State of Florida
Department of Environmental Regulation

District Routing Slip

To: Phil Barbaccia Date: 3/2/93

			CC To:
	Pensacola	**Northwest District**	
	Panama City	Northwest District Branch Office	
	Tallahassee	Northwest District Branch Office	
	Apalachicola	Northwest District Satellite Office	
	Tampa	**Southwest District**	
	Bartow	Southwest District Satellite Office	
	Venice	Southwest District Satellite Office	
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	Melbourne	Central District Satellite Office	
	Jacksonville	**Northeast District**	
	Gainesville	Northeast District Branch Office	
X	**Fort Myers**	**South District**	
	Punta Gorda	South District Branch Office	
	Marathon	South District Branch Office	
	West Palm Beach	**Southeast District**	
	Port St. Lucie	Southeast District Branch Office	

Reply Optional ☐ Reply Required ☐ Info Only ☒
Date Due _____ Date Due: _____

MAR 05 1993

Comments:

FYI

From: Tom Mooc Tel.: SC 292-6104

Lee COUNTY

BOARD OF COUNTY COMMISSIONERS

John E. Manning
District One

Douglas R. St. Cerny
District Two

Ray Judah
District Three

Franklin B. Mann
District Four

John E. Albion
District Five

William H. Hammond
Acting Deputy County Administrator

James G. Yaeger
County Attorney

Diana M. Parker
County Hearing Examiner

P.O. Box 398
Fort Myers, Florida 33902-0398
(813) 335-2111
(813) 338-3100

Writer's Direct Dial Number
SL-93-062

February 19, 1993

Ms. Jan Rae Clark
Solid Waste Division
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, FL 32399-2400

Dear Ms. Clark:

Please accept this letter as Lee County's authorization for Ogden Martin Systems of Lee, Inc., to make application on Lee County's behalf for qualifying certain components of the County's resource recovery facility as exempt from sales and use taxes under Chapter 212, Florida Statutes.

Ogden Martin Systems of Lee, Inc., is the County's general contractor for the construction of the County's 1200 ton per day waste-to-energy facility and is authorized pursuant to the terms of the existing Construction Agreement with the County to make such application on the County's behalf.

In the event you have any questions concerning the authorization set forth herein, please feel free to contact me.

Sincerely,

DEPARTMENT OF SOLID WASTE MANAGEMENT

Larry A. Johnson

Larry A. Johnson, P. E.
Director

LAJ:sln

cc: Joe Treshler, Ogden Martin Systems, Inc.
Peter Young, Ogden Martin Systems of Lee, Inc.
David Owen
II A 204

OGDEN MARTIN SYSTEMS, INC.

P. O. BOX 709
BRANDON, FL 33509-0709

AN OGDEN PROJECTS COMPANY

JOSEPH R. TRESHLER
VICE PRESIDENT
GENERAL MANAGER

(813) 684-5688
FAX (813) 684-7964

February 23, 1993

Ms. Jan Rae Clark
Solid Waste Division
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Rd.
Tallahassee, FL 32399-2400

RE: Lee County Solid Waste Resource Recovery Facility

Dear Ms. Clark:

Please find attached four signed original copies of the Application for Preliminary Examination of Resource Recovery and Recycling Equipment for the above-stated project. Ogden Martin Systems of Lee, Inc. is filing this Preliminary Application on behalf of Lee County, Florida, the owner of this facility. In preparing our application, we have followed the same procedures utilized for the evaluation of the Pasco County Resource Recovery Facility recently reviewed and certified by your department. Please advise us of any questions or comments you have concerning this application or any additional information you need to complete your evaluations.

Thank you for your assistance in this matter.

Best Regards,

Joseph R. Treshler

JRT/pg

cc: Larry Johnson
Lindsey Sampson

jrt93037

Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Virginia B. Wetherell, Secretary

March 3, 1993

Mr. Melton McKown
Florida Department of Revenue
Post Office Box 5139
Tallahassee, Florida 32399-0100

Dear Mr. McKown:

Enclosed is a copy of the Application for Preliminary Examination of resource recovery equipment at the Lee County Solid Waste Resource Recovery Facility. We are reviewing the application for compliance with Section 17-704.400, Florida Administrative Code. Our Preliminary Examination Report will be forwarded to you when complete.

Sincerely,

Tom Moore

Tom Moore
Environmental Specialist
Solid Waste Section

TM/grc

Enclosure

cc: Jan Rae Clark
Phil Barbaccia
File

Florida Department of Environmental Regulation

Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

Lawton Chiles, Governor

Virginia B. Wetherell, Secretary

March 3, 1993

Ogden Martin Systems of Lee, Inc.
40 Lane Road
P.O. Box 2615
Fairfield, NJ 07007-2615

Dear Mr. Young:

On March 2, 1993 we received your Application for Preliminary Examination of resource recovery equipment at the Lee County Solid Waste Resource Recovery Facility. We are proceeding to determine completeness of the application. Upon our determination of completeness, we will begin examination of the application.

Sincerely,

Tom Moore

Tom Moore
Environmental Specialist
Solid Waste Section

TM/grc

cc: Jan Rae Clark
Phil Barbaccia
Melton McKown
File

Florida Department of Environmental Regulation
Twin Towers Office Bldg. • 2600 Blair Stone Road • Tallahassee, Florida 32399-2400

DER Form # 17-704.900(1)
Form Title Ap.for Prelim. Exam, Final Exam. of Resource Recovery & Recycling Equipment
Effective Date August 14, 1990
DER Application No. (Filled in by DER)

Application for
[x] Preliminary Examination
[ ] Final Examination and Certification
of Resource Recovery and Recycling Equipment

An application for preliminary examination of proposed Resource Recovery equipment is required for issuance of preliminary examination report pursuant to Rule 17-704.400, Florida Administrative Code (F.A.C.). An application for final examination and certification is required for final examination and certification of Resource Recovery equipment, pursuant to Rule 17-704.410, F.A.C. An applicant may not apply for final examination and certification of Resource Recovery equipment before that equipment is installed.

1. Identity of Applicant

   Applicant's Name: Ogden Martin Systems of Lee, Inc. (OMSL)

   Mailing Address: 40 Lane Road P.O. Box 2615 Fairfield, NJ 07007-2615 Attn: Peter Young (on behalf of Lee County, FL)

   Phone Number: (201) 882-9000

2. a. Name of the facility or project: Lee County Solid Waste Resource Recovery Facility

   b. Construction permit number for the facility: PSD-FL-151 Lee County Building Dept. File #252898

   c. Street address of the facility (Main Entrance): 10500 Buckingham Rd. Ft. Myers, FL 33905

   d. Estimate the date when the facility or project will be ready for operation: February 1995

3. Name of the unit of local government that will eventually own or benefit from the resource recovery equipment:

   Lee County, FL (see Attachments, Section 3A)

   Attach proof of contractual agreement between the purchaser of the equipment and the unit of local government which is to benefit from or own the resource recovery equipment. (see Attachments, Section 3B)

4. Describe the resource recovery process (include technology used and materials or energy recovered): Attach descriptions (including blueprints, drawings, engineering plans, etc.) that will indicate where and how the equipment is integrated into the resource recovery process. (attach additional sheets, if necessary) The Facility utilizes "mass burn" technology to process 1200 tons per day of municipal solid waste and recovers steam, electrical energy and ferrous metals. For specific details see Attachment, Section 4A "Process & Technology Description", Section 4B "Process & Technology Specification, Section 4C "Preliminary Drawings".

5. Attach a numbered listing of equipment which the applicant declares is qualified resource recovery equipment subject to the exemption provisions of Rule 17-704.400, 17-704.410, 17-704.420, and 12A-1.001(27), F.A.C., using the format on page 3.
   a. Use the "Item No." column to sequentially number equipment on the list.
   b. Use the "Item Description" column to provide the name and a brief description of the equipment.
   c. Use the "Number of Pieces" column to indicate how many of this particular piece of equipment are being certified.
   d. Use the "Process Description" column to indicate the page number of the process description text where the equipment and it's function is described.

   If drawings are submitted as supporting documentation:
   e. Use the "Drawing Number" column to indicate the drawing number on which the equipment is shown.
   f. Use the "Drawing Item No." column to indicate what number on the drawing represents this piece of equipment.
   g. Use the "Equipment Cost" column to indicate the cost of the equipment.

Northwest District 160 Governmental Center Pensacola, Florida 32501-5794 904-436-8300
Northeast District Suite 200, 7825 Baymeadows Way Jacksonville, Florida 32256-7577 904-448-4300
Central District 3319 Maguire Blvd. Suite 232 Orlando, Florida 32803-3767 407-894-7555
Southwest District 4520 Oak Fair Blvd Tampa, Florida 33610-7347 813-623-5561
South District 2269 Bay St Fort Myers, Florida 33901-2896 813-332-6975
Southeast District 1900 S. Congress Ave., Suite A West Palm Beach, Florida 33406 407-433-2650

DER Form # 17-704.900(1)
Form Title Ap. for Prelim. Exam, Final Exam & Cert. of Resource Recovery & Recycling Equipment
Effective Date August 14, 1990
DER Application No. _____ (Filled in by DER)

6. Certification A shall be completed if the applicant wishes to certify only equipment appearing on the list in Rule 17-704.600, F.A.C.

Certification B shall be completed if the applicant wishes to certify equipment not appearing on the list in Rule 17-704.600, F.A.C., or equipment appearing on the list in Rule 17-704.600, F.A.C. together with auxiliary equipment.

Certification A

I hereby certify that the equipment contained herein is Resource Recovery Equipment as defined in Rule 17-704.200(12), F.A.C. I further certify that all of the equipment meets the criteria set forth in Rule 17-704.420, F.A.C., and all of the equipment appears on the list in Rule 17-704.600, F.A.C.

Signature of Purchaser

Name and Title

Date: _____

Certification B

I hereby certify that the equipment contained herein is Resource Recovery Equipment as defined in Rule 17-704.200(12), F.A.C. I further certify that the equipment, including all auxiliary equipment associated with that equipment, meets the criteria set forth in Rule 17-704.420, F.A.C.

Affix Seal Here

Signature of Professional Engineer

Joseph R. Treshler Vice President
Name and Title

Florida Registration No. 32074

Date 2/23/93

7. The undersigned applicant is aware that statements made in this form and attached exhibits constitute an application for certification of Resource Recovery equipment from the Florida Department of Environmental Regulation. The applicant certifies that the information in this application is true, correct, and complete to the best of his knowledge and belief.

Signature of Applicant

Peter Young Project Manager
Name and Title

Date 2/22/93

An applicant shall submit four (4) copies of the application to:

Environmental Administrator
Solid Waste Section
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32399-2400
904/922-6104

DER Form # 17-704.900(1)
Form Title Ap. for Prelim. Exam., Final Exam. & Cert. of Resource Recovery & Recycling Equipment
Effective Date August 14, 1990
DER Application No. _____ (Filled in by DER)

Listing of Major Equipment for Lee County Solid Waste Resource Recovery Facility (Facility Name)

Item No.	Item Description	Number of Pieces	Process Description, page reference	Drawing No.	Drawing Item No.	Equipment Cost
	A listing of the major equipment is provided in the attached Section 5A of this Application for Preliminary Examination. The estimated cost for this equipment is included in the attached Section 5B.					

APPLICATION OF PRELIMINARY EXAMINATION

RESOURCE RECOVERY EQUIPMENT

SECTION 3A

AUTHORIZATION TO FILE

ON BEHALF OF LEE COUNTY

APPLICATION OF PRELIMINARY EXAMINATION

RESOURCE RECOVERY EQUIPMENT

SECTION 3B

SUMMARY OF CONSTRUCTION AND

SERVICE AGREEMENTS

NEW ISSUE, BOOK-ENTRY ONLY

$197,245,000
Lee County, Florida

$179,245,000
Solid Waste System Revenue Bonds, Series 1991A

$18,000,000
Solid Waste System Revenue Bonds, Series 1991B

Dated: June 15, 1991

Due: October 1, as shown on the inside cover page hereof

The Series 1991A Bonds and the Series 1991B Bonds (collectively, the "1991 Bonds") are being issued by Lee County, Florida, pursuant to an Indenture of Trust, dated as of June 15, 1991, as amended and supplemented (the "Indenture"), from the County to NCNB National Bank of Florida, Tampa, Florida, as Trustee, to finance or reimburse the County for (1) a part of the cost of the design, acquisition and construction of a 1,200 ton per day County-owned mass burn solid waste disposal/resource recovery and electric generation facility (the "Facility"), and (2) related costs, which will comprise a part of the Solid Waste System of the County (the "System"). The Facility will be designed, constructed and operated by Ogden Martin Systems of Lee, Inc. (the "Contractor") pursuant to a Construction Agreement and a Service Agreement. The Contractor is an indirect subsidiary of Ogden Corporation, which will guarantee the obligations of the Contractor under the Construction Agreement and the Service Agreement.

The 1991 Bonds are the first two Series of Bonds to be issued under and pursuant to the Indenture. The 1991 Bonds and any Parity Bonds issued under and pursuant to the Indenture will be secured by and payable solely from (1) the Net Revenues and other payments and receipts to be derived by the County from the operation, sale, lease or other disposition of the System, (2) moneys on deposit in the herein described Pledged Funds and Accounts established under the Indenture, including the investments, if any, thereof, and (3) any and all other funds, moneys and property of any kind from time to time hereafter pledged as additional security under the Indenture by supplemental indenture or delivered to the Trustee (collectively, the "Trust Estate"). Payment of the principal of and interest on each Series of the 1991 Bonds is guaranteed under separate policies of municipal bond insurance issued by:

MBIA

The 1991 Bonds are being issued as fully registered bonds, and, when issued, will be registered in the name of Cede & Co., as nominee for The Depository Trust Company, New York, New York ("DTC"), which will act as securities depository for the 1991 Bonds. The 1991 Bonds will be in principal denominations of $5,000 and integral multiples thereof. Purchasers will not receive physical delivery of the 1991 Bonds. A Beneficial Owner (as defined herein) must maintain an account with a DTC Participant or Indirect Participant (as defined herein) to receive payment of the principal of, redemption premium, if any, or interest on any 1991 Bond. Interest is payable semiannually on each April 1 and October 1, commencing October 1, 1991. The 1991 Bonds will be subject to optional redemption, extraordinary optional redemption and mandatory redemption prior to maturity as set forth herein.

THE AMOUNTS, MATURITIES, INTEREST RATES AND PRICES OR YIELDS ON THE 1991 BONDS ARE DESCRIBED ON THE INSIDE COVER HEREOF.

In the opinion of Bond Counsel, under existing statutes, regulations, rulings and court decisions, assuming continuing compliance with certain tax covenants, interest on the 1991 Bonds is excluded from gross income for federal income tax purposes, except for interest on any 1991 Bond during any period while such 1991 Bond is held by a "substantial user" or a "related person" within the meaning of Section 147(a) of the Internal Revenue Code of 1986, as amended. However, see "TAX EXEMPTION" herein for a description of the alternative minimum tax imposed on corporations and individuals and certain other federal tax consequences of ownership of the 1991 Bonds. Bond Counsel is further of the opinion that the 1991 Bonds and the interest thereon are exempt from taxation under the laws of the State of Florida, except as to estate taxes and taxes imposed by Chapter 220, Florida Statutes, on interest, income or profits on debt obligations owned by "corporations," "banks" and "savings associations," as defined therein.

The 1991 Bonds shall not constitute a general indebtedness of the County within the meaning of any constitutional or statutory provision or limitation, but shall be special obligations of the County payable solely from, and secured solely by, the pledge and lien on the Trust Estate as provided in the Indenture. Neither the faith and credit nor the ad valorem taxing power nor any other taxing power of the County, the State of Florida or any other political subdivision thereof is pledged to the payment of the principal, redemption premium, if any, or interest on the 1991 Bonds and neither the State of Florida nor any political subdivision thereof, other than the County, shall be obligated to pay the principal thereof, redemption premium, if any, or interest thereon.

The 1991 Bonds will be offered when, as and if delivered to the Underwriters, subject to the approval of the legality thereof by Greenberg, Traurig, Hoffman, Lipoff, Rosen & Quentel, P.A., Miami, Florida, Bond Counsel. Certain legal matters will be passed upon for the Underwriters by their counsel, Nabors, Giblin & Nickerson, P.A., Tampa, Florida. Certain legal matters will be passed upon for the County by James G. Yaeger, Esq., County Attorney. Certain legal matters will be passed upon for Ogden Martin Systems of Lee, Inc. and Ogden Corporation by their counsel, Nixon, Hargrave, Devans & Doyle, Washington, D.C. Winston & Strawn, Washington, D.C., has served as Special Negotiating Counsel to the County in connection with the Construction Agreement and Service Agreement. It is expected that the 1991 Bonds will be available for delivery in New York, New York, on or about June 27, 1991.

Smith Barney, Harris Upham & Co.
Incorporated

William R. Hough & Co.

AIBC Investment Services Corp.

Pryor, McClendon, Counts & Co., Inc.

Dated: June 21, 1991

Summary of Construction and Service Agreements

Construction Agreement

The County and the Contractor have entered into the Construction Agreement. The price of the Facility under the Construction Agreement inclusive of Change Order No. 2 is $126,020,000 (the "Facility Price"), subject to escalation after March 1, 1992 to the date on which the County provides the Contractor with a Notice to Proceed (the "Construction Date"). The Facility Price is also subject to downward adjustment in the event automatic sprinklers are not required in the boiler building and air pollution control building. The Construction Date occurred on October 28, 1992. The Facility Price may also be adjusted due to an Uncontrollable Circumstance, a County Fault or a County-initiated change order. The obligations of the contractor under the Construction Agreement are guaranteed by Ogden, of which the Contractor is a third tier subsidiary. As additional security for the obligations of the Contractor under the Construction Agreement, the Contractor will post with the County, in lieu of a performance and payment bond, a letter of credit in the maximum stated amount of $130,000,000 upon which the Trustee, on behalf of the County, may draw in the event of a default by the Contractor under the Construction Agreement in an amount up to the Facility Price. The letter of credit will be released by the Trustee upon the later to occur of the Acceptance Date or the resolution of any material disputes under the Construction Agreement.

The Construction Agreement provides for Acceptance to occur no later than 821 days (approximately 27 to 28 months) from the Construction Date (the "Scheduled Acceptance Date"). The Scheduled Acceptance Date is subject to extension for delays due to Uncontrollable Circumstances, County Fault or County-initiated change orders. the term "Uncontrollable Circumstances" includes such occurrences as acts of God (except normal weather conditions); court orders, injunctions, or judgements; failure to issue or obtain the necessary permits, licenses, or authorizations required for construction or operation; loss of necessary utilities; default in the Power Purchase Agreement; a change in law; unavailability of a landfill sufficient for disposal of all Residue; certain failure of subcontractors or suppliers to furnish services, material or equipment if such failure is caused by an Uncontrollable Circumstance, materially adversely affects the Contractor's ability to perform its obligations and the contractor is not able reasonably to obtain substitute services, material or equipment in a timely manner. If Acceptance does not occur by the Scheduled Acceptance Date (and not due to Uncontrollable Circumstances, County Fault or County-initiated change orders), the Contractor may utilize a period not to exceed 548 days (approximately 18 to 19 months) to achieve acceptance (the "Extension Period"). During the Extension Period, the Contractor must pay the County damages relating to outstanding debt service on the Series 1991A Bonds during such period and landfill charges on waste disposed in a

landfill. The Contractor will not receive the Operation and Maintenance Charge under the Service Agreement, but is entitled to the Energy Revenues during the Extension Period.

Acceptance will occur when the Contractor demonstrates through testing that the Facility meets the Full Acceptance Standard which includes meeting the Daily Guaranteed Capacity (1,200 tons of waste per day), the Effluent Guarantee and the Environmental Guarantee. At the option of the Contractor, Acceptance can occur if, at any time prior to the Scheduled Acceptance Date through the end of the extension Period, the Facility does not meet the Daily Guaranteed Capacity, but at least meets the Minimum Acceptance Standard. The Minimum Acceptance Standard is 85% of the Daily Guaranteed Capacity (1,020 tons per day) and 100% of the Effluent Guarantee and the Environmental Guarantee. If, at any time prior to the Scheduled Acceptance Date, or at any time during the Extension Period, the Contractor certifies operation between the Minimum and Full Acceptance Standards, the Facility will be accepted at the derated level and the Contractor will pay the Derated Facility Payment. If at the end of the Extension Period the Facility cannot meet the Minimum Acceptance Standard, the Contractor will be in default under the Construction Agreement.

The "Derated Facility Payment" is the percentage reflecting the difference between the actual processing capacity and the Daily Guaranteed Capacity (the "Shortfall Percentage") times the sum of the principal amount of all Series 1991A Bonds and any Additional Bonds then Outstanding issued for Work Changes relating to the Facility plus the County Contribution, less the amount of such Bonds which would have been redeemed from excess proceeds pursuant to the Indenture but for the Derated Facility Payment. In addition, the Initial Operation and Maintenance Charge contained in the Service Agreement would also be reduced by the Shortfall Percentage.

If there is a termination of the Construction Agreement for an Event of Default by the Contractor, the Contractor will be obligated to pay to the County, as liquidated damages, the amount necessary to defease the Series 1991A Bonds then Outstanding and any Additional Bonds relating to the Facility then Outstanding issued to finance the cost of Work Changes (taking into account any Derated Facility Payment), plus the County Contribution, plus all Direct Costs incurred by the County with respect to the termination, excluding remedies such as covering disposal costs or alternate facility costs (but including any cancellation costs), less funds from such Bond proceeds and insurance proceeds which are available under the terms of the Indenture for the redemption of Outstanding Bonds. If the Contractor is required to pay the County the foregoing amount, then it may, at its sole option, elect to occupy the Facility site for a period of one year from the effective date of termination of the Service Agreement, during which period of time the Contractor shall be permitted to salvage and sell any component of the Facility. If there is a termination of the Construction Agreement for an Event of Default on the part

of the County, then the County will be obligated to pay to the Contractor any amounts due under the drawdown schedule as of termination, all Direct Costs incurred in the termination, plus five million dollars ($5,000,000) liquidated damage, less any adjustment favorable to the County.

Technical disputes arising under the Construction Agreement and involving engineering judgement with an estimated cost of $2,000,000 or less are required to be resolved by binding arbitration conducted by the Independent Engineer. Any dispute involving amounts over $2,000,000 (except for events of default), may be submitted to the Independent Engineer for arbitration or shall be subject to judicial resolution.

Service Agreement

The County and the Contractor have entered into the Service Agreement. Unless earlier terminated in accordance with the provisions of the Service Agreement, the term of the Service Agreement will be for twenty years commencing upon the Acceptance Date. Pursuant to the Service Agreement, the Contractor is responsible, at its sole cost and expense, to provide management, supervision, personnel, materials, equipment, services and supplies (other than waste) necessary for the operation, maintenance and repair of the Facility, including repair and replacement due to design and construction errors and omissions and for the guaranteed performance of the Facility for processing Solid Waste and generating electricity. The Contractor's obligations under the Service Agreement are unconditionally guaranteed by Ogden.

The Service Agreement requires the County to pay the Contractor a monthly Service Fee. The Service Fee is comprised of one-twelfth of the annual Operation and Maintenance Charge, plus Pass Through Costs and the Energy Credit, less Recovered Resources Revenues, the Landfill Charge and Monthly Damages, plus the Monthly Adjustment. The Initial Operation and Maintenance Charge under the Service Agreement is $5,631,496, plus $9.245 for each ton by which the Guaranteed Tonnage exceeds 279,225 up to a maximum Guaranteed Tonnage of 372,300 at which point the total becomes $6,491,995, adjusted from August 1, 1990 in accordance with certain indices set forth in the service Agreement, and is also subject to upward or downward adjustment for, among other things, the processing of waste in excess of the Guaranteed Tonnage, Uncontrollable Circumstance, County Fault, Contractor Fault or Derated Capacity.

Under the Service Agreement, the Contractor is also obligated to pay damages incurred by the County, calculated pursuant to the Service Agreement, as the result of a failure to satisfy the Energy Efficiency Guarantee, the Residue Quality Guarantee, the Annual Average Electrical Guarantee, excess utility and reagent utilization, environmental fees and penalties, Ferrous Metal Guaranty and Capacity Guaranty.

The County will annually guarantee the Contractor that it will deliver an amount of tons which shall not exceed 372,300 tons per year of Processible Waste to the Facility (the "Guaranteed Tonnage").

The Service Agreement contains both a Daily Guaranteed Capacity and an annual Processing Guarantee, both of which are subject to Uncontrollable Circumstances and County Fault. The Daily Guaranteed Capacity requires that the Contractor operate the Facility so that it is capable of processing 1,200 tons per day of Processible Waste and the Annual Processing Guarantee requires that the Contractor operate the plant in order to process at least 372,300 tons per year. In addition, the Contractor guarantees subject to Uncontrollable Circumstances and County Fault, that the Facility shall be operated and maintained so as to generate net saleable electric energy per ton of Processible Waste Processed at least equal to the Annual Average Energy Guarantee. Verification of continued efficient Facility operations will be based upon a daily monitoring and recording of the Operating Parameters established in the Service Agreement. The Contractor shall provide the County with a compilation of all such Operating Parameters and any noncompliance with any applicable air quality permit conditions with each monthly invoice for payment of the Service Fee. At any time the County can require tests to determine if the performance guarantees are being met.

The Service Agreement obligates the County to take reasonable steps to prevent the delivery of Hazardous Waste or infectious waste to the Facility and requires the Contractor to use reasonable efforts to avoid the deposit or acceptance of Hazardous Waste or infectious waste at the Facility. The responsibility for the removal, transport and disposal of Hazardous Waste delivered to the Facility is the County's.

Providing a landfill is the responsibility of the County. Under the Service Agreement, the County is obligated to transport all nonprocessible waste and residue to the Regional Landfill, which will be disposed of by the County. If the Contractor is unable to meet the Daily or Annual Processing Guarantees and is forced to reject Processible Waste ("Bypassed Waste") the Contractor will be obligated to pay the County, on a per ton basis, for use of a landfill through an adjustment to the Service Fee.

Upon termination of the Service Agreement as the result of an Event of Default thereunder by the Contractor, the County may elect either of the following remedies:

(1) Require the Contractor to pay the County, as liquidated damages, an amount sufficient to defease the Series 1991A Bonds then Outstanding, plus any Additional Bonds issued to finance Capital Projects which are then Outstanding, plus the County Contribution, less funds from such Bond proceeds and insurance proceeds which are available under the terms of the Indenture for the redemption of all or a portion of the Outstanding Bonds. If

the Contractor is required to pay the County the foregoing amount, then it may, at its sole option, elect to occupy the Facility site for a period of one year from the effective date of termination of the Service Agreement, during which period of time the Contractor shall be permitted to salvage and sell any component of the Facility.

(2) The County may choose to retain the Facility, in which case the Contractor shall make any repairs required and perform performance tests of the Facility to determine whether the Facility is capable of meeting the performance guarantees within 90 days of the date of termination. In the event the final performance tests demonstrate that the Facility does not meet such requirements, the Contractor shall pay to the County as liquidated damages $2,000,000, times each percent the performance tests demonstrate the Facility is below 96%, of the Daily Guaranteed Capacity at which the Facility was Accepted (but not in excess of the Full Acceptance Standard) as adjusted for Uncontrollable Circumstances, County Fault or a County-initiated Work Change. The Contractor must also meet 100% of the Environmental Guaranty for air emissions or pay damages equal to the Facility Price. The combined damages shall not exceed the Facility Price. The Contractor must also pay the cost of any repair to the sanitary sewage system. In addition, the Contractor must operate the Facility in accordance with the terms of the Service Agreement within said 90-day period and must pay the County $10,000,000 in liquidated damages if the termination notice occurs in the first 10 years following the Acceptance Date (declining $1,000,000 per year thereafter until such amount reaches a minimum of $2,000,000). Upon the termination of the Service Agreement and the exercise of the County of the option described in this paragraph (2), the Contractor must grant to the County any necessary patent licenses, copyrights or trade secrets necessary for the County to operate the Facility.

In the event that the County defaults and the Service Agreement is terminated, the County would be obligated to pay to the Contractor in an amount equal to: (1) any outstanding Service Fee due through the effective date of termination, plus (2) all Direct Costs incurred by the Contractor in connection with such termination, plus (3) any amounts expended by the Contractor for Capital Projects not theretofore recovered by the Contractor as part of its Service Fee, plus (4) $10,000,000, as liquidated damages if the termination occurs in the first 10 years following the Acceptance Date (declining $1,000,000 per year thereafter until such amount reaches a minimum of $2,000,000).

At least 12 months prior to the end of the term of the Service Agreement, the County is permitted to require that the Facility undergo performance tests. Based on such performance tests, the Contractor must pay the same liquidated damages for failure to meet the daily capacity, the Environmental Guaranty for air emissions and sanitary sewage as under termination for Contractor fault.

APPLICATION FOR PRELIMINARY EXAMINATION

RESOURCE RECOVERY EQUIPMENT

SECTION 4A

PROCESS AND TECHNOLOGY DESCRIPTION

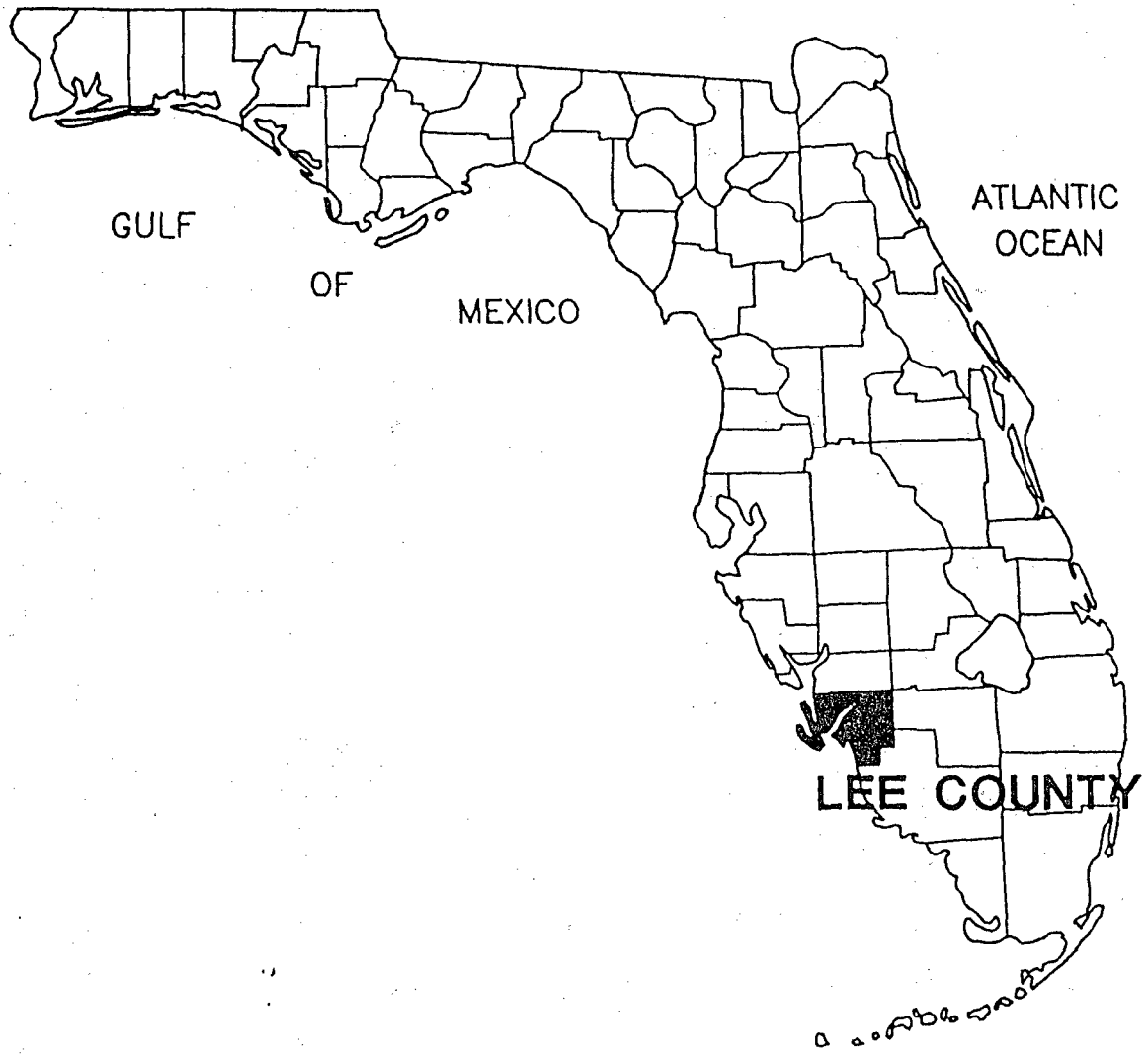
OF THE

LEE COUNTY SOLID WASTE RESOURCE RECOVERY FACILITY

THIS SECTION TAKEN DIRECTLY FROM THE CONSULTING ENGINEER'S FEASIBILITY REPORT, LEE COUNTY SOLID WASTE SYSTEM PREPARED BY CAMP, DRESSER & MCKEE, INC.

THIS SECTION IS NOT MARKED TO IDENTIFY EQUIPMENT QUALIFYING AS RESOURCE RECOVERY EQUIPMENT.

CONSULTING ENGINEER'S FEASIBILITY REPORT



LEE COUNTY SOLID WASTE SYSTEM

CAMP DRESSER & McKEE INC.
FT. MYERS, FLORIDA

environmental engineers, scientists, planners, & management consultants
CDM

Alternate Configuration

The Alternate Configuration of the Regional Landfill removes all landfilling from within 10,000 feet of the private airport. The design is the same as the Proposed Configuration with respect to the liner and leachate management system. The Class I cells would have approximately 16,000,000 (13,000,000 net of cover material) cubic yards of total volume and would meet the County's disposal needs without the Facility for approximately 10 years and with the Facility (assuming it begins operation in mid-1994, is expanded to 1,800 tpd in year 2002 and operates at the Full Performance Standard for 25 years) for approximately 25 years.

If the Alternate Configuration is required, modification, resubmittal and review of permit application documents would likely result in a six to nine month delay in the overall schedule identified above for the Proposed Configuration Regional Landfill.

THE FACILITY

The Facility is contracted to be designed to receive and combust, in an economic and environmentally sound manner, 1,200 tons per day of acceptable waste generated by residential, commercial and industrial sources. Two separate combustion units each consisting of a Martin Stoker and a boiler system are provided. Each combustion unit has a rated capacity of 600 tons per day and will generate steam from the heat released from the combustion of the refuse. The steam will then be converted by a steam turbine generator from heat energy to electric energy for sale and in-plant use.

