

Memorandum

To: Fla Rock File

TO: Doug Beason, OGC

FROM: Al Linero



DATE: May 16, 1997

SUBJ: Florida Rock Public Record Request from Priscilla Harris

On Thursday, May 15, Ms. Harris visited our office requesting to look at files regarding Florida Rock Industries. She presented a memo that requested all documents relating to Florida Rock which included documents that were written, prepared, dictated, sent or received (by Howard Rhodes, Clair Fancy, Al Linero, and Teresa Heron) after March 7, 1996 until May 15, 1997.

We let her look at the permit files and she copied a minimal amount of material. Please advise on fulfillment of the entire request. I assume that this may still be a matter in litigation and that she needs to make such requests through OGC.

AAL/kt

cc: P. Harris

To: Air Division (Dep)

From: P. Harris

Date: May 15, 1997

Re: Public Records

I request ALL documents, relating to or concerning the proposed cement plant to be built by Florida Rock Industries in Alachua County which are dated, were written, prepared, dictated, sent, &/or received AFTER March 7, 1996 until May 15, 1997.

This request applies to everyone in this office of Air Division, including but not limited to Al Limer, T. Herson, Clair Farcy, & Howard Rhodes. ~~Any person~~

Priscilla Harris

5/15/97 - 4 pages copied = 60¢ pd cash #/mtf



FLORIDA ROCK INDUSTRIES INC

Mining, Ready Mix Concrete, and Construction Products

May 8, 1997

Via Hand Delivered

Mr. A. A. Linero, P.E.

Bureau of Air Regulation

FLORIDA DEPARTMENT OF ENVIRONMENTAL PROTECTION

Twin Towers Office Building

2600 Blair Stone Road

Tallahassee, Florida 32399-2400

Re: Air Permit AC01-26311/PSD-FL-288
Florida Rock Industries, Inc.



RECEIVED

MAY 09 1997

BUREAU OF
AIR REGULATION

Dear Mr. Linero:

The purpose of this letter is to update your files with Florida Rock Industries, Inc.'s commencement of construction under the above-referenced permit. We previously notified you of the ground-breaking ceremony for the cement plant held on March 26, 1997.

Florida Rock Industries, Inc. has entered into binding contractual agreements with two contractors to undertake a program to construct the Portland Cement plant which is subject to the above-referenced permit. One contract was entered into between Florida Rock Industries, Inc. and Polysius Corporation on April 1, 1996, for process engineering and equipment supply, and another contract was entered into between Florida Rock Industries, Inc. and The Hardaway Company/Stone & Webster Engineering Corporation, J.V. on December 9, 1996, for engineering and construction services.

Both contractual agreements were activated by amendments to the original agreements on April 7, 1997. Non-refundable down-payments to both Polysius Corporation and The Hardaway Company/Stone & Webster Engineering Corporation, J.V. pursuant to the contractual agreements with Florida Rock Industries, Inc. were made on April 4, 1997.

In addition, we hereby provide to FDEP, pursuant to Specific Condition 27 of the above-referenced permit, the final construction schedule for the construction of the cement plant. The terms of the contracts with both major suppliers of goods and services for the construction of the cement plant (Polysius Corporation and The Hardaway Company/Stone & Webster Engineering Corporation, J.V.) Call for twenty-four (24) month's construction time. We anticipate

A. A. Linero, P.E.
May 8, 1997
Page Two

plant start-up to occur in May or June of 1999, provided certain delivery items will arrive on the job site as promised by the suppliers. With the activation of the contracts on April 7, 1997, this is consistent with the 24-month schedule previously discussed with you.

We also hereby provide FDEP with the design and manufacturer's guarantee for Electrostatic Precipitators (ESP's) for the cement plant pursuant to Specific Condition 26 of the above-referenced permit. See enclosed documents from Environmental Elements Corporation of Baltimore, Maryland. These documents were previously submitted to FDEP on March 11, 1996, in a letter from Florida Rock Industries, Inc.'s consultant, John B. Koogler, Ph.D., P.E., to Mr. Howard Rhodes, Director, FDEP, Division of Air Resources Management. Any as-built variations will be consistent and equivalent to these, and will be provided to you as we receive them.

I apologize for the delay in formally providing the attached documents for your files post-permit issuance. I have assumed all along that our previous submittal would have sufficed for Specific Condition 26, but submit these again in an overabundance of caution. If you need any further information, or have any questions concerning this letter of the attached documents, please contact me at 800/874-8382/Ext. 307.

Sincerely,



Fred W. Cohrs
Vice President

FWC:bvk

Enclosures/

**ENVIRONMENTAL ELEMENTS CORPORATION
ELECTROSTATIC PRECIPITATOR**

FOR

**POLYSIUS CORPORATION
ATLANTA, GEORGIA**

FOR

**FLORIDA ROCK
NEWBERRY, FLORIDA**

**Environmental Elements Corporation
Proposal Number ACS-95-04-15290-R2110E-F-A&B
May 5, 1995**

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ENVIRONMENTAL ELEMENTS CORPORATION

SECTION 1
PROPOSAL SUMMARY

SECTION 1**1. PROPOSAL SUMMARY****A. DESIGNATION**

Throughout this proposal, Polysius Corporation, Atlanta, Georgia 30339 and Environmental Elements Corporation, Baltimore, Maryland 21203, shall be referred to as "Buyer" and "Seller", respectively.

B. TRADEMARKS

Trademarks of Environmental Elements Corporation, Baltimore, Maryland 21203.

ENELCO®
RIGITRODE™
DIGICON®
OPTI-CON II®
MODULOK®
OPTIPULSE™

C. SCOPE - GENERAL

Seller will design, fabricate and deliver F.O.B. jobsite, two single chamber electrostatic precipitator one to clean the flue gases from the cement preheater kiln with roller mill circuit and one to clean the flue gas from the clinker cooler.

D. SCOPE - SELLER

Included in the scope of this proposal as part of Seller's supply are:

1. Two single chamber electrostatic precipitators of the floating bottom design with trough hoppers.
2. A pressurized penthouse covering the entire precipitator hot roof for the housing of the high voltage insulators and bus bars, complete with pressurizing blower and insulator heaters.
3. Electric rapping system for the collecting plates, discharge electrodes and gas distribution plates, complete with solid state microprocessor rapper panel.
4. Transformer-rectifiers with digital microprocessor controllers.
5. Inlet and outlet nozzles.
6. Shop paint as described in the proposal.
7. Structural steel to support the precipitator from grade.

8. Access facilities to scope shown on the drawing.
9. Hopper conveyor and dust valve.
10. High dust level alarm system for the precipitator hoppers.
11. Hopper heaters including thermostats and controls.
12. Motor control center/Power distribution panel.
13. Main breaker.
14. Insulation specifications.
15. A resident Construction Advisor/Superintendent. (Monthly rate)
16. Engineering personnel for mechanical and electrical inspections, precipitator start-up, and training of plant personnel.
17. Six (6) copies of operations and maintenance manuals.

E. SCOPE -- BUYER

Under this proposal, it shall be the responsibility of the Buyer to provide and/or complete the following:

1. Required foundations and anchor bolts.
2. All ductwork to and from precipitator, except inlet and outlet nozzles.
3. Inlet test ports with access thereto.
4. Stack with test ports and access thereto.
5. Dust removal system from the screw conveyor dust valve exit.
6. Performance tests.
7. Ventilated control room for rectifier controls.
8. Annunciator panel as required.
9. All interconnecting low voltage wiring.
10. Permanent area lighting.
11. Grounding of all precipitator equipment to mill grounding system.
12. Precipitator and nozzle insulation, insulation supports and lagging.

13. Erection of all materials furnished by Seller.

F. GENERAL ARRANGEMENT

1. Kiln/Mill Precipitator - Proposal Drawing 15290-21110-D-1

ENELCO ESP Model SC 23-16-4x9x36T will be single chamber with 23 gas passages on 16 inch centers. The precipitator will have four mechanical and electrical fields in direction of gas flow. Each mechanical field will contain 24 collecting surfaces, 36 feet high by 9.125 feet long. This provides a total field length of 36.5 feet. Each of the four fields is independently powered.

2. Clinker Cooler - Proposal Drawing 15290-21110-D-2

ENELCO ESP Model SC-19-16-4x9x36T will be single chamber with 19 gas passages on 16 inch centers. The precipitator will have four mechanical and electrical fields in direction of gas flow. Each mechanical field will contain 20 collecting surfaces, 36 feet high by 9.125 feet long. This provides a total field length of 36.5 feet. Each of the four fields is independently powered.

