

*CITY OF GRAND ISLAND
UTILITIES DEPARTMENT*

*PLATTE GENERATING STATION
1035 W. WILDWOOD DRIVE
GRAND ISLAND, NE 68801
PHONE: 308-385-5496*

***REQUEST
FOR
PROPOSALS***

PULVERIZER STEAM INERTING SYSTEM

ENGINEERING SERVICES

Specification 113-13

Issue Date
May 2, 2013

**ADVERTISEMENT FOR PROPOSALS
ENGINEERING SERVICES FOR THE
PULVERIZER STEAM INERTING SYSTEM
FOR
CITY OF GRAND ISLAND, NEBRASKA**

Proposals will be received at the office of the City Clerk, 100 E. First Street, P.O. Box 1968, Grand Island, Nebraska 68802, until Thursday, May 16, 2013 at 4:00 p.m. local time for the Proposal for the Pulverizer Steam Inerting System, FOB the City of Grand Island. Site inspections can be arranged by contacting Darrell Dorsey (308) 385-5492 for an appointment.

Proposals received after the specified time will be returned unopened to sender. Proposals shall include the following on the *outside* of the envelope: **“Proposal for Pulverizer Steam Inerting System Engineering Services”**. All proposals must be signed and dated in order to be accepted. Proposals shall be addressed to the attention of Darrell Dorsey, Plant Superintendent. **Four complete copies with the original** proposal shall be submitted for evaluation purposes.

Proposal package is also available on-line at www.grand-island.com under Business – Bid Calendar.

Proposals will be evaluated by the Purchaser based on Contractor's response to the proposal, experience of the company and project personnel, commercial terms, and pricing to perform the project required.

The Purchaser reserves the right to reject any or all proposals, to waive irregularities therein, and to accept whichever proposal that may be in the best interest of the City, at its sole discretion.

RaNae Edwards, City Clerk

Advertised
Grand Island Independent

INSTRUCTIONS TO BIDDERS

1. GENERAL INFORMATION.

The following instructions outline the procedure for preparing and submitting Bids. Bidders must fulfill all requirements as specified in these Documents.

2. TYPE OF BID.

Bidders shall be required to submit prices for all items listed in the Detailed Specifications.

3. PREPARATION/SUBMISSION OF BIDS.

All Bids must be submitted intact not later than the time prescribed, at the place, and in the manner set forth in the ADVERTISEMENT FOR BIDS. Bids must be made on the Contractor's official letterhead, and must be signed and dated to be accepted. Each Bid must be submitted intact in a sealed envelope, so marked as to indicate its contents without being opened, and delivered in person or addressed and mailed in conformance with the instructions in the ADVERTISEMENT FOR BIDS.

4. BID SECURITY.

Bids must be accompanied by cash, a certified check, or cashier's check drawn on a bank which is insured by the Federal Deposit Insurance Corporation, or a bid bond issued by a Surety authorized to issue such bonds in the state where the Work is located, in the amount of five percent (5%) of the bid amount payable to OWNER. This bid security shall be given as a guarantee that the Bidder will not withdraw his/her Bid for a period of **thirty (30) days after** bid opening, and that if awarded the Contract, the successful Bidder will execute the attached Contract and furnish a properly executed Performance Bond and Payment Bond each in the full amount of the Contract price within the time specified.

The Attorney-in-Fact that executes this bond on behalf of the Surety must attach a notarized copy of his/her power of attorney as evidence of his/her authority to bind the Surety on the date of execution of the bond. Where State Statute requires, certification by a resident agent shall also be provided.

5. RETURN OF BID SECURITY.

Within fifteen (15) days after the award of the Contract, the OWNER will return the bid securities to all Bidders whose Bids are not to be further considered in awarding the contract. All other retained bid securities will be held until the Contract has been finally executed, after which all bid securities, other than Bidders' bonds and guarantees which have been fortified, will be returned to the respective Bidders whose Bids they accompanied.

6. BASIS OF AWARD

The award will be made by the OWNER on the basis of the Bid from the lowest responsive, responsible Bidder which, in the OWNER's sole and absolute judgment will best serve the interest of the OWNER. All Bids will be considered on the following basis:

Conformance with the terms of the Bid Documents	Suitability to project requirements.
Bid Price	Delivery time
Cost of installation	Responsibility and qualification of Bidder.