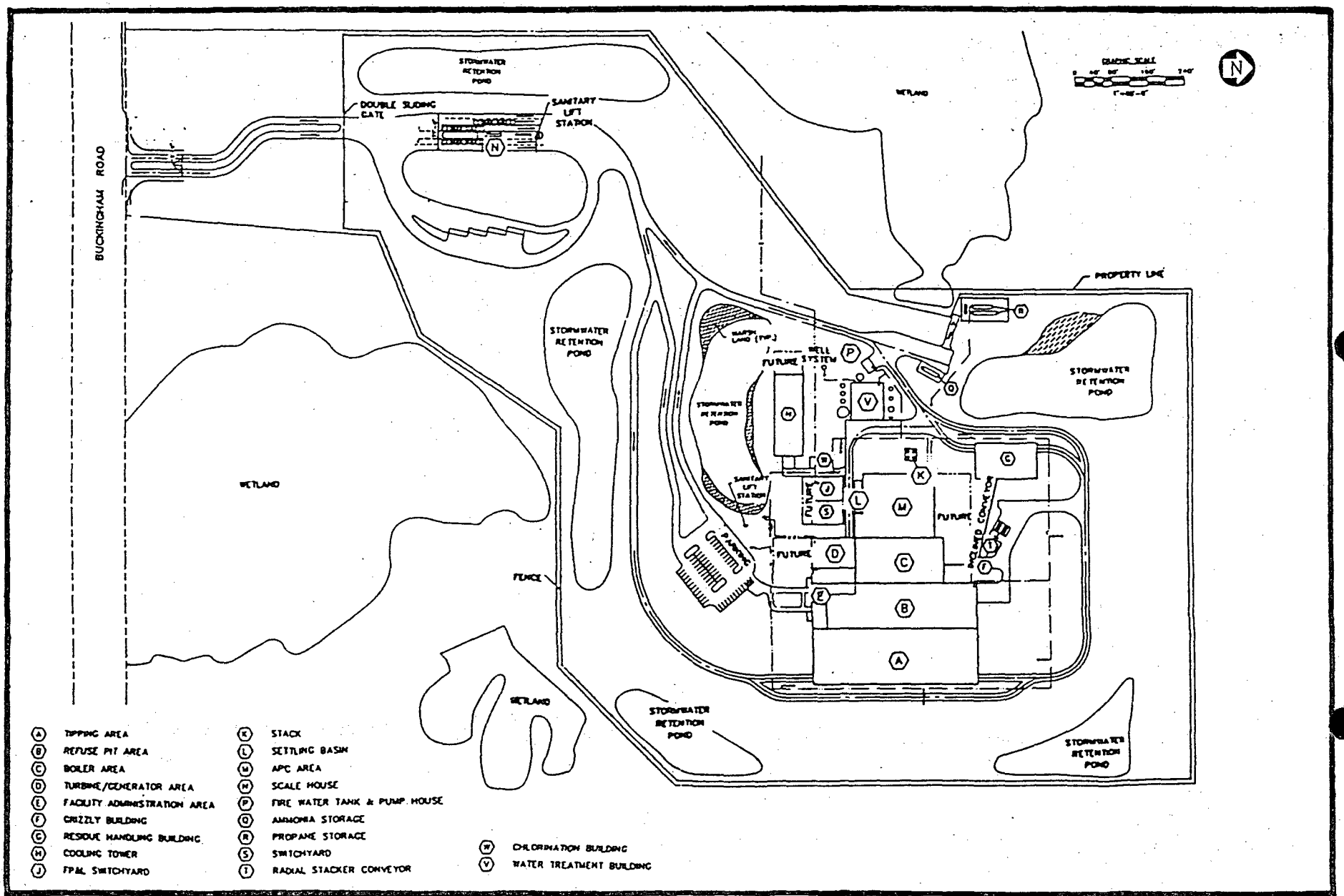
The Facility's design is based upon mass burn waterwall technology for the combustion of the refuse and will burn the refuse as delivered. The Facility will be similar to approximately 142 other facilities in operation worldwide, utilizing Martin technology, including 19 facilities in the United States. A plan view of the Facility Site and the Facility is shown on Figure 4. A cross sectional view of the Facility is shown on Figure 5.

Delivery and Charging

Refuse will be delivered to the Facility in standard packer vehicles, open body dump trucks, and transfer trailers with capacities up to 100 cubic yards. Deliveries will be accepted 10 hours each day, Monday through Saturday, excluding legal holidays.

Three automated truck scales, a totally enclosed scalehouse, and a computerized recordkeeping system will be provided to maintain an accurate accounting of all refuse delivered to and Residue removed from the Facility. The system will include the use of certified scales capable of recording the time, date, weight, and origin of each delivery. The County will operate the scale system.

After being weighed, refuse vehicles will proceed to the Facility tipping floor to discharge the refuse which will be stored in the refuse storage pit. The refuse storage pit has been sized to allow storage or stockpiling of refuse so that the Facility can continue to operate over weekends and holidays when deliveries will not be accepted. Approximately 5,400 tons of



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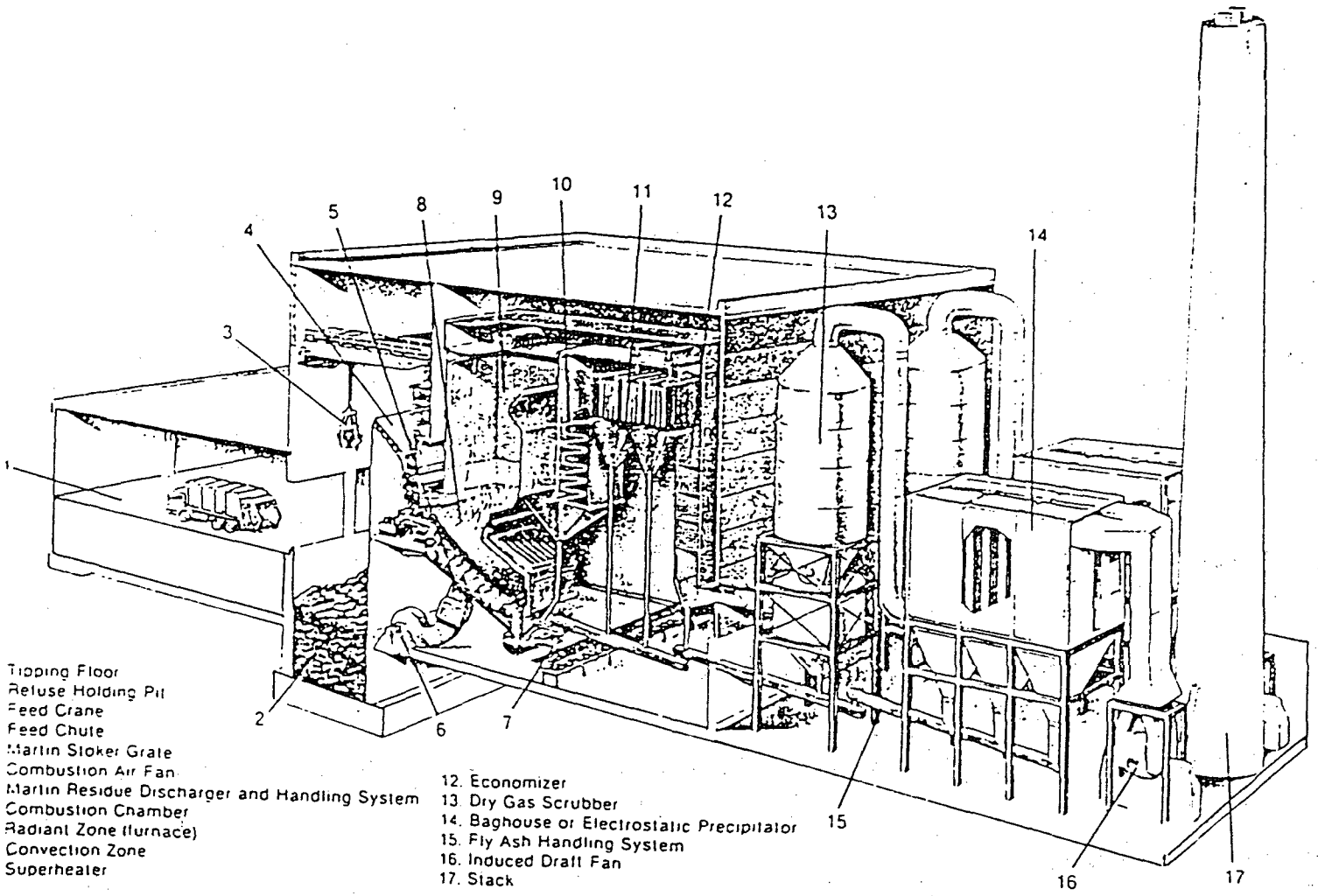
SOLID WASTE/RESOURCE RECOVERY SYSTEM
LEE COUNTY, FLORIDA

Proposed Facility Site Plan FIGURE 4



1. Tipping Floor
2. Refuse Holding Pit
3. Feed Crane
4. Feed Chute
5. Martin Stoker Grate
6. Combustion Air Fan
7. Martin Residue Discharger and Handling System
8. Combustion Chamber
9. Radiant Zone (furnace)
10. Convection Zone
11. Superheater
12. Economizer
13. Dry Gas Scrubber
14. Baghouse or Electrostatic Precipitator
15. Fly Ash Handling System
16. Induced Draft Fan
17. Stack

CAMP DRESSER & McKEE INC.

environmental engineers, scientists, planners, & management consultants CDM

SOLID WASTE/RESOURCE RECOVERY SYSTEM

LEE COUNTY, FLORIDA

Proposed Typical Cross Sectional View Of The Facility

FIGURE 5

solid waste storage, at a density of 550 pounds per cubic yard, is provided. From the pit, the refuse is lifted by one of two overhead cranes and loaded into one of two combustion unit feed chute hoppers. After being charged into the feed chute hoppers, the refuse is then metered out from the bottom of the feed chutes by hydraulic ram feeders onto the Martin stoker grates.

The design of the Facility provides for the combustion air necessary to combust the refuse to be drawn from above the storage pit area of the Facility. This action will draw fresh air from outside the building into the tipping floor area, resulting in a relatively dust and fume free atmosphere for the vehicle drivers, and will assist in controlling the escape of odorous air from the Facility.

Stoker Grate

The reverse-reciprocating action of the Martin stoker grate agitates the refuse fuel bed continuously in a manner which causes refuse to burn from the bottom of the refuse bed, resulting in a burnout of approximately 96 percent or more of all combustible matter.

The stoker grate will be inclined downward from the feed end toward the discharge end, and will consist of alternating rows of fixed and moving grate bars. The moving grate bars push upward against the natural gravitational movement of the refuse at 30 to 50 strokes per hour. This movement agitates the burning refuse to form an even depth of fuel bed.

Burning refuse is pushed back under the freshly fed refuse to achieve continuous drying, volatilization, ignition, and combustion. A series of plenum chambers under the stoker grate admits primary combustion air at rates controlled to suit the combustion conditions of each burning zone. Secondary or overfire air will be provided through nozzles located in the front and rear furnace walls. Each stoker includes an automatic grate siftings removal system which conveys the siftings to the residue dischargers. Each stoker is furnished with a proprietary Martin residue discharger, which receives the burned out bottom ash material as it falls over the residue roller into a quench chamber.

Residue Ash Handling System

The ash handling system is completely enclosed. Bottom ash and grate siftings from the combustion units are collected and quenched in the quench tank of the proprietary Martin residue dischargers. From the quench tank, a hydraulically driven ram pushes the Residue up an inclined draining/drying chute, and any excess water from the Residue drains back into the quench bath. The Residue then falls onto the main Residue conveyor. Fly ash and spent scrubber reagent are collected in the air pollution control equipment and are directed to the Martin residue discharger where it is also quenched and combined with the quenched bottom ash and grate siftings. The main Residue conveyor feeds a scalper screen to remove large materials before the Residue is transferred by an enclosed belt conveyor to the residue processing and storage building. Residue from the belt conveyor will pass under a magnetic drum which separates the ferrous metal from the ash. The ferrous then passes through a trommel to

dislodge ash adhering to the metal. A distributing conveyor and chute system will deposit the ash in appropriately sized storage bunkers, and the ferrous is dropped from the trommel into a separate storage area. Processed Residue will be loaded into trucks by a front-end loader for ultimate disposal in the Regional Landfill.

Furnace and Boiler

Located above the stoker grate will be the boiler furnace/combustion chamber constructed of gas-tight, continuously welded waterwalls down to the grate surface. In the combustion chamber, all unburned gasses will be fed back under the rear arch directly into the high temperature combustion zone to complete the combustion process. The combustion chamber exit temperature will be sufficiently high to destroy odorous vapors. At the furnace throat, where the high intensity combustion takes place, closely spaced, high pressure overfire air jets on the front and rear furnace walls cause flame turbulence to help prevent stratification of unburned gasses such as carbon monoxide and hydrocarbons, thus assisting in more complete combustion before passing into the subsequent boiler sections and superheaters. This design is in compliance with good combustion practices which are recommended to minimize the production of dioxins and furans.

At full load, the boiler (first pass) will be designed to provide for flue gas exit temperatures below 1,900°F before entering the waterwall panel construction multiple pass boiler section. The temperature of the flue gas leaving the boiler and entering the superheater will be maintained under 1,300°F. This will help prevent slagging and subsequent corrosion of the superheater tubes, which results from the fusion of fly ash at temperatures above 1,300°F. The superheater will be divided into four sections and will be located downstream of the boiler bank sections. Superheater temperature control will be completely automatic. Steam properties will be about 865 psig and 830°F at the superheater outlet. The combustion gas leaving the superheater will enter into the serpentine-configuration economizer sections. The economizer will be constructed from carbon steel tubes, with sufficient clearance between the tubes to help prevent plugging. To help deliver maximum heat recovery, automatically sequenced rotary and retractible type sootblowers are provided to aid in gas side cleaning of the superheater and the economizer tubes.

Each combustion unit will be equipped with reagent injection nozzles as part of the Selective Non-Catalytic Reduction (SNCR) system. The system will be based on the injection of ammonia (Thermal DeNo$_x$) or urea into one or more temperature zones in the furnace. Each combustion unit will have an independent SNCR injection system designed for continuous operation at maximum continuous rating (1,200 tpd) and to provide a stack NO_x concentration of 0.292 lb/MMBtu (180 ppmdv at 7 percent O_2).

Each combustion unit will also have injection nozzles as part of a mercury reduction sorbent injection system to provide for the injection of activated carbon, sodium sulfide or other chemical reagent as the medium to provide for further reduction of mercury emissions.

After the flue gasses leave the economizer, they pass through a dry scrubber and fabric filter baghouse for the removal of acid gas and particulates. The dry scrubber will reduce the chloride gasses by about 95

percent, and oxides of sulfur by approximately 85 percent. The baghouse, designed for high particulate collection efficiency, will provide for stack flue gas emissions with a maximum outlet particulate matter content of 0.010 grains per dry standard cubic foot ("gr/dscf"), corrected to 7 percent O_2. After the flue gases have been cleaned, they will be discharged to the atmosphere through a square, two-flue, single-shell, 275-foot high stack. The stack will have space for a third flue for use if the Facility is expanded.

Steam and Electric Generator System

The high pressure, superheated steam generated in the boilers will be supplied by the main steam header to the steam turbine generator where electricity will be produced for in-plant use and export to FPL. Steam required for inplant use will be extracted from the turbine.

The steam turbine generator system will consist of one multistage, condensing unit with multiple uncontrolled extraction points, sized to handle 100 percent of the total facility steamflow. It will have a nameplate rating of approximately 39.7 MW with full turbine throttle flow resulting from the steam production at 1,200 tons per day of approximately 5,000 Btu/lb refuse. The inlet throttle steam conditions for the turbine will be 850 psig and 825°F. The turbine is designed to exhaust steam to a surface condenser at a design pressure of 2.6 inches Hg absolute and annual average pressure of 2.3 inches Hg absolute. This system is contracted to meet all design and operational requirements for interconnection and delivery of electricity to FPL.

The steam from the uncontrolled extraction points of the turbine will be supplied to the feedwater heaters, deaerator and combustion air preheater. From the turbine, steam will pass to the surface condenser. The surface condenser is designed to accept full turbine exhaust flow when the Facility is operating at 1,200 tons per day with refuse having a heating value of 5,000 Btu/lb.

The steam generating equipment can be operated independently of the electric generating equipment by directing the superheater outlet steam to the bypass condenser. Thus, the Facility has the capability to combust solid waste at full rated capacity even when the turbine generator is shut down.

A circulating water system will be provided to furnish the cooling medium for the steam surface condenser, the bypass condenser, and the auxiliary equipment requiring cooling water. A multiple cell wet cooling tower, configured to allow each cell to be effectively operated independently of each other, will be furnished. This arrangement provides for desired operational flexibility and reliability. The cooling tower makeup water supply, along with other process water, will be taken from the treated wastewater effluent supplied by the City of Ft. Myers. The use of treated wastewater effluent for cooling tower makeup has been successfully employed in mass burn facilities operating in Pinellas County, the City of Tampa, Hillsborough County, and Pasco County, Florida, and Bristol, Connecticut.

APPLICATION FOR PRELIMINARY EXAMINATION

RESOURCE RECOVERY EQUIPMENT

SECTION 4B

PROCESS AND TECHNOLOGY SPECIFICATION

OF THE

LEE COUNTY SOLID WASTE RESOURCE RECOVERY FACILITY

CONTAINED IN SECTION 4B IS SCHEDULE 2 PART B OF THE CONTRACTUAL SPECIFICATIONS AND PROCESS DESCRIPTION FOR THE FACILITY.

THIS SECTION HAS BEEN MARKED TO IDENTIFY EQUIPMENT QUALIFYING AS RESOURCE RECOVERY EQUIPMENT.

THE ITEMS LINED OUT ARE NOT CONSIDERED TO BE RESOURCE RECOVERY EQUIPMENT, THE VALUE OF THESE EXCLUDED ITEMS HAS NOT BEEN INDICATED IN THE PROJECT VALUE REPORTED IN SECTION 5B OF THIS APPLICATION.

EXHIBIT A

SCHEDULE 2
PART B
SPECIFICATIONS
TABLE OF CONTENTS
VOLUME I

SCHEDULE 2
PART B
SPECIFICATIONS
TABLE OF CONTENTS
VOLUME I
(continued)

Pages 2B-3 and 2B-4 are not applicable to this submission.

1.0 INTRODUCTION

Schedule 2, Part B, describes the specifications Ogden Martin Systems of Lee, Inc. ("Ogden Martin") proposes for the design, construction and long term reliable operation of the Lee County, Solid Waste Resource Recovery Facility (Facility). This Schedule 2, Part B conforms to the anticipated requirements specified in Schedule 2, Part A to the Construction Agreement to be prepared and negotiated for a 1200 TPD Facility project. We have prepared a technical proposal which we feel is in conformity with the anticipated requirements of such a Schedule 2, Part A for a 1200 TPD Facility. We recognize conflicts may occur, and that any conflicts between Part A and Part B will be resolved in favor of Part A unless specifically addressed in our Schedule 2, Part B submittal.

In responding to this bid request, we have included in our three (3) volume Schedule 2, Part B submittal descriptions of major equipment, site work, buildings, etc., (as outlined in the provided Schedule 2, Part B, Table of Contents); the completed Proposal Form A - Equipment Specification Sheets; the completed Proposal Form B - Environmental Impact Data; the completed Proposal Form C - Major Equipment Replacement Schedule for the Facility; our independently conducted Contractor Geotechnical Investigation Report; the requested Drawings; and all other technical submittals identified by the County's Project Team. Descriptions of major equipment include equipment specifications and vendor information when applicable.

Schedule 2, Part A sets forth the following requirements for the Lee County Solid Waste Resource Recovery Facility:

- Receiving and Storage of Solid Waste
- Solid Waste Processing and Steam Generation
- Air Pollution Control
- Power Generation
- Site work, Buildings and Structures
- Process Control and Monitoring
- Environmental Requirements
- Safety and Hazard Precautions
- Vehicles and Containers
- Spare Parts

These requirements are presented in the order prescribed by the Schedule 2, Part B; Table of Contents.

The equipment described will be furnished and installed in conformance with:

(i) generally accepted engineering and construction practice;

(ii) the detailed specifications, which are substantially based on Schedule 2, Part A;

(iii) all applicable codes, standards and regulations including, but not limited to, those referenced in the Schedule 2, Part A.

The Facility will be designed based on our extensive in-house technical and operational experience to ensure that the County receives the best

possible overall project performance. A team of experienced Ogden Martin personnel coupled with proven subcontractors, qualified in accordance with the laws of the State of Florida, has been assembled to execute this project implementation. Ogden Martin will adhere to the codes listed in Table 2-1, Schedule 2, Part A and restated herein as part of Section 2.2 (Codes and Standards) for the design, construction and operation of the Facility. Conflicts in codes will be resolved in favor of the more stringent code requirement or part thereof. Local codes will take precedence where applicable.

We have designed the Facility to operate efficiently at a continuous rated capacity of 1,200 tons per day (TPD) when firing Reference Waste (5,000 BTU/lb Higher Heating Value (HHV) as defined in Table 1 of paragraph 1 of Schedule 7 to the Construction Agreement. Two (2) combustion units utilizing the Martin Technology will be supplied to accomplish the performance specified for this Project. Based upon the receipt of acceptable waste with a Higher Heating Value (HHV) of 5,000 BTU/lb, the Facility will be capable at minimum of processing 372,300 Tons Per Year (TPY) of acceptable waste without compromise to the permit conditions established for the Project.

The Facility has been arranged to include dedicated space for a third 600 TPD combustion unit as well as a second turbine generator unit, which will allow for a future expansion of the Facility's waste processing capabilities to 1,800 TPD. Certain key systems, tie-ins and equipment will be initially installed capable of achieving the capacity requirements of the future 1,800 TPD expanded Facility processing

capability with minimum interference to the Facility's operation at the time expansion in service becomes a reality.

The main processing building provides for complete enclosure of the refuse receiving area and refuse storage pit, refuse cranes, the refuse combustion stoker/steam generation units (combustion units), the turbine generator, other supporting ancillary equipment, the control room, ~~maintenance shop, employee facilities, lunchroom, first-aid room,~~ laboratory ~~storage room, contractor administrative offices and dedicated County administrative office area.~~

The pollution control equipment which includes acid gas scrubber, fabric filter baghouses, lime handling and storage equipment and induced draft fans ~~are also totally enclosed within the~~ main process building structure. Separate enclosed areas are provided for handling and storage of Residue, water treatment equipment and ~~scale house.~~

One (1) steam turbine-generator designed for the maximum steam output of the <u>two (2)</u> 600 TPD combustion units is included in accordance with Schedule 2, Part A. Florida Power and Light Co. (FP&L) will be responsible for the design, installation and maintenance of the power transmission line from the utility power grid to a FP&L switchyard located on the Facility site adjacent to the Facility switchyard supplied by Ogden Martin. The point of electrical interconnect will be 138 kV FP&L bus installed by FP&L and located within the onsite FP&L switchyard. The County will be kept actively involved in all interconnect activties. The interconnect design will allow for the

transmission out into the FP&L System of generated power as well as for the purchase and separate metering of power for facility operations in the event of a turbine-generator shutdown.

All equipment will be furnished completely piped, wired, insulated and painted, as required and includes all instrumentation piped and wired for control of process variables in accordance with accepted practice for safe operation. Special tools required for equipment operation are furnished. All electrical motors above one (1) horsepower that are in exposed outside locations will be totally enclosed and fan cooled (TEFC). All equipment and design data shown in this Schedule 2, Part B are based on design calculations which are subject to verification or change by Ogden Martin during definitive design.

~~The Facility we propose will present a positive visual image to the~~ public and ~~our~~ immediate neighbors. In the development of our aesthetic theme and landscaping ~~plan~~, we have researched the requirements of the County's land use regulations and ~~the~~ Lee County Development Standards Ordinance to ensure that our Facility configuration meets the safety and operational performance requirements of the County ~~while~~ providing a pleasant appearance and work atmosphere which compliment the surrounding ~~lands~~.

1.1 Design Engineer Qualifications

The Facility shall be designed by experienced personnel qualified in accordance with the laws of the State of Florida.

Ogden Martin will execute the detailed design and engineering of the Facility by utilizing the services of **United Engineers and Constructor Inc.,** an experienced Architectural Engineering firm with "hands-on" experience in the design of mass burn waste-to-energy facilities. Our selection **is** based on the specific needs of this project.

Ogden Martin retains direct control of the Facility design and responsibility for the quality and performance of the completed Project.

1.2 General Contractors Qualifications

The Facility will be constructed by experienced personnel qualified in accordance with the laws of the State of Florida.

Ogden Martin maintains on a national basis working relationships with general contractors which have demonstrated experience in the

construction of waste-to-energy facilities. The work performed by the selected general contractor will be directly supervised by Ogden Martin site construction management personnel to ensure that Project schedule, budget and quality guarantees are strictly adhered to.

For the Lee County Project we **have selected United Engineers and Constructors Inc. and their selected general constructor Yeargin, Inc. to** construct the facility under our direct supervision. **In addition, we have, to date, selected the following subcontractors to provide specific facility equipment, including erection:**

ABB Environmental Systems	**Dry Scrubber/Baghouse/Carbon Injection System**
Custodis	**Chimney**
Lancaster Distral	**Boilers**
GEA/Thermal Dynamics	**Cooling Tower**

These contractors, subcontractors and any remaining vendors selected will also be filing with the Department in accordance with Rule 17-704-410 FAL.

1.3 Project Site Location

The Facility will be located on a 70 acre plus portion of a 200 acre land tract located on and accessed from Buckingham Road, approximately 2.0 miles east of the intersection of I-75 and State Road 82 as shown on the Site Plan Drawing (Drawing C100). The site is within the southeast quarter of Section 24, Township 44 South, Range 25 East in Lee County, Florida. The Facility will be arranged on the site based on the requirements of Schedule 2, Part A, Section 5.3 to the Construction Agreement, with careful consideration of the aesthetic/visual impact of the Facility, necessary set-backs from the property line, location of

Page Ammended 2/3/93 for Tax Exemption Filing

protected wetlands and the surrounding property land uses.

2.0 WASTE PROCESSING SECTION

2.1 General

The Facility will be capable of accepting and processing the quantities of waste delivered by the County in accordance with their normal collection and delivery practices up to the limit of the Processing Guarantee specified in the Construction and Service Agreements. The Facility will have a minimum continuous design rated capacity of 1,200 TPD of Reference Waste (5,000 BTU/lb HHV) as defined in Table 1 of Paragraph 1 Schedule 7 to the Construction Agreement. Two (2) 600 TPD refuse combustion stoker/steam generation units (combustion units) will be provided to meet the above stated 1,200 TPD waste processing capacity. A single steam turbine-generator designed for the maximum steam output of both combustion units will be provided.

The Facility has been arranged to include dedicated space for a third 600 TPD combustion unit, which will allow for future expansion of the Facility's waste processing capability to 1,800 TPD. To accomplish this expansion smoothly, with minimum interference to the existing two operating units, the following equipment and elements of the Facility will be installed at the expanded capacity as part of the initial project construction:

(i) the overhead refuse cranes

(ii) the boiler feedwater treatment system

(iii) the demineralized water storage tank

(iv) the deaerator

(v) the ash system and ferrous recovery equipment

(vi) the tipping floor and refuse storage pit areas

(vii) the foundations necessary to support the common wall to the future third combustion unit including space allocation

(viii) provide space in the stack for the future third combustion unit flue.

All other equipment and structures associated with the Facility expansion will be furnished at the time of expansion.

The waste processing portion of the Facility is comprised of a receiving area with refuse storage pit, cranes, combustion units with their ancillary equipment, air pollution control equipment, stack, cooling tower, Residue storage and load out areas, ~~truck weighing facilities,~~ recyclables and small vehicle service area, ~~administrative offices, parking area,~~ roadways ~~and security fencing~~. The main process building will be constructed of non-combustible materials and will provide complete enclosure of the refuse receiving area and storage pit, refuse cranes, combustion units, forced draft and overfire air fans, other supporting ancillary equipment, control room, laboratory, ~~maintenance shop, employee facility, lunchroom, first aid area, storage room and administrative offices.~~ The air pollution control equipment which includes acid gas scrubbers, fabric filter baghouses, lime handling and storage equipment and the induced draft fans ~~will also be totally enclosed within the main process building~~. Separate buildings are provided for handling and storage of process Residue and recovered ferrous metals, water treatment equipment ~~and scale house.~~

Facility services include, ~~heating, ventilating, and air conditioning systems;~~ electrical and lighting systems; ~~plumbing; communication systems; service elevator; and the fire protection systems.~~

The Facility design includes provisions for handicapped access ~~to the visitor and administrative office areas and the scale house~~. All other areas will be designed to facilitate proper operation and maintenance of the plant equipment and provide essential comfort for the operating staff.

The stack will be an aesthetic feature of the Facility constructed using concrete colorized to blend with the major building architectural color scheme. The stack will be square with two (2) flues to accommodate the initial two 600 TPD combustion units as well as space for the addition of a future third 600 TPD combustion unit flue.

The Facility design and construction includes: ~~all clearing, grubbing, cut and fills, and drainage necessary to prepare the site for construction of the Facility; all landscaping,~~ access roads and ramps, ~~parking facilities~~, outside building lighting, ~~parking lot and sidewalk lighting, berms, drainage swales, stormwater retention basins~~, utility connects, water supply and wastewater conveyance systems, ~~and fencing.~~ Design and construction will comply with all governmental requirements, the Lee County Zoning Ordinance the Lee County Development Standards Ordinance (DSO) and all applicable local and state codes.

2.1.1 Waste Receiving and Storage of Solid Waste

The Facility entrance road is designed to help facilitate the proper direction of each type of vehicle entering the facility conveniently to its destination. Operating staff, visitors and or maintenance deliveries can bypass the ~~scale system~~ for direct access to their designated areas. Citizens desiring to utilize the recyclables and small vehicle service area will be directed and controlled by the County's ~~scale house~~ attendees. County waste delivery will be promptly processed ~~via the inbound scales~~ to determine the net weight of the solid waste (MSW) being delivered to the Facility. On-site MSW truck traffic flow is designed to minimize congestion while providing essential truck queuing space. Roadway design and operating procedures will eliminate the potential for vehicle queuing on public roadways.

2.1.2 Tipping Floor Area

After completing weigh in procedures ~~at the scale house,~~ refuse trucks carrying MSW will be directed to the tipping floor area for unloading. The tipping floor area will be totally enclosed. To facilitate refuse truck maneuvering, a one-hundred-twenty (120) foot wide minimum clear space, when measured from the tipping bay back up barriers at the middle tipping bays of the pit to the opposite wall, will be provided. The tipping floor area will have a minimum vertical clearance of thirty-five (35) feet as measured from the highest elevation of the tipping floor to the lowest part of the roof structure, piping, ducting, electrical work or other equipment located over this area. The entire tipping floor area will be a clear span. The tipping floor area will be constructed on consolidated fill material. Fourteen (14) unloading bays, thirteen (13)

bays each fifteen (15) feet wide and one (1) bay twenty-four (24) feet wide (inside dimension) will be provided. The tipping bays will be designed so that trucks opening or closing their rear gate will clear the front wall of the refuse storage pit. The bay at each end of the refuse storage pit will have reinforced concrete chutes discharging into the refuse storage pit. The front concrete curtain wall shall begin approximately four (4) feet above the tipping floor at these locations. At each end of the refuse storage pit, adequate area of the tipping floor will be accessible to the overhead bridge cranes for the removal of Nonprocessible Waste, Bypassed Waste, or for the transfer of waste out of the refuse storage pit into roll-off containers. The reinforced concrete tipping floor will be sloped toward the refuse storage pit to control moisture and to allow for periodic washdown of the area. An abrasion resistant coating will be applied over the entire tipping floor surface. The coating will be Masterbuilders Masterplate 200 or Burke Metallic Floor Hardener, or equivalent. The shake-on hardener will be applied at the rate of two-point-five (2.5) pounds per square foot. Eight foot high reinforced concrete walls will be provided on the sides and front end of the tipping floor area. Slotted backup wheel stop barriers will be provided at each tipping bay to prevent vehicles from backing into the refuse storage pit.

Building elements, including all walls, doorways, piers and columns will be protected against waste vehicle impacts through the use of curbs, guard rails, guard posts, and embedded steel angles at all concrete edges, vertical and horizontal.

Two (2) motor operated roll-up entrance/exit doors, located as shown on the Site Plan, will be provided to access the tipping floor area, each

having a minimum clear width of eighteen (18) feet and a height of twenty-eight (28) feet. Each door and operating mechanism will be furnished with barrier protection to guard against truck damage. Concrete filled pipe posts will be installed at entrance/exit doors in the tipping area for protection from truck impacts. There will be no roof vent fans in the tipping floor area, the furnace combustion air system will maintain a negative pressure in the tipping floor area during operation by drawing the furnace combustion air from the tipping floor and refuse storage pit areas. Therefore, the transmission of odors to the outside or to other areas of the Facility is minimized. Louvers will be provided along the bottom of the entire front end wall of the tipping floor area and shall be a minimum of two (2) feet high and located above the eight (8) foot high reinforced concrete front end and side walls.

2.1.3 Refuse Storage Pit

Solid waste will be stored in a reinforced concrete refuse storage pit located within the main process building. The refuse storage pit will have a front concrete wall starting approximately twenty-four (24) feet above the tipping floor elevation (except over the end bays equipped with chutes where the concrete wall will start approximately four (4) feet above the tipping floor) and extending upwards to the top of the highest elevation reached by the overhead refuse crane grapple. Above this point the wall extending to the roof of the building will be metal siding. The refuse storage pit floor area will be sloped to allow the removal of water by a portable pump. As with the waste receiving area, the waste storage and handling area will be under negative pressure at all times

during operation to minimize the transmission of dust and odors. Air withdrawn from the area will be used for furnace combustion air. The furnace combustion air system will be designed to handle dust laden air.

The refuse storage pit will be sized for minimum storage capacity, measured downward from the tipping floor elevation, of 19,636 cubic yards (5,400 tons of solid waste at a density of 550 pounds per cubic yard). The lowest elevation of the refuse storage pit floor and associated excavation will not breach the clay confining layer which is found between approximately twenty (20) and twenty-five (25) feet below existing grade of the Facility site.

In laying out the refuse storage pit, tipping floor area, refuse charging area, combustion unit area and other key areas of the Facility, the future expansion requirements for the Facility have been taken into consideration to allow for efficient integration of an additional 600 TPD combustion unit.

2.1.4 Citizens Drop-off Area

A citizens drop-off area as shown on the Site Plan is provided to allow interested individuals to directly participate in the County's collection and recycling efforts. The container resting area and all access roads are concrete. The "Z-wall" is also concrete. The vertical height of the Z-wall is approximately four-and-one-half (4.5) feet high and allows convenient access to the containers. Roll off-type containers will be provided for this drop-off area. Section 2.5B describes in more detail the design and function of this area.