G. DESIGN FEATURES

1. The ENELCO electrostatic precipitator utilizes the RIGITRODE discharge electrode. This is a virtually indestructible rigid mast electrode system.
2. Patented MODULOK collecting surfaces are included providing a factory assembled, rigid, baffled, one piece collecting electrode. Field assembly of collecting electrodes is not required.
3. DIGICON OPTIPULSE microprocessor automatic power controllers provide the latest state-of-the-art precipitator control. These user-friendly controllers are among the most intelligent and responsive voltage controllers available today, and include programmable intermittent energization. In-house construction and testing before shipment insures trouble-free field installations.
4. Top mounted electronic impulse rappers, complete with microprocessor controllers, provides an adjustable, essentially maintenance free, rapper system mounted outside of the gas stream.
5. Rigid frame casing construction with no internal struts or bracing to support dust build-ups or disrupt uniform gas flow. Minimal number of support points to grade for ease of site maintenance.
6. Nozzle and hopper designs incorporate minimum 55° sloped sides and no ledges to impede the flow of collected materials.

H. SCHEDULE

1. Delivery of materials may begin seven to eight months from issuance of purchase order.
2. Erection period will normally extend over a three to four month period dependent on scope of work, weather and labor conditions.
3. For the purposes of this project, delivery of materials will begin on or about April 1996 based on an award of contract or notice to proceed by September 1995.

SECTION 2
DESCRIPTION OF EQUIPMENT

SECTION 2

2. DESCRIPTION OF EQUIPMENT

A. CASING

The precipitator casing is fabricated from 3/16 inch ASTM A-36 steel plate with external columns and stiffeners. The design utilizes rigid frame construction with no internal struts or bracing thus avoiding ledges for dust buildup and disturbance to uniform gas flow. The roof and all internal loads are supported by fabricated plate girders. The design utilizes a "floating bottom" system where the precipitator is anchored at only one point on the support steel. Lubrite sliding plates are provided for the other support points to allow for thermal expansion in all directions.

Seller's shell design allows 4'-5" head room above the top of the dust plates for interior access to perform maintenance or inspection.

Interlocked single wall doors are provided for penthouse roof access. Access to the area above the collecting plates is gained through non-interlocked double wall doors in the precipitator hot roof.

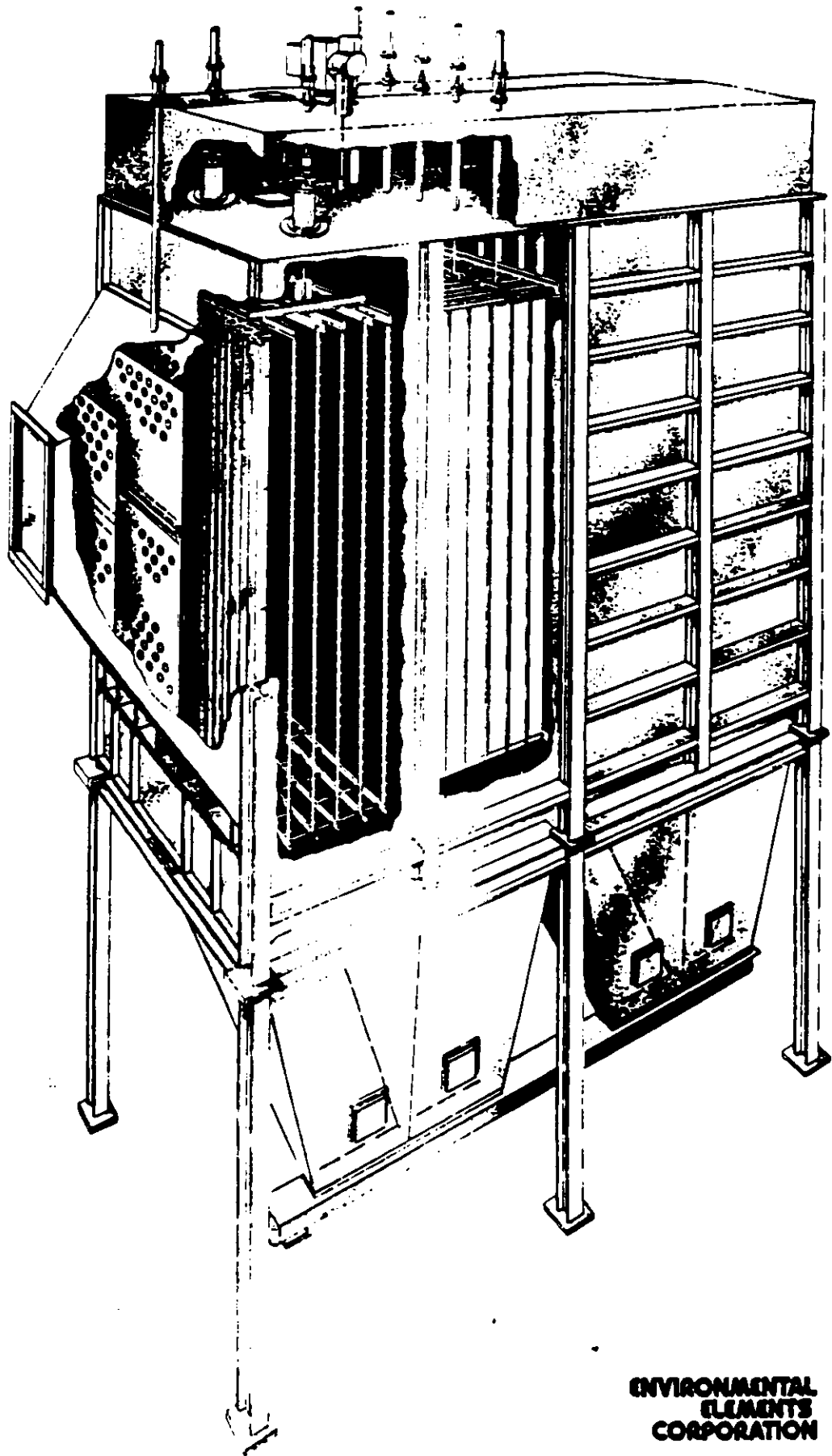
B. NOZZLES

Inlet and outlet nozzles are fabricated from 3/16 inch ASTM A-36 steel with external structural stiffeners of uniform depth to provide full support for insulation and siding. The bottom of the nozzles are sloped 55° with no horizontal ledges to impede free flow of dust fallout inherent with reduction in gas velocity.

The inlet nozzle is complete with three perforated plates to distribute the gas across the face of the treatment zone. The lower 4 inches of the perforated plates are open to allow any dust that falls out in the nozzle to be carried into the inlet field hopper. A double wall, quick-opening, interlocked door is provided in each nozzle for internal inspection and maintenance. Bolted panels are incorporated into the perforated plates for through access.

C. HOPPERS

Trough type hoppers are provided fabricated from 3/16 inch ASTM A-36 steel with external stiffeners of uniform depth to provide support for thermal insulation and siding. The hoppers are designed to support a full dust load. The sides and ends are sloped 60° and 75°, respectively, from the horizontal. The valley angle resulting from this design is 57-1/2°. The between field baffles are extended to the hopper outlet to eliminate gas bypassing in the hoppers. A double wall interlocked door is provided as shown to permit access into each baffled section of each hopper. Each hopper is provided with high level alarms, strike plates for manual hopper rapping, and dust removal system. Hoppers should not be used for storage.



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CORPORATION**

D. HOPPER LEVEL DETECTORS

A Indicator or equal high level switch is provided for each section of each hopper. This system operates by radio frequency oscillation, which is dampened by a high ash level, producing a proportionate A/C signal. The detector operates a DPDT relay for alarm actuation. The probe is mounted in the side wall of the hopper with the electronics mounted in the hopper area away from high temperatures.

E. DUST REMOVAL SYSTEM

The dust removal system consists of hopper screw conveyor sized to operate at 28 rpm maximum to reduce wear. The hopper conveyor is designed to operate at 30% loading at rated conditions and powered for flooded operation in the event of hopper dust buildup. The conveyor is equipped with a motion detector to initiate a conveyor failure alarm.

To insure positive dust removal a Sprout Bauer, or equal, motor operated rotary dust valve with Type 2 rotor with ni-hard adjustable tips is furnished at the outlet of the hopper conveyor. The dust valve is equipped with a motion detector to initiate a valve failure alarm.

