B5	12"	1020"	
B6	19"	1341"	



DRAWING NO.	REFERENCE DRAWING	NO.	REVISION	DATE	NO.	REVISION	DATE
01-24-0011	ASH HANDLING BUILDING - PLANS & ELEVATIONS/SECTIONS & DETAILS	4	RELEASED FOR BID	7-24-99			
01-25-0111	ASH HANDLING BUILDING - LIGHTING & HVAC PLANS	0	RELEASED FOR CONSTRUCTION	9-11-99			
01-27-0011	ASH HANDLING BUILDING - GENERAL ARRANGEMENT SECTIONS	1	RELEASED FOR CONSTRUCTION	10-4-99			
01-30-0011	FIRE PROTECTION SYSTEM GA - ASH HANDLING BUILDING	2	RELEASED FOR CONSTRUCTION	10-23-99			

Wheelabrator McKay Boy Inc.

RELEASED FOR CONSTRUCTION
By *[Signature]* Date *12/1/99*

S/D Engineers, Inc.

CITY OF TAMPA
MCKAY BAY REFUSE TO ENERGY FACILITY
RETROFIT PROJECT

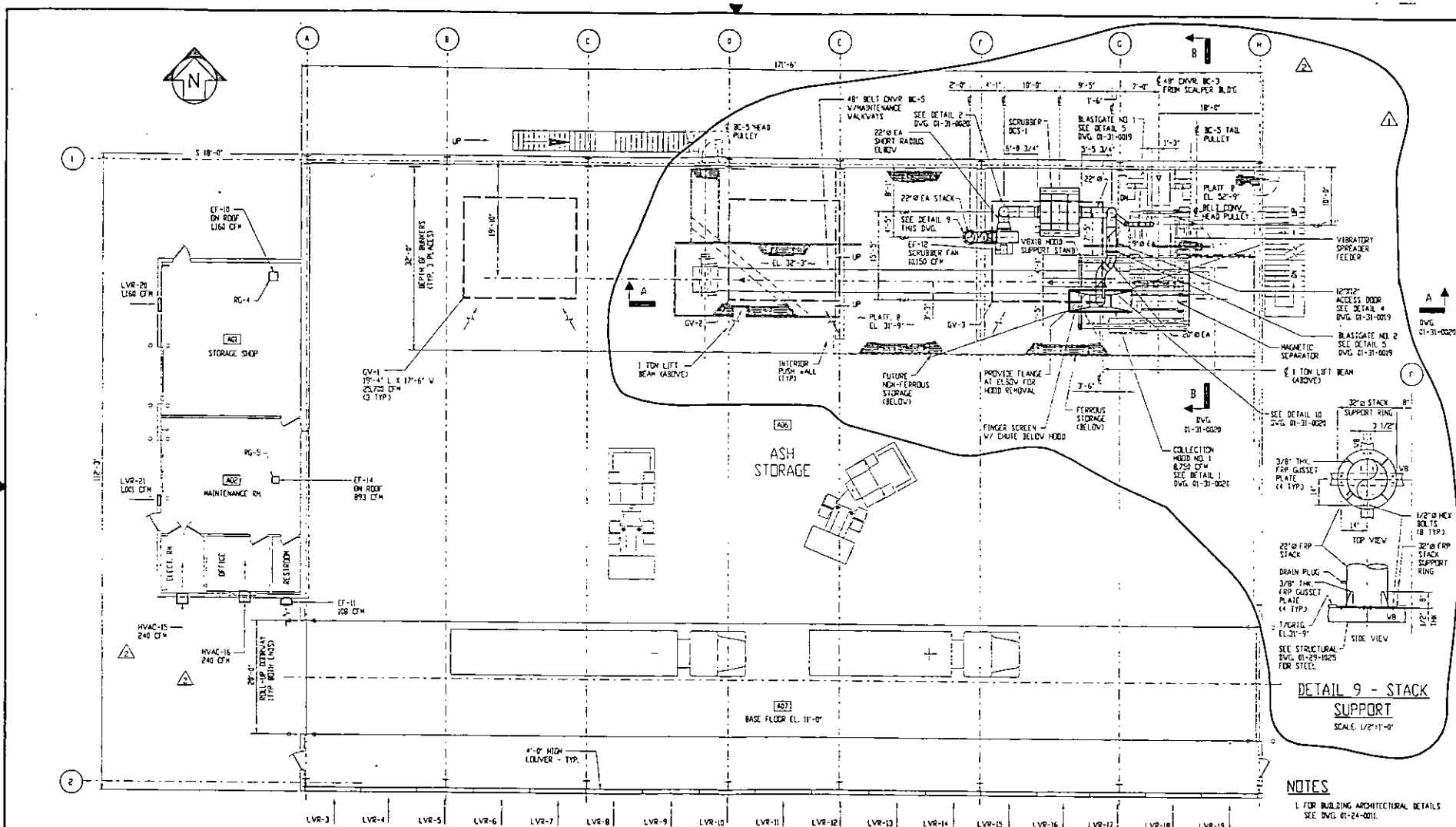
CONTRACT 01-0083-00

ASH HANDLING BUILDING
SECTIONS

DRAWING NUMBER 01-31-0020

Pittsburgh, PA

REV. 2



PLAN VIEW

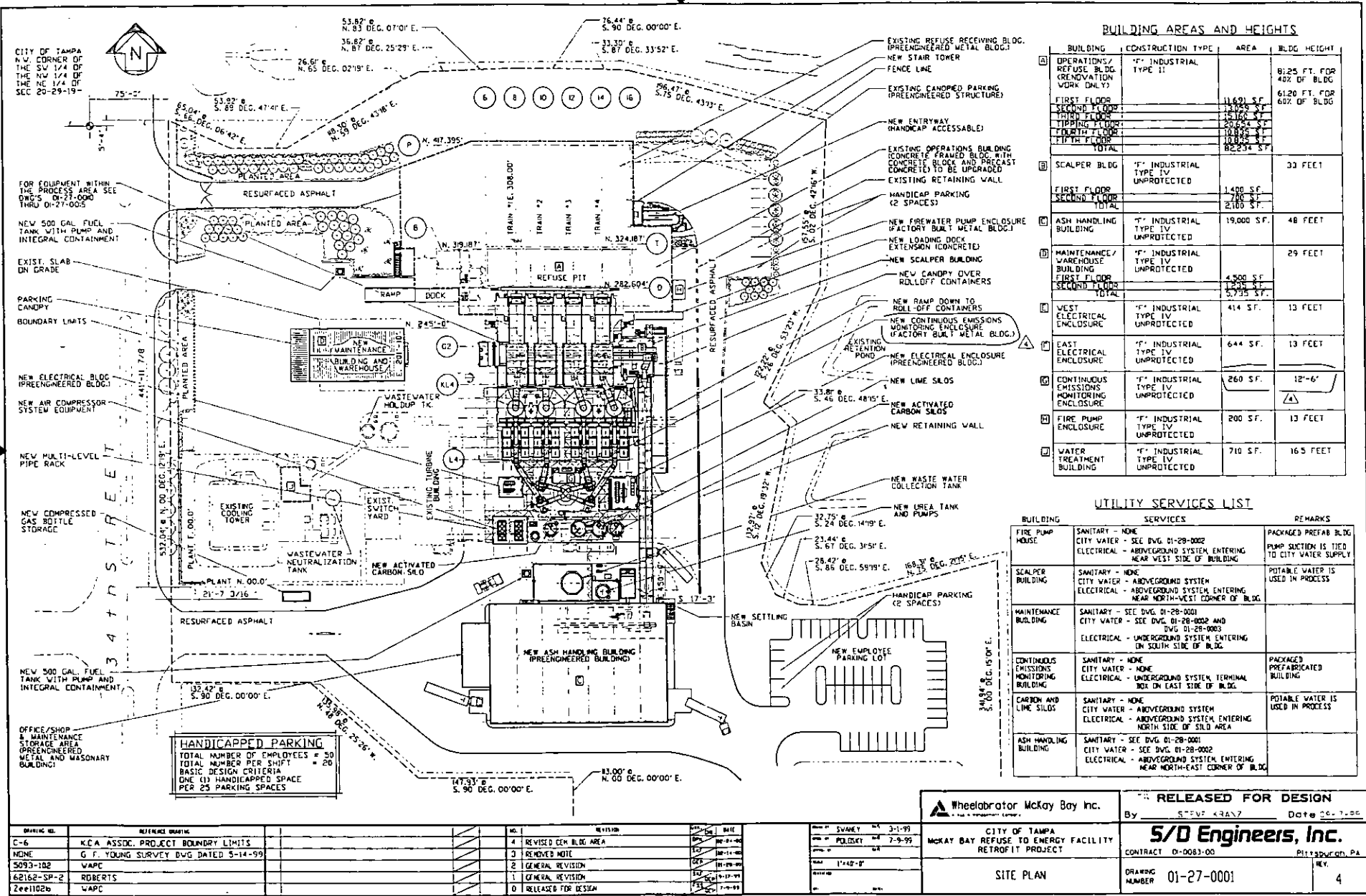


DRAWING NO.	REFERENCE DRAWING	NO.	REVISION	DATE	NO.	REVISION	DATE
01-31-0011	ASH HANDLING BLDG. - PLAN & ELEVATIONS & DETAILS	1	RELEASED FOR BID	1-21-99			
01-31-0011	ASH HANDLING BLDG. - LIGHTING & HVAC PLAN	0	RELEASED FOR CONSTRUCTION	9-3-99			
01-31-0010	ASH HANDLING BLDG. - GENERAL ARRANGEMENT PLAN	1	RELEASED FOR CONSTRUCTION	9-11-99			
01-30-0014	FIRE PROTECTION SYSTEM GA. - ASH HANDLING BLDG.	2	RELEASED FOR CONSTRUCTION	10-23-99			