The OWNER reserves the right to reject all Bids, or any Bid not in conformance with the intent of the Bid Documents, and to waive any informalities and irregularities in said Bids.

7. EXECUTION OF CONTRACT.

The successful Bidder shall, within fifteen (15) days after receiving notice of award, sign and deliver to the OWNER the Contract hereto attached together with the acceptable bonds as required in these Bid Documents. Within fifteen (15) days after receiving the signed Contract with acceptable bond(s) from the successful Bidder, the OWNER's authorized agent will sign the Contract. Signature by both parties constitutes execution of the Contract.

8. PERFORMANCE AND PAYMENT BONDS.

The successful Bidder shall file with the OWNER Performance and Payment Bonds in the full amount (100 percent) of the Contract price, as security for the faithful performance of the Contract and the payment of all persons supplying labor and materials for the Work under this Contract, and to cover all guarantees against defective workmanship or materials, or both, for a period of one (1) year after the date of final acceptance of the Work by the OWNER. The Surety furnishing these bonds shall have a record of service satisfactory to the OWNER, be authorized to do business in the State where the OWNER's project is located and shall be named on the current list of approved Surety Companies, acceptable on Federal bonds as published by the Audit Staff, Bureau of Accounts, U.S. Treasury Department.

The Attorney-in-Fact (Resident Agent) who executes these bonds on behalf of the Surety must attach a notarized copy of his/her power-of-attorney as evidence of his/her authority to bind the Surety on the date of execution of the bond.

9. TIME OF COMPLETION.

The time of completion of the Work to be performed under this Contract is the essence of the Contract.

11. GRATUITIES AND KICKBACKS

City Code states that it is unethical for any person to offer, give, or agree to give any City employee or former City employee, or for any City employee or former City employee to solicit, demand, accept, or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, or preparation of any part of a program requirement or a purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any proceeding or application, request for ruling, determination, claim or controversy, or other particular matter, pertaining to any program requirement or a contract or subcontract, or to any solicitation or proposal therefor. It shall be unethical for any payment, gratuity, or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime contractor or higher tier subcontractor or any person associated therewith, as an inducement for the award of a subcontract or order.

12. FISCAL YEAR

The City of Grand Island, Nebraska operates on a fiscal year beginning October 1st and ending on the following September 30th. It is understood and agreed that any portion of this agreement which will be performed in a future fiscal year is contingent upon the City Council adopting budget statements and appropriations sufficient to fund such performance.

ENGINEERING SERVICES - CONTRACT AGREEMENT

THIS AGREEMENT made and entered into by and between **[SUCCESSFUL BIDDER]**, hereinafter called the Contractor, and the **CITY OF GRAND ISLAND, NEBRASKA**, hereinafter called the City.

WITNESSETH:

THAT, WHEREAS, in accordance with law, the City has caused contract documents to be prepared and an advertisement calling for proposals to be published for *PULVERIZER STEAM INERTING SYSTEM*; and

WHEREAS, the City, in the manner prescribed by law, has evaluated the proposals submitted, and has determined the aforesaid Contractor to be the responsible proposer, and has duly awarded to the said Contractor a contract therefore, for the sum or sums named in the Contractor's proposal, portions thereof being attached to and made a part of this contract.

NOW, THEREFORE, in consideration of the compensation to be paid to the Contractor and of the mutual agreements herein contained, the parties have agreed and hereby agree, the City for itself and its successors, and the Contractor for itself, him/herself, or themselves, and its, his/her, or their successors, as follows:

ARTICLE I. That the following documents shall comprise the Contract, and shall together be referred to as the "Agreement" or the "Contract Documents";

1. This Contract Agreement.
2. Appendix A - City of Grand Island's Request for Proposals.
3. Appendix B – Detailed Work Plan.
4. Appendix C – Project Schedule.
5. Appendix D – Fees for Services

In the event of any conflict between the terms of the Contract Documents, the provisions of the document first listed shall prevail.