F. PRECIPITATOR SUPPORTING STEEL

Structural steel is provided to support the precipitator as shown on the proposal drawings. All columns, beams, wind bracing and other structural members supplied by Seller for support of the precipitator will be rolled or fabricated from ASTM A-36 steel. Connections will be bolted and the overall structural design will be in accordance with the latest applicable AISC Standard except as noted under Design Conditions. The support steel and bracing is arranged to provide maximum access for maintenance and cleanup.

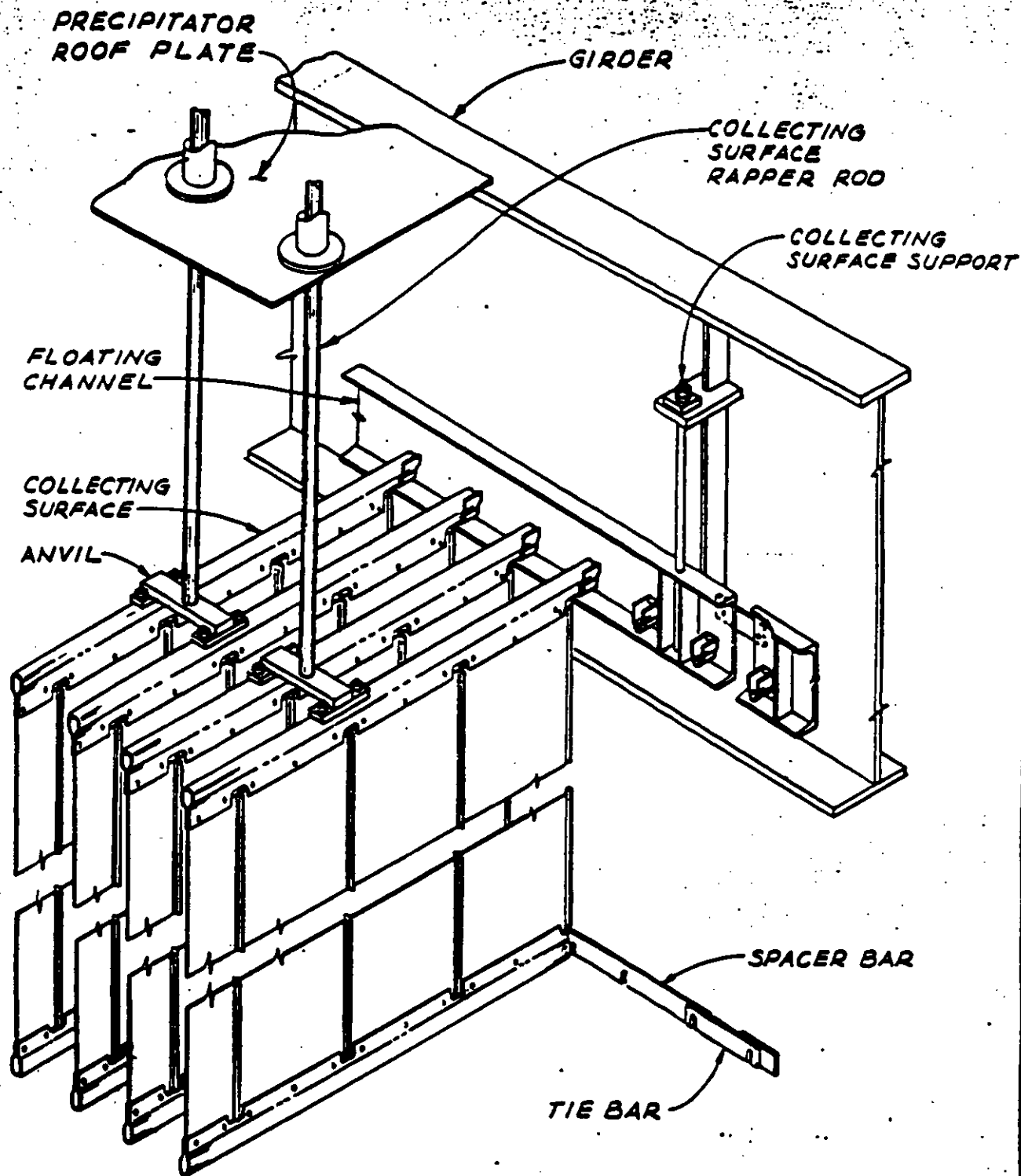
G. ACCESS FACILITIES

Access facilities are provided to the scope as shown on the proposal drawings. Structural steel is ASTM A-36 designed for 100 psf loading. Stairtreads and grating are galvanized. The handrail will be dual rail using 1-1/4 standard pipe rail and post. Platforms will be provided with 4 inch x 1/4 inch toe plates. Walkways are 36 inch minimum width. Stairways are 30" width.

H. COLLECTING ELECTRODE SYSTEM – Drawing No. 1120

Seller's C1010 steel MODULOK collecting surfaces (U.S. Patent # 3,418,792) are roll formed into 18 inch modules having tightly interlocked edges which when factory assembled form a rigid one piece baffled structure, which provides maximum stiffness, optimum gas exposure and minimum field assembly.

The top and bottom edges of each collecting surface are reinforced and stiffened by 7 gauge and 11 gauge respectively tubular structural members which are factory welded to the roll formed collecting surfaces. These members prevent edge effect arc-over where the discharge electrodes enter and leave the collecting-field. This horizontal welding at the top and bottom is the only heat applied to the plate during manufacture. This procedure



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 CORPORATION**

**COLLECTING SURFACE
 RAPPER ARRANGEMENT**

ELK 2-21-76

DWG. No 1120

prevents the deformation and "oil-canning" which can easily result when individual modules are welded together. The collecting surfaces are rapped by electric impact type rappers located on the penthouse roof. Full provision is made in the collecting system suspension for uniform thermal movement up to the maximum design temperature without disturbance to internal alignment.

These collecting surfaces are shipped and lifted into the precipitator shell in nested, upright packages thereby affording maximum protection against handling damage for optimum straightness and uniformity in operation.

I. DISCHARGE ELECTRODE SYSTEM - Drawing No. 1121

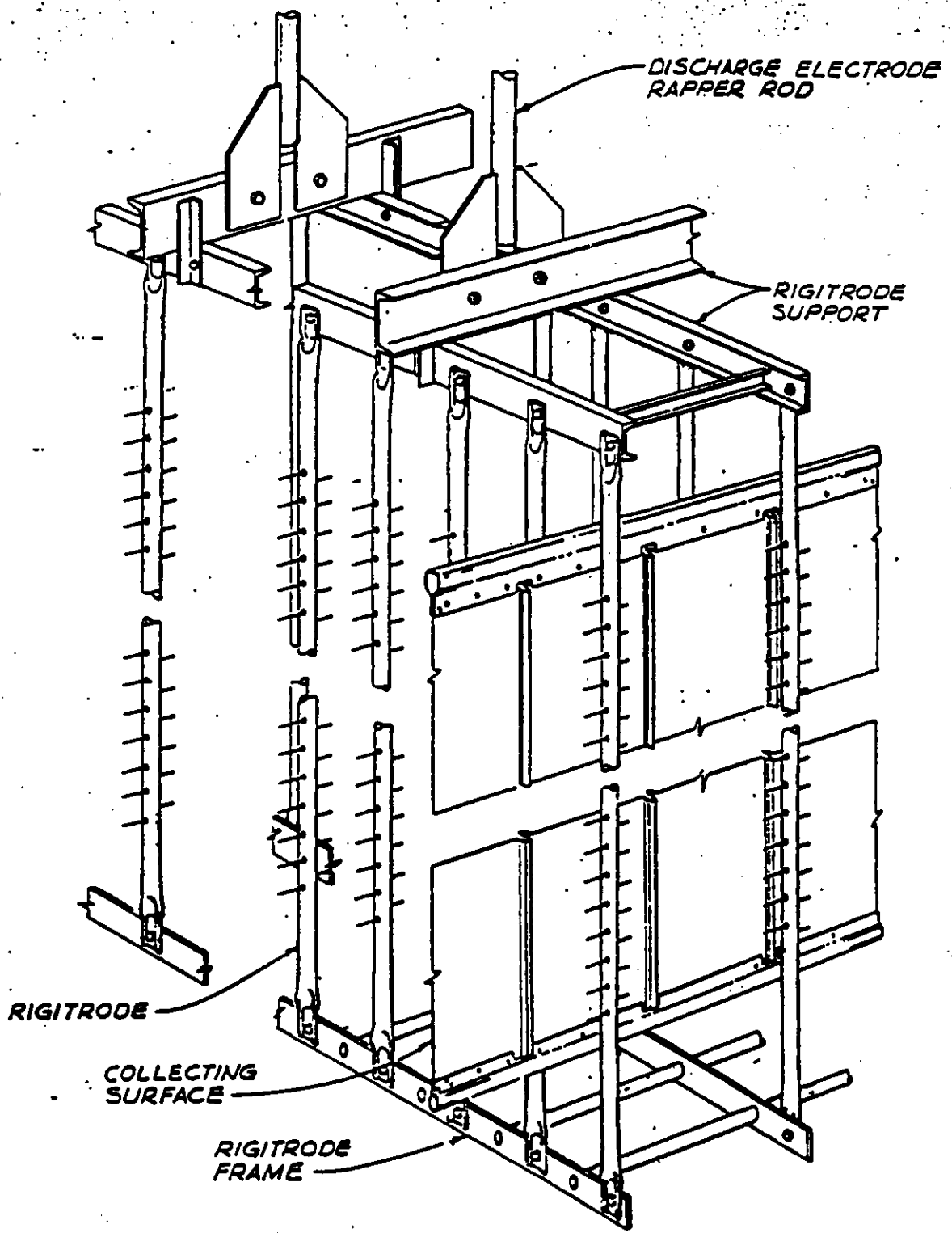
Seller's RIGITRODE electrode is a true unbreakable rigid discharge electrode. The RIGITRODE electrode is a 1-1/2 inch diameter 16 gauge mild steel tube with corona-generating studs welded to it. The studs are 12 gauge and are fully annealed to eliminate fatigue cracking. The RIGITRODE electrode exhibits a low corona onset voltage typical of a pointed discharge electrode. This feature makes it appropriate in inlet fields where dust loadings are high. As voltage is increased, the V-I relationship approaches that of a smooth electrode. This feature allows the same RIGITRODE electrode to be used effectively in outlet fields. Laboratory tests and commercial operation has shown this design to have a unique combination of several characteristics: high sparkover voltage, high field strength and an even current distribution from discrete emission points.