2.2 Codes and Standards as Listed in Part A of This Schedule

The equipment described in this Section 2, Part B, will be furnished and installed in conformance with: (i) generally accepted engineering and construction practice, (ii) the detailed specifications which will be substantially based on the Schedule 2, Part A and (iii) all applicable codes, standards and regulations as identified in Schedule 2, Part A Section 4.0, Table 2-1 including but not limited to the following:

DESIGN STANDARDS AND CODES

Design Standard	Code
1. Air Conditioning and Refrigeration Institute	(ARI)
2. Air Moving and Conditioning Association	(AMCA)
3. American Association of State Highway and Transportation Officials	(AASHTO)
4. American Concrete Institute	(ACI)
5. American Gas Association	(AGA)
6. American Gear Manufacturers Association	(AGMA)
7. American Institute of Architects	(AIA)
8. American Institute of Steel Construction	(AISC)
9. American Iron and Steel Institute	(AISI)
10. American National Standard	(ANS)
11. American National Standards Institute	(ANSI)
12. American Petroleum Institute	(API)
13. American Public Health Association	(APHA)

DESIGN STANDARDS AND CODES
(continued)

14.	American Public Works Association	(APWA)
15.	American Society of Civil Engineers	(ASCE)
16.	American Society of Heating, Refrigeration, and Air Conditioning Engineers	(ASHRAE)
17.	American Society of Landscape Architects	(ASLA)
18.	American Society of Mechanical Engineers	(ASME)
19.	American Society of Non-Destructive Test Engineers	(ASNDTE)
20.	American Society of Testing and Materials	(ASTM)
21.	American Water Works Association	(AWWA)
22.	American Welding Society	(AWS)
23.	American Wood Preservers Association	(AWPA)
24.	Anti-Friction Bearing Manufacturers Association	(AFBMA)
25.	Code of the Federal Register of the Environmental Protection Agency	(EPA)
26.	Commercial Standards	(CS)
27.	Cooling Tower Institute	(CTI)
28.	DER Design Standards, rules, regulations and published policies as applicable	(DER)
29.	Ductile Iron Pipe Research Association	(DIPRA)
30.	Factory Mutual	(FM)
31.	Federal Aviation Administration	(FAA)
32.	Florida Department of Transportation Standards	(FDOT)
33.	Heat Exchange Institute	(HEI)
34.	Institute of Boiler & Radiator Manufacturers	(IBRM)
35.	Institute of Electrical and Electronic Engineers	(IEEE)
36.	Insulated Power Cable Engineer Association	(IPCEA)
37.	Instrument Society of America	(ISA)

DESIGN STANDARDS AND CODES
(continued)

38.	National Bureau of Standards	(NBS)
39.	National Clay Pipe Institute	(NCPI)
40.	National Electric Manufacturers Association	(NEMA)
41.	National Electrical Code	(NEC)
42.	National Electrical Safety Code	(NESC)
43.	National Fire Protection Association	(NFPA)
44.	Occupational Safety and Health Administration	(OSHA)
45.	Sheet Metal Air Conditioning Contractors National Association	(SMACNA)
46.	Steel Structures Painting Council	(SSPC)
47.	Tile Council of America	(TCA)
48.	Underwriters Laboratory, Inc.	(UL)
49.	All Other Applicable Codes and Regulations	

All codes, standards and regulations upon which the design is based are the latest editions as of June 11, 1990, unless otherwise stated herein. If a conflict develops in utilizing the codes governing this Project, the more stringent code or part thereof will apply. Local codes will take precedence where applicable.

2.3 Structures

The buildings which together comprise the Facility will be constructed of non-combustible materials. Structural steel members will be enclosed with metal siding utilizing accents of exposed masonry. These materials are visually attractive, durable and easily maintained. ~~The metal siding will be insulated in the administrative area.~~ Areas of translucent

panels will provide natural light to the interior of the buildings. Bands of accent colored metal siding will be used to soften the visual impact of the building, and to portray an office building appearance when viewed from a distance.

The complete Facility, including buildings required to house process equipment ~~and administrative functions, public areas~~, ancillary buildings, infrastructure such as roadways, ~~parking areas and landscaping~~, is designed and will be constructed to meet all functional requirements of the Project. The Facility is designed and will be constructed of high quality materials to ensure that with proper maintenance and repair the Facility will remain in good condition both functionally and visually over the Facility's operating lifetime. The selection of exterior materials has been made from the standpoint of image, durability, weather resistance and ease of maintenance.

2.3.1 Main Process Building

The main process building will be constructed of non-combustible materials and includes a totally enclosed tipping floor area, the solid waste handling and storage area, combustion unit area, ~~turbine generator area and air pollution control equipment enclosure area.~~ The main process building also houses the boiler feedwater system, waste water handling systems, control room, ~~locker rooms, administrative office space, employee area, visitor accommodations, maintenance and storage areas~~, laboratory ~~and the first aid center.~~

Strategically placed louvers will be provided throughout the main process building to allow proper ventilation. These louvers will be colored and positioned to complement the exterior color scheme. Within the buildings materials that are easily maintained, damage resistant and tolerant of the various equipment maintenance activities and operating conditions have been selected for interior walls and partitions. ~~Metal wall partitions will be used to enclose the maintenance shop and storage room areas.~~ From the charging floor to the underside of the roof, a metal siding wall will separate the refuse handling area from the combustion unit area. Rated firewalls will be provided where they are required by local codes as well as in accordance with the technical requirements of Schedule 2, Part A. The main process building roofs will be sloped to an interior roof drain system.

A minimum maintenance clearance space of five (5) feet will be provided around all major mechanical equipment components. Clearance around electrical components will be in accordance with NEC and NESC requirements. The use of knockout walls to facilitate repair and maintenance of equipment will be minimized.

~~A central vacuum cleaning system will be included with vacuum ports~~ located conveniently throughout the main process building including the charging floor and at the lime storage silo and baghouses to facilitate ~~maintenance and housekeeping.~~

The Residue conveyors from the main process building to the grizzly scalper building and from the grizzly scalper building to the Residue

building will be totally enclosed. Metal galleries color-matched closely to the metal panels incorporated in the main structure will be used to enclose the conveyors so that they blend with the architecture and aesthetics of the main process building.

The main process building design will include provisions to facilitate future expansion by the addition of another combustion unit, ~~its dedicated air pollution control equipment and another steam turbine-generator unit.~~

Floor trenches and drains will be provided as dictated by process needs in the ground floor of the main process building, the Residue storage building and other ancillary buildings. Floor trenches and drains will be directed to the settling basin.

2.3.2 Ancillary Buildings

Other site buildings include the ~~scale house,~~ Residue storage building, water treatment building, and grizzly scalper building. These buildings will primarily be pre-engineered metal frame buildings with metal siding walls and roofs. Exterior treatment of these buildings will blend with the primary theme and the overall aesthetics of the site.

~~The scale house is a separate building and is designed to allow for~~ handicapped ~~personnel~~ access. Design ~~details related~~ to scale house inclusions are ~~outlined in Section 2.5G, Refuse and Residue Truck Scales, of this Schedule 2, Part B to the Construction Agreement.~~

The Residue storage building will be sized to accommodate the loading/parking of trucks for ash and material removal for the 1,200 TPD waste processing capacity of the Facility. The building will be fully enclosed and equipped with a dedicated baghouse for fugitive dust control. The Residue and ferrous removal and storage areas have adequate floor drains and trenches to assist drainage. The floor area is sloped to the trenches and sufficient washdown hoses will be provided to maintain clean conditions and prevent fugitive dust from leaving the area. Design details related to the Residue storage building are outlined in Section 2.23, Ash Handling System, of this Schedule 2, Part B to the Construction Agreement. The building will be designed such that it can be expanded if necessary to support the ultimate 1,800 TPD Facility size.

Resource Recovery buildings include the roofing, siding, structural steel, concrete building foundations, reinforcing steel and piling for the following buildings:

- Refuse Building
- Tipping Building
- Grizzly Building
- Ash Handling Building

2.4 ~~Geotechnical Survey~~

~~Ogden Martin reviewed the Hortensen Engineering, Inc. Preliminary~~ Foundation & Soils Study dated 4/16/90 which formed a part of the RFP documents. The report included a subsurface description based on five (5) Deep Standard Penetration Test (SPT) borings each to a depth of eighty (80) foot within the proposed facility area. In order to better define foundation requirements, Ogden Martin recognized the need for ~~additional borings located at major equipment and structure load~~

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~~concentrations. Accordingly, Ogden Martin contracted with Ardaman & Associates, Inc. (Ardaman) to perform seven (7) additional borings to develop a basis for the Facility foundation design.~~

After field work and laboratory testing, Ardaman submitted a report dated 6/1/90 recommending the use of shallow spread footings for columns loaded up to approximately 360 KIPS, mat foundations with surcharging and, driven pile foundations for heavy column loads in excess of 360 KIPS as the basis of design for the Facility foundations.

A copy of the Ardaman report dated 6/1/90 is provided in the separately bound volume entitled Volume II "Additional Submissions In Accordance with Schedule 2, Part A; Lee County Solid Waste Resource Recovery Facility" submitted as part of this Schedule 2, Part B to the Construction Agreement.

The following tabulation describes the preliminary foundation types for each building and equipment item and is subject to change by Ogden Martin during the detailed design of the Facility.

Net allowable soil bearing pressures for shallow foundations will not exceed 3,000 PSF (or 4,000 PSF with wind loading) and one inch (1") total settlement for a maximum column load of 300 KIPS, 2,500 PSF for 330 KIPS and 2,000 PSF for 360 KIPS. For deep foundations, a fourteen (14) inch square, prestressed, precast concrete piles are recommended with net compressive capacity estimated to be seventy (70) tons, net uplift thirty ~~(30) tons and a lateral load of five (5) tons with an estimated embedment depth below existing grade of seventy-five (75) feet~~.

ITEM	SPREAD FOOTING Note (3)	MAT	SURCHARGE	PILING
Tipping Bldg.	X		X Note (1)	
Refuse Pit		X	X Note (4)	
Refuse Bldg.	X			X
Boiler			X	
Air Pollution Control Equipment	X	X		
I.D. Fan		X		
Chimney				X
T-G Unit				X
T-G Bldg.	X			
Cooling Tower		X	X Note (2)	
Grizzly Bldg.		X	X Note (2)	
Residue Bldg.		X	X Note (2)	
Electrical Yard	X			
Administration Bldg.	X			

NOTES:

(1) Elevated compacted structural fill height of approximately 21' will serve as a surcharge.

(2) 10 feet of fill @ approximately 6 to 8 weeks duration.

(3) Proof rolling required with a vibrating compactor - 5 minimum passes with a static weight of 20,000 lbs.

(4) Refuse pit will be surcharged with 13'-0" of water for six (6) to eight (8) weeks duration.

~~The depth to ground water as recorded in each boring ranged between 4'-6"~~ to 6'-0" below the ground surface. Consequently, this will necessitate dewatering during excavation and construction of the refuse storage pit. Exterior refuse storage pit walls will be waterproofed.

Temporary excavation slopes will be constructed no steeper than 1.5H:1V except at the refuse storage pit where 2H:1V shall be used. Permanent slopes will be no steeper than 3H:1V.

All foundation fill soils shall be compacted to 95% modified proctor maximum dry density (ASTM D-1557) in lifts of 12" or less. In-situ soils will be compacted to 95% of their modified proctor to a depth of two (2) feet below the ground surface. These soils should also be proofrolled with a vibratory compactor having a static weight of 20,000 lbs. A ~~minimum of five (5) overlapping passes are necessary in construction areas.~~

2.5 Concrete

Concrete work required to construct the Facility includes cast-in-place concrete. Paving, main haul roads, retaining walls, equipment and building foundations, curbs, sidewalks and other related items necessary to complete the Project will conform to all requirements of ACI 301-84 (Revised 1988) Specifications for Structural Concrete for Buildings.

Concrete walls, slabs, foundations and the refuse storage pit will be reinforced with ASTM A615 grade 60 reinforcing steel. The reinforcing will be detailed in accordance with the ACI 315-89.

All concrete structures, floors and paving will be constructed with reinforced concrete with a minimum compressive strength of 4,000 psi. All methods and materials used for hot and cold weather concreting will be in accordance with the requirements of "Recommended Practice for Hot Weather Concreting" (ACI 305) and/or "Recommended Practice for Cold Weather Concreting" (ACI 306).

Resource Recovery Foundations includes the concrete, reinforcing steel, equipment anchor bolts and piling directly associated and physically supporting the Resource Recovery Equipment identified in the Equipment Listing provided in Section 5A.

2.6 Structural Steel

The buildings which together comprise the Facility will be constructed of structural steel. The design, fabrication and erection of structural steel for buildings and structures will be in accordance with AISC specifications and state and local codes incorporating applicable wind and seismic forces. Pre-engineered buildings will be in accordance with Metal Building Manufacturers Association (MBMA) requirements. The structural framing will be primarily wide flange shapes, trusses and/or plate girders fabricated from ASTM A36 or higher yield strength steel. Steel joists will also be utilized as structural members for roof construction. High strength A325 bolts will be used for primary connections and A307 bolts for secondary connections. Structures will be braced vertically and horizontally to provide stability and to resist lateral loads, per code requirements.

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Resource Recovery Structural Steel includes the structural steel directly associated and physically supporting the Resource Recovery Equipment identified in the Equipment Listing provided in Section 5A.

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2.7 Platforms and Ladders

~~An elevator and~~ multiple stair towers will be provided for general means of egress and serviceability within the Facility buildings. ~~The elevator will be located in the administration area and will provide access to the major levels within the main process building~~. Stair towers will be located in accordance with local code requirements. Equipment platform access will be provided as required throughout the Facility. The ladders and platforms will be designed to meet the requirements of OSHA. Ladders which extend twenty (20) feet in length or more will have a safety cage.

The platforms will be constructed of structural steel framing and grating. The structural steel framing will consist of ASTM A36 shapes and plates. Main framing members will be connected utilizing high strength A325 bolted or welded connections. The platforms will be supplied with handrails and kick plates as required. Connections for ladders, handrails, stairtreads and other miscellaneous steel framing will be made utilizing unfinished structural A307 bolts.

2.8 Roadways, ~~Parking, and Landscaping~~

A single divided entrance road to the Facility will be provided in accordance with Schedule 2, Part A directly from Buckingham Road. ~~The entrance road will be curved and designed with adjacent mounding and~~ landscaping to reduce the visibility of onsite truck traffic from the surrounding areas. Each side of the Facility entrance at Buckingham Road will be provided with curved masonry walls. The masonry walls will each ~~have a length of approximately one hundred and fifty (150) feet and will~~

~~be no less than five (5) feet in height. The wall design will be fully~~ integrated with the Facility landscaping and shall provide the appearance of an office park development.

Access from the primary perimeter roadway to the Facility Administration Area and visitor's center will be along a tree lined boulevard. This divided avenue will gently curve around the large pond that serves as the foreground to the main process building. The natural groupings of trees along this boulevard allow for selected vistas of the Facility aesthetics, climaxed as the full Facility becomes visible where the ~~boulevard terminates at the parking area.~~

2.8.1 Access Roads and Ramps

Concrete access roads will be provided ~~from the Facility entrance~~ to the tipping area, Residue storage building, ~~scales~~ and grizzly scalper building. ~~Access roads to the Facility Administration Area, cooling tower, turbine and boiler enclosures will be constructed of bituminous concrete.~~ Grades for ~~Facility entrance roads as well as~~ tipping floor area entry ramp will be a maximum of three (3) to five (5) percent. A five (5) percent grade will be used for the tipping floor exit ramp. All roads will comply with FDOT standard requirements.

2.8.2 ~~Parking~~

~~Parking for a total of fifty (50) cars and two (2) buses will be provided~~ adjacent to the Facility Administration Area. ~~Two (2)~~ of the car parking spaces will be designed, reserved and identified for use by handicapped ~~persons. Additional spaces will be reserved for visitors. The parking~~

~~lot will be constructed of bituminous concrete placed over a stabilized~~ base and will comply with the ~~Florida~~ Department of Transportation (FDOT) ~~design standards.~~

2.8.3 ~~Site Drainage~~

~~Stormwater drainage of the site will be controlled through use of proper~~ landscaping, grading and a system of open drainage swales and culverts to collect and direct surface run-off to the onsite retention pond(s). The retention ponds will be sinuous in design with littoral shelves and aquatic plantings. Any discharges from the Facility site stormwater retention system via overflow structures will meet State and South ~~Florida Water Management District water quality standards.~~

The Facility switchyard area supplied by Ogden Martin will be covered with crushed stone ~~and will be provided with a security fence and locked gate.~~ Spill protection will be provided for the large oil filled transformer through the use of a collection trough integral with the perimeter of the concrete equipment foundation and connected to a collection sump. The Facility switchyard design is based on the assumption that foundations, ~~fencing,~~ crushed stone or spill protection which may be required for the separate FP&L switchyard area located on the Facility site will be provided by FP&L.

2.8.4 ~~Signage and Flag Poles~~

~~Informational and directional signage, lane markings and other traffic~~ control features will be ~~furnished to~~ provide a safe and efficient site ~~operation.~~

~~An illuminated sign identifying the Facility will be integrated with the~~ curved masonry wall located at the site entrance. The sign will utilize lettering of at least twelve (12) inches in height and the wording will be approved by the County.

Three (3) flag poles will be furnished at the entrance to the Facility Administration Area. The center flag pole will be ~~forty-five~~ (45) feet tall and equipped with a twelve (12) feet by eight (8) feet American ~~flag. The remaining two (2) flag poles will each be forty (40) feet tall.~~

2.8.5 ~~Site Security and Fencing~~

~~The Facility boundaries will be secured with a six (6) foot high green or~~ black vinyl coated steel chain link fence. Appropriate gates will be provided for equipment and personnel access. The security fencing will be placed on the Facility side of all landscape screening. A motor operated slide gate under camera surveillance, with control from the main control room and scale house, will be used at the Facility entrance to maintain site security. Fencing, including manually operated access gates, will also be provided around the Facility switchyard area provided ~~by Ogden Martin.~~

2.8.6 ~~Landscaping~~

~~The site will be landscaped in accordance with the landscaping plan,~~ Drawing L100. ~~Landscaping~~ will be ~~designed by~~ a local landscape architect licensed in ~~the~~ State of Florida. ~~The~~ Facility landscaping ~~plan will comply with the requirements of the Lee County Zoning~~

~~Ordinance, the Lee County Development Standards (DSO), and all other~~ related County regulations including but not limited to buffer width, planting requirements, plant heights and opacity of screening materials littoral plantings and general open space requirements.

The landscaping plan will feature a variety of elements designed to complement the architectural scheme of the Facility. The landscape design will soften the architectural features and provide relief to larger areas. The site will be graded and planted to provide screening of site activities from public view.

Removal of trees in excess of ten (10) feet in height or with diameters of three (3) inches or greater at breast height will be minimized to the greatest extent possible, (except in areas where new landscape plantings are provided). Existing exotic invasive species will be removed from the site in accordance with Lee County's DSO requirements. Appropriate methods of removal will be determined during the review process.

New trees, shrubs, foundation plantings and ground cover will be used to enhance the aesthetics of the site. Materials and plantings will be compatible with the County's native environment. Plantings will be selected from native plant species which are hardy to the climatic and geological conditions of the area as well as tolerant to the site specific microclimate and operations that occur at the Facility. Plantings will be developed in naturalized groupings of irregular ~~patterns to provide an aesthetically pleasing presentation along the site~~

~~perimeter and to minimize the mass of the Facility as well as to present~~ an informal and "natural" appearance to the open lands surrounding the Facility. The locations of plant materials will be determined by safety requirements, noise abatement and aesthetic composition. The landscape design will generally follow basic Xeriscape principals, as outlined by the South Florida Water Management District.

Sod will be provided on all slopes greater than 1:3 (vertical:horizontal) and on 1:3 slopes having a slope length of fifteen (15) feet or greater. Other areas disturbed by earth work or construction activities, which will not be provided with landscape plantings, pavement or crushed stone, will be seeded with Argentine Bahia grass or returned to the natural state.

A permanent efficient irrigation system will be provided in all appropriate landscaped, seeded and sodded areas not returned to the natural state.

In conjunction with the landscaping and buffering requirements defined within the County's Zoning Ordinance and the Lee County DSO, additional decorative landscaping will be provided. The additional decorative landscaping will incorporate primary, secondary, and minor trees and shrubbery. Primary trees will be at least ten (10) to twelve (12) feet in height. The additional decorative landscaping will include landscaping along the entrance road and adjacent to the Facility Administration Area and parking area. Plant materials will incorporate native species to the ~~greatest extent possible. Plant groupings will be as natural as~~

~~possible. The additional decorative landscaping scope of work will~~ contain no less than two-hundred-and-fifty (250) primary trees, two hundred (200) secondary trees, and fifteen ~~thousand~~ (15,000) square feet of bedded plantings. ~~Littoral~~ zone plantings, as well as any required wetland mitigation plantings will be designed so as to mimic natural ~~systems and maintain the natural water flow.~~

2.9 Lighting

The Facility lighting system will consist of 120V incandescent, 277V fluorescent and 277V high-pressure sodium fixtures and will be designed in accordance with the NEC and good safety practices. In areas where fixture mounting heights are eighteen (18) feet or higher, high bay fixtures will be used. Fluorescent fixtures will be used in the electrical room, control room ~~and office areas.~~ Incandescent fixtures will be used in the battery room and for control room emergency lighting. ~~Exterior lighting will be provided around outside equipment, parking areas, and roadways per IES standards and good safety practices. Exterior lighting will be kept low and will not shine toward the Facility site boundaries.~~ Only obstruction lighting as required for the FAA permit will be provided for the stack. A 125V DC emergency lighting system will be supplied for the control room. General lighting in the refuse storage pit area will be by roof mounted fixtures.

120/208 volt service will be provided by dry type transformers supplied from the 480V motor control centers. The transformers and associated panels will be located conveniently throughout the Facility structures.

All high intensity lighting will be served at 277V through 480V-480/277V lighting transformers and panels located conveniently throughout the Facility.

Although lighting will be designed for night conditions, provisions will be made in the tipping floor area to reduce light intensity and conserve electricity when day light is available and capable of providing adequate illumination for safe Facility operation.

2.10 ~~Administration Area and Authority Area~~

~~The Facility Administration Area will be located in the main process~~ building adjacent to the turbine generator and refuse storage areas. The architectural treatment, through the use of color and material variance, will establish the Facility Administration Area as the focal point of the Facility. The Facility Administration Area will consist of four (4) levels. Employee support areas (locker rooms, lunch room etc.) will be located at the ground floor, County administrative offices on the second floor, the visitor's center/conference room and facility control room on the third floor and Facility operations offices on the fourth level.

The Facility Administration Area will be of commercial office design and will be the center for both the County's and the Facility's operations and management staff. A storefront window system will provide natural light to the Facility Administration Area interior and will harmonize with the accent features of the Facility's architectural design. Through the use of this glazing system, framed by the masonry stair towers and stucco materials, the Facility Administration Area is reinforced as the ~~visual focal point of the Facility.~~

~~Interior construction of the Facility Administrative Area will consist of~~ concrete block and metal stud with drywall partitions with washable wall coverings. The floor coverings will consist of vinyl composition tile and carpeting. The washrooms, lockers and shower areas will have ceramic tile and epoxy painting. Suspended acoustical tile ceilings will be used throughout the Facility Administration Area.

2.10.1 ~~Facility Operations Staff Administration Area~~

The Operating Staff's Administrative offices, cubicles and secretarial areas located on the fourth floor level of the Facility Administration Area will be provided with required furniture consisting of desks, chairs, tables and file cabinets. Office equipment such as a telephone system, photocopier, telefax machine and desk top computer will also be provided.

2.10.2 ~~County Staff Administration Area~~

The County Administration Area will be located on the second floor of the Facility Administration Area. This office area (minimum 1,250 sq. ft. of floor space) will be provided for the exclusive use of the County's personnel and will be of typical commercial office design. Included in the County's Staff Administration Area design will be two 240 sq.ft. offices, two 150 sq.ft. work cubicles, a minimum of 200 sq.ft. of secretarial/filing space, a conference room, a visitor's reception area, restrooms and lunchroom facilities. The administrative space will be complete with office furniture consistent with the normal office requirements for each work space, office and conference room; floor coverings, finished walls, with washable wall coverings that resist soiling and scratching and are suitable for industrial administrative ~~office purposes, ceilings, window dressing, and the like. Wiring will be~~

~~provided for computer equipment and telephones as well as an intercom~~ system between the offices, scale house, crane pulpit and Facility control room.

2.10.3 ~~Visitors Conference Room~~

A visitors' conference room will be provided on the third floor level of the Facility Administration Area. The visitor's conference room will be equipped with seating capacity for fifty (50) people, audio visual equipment and a wall mounted cross-sectional model of the Facility. A film or video tape of the Facility construction and operation will be available for viewing at the visitors' conference room.

2.10.~~4 Dedication Plaque~~

A cast bronze dedication plaque, three (3) feet by four (4) feet in size, will be provided at the entrance/reception area of the Facility Administration Area. The labeling will contain the name of the Facility ~~and the date. Final design wording and location of the plaque will be approved by the County.~~

2.11 Refuse Cranes and Load Cells

EQUIPMENT SPECIFICATION

Crane Handling Capacity:	1,800 TPD plus recast and mixing
Bridge Crane Span:	92 ft.
Maximum Lift Height:	82 ft.
Grapple Capacity:	8 to 10 cu.yd. approx.

Two (2) heavy duty overhead traveling bridge cranes will be provided suitable for continuous operation with a CMAA Spec. 70 Classification F.

Each crane will be equipped with a six (6) tine, polyp type (orange peel) grapple and will be sized for the expanded Facility capacity of 1,800 tons of refuse per day. This crane sizing allows for proper refuse storage pit maintenance which includes the ability to feed three (3) combustion units (two + one future) in addition to mixing/restacking in the refuse storage pit and removing inadvertently delivered non-processible waste. One crane will be a 100 percent stand-by but can be used to recast and mix refuse during peak delivery times.

The cranes and crane rails will be specifically designed and installed for the intended service (taking into account expected temperature and humidity conditions for the site) and will be furnished by a manufacturer with demonstrated satisfactory experience. The cranes will span the entire length and width of the refuse storage pit, the combustion unit charging floor (where the refuse charging hoppers are located), and the Non-Processible Waste roll-off container location(s). Crane laydown areas will be located so that either crane will be capable of reaching the above locations. The roll-off container areas located at both ends of the refuse storage pit, can also be used as the crane laydown areas.

The crane switchgear will be located in crane switchgear rooms, one at each end of the refuse storage pit. Switchgear rooms will be provided with adequate ventilation to disperse generated heat. Power will be supplied to the cranes by a festooned cable system running the entire length of the refuse storage pit.

A crane control pulpit with two (2) operating stations will be provided

and will be located on the long wall of the refuse storage pit between the refuse charging hoppers at the charging floor level. This location provides an unobstructed view of the refuse storage pit, refuse charging hoppers and tipping bays. The control pulpit will be provided with its own HVAC system supplied with a dedicated fresh outside air intake.

Each crane shall have a separate control station within the pulpit which shall consist of manual joy stick controls for bridging, trollying, raising and lowering the bucket, and bucket operation.

A semi-automatic control system will be provided to allow for automatic lift of the grapple and positioning over any of the preselected refuse feed hopper locations. Emptying of the grapple, return to location of loading in refuse storage pit, descent and filling of the grapple will be manually controlled.

Each crane will be equipped with load cells to weigh the amount of waste fed into each refuse feed hopper during tests. The system will have digital readout, totalizer and printout in the crane control pulpit. Readout for the crane load cells will be conveniently located for viewing by the crane operator. A calibration weight will be provided as part of the permanent Facility outfitting which is suitable for calibrating the crane load cells.

~~A communication system will be provided which will allow the crane~~ operator ~~to~~ have voice communication with the ~~Facility~~ control room, the tipping floor area, ~~the scale~~ house, the County's administration offices ~~and the front end loader operator.~~

TV cameras will be provided at each refuse charging hopper with monitors located in the crane control pulpit and main control room for observation of the refuse level in each refuse charging hopper.

The cranes and craneway will be designed to allow for parking of one crane at each end of the refuse storage pit and to permit laydown of the grapple at either the charging floor or tipping floor level to facilitate maintenance.

2.12 Refuse Feed Chutes

Each of the two (2) combustion units will include one (1) Martin GmbH refuse feed chute with refuse charging hopper. The upper refuse feed chute, below the refuse charging hopper, will include a built in shutoff damper activated by hydraulic cylinders. The lower refuse feed chute will be water jacketed. Each refuse feed chute will be equipped with microwave type level sensor in addition to visual monitoring by the TV cameras located above each refuse charging hopper.

2.13 Refuse Combustion Stokers/Combustors

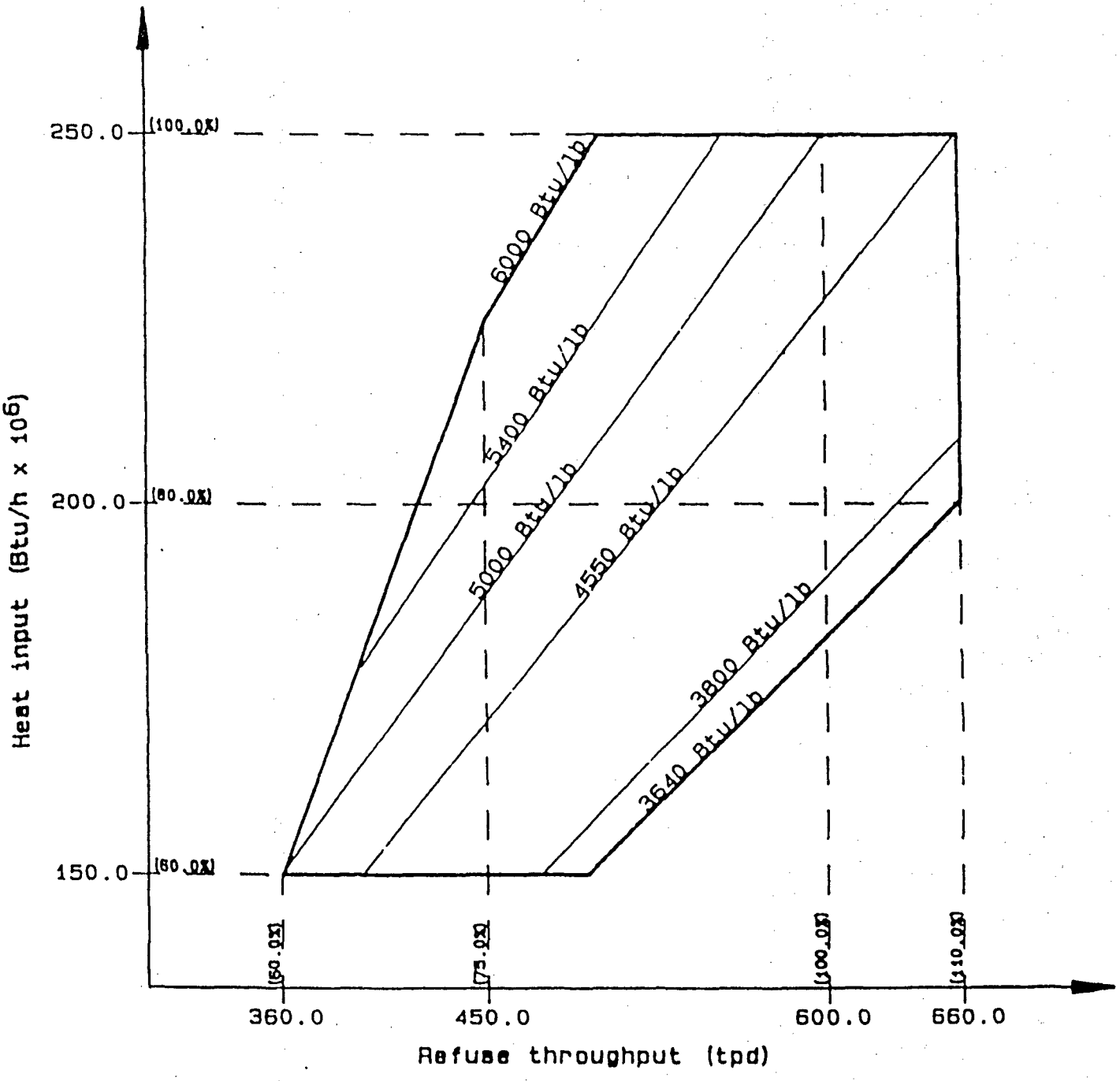
Each of the two (2) combustion units will be equipped with one Martin GmbH refuse combustion stoker of the reverse reciprocating type, (stoker).

Each stoker unit will have a nominal capacity of 250 million Btu/hr heat input when firing "as received" Reference Waste. Each stoker has the capability of firing waste over a range of heating values from 3,800 Btu/lb to 5,400 Btu/lb (Refer to Stoker Capacity Diagram, Figure 2-1).

Figure 2-1

STOKER CAPACITY DIAGRAM

LEE COUNTY



Date: 8-11-80

OGDEN MARTIN SYSTEMS, INC.

Each stoker, made up of four (4) individual thirteen (13) step grate runs, will have an approximate width of twenty-nine (29) feet, six (6) inches and a length of approximately twenty-three (23) feet, six (6) inches.

Each stoker will include the following:

- Grate support structure from the lower end of the feed chute to the clinker rolls, with hydraulic operating mechanism for moving the grate steps, clinker rolls, and all necessary accessories

- Grate surface consisting of multiple steel grate bars made from high grade chromium alloy cast steel

- Undergrate hopper of sheet steel divided into multiple compartments with access doors, stiffeners and the necessary accessories. Included is the automatic system for the removal of the undergrate siftings into the ash discharger, with all necessary accessories such as pneumatic cylinders and control equipment for the automatic discharge of the grate siftings

- Refuse feeding table with feed ram, supports and controls

- Hydraulic drives for moving the grate, refuse feeding device, ash discharger and the clinker roll, with the necessary electro-hydraulic control equipment for an infinitely variable control

of the reciprocating movement of the grate and for the feeding device, as well as the hydraulic cylinders for feed chute damper operation

- Overfire air nozzles above the front and rear furnace arches, including the nozzle tubes to supply air in the appropriate quantity, locations and relocities to provide turbulent mixing of the combustion gases.

- Automatic central lubricating system for all lubricating points of the stoker, including the distribution piping, grease pump and accessories.

- Lower ash discharger suspension frames made of steel plate, and two cleaning doors.

- Replaceable cast steel and steel plate ash chute lining pieces.

- Distribution cabinets for hydraulic drives containing electrical and hydraulic controls.

2.14 Ash Quench System

Two (2) Martin GmbH ash dischargers will be furnished with each stoker for quenching and discharging the bottom ash produced on the grate and fly ash from the downstream systems.

The discharging ram will be driven hydraulically from a central pumping station.

The ash discharger body will be of solid welded construction with replaceable liners. Each discharger will be equipped with a vibrator to reduce moisture content of the combined flyash and bottom ash prior to discharge on to the main conveyor.

Each ash discharger will be equipped with a transfer chute to permit uninterrupted removal of Residue while the main Residue conveyor is shut down for maintenance. The transfer chutes will be designed to provide rapid bypass of the main conveyor by directing the Residue into removable bins. Space will be provided to permit convenient access for removal of the bins. The bins will then be transported to the Residue storage building.

2.15 Boilers

Two (2) refuse fired steam generators (boilers) of the single drum, top supported, multiple pass water tube type, with integral welded waterwall cooled furnace, superheater and economizer sections will be provided as part of each combustion unit. The boiler units will be suitably insulated for indoor installation.

Each boiler unit will be directly coupled to its respective Martin GmbH refuse combustion stoker.

Each boiler unit will have a nominal capacity of 250 million Btu/hr refuse heat input when firing "as received" refuse having a higher heating value of 5,000 Btu/lb. Units will be designed in accordance with ASME Boiler and Pressure Vessel Code, Section I, Power Boilers.

Each boiler unit will be designed to provide steam at 865 psig with a final steam temperature of 830°F at the superheater exit with feedwater entering the economizer at 300°F and a normal minimum economizer flue gas exit temperature of 425°F.

Each boiler unit will include, but not be limited to the following scope of equipment:

- Boiler/stoker support steel, buckstays and hangers for independent support of each boiler/stoker unit and designed for applicable seismic loadings.

- All downcomer, feeder and riser piping, piping between economizer and steam drum, piping between steam drum and superheater and piping between primary and secondary superheater sections.

- Miscellaneous trim including safety valves for the boilers, steam drum and superheater, direct viewing water gauge complete with high and low water alarm contacts, water gauge with remote drum level viewing system, dial steam pressure gauge, main steam valves, main feedwater valves and all trim valves.

- A number of thermowells and thermocouples appropriately located on boiler drum and superheater to monitor steam temperatures.

- Platforms, walkways, ladders and stairs as required for normal access and inspection of the steam generator and stoker.

- Access doors and observation ports necessary for proper operation and maintenance.