NO.	DATE	BY	CHKD.
1	2-24-99	L. MEUSER	
2	9-3-99	SCHARNKEY	
3	9-11-99	SCHARNKEY	
4	10-23-99		

Wheelabrator McKay Bay Inc.
 CITY OF TAMPA
 MCKAY BAY REFUSE TO ENERGY FACILITY
 RETROFIT PROJECT
 ASH HANDLING BUILDING
 HVAC & SCRUBBER PLAN

RELEASED FOR CONSTRUCTION
 By: [Signature] Date: 10-26-99
S/D Engineers, Inc.
 CONTRACT: 01-0083-00
 DRAWING NUMBER: 01-31-0018
 PLYMOUTH, PA. 19104
 2



BUILDING AREAS AND HEIGHTS

BUILDING	CONSTRUCTION TYPE	AREA	BLDG HEIGHT
A OPERATIONS / REFUSE BLDG (RENOVATION WORK ONLY)	"F" INDUSTRIAL TYPE II		81.25 FT. FOR 40% OF BLDG
		FIRST FLOOR	61.20 FT. FOR 60% OF BLDG
		SECOND FLOOR	
		THIRD FLOOR	
		FIFTH FLOOR	
B SCALPER BLDG	"F" INDUSTRIAL UNPROTECTED	1,400 SF	33 FEET
C ASH HANDLING BUILDING	"F" INDUSTRIAL TYPE IV UNPROTECTED	FIRST FLOOR	19,000 SF
		SECOND FLOOR	2,100 SF
D MAINTENANCE / WAREHOUSE BUILDING	"F" INDUSTRIAL TYPE IV UNPROTECTED	FIRST FLOOR	4,800 SF
		SECOND FLOOR	1,200 SF
E WEST ELECTRICAL ENCLOSURE	"F" INDUSTRIAL TYPE IV UNPROTECTED	414 SF.	13 FEET
F EAST ELECTRICAL ENCLOSURE	"F" INDUSTRIAL TYPE IV UNPROTECTED	644 SF.	13 FEET
G CONTINUOUS EMISSIONS MONITORING ENCLOSURE	"F" INDUSTRIAL TYPE IV UNPROTECTED	260 SF.	12'-6"
H FIRE PUMP ENCLOSURE	"F" INDUSTRIAL TYPE IV UNPROTECTED	200 SF.	13 FEET
I WATER TREATMENT BUILDING	"F" INDUSTRIAL UNPROTECTED	710 SF.	16.5 FEET

UTILITY SERVICES LIST

BUILDING	SERVICES	REMARKS
FIRE PUMP HOUSE	SANITARY - NONE CITY WATER - SEE DWG. 01-28-0002 ELECTRICAL - ABOVEGROUND SYSTEM ENTERING NEAR WEST SIDE OF BUILDING	PACKAGED PREFAB BLDG PUMP SECTION IS TIED TO CITY WATER SUPPLY
SCALPER BUILDING	SANITARY - NONE CITY WATER - ABOVEGROUND SYSTEM ENTERING NEAR NORTH-WEST CORNER OF BLDG	POTABLE WATER IS USED IN PROCESS
MAINTENANCE BUILDING	SANITARY - SEE DWG. 01-28-0001 CITY WATER - SEE DWG. 01-28-0002 AND DWG. 01-28-0003 ELECTRICAL - UNDERGROUND SYSTEM ENTERING IN SOUTH SIDE OF BLDG	
CONTINUOUS EMISSIONS MONITORING BUILDING	SANITARY - NONE CITY WATER - NONE ELECTRICAL - UNDERGROUND SYSTEM TERMINAL BOX IN EAST SIDE OF BLDG	PACKAGED PREFABRICATED BUILDING
CARBON AND LINE SILDS	SANITARY - NONE CITY WATER - ABOVEGROUND SYSTEM ENTERING NORTH SIDE OF SILD AREA	POTABLE WATER IS USED IN PROCESS
ASH HANDLING BUILDING	SANITARY - SEE DWG. 01-28-0001 CITY WATER - SEE DWG. 01-28-0002 ELECTRICAL - ABOVEGROUND SYSTEM ENTERING NEAR NORTH-EAST CORNER OF BLDG	

HANDICAPPED PARKING
 TOTAL NUMBER OF EMPLOYEES = 50
 TOTAL NUMBER PER SHIFT = 20
 BASIC DESIGN CRITERIA
 ONE (1) HANDICAPPED SPACE
 PER 25 PARKING SPACES

NO.	REVISION	DATE
4	REVISED GEN BLDG AREA	01-24-99
3	REMOVED NOTE	01-24-99
2	GENERAL REVISION	01-20-99
1	GENERAL REVISION	01-17-99
0	RELEASED FOR DESIGN	01-14-99

Wheelabrator McKay Bay Inc.

RELEASED FOR DESIGN
 By: *[Signature]* Date: 01-27-99

CITY OF TAMPA
 MCKAY BAY REFUSE TO ENERGY FACILITY
 RETROFIT PROJECT

S/D Engineers, Inc.
 CONTRACT: 01-0081-00 PLYMOUTH, PA

SITE PLAN

DRAWING NUMBER: 01-27-0001 REV. 4