The restoring forces of this system are substantial; therefore, an overfull hopper will not cause permanent misalignment. The system will return to correct alignment when the hopper is emptied, thus avoiding unscheduled outages. Further, the computerized power control (discussed in detail later in this proposal) will protect the power supply and prevent the formation of fused ash in a full hopper.

J. HIGH VOLTAGE SUPPORT - PENTHOUSE DESIGN - Drawing No. 1217

Each bus section is supported by two (2) suspension insulators located on the precipitator roof. An epoxy filled glass filament rod connects an externally located rapper to the high voltage support rod to transmit energy while at the same time providing the necessary electrical insulation.

The insulators are housed in a gas-tight 6 foot high penthouse covering the entire roof area. The sides are fabricated from 10 gauge steel. The roof is fabricated from 1/4 inch checker plate to provide a firm walk surface. All rappers, transformer-rectifiers and rapper panels are located on the penthouse roof allowing inspection and maintenance with the precipitator in operation. The penthouse construction reduces the radiator effect of the many projections through the precipitator and eliminates the roof corrosion inherent with the use of individual insulator compartments. The insulators are totally accessible for cleaning and inspection. The penthouse roof is sloped 1/4 inch in 12 inches for drainage. The penthouse is pressurized by a forced air system, sized to supply 100 cfm per insulator, to prevent the entrance of dust into the penthouse and to keep the inside surface of the support insulators clean.

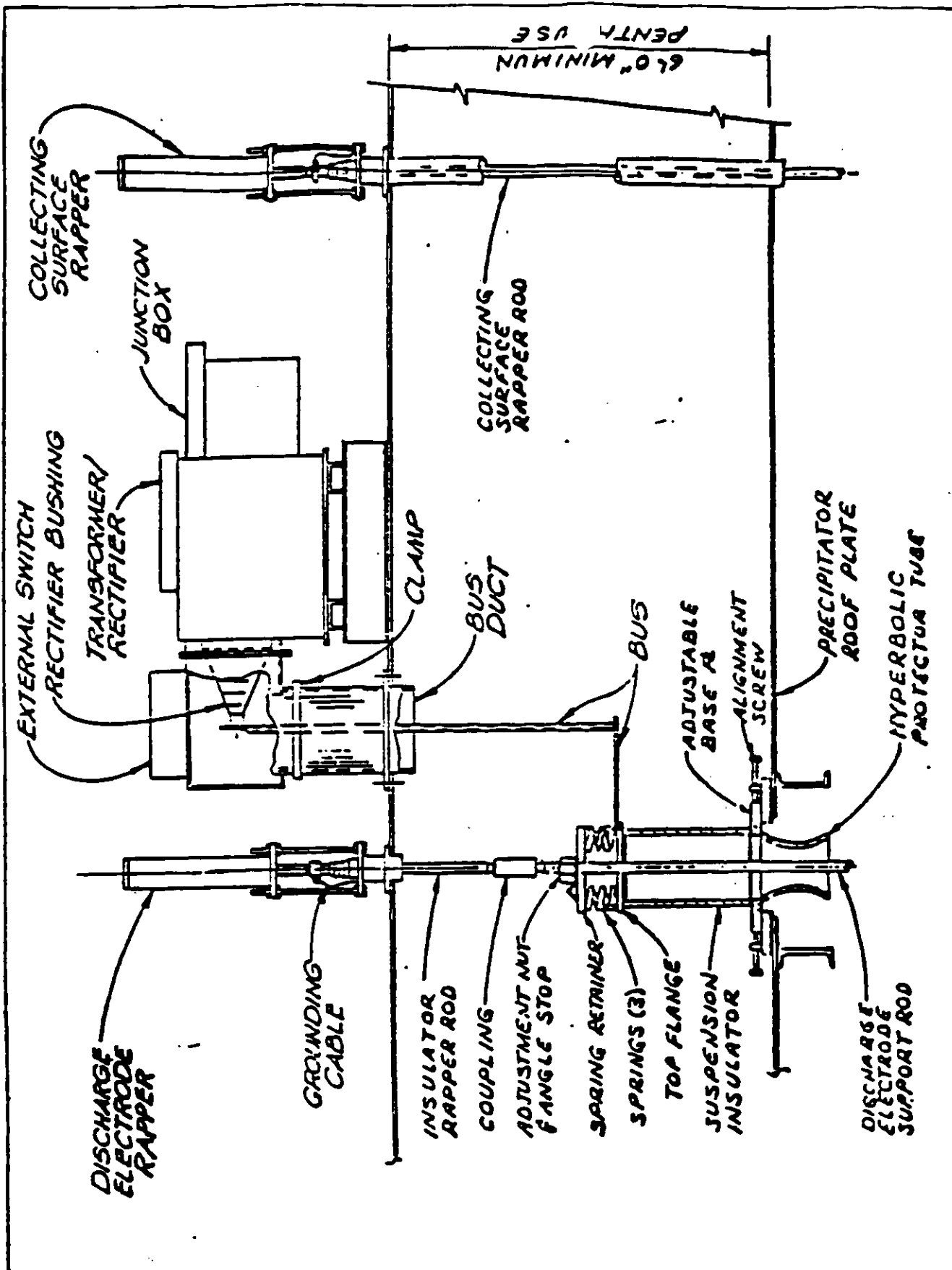


**ENVIRONMENTAL
ELEMENTS
CORPORATION**

**RIGITRODE
DISCHARGE ELECTRODE
ARRANGEMENT**

DWG. No. 1121

REV.
ELK 10-28-60



ENVIRONMENTAL ELEMENTS CORPORATION	HIGH VOLTAGE SYSTEM PENTHOUSE ARRGT
	DWG. NO. 1217

M.J.W 2-24

K. INSULATOR HEATERS

A 0.4 KW contact heater is provided around each support insulator. Insulator heaters are not essential to operation of the precipitator since the precipitator is normally heated prior to energization. The insulator heaters are included, however, as insurance in the event that the precipitator is energized cold.

L. ELECTRIC IMPULSE RAPPER MODEL ESI-I -- Drawing No. 1076

The electric impulse rapper has been specifically designed for rapping the collecting surfaces, discharge electrodes and perforated distribution plates of electrostatic precipitators. The ESI-I is a single impulse gravity impact type rapper consisting of an integral DC coil and steel housing assembly, a 20 pound piston and mounting hardware. Its features include:

Accurate Control. Rapper impact is precisely repeatable. Intensity of impact and frequency of operation are controlled by a microprocessor based controller. With the optional Data Management System, the operating characteristics can be controlled from a remote control room through the CRT.

One Piece Construction. The coil is permanently bonded to the inside of the housing and is totally encapsulated in epoxy to seal out the environment. Long life is assured with this uncomplicated construction.

Lubrication. None is required.