- The forced draft and overfire combustion air fans and the induced draft fan, including control dampers (vanes), motor drives and all normal fan appurtenances. The fans will be designed per OMS standards which exceed RFP requirements that test block flow be at least 120% of the design flow at 145% of the design static pressure at MCR conditions.

- All air ducts, including expansion joints, dampers and access doors from the combustion air intakes located over the refuse storage pit to the combustion air fans, also from the combustion air fans to the air heaters, and from the air heaters to the stoker plenum and all overfire air ducts. All ducts will be constructed of A-36 steel plate properly supported, stiffened and made commercially tight.

- All waterwall sections in the flame area protected with castable refractory or gunnited refractory material for metal protection.

- All boiler and economizer hoppers constructed of A-36 steel plate, suitably lined and insulated where required.

- All external boiler surfaces insulated to reduce heat loss and also for operator protection.

- One sootblowing system consisting of rotary and retractable type sootblowers for boiler, superheater and economizer, all electrically driven with automatic sequential control using a solid state controller mounted in the central control room. Sootblowing system will further include all electrical accessories, piping, valves and fittings and automatic steam valve.

- Two steam temperature control systems consisting of spray header, spray water assembly including spray nozzle, spray header liner and temperature control components to maintain superheater outlet temperature.

- One three-element feedwater control system including drum level transmitter, steam flow transmitter, feedwater flow transmitter, drum level controller, manual/automatic control station, feedwater control valve, steam flow element and feedwater flow element.

- One propane gas fired auxiliary burner complete with combustion control system and capable of automatic operation. Burner will be sized for start-up, shutdown and be capable of raising the furnace gas temperature to 1,800° F prior to combusting waste and to maintain combustion gases at 1,800°F for a combustion gas

residence time of at least one second.

- Properly sized and positioned penetrations in the furnace walls for ammonia or urea injection to control emissions of oxides of nitrogen.

- All appropriate flue gas pressure taps and temperature points to monitor combustion conditions and control process functions, including thermocouples located outside the combustion zone which are used along with combustor/boiler modeling to assure compliance with maintaining combustion gases at 1,800°F.

The design of Martin facilities with respect to control of corrosion and/or erosion in various sections of the furnace/boiler and particularly the superheater is based on experience in operating facilities having equivalent or more stringent operating pressures and temperatures than those proposed for the Lee County Facility. The following is a listing of some of these facilities.

Facility	Capacity No. x TPD	In Operation YEAR	Pressure/Temperature PSIA/°F
Stuttgart	1 x 529	1965	940/980
Paris - Ivry	2 x 1323	1969	1160/880
Munich South	2 x 1058	1971	2675/1005
Nurnberg	1 x 529	1979	1175/842
Bristol	2 x 325	1988	880/830

Facility	Capacity No. x TPD	In Operation YEAR	Pressure/Temperature PSIA/°F
Stanislaus	2 x 312.5	1989	880/830
Haverhill	2 x 825	1989	880/830
Kent	2 x 312.5	1989	880/830
Fairfax	4 x 750	1990	895/830

Furnace walls above the grate surface will be protected from high temperature corrosion by the application of a refractory coating to a height of approximately thirty (30) feet. The type of refractory and studding of the furnace walls will be designed to optimize high heat transfer. The net effect of such a design will be reduced furnace wall temperatures and reduced fouling of the walls. For tube metal temperature data refer to Proposal Form A in Section 4.0 of this Schedule.

Research has shown that superheater corrosion is a function of gas side temperature, steam temperature, fly ash particle temperature and the degree of surface fouling unremoved with available cleaning systems functional during normal operation. Corrosion has clearly been shown to occur on tube surfaces beneath heavy layers of fouling. The corrosion is due to condensation of acid gases between the tube surface and the fouling layer.

Research has further shown that corrosion is controlled when fouling is controlled and that, most importantly, fouling is controlled when the gas temperature entering the superheater is controlled below the fly ash softening temperature of approximately 1,300°F. The steam side

temperature has been shown to have less influence on corrosion. In addition, fly ash particle temperature studies have revealed that such particles may be elevated above the gas temperature unless their residence time in the gas stream allows them to come into equilibrium with gas stream temperature. This residence time requirement, starting with combustion on the grate, has been shown to be at least six (6) seconds.

These research findings on corrosion and erosion have been validated again at our Bristol, Connecticut facility. After more than two (2) years of operation at steaming conditions of 880 PSIA, 830°F there is no evidence of corrosion or erosion.

All aspects of the furnace/boiler design for the Lee County Solid Waste Resource Recovery Facility consider the operating and research findings stated above. Boiler configuration, flow velocities and design and placement of heating surfaces are all directed toward achieving and maintaining flue gas temperatures under 1,300° F entering the superheater and ensuring the required fly ash particle residence time. Specifically, these design aspects include the following:

- Radiant heat absorption surfaces in the first two (2) boiler passes (furnace and radiant pass) have been established based on fouling factors experienced while burning refuse of varying characteristics in the United States. Thus, gas temperatures through these passes are predictable within a narrow range.

- In the third boiler pass, convection type heating surface is applied to ensure that the gas temperature entering the superheater remains in accordance with design regardless of fouling characteristics ahead of that surface. Convection surface in a boiler tends to adjust to available heat. Since heat absorption is dependent upon temperature differential among other things if the gas temperature rises at the inlet, more heat is absorbed in this surface, lessening the effect of the temperature rise at the outlet. This is possible since a greater temperature differential occurs between the gas and the saturated water in the tubes.

- The first three (3) boiler passes and the gas velocities therein provide for a gas residence time in excess of six (6) seconds between the fuel bed and entry to the superheater. Fly ash particle temperature is thus in equilibrium with gas stream temperature.

- The superheater is arranged in multiple stages with two (2) stages of water spray attemperation to closely control final superheat temperature as well as interstage temperature. The interstage attemperator is provided for greater control over final steam temperature as well as lower tube metal temperatures, which further reduce corrosion potential.

The materials of construction in the superheater are all selected based on American Society of Mechanical Engineers (ASME) Codes for expected tube metal temperatures. They are as follows:

Primary Superheater	
First Stage	SA 178 A
Second Stage	SA 210 A
Final Superheater	SA 210 A/SA 213 T11

- All heating surfaces in the convection, superheater and economizer areas are arranged for effective cleaning by retractable or rotary sootblowers as applicable.

- In the convection and superheater sections of the boiler, stainless steel tube shields are installed on the initial tube rows facing the gas flow or where such tubes are adjacent to sootblower cleaning lances. These shields are designed to be expendable and replaceable as required. They protect the tubes from corrosion and/or erosion.

- To prevent combustion chamber corrosion, the membrane walls are protected by silicon carbide refractory. The refractory and studding of these walls are designed for good heat transfer properties such that the wall temperature prevents slagging of fly ash.

At full load, the combustion chamber (first pass) flue gas temperature is approximately 1,900°F midway in the furnace and approximately 1,729°F entering the open second pass. The temperature of the flue gas leaving the third pass containing the convection section and entering the superheater is approximately 1,222°F. This prevents slagging of the superheater tubes, which results from the fusion of fly ash at temperatures above 1,300°F.

To minimize erosion, low flue gas velocities are employed, and fly ash hoppers are arranged under the boiler and superheater sections to minimize fly ash carryover.

The flue gas leaving the superheater enters the serpentine configuration economizer sections. These sections are enclosed in a vertical steel casing. The flow of feedwater in the economizer is counter to the flow of flue gas. The economizer is constructed from carbon steel tubes, with sufficient clearances between tubes designed to avoid plugging.

Strategically located and automatically sequenced rotary and retractable type sootblowers are provided to enable gas side cleaning of the boiler, superheater and economizer tubes. Retractable sootblowers constructed of suitable alloy material are used in the high temperature zones.

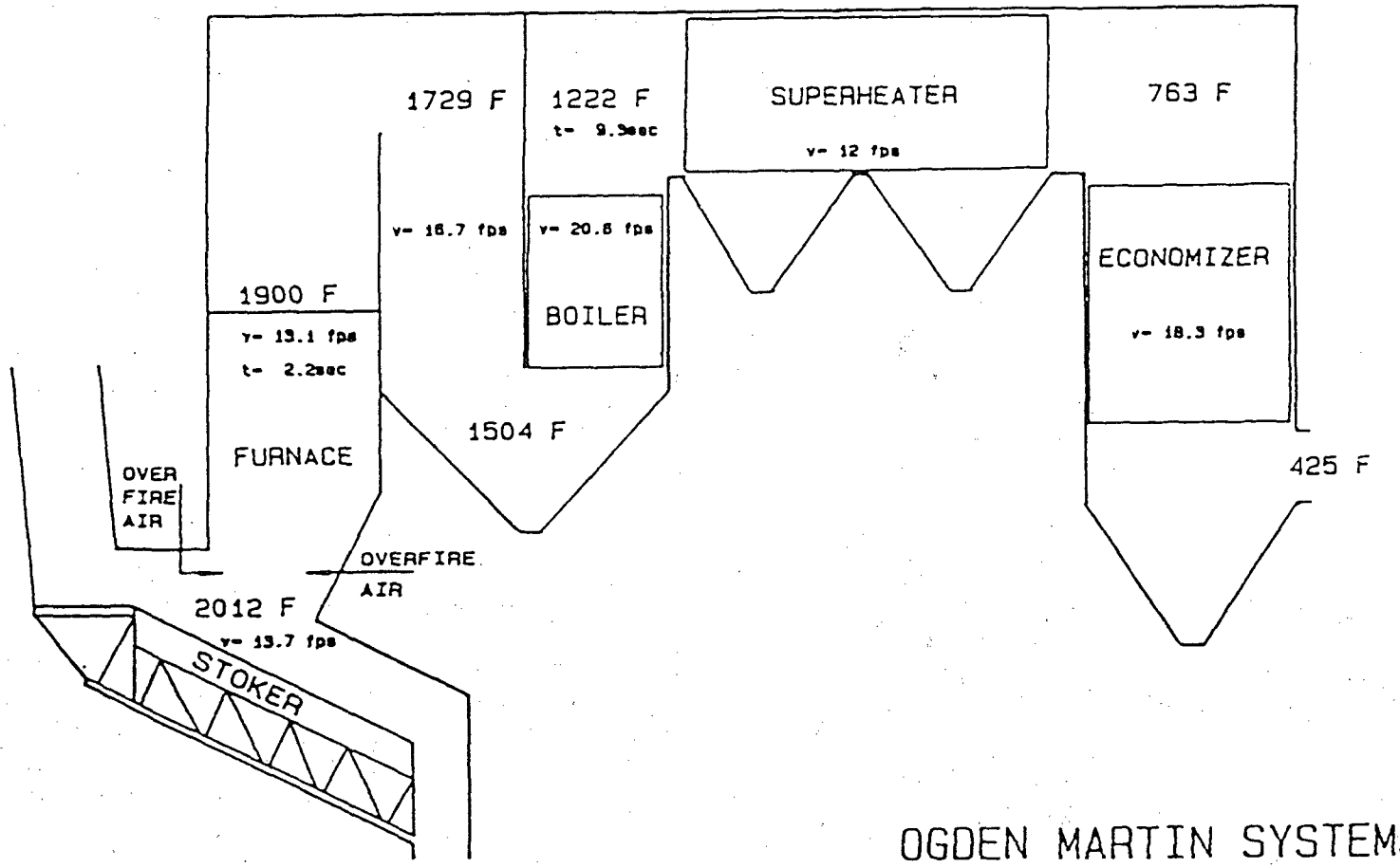
Additional design data is shown on Proposal Form A Equipment Specification Sheet No. 3 of this Schedule.

2.15.1 Predicted Furnace/Boiler Temperature Profile

Figure 2-2 depicts expected temperatures and flue gas velocities throughout the boiler.

LEE COUNTY - RESOURCE RECOVERY FACILITY

PREDICTED TEMPERATURE PROFILE - FURNACE/BOILER [HHV= 5000 BTU/LB]



OGDEN MARTIN SYSTEMS, INC.

Figure 2-2

2.15.2 Control of Oxides of Nitrogen

Uncontrolled emissions of Oxides of Nitrogen (NO_X) will be limited to three-hundred-and-fifty (350) pmdv at 7% O_2 expressed as nitrogen dioxide (NO_2), based on a three (3) hour average.

A Selective Non-Catalytic Reduction (SNCR) system will be designed and installed to provide a stack NO_X concentration of 0.324 lb/MMBtu (two-hundred (200) ppmdv at 7% O_2) as a twenty four (24)-hour block CEM average for each combustion unit. Each combustion unit will have an independent SNCR injection system designed for continuous operation at maximum continuous rating (MCR).

The reagent preparation portion of the SNCR system will be common to the two (2) installed injection systems. The system will be based on the injection of either ammonia (Thermal $DeNO_X$) or urea into one or more temperature zones of the furnace. The ammonia based system is described below.

The system will consist of an ammonia storage tank, ammonia vaporizers, air blowers, an ammonia/air blending system for each combustion unit and ammonia injection nozzles at the boiler.

Ammonia storage and handling facilities will be designed in accordance with the requirements of ANSI K61.1 and all applicable codes and standards. A high pressure ammonia storage tank will be included and will provide a (7) seven day supply of liquid anhydrous ammonia.

Three (3) ammonia vaporizers will be provided. Each vaporizer will be sized to provide 100 percent of the ammonia required for a single combustion unit. One vaporizer is provided as a spare for reliability.

Two (2) air blowers will be provided to supply carrier air for the ammonia and provide the momentum necessary to promote good mixing with the flue gas in the boiler.

The Thermal DeNO$_x$ system will include all piping, safety valves, instruments and excess flow valves necessary for a safe and operable system.

A urea based injection system would be similar to the ammonia system described above with the exception that vaporizers or high pressure storage are not required.

2.15.3 Mercury Abatement System

Mercury reduction will be accomplished by injecting a chemical and/or sorbent into the flue gas stream after the boiler economizer. The solid sorbent with the absorbed mercury or the solid particulates consisting of the chemical additive combined/reacted with mercury from the flue gas will be collected in the baghouse and discharged to the fly ash system. The chemical or sorbent additive will be stored on the facility site in a bulk storage area. Storage will be provided for a minimum of seven days normal operation. The chemical or sorbent additive will be transferred from the

bulk storage area to each boiler and injected at a constant feed rate developed during initial facility performance testing. The overall system shall be designed with sufficient redundancy that failure of a system component will have minimal impact upon Facility operation.

The storage, transfer and injection systems for the chemical or sorbent additive shall be designed in accordance with all applicable codes and recommended engineering practices. The installation of this equipment will not effect Facility energy or throughput guarantees.

2.16 Forced Draft Fans

Test Block Condition

Flow: 74,000 ACFM @ 105°F approx.

Static pressure: 19 inches w.g. approx.

Each of the two (2) combustion units will be equipped with a dedicated forced draft fan. The fan will be of the single inlet, single width, split housing, design and will include the inlet box, drain, variable inlet vanes, coupling and guard, antifriction bearings, vane operator and motor drive. Each forced draft fan will draw in ambient air from the refuse storage pit/tipping floor area to meet the undergrate combustion

air requirements and to control odor in the refuse storage pit/tipping floor areas.

The forced draft fan test block flow will be at least 120 percent (120%) of the design flow at 145 percent (145%) of the design static pressure at MCR conditions. This will provide a fan whose capability will exceed that which is specified in Schedule 2, Part A, and meets the requirements for Martin stoker/combustion unit operation over a wide range of refuse throughputs and higher heating values.

2.17 Overfire Air Fans

Test Block Condition

Flow: 34,500 ACFM @ 105°F approx.

Static Pressure: 21 inches w.g. approx.

Each of the two (2) combustion units will be equipped with a dedicated overfire air fan. The fan will be of the single inlet, single width, split housing, design and will include inlet box, drains, variable inlet vanes, coupling and guard, antifriction bearings, vane operator and motor drive. Each overfire air fan will draw in ambient air from the refuse storage pit/tipping floor area to meet the overfire combustion air requirements and to control odor in the refuse storage pit/tipping floor areas.

The overfire air fan test block flow will be at least 120 percent (120%) of the design flow at 145 percent (145%) of the design static pressure at MCR conditions. This will provide a fan whose capability will exceed

that which is specified in Schedule 2, Part A and meets the requirements for Martin stoker/combustion unit operation over a wide range of refuse throughputs and higher heating values.

2.18 Seal Air Fans

Test Block Condition

Flow: 1,610 ACFM @ 105°F

Static Pressure: 19 inches w.g. approx.

Each of the two (2) combustion units will be equipped with a dedicated seal air fan. Each seal air fan will draw in ambient air from the combustion unit enclosure area to supply air to seal the stoker grate transverse frame.

2.19 Induced Draft (ID) Fans

Test Block Condition

Flow: 167,000 ACFM @ 300°F approx.

Static Pressure Rise: 17 inches w.g. approx.

Each of the two (2) combustion units will be equipped with a dedicated induced draft fan. The fan will be of the split housing design and will include inlet box, drain, variable inlet vanes, coupling and guard, antifriction bearings, vane operator and motor drive. The ID fans will be used to maintain a negative pressure throughout the air pollution control system and combustion unit to direct flue gases from the furnace section through the unit to the stack. Fans will be designed to operate at 900 RPM maximum.

The induced draft fans are designed to supply at least 120 percent (120%) of the flue fas flow and 145 percent (145%) of the system losses at MCR flow.

2.20 Air Preheaters

Each of the two (2) combustion units will be equipped with two (2) finned tube steam coil air heaters per combustion unit, complete with steam headers and control valve, plate steel enclosure with inlet and outlet flanged connections. These heaters will be designed to preheat both the undergrate and overfire combustion air from 80°F to 300°F at rated combustion unit capacity.

2.21 Dry Scrubbers

The flue gas dry scrubber technology intended for use at the Lee County Facility has been successfully demonstrated on operating Martin waste-to-energy facilities world wide.

Each of the two (2) combustion units will be equipped with a flue gas dry scrubber system for acid gas reduction. The dry scrubber system will utilize a lime slurry as the scrubbing reagent and will be designed for 95 percent (by weight) reduction of HCl or an outlet concentration of 25 ppmdv at 7 percent O_2, whichever is less stringent and 85 percent by weight reduction of SO_2 or an outlet concentration of 30 ppmdv at 7 percent O_2, whichever is less stringent. The acid gas control equipment will also be designed to control SO_2 outlet concentration such that it does not exceed 49.5 ppmdv at 7 percent O_2 over a 24 hour block CEM

average when inlet SO_2 concentrations are less than or equal to 330 ppmdv at 7 percent O_2 over a 24-hour block CEM average. The SO_2 criteria is as a block 24-hour average as monitored by CEM whereas the HCL criterion is by manual test method (EPA Method 5-modified).

Each dry scrubber system will include a reaction vessel, slurry atomizer(s), structural supports, platforms, stairs, process controls and other accessories necessary for complete independent operation of each combustion unit.

A lime slurry preparation system common to the two (2) dry scrubber systems will be provided. This system will be located within the main process building and will include a pebble lime storage silo, two lime slaking systems, a slurry tank with agitator, slurry pumps, and piping and controls.

The lime storage silo(s) will be located within the main process building and will be designed for a total storage of seven (7) days capacity at the expected normal operation reagent consumption rate. A truck fill panel, fill pipe and vent filter will be provided for delivery of pebble lime from pneumatic conveying bulk trucks. The vent filter will be mounted on the roof of the silo to filter and vent the lime transport and displaced silo air outside the main process building. The vent filter (baghouse) will be designed to have a particulate removal efficiency of 99.9% removal of particles larger than 1 micron. A caged ladder, platform with handrails, and manholes will be provided for inspection and maintenance.

Each lime slaking system will consist of a volumetric feeder and a 100 percent capacity slaker with grit removal system. Lime slurry from both slakers will feed a common lime slurry tank.

The lime slurry tank will be designed for six (6) hours of storage and be fitted with a top mounted agitator. Lime slurry from the slurry tank will be pumped via two (2) 100 percent lime slurry pumps (one operating, one common spare) to the dry scrubber of each combustion unit.

The slurry pumps will provide a continuous flow of lime slurry to each dry scrubber. The self-draining piping network will have sufficient velocity to prevent particle fallout. The slurry piping will incorporate quick-connect fittings to allow flushing. Tees and crosses will be used rather than elbows to facilitate mechanical cleaning.

Each dry scrubber will house a slurry atomizer system and provide for the mixing of the atomized absorbent and the hot flue gases. A slurry atomizing system will provide the optimum size droplets to the reaction chamber. The atomizer will be designed for reliable, continuous operation with minimum maintenance. The atomizer will be either of the dual fluid nozzle type or the mechanical rotating type. The reaction chamber will typically have a cylindrical shell and conical bottom constructed of carbon steel plate. The dry product falling into the hopper at the bottom of the chamber will be removed by screw conveyors and combined with fly ash from the baghouses. Hopper accessories will be equal to those provided for the baghouse hoppers. Access doors will be

provided to the interior of the scrubber module for maintenance purposes. The scrubber and ductwork will be thermally insulated.

2.22 Baghouses

Following each flue gas dry scrubber system will be a multi-module fabric filter dust collector (baghouse) including a cleaning system with controls, compartment isolation system and ash collecting hoppers with heaters. Each baghouse unit will be designed for indoor installation, and will include support steel, stairs, ladders and walkways.

The baghouses will be designed to meet an emission limitation for particulates of 0.010 grains per dry SCF of flue gas corrected to 7 percent O_2.

The baghouses will be made up of multiple compartments to allow bag cleaning with one (1) module off line while maintaining system operation and guaranteed particulate removal efficiencies. The cleaning process will be selectable for either automatic mode initiated by a signal from the adjustable differential pressure set point, with pre-set sequence and cycle duration, or manual control (remote or local), with all variables selectable.

The fabric filter units will be designed for continuous operation at the specified conditions and for long bag life with a temperature limit of 500°F. This high design temperature, along with an automatic bypass system which is activated upon loss of lime injection, will protect the bags in the event of a scrubber lime slurry atomization system failure.

The bag and cage assemblies will be suspended from a tube sheet secured in an airtight casing. The ash will be collected in hoppers fabricated of one quarter (1/4) inch thick carbon steel plate with a minimum valley angle of 60° from horizontal and designed for up to eight (8) hours emergency storage.

The baghouses will be insulated to limit the temperature drop through the entire unit to 10°F using a minimum of four (4) inches of fiberglass batt insulation installed over stiffeners. All insulated surfaces will be covered with aluminum cladding or equivalent.

The hoppers will be insulated and covered with aluminum cladding or equivalent. The lower third of each hopper will be provided with electric heaters. One (1) access door and one (1) rod-out opening per hopper will be provided.

ID fans and ducts will be insulated with a minimum of four (4) inches of fiberglass insulation over stiffeners. All insulated exterior ductwork and expansion joints will be provided with weatherproof aluminum cladding or equivalent.

All expansion joints handling gases above ambient temperature will be insulated to prevent condensation at the joint. All expansion joint connections will be flanged with air tight sealing gaskets made of non-hazardous materials.

The layout of the air pollution control equipment will allow adequate

space for future expansion of the main process building to support an expanded Facility size of 1,800 TPD.

2.23 Ash Handling System

The Residue removal system will be designed to ensure maximum availability of the combustion units. Bottom ash consisting of boiler fly ash, burned-out waste residues, and grate siftings, will be wetted, quenched, combined with fly ash from the dry scrubber and fabric filter baghouse and discharged by the Martin ash dischargers to a common main Residue conveyor.

The bottom ash system components will be sized to handle twenty-eight (28) tons per hour as a normal flow and fifty-six (56) tons per hour as a short-term surge flow.

The fly ash collected from the dry scrubber and fabric filter baghouse air pollution control equipment which includes spent lime reagent, collected salts and fly ash will be collected by a system of screw conveyors. The fly ash will be directed to the Martin ash dischargers where it will be combined with the bottom ash. The Martin ash dischargers will be equipped with vibrators to condition the mixture of bottom ash and fly ash. Moisture content of the combined water quenched ash streams will not exceed 30% by weight in normal operation.

Provision will be made to allow for installation of a future system to collect the fly ash from the dry scrubber and fabric filter baghouse air pollution control equipment separately from the bottom ash should this ever become necessary.

If a vibrating pan conveyor is used for the main Residue conveyor it will have multiple drives and be capable of operating on a timed cycle. Provision for by-passing the main Residue conveyor during periods of conveyor maintenance, (and sufficient access to allow for removal of bypassed Residue during such periods) has been designed into the equipment and Facility layout. The main Residue conveyor will carry discharged ash from the combustion units to a grizzly scalper. The grizzly scalper will extract pieces larger than ten (10) inches from the main Residue stream. Oversized pieces will be transported to the Residue storage building via front end loader. Undersized pieces will be fed to an inclined belt conveyor for transport to the Residue storage building. Conveyors between buildings will be totally enclosed.

The design and type of the Residue removal system being supplied has been previously installed and proven satisfactory in operation in other Ogden Martin mass burn resource recovery facilities. The Residue removal system will be designed for the maximum Residue quantity resulting from maximum waste processing at the expanded Facility size of 1,800 TPD at a 70 lb/ft^3 density.

The Residue storage building will be divided into appropriately sized compartments to store ferrous metals and processed Residue separately. One third of the storage compartments will be dedicated to ferrous storage and two thirds will be dedicated to non-ferrous storage. The Residue coming from the scalper via belt conveyor will be subjected to magnetic separation of ferrous material. The building will be sized to provide three (3) days of Residue and ferrous material storage at the 1,200 TPD Facility size based on an average Residue density of 70 lb/ft^3. The building will be designed such that it will be capable of expansion to serve the expanded 1,800 TPD Facility size.

The entire floor surface of the Residue building and the floor area around the grizzly scalper shall be reinforced with an abrasion resistant coating of Masterbuilders Masterplate 200 or Burke Metallic Floor Hardener or equivalent. Shake-on hardener materials will be applied at a rate of two-point-five (2.5) pounds per square foot.

The floor of the Residue storage building will be provided with drainage trenches in the truck loading area with the floor in this area sloped to the drains. Sufficient wash down hoses will be provided to maintain clean conditions and prevent fugitive dust from leaving the area. The collected drainage from the Residue storage building will be directed to the settling basin for reuse as quench water in the ash dischargers.

The Residue building will be kept under negative pressure by a ventilation fan. The air will be filtered by a baghouse located in the Residue building prior to its discharge to atmosphere above the Residue building roof elevation through a stack. The baghouse will be designed to have a maximum outlet loading of 0.015 gr/dscf.

The Facility ferrous recovery system will be located within the Residue storage building and will be designed to remove eighty (80) percent of the ferrous metal in Residue containing at least eight (8) percent by weight of magnetic ferrous metals greater than one (1) inch in size. The ferrous material will be loaded from its storage bin into roll-off containers or other suitable vehicle for transport to market.

The system will consist of the following items:

- Rotary drum magnet located above the feeder conveyor to recover the magnetic ferrous material
- Rotary trommel to agitate and remove loose dirt and scale from the ferrous material
- All necessary chute work and product distribution conveyors
- Roll-off containers or other means to transport recovered ferrous material to market.

The ferrous recovery system will be designed for the requirements of the 1,800 TPD expanded Facility.

2.24 Stack

The stack will be two-hundred-seventy-five (275) feet high, square, free standing and of precast concrete construction or cast in place designed to look identical to a precast stack with two (2) insulated flues plus space for installation of one (1) future flue. Stack liner material will be of corrosion resistant material consisting of ASTM A36 except the top twenty feet of each flue will be stainless steel conforming to ASTM A167, Type 316. Each flue will be approximately 6 feet-6 inches in diameter, extending five (5) feet above the two-hundred-seventy (270) foot high shell of the stack. The portion of each flue extending above the shell will be colorized to match the precast concrete shell of the stack. Sufficient ports will be provided in the stack and stack inlet ductwork for gas sampling and monitoring in accordance with U.S. Environmental Protection Agency (EPA) and Florida Department of Environmental Regulation (FDER) requirements. Platforms and ladders will be included to provide access to designated sampling locations as well as the top of the stack. The stack will be grounded and will be designed in compliance with Good Engineering Practice as defined in 40 CFR 51.1.

If an exterior sampling platform is required, it will be constructed of concrete and will be located no higher than twenty (20) feet above the roof of the section of the main process building which encloses the air pollution control equipment.

The stack shall be designed as an architectural feature of the Facility and will be constructed from smooth finished concrete panels with no

apparent slipform joints or markings when viewed from the site boundary. A recessed vertical accent band will be cast into the concrete panels allowing the stack to assume its role as an architectural element of the Facility. The stack shall be "colorized" to match the dominant color of the Facility buildings.

Only obstruction lighting in accordance with Federal Aviation Administration (FAA) Regulations will be provided. The distance between the stack and the main Facility building will be kept to a minimum.

2.25 Boiler Feedwater Treatment System

The Facility potable water system will supply makeup water to carbon filters and cation and anion exchangers to demineralize the water for use as boiler feedwater. Two (2) full capacity carbon filter, cation and anion trains, each sized for the expanded Facility capacity of 1,800 TPD, will be provided. This will allow uninterrupted operation of the demineralizer system when one cation and anion train is backwashed, rinsed and regenerated. The boiler feedwater system will be capable of treating the makeup water to American Boiler Manufacturers Association (ABMA) boiler water quality standards for the design steam conditions.

Wastewater from the treatment system will be directed to the Residue water quench or other in-plant water needs to the maximum extent possible.

A 4,500 gallon minimum capacity sulfuric acid tank will be provided for cation exchanger regeneration and wastewater neutralization. A 4,500 gallon minimum capacity caustic tank will be provided for anion exchanger

regeneration and wastewater neutralization. A 38,000 gallon neutralization tank will be provided to allow for adjustment of wastewater pH prior to discharge to the sewer. A 26,000 gallon demineralized water or treated water makeup storage tank and transfer pumps with a design capacity of greater than twenty (20) minutes based on the continuous design rated feedwater flow rate required for the expanded Facility, will also be provided.

2.26 Boiler Chemical Feed System

The boiler chemical feed system will be common to all boiler units and will consist of:

- One (1) oxygen scavenger system
- One (1) boiler mixed chemical system
- One (1) corrosion inhibitor system

Each system will consist of a storage tank (100 gallons minimum), mixer and pumps. Pumps will be of manufacturer's standard construction of the manually adjustable range proportioning type fitted with check and relief valves.

Antifoam treatment will be added in the mixed chemical system.

The quality of the boiler drum water will be held within the limits recommended by the ABMA for the design operating pressure.

2.27 Boiler Feedwater Deaerator

The boiler feedwater deaerator will be a packaged unit of the tray type with integral horizontal feedwater storage tank designed to deaerate and heat boiler feedwater. The unit will be supplied complete with safety valves, vent valves, overflow, vacuum breaker, and other related accessories. The deaerator will be designed in accordance with ASME Boiler & Pressure Vessel Code, Section VIII. The deaerator storage tank will be designed for the expanded Facility size of 1,800 TPD with twenty (20) minutes of emergency storage based on operation at continuous design rated capacity and deaeration to 0.005 cc per liter oxygen with an outlet water temperature of approximately 300°F. The design pressure will be seventy-five (75) psig with a normal operating pressure of approximately forty-nine (49) psig .

2.28 Feedwater Heater

The feedwater heater system will utilize two (2) low pressure regenerative type feedwater heaters to heat the condensate pumped from the main condenser to the deaerator. Steam will be extracted from the main turbine to heat the condensate. Drains from the feedwater heaters will be cascaded to the main condenser. The heater tubes will be stainless steel. The heaters will be designed in accordance with the applicable requirements of ASME Boiler & Pressure Vessel Code, Section VIII and HEI standards for closed feedwater heaters.

2.29 Boiler Blowdown Exchanger

The boiler blowdown exchanger will be of shell and tube type construction in accordance with ASME Boiler & Pressure Vessel Code, Section VIII and the Tubular Exchanger Manufacturers Association (TEMA), Class C

Mechanical standards. Heat exchanger tubes will be stainless steel. The heat exchanger will be fed by the makeup water line to the deaerator and will be designed to recover the optimum amount of heat from the continuous boiler blowdown stream. Boiler blowdown will be metered and reused after discharge from the boiler blowdown tank.

2.30 Bypass Condenser

Equipment Specification

Flowrate: 337,500 lb/hr (approx)

Condenser Duty: 416 MBtu/hr (approx)

The bypass condenser will be shell and tube design, including the necessary pressure and temperature control equipment, and will be constructed in accordance with ASME Boiler & Pressure Vessel Code, Section VIII and HEI standards for closed feedwater heaters. The bypass condenser will be sized and installed such that the two (2) combustion units can operate at maximum Facility design capacity (1,200 TPD) during periods of complete turbine-generator outage.

2.31 Cooling Tower

Equipment Specification

Cooling Water Flow: 33,200 GPM

Blowdown Rate: 127 GPM approx.

Makeup Rate: 580 GPM approx.

The cooling tower will be a multiple cell mechanical induced draft cooling tower constructed with redwood timber members (pressure treated

in accordance with CCA 0.40) and designed in accordance with National Design Specification for Wood Construction and the Cooling Tower Institute Standards for installation and operation utilizing treated secondary waste-water effluent from the Ft. Meyers waste-water treatment plant as makeup. The tower will include the structure, stairs, fans, lightning protection and cooling water distribution system. It will be provided with a fire protection system and equipped with drift eliminators. The cooling tower will be installed on a concrete basin and will be located as shown on the Site Plan, Drawing C-100. The location was chosen so as not to obstruct the vision of drivers or create slippery roads or sidewalks. The cooling tower will be sized to meet the installed 1,200 TPD Facility's maximum cooling requirements and configured to allow for the installation of additional cells required to meet the cooling requirements of the expanded 1,800 TPD Facility. Refer to Figure 2-3 or Figure 2 of Schedule 5 to this Construction Agreement for cooling tower performance curves.

2.32 Cooling Water Treatment System

Makeup to the cooling tower will be supplied from the County's reclaimed water system with filtering provided by the Facility's dual media filter system. Chemical treatment is also provided for the cooling water system to control corrosion, scaling and fouling.