Maintenance Free. The ESI-I requires absolutely no periodic adjustment or maintenance over its entire service life.

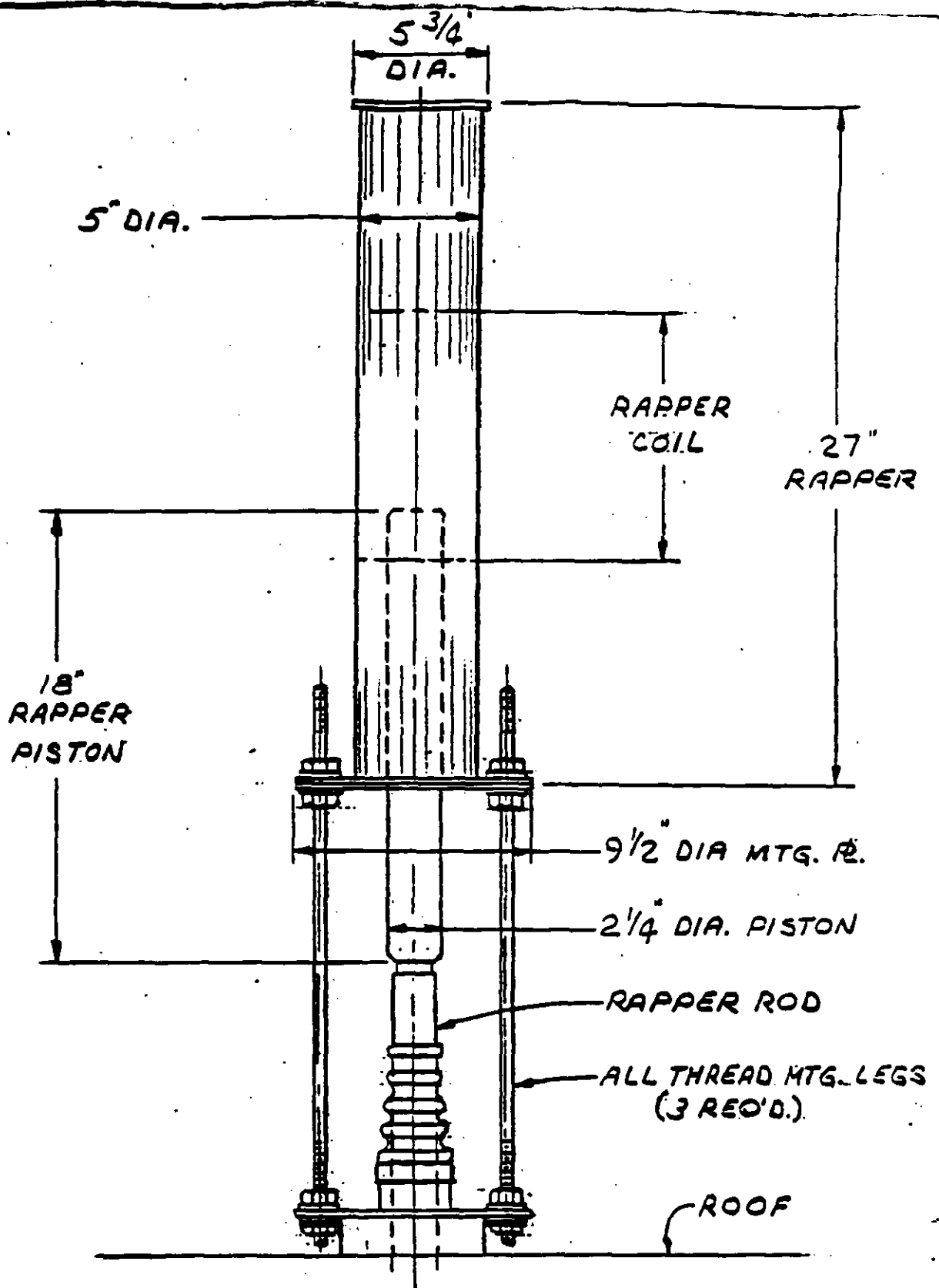
Roof Mounting. The rapper is mounted on the roof by means of three (3) support rods. The piston moves freely in and out of the rapper body when striking the rapper rod. The impact does not impart a shock to the housing which eliminates any chance of material fatigue. The rapper is weatherproof for outdoor operation.

Power Supply. The rapper operates from a 240 volt supply and draws an instantaneous current of 22 amperes maximum. The three (3) wire conductor cable supplied with the rapper is used to make the electrical connections. An additional grounding strap is provided for connecting the housing to the precipitator roof.

Energy Output. Microprocessor controlled output levels are provided.

M. RAPPER CONTROLS

The microprocessor based rapper controls are housed in a NEMA 4 weathertight enclosure. The rapper control system is designed to operate within ambient temperature limitations of -25°C to 85°C. The rappers for the discharge electrodes and each collecting surface field are individually controlled to permit adjustment of rapper impact intensity and cycle time for each section. Impact is variable up to 10 foot pounds. On time is 1 to 8 half line cycles



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ESI RAPPER

DWG. N^o 1076

REV. 8-81 REV'D. 9-90

and off time is variable from 1 to 999 seconds. Control, rapper status indication and fault detection can be transferred to a remote location by multiplex signals from the optional Data Management System. For further details, see Attachments.

N. TRANSFORMER-RECTIFIER -- Drawing No. 1221, 1222

Each field is energized by a high voltage, coolant filled, silicon diode transformer-rectifier. Power is conducted to the precipitator through 3/4 inch A-36 steel bus bar enclosed in a 16 inch round 10 gauge A-36 steel water-tight housing.

The transformer is single phase, liquid cooled with the silicon diode rectifiers immersed in the same tank. Line voltage is regulated by a full range thyristor controller (SCR) which provides automatic power control. The current linear reactor is located in the junction box.

The transformer-rectifiers are furnished with a magnetic liquid level gauge, dial thermometer, drain, low voltage junction box and liquid filled bushings. The units are designed for a 55°C rise, at rated load, based on operation in an average ambient temperature of 40°C providing the maximum daily ambient shall not exceed 50°C. An alarm contact is provided on the temperature gauge.

The high voltage ground switch is integrated into the key interlock system to insure that the transformer-rectifier bushing is grounded before entry can be gained to the precipitator.

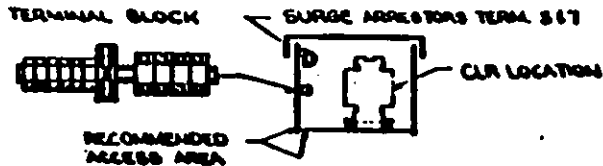
O. AUTOMATIC GROUNDING SYSTEM

The automatic grounding switch is located in the bus duct between the transformer-rectifier and penthouse insulator compartment. The automatic grounding of the high voltage system is solenoid activated when the transformer-rectifiers are deenergized on CO gas detection signal.

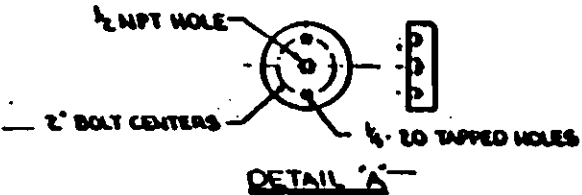
P. RECTIFIER CONTROL CABINETS -- Drawing No. 1224, 1225

Environmental Elements rectifier control cabinets are fabricated as attractive two section (2-PAC) dead front, NEMA 12 enclosures. The cabinets are independent of one another, each containing separate assemblies to apply voltage to the primary of an associated transformer-rectifier at levels determined by a dedicated automatic power controller. Access to all equipment is through the front door allowing easy access for maintenance. Components include the circuit breaker, contactor, control transformer, monitoring circuits, relays, firing circuit and Silicon Controlled Rectifiers (SCR's). The SCR assembly utilizes two (2) SCR's fitted to electrically isolated heat sinks of an appropriate size. The electronic components of the firing circuit are mounted on a printed circuit board attached to the heat sink. The firing circuitry determines the conduction angle (0° to 180°) of the SCR's as a function of the signal from the automatic power control or manual control.

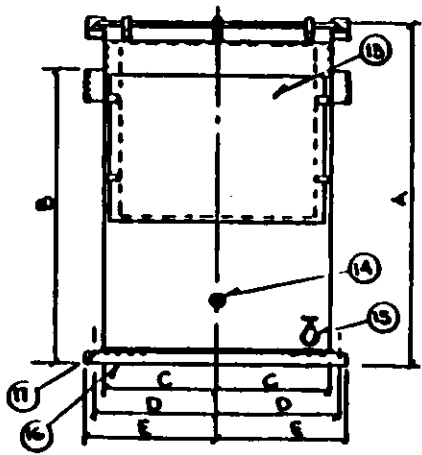
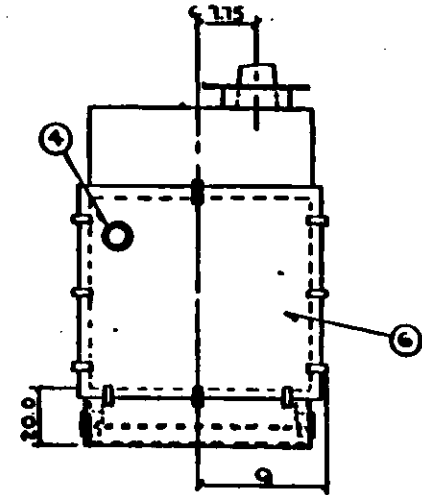
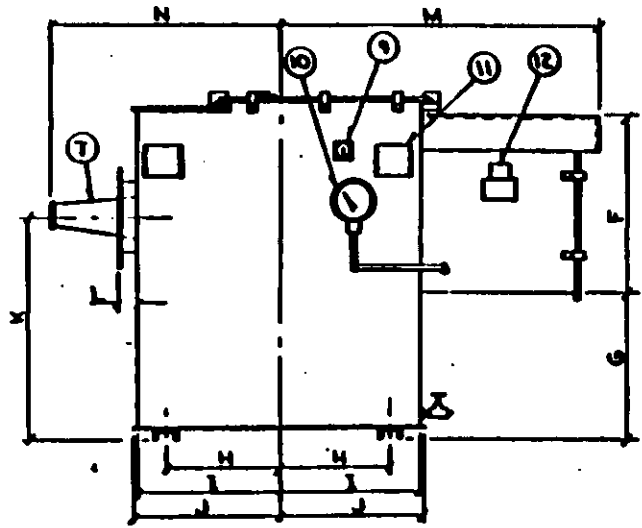
A separately enclosed high impedance linear reactor (CLR) with an iron core and air chimneys in the windings is connected in series with the SCR's to limit primary current surges during sparking.



JUNCTION BOX LAYOUT



DETAIL A



REVISIONS			
DATE	BY	DESCRIPTION	APP'D

- (4) 0.5" FULL CPUG (PLUG WITH PRESSURE RELIEF VALVE INSTALLED)
- (6) HANDHOLE FOR INTERNAL ACCESS WITH REMOVABLE COVER
- (7) HIGH VOLTAGE SEMI OUTDOOR SUBMOUNT SEE DETAIL A FOR CORONA RING.
- (9) MAGNETIC LIQUID LEVEL INDICATOR
- (10) TEMP. IND. MOUNTED IN WELL TO FACILITATE REMOVAL WITH OVERTEMP CONTACTS
- (11) LIFTING CHANNEL 4"x4"x2" A PROVIDED
- (12) NAMEPLATE LOCATION
- (13) LOW VOLTAGE JUNCTION BOX WITH REMOVABLE COVER
- (14) 0.5" 13 GND BOLTS WITH TND PROTECTIVE PLUG.
- (15) 0.5" GATE VALVE (PLUG FOR SAMPLING
- (16) 0.25" FLAT RATE BOTTOM WITH (2) 3" x 3" STEEL CHANNELS
- (17) 0.687" DIA MTG HOLES 4-REED

DIM	100-500MA	750 MA
A	21.88	21.88
B	26.75	26.75
C	12.75	12.75
D	14.25	14.25
E	12.75	12.75
F	10.00	10.00
G	0.5	0.5
H	17.0	17.0
I	14.5	14.5
J	14.25	14.25
K	12.75	12.75
L	21.5	21.5
M	24.5	24.5
N	20.0	20.0
P	23.0	23.0
Q	18.25	18.25
R	14.75	14.75

SPECIFICATIONS		
KV.D.C.	M.A.D.C.	APPROX. WEIGHT
55	100	1700
55	250	1800
55	500	1900
55	750	2200

SHIPPING NUMBER	PROD OR MARK NO.	DRAWING NUMBER	REV. NO.	REV. DATE	REV. BY	CODE ORG.	DESCRIPTION	MATERIAL REMARKS	PAGE	LINE
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PARTS LIST

UNLESS OTHERWISE SPECIFIED, DIMENSIONS ARE IN INCHES.
 TOLERANCES: DIMENSIONS: 3 PLACE DECIMALS & 1 PLACE DECIMALS & ANGLES: 1 PLACE DECIMALS & 1 PLACE DECIMALS &
 MATERIAL SPECIFICATIONS, UNLESS OTHERWISE INDICATED:
 SHAPES: ASTM A30
 ROD BAR: MERCHANT QUALITY ASS-MINED 888-8-830
 PLATE: ASTM A30
 SHEET OR STAMP:

M.B. NO.	CONTRACT NO.
DESIGNED	BY
CHECKED	BY
APPROVED	BY
APPROVED	BY
APPROVAL	
APPROVAL	

ENVIRONMENTAL ELEMENTS CORPORATION
 P.O. Box 1210
 Baltimore, Md 21203 USA

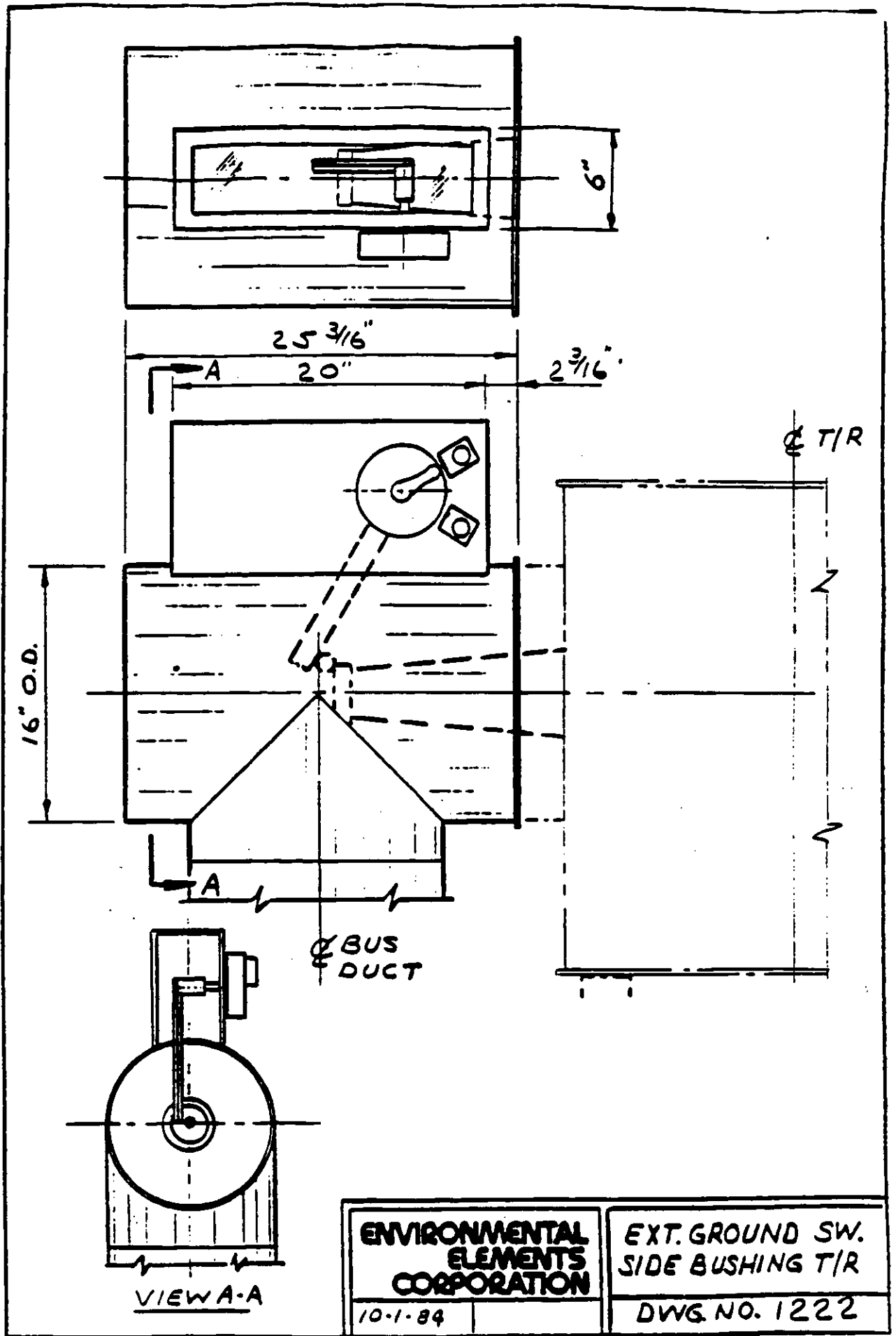
TRANSFORMER RECTIFIER GENERAL ARRANGEMENT