Corrosion of the recirculating cooling water system will be controlled by injecting corrosion inhibitor into the cooling tower basin and circulating water piping. Inhibitors to be used could include hydroxy-ethylidine-diphosphoric acid (HEDP), phosphates, molybdates, tolytriazole (TTA), or other suitable chemicals. A polymer dispersant will also be

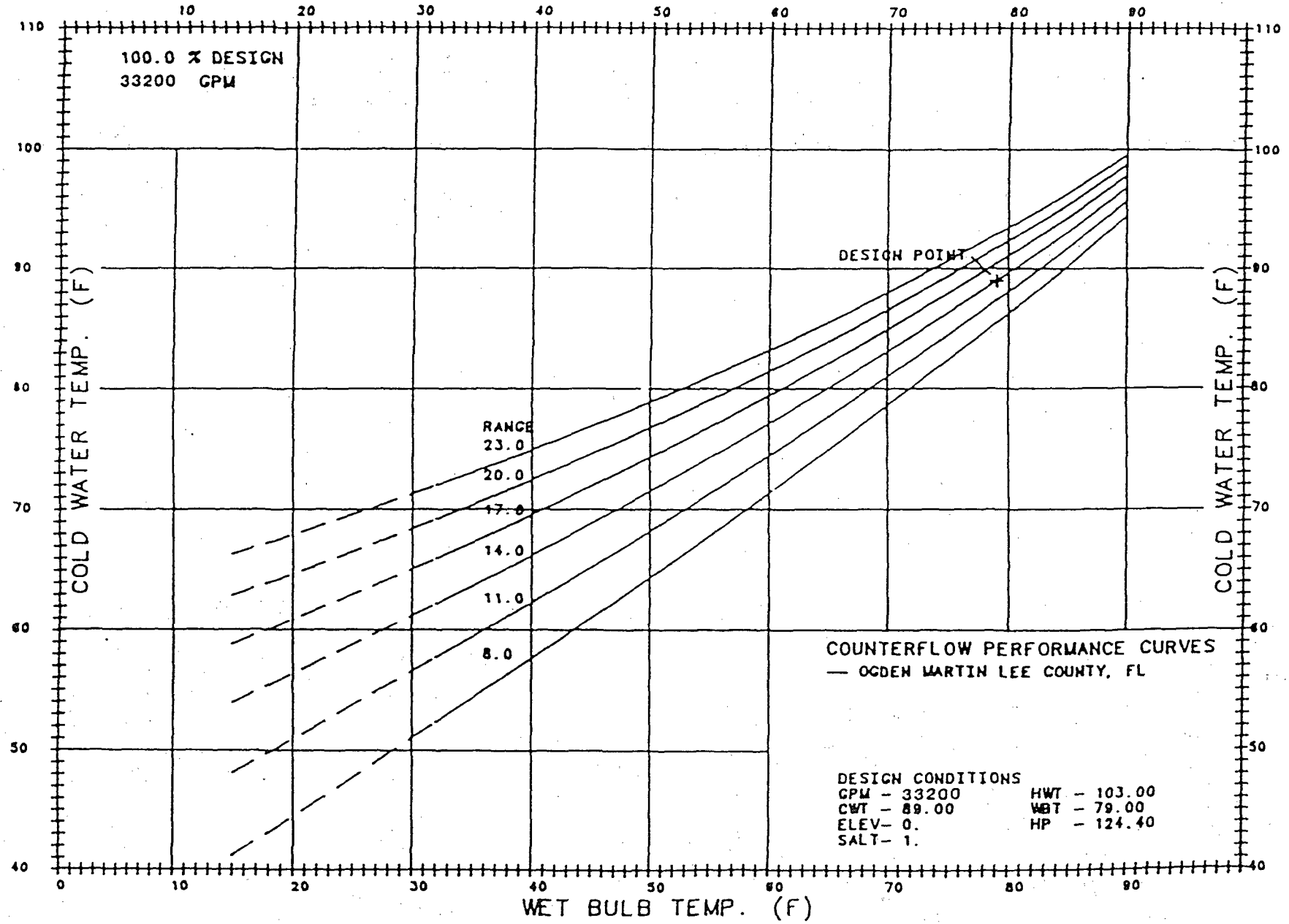

100.0 % DESIGN
33200 GPM
DESIGN POINT
RANGE
23.0
20.0
17.0
14.0
11.0
8.0
COUNTERFLOW PERFORMANCE CURVES
— OGDEN MARTIN LEE COUNTY, FL
DESIGN CONDITIONS
GPM - 33200
CWT - 89.00
ELEV- 0.
SALT- 1.
HWT - 103.00
WBT - 79.00
HP - 124.40
COLD WATER TEMP. (F)
WET BULB TEMP. (F)
0
10
20
30
40
50
60
70
80
90
100
110

Figure 2-3

used to disperse deposits and/or corrosion products, which will be removed from the system in the cooling tower blowdown.

Scaling control will be provided by the addition of sulfuric acid to the cooling tower makeup line. The acid dose and cooling tower cycles of concentration will be adjusted to maintain a Langelier Index which is slightly positive to inhibit the formation of scale on heat transfer surfaces.

Chlorine will be used as a biocide to control the formation of microbial deposits in the cooling water system. A gaseous chlorination system, injecting a solution of gaseous chlorine dissolved in water, will be used. Diffusers will be employed to disperse the chlorine in the cooling tower basin. Free chlorine or biocide levels in the cooling tower will be continuously monitored.

2.33 Steam Piping

Steam piping for the Facility will be designed, fabricated and installed in accordance with ANSI B31.1, "Power Piping". High pressure steam piping (865° psig, 830°F) which includes the main steam and boiler blowdown piping will be ferritic steel per ASTM A335, Gr. P11. Low pressure steam piping and all other steam, feedwater and condensate piping will be carbon steel. The main steam header will be sized to permit 100 percent (100%) of the 1,200 TPD Facility steam generation flow to be directed to the dump condenser. Valve class will be per ANSI B16.34. Metering of both individual and combined blowdowns and a blowdown flash tank will also be provided.

2.34 Condensate Piping

Condensate piping will be designed, fabricated and installed in accordance with ANSI B31.1, "Power Piping". Condensate piping will be carbon steel.

2.35 Boiler Feedwater Pumps

Rated Condition

Flow: 845 GPM

Head: 3,000 feet (approx)

The boiler feedwater pumps will be multi-stage, radially segmented casing pumps. Two (2) 100 percent capacity pumps will be supplied, one (1) steam turbine driven and one (1) electric motor driven with a totally-enclosed fan cooled (TEFC) motor. Each pump will be capable of supplying boiler feed water to the Facility combustion units at the 1,200 TPD rated design capacity. The pump casing material will be steel. The impellers, heat treated wear rings and other interstage wearing parts will be alloy steel. The impellers will be keyed to the shaft and mounted with a light shrink fit against fully retained split rings.

2.36 Condensate Pumps

Rated Condition

Flow: 645 GPM

Head: 350 feet (approx)

Two (2) canned vertical type condensate pumps, 100 percent of condensate flow capacity each, will be supplied. The suction barrel and discharge head will be steel. Each column assembly will be steel. The impellers will be cast iron.

2.37 Circulating Water Pumps

Rated Condition (Two 100% Pumps)	(Three 50% Pumps)
Flow: 33,200 GPM (approx)	Flow: 16,600 GPM (approx)
Head: 100 feet (approx)	Head: 100 feet (approx)

Two (2) vertical wet pit type pumps, sized for 100 percent flow capacity each, or three (3) vertical wet pit type pumps, sized for 50 percent flow capacity each, will be provided. The impellers will be constructed of bronze and will be of the enclosed mixed flow type. The impellers will be collar mounted to a carbon steel pump shaft. The flanged column will be constructed of carbon steel. The discharge head will be constructed of cast iron.

2.38 ~~Fire Pump~~

~~Design Condition (Fire Water Pump)~~	~~Design Condition (Jockey Pump)~~
Flow: ~~2,500~~ GPM	Flow: 5 GPM (approx.)
Head: 125 psi	Head: ~~125~~ psi

A horizontal diesel driven fire water pump will be provided in accordance with NFPA Standard 20. The pump will be provided with a diesel drive equipped with dual batteries and a fuel tank sized per NFPA Code. The ~~pump will take suction from the water storage tank and discharge to the~~

~~yard loop. An electric motor driven jockey pump to maintain constant fire protection loop pressure will also be provided.~~

2.39 Demineralized Water Pumps

Rated Condition

Flow: 57 GPM

Head: 230 feet (approx)

Two (2) horizontal centrifugal demineralized water pumps, each sized for 100 percent of full required capacity, will be provided. Each pump will be designed for continuous duty and will be mounted on a common base plate for pump and motor.

2.40 Bulk Acid Transfer Pump

Two (2) 100 percent capacity positive displacement diaphragm type pumps will be provided, each with sufficient capacity to regenerate one (1) train of the demineralizer system. The pump will be constructed of Alloy 20 material with a Teflon diaphragm.

2.41 Bulk Caustic Transfer Pump

Two (2) 100 percent capacity positive displacement diaphragm type pumps will be provided, each with sufficient capacity to regenerate one (1) train of the demineralizer system. The pump will be constructed of Type 316 stainless steel with a Teflon diaphragm.

2.42 Process Water Supply System

The primary source of process water will be treated wastewater effluent

provided to the site boundary from the County's reclaimed water system. The Facility design assumes adequate pressure is available at the site boundary and that booster pumps for reclaimed water are not required.

2.42.1 Process Water Pump Station

Rated Condition

Flow: 550 GPM

Head: 70 feet (approx.)

Two (2) horizontal centrifugal water pumps, each sized for 100 percent capacity of the required 1,200 TPD Facility requirements, will be provided. Each pump and motor will be designed for continuous duty and will be mounted on a common baseplate.

2.42.2 Process Water Treatment System

The process water treatment system will supply process water for washdowns, cooling tower make-up, and water to the fire protection system water storage tank.

Raw secondary sewage treatment effluent (reclaimed water) is treated with a polymer and processed through dual media filters prior to use within the Facility. Product water from the filters is utilized as make-up to the cooling tower. Continuous filter backwash passes to a Lamella clarifier for solids concentration. Clarified water will be used as cooling tower make-up. Clarifier sludge underflow is treated in a solids sludge concentrator and the filtrate is reused within the Facility.

The system shall include two (2) filters sized for the cooling tower makeup water requirements at Facility MCR operation, a filtered water storage tank sized to hold thirty (30) minutes of storage capacity of the cooling tower MCR makeup water requirements along with two (2) 100 percent capacity process makeup water pumps. The secondary source or process water will be an onsite well system. The well system will consist of single or multiple pumps, as necessary, designed to supply the total Facility process makeup water requirements. The well system will tap the shallow sandstone aquifer located approximately 120 feet below grade.

2.43 Process Wastewater Treatment System

The design of the process waste water treatment system will maximize the reuse of all process wastewater streams generated within the Facility. Neutralization wastes and reverse osmosis reject water will be combined in a waste water collection tank and used as dry scrubber dilution water and as an alternate source of ash quench water. Excess process waste waters which can not be reused will be treated to meet the required discharge standards and will be combined with ~~sanitary wastewater for discharge to the County's sanitary sewer system. Wastewater discharge to the County sewer system~~ will be limited to one hundred fifty thousand (150,000) gallons per day (GPD).

Drains and washdown water from the combustion unit area, turbine generation area and air pollution control equipment area trenches will be routed to a settling basin where the clean water discharge will be used for ash quenching. Cooling tower blowdown will be treated by

clarification, filtration and reverse osmosis. The product water will be used for dry scrubber slaking water and as cooling tower make-up water.

2.44 Potable Water Supply and Treatment System

The County will construct a potable water line to be available prior to the start-up date. Potable water will be available up to seventy five thousand (75,000) gallons per day (GPD) from this line located in the right of way (North side of Facility entrance road) of Buckingham Road. Typical pressure in this line will be forty (40) to sixty (60) psig. It is assumed that no treatment of the potable water is required. **Domestic and Sanitary uses of this potable water are not considered to be Resource Recovery Equipment and therefore are not exempt from sales tax.**

2.45 Residue Handling

See 2.23 - Ash Handling System

2.46 ~~Elevator~~

~~A passenger/freight elevator will be provided as part of the Facility to~~ allow for direct access to the Administration Areas the control room and for operation and maintenance access to the main levels in the main process building. The elevator will be handicap accessible and will have a rated capacity of four thousand (4,000) pounds. Total vertical car travel will be approximately sixty-two (62) feet. The elevator will be fully equipped with interior lighting, exhaust fan, car telephone, car position indicator, car operating panel, corridor pushbutton stations and ~~other associated hardware.~~

2.47 Compressors

Two (2) 100 percent capacity air compressors of the lubricated rotary

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type will be used. Each compressor will be designed for 400 SCFM and 110 psi. One compressor will be standby for emergencies and for peak loads. Each compressor will be supplied with a coupling guard; and both the compressor and motor will be mounted on a fabricated steel base. Inlet filters and silencers will also be provided. High efficiency moisture and oil separators will be provided on the discharge, complete with gauge glass, low level floats with high level alarm switches, relief valves, drain traps and blowdown valves. A twin tower dessicant air dryer and receiver is provided for instrument air needs.

2.48 Distributed Control System

A distributed control system (DCS) consistent with the industrial standard found in electrical power utility station services will be provided, consisting of a network of microprocessors integrated with a central control console. The DCS will perform the following functions:

- Control, monitoring and interlocking (except safety interlocks which will be hard wired)

- Annunciation of abnormal conditions

- Process data acquisition and manipulation

- Process data trending, logging, and historical storage and retrieval

- Printed report generation

Subsystems of the Facility, such as the steam generator unit combustion controls, the turbine generator governor, and the continuous emission monitoring system, each may have dedicated microprocessor control systems which interface with the DCS system for operation and process monitoring only.

One central control console (CCC), located in the main control room, monitors and controls the entire process. The CCC is equipped with 19" color monitors (CRT) and interactive keyboards. Three sets of high resolution color CRT and keyboard will be provided for the main control room and a fourth set will be located in the County's office for Facility performance monitoring.

From the CCC, the operator can start and stop individual equipment such as valves, pumps, fans, etc. or automatic sequences such as fly ash conveyors start-up sequence, combustion unit ventilation, etc. The operator can also manipulate analog control loops, i.e. transferring control loops to "manual" or "auto", changing setpoints, reading setpoint value, process variable and control valve position.

The CRTs will have a number of display formats including overview or group, faceplate, point detail, trend, process graphic, listings and menu. Under any type of format, the display will be interactive, reflecting actual on-line values.

Any abnormal or emergency condition will be also displayed on the CRT.

The annunciator function will provide intelligent alarms (e.g. no low pump discharge pressure alarm when the pump is shut off) and a hierarchical organization of the alarms, allowing the operator to immediately focus on the critical conditions when they occur and saving the other alarms for later analysis.

The CRT will display process trending, similar to pen recorders. The operator can select any single or multiple point(s) for trending or comparison on the CRT; in the background the process points assigned to be trended will be recorded for later retrieval and display.

A removable mass storage device, such as tape or disk, will be used for long-term historical storage of data. The operator can re-load, at any time, any block of data, which can be studied to reveal long term trends or compared with current readings to reveal abnormalities. All of these will ensure that process and equipment are operated at an optimum performance level.

Another component of the DCS, also located in the main control room, will be the printers. Two high speed printers will be provided, with failover switching capability between them. The logs and reports generated automatically or on request will be produced on these printers. In addition, either printer can be used as a high resolution video display copier providing hard copies of a CRT display.

The main component of the DCS is the microprocessor-based process control unit (PCU). All automatic functions are implemented at the PCU level.

The I/O signal processing functions will also be executed at the PCU level. All necessary programs and configurations will be retained in the non-volatile memory at the PCU. All PCU's will communicate among themselves and with the central control console via a redundant high speed communication data highway.

Each PCU constitutes an independent system element, or a "drop", which is capable of autonomous operation without being connected to other drops or to the central control console. Fully redundant PCUs will be provided with automatic failover, which means the continuity of the control functions is preserved and the operator will only be notified of the event, given the address of the faulty PCU and asked to replace it. This provides a high level of reliability and is consistent with control practice in utility power plants and resource recovery facilities.

The system does not require custom software. The total system will be programmed by the supplier and completely checked by the supplier and the Contractor prior to operation. The software will be menu driven and modular. Graphic and report format changes will be easily accomplished. Hardware and software integration testing will be done and witnessed at the factory.

Calibration procedures and documentation will be well-established.

Each measured, monitored, or recorded function will have provision for field calibration. Calibration gauges for each function will be furnished. All test equipment will be traceable to the National Bureau

of Standards and currently calibrated with a calibration cycle of six (6) months or less. Accuracy of all calibration gauges and equipment will be less than zero-point-one (0.1) percent.

The control measurement, recording, and monitoring functions for the Facility will include, but will not be limited to, the following:

1. All incoming solid waste and all Residue, Bypassed Waste, and Unacceptable Waste leaving the Facility (these functions need not be tied into the DCS system).
2. Solid waste fed to the combustion units.
3. The mass flow rate pressure and temperature of feedwater, steam generation, and blowdown for each boiler, steam generation as the difference between (i) the sum of the feedwater meters and (ii) the blowdown meters, and totals for the Facility.
4. Monitoring and recording the mass flow rates of all plant effluents.
5. Continuous monitoring, measuring, and recording of those items listed in Schedule 5 to the Construction Agreement and SO_2, CO, O_2, NO_x, CO_2 and opacity at the exit to each ar pollution control system. SO_2, CO, CO_2, and O_2 will be measured at the inlet to each air pollution control system.
6. Electric power production and export, steam production, and boiler feedwater.
7. Remote (off-site) fire alarms.
8. Continuous monitoring of free chlorine or biocide level in cooling tower sump.
9. Condensate conductivity.

10. Boiler drum level.
11. Personnel safety (emergency showers and eye wash stations, station location, date and time).
12. Propane used as auxiliary fuel in the Facility.
13. A time reference on each recording for data reduction.

All measurement reporting and recording shall be made in common English engineering units (e.g., lb/hr, °F, kW).

An overview of the distributed control system is given in Sketch No. DCS-1A, 1B included with Proposal Form A of this Schedule.

2.49 Storage Tanks

All liquids (except water stored in retention ponds or collected in process water sumps) will be stored in above ground storage tanks equipped with spill protection in accordance with 40 CFR112, Spill Prevention, Control and Countermeasures of Guidance. The following listing identifies the major tanks required for proper operation of the Facility. Minor tanks will be provided on an as required basis as part of specific subsystems requirements.

A. Acid Storage Tank

This tank will be 4,500 gallons minimum, made of carbon steel with a baked phenolic lining and designed for atmospheric pressure. The tank will include a twenty (20) inch man-way and will be equipped with a vent with dessicant and a tank level meter.

B. Caustic Storage Tank

This tank will be 4,500 gallons minimum, made of carbon steel with an epoxy phenolic lining and designed for atmospheric pressure. It will be equipped with a twenty (20) inch man-way and a tank level meter.

C. Demineralized Water Tank

This will be a 26,000 gallon vertical tank designed for atmospheric pressure. The tank will be constructed of carbon steel with a Plasite 7155 lining or equal.

D. ~~Firewater Water Storage Tank~~

~~This will be a 300,000 gallon vertical tank designed for atmospheric~~ pressure ~~and~~ designed in accordance ~~with~~ NFPA-22. The tank will be ~~constructed of carbon steel.~~

E. Neutralization Tank

The waste water neutralization tank will be a 38,000 gallon, field fabricated, carbon steel tank. The tank will be internally lined with Plasite 4100 or equal.

F. Propane Storage Tanks

A propane storage system will be provided including one (1) 60,000 gallon storage tank. Complete details of this system are provided in Section 2.53 On-Site Utilities Sub-Section 2.53.7 of this Schedule 2, Part B to the Construction Agreement.

G. Filtered Water Storage Tank

A filtered water storage tank sized to store thirty (30) minutes of make up water for the cooling tower (approximately 17,000 gallons) will be provided. The tank will be designed for atmospheric pressure and constructed of carbon steel.

H. Wastewater Collection Tank

The wastewater collection tank will be provided with a capacity of 38,000 gallons. The tank will be designed for atmospheric pressure and constructed of carbon steel with an appropriate liner material if necessary.

I. Ammonia Storage Tank

A high pressure seven (7) day capacity ammonia storage system will be provided to supply anhydrous ammonia to the SNCR Thermal DeNO$_x$ System. Complete details of this system are provided in Section 2.15.2 Control of Oxides of Nitrogen of this Schedule 2, Part B to the Construction Agreement.

2.50 ~~Fire Protection~~

~~The Facility design, construction, and operation includes a fire~~ protection system which includes detectors, remote fire alarms, and suppression systems in accordance with all applicable codes including, but not limited to: insurance underwriters' standards; the National Fire Protection Association (NFPA); local County fire regulations; and good industrial practice for a highly protected risk facility and will comply with all insurance requirements applicable to the design, construction, ~~and operation of the Facility.~~

~~The tipping, transfer, and solid waste storage areas; combustion unit,~~ air pollution control equipment areas and the Facility Administration Area will be protected with automatic fire protection systems. In addition, the refuse storage pit will be protected by manually operated nozzles located around the refuse storage pit and connected to the fire protection water supply. Fire protection systems will be installed in the power generation and electrical switchgear areas, and in lubricant and fuel storage areas, as appropriate.

A ten (10) inch buried yard loop circling the main process building will be provided. Single leg branches will be provided from the yard loop for protection of remote Facility areas such as the scale house. System pressure will be maintained by an electric motor driven jockey pump. In the event that the demand on the system exceeds the jockey pump's capacity, the diesel driven fire pump will automatically start. The fire pumps will take suction from the 300,000 gallon water storage tank. Standpipes and hose stations fed from the yard loop will be provided in accordance with NFPA-14 and located in the major Facility buildings. A minimum of six (6) yard hydrants will be provided around the perimeter of the main Facility buildings. Hydrants will be located at approximately three hundred (300) foot intervals along the yard loop and branches. Sprinkler and water spray systems will be provided in accordance with the following:

- <u>Tipping Floor</u> - the entire tipping floor area will be protected ~~by an automatic sprinkler system (dry pipe system) providing~~

~~0.25 gpm/ft^2 over the most hydraulically remote 5,000 ft^2 area~~ with a hose stream allowance of 750 gpm. Sprinkler heads will be rated at 286°F.

- Refuse Storage Pit and Refuse Charging Hoppers for Furnace - automatic sprinkler system (wet pipe system) providing 0.45 gpm/ft^2 over the most hydraulically remote 3,300 ft^2 area using large orifice (17/32 inch) sprinkler heads rated at 286°F. Four (4) manual cannon outlets (wet pipe system), located two (2) at each end of the refuse storage pit on the mezzanine level capable of covering the refuse storage pit and refuse charging hoppers, each outlet at a minimum of two hundred fifty (250) gpm with a hose stream allowance of seven hundred fifty (750) gpm, will be provided.

- Turbine-Generator - automatic sprinkler system (wet pipe system) providing 0.30 gpm/ft^2 over the lube oil equipment area located below the floor and cover an area twenty (20) feet beyond all lube oil storage and purification skids. Sprinkler heads will be rated at 165°F. At least two (2) hose outlets (minimum 1½ inch diameter) per floor, each with seventy-five (75) feet of lined hose and adjustable nozzles will be located around the operating and lower floor. Automatic fixed water spray protection system for the bearing housing will be provided in ~~accordance with NFPA and FM standards.~~

- ~~Battery Room — Hand held, suitably rated extinguishers and a~~ hose station immediately outside the room.

- Cooling Tower - Automatic sprinkler system in accordance with NFPA and FM standards. Manual controls for circulating water pumps and fan controls will be located so as to be accessible in an emergency.

- Facility Administration Areas - Automatic sprinkler system providing 0.15 gpm/ft^2 to the most hydraulically remote 2,000 ft^2 area with a hose stream allowance of two hundred fifty (250) gpm. Sprinkler heads will be rated at 165°F.

- Control Room - Manually activated Halon extinguishing system in accordance with the most stringent of the NFPA and FM standards and capable of activation from inside and outside the room. An automatic fire alarm system will be provided with visual and audible signals.

- Cables - All Facility interconnecting electric cables (excluding lighting, communication, fire detection, and CCTV cables) will be fire retardant meeting IEEE-383 requirements. Cables excluded from this requirement will pose little hazard since they will be routed in dedicated conduit. Additionally, fire detection circuits will be electrically supervised. All electrical cable penetrations through fire rated walls will be ~~sealed with fire-proof sealant.~~

- ~~Baghouses - Two (2) hose outlets (minimum 1½ inch diameter)~~ with seventy-five (75) feet of lined hose and adjustable nozzles will be provided for each baghouse, in accordance with NFPA and FM standards.

- Firewalls - One (1)-hour fire rated walls will be provided in all corridors and staircases within the Facility Administration Area. The Facility Administration Area will be isolated from all other refuse receiving, storage and processing areas including the turbine generator room by a three (3)-hour rated fire separation wall. A three (3)-hour rated fire separation will also be provided between the combustion unit area and turbine generator area; penetrations of this wall will be sealed to prevent flame travel.

- Propane Storage - In accordance with FM recommendations, the propane storage tank will be provided with an automatic fixed water spray designed to apply a minimum of 0.3 gpm/ft2 of external tank surface. At least two (2) hose connections (2-1/2" diameter) with combination nozzles and seventy five (75) feet of lined hose will be provided at readily accessible locations. Hose stream allowance is two-hundred-fifty (250) gpm. The storage tank and truck unloading station will be located in accordance with FM recommendations for LPG gas systems, to minimize exposure to sources of ignition and to ~~prevent damage to buildings, equipment and personnel should fire occur~~.

~~All other areas will be provided with fire protection per~~ applicable code including the boiler and air pollution control area.

Heat, infrared or photo-electric smoke detectors will also be provided in the control room, electrical switchgear room, and crane switchgear rooms. ~~All~~ alarms and systems will annunciate at a central control panel ~~located in the control room. The control panel alarm actuation will also alarm offsite.~~

2.51 Central Control Room

The control room will be designed to provide effective monitoring and control of Facility operations by one dedicated operator. The shift supervisor's office will be located in the control room.

The following equipment will be located in the control room:

a. Martin Stoker combustion system controls

b. DCS central control console

c. Turbine Generator controls

d. Electrical control panel

~~e. Fire protection panel~~

f. Sootblower panel

A closed circuit TV system will be provided in the main control room, for selective viewing of the refuse charging hoppers, tipping floor area, grizzly scalper, Residue building ~~and Facility entrance.~~

2.52 Station Auxiliaries

Station Auxiliary include the balance of in plant systems and services required for continuous safe operation and performance of the Facility. Included for this Facility are the following systems:

2.52.1 Closed Cooling Water System

Due to the possibility of suspended solids in the circulating water system using wastewater treatment plant effluent as make-up, a closed cooling water system will be used for equipment heat removal.

The system will utilize two (2) motor driven pumps and two (2) heat exchangers; only one (1) pump and one (1) heat exchanger will normally be in service at any time. A head tank will maintain system pressurization and provide sufficient suction head to the pumps. The system will cool stoker hydraulic system coolers, boiler feedwater pump oil coolers, sample coolers, air compressor oil and interstage coolers, and the turbine lube oil and generator coolers. Circulating cooling tower water will be used to remove the heat from the closed cooling water system.

Make-up to the closed cooling water system will be automatically controlled from the demineralized water storage tank.

The system will be chemically treated to minimize corrosion.

2.52.2 Heating, Ventilating & Air-Conditioning

The tipping floor and solid waste storage area will be kept under

negative pressure at all times during operation in order to minimize the escape of dust and odors to the outside atmosphere. Air drawn from the tipping floor and solid waste storage area will be utilized as furnace combustion air. A louvered area, approximately 2'-0" high, located above and extending along the entire 8'-0" high concrete front wall of the tipping floor, will be provided as the means through which the ventilation/combustion air will be drawn into the building. The building will be unheated.

The ~~Facility Administration Area and~~ control room complex will be provided with individual roof top mounted heating and air conditioning units. ~~The Facility Administration Area heating and air conditioning system will be variable air volume with separate zones for the conference rooms, lunchroom, men's locker room, women's locker room and office areas.~~ The control room complex heating and air conditioning system will be a conventional single duct, low velocity system and will include the control room, ~~shift supervisor's office, file room~~ and laboratory.

Enclosed rooms located immediately adjacent to the tipping floor and refuse storage pit areas will be positively pressurized with fresh ambient outside air for odor control. Ventilation systems for these enclosed rooms will not draw or exhaust air to the tipping floor or refuse storage pit areas.

Ventilation systems for combustion unit, ~~air pollution control equipment and turbine generator areas~~ will consist of power roof ventilators and

manually operable wall louvers. Roof ventilators will be designed for on-off operation.

The crane pulpit will be provided with an independent heating, ventilating and air conditioning unit. The pulpit will draw fresh air from outside the main process building.

~~The scale house will be provided with a packaged heat pump. The~~ maintenance shop, storage room, electrical equipment areas, switchgear rooms, and elevator machine rooms will utilize exhaust fans, and ductwork ~~where necessary, for ventilation.~~

Exhaust fans will be used to ventilate ~~all toilet and shower rooms~~, the ~~fire water pumphouse,~~ battery room, and laboratory.

The battery room will be provided with a separate exhaust system. Inlet air will be drawn in from the surrounding areas and exhausted directly outdoors.

2.52.3 ~~Communications~~

~~A public address and intercommunication system will be provided~~ throughout the Facility. The public address system will include combustion unit area, material handling area, storage areas, remote buildings and outside areas as required. The intercommunication system will provide for direct contact between various areas of the Facility for control of process. A complete telephone system will also be provided in ~~the Facility Administration Area, offices, control rooms, remote~~

~~buildings and at vital operating stations. An intercom system will be provided between the offices, scale house, crane pulpit and the Facility control room.~~

2.52.4 Closed Circuit TV Monitoring System

A closed circuit television surveillance system will be provided for the Facility.

Cameras will be provided at locations as follows:

~~a) 1 - Main gate~~

~~b) As required Other security locations~~

c) 1 - Each refuse charging hopper

d) 1 - Residue building vibrating conveyor including belt discharge

e) 1 - Residue building vibrating conveyor discharge to piles

f) 1 - Grizzly scalper

g) 1 - Tipping floor

h) 1 - Charging floor with a view to the refuse storage pit

Lenses will be adjustable in the field in order to select the best viewing angle (wide angle to telephoto). Cameras "e" and "g" will have remote "tilt and pan" controls from the control room.

Monitors will be provided as follows:

- In the crane pulpit, one (1) monitor for each refuse charging hopper. Space will be provided for a future refuse charging

hopper monitor.

- In the control room, three monitors. Two (2) of the three (3) monitors will be capable of automatically and continuously switching between cameras "a" through "g" and specified above, and able to be manually selected by the operator to continuously display any one particular camera view. The third monitor will permanently display camera "h" view.

Sun shields and weather proofing will be provided where required.

2.52.5 Continuous Emission Monitoring System (CEM)

The continuous emission monitoring system (CEM) will utilize a dedicated computer to perform data acquisition and transmission functions. The CEM computer will execute simultaneous conditioning of raw data, printing of various reports, and transmitting of data via modem and telephone lines. The CEM computer will also be capable of storing data on the hard disk and downloading it on a removable media for historical storage. An interface to the distributed control system will be provided.

All continuous emission monitoring equipment will meet the requirements of the Code of Federal Regulations, 40CFR, Part 60, Appendix B. The system will continuously monitor, measure and record the items identified in Schedule 5 and SO_2, CO, CO_2, O_2, NO_X and opacity at the exit to each air pollution control system. SO_2, CO, CO_2 and O_2 will be measured at the inlet to each air pollution control system.

2.52.6 Vehicles and Containers

As a minimum, the following vehicles will be provided for Facility operation:

- One (1) power sweeper for tipping floor and access road sweeping.
- Two (2) front-end loaders, one (1) for moving delivered waste from the tipping floor into the refuse storage pit and the other for loading Residue into trucks.
- Containers for recovered ferrous materials.

2.52.7 Spare Parts

Ogden Martin will provide the initial set of adequate spare parts required for the operation of the Facility and maintain an adequate supply for the term of the Service Agreement.

2.52.8 ~~Safety Equipment~~

~~The Facility will be equipped with all necessary safety equipment~~ necessary for proper operation including;

1. An internal communications or alarm system capable of providing immediate emergency instruction (visual and audible) to Facility personnel.
2. All fire suppression and fire alarm systems will be supervised by a UL listed approved central station, if available. Alarms shall signal at the local fire company.
3. Portable fire extinguishers, fire control equipment using foam, inert gas, or dry chemicals.
4. Water at adequate volume and pressure to operate hose, foam ~~producing equipment, or automatic sprinkler, and water spray~~

~~system.~~

~~5. Eye wash stations and emergency showers.~~

~~6. Chlorine handling equipment.~~

2.53 On-Site Utilities

The following on-site utilities will be provided to ensure the proper operation of the Facility. Tie-ins to the County's potable water, reclaimed water and ~~sanitary sewer systems~~ will be coordinated with the Department of Lee County Utilities and will utilize County approved methods and materials.

2.53.1 ~~Sanitary Sewer~~

~~Sanitary Sewer service will be provided to the site boundary by the County up to a maximum allowable discharge rate of one hundred fifty thousand (150,000) gallons per day (GPD).~~

2.53.2 ~~Stormwater Overflow~~

~~Site stormwater will be directed via drainage ditches and culverts to~~ retention ponds. Any discharge which results ~~from~~ any event less than a ten (10) year ~~twenty four~~ (24)-hour storm will meet state water quality ~~standards, Ch. 17-3 FAC.~~

2.53.3 Electrical Power

The Facility will interface with the FP&L 138 kV transmission system for all electrical service and power transmission needs. The tie-in to FP&L will allow the purchase and separate metering of power in the event of a turbine generator outage. The point of interconnection to FP&L will be

the 138 kV FP&L bus installed by FP&L and located within the onsite FP&L switchyard adjacent to the Facility switchyard fence. The Facility switchyard will consist of one (1) 100% step-up transformer, high voltage disconnect switch and bus work as shown on the Main One Line Diagram, Drawing E100. The Facility switchyard will be adjacent to FP&L's onsite switchyard which will be furnished, installed, fenced and maintained by FP&L. FP&L's onsite switchyard will contain an FP&L 138 kV circuit breaker and other equipment. This proposal is based on the following assumptions regarding the Facility's ability to operate FP&L's 138 kV circuit breaker (CB):

- The CB will be capable of being remotely tripped from the Facility control room.
- Customary automatic protective relaying will be provided in the Facility to trip and lockout the CB in event of an upset condition in the Facility up to and including the CB.

All equipment for the foregoing controls will be provided as part of the Facility except for three (3) current transformers assumed to be provided on the line side bushings of the CB by FP&L.

- Any protective equipment needed for protection of FP&L's 138 kV system in event of an upset condition on the 138 kV system (i.e. the CB and back to FP&L) is assumed to be furnished, installed and wired by FP&L. The system design is based on all other CB control being provided by FP&L.

Special or custom telemetering or remote termination units have not been specified by FP&L in the RFP. Therefore, we have included commercial type telemetering equipment for the Facility capable of using a single conventional telephone line. The facility electrical distribution system

control panel located in the control room will be equipped with fully automatic controls for synchronizing with FP&L and for control of the Facility's internal electrical distribution system. A protective relay panel will be provided with protective relays, as shown on the Main One Line Diagram, which provides protection of the Facility step-up and auxiliary transformers as well as the Facility generator. Final design of the protective relay system will be coordinated with FP&L.

The electrical system design will allow for the following four (4) conditions:

1. Buy power from FP&L in the event the turbine-generator is out of service so that combustion of the waste can be maintained;

2. Allow the T-G to runback from full load to Facility load in the event FP&L interrupts connection to their power grid.

3. Allow for a smooth tie-in after FP&L has restored power; and,

4. Run the turbine-generator to supply power to the Facility and sell the excess power to FP&L.

Meters included within the scope of this proposal are indicated on the Main One Line Diagram.

Signals for voltage, watts, vars, power factor and frequency will be integrated into the DCS to provide automatic metering and recording for

each condition (1), (2) and (4) above. The DCS will record the sequence of events which occur during a turbine trip.

The equipment furnished will meet NEMA Standards, FP&L's technical characteristics and tie-in requirements identified in Schedule 11 to the Construction Agreement. The Facility tie-in will be designed consistent with the fault values shown in Table 2-4 of Schedule 2, Part A to the Construction Agreement. Additional interconnect requirements as contained in Florida Public Service Commissions Interconnection Guideline Rule 25-17.087 will also be met. The voltage at which the Facility connects to FP&L will be 138 kV with a tolerance of ± 5%. The main power step-up transformer will be Y-grounded on the high side and delta connected on the low (generator) side.

The system will consist of: one (1) step-up transformer, sized to carry the turbine generator VWO output, unit substations, protective relaying equipment, main switchgear, uninterruptable power supply for the DCS and all auxiliary equipment. The requirements of NFPA 850 will also be met.

The Facility switchyard will have a separate security fence and locked entrance gate. Oil-filled transformers will be provided with appropriate spill protection.

2.53.4 Potable Water

Prior to the planned start-up date for the Facility, the County will construct a potable water line within the right of way running along the north side of Buckingham Road (South Property line of the Facility Site).