DATE	FORM NO.	DRAWING NO.	REV
C		1221	
SCALE			SHEET

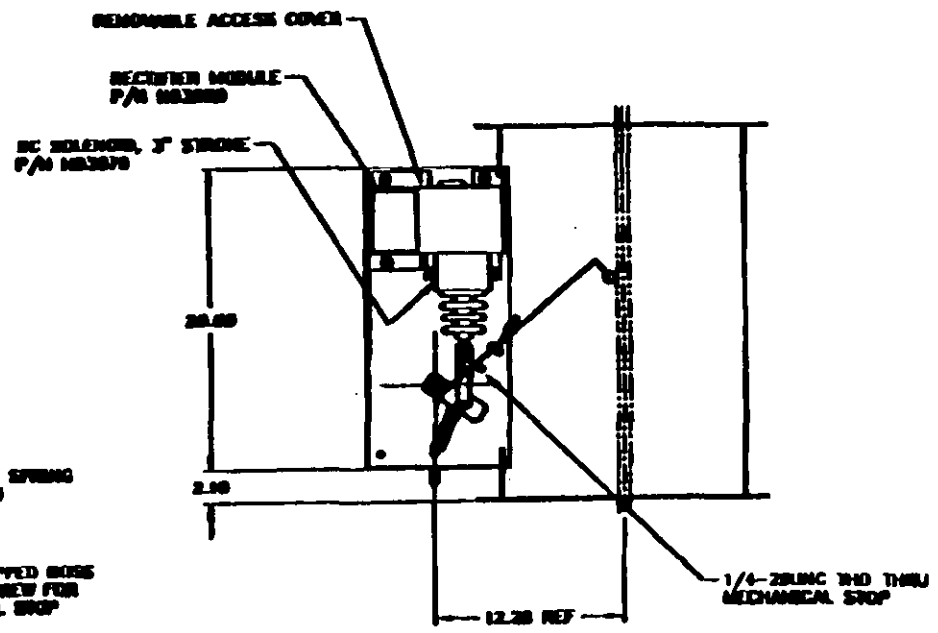
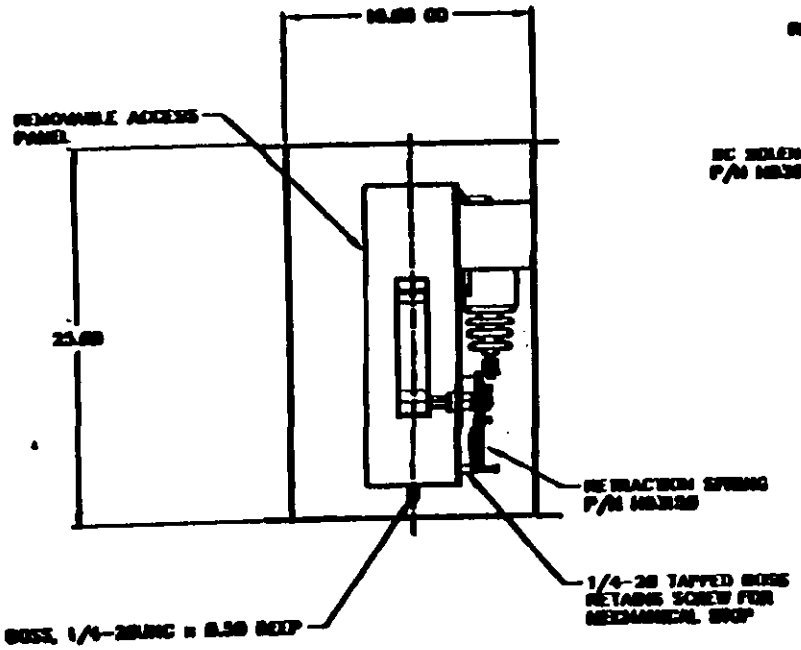
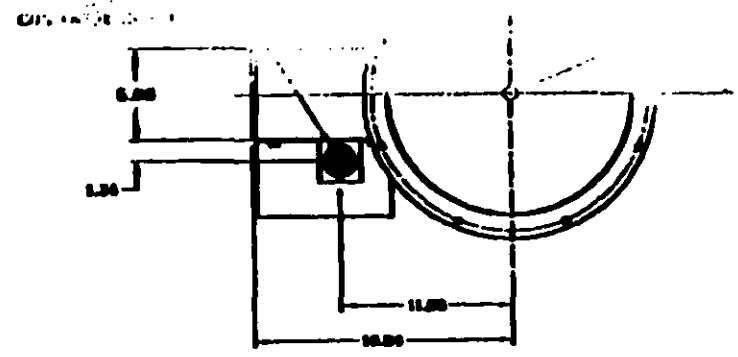
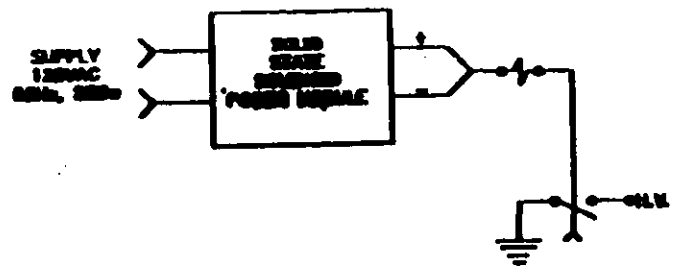
9-24-84

NEXT ASSY	USED ON
APPLICATION	

CLEARPRINT 1020X



APR 24 '95 11:06AM BORDENTOWN NJ



NOTES:
 1. THIS DUCT IS TO BE SELF SUPPORTING.

REV	BY	DESCRIPTION

TRANSFORMERS <small>MADE IN THE U.S.A.</small>		
PHYSICAL OUTLINE NWL # 37136		
1-6	7H	02/15/93
RK	7H	C29652
<small>FOR APPROVED DIMENSIONS, REFER TO DRAWING AND SPECIFICATIONS. ALL DIMENSIONS ARE IN UNLESS OTHERWISE SPECIFIED.</small>		

The control cabinets also contains a number of features that protect the precipitator and other components. Associated fuses and surge arresters protect the SCR's and metering circuits against external circuit failure and transient current sparks. An electronic overcurrent relay provides additional protection.

To eliminate the manual monitoring of the units, each cabinet contains a DIGICON OPTIPULSE automatic power controller to maintain optimum power input to the precipitator.

Each controller has a two line 32 character alphanumeric Liquid Crystal Display (LCD) located on the front panel which presents a user-friendly interface to the plant operator. Controller faults, operating status and other information are presented in plain English.

Six standard alarms are annunciated through the controller:

- Overcurrent
- Undervoltage
- Overspark
- SCR Phase Imbalance
- High Ambient Temperature
- T-R High Temperature

In the event that power is interrupted due to one of the above mentioned faults, the fault is indicated on the LCD display. An additional three (3) alarm points are available for customized alarming (e.g. SCR high temperature, T-R low liquid level, ...etc.). Process related alarms may also be incorporated into the controller to trip the precipitator field due to such conditions as incomplete combustion in the boiler.

The DIGICON OPTIPULSE controller is described in more detail on the following pages.