The Facility will interconnect with this potable water service making potable water (up to 0.075 mgd) available for the following purposes:

~~• On-site potable water~~

- Demineralizer supply water for:
  - boiler feedwater makeup
  - boiler chemical mixing
  - demineralizer acid dilution

~~• Fire protection water (per local code requirements)~~

Domestic and Sanitary uses of this potable water are not considered to be Resource Recovery Equipment and therefore are not exempt from sales tax.

The Facility potable water system will be designed to incorporate the line pressure, water quality parameters and tie-in requirements identified in Schedule 2, Part A Section 5.4.1, to the Construction Agreement.

2.53.5 Process Water

The main source of process water will be reclaimed water (treated wastewater effluent) from the County's reclaimed water line to be located in the right of way located along the North side of Buckingham Road

Page Ammended 2/3/93 for Tax Exemption Filing

(South side of Facility site). Tie-in to the County's reclaimed water system will be coordinated with the Department of Lee County Utilities. Use of reclaimed water will be maximized where technically and economically acceptable.

Any changes necessary to the water treatment system due to reclaimed quality which is in excess of the concentrations given in Table 2-3 of Schedule 2, Part A will be addressed in accordance with Section 5.08 of the Service Agreement.

Combustion unit area and air pollution control equipment area washdowns will be used for ash quench. Treated cooling tower blowdown will be used as dry scrubber slaking water and supplementary cooling tower makeup.

2.53.6 On-site Well System

Rated Condition

Flow: 1000 GPM (approximate)

Head: 60 Feet (approximate) @ Facility grade elevation.

An on-site well system, consisting of single or multiple wells and pumps as necessary, will be constructed and used as backup water supply to the process water system. The well system will tap the shallow sandstone aquifer located approximately 120 feet below grade. This system will be used in the event that reclaimed water is not available, or if the quality of the reclaimed water is such that a minimum of four (4) cycles of concentration in the cooling tower cannot be achieved without causing the quality of the Facility's wastewater discharge to exceed the Lee County Sanitary Sewer Industrial Pretreatment Standards.

Any changes necessary to the water treatment system due to reclaimed quality which is in excess of the concentrations given in Table 2-3 of Schedule 2, Part A will be addressed in accordance with Section 5.08 of the Service Agreement.

2.53.7 Auxiliary Fuel System

Propane shall be used to fuel the auxiliary burners of each combustion unit. A propane storage system will be provided including one (1) 60,000 gallon storage tank. A propane vaporizer system shall be provided, designed to deliver flow over the range of 3 percent of single combustion unit duty to 40 percent of full Facility combustion unit duty under all ambient conditions. A truck unloading area shall also be provided. The propane storage facility will be designed in accordance with the local codes and Factory Mutual recommendations.

The propane storage, unloading and supply system shall be enclosed by a six (6) foot high galvanized steel chain link fence equipped with manually operated and locked gates.

The system shall be located a minimum of seventy five (75) feet from any building or source of ignition and shall be designed in accordance with Factory Mutual standards for LP-GAS. The storage tanks shall be oriented such that tank heads face away from other tanks, buildings or critical process equipment.

The unloading station shall be located at least fifty (50) feet from the storage tanks and main building walls or at least seventy-five (75) feet from an opening into a building.

Electric vaporizers shall be located a minimum of fifteen (15) feet from storage tanks and a minimum of seventy-five (75) feet from the tank relief valve discharge.

Drainage ditches or sewers in the vicinity of the propane storage area shall be routed away from the main process buildings and away from any potential source of ignition. The storage system shall be located down slope of the Facility building and utility installations in an area where the natural topography allows flow away from the Facility, to avoid potential hazards if a leak should occur.

The storage tank and truck unloading station will be located in accordance with FM recommendations for LP-Gas systems, to minimize exposure to sources of ignition and to prevent damage to buildings, equipment and personnel should a fire occur.

2.54 ~~First Aid Center~~

~~A designated area will be provided on the ground floor of the Facility~~ Administration Area as a first aid center. First aid equipment and supplies will be provided in accordance with standard industrial practices to serve the ~~Facility~~. In addition to the first aid center, emergency eyewash stations, emergency showers and first aid kits will be ~~provided at strategic locations throughout the Facility.~~

2.55 Laboratory

A laboratory suitable for conducting daily onsite water and steam quality analysis work will be provided. The laboratory will be located convenient to the control room and will be equipped with all equipment and appurtenances necessary to support the operation of the Facility. The area will be ventilated, illuminated and provided with appropriate cabinets, sinks, utilities and plant services.

2.56 ~~Refuse and Residue Truck Scales~~

~~Equipment Specification~~

~~Dimension: 70 feet x 10 feet~~

~~Capacity: 60 tons (weight increments of 20 pounds)~~

~~The Facility will be equipped with one automatic weighing station, to record the quantity of solid waste delivered to the Facility. The weigh station shall consist of three (3) identical scales, each with a weighing capacity of sixty (60) tons, as shown on the Site Plan. The weigh scales will be of the low profile above ground type, and include proper guard rail protection to prevent trucks from driving off the sides. Controls, read- outs, and records for this scale system shall be located in the scale house. The scales will be low profile, above ground design.~~

~~The scales, two (2) inbound and one (1) outbound, will be located adjacent to the scale house to improve communication and to facilitate visual inspection of incoming vehicles.~~

~~A data acquisition system consisting of electronic data processing,~~ indicating and recording equipment for billing and record keeping purposes will be provided. This will include digital weight meters and a printer capable of listing vehicle number, delivery date and time as well as gross, net and tare weights. Each scale will have a recorder for the daily total of the net weight. The scale house will be provided with a telephone line link (modem) compatible with the County's existing computer system. The scale metering and recording system will also be compatible with the DCS. The ancillary equipment of the scales will be housed in the totally enclosed scale house located between the scales.

The scale house will be designed to be compatible with the aesthetic theme of the main structure and will be equipped with the following: 1) lavatory facility for the scale house operator, 2) phone with separate number, 3) desk, 4) 4-drawer file cabinet, 5) sink with hot and cold water, 6) storage cabinets, 7) a complete climate control system including heating, ventilation and air conditioning, 8) separate countertop for meter and printer, and 9) intercom or telephone communication with the crane pulpit, the control room and the County administrative offices.

~~Detail design of the scale system will be closely coordinated with the County to assure compatability.~~

2.57 ~~Workshop~~

~~A workshop and maintenance area will be provided for the Facility. The workshop will be adequately supplied with equipment and spare parts to~~

~~allow the operations staff to conduct routine maintenance activities.~~ The workshop will be located in the main process building at one end of the refuse storage pit with easy access to all major maintenance/equipment removal aisles. The workshop will be ventilated and heated for personnel comfort. A separate storage area will be provided with the space necessary to maintain the spare parts inventory required to ~~minimize equipment and Facility down time.~~

2.58 Recyclables and Small Vehicle Service Area

A recyclables collection and service area for vehicles without automated unloading capability will be provided as shown on the Site Plan. The four (4) roll-off type container resting areas and all access roads will be concrete. The "Z-wall" will also be of reinforced concrete construction. The vertical height of the Z-wall will be approximately four and one-half (4.5) feet high and allow convenient access to the containers. ~~Appropriate signage to direct users to the various containers will be provided.~~ The final design of this service area will be coordinated with the County.

3.0 ELECTRIC GENERATING SYSTEM

3.1 General

The electric generating portion of the Facility will be comprised of a condensing turbine-generator, its ancillary equipment and electrical switchyard. Steam generated in the waste processing portion of the Facility will be used by the turbine-generator to generate electricity for in-plant use and for delivery and sale to FP&L.

Electrical Generating System includes the concrete, reinforcing steel, equipment anchor bolts and piling directly associated and physically supporting the Electrical Generating Equipment identified as Resource Recovery Equipment in the equipment Listing provided in Section5A. Electrical Generating Structural Steel includes the structural steel directly associated and physically supporting the Electrical Generating Equipment identified as Resource Recovery Equipment in the Equipment Listing provided in Section 5A.

3.2 ~~Structure~~

~~The turbine area will be integral with the main process building and will~~ be enclosed with colored metal siding. It will be architecturally treated in a manner similar to the buildings for the waste processing section (See Section 2.3). Within the building, metal wall partitions will be used to enclose specific work and equipment areas as required. Adequate maintenance laydown area has been designed into the building layout so that rotating elements of the turbine generator can be removed ~~and sent for repair without removing exterior wall sections.~~

3.3 Concrete

The turbine building main floor slab and the operating floor will be reinforced concrete. The foundation for the turbine-generator pedestal is described in Section 2.4. The materials and construction will be as described in Section 2.5.

3.4 ~~Structural Steel~~

~~The turbine building will be constructed of structural steel framing.~~ The materials and construction will be as described in Section 2.6.

3.5 Roofing and Siding

The turbine building will be enclosed with uninsulated colored metal siding and insulated roof decking. The materials and architectural treatment will be as described in Sections 2.3 and 3.2. A large circular glass wall area will allow natural light into the turbine operating area ~~while providing an architectural feature to the building exterior.~~

3.6 Turbine-Generator

Equipment Specification

Steam Throttle Flow (MCR): 337,500 lbs/hr @ 850 psig and 825°F;

Steam Throttle Flow (VWO): 362,400 lbs/hr @ 850 psig and 825°F;

One (1) multistage, condensing steam turbine will be provided sized to fully utilize the steam generating capacity generated by the Facility at the 1,200 TPD 5,000 Btu/lb reference waste design basis. Four (4) uncontrolled extraction points will supply steam to the deaerator, feedwater heaters and airheaters. The turbine will be supplied complete with governor control system, lubricating and control oil system, oil conditioning equipment, steam seal system with automatic regulation, drain valves, turning gear and vibration monitoring system. A D.C. emergency oil pump will be provided which will be automatically engaged when normal power fails in order to protect turbine bearings during rundown.

The generator will be a 3,600 rpm totally enclosed, water-air cooled unit, rated at approximately 47 MVA at 0.85 pf lagging to 0.85 pf leading. The generator will be furnished with brushless excitation equipment, automatic voltage regulator and equipment, automatic synchronizer, vibration monitor and space heater.

The generator will be designed to meet FP&L's technical characteristics and tie-in requirements as contained in Schedule 11 to the Construction Agreement.

3.6.1 Turbine-Generator Performance Curve

Presented on the following pages are typical Turbine-Generator Performance Curves based on combusting 1,200 TPD of reference waste at the following conditions.

- Annual Average Ambient Temperature and Induced Draft Cooling Tower
- Average Winter Ambient Temperature and Induced Draft Cooling Tower.
- Average Summer Ambient Temperature and Induced Draft Cooling Tower.

3.7 Turbine Exhaust Condenser

Equipment Specification

Design Operating Pressure: 2.6 Hg. ABS.

Design Steam Flow: 248,000 lbs/hr

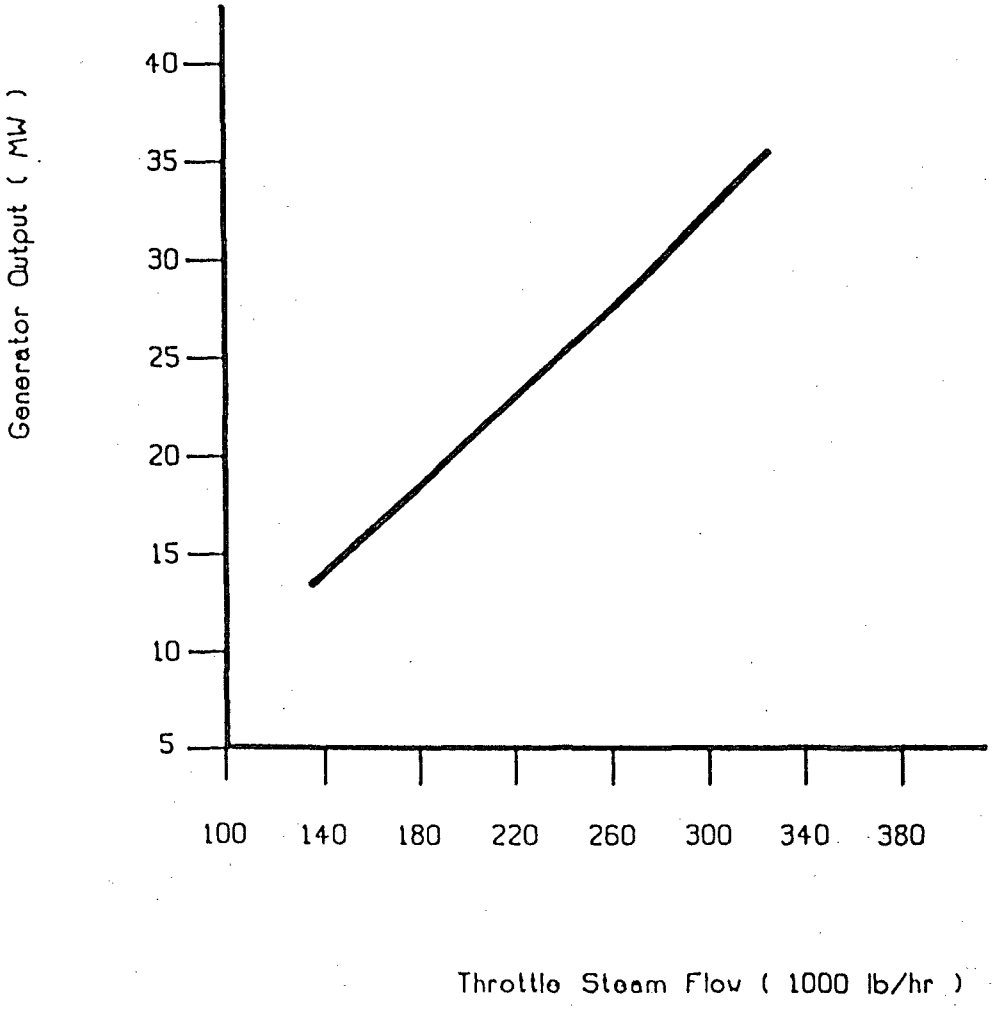
Condenser Duty: 225 MBtu/hr approx.

A steam exhaust surface condenser package designed for the turbine exhaust conditions when combusting 1,200 TPD of reference waste will be provided, including a water cooled shell and tube condenser complete with duct from turbine, air ejectors, inter and after coolers, relief valves and other required accessories. The condenser will be designed in accordance with HEI standards and all other applicable codes and standards. The condenser will be two-pass design with shop fabricated and shop installed tubes and connections. Redundant multistage air ejector systems will be supplied for removing oxygen, CO_2 and other gases from the condenser during normal operations of the steam generator units.

LEE COUNTY

PROJECTED TURBINE GENERATOR PERFORMANCE AT AVERAGE ANNUAL AMBIENT TEMP.

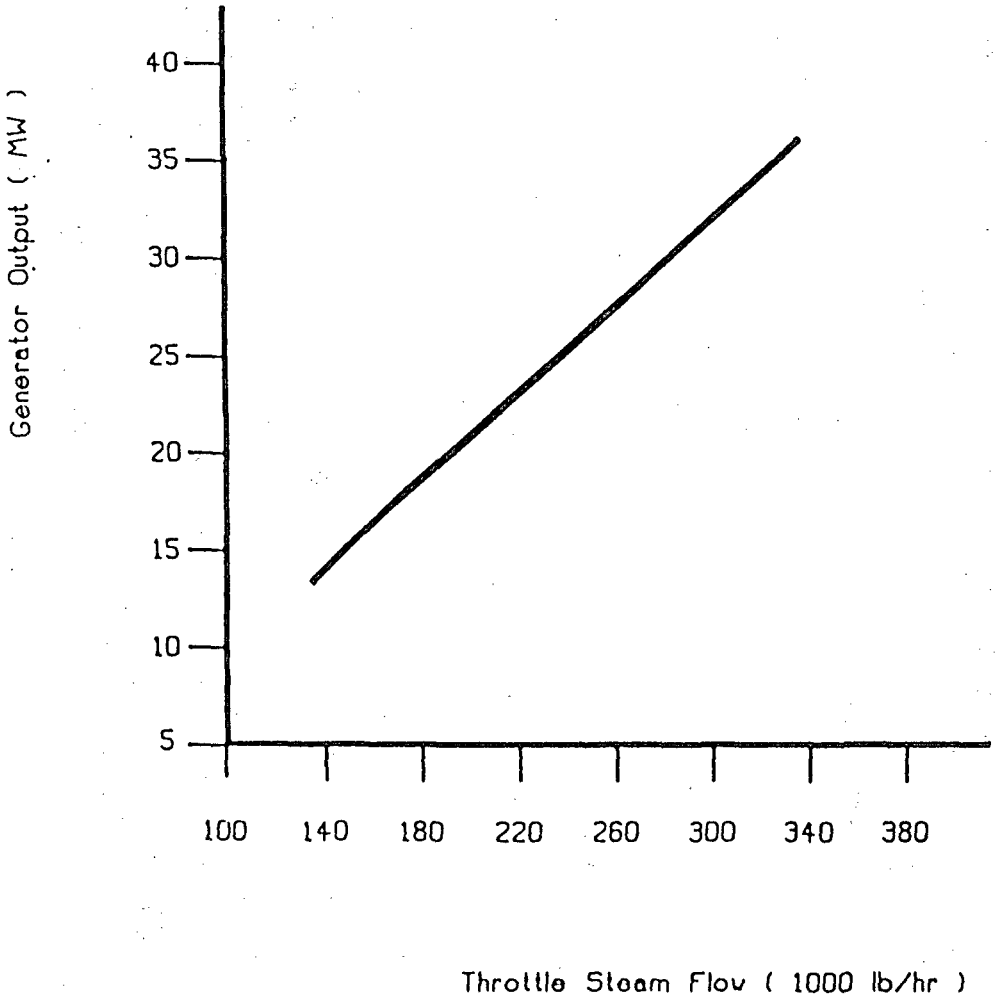
69° F WET BULB



LEE COUNTY

PROJECTED TURBINE GENERATOR PERFORMANCE AT AVERAGE WINTER AMBIENT TEMP.

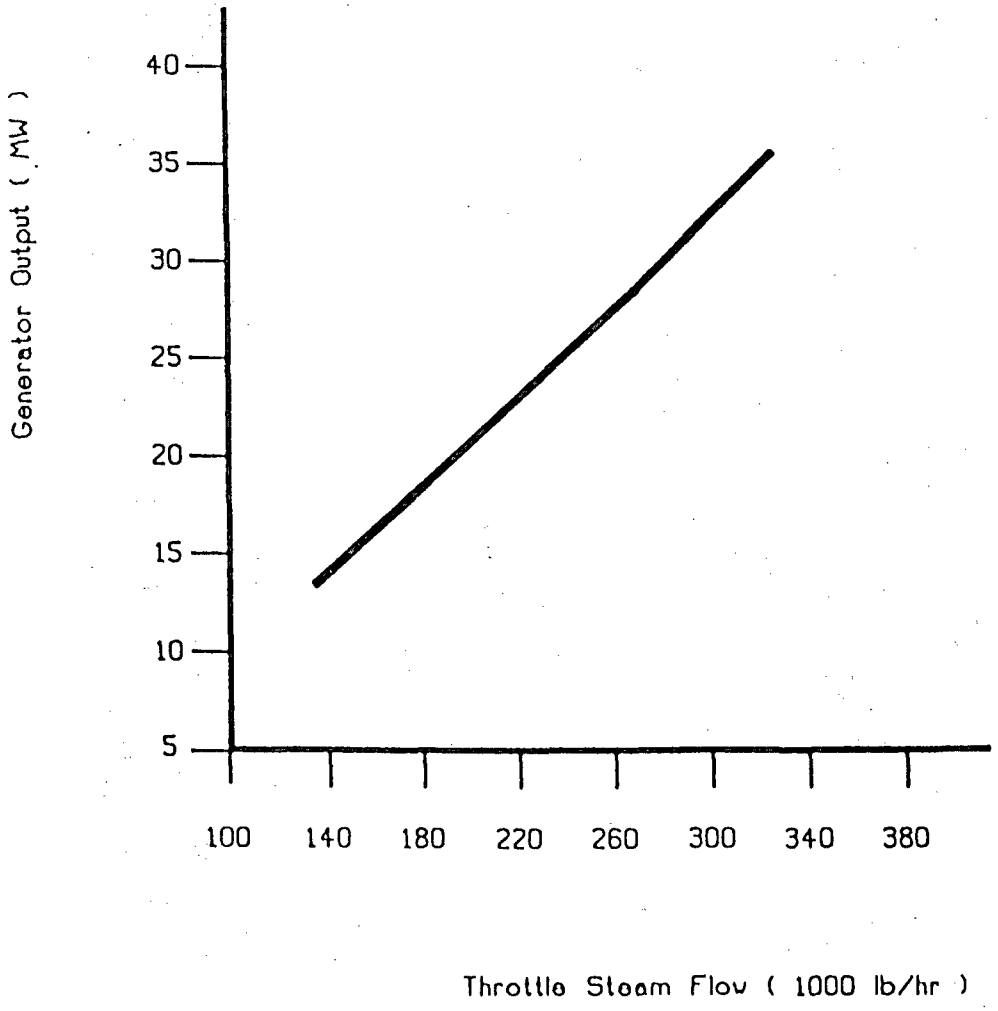
59° F WET BULB



LEE COUNTY

PROJECTED TURBINE GENERATOR PERFORMANCE AT AVERAGE SUMMER AMBIENT TEMP.

76° F WET BULB



The condenser shell and waterboxes will be carbon steel per ASTM A285 Grade C. The condenser tubes will be 316 L S.S. Refer Figure 2-4 or to to Figure 1 of Schedule 5 to this Construction Agreement for condenser performance curves.

3.8 ~~Maintenance Crane for Turbine Generator~~

~~A traveling bridge crane with a twenty five (25) ton hoist capacity will be provided for turbine generator maintenance.~~

3.9 Central Station Equipment

The electrical Main One Line Diagram (Drawing E100) depicts the major electrical equipment. Facility electrical design responsibility commences at disconnect switch near the high side bushings on the main step-up transformer and includes coordination of the interconnect with FP&L and the controls necessary to allow opening FP&L's local 138 kV breaker. Refer to Section 2.53.3 of this Schedule for a description of the Facility interconnect and the electrical system capabilities. The generator voltage will be 13.8 kV. The generator will be connected to the 13.8 kV generator circuit breaker by means of non-segregated phase bus duct. Non-segregated phase bus duct will also be used to connect the 13.8 kV utility tie breaker to a single 100 percent capacity 28.2/37.6/47 MVA, 13.8-138 kV step-up transformer.

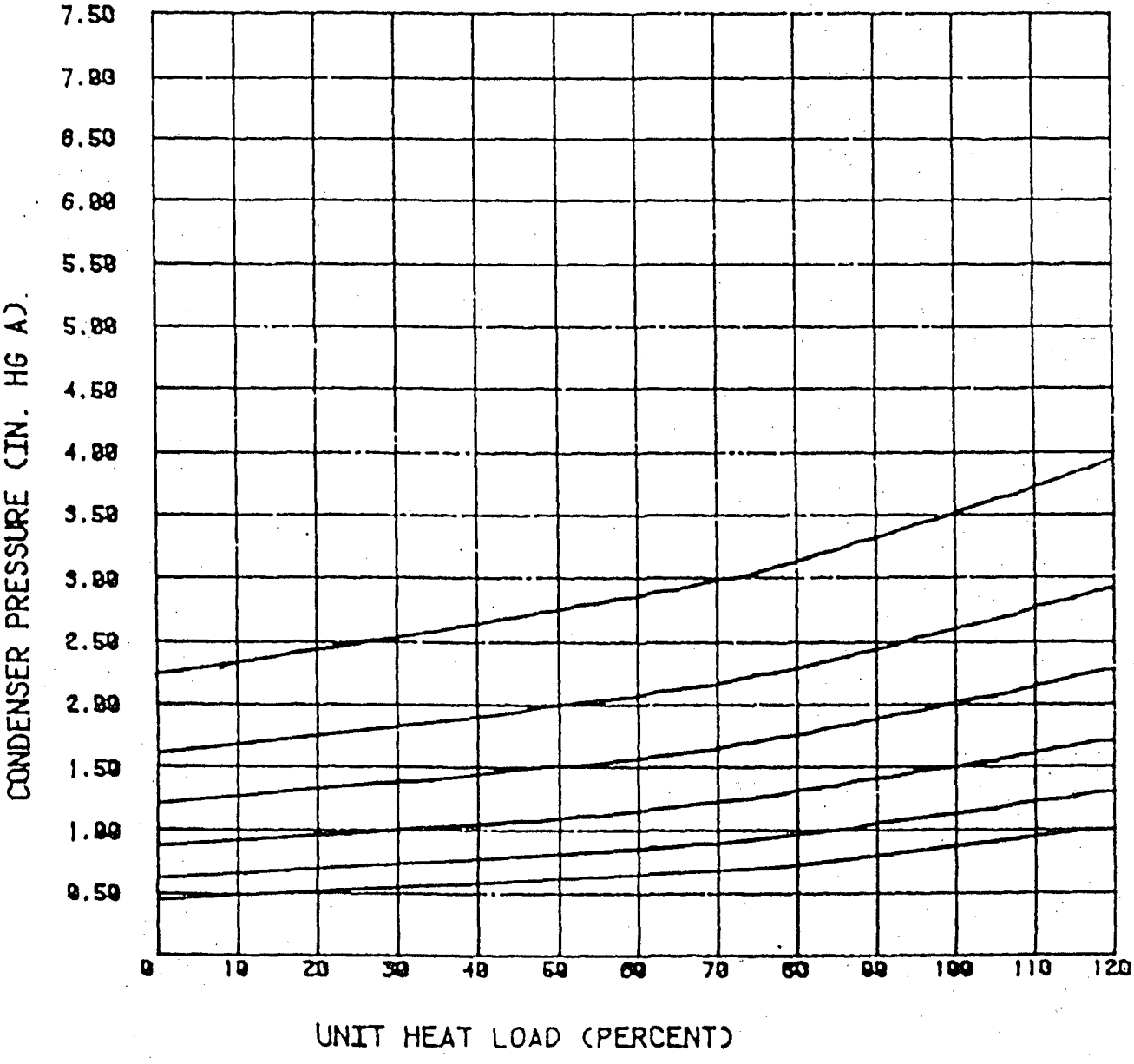
There will be two (2) dry type 13.8-4.16 kV auxiliary transformers to supply one double ended 4.16kV unit substation. Loads fed from the 4,160

Figure 2-4

EXPECTED CONDENSER PERFORMANCE

OGDEN MARTIN-LEE COUNTY

1. CIRC. WATER TEMPS.: 100, 89, 80, 70, 60, 50 (°F)
2. CLEANLINESS FACTOR: 85%
3. 100 PERCENT UNIT HEAT LOAD: 225000000 (BTU/HR)
4. CIRC. WATER FLOW: 32200 (GPM)



volt distribution system will consist of 4,000 volt motors approximately 300 HP and larger. 4,000 volt motors will have fused motor controllers.

There will be two (2) dry type 13.8 kV - 480 volt transformers to supply one double ended 480 volt unit substation. The unit substation will contain feeder breakers for motors of 125 to 250 HP in size and also feeder breakers to motor control centers.

The 480 volt motor control centers will be totally enclosed, free-standing, cabinet-type structures with main and vertical buses, motor starters, circuit breakers and other equipment as required. Appropriately sized circuit breakers and starters will be furnished to feed motor loads 1/2 hp through approximately 100 hp, lighting transformers, miscellaneous loads and battery chargers.

A 125V DC lead-acid battery system will be provided. It will be of sufficient amperehour capacity for operation of the 13.8 and 4.16 kV circuit breakers and 480 V unit substation circuit breakers, backup DC source for the Uninterruptable Power System (UPS), turbine-generator emergency lube oil pump and other DC service. Two (2) battery chargers will be provided to maintain the batteries in a fully charged condition and act as a spare DC power supply for the UPS system. The chargers will operate in parallel on 480V, three-phase and each charger will be sized to carry the total DC load and simultaneously recharge the battery from a fully discharged state.

A 120V single-phase (UPS) will be provided to feed the DCS, communication, fire detection and critical instrumentation systems. It will consist of a rectifier, inverter, automatic static transfer switch and a manual maintenance bypass switch.

Together, the 125V DC System and the 120V UPS will furnish the electrical power required to safely shut down the Facility in the unlikely emergency of a loss of all normal Facility power.

APPLICATION FOR PRELIMINARY EXAMINATION

RESOURCE RECOVERY EQUIPMENT

SECTION 4C

PRELIMINARY DRAWINGS

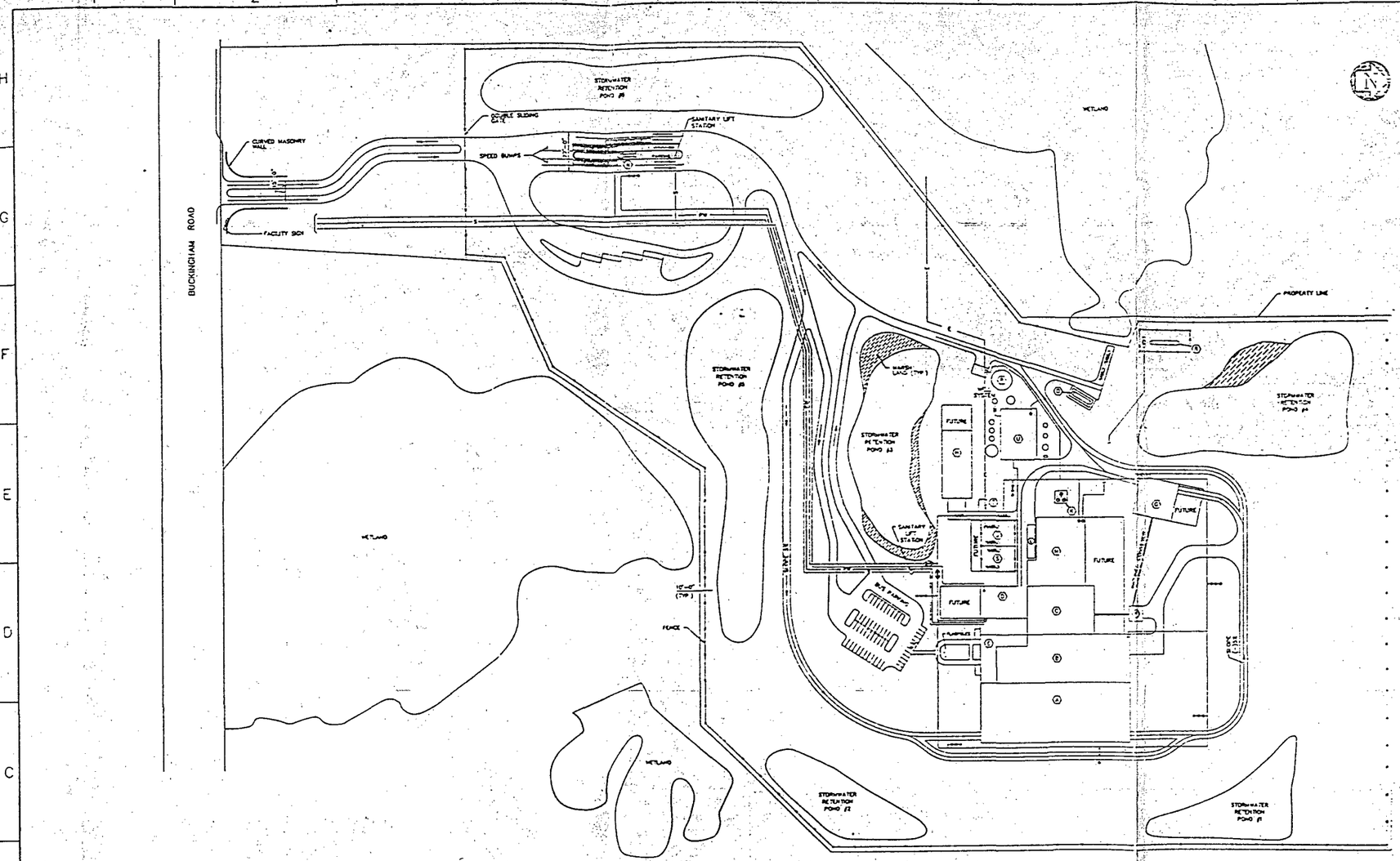
FOR THE

LEE COUNTY SOLID WASTE RESOURCE RECOVERY FACILITY

NOTE: THESE DRAWINGS WERE DEVELOPED BY OGDEN MARTIN SYSTEMS, IN THE PROPOSAL PHASE OF THIS PROJECT; AND WILL ALSO DEVELOP SIMILAR DRAWINGS FOR THE ACTUAL PROJECT.

SECTION 4C

DRAWING NO.	ISSUE	DRAWING TITLE
C-100	F	Site Plan
A-100	F	Architectural Elevations
M-200	G	General Arrangement
M-201	G	General Arrangement
M-202	G	General Arrangement
M-203	E	General Arrangement
E-1033	D	Main Oneline Diagram



REVISIONS
A ISSUED FOR COMMENTS 2/25/90
B ISSUED FOR CONTRACTOR BID 5/25/90
C ISSUED FOR PROPOSAL 6/12/90
D REVISED FOR FINAL PROPOSAL ISSUE 7/9/90
E ISSUED FOR FINAL CONTRACTOR BID REVISED FROM THREE (3) 600TPD TO TWO (2) 600TPD BOILERS 7/9/90
F ISSUED FOR 1200TPD FACILITY PROPOSAL 03/03/91

(A) TIPPING AREA
(B) REFUSE PIT AREA
(C) BOILER AREA
(D) TURBINE/GENERATOR AREA
(E) FACILITY ADMINISTRATION AREA
(F) GRIZZLY BUILDING
(G) RESIDUE HANDLING BUILDING
(H) COOLING TOWER
(J) FP&L SWITCHYARD
(K) STACK
(L) SETTLING BASIN
(M) APC AREA
(N) SCALE HOUSE
(P) FIRE WATER TANK & PUMP HOUSE
(Q) AMMONIA STORAGE
(R) PROPANE STORAGE
(S) SWITCHYARD
(T) CHLORINATION BUILDING
(U) WATER TREATMENT BUILDING

FIRE PROTECTION
E OVERHEAD ELECTRIC
PROPANE
W WELL WATER
EFFLUENT MAKE-UP
S SANITARY SEWER
PW POTABLE WATER
PIV
HYDRANT

OGDEN MARTIN SYSTEMS, INC.
SITE PLAN AND UNDERGROUND UTILITIES
LEE COUNTY RESOURCE RECOVERY FACILITY

OGDEN MARTIN SYSTEMS, INC.