Each cabinet is provided with the following meters:

- Primary Current
- Primary Voltage
- Secondary Current
- Secondary Voltage
- Spark Rate (Digital)

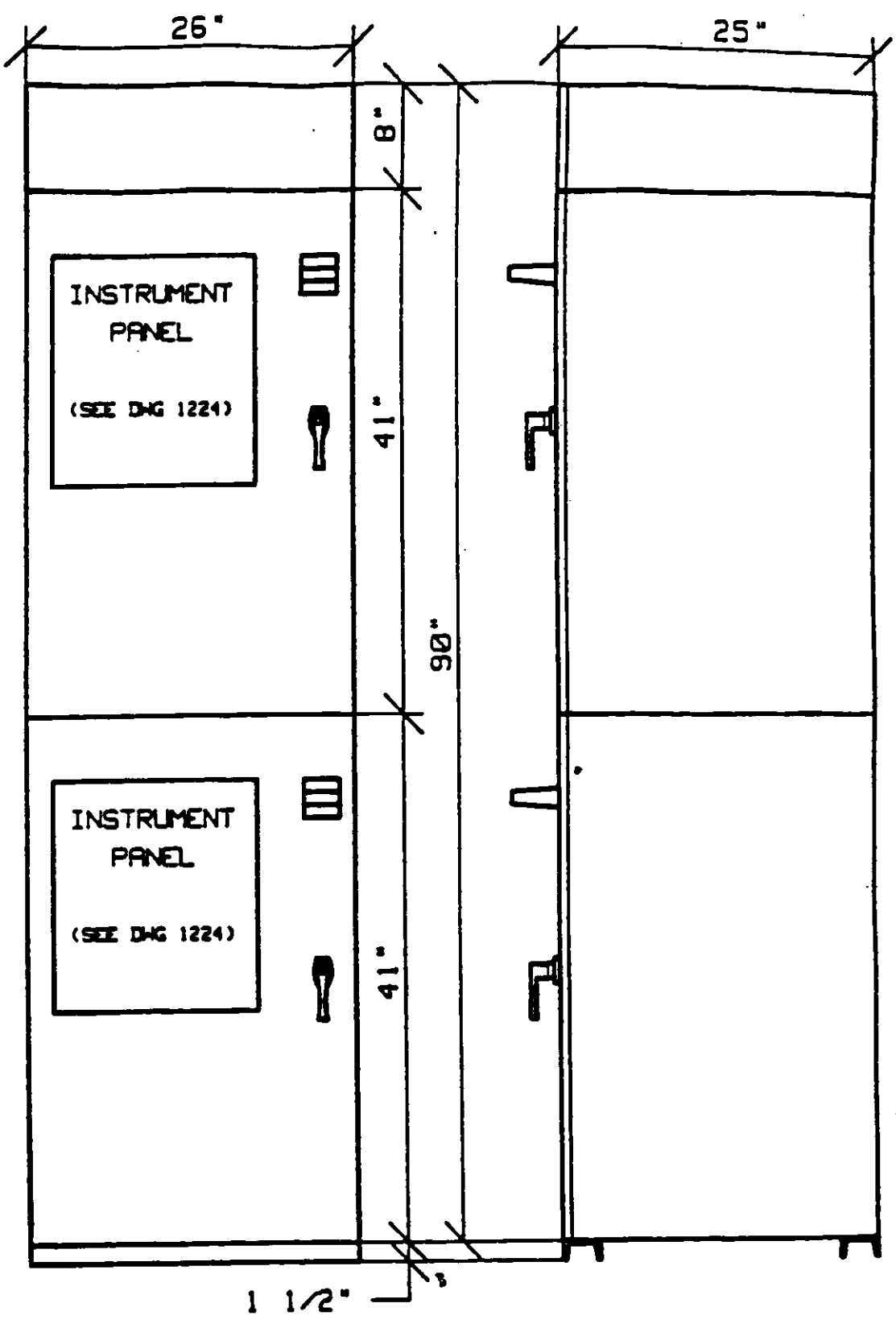
The control cabinets are equipped with face mounted breakers. The circuit breaker interrupting capacity is greater than or equal to 50,000 amperes symmetrical. As a safety feature, each cabinet is integrated into the key interlock system.

Where space is limited, the 2-PAC arrangement offers an attractive alternative to conventional rectifier control cabinets which house the automatic power controller, power components and current limiting reactor all in one enclosure.

Q. DIGICON OPTIPULSE AUTOMATIC POWER CONTROLLER

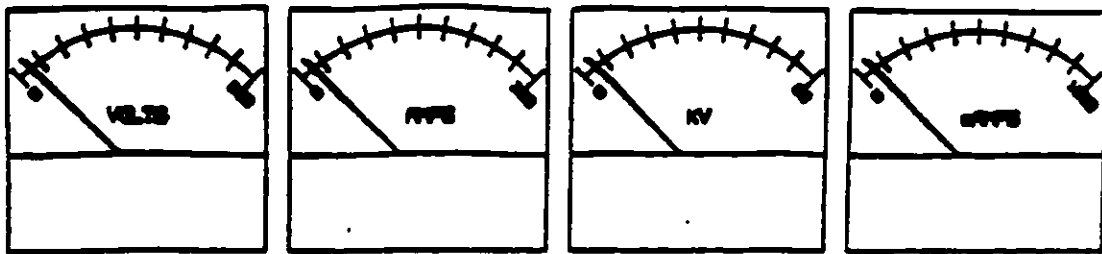
The DIGICON OPTIPULSE Automatic Power Controller is a microprocessor based controller using the latest state-of-the-art components. The controller is equipped with dual

DWG. NO. REV. BY



ENVIRONMENTAL ELEMENTS CORPORATION	M.O. NO.	DUAL CONTROL CONSOLE WITH CIRCUIT BREAKER	
	SIZE A	DRAWING NO. 1225	REV.
DRAWN ATD 2-2-67	SCALE	SHEET	
DATE			

A & B INC - BALT.

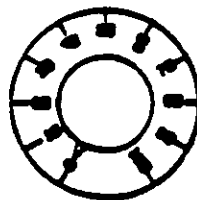
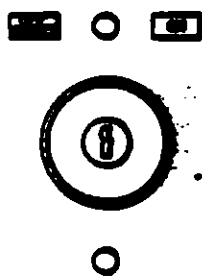
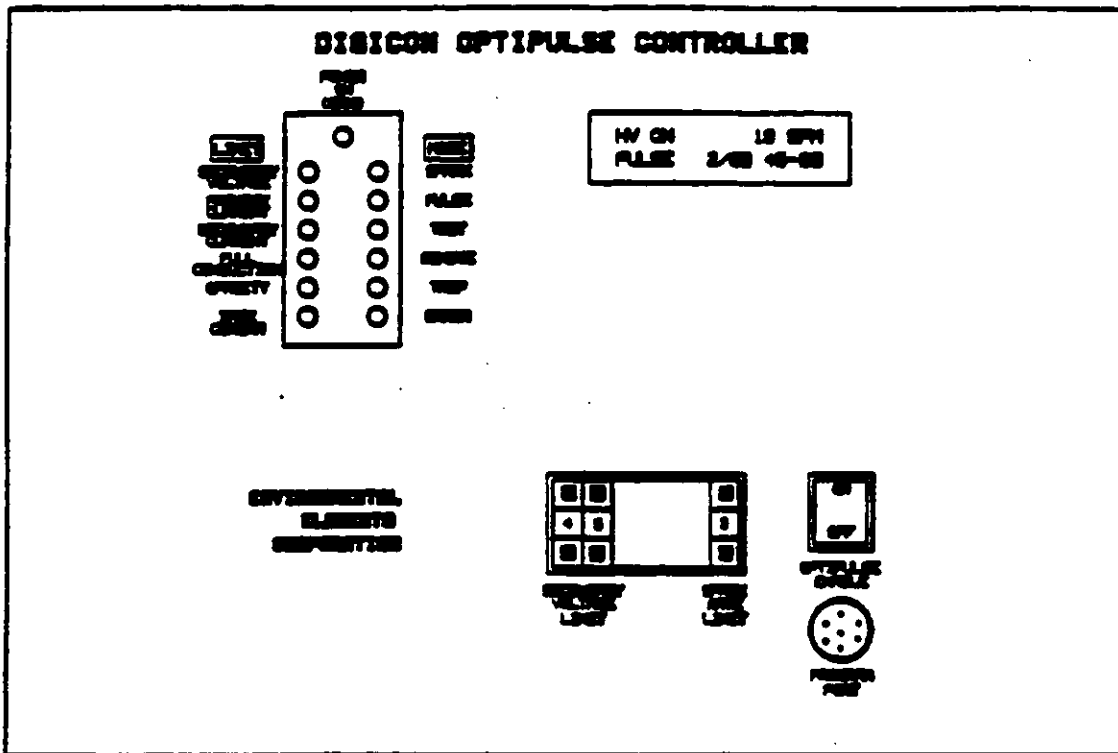


PRIMARY
VOLTAGE

PRIMARY CURRENT
171 AMP LGST

PRECIPITATOR
VOLTAGE

PRECIPITATOR CURRENT
1888 AMP LGST



TEST CONTROL



A153

ENVIRONMENTAL ELEMENTS CORPORATION	M.O. NO. INSTRUMENT PANEL		
	SIZE	FSCM NO.	DRAWING NO. 1224
DRAWN J. HAMLIN	SCALE		REV. <input checked="" type="checkbox"/>
DATE 2-16-87			SHEET