DRAWN	DATE 5/24/90	DESIGNED BAZ	DATE 5/21/90	
CHECKED	DATE 6/ 4/90	PROJECT NO. E-1033		SCALE 1"=80'-0"
APPROVED	DATE / /	DRAWING NO. C100	SHT. NO. 1	REV. F

REVISIONS
A ISSUED FOR PROGRESS 3/23/90
B ISSUED FOR CONTRACTOR BID 5/1/90
C RE-ISSUED FOR CONTRACTOR BID 5/25/90
D ISSUED FOR PROPOSAL 06/08/90
E REVISED BYPASS CONDENSER 05/14/90
F REVISED FOR TWO (2) BOILERS 01/24/91
G ISSUED FOR 1200 TPD FACILITY PROPOSAL 03/04/91

PLAN EL 0'-0"

PLAN EL 14'-3"

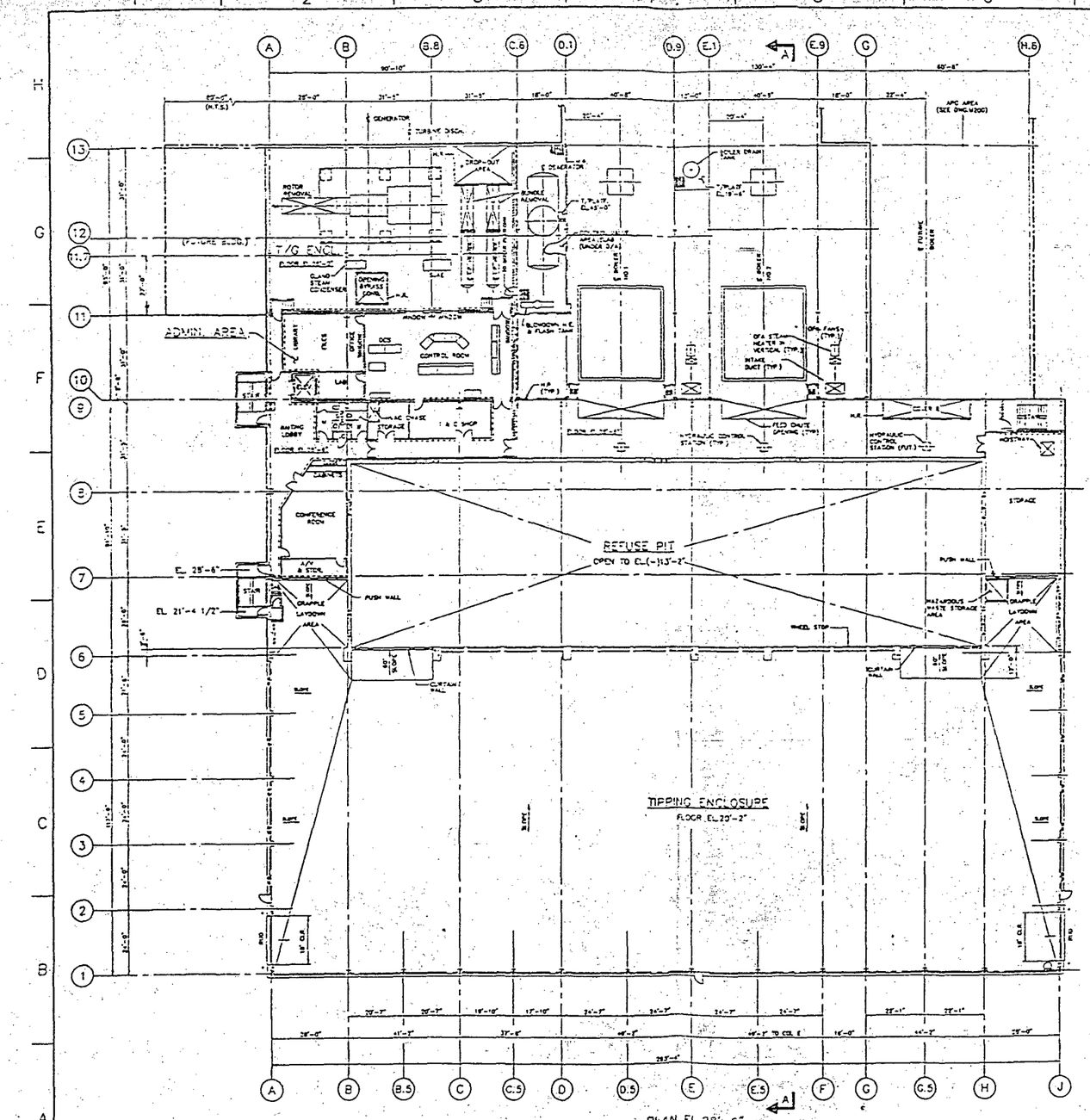
CONCRETE WALL
BLOCK WALL
PARTITION WALL
SIDING
INSULATED WALL
1HR FIREWALL
3HR FIREWALL

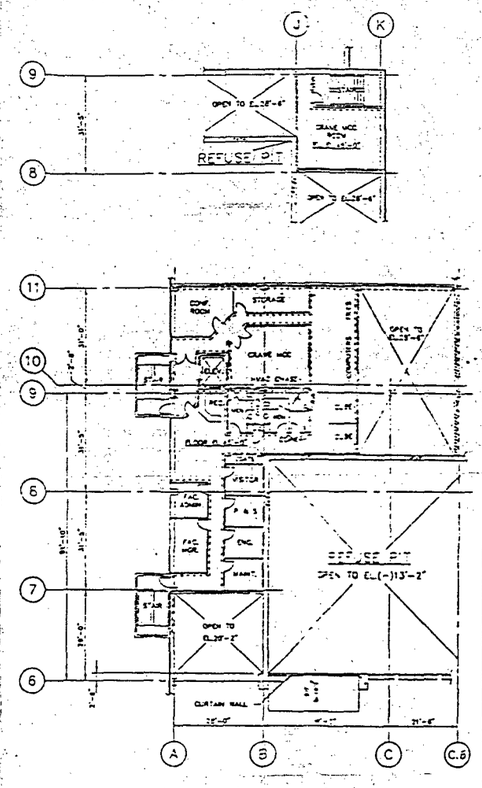
GRAPHIC SCALE
0' 16' 32' 48'
1/16"=1'-0"

OGDEN MARTIN SYSTEMS, INC.
GENERAL ARRANGEMENT
PLAN EL. 0'-0" & 14'-3"
LEE COUNTY RESOURCE RECOVERY FACILITY

OGDEN MARTIN SYSTEMS, INC.

DRAWN	DATE 3/7/90	DESIGNED	DATE / /		
CHECKED	DATE 06/01/90	PROJECT NO.	E-1033	SCALE	1/16"=1'-0"
APPROVED	DATE / /	DRAWING NO.	M200	SHT. NO.	1 1 G





REVISIONS
A ISSUED FOR PROGRESS 3/23/90
B ISSUED FOR CONTRACTOR BID 5/11/90
C RE-ISSUED FOR CONTRACTOR BID 5/25/90
D ISSUED FOR PROPOSAL 08/08/90
E REVISED BYPASS CONDENSER 11/14/90
F REVISED FOR TWO (2) BOILERS 01/24/91
G ISSUED FOR 1200 TPD FACILITY PROPOSAL 03/22/91

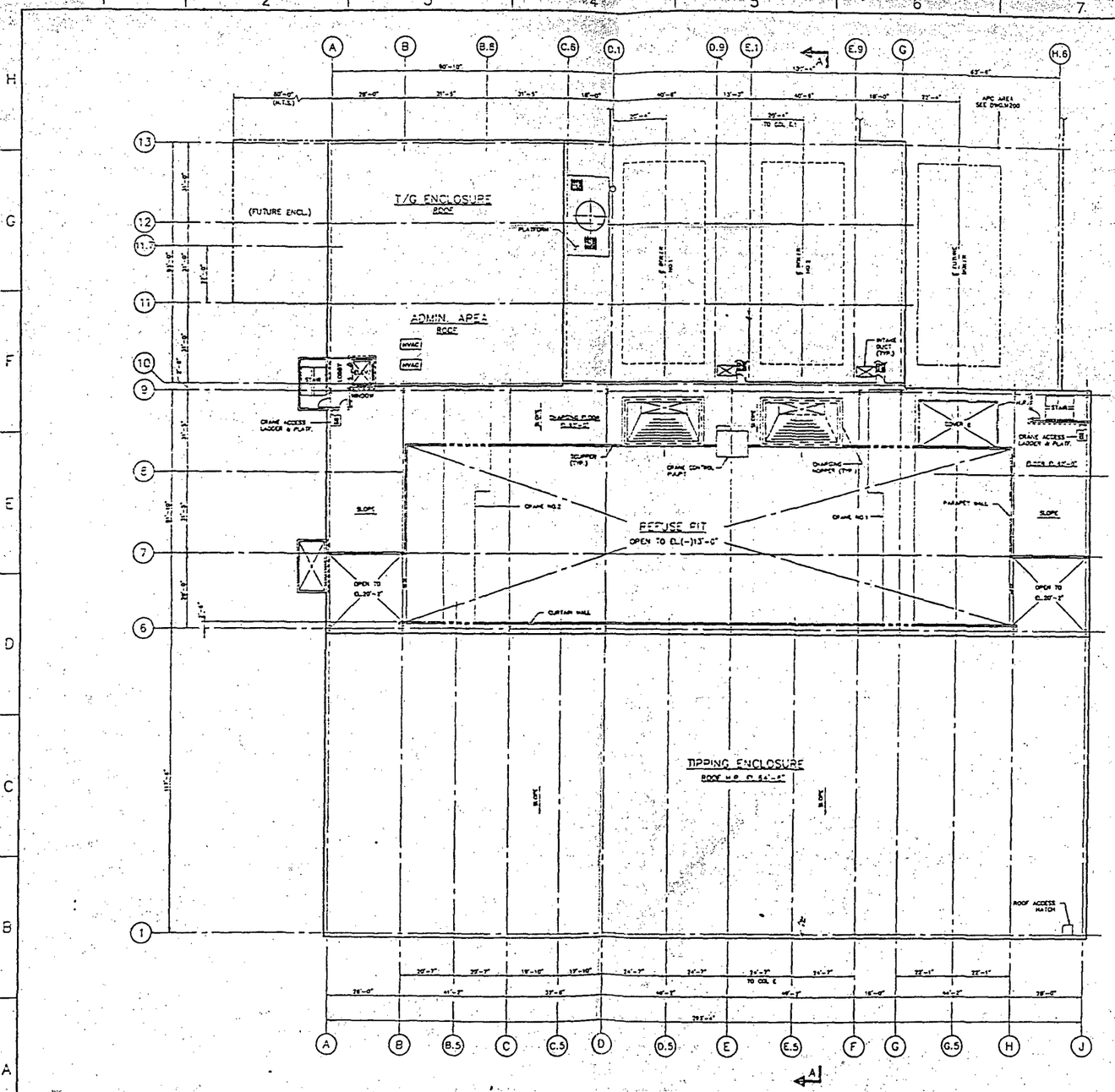
WALL LEGEND
- CONCRETE WALL
- BLOCK WALL
- PARTITION WALL
- SIDING
- INSULATED WALL
- 1HR FIREWALL
- 3HR FIREWALL

GRAPHIC SCALE
0 8' 16' 32' 48'
1/16"=1'-0"

OGDEN MARTIN SYSTEMS, INC.
GENERAL ARRANGEMENT
PLAN EL. 28'-6" & EL. 45'-0"
LEE COUNTY RESOURCE RECOVERY FACILITY

OGDEN MARTIN SYSTEMS, INC.

DRAWN 03/16/90	DESIGNED / /		
CHECKED 06/01/90	PROJECT NO. E-1033	SCALE 1/16"=1'-0"	
APPROVED / /	DRAWING NO. M201	SHT 1	REV G



REVISIONS
A ISSUED FOR PROGRESS - 3/23/90
B ISSUED FOR CONTRACTOR BID 5/1/90
C RE-ISSUED FOR CONTRACTOR BID 5/25/90
D ISSUED FOR PROPOSAL 06/25/90
E RE-ISSUED FOR TWO (2) BOILERS 01/24/91
F ISSUED FOR 1200 TPD FACILITY PROPOSAL 03/04/91

LEGEND

- CONCRETE WALL
- BLOCK WALL
- PARTITION WALL
- SIDING
- INSULATED WALL
- 1HR FIREWALL
- 3HR FIREWALL

GRAPHIC SCALE

0 8' 16' 32' 48'

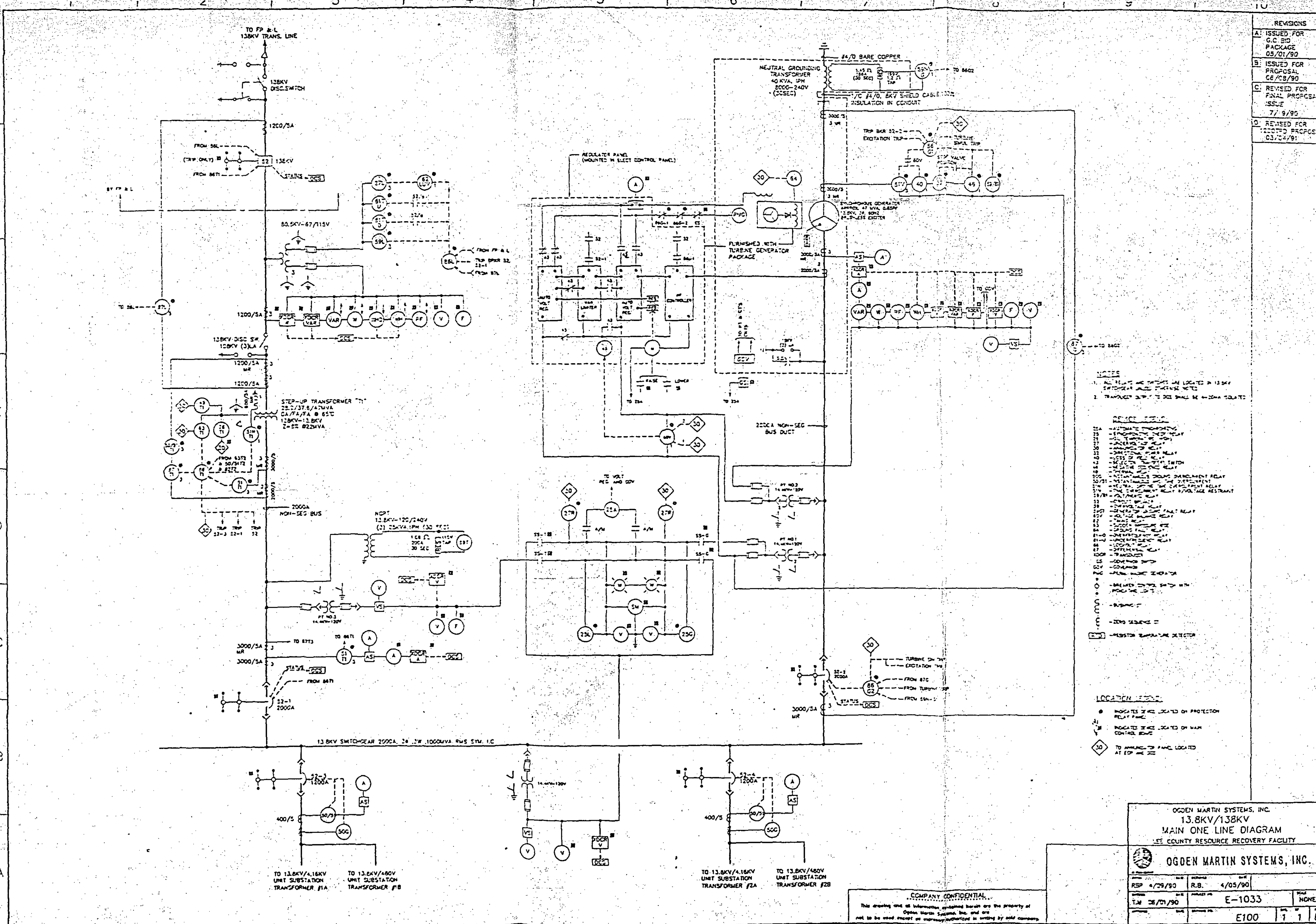
1/16"=1'-0"

N

OGDEN MARTIN SYSTEMS, INC.
GENERAL ARRANGEMENT
PLAN EL. 62'-0"
LEE COUNTY RESOURCE RECOVERY FACILITY

OGDEN MARTIN SYSTEMS, INC.

DRAWN	3/16/90	CHECKED	/ /
APPROVED	06/01/90	PROJECT NO.	E-90-33
SCALE	1/16"=1'-0"	
DESIGNED	/ /	DRAWING NO.	M202
SHT.	1	REV.	F


TO FP &L
138KV TRANS. LINE
138KV DISC.SWITCH
1200/5A
FROM 86L
(TRIP ONLY)
FROM 86T1
52 138KV
STATUS DCS
BY FP & L
80.5KV-67/115V
FROM FP & L
TRIP BRKR 52, 52-1
FROM 87L
TO 86L
1200/5A
VAR
W
WH
PF
V
F
DCS
138KV DISC SW.
108KV (3)LA
1200/5A MR
1200/5A
STEP-UP TRANSFORMER "T1"
28.2/37.6/47MVA
OA/FA/FA @ 65°C
138KV-13.8KV
Z=8% @22MVA
FROM 63T2 & 50/51T2 & 87T2
2000A NON-SEG BUS
TRIP 52-3
TRIP 52-1
TRIP 52
NGPT
13.8KV-120/240V
25KVA 1PH (30 SEC)
PT NO.3
14.4KV-120V
3000/5A MR
3000/5A
TO 87T3
TO 86T1
STATUS DCS
FROM 86T1
52-1 2000A
13.8KV SWITCHGEAR 2000A, 3Ø, 3W, 1000MVA RMS SYM. I.C.
52-3 1200A
400/5
50/51
50G
AS
TO 13.8KV/4.16KV UNIT SUBSTATION TRANSFORMER #1A
TO 13.8KV/480V UNIT SUBSTATION TRANSFORMER #1B
14.4KV-120V
VS
REGULATOR PANEL (MOUNTED IN ELECT CONTROL PANEL)
AUTO VOLT REG
VAR LIMITER
AUTO VOLT REG
PF CONTROLLER
RAISE
LOWER
TO 234
TO VOLT REG AND GOV
27R
25A
27R
SS-1
SS-G
SM
25L
25G
52-4 1200A
TO 13.8KV/4.16KV UNIT SUBSTATION TRANSFORMER #2A
TO 13.8KV/480V UNIT SUBSTATION TRANSFORMER #2B
#4/0 BARE COPPER
NEUTRAL GROUNDING TRANSFORMER
40 KVA, 1PH
8000-240V
(30SEC)
1.45 Ω 186A (30 SEC)
1.2 Ω TAP
59N G
TO 86G2
1/C #4/0, 8KV SHIELD CABLE 133% INSULATION IN CONDUIT
3000/5
3 MR
TRIP BKR 52-2
EXCITATION TRIP
TURBINE SIMUL TRIP
86 G1
STOP VALVE POSITION
60V
51V
40
46
FURNISHED WITH TURBINE GENERATOR PACKAGE
SYNCHRONOUS GENERATOR APPROX. 47 MVA, 0.85PF 13.8KV, 3Ø, 60HZ BRUSHLESS EXCITER
3000/5A MR
2000/5A
PMG
TO GOV
2000A NON-SEG BUS DUCT
PT NO.2
14.4KV-120V
PT NO.1
14.4KV-120V
52-2 2000A
TURBINE SHUT TRIP
EXCITATION TRIP
FROM 87G
FROM TURBINE TRIP
FROM 59N-G
86 G2
STATUS DCS
3000/5A MR
TO 86G2
NOTES
1. ALL RELAYS AND METERS ARE LOCATED IN 13.8KV SWITCHGEAR UNLESS OTHERWISE NOTED.
2. TRANSDUCER OUTPUT TO DCS SHALL BE 4-20MA ISOLATED
DEVICE LEGEND
LOCATION LEGEND
INDICATES DEVICE LOCATED ON PROTECTION RELAY PANEL
INDICATES DEVICE LOCATED ON MAIN CONTROL BOARD
TO ANNUNCIATOR PANEL LOCATED AT EOP AND DCS
REVISIONS
A ISSUED FOR G.C. BID PACKAGE 05/01/90
B ISSUED FOR PROPOSAL 06/08/90
C REVISED FOR FINAL PROPOSAL ISSUE 7/9/90
D REVISED FOR 1200TPD PROPOSAL 03/04/91
COMPANY CONFIDENTIAL
This drawing and all information contained herein are the property of Ogden Martin Systems, Inc. and are not to be used except as expressly authorized in writing by said company.
OGDEN MARTIN SYSTEMS, INC.
13.8KV/138KV
MAIN ONE LINE DIAGRAM
LEE COUNTY RESOURCE RECOVERY FACILITY
OGDEN MARTIN SYSTEMS, INC.
RSP 4/29/90
R.B. 4/05/90
T.M. 06/01/90
E-1033
NONE
E100
1 1 D

APPLICATION FOR PRELIMINARY EXAMINATION

RESOURCE RECOVERY EQUIPMENT

SECTION 5A

RESOURCE RECOVERY EQUIPMENT LIST

AND DESCRIPTIONS

FOR THE

LEE COUNTY SOLID WASTE RESOURCE RECOVERY FACILITY

NOTE: THE ITEMS LINED OUT ARE NOT CONSIDERED TO BE RESOURCE RECOVERY EQUIPMENT, THE VALUE OF THESE EXCLUDED ITEMS HAS NOT BEEN INCLUDED IN THE PROJECT VALUE REPORTED IN SECTION 5B OF THIS APPLICATION.

LEE COUNTY RESOURCE RECOVERY FACILITY
OMS PROJECT NO. 7102.001
EQUIPMENT AND ELECTRICAL LOAD LIST

REV	SYS	EQP	NUMBER	EQUIPMENT NAME	CAP FACT	TOT QTY	H.P. (EACH)	B.H.P. (EACH)	B.H.P. (TOTAL)	DVSTY FACT	CONT.KW (TOTAL)	INT. KW (TOTAL)	LOCATION	DESCRIPTIONS/SPEC. NO.

The following information is provided for adequate comprehension of the terms used in this load list.

IMPORTANT DEFINITIONS:

CAP FACT (capacity factor)
The portion of total function provided by a single component, either operating continuously or intermittently. This is used to determine the net operating HP (TOTAL BHP) of that component.

Component
An individual motor identified by its tag number.

Load Group
A group of motors common to a single EQP designation. This includes all components and spares under a particular SYS and EQP (each row in the table).

DVSTY FACT (diversity factor)
Whole numbers indicate CONTINUOUS operation; fractional values indicate INTERMITTENT operation. This variable is used for two purposes:

a) To assign an intermittent or continuous status to the calculated KW of components that operate with no diversity
b) Components in load groups that have diversity are added in the "INT KW" column and are time-averagfed. In this case the DIV FACT represents the percentage of time each component in that load group is operating.

BHP (TOTAL)
The sum of operating UNIT BHP's. (Spare BHP is not included in BHP (TOTAL). Spare units are indicated by TOTAL QTY and CAP FACT, where the no. operating = TOTAL QTY/CAP FACT).

DIRECT KW
An field denoting power used in non-mechanical (electrical-only) loads; figured into CONT KW and INT KW.

FORMULAS:

TOTAL BHP = (1 / CAP FACT) * UNIT BHP
CONT. KW= (TOTAL BHP * (0.746 KW/HP) / (0.92 elec. eff.) + DIRECT KW) * INT(DVSTY FACT)
INT. KW = (TOTAL BHP * (0.746 KW/HP) / (0.92 elec. eff.) + DIRECT KW) * DVSTY FACT * (1 - INT(DVSTY FACT))

LEE COUNTY RESOURCE RECOVERY FACILITY
OMS PROJECT NO. 7102.001
EQUIPMENT AND ELECTRICAL LOAD LIST

REV	SYS	EQP	NUMBER	EQUIPMENT NAME	CAP FACT	TOT QTY	H.P. (EACH)	B.H.P. (EACH)	B.H.P. (TOTAL)	DVSTY FACT	CONT.KW (TOTAL)	INT. KW (TOTAL)	LOCATION	DESCRIPTIONS/SPEC. NO.
B	AC	PU	001A&B	REGENERATION ACID PUMPS	1.000	2	0.50	0.40	0.40	0.999	0.00	0.32	WTR TRTMNT BLDG	SM-127
B	AC	PU	002A&B	ACID TRANSFER PUMP	1.000	2	0.50	0.40	0.40	0.999	0.00	0.32	WTR TRTMNT BLDG	SM-127
B	AC	TK	001	ACID BULK STORAGE TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WTR TRTMNT BLDG	SM-127 (4500 GAL)
B	AH	AL	101A1&A2	S.H. "A" HOPPER FLAP GATE	0.250	4	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-133
B	AH	AL	102A1&A2	S.H. "B" HOPPER FLAP GATE	0.250	4	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-133
B	AH	AL	103A1&A2	ECON. HOPPER DOUBLE DUMP VLV	0.250	4	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-133
B	AH	AL	104A	SCRUBBER HOPPER DOUBLE DUMP VLV	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	APC AREA	SM-133
B	AH	AL	105A1&A2	BAGHOUSE CONVEYOR ROTARY FEEDER	0.250	4	5.00	3.50	14.00	1.000	11.35	0.00	APC AREA	SM-134
B	AH	BH	001	RESIDUE ENCLOSURE DUST COLLECTOR	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	RESIDUE BLDG	SM-142 (H.P. EST.)
B	AH	CV	001	MAIN VIBRATING CONVEYOR	1.000	1	50.00	45.00	45.00	1.000	36.49	0.00	BOILER AREA	SM-131; FIELD FINISH PAINT
B	AH	CV	002	GRIZZLY SCALPER	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	GRIZZLY BLDG	SM-131; FIELD FINISH PAINT
B	AH	CV	003	UNDERS VIBRATING FEEDER	1.000	1	8.50	6.80	6.80	1.000	5.51	0.00	GRIZZLY BLDG	SM-131; FIELD FINISH PAINT
B	AH	CV	004	INCLINED BELT CONVEYOR	1.000	1	15.00	12.00	12.00	1.000	9.73	0.00	GRIZZLY/RESIDUE	SM-131; FIELD FINISH PAINT
B	AH	CV	005	SPREADER FEEDER	1.000	1	5.00	4.00	4.00	1.000	3.24	0.00	RESIDUE HANDL. BL	SM-131; FIELD FINISH PAINT
B	AH	CV	006	NON-FERROUS DISTRIBUTION CONVEYOR	1.000	1	30.00	25.00	25.00	1.000	20.27	0.00	RESIDUE HANDL. BL	SM-131; FIELD FINISH PAINT
B	AH	CV	007	MAGNETIC DRUM SEPARATOR	1.000	1	10.00	7.00	7.00	1.000	5.68	0.00	RESIDUE HANDL. BL	SM-131; FIELD FINISH PAINT
B	AH	CV	008	TROMMEL FEEDER	1.000	1	20.00	17.00	17.00	1.000	13.79	0.00	RESIDUE HANDL. BL	SM-131; FIELD FINISH PAINT

LEE COUNTY RESOURCE RECOVERY FACILITY
OMS PROJECT NO. 7102.001
EQUIPMENT AND ELECTRICAL LOAD LIST

REV	SYS	EQP	NUMBER	EQUIPMENT NAME	CAP FACT	TOT QTY	H.P. (EACH)	B.H.P. (EACH)	B.H.P. (TOTAL)	DVSTY FACT	CONT.KW (TOTAL)	INT. KW (TOTAL)	LOCATION	DESCRIPTIONS/SPEC. NO.
B	AH	CV	009	FERROUS DISTRIBUTION FEEDER	1.000	1	10.00	8.00	8.00	1.000	6.49	0.00	RESIDUE HANDL. BL	SM-131; FIELD FINISH PAINT
B	AH	CV	101A1&A2	BAGHOUSE CONVEYOR	0.250	4	3.00	1.00	4.00	1.000	3.24	0.00	APC AREA	SM-134; FIELD FINISH PAINT
B	AH	CV	102A	BAGHOUSE COLLECTION CONVEYOR	0.500	2	2.00	1.00	2.00	1.000	1.62	0.00	APC AREA	SM-134; FIELD FINISH PAINT
B	AH	CV	103A	BAGHOUSE TRANSFER CONVEYOR	0.500	2	10.00	5.00	10.00	1.000	8.11	0.00	APC AREA	SM-134; FIELD FINISH PAINT
B	AH	CV	104	FLYASH TRANSFER CONVEYOR	0.500	2	5.00	1.50	3.00	1.000	2.43	0.00	APC/BLR AREA	SM-134; FIELD FINISH PAINT
B	AH	CV	105A	ECONOMIZER COLLECTION CONVEYOR	0.500	2	2.00	1.00	2.00	1.000	1.62	0.00	BOILER AREA	SM-134; FIELD FINISH PAINT
B	AH	CV	106A1&A2	BOILER SCEW CONVEYOR	0.250	4	5.00	1.50	6.00	1.000	4.87	0.00	BOILER AREA	SM-134; FIELD FINISH PAINT
B	AH	CV	107A1&A2	ASH DISCHARGER FEED CONVEYOR	0.250	4	1.00	0.70	2.80	1.000	2.27	0.00	BOILER AREA	SM-134; FIELD FINISH PAINT
B	AH	FN	001	RESIDUE DUST COLLECTOR FAN	1.000	1	150.00	122.00	122.00	1.000	98.93	0.00	RESIDUE AREA	SM-142
B	AH	TM	001	ROTARY SCREEN TROMMEL	1.000	1	20.00	18.00	18.00	1.000	14.60	0.00	RESIDUE AREA	SM-131; FIELD FINISH PAINT
B	BD	HX	001	BLOWDOWN HEAT EXCHANGER	1.000	1	0.00	0.00	0.00	0.000	0.00	0.00	BOILER AREA	SM-270
B	BD	VE	001	CONTINUOUS BLOWDOWN TANK	1.000	1	0.00	0.00	0.00	0.000	0.00	0.00	BOILER AREA	SM-270
B	BD	VE	002	BOILER DRAIN TANK	1.000	1	0.00	0.00	0.00	0.000	0.00	0.00	BOILER AREA	SM-270
~~B~~	~~BL~~	~~BH~~	~~001~~	~~CENTRAL VACUUM BAG SHAKER~~	~~1.000~~	~~1~~	~~0.75~~	~~0.60~~	~~0.60~~	~~1.000~~	~~0.49~~	~~0.00~~	~~BOILER AREA~~	~~SM-143~~
~~B~~	~~BL~~	~~CS~~	~~001~~	~~INPLANT PAGING SYSTEM~~	~~1.000~~	~~1~~	~~0.00~~	~~0.00~~	~~0.00~~	~~1.000~~	~~0.00~~	~~0.00~~	~~THROUGHOUT PLANT~~	~~(GENERAL CONTRACTOR'S PACKAGE)~~
~~B~~	~~BL~~	~~CS~~	~~002~~	~~TELEPHONE SYSTEM~~	~~1.000~~	~~1~~	~~0.00~~	~~0.00~~	~~0.00~~	~~1.000~~	~~0.00~~	~~0.00~~	~~THROUGHOUT PLANT~~	~~(GENERAL CONTRACTOR'S PACKAGE)~~
B	BL	CS	003	CCTV SYSTEM	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	THROUGHOUT PLANT	(GENERAL CONTRACTOR'S PACKAGE)
B	BL	CS	004A-H	ROLL-UP DOORS	0.125	8	0.00	0.00	0.00	1.000	0.00	0.00	THROUGHOUT PLANT	(GENERAL CONTRACTOR'S PACKAGE)
~~B~~	~~BL~~	~~EL~~	~~001~~	~~PASSENGER/FREIGHT ELEVATOR~~	~~1.000~~	~~1~~	~~0.00~~	~~0.00~~	~~0.00~~	~~1.000~~	~~40.00~~	~~0.00~~	~~ADMIN. BLDG~~	~~SA-507~~

LEE COUNTY RESOURCE RECOVERY FACILITY
OMS PROJECT NO. 7102.001
EQUIPMENT AND ELECTRICAL LOAD LIST

REV	SYS	EQP	NUMBER	EQUIPMENT NAME	CAP FACT	TOT QTY	H.P. (EACH)	B.H.P. (EACH)	B.H.P. (TOTAL)	DVSTY FACT	CONT.KW (TOTAL)	INT. KW (TOTAL)	LOCATION	DESCRIPTIONS/SPEC. NO.
~~B~~	~~BL~~	~~GC~~	~~001~~	~~TURBINE CRANE~~	~~1.000~~	~~1~~	~~26.50~~	~~21.20~~	~~21.20~~	~~0.010~~	~~0.00~~	~~0.17~~	~~T/G AREA~~	~~4 MOTORS TOTAL (1 @ 1 H.P., 1 @ 20 H.P., 2 @ 2 H.P. EACH & 1 @ 1.5 H.P.)~~
B	BL	GC	002A&B	MISCELLANEOUS HOISTS	1.000	2	0.50	0.40	0.40	0.999	0.00	0.32	MAINT./BOILER ARE	1 TON HOISTS
~~B~~	~~BL~~	~~HW~~	~~001~~	~~WATER HEATER~~	~~1.000~~	~~1~~	~~0.00~~	~~0.00~~	~~0.00~~	~~1.000~~	~~120.00~~	~~0.00~~	~~ADMIN. BLDG~~	~~(GENERAL CONTRACTOR'S PACKAGE)~~
~~B~~	~~BL~~	~~HW~~	~~002~~	~~WATER HEATER~~	~~1.000~~	~~1~~	~~0.00~~	~~0.00~~	~~0.00~~	~~1.000~~	~~4.60~~	~~0.00~~	~~SCALEHOUSE~~	~~(GENERAL CONTRACTOR'S PACKAGE)~~
~~B~~	~~BL~~	~~HW~~	~~003~~	~~WATER HEATER~~	~~1.000~~	~~1~~	~~0.00~~	~~0.00~~	~~0.00~~	~~1.000~~	~~6.00~~	~~0.00~~	~~LABORATORY~~	~~(GENERAL CONTRACTOR'S PACKAGE)~~
~~B~~	~~BL~~	~~VC~~	~~001~~	~~CENTRAL VACUUM SYSTEM~~	~~1.000~~	~~1~~	~~15.00~~	~~12.00~~	~~12.00~~	~~1.000~~	~~9.73~~	~~0.00~~	~~THROUGHOUT PLANT~~	~~SM-143~~
B	BO	FN	101	SEAL AIR FAN	0.500	2	20.00	14.00	28.00	1.000	22.71	0.00	BOILER AREA	1,760 ACFN @ 20 IN. W.C. (BOILER PACKAGE)
B	BO	FN	102	BURNER FAN	0.500	4	40.00	12.00	24.00	1.000	0.00	19.46	BOILER AREA	SM-101
B	BO	FN	103	BURNER PURGE COOLING FAN	0.500	4	3.00	1.20	2.40	1.000	0.00	1.95	BOILER AREA	SM-101
B	BO	SB	101A-P	RETRACTABLE SOOT BLOWERS	0.021	48	1.00	1.00	48.00	1.000	0.00	38.92	BOILER AREA	SM-101
B	BO	SB	101Q-AV	ROTARY SOOT BLOWERS	0.016	64	1.13	1.13	72.00	1.000	0.00	58.38	BOILER AREA	SM-101
B	BO	SG	101	REFUSE BOILER	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-101
B	CA	FN	101	FORCED DRAFT FAN	0.500	2	350.00	229.00	458.00	1.000	371.39	0.00	BOILER AREA	SM-101
B	CA	FN	102A&B	OVERFIRE AIR FAN	0.500	2	200.00	111.00	222.00	1.000	180.02	0.00	BOILER AREA	SM-101
B	CA	HX	101	FORCED DRAFT AIR HEATER	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-101
B	CA	HX	102	OVERFIRE AIR HEATER	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-101
B	CC	HX	001A&B	CLOSED COOLING WATER HEAT EXCHANGER	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	SM-116

LEE COUNTY RESOURCE RECOVERY FACILITY
OMS PROJECT NO. 7102.001
EQUIPMENT AND ELECTRICAL LOAD LIST

REV	SYS	EQP	NUMBER	EQUIPMENT NAME	CAP FACT	TOT QTY	H.P. (EACH)	B.H.P. (EACH)	B.H.P. (TOTAL)	DVSTY FACT	CONT.KW (TOTAL)	INT. KW (TOTAL)	LOCATION	DESCRIPTIONS/SPEC. NO.
B	CC	PU	001A&B	CLOSED COOLING WATER PUMP	1.000	2	75.00	47.00	47.00	1.000	38.11	0.00	BOILER AREA	SM-121
B	CC	TK	001	CLOSED COOLING WATER EXPANSION TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-140; FIELD FINISH PAINT
B	CD	CD	001	SURFACE CONDENSER	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	SM-111
B	CD	CD	002	GLAND STEAM CONDENSER	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	SM-107
B	CD	CD	004	INTER/AFTER CONDENSER	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	SM-111
B	CD	DA	001	DEAERATOR	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-115
B	CD	HX	001	L.P. FEEDWATER HEATER 1	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	SM-114
B	CD	HX	002	L.P. FEEDWATER HEATER 2	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	SM-114
B	CD	PU	001A&B	CONDENSATE PUMP	1.000	2	100.00	74.00	74.00	1.000	60.01	0.00	T/G AREA	SM-118
B	CD	PU	002	GLAND STEAM VACUUM PUMP	1.000	1	5.00	5.00	5.00	1.000	4.05	0.00	T/G AREA	SM-107
B	CD	VA	003A-F	MOTOR OPERATED AIR ASSISTED CHECK VALVES	0.167	6	0.75	0.70	4.20	0.010	0.00	0.03	T/G AREA	
B	CD	XX	001	LEVEL CONTROL PRESSURE COMPENSATOR	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00		
B	CF	AG	001	OXYGEN SCAVENGER FEED AGITATOR	1.000	1	0.50	0.40	0.40	1.000	0.32	0.00	BOILER AREA	SM-130
B	CF	AG	002	NETRALIZING AMINE FEED AGITATOR	1.000	1	0.50	0.40	0.40	1.000	0.32	0.00	BOILER AREA	SM-130
B	CF	AG	003	MIXED CHEMICAL FEED TANK AGITATOR	1.000	1	0.50	0.40	0.40	1.000	0.32	0.00	BOILER AREA	SM-130
B	CF	IN	001	CHLORINATION SYSTEM	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	CHLORINE BLDG	SM-129
B	CF	IN	002	CHLORINE HEATER	1.000	1	0.00	0.00	0.00	1.000	2.00	0.00	CHLORINE BLDG	SM-129

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REV	SYS	EQP	NUMBER	EQUIPMENT NAME	CAP FACT	TOT QTY	H.P. (EACH)	B.H.P. (EACH)	B.H.P. (TOTAL)	DVSTY FACT	CONT.KW (TOTAL)	INT. KW (TOTAL)	LOCATION	DESCRIPTIONS/SPEC. NO.
B	CF	MO	001	CHLORINE CYLINDER HOIST	1.000	1	1.00	0.85	0.85	0.010	0.00	0.01	CHLORINE BLDG	SM-129
B	CF	PU	001A&B	OXYGEN SCAVENGER FEED PUMP	1.000	2	0.25	0.20	0.20	1.000	0.16	0.00	BOILER AREA	SM-130
B	CF	PU	002A&B	NEUTRALIZING AMINE FEED PUMP	1.000	2	0.25	0.20	0.20	1.000	0.16	0.00	BOILER AREA	SM-130
B	CF	PU	003A-C	MIXED CHEMICAL FEED PUMP	0.500	3	0.75	0.45	0.90	1.000	0.73	0.00	BOILER AREA	SM-130
B	CF	TK	001	OXYGEN SCAVENGER FEED TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-130
B	CF	TK	002	NEUTRALIZING AMINE FEED TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-130
B	CF	TK	003	MIXED CHEMICAL FEED TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-130
B	CS	PU	001A&B	REGENERATION CAUSTIC PUMPS	1.000	2	0.50	0.40	0.40	1.000	0.32	0.00	WTR TRTMNT BLDG	SM-127
B	CS	PU	002A&B	CAUSTIC TRANSFER PUMP	1.000	2	0.50	0.40	0.40	1.000	0.32	0.00	WTR TRTMNT BLDG	SM-127
B	CS	TK	001	CAUSTIC BULK STORAGE TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WTR TRTMNT BLDG	SM-127
B	CS	TK	002	CAUSTIC DILUTION WATER HEATER	1.000	1	0.00	0.00	0.00	1.000	40.00	0.00	WTR TRTMNT BLDG	SM-127
B	CW	CT	001	COOLING TOWER	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	YARD	SM-110
B	CW	FL	001	COOLING TOWER FILTER SCREEN	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	YARD	(GENERAL CONTRACTOR'S PACKAGE)
B	CW	FN	001A-C	COOLING TOWER FAN	0.333	3	100.00	95.00	285.00	1.000	231.11	0.00	YARD	SM-110
B	CW	PU	001A-C	CIRCULATING WATER PUMPS	0.500	3	600.00	495.00	990.00	1.000	802.79	0.00	YARD	SM-119
B	DW	PU	001A&B	DEMINERALIZER WATER TRANSFER PUMPS	1.000	2	7.50	6.00	6.00	1.000	4.87	0.00	BOILER AREA	SM-121
B	DW	PU	002A&B	RECYCLE PUMPS	1.000	2	0.00	0.00	0.00	1.000	0.00	0.00	WTR TRTMNT BLDG	SM-127
B	DW	TK	001	DEMINERALIZED WATER STORAGE TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-141; FIELD FINISH PAINT

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REV	SYS	EQP	NUMBER	EQUIPMENT NAME	CAP FACT	TOT QTY	H.P. (EACH)	B.H.P. (EACH)	B.H.P. (TOTAL)	DVSTY FACT	CONT.KW (TOTAL)	INT. KW (TOTAL)	LOCATION	DESCRIPTIONS/SPEC. NO.
B	EE	BC	001	125V D.C. POWER SYSTEM	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	1,500 AH
B	EE	MC	001A-J	480V MOTOR CONTROL CENTERS	0.125	8	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	800A, 22KA
	EE	SW	001	STEP-UP TRANSFORMER	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	SWITCHYARD	14/18/23 MVA OA/FA/FA OIL 138/13.8KV
	EE	SW	003A-D	AUXILIARY TRANSFORMER	0.250	4	0.00	0.00	0.00	1.000	0.00	0.00	ELECTRICAL ROOM	2,500/3,333 KVA MAX., AA/FA DRY, 2 X 13.8/4.16KV, 2 X 13.8/.48 KV
	EE	SW	004	15 KV NON-SEGREGATED BUS	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	SWTCHYD-T/G ENCL.	3,000A, 15KV, 1,200A, 15KV
B	EE	SW	005	15 KV GROUNDING TRANSFORMER/RESISTOR	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	50 KVA, 13.8 KV 120V
B	EE	SW	006A&B	480V DOUBLE END UNIT SUBSTATION	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	4,000A, 85 KA
B	EE	SW	007	15 KV SWITCHGEAR	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	3,000A, 1,000 MVA
B	EE	SW	008	5 KV DOUBLE ENDED UNIT SUBSTATION / 5 KV MCC	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	1,200A, 350 MVA
	EE	SY	001	138 KV SWITCHYARD	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	SWITCHYARD	LA'S, PT'S, CT'S, BUS, DISC SWITCHES, SUPPORTS
B	EE	UP	001	UPS SYSTEM	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	30 KVA, 120 VAC
B	EE	XF	023	DISTRIBUTION TRANSFORMERS, PANELS	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	THROUGHOUT PLANT	45 KVA EACH, AS REQUIRED
B	FG	AG	005A-C	HEAD TANK AGITATOR	0.333	3	1.00	0.80	2.40	1.000	1.95	0.00	APC AREA	SM-105
B	FG	AG	006	APC LIME AGITATOR	1.000	1	5.00	4.00	4.00	1.000	3.24	0.00	APC AREA	SM-105
B	FG	AG	007A&B	LIME SLURRY PUMP	1.000	2	15.00	12.00	12.00	1.000	9.73	0.00	APC AREA	SM-105
B	FG	AP	001A-C	CEM SYSTEM	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	APC AREA	(LATER)

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REV	SYS	EQP	NUMBER	EQUIPMENT NAME	CAP FACT	TOT QTY	H.P. (EACH)	B.H.P. (EACH)	B.H.P. (TOTAL)	DVSTY FACT	CONT.KW (TOTAL)	INT. KW (TOTAL)	LOCATION	DESCRIPTIONS/SPEC. NO.
B	FG	AT	101A-C	SCRUBBER ATOMIZER	0.333	3	100.00	80.00	240.00	1.000	194.62	0.00	APC AREA	SM-105
B	FG	BH	101	FABRIC FILTER (BAGHOUSE)	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	APC AREA	
B	FG	BL	001A&B	AMMONIA CARRIER AIR BLOWER	0.500	2	300.00	289.00	578.00	1.000	468.70	0.00	BOILER AREA	SM-198-2
B	FG	CV	014	SLAKER GRIT SCREW CONVEYOR	1.000	1	0.75	0.66	0.66	1.000	0.54	0.00	APC AREA	SM-105
B	FG	DL	101	SCRUBBER DELUMPER	0.500	2	7.50	5.00	10.00	1.000	8.11	0.00	APC AREA	SM-105
B	FG	FD	015A&B	LIME FEEDER	0.500	2	1.00	0.40	0.80	1.000	0.65	0.00	APC AREA	SM-105
B	FG	FL	019	SCRUBBER TANK SCREEN	1.000	1	4.00	3.50	3.50	1.000	2.84	0.00	APC AREA	SM-105
B	FG	FL	020A&B	SLAKER GRIT SCREEN	1.000	2	0.75	0.70	0.70	1.000	0.57	0.00	APC AREA	SM-105
B	FG	FN	101	I.D. FAN	0.500	2	600.00	430.00	860.00	1.000	697.37	0.00	APC AREA	SM-105
B	FG	GC	017	SDA HOIST & TROLLEY	1.000	1	0.00	0.00	0.00	1.000	5.00	0.00	APC AREA	SM-105
B	FG	HT	101A-H	BAGHOUSE HOPPER HEATERS	0.063	16	0.00	0.00	0.00	1.000	60.80	0.00	APC AREA	SM-105
B	FG	PU	001A&B	WATER BOOSTER PUMP (FOR SLAKERS)	1.000	2	4.00	3.00	3.00	1.000	2.43	0.00	APC AREA	25 GPM, 125 PSI (LATER)
B	FG	SC	101	FLUE GAS SCRUBBER	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	APC AREA	SM-105
B	FG	SL	002A&B	SLAKERS	1.000	2	2.00	1.80	1.80	1.000	1.46	0.00	APC AREA	SM-105
B	FG	ST	001	STACK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	YARD	
B	FG	TK	001	AMMONIA STORAGE TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	YARD	12,000 GALLON CAPACITY
B	FG	TK	010	APC LIME SLURRY TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	APC AREA	SM-105
B	FG	TK	022	APC HEAD TANK	1.000	0	0.00	0.00	0.00	1.000	0.00	0.00	APC AREA	SM-105
B	FG	VE	021	PEBBLE LIME SILO	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	APC AREA	SM-105

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REV	SYS	EQP	NUMBER	EQUIPMENT NAME	CAP FACT	TOT QTY	H.P. (EACH)	B.H.P. (EACH)	B.H.P. (TOTAL)	DVSTY FACT	CONT.KW (TOTAL)	INT. KW (TOTAL)	LOCATION	DESCRIPTIONS/SPEC. NO.
B	FG	VP	001A-C	AMMONIA VAPORIZER	0.333	3	0.00	0.00	0.00	1.000	42.00	0.00	YARD	3 @ 50%, 1 KV EACH
~~B~~	~~FP~~	~~PU~~	~~001~~	~~FIRE WATER PUMP (DIESEL DRIVEN)~~	~~1.000~~	~~1~~	~~0.00~~	~~0.00~~	~~0.00~~	~~1.000~~	~~0.00~~	~~0.00~~	~~FIRE PUMP HOUSE~~	~~SM-120~~
~~B~~	~~FP~~	~~PU~~	~~002~~	~~ELECTRIC JOCKEY FIRE PUMP~~	~~1.000~~	~~1~~	~~5.00~~	~~4.00~~	~~4.00~~	~~1.000~~	~~3.24~~	~~0.00~~	~~FIRE PUMP HOUSE~~	~~SM-120~~
~~B~~	~~FP~~	~~TK~~	~~001~~	~~FIRE WATER TANK~~	~~1.000~~	~~1~~	~~0.00~~	~~0.00~~	~~0.00~~	~~1.000~~	~~0.00~~	~~0.00~~	~~YARD~~	~~300,000 GAL/SM-141, FLD PNT~~
~~B~~	~~FP~~	~~TK~~	~~002~~	~~DIESEL FUEL TANK (FIRE PUMP)~~	~~1.000~~	~~1~~	~~0.00~~	~~0.00~~	~~0.00~~	~~1.000~~	~~0.00~~	~~0.00~~	~~FIRE PUMP HOUSE~~	~~400 GALLONS (FIRE WATER PUMP PACKAGE, LATER), FLD PNT~~
B	FP	TK	003	DIESEL FUEL TANK (FACILITY VEHICLES)	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	YARD	1000 GALLONS
B	FW	HX	001	BFW PUMP TURBINE OIL COOLER	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	FIELD FINISH PAINT
B	FW	HX	001A&B	BFW PUMP SEAL COOLERS	1.000	2	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-117
B	FW	PU	001A	BOILER FEED PUMP (MOTOR DRIVEN)	1.000	1	1000.00	810.20	810.20	1.000	656.99	0.00	BOILER AREA	SM-117
B	FW	PU	001B	BOILER FEED PUMP (TURBINE DRIVEN)	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-117
B	FW	TU	001	BOILER FEED PUMP TURBINE	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-117
~~B~~	~~HC~~	~~FN~~	~~004~~	~~MAINTENANCE AREA VENTILATORS~~	~~1.000~~	~~1~~	~~0.50~~	~~0.40~~	~~0.40~~	~~1.000~~	~~0.32~~	~~0.00~~	~~MAINT. AREA~~	~~SUMMER LOAD ONLY (GENERAL CONTRACTOR'S PACKAGE, LATER)~~
~~B~~	~~HV~~	~~AC~~	~~001~~	~~ADMIN BLDG AIR CONDITIONING UNIT~~	~~1.000~~	~~1~~	~~0.00~~	~~0.00~~	~~0.00~~	~~1.000~~	~~36.00~~	~~0.00~~	~~ADMIN. BUILDING~~	~~SUMMER LOAD ONLY (GENERAL CONTRACTOR'S PACKAGE, LATER)~~
B	HV	AC	002	MAIN CONTROL ROOM AIR CONDITIONING UNIT	1.000	1	0.00	0.00	0.00	1.000	16.00	0.00	CONTROL ROOM	SUMMER LOAD ONLY (GENERAL CONTRACTOR'S PACKAGE; LATER)
~~B~~	~~HV~~	~~AC~~	~~003~~	~~SCALEHOUSE HEAT PUMP~~	~~1.000~~	~~1~~	~~0.07~~	~~0.07~~	~~0.07~~	~~1.000~~	~~0.06~~	~~0.00~~	~~SCALE HOUSE~~	~~SUMMER LOAD ONLY (GENERAL CONTRACTOR'S PACKAGE, LATER)~~
B	HV	FN	001A-H	BOILER AREA ROOF VENTILATOR	0.125	8	15.00	13.50	108.00	1.000	87.58	0.00	BOILER AREA	SUMMER LOAD ONLY (GENERAL

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~~B~~	~~HV~~	~~FN~~	~~002A&B~~	~~TURBINE AREA ROOF VENTILATOR~~	~~0.500~~	~~2~~	~~3.00~~	~~2.50~~	~~5.00~~	~~1.000~~	~~4.05~~	~~0.00~~	~~TURBINE AREA~~	~~SUMMER LOAD ONLY (GENERAL CONTRACTOR'S PACKAGE, LATER)~~
B	HV	FN	005A-H	WATER TREATMENT BLDG VENTILATIOR	0.125	8	10.00	9.60	76.80	1.000	62.28	0.00	WATER TRTMT BLDG.	SUMMER LOAD ONLY (GENERAL CONTRACTOR'S PACKAGE) ON HOLD
B	HV	FN	007	GRIZZLY BLDG VENTILATORS	0.500	2	1.50	1.50	3.00	1.000	2.43	0.00	GRIZZLY BLDG	SUMMER LOAD ONLY (GENERAL CONTRACTOR'S PACKAGE; LATER)
B	HV	FN	008A-Q	MISCELLANEOUS VENTILATORS	0.059	17	30.00	30.00	509.49	1.000	413.15	0.00	THROUGHOUT PLANT	SUMMER LOAD ONLY (GENERAL CONTRACTOR'S PACKAGE; LATER)
~~B~~	~~HV~~	~~FN~~	~~009~~	~~ADMIN BLDG EXHAUST FAN~~	~~1.000~~	~~1~~	~~8.50~~	~~6.80~~	~~6.80~~	~~1.000~~	~~5.51~~	~~0.00~~	~~ADMIN. BUILDING~~	~~CONTROL ROOM FAN @ 5 H.P.; ADMINISTARTION BUILDING FANS 7 TOTAL @ 1/2 H.P. EACH (GENERAL CONTRACTOR'S PACKAGE, LATER)~~
~~B~~	~~HV~~	~~UH~~	~~001A-F~~	~~ADMIN BLDG ELECTRIC SPACE HEATER~~	~~0.167~~	~~6~~	~~0.00~~	~~0.00~~	~~0.00~~	~~1.000~~	~~30.00~~	~~0.00~~	~~ADMIN. BUILDING~~	~~WINTER LOAD ONLY, 5 KW EACH (GENERAL CONTRACTOR'S PACKAGE, LATER)~~
~~B~~	~~HV~~	~~UH~~	~~004A&B~~	~~MAINTENANCE AREA UNIT HEATERS~~	~~0.500~~	~~2~~	~~0.00~~	~~0.00~~	~~0.00~~	~~1.000~~	~~10.00~~	~~0.00~~	~~MAINT. AREA~~	~~WINTER LOAD (GENERAL CONTRACTOR'S PACKAGE), 2-10 KW EA. (LATER)~~
B	IN	IN	001	DISTRIBUTION CONTROL SYSTEM	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	(LATER)
B	MS	CD	001	BYPASS CONDENSER	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	SM-113
B	MS	DS	001	MAIN STEAM DESUPERHEATER	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	
B	MS	PU	001	STEAM JET AIR EJECTOR	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	SM-111
B	PP	TK	001A	PROPANE STORAGE TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	YARD	60,000 GALLONS/SM-199
B	PP	YP	001A,B,C	PROPANE VAPORIZER	0.500	3	0.00	0.00	0.00	1.000	270.00	0.00	YARD	SM-199
~~B~~	~~PW~~	~~PU~~	~~001A&B~~	~~POTABLE WATER PUMPS~~	~~1.000~~	~~2~~	~~10.00~~	~~10.00~~	~~10.00~~	~~1.000~~	~~8.11~~	~~0.00~~	~~ADMIN BLDG~~	~~SM-121~~

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REV	SYS	EQP	NUMBER	EQUIPMENT NAME	CAP FACT	TOT QTY	H.P. (EACH)	B.H.P. (EACH)	B.H.P. (TOTAL)	DVSTY FACT	CONT.KW (TOTAL)	INT. KW (TOTAL)	LOCATION	DESCRIPTIONS/SPEC. NO.
B	RF	GC	001A&B	REFUSE CRANES	1.000	2	273.00	273.00	273.00	1.000	221.38	0.00	REFUSE PIT AREA	SM-102
B	RF	HX	101, 201	STOKER HYDRAULIC OIL COOLERS	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	(STOKER PACKAGE)
B	RF	PU	102	REFUSE STOKER HYDRAULIC PUMP	0.167	6	30.00	30.00	180.00	1.000	145.96	0.00	BOILER AREA	(STOKER PACKAGE; LATER)
B	RF	PU	103	REFUSE STOKER GREASE PUMP	0.500	2	0.18	0.14	0.28	1.000	0.23	0.00	BOILER AREA	(STOKER PACKAGE; LATER)
B	RF	ST	101	REFUSE STOKER	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	(STOKER PACKAGE)
~~B~~	~~RF~~	~~TS~~	~~001A-C~~	~~TRUCK SCALE~~	~~0.333~~	~~3~~	~~0.00~~	~~0.00~~	~~0.00~~	~~1.000~~	~~0.00~~	~~0.00~~	~~YARD~~	~~SC-320~~
B	SA	AC	001A&B	AIR COMPRESSORS	1.000	2	100.00	92.00	92.00	1.000	74.60	0.00	BOILER AREA	SM-126
B	SA	AD	001	INSTRUMENT AIR DRYER	1.000	1	0.00	0.00	0.00	1.000	14.00	0.00	BOILER AREA	SM-126
B	SA	AF	001A&B	INLET AIR FILTER/SILENCER	1.000	2	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-126
B	SA	HX	001A&B	AIR COMPRESSOR AFTER COOLER	1.000	2	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-126
B	SA	HX	002A&B	AIR COMPRESSOR OIL COOLER	1.000	2	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-126
B	SA	TK	001A&B	AIR RECEIVERS	1.000	2	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	SM-126
B	SP	SC	001,002	SAMPLE COOLERS	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	LATER
B	SP	SC	101-103	SAMPLE COOLERS	0.333	3	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	LATER
B	SP	SC	201-203	SAMPLE COOLERS	0.333	3	0.00	0.00	0.00	1.000	0.00	0.00	BOILER AREA	LATER
~~B~~	~~SS~~	~~PU~~	~~001~~	~~SEWAGE LIFT STATION 1~~	~~1.000~~	~~2~~	~~5.00~~	~~5.00~~	~~5.00~~	~~1.000~~	~~4.05~~	~~0.00~~	~~ADMIN BLDG~~	~~LATER~~
~~B~~	~~SS~~	~~PU~~	~~002~~	~~SEWAGE LIFT STATION 2~~	~~1.000~~	~~1~~	~~7.50~~	~~7.50~~	~~7.50~~	~~1.000~~	~~6.08~~	~~0.00~~	~~WATER TRTMT BLDG.~~	~~LATER~~
~~B~~	~~SS~~	~~PU~~	~~003~~	~~SEWAGE LIFT STATION 3~~	~~1.000~~	~~1~~	~~1.00~~	~~1.00~~	~~1.00~~	~~1.000~~	~~0.81~~	~~0.00~~	~~YARD~~	~~LATER~~
~~B~~	~~SS~~	~~PU~~	~~004~~	~~SEWAGE LIFT STATION 4~~	~~1.000~~	~~2~~	~~7.50~~	~~7.50~~	~~7.50~~	~~1.000~~	~~6.08~~	~~0.00~~	~~YARD~~	~~LATER~~

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OMS PROJECT NO. 7102.001
EQUIPMENT AND ELECTRICAL LOAD LIST

REV	SYS	EQP	NUMBER	EQUIPMENT NAME	CAP FACT	TOT QTY	H.P. (EACH)	B.H.P. (EACH)	B.H.P. (TOTAL)	DVSTY FACT	CONT.KW (TOTAL)	INT. KW (TOTAL)	LOCATION	DESCRIPTIONS/SPEC. NO.
B	TG	GE	001	GENERATOR	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	SM-107
B	TG	HX	001A-D	GENERATOR AIR COOLERS	0.250	4	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	SM-107
B	TG	MO	001	TURNING GEAR	1.000	1	7.50	3.00	3.00	0.999	0.00	2.43	T/G AREA	SM-107
B	TG	TU	001	MAIN TURBINE	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	SM-107
B	TO	HX	001A&B	LUBE OIL COOLERS	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	SM-107
B	TO	PU	001	MAIN LUBE OIL PUMP	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	
B	TO	PU	002	TURBINE AUXILIARY LUBE OIL PUMP	1.000	2	50.00	45.00	45.00	0.999	0.00	36.45	T/G AREA	
B	TO	PU	003	TURBINE EMERGENCY LUBE OIL PUMP	1.000	1	15.00	15.00	15.00	0.999	0.00	12.15	T/G AREA	D.C. (TURBINE PACKAGE; LATER)
B	TO	PU	005	LUBE OIL CONDITIONER	1.000	1	3.00	2.50	2.50	0.999	0.00	2.03	T/G AREA	(TURBINE PACKAGE; LATER)
B	TO	TK	001	LUBE OIL TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	T/G AREA	(TURBINE PACKAGE; LATER)
B	WE	PU	001,002	WELL WATER PUMP	1.000	2	50.00	45.00	45.00	0.999	0.00	36.45	YARD	
B	WT	AG	001	WATER TREATMENT LIME SOLUTION TANK MIXER	1.000	1	0.25	0.20	0.20	1.000	0.16	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	AG	002	WATER TERATMENT SODA ASH SOLUTION TANK MIXER	1.000	1	0.25	0.20	0.20	1.000	0.16	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	AG	003	CARBON SOLUTION TANK MIXER	1.000	1	0.25	0.20	0.20	1.000	0.16	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	AG	004	POLYMER SOLUTION TANK MIXER	1.000	1	0.33	0.27	0.27	1.000	0.22	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	AG	005	POLYMER FEED MIXER	1.000	1	0.25	0.20	0.20	1.000	0.16	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	AG	006	LIME BIN ACTIVATOR	1.000	1	0.25	0.20	0.20	1.000	0.16	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	AG	007	REVERSE OSMOSIS CHEMICAL CLEANING TANK MIXER	1.000	1	5.00	4.00	4.00	1.000	3.24	0.00	WATER TRTMT BLDG.	SM-128-1

LEE COUNTY RESOURCE RECOVERY FACILITY
OMS PROJECT NO. 7102.001
EQUIPMENT AND ELECTRICAL LOAD LIST

REV	SYS	EQP	NUMBER	EQUIPMENT NAME	CAP FACT	TOT QTY	H.P. (EACH)	B.H.P. (EACH)	B.H.P. (TOTAL)	DVSTY FACT	CONT.KW (TOTAL)	INT. KW (TOTAL)	LOCATION	DESCRIPTIONS/SPEC. NO.
B	WT	AG	008	COOLING TOWER SIDESTREAM CLARIFIER RECIRCULATOR	1.000	1	1.00	0.80	0.80	1.000	0.65	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	AG	009	CARBON BIN ACTIVATOR	1.000	1	0.25	0.20	0.20	1.000	0.16	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	AG	010	FILTRATE SUMP MIXER	1.000	1	0.75	0.66	0.66	1.000	0.54	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	AG	011	CARBON ABSORPTION MIXER	1.000	1	0.25	0.20	0.20	1.000	0.16	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	AG	012	COOLING TOWER SIDESTREAM CLARIFIER SCRAPER	1.000	1	0.50	0.40	0.40	1.000	0.32	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	AG	013	DILUTE ACID TANK MIXER	1.000	1	0.25	0.20	0.20	1.000	0.16	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	AG	014	ANTI-SCALANT TANK MIXER	1.000	1	0.25	0.20	0.20	1.000	0.16	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	AG	015	SODA ASH BIN ACTIVATOR	1.000	1	0.25	0.20	0.20	1.000	0.16	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	AG	016	POLYMER FEED MIXER	1.000	1	0.25	0.20	0.20	1.000	0.16	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	AG	017	STATIC MIXER	1.000	1	0.25	0.20	0.20	1.000	0.16	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	BH	001	WATER TREATMENT LIME BIN DUST COLLECTOR	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	BH	002	WATER TREATMENT SODA ASH BIN DUST COLLECTOR	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	BH	003	CARBON BIN DUST COLECTOR	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	BL	001A&B	BLOWERS	1.000	2	25.00	20.00	20.00	1.000	16.22	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	FD	002	WATER TREATMENT LIME FEEDER	1.000	1	0.50	0.35	0.35	1.000	0.28	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	FD	003	WATER TREATMENT SODA ASH FEEDER	1.000	1	0.50	0.35	0.35	1.000	0.28	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	FD	004	CARBON FEEDER	1.000	1	0.50	0.35	0.35	1.000	0.28	0.00	WATER TRTMT BLDG.	SM-128-1

LEE COUNTY RESOURCE RECOVERY FACILITY
OMS PROJECT NO. 7102.001
EQUIPMENT AND ELECTRICAL LOAD LIST

REV	SYS	EQP	NUMBER	EQUIPMENT NAME	CAP FACT	TOT QTY	H.P. (EACH)	B.H.P. (EACH)	B.H.P. (TOTAL)	DVSTY FACT	CONT.KW (TOTAL)	INT. KW (TOTAL)	LOCATION	DESCRIPTIONS/SPEC. NO.
B	WT	FL	002A&B	R.O. PRE-FILTERS	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	FL	003A&B	REVERSE OSMOSIS MODULES	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	FL	004A&B	GRAVITY FILTERS	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	FL	005	FILTER PRESS	1.000	1	0.50	0.40	0.40	1.000	0.32	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	PL	001A&B	DYNA-SAND FILTER	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-2
B	WT	PU	001A&B	REVERSE OSMOSIS BOOSTER PUMP	1.000	2	50.00	45.00	45.00	1.000	36.49	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	PU	002A&B	CARBON SOLUTION FEED PUMPS	1.000	2	3.00	2.70	2.70	1.000	2.19	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	PU	003A&B	PROCESS WATER PUMPS	1.000	2	20.00	16.00	16.00	1.000	12.97	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	PU	005	POYMER FEED PUMP	1.000	1	0.25	0.20	0.20	1.000	0.16	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	PU	005A&B	DEMINERALIZER RECYCLE PUMP	1.000	2	3.00	2.70	2.70	1.000	2.19	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	PU	006A&B	R.O. ACID FEED PUMPS	1.000	2	0.25	0.20	0.20	1.000	0.16	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	PU	007A&B	R.O. CHEMICAL CLEANING PUMPS	1.000	2	5.00	4.00	4.00	1.000	3.24	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	PU	008A&B	ACID FEED PUMPS	1.000	2	0.50	0.40	0.40	1.000	0.32	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	PU	009A&B	FERRIC SULFATE PUMPS	1.000	2	0.50	0.40	0.40	1.000	0.32	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	PU	010A&B	FILTRATE SUMP PUMPS	1.000	2	0.50	0.40	0.40	1.000	0.32	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	PU	011A&B	SLUDGE RECIRCULATING PUMPS	1.000	2	0.50	0.40	0.40	1.000	0.32	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	PU	012A&B	FILTERED WATER PUMP	1.000	2	10.00	7.80	7.80	1.000	6.33	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	PU	013A&B	WATER TREATMENT LIME SOLUTION FEED PUMP	1.000	2	3.00	2.70	2.70	1.000	2.19	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	PU	014A&B	ANTI-SCALCANT FEED PUMPS	1.000	2	0.25	0.20	0.20	1.000	0.16	0.00	WATER TRTMT BLDG.	SM-128-1

LEE COUNTY RESOURCE RECOVERY FACILITY
OMS PROJECT NO. 7102.001
EQUIPMENT AND ELECTRICAL LOAD LIST

REV	SYS	EQP	NUMBER	EQUIPMENT NAME	CAP FACT	TOT QTY	H.P. (EACH)	B.H.P. (EACH)	B.H.P. (TOTAL)	DVSTY FACT	CONT.KW (TOTAL)	INT. KW (TOTAL)	LOCATION	DESCRIPTIONS/SPEC. NO.
B	WT	PU	015A&B	WASTEWATER DISCHARGE PUMPS	0.500	2	2.00	1.50	3.00	1.000	2.43	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	PU	016	POLYMER FEED PUMP	1.000	1	0.25	0.20	0.20	1.000	0.16	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	PU	018A&B	WATER TREATMENT SODA ASH SOLUTION FEED PUMP	1.000	2	3.00	2.70	2.70	1.000	2.19	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	PU	019A&B	SLUDGE TRANSFER PUMPS	1.000	2	2.00	1.60	1.60	1.000	1.30	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	TK	001	FILTERED WATER STORAGE TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	17,400 GAL/SM-141; FIELD FINSIH PAINT
B	WT	TK	002	FERRIC SULFATE TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	TK	004	POLYMER FEED TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	TK	005	SODA ASH SOLUTION TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	TK	006	CARBON ABSORPTION TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	TK	007	REVERSE OSMOSIS CHEMICAL CLEANING TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	TK	008	COOLING TOWER SIDESTREAM CLARIFIER TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	TK	009	GRAVITY FILTER CLEARWELL	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	TK	010	FILTRATE SUMP	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	
B	WT	TK	011	LIME SOLUTION TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	TK	013	REVERSE OSMOSIS DILUTE ACID STORAGE TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	TK	014	ANTI-SCALANT STORAGE TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	TK	015	WASTEWATER COLLECTION TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	38,000 GALLONS/SM-141; FIELD

LEE COUNTY RESOURCE RECOVERY FACILITY
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B	WT	TK	019	SLUDGE STORAGE TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	TK	032	CARBON SOLUTION TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	VE	001A&B	DEMINERALIZER CATION EXCHANGE VESSELS	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-127
B	WT	VE	002A&B	ANION EXCHANGE VESSELS	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-127
B	WT	VE	003A&B	ACTIVATED CARBON FILTERS	0.500	2	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-127
B	WT	VE	004	WATER TREATMENT LIME SILO	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	VE	005	WATER TREATMENT SODA ASH SILO	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WT	VE	006	CARBON STORAGE SILO	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMT BLDG.	SM-128-1
B	WW	PU	001A&B	WASTE WATER SETTLING BASIN PUMPS	1.000	2	5.00	4.00	4.00	1.000	3.24	0.00	APC AREA	
B	WW	PU	001A&B	NEUTRALIZATION TANK DISCHARGE PUMP	0.500	2	5.00	4.00	8.00	1.000	6.49	0.00	WATER TRTMT BLDG.	SM-127
B	WW	TK	001	NEUTRALIZATION TANK	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	WATER TRTMNT BLDG	15,000 GALLONS/SM-141
B	WW	TK	002	WASTE WATER SETTLING BASIN	1.000	1	0.00	0.00	0.00	1.000	0.00	0.00	APC AREA	

TOTALS: CONT. KW	INT. KW
5877.22	209.42

Lee County

Resource Recovery Buildings

Includes roofing, siding structural steel, concrete, building foundations, reinforcing steel and piling for the following:

- Refuse Building
- Tipping Building
- Grizzly Building
- Ash Handling Building

Resource Recovery Foundations

Includes the concrete, reinforcing steel, equipment anchor bolts and piling directly associated and physically supporting the Resource Recovery Equipment identified in this Equipment Listing.

Resource Recovery Structural Steel

Includes structural steel directly associated and physically supporting the Resource Recovery Equipment identified in this Equipment Listing.

APPLICATION FOR PRELIMINARY EXAMINATION

RESOURCE RECOVERY EQUIPMENT

SECTION 5B

ESTIMATED PURCHASE COST

FOR

RESOURCE RECOVERY EQUIPMENT

FOR THE

LEE COUNTY SOLID WASTE RESOURCE RECOVERY FACILITY

SECTION 5B

The estimated cost of the resource recovery equipment listed in Section 5A including associated installation materials is $105,703,664.00 (one hundred five million seven hundred three thousand six hundred sixty-four dollars). The items are being provided as part of a fixed construction price for the design, construction, start-up, and acceptance testing of the entire facility in accordance with the OMS/Lee County Construction Agreement.

BREAKDOWN BY MAJOR CATEGORY

Resource Recovery Foundations, Buildings Civil and Structures	$20,880,048.00
Waste Receiving and Storage Equipment	2,527,856.00
Combustion/Steam Generation Equipment (including residue removal system)	51,236,241.00
Air Pollution Control Equipment	14,044,599.00
Power Generation Equipment	9,671,821.00
Steam Condensing Equipment (including Cooling Tower)	3,498,525.00
Process Water and Waste Water Systems	3,844,574.00