ARTICLE II. That the Contractor shall (a) furnish all tools, equipment, superintendence, transportation, and other construction materials, services and facilities; (b) provide and perform all necessary labor; and (c) in a good substantial and workmanlike manner and in accordance with the requirements, stipulations, provisions, and conditions of the contract documents as listed in the attached General Specifications, said documents forming the contract and being as fully a part thereof as if repeated verbatim herein, perform, execute, construct and complete all

work included in and covered by the City's official award of this contract to the said Contractor, such award being based on the acceptance by the City of the Contractor's proposal;

ARTICLE III. That the City shall pay to the Contractor for the performance of the work embraced in this contract and the Contractor will accept as full compensation therefore the sum (subject to adjustment as provided by the contract) of **[DOLLAR AMOUNT] (\$00.00)** for all services and work covered by and included in the contract award and designated in the foregoing Article II; payments thereof to be made in cash or its equivalent in the manner provided in the General Specifications.

The total cost of the Contract includes:

Base Bid:	\$.00
Sales Tax on Materials/Equipment:	\$.00
Sales Tax on Labor:	<u>\$.00</u>
Total	\$.00

The City of Grand Island, Nebraska operates on a fiscal year beginning October 1st and ending on the following September 30th. It is understood and agreed that any portion of this agreement which will be performed in a future fiscal year is contingent upon the City Council adopting budget statements and appropriations sufficient to fund such performance.

ARTICLE IV. The Contractor hereby agrees to act as agent for the City. The invoice for contractor's services will be paid after approval at the next regularly scheduled City Council meeting and occurring after departmental approval of invoice. The City Council typically meets the second and fourth Tuesday of each month. Invoices must be received well in advance of Council date to allow evaluation and processing time.

ARTICLE V. The Contractor agrees to comply with all applicable State fair labor standards in the execution of this contract as required by Section 73-102, R.R.S. 1943. The Contractor further agrees to comply with the provisions of Section 48-657, R.R.S. 1943, pertaining to contributions to the Unemployment Compensation Fund of the State of Nebraska. During the performance of this contract, the Contractor and all subcontractors agree not to discriminate in hiring or any other employment practice on the basis, of race, color, religion, sex, national origin, age or disability. The Contractor agrees to comply with all applicable Local, State and Federal rules and regulations. The Contractor agrees to maintain a drug-free workplace policy and will provide a copy of the policy to the City upon request. Every public contractor and his, her or its subcontractors who are awarded a contract by the City for the physical performance of services within the State of Nebraska shall register with and use a federal immigration verification system to determine the work eligibility status of new employees physically performing services within

the State of Nebraska.

GRATUITIES AND KICKBACKS

City Code states that it is unethical for any person to offer, give, or agree to give any City employee or former City employee, or for any City employee or former City employee to solicit, demand, accept, or agree to accept from another person, a gratuity or an offer of employment in connection with any decision, approval, disapproval, recommendation, or preparation of any part of a program requirement or a purchase request, influencing the content of any specification or procurement standard, rendering of advice, investigation, auditing, or in any other advisory capacity in any proceeding or application, request for ruling, determination, claim or controversy, or other particular matter, pertaining to any program requirement or a contract or subcontract, or to any solicitation or proposal therefor. It shall be unethical for any payment, gratuity, or offer of employment to be made by or on behalf of a subcontractor under a contract to the prime contractor or higher tier subcontractor or any person associated therewith, as an inducement for the award of a subcontract or order.

[SUCCESSFUL PROPOSER]

By _____ Date _____

Title _____

CITY OF GRAND ISLAND, NEBRASKA

By _____ Date _____
Mayor

Attest: _____
City Clerk

DRAFT

The contract is in due form according to law and hereby approved.

_____ Date _____
Attorney for the City

REQUEST FOR PROPOSALS

GENERAL SPECIFICATIONS

The Proposal shall be in accordance with the following and with the all attached DETAILED SPECIFICATIONS.

All prices are to be F.O.B. Grand Island, Nebraska. **All prices shall be firm, and shall include all sales and use taxes as lawfully assessed under laws and regulations of the State of Nebraska.**

Proposals shall include the following on the **outside** of the mailing envelope: "**Proposal for Pulverizer Steam Inerting System Engineering Services**". All sealed Proposals are due no later than **Thursday, May 16, 2013 at 4:00 p.m. local time**. All proposals must be signed and dated to be accepted. Proposals shall be addressed to the attention of Darrell Dorsey, Plant Superintendent. **Four complete copies with the original proposal** shall be submitted for evaluation purposes to the following:

Mailing Address: RaNae Edwards, City Clerk
City Hall
P. O. Box 1968
Grand Island, NE 68802-1968

Street Address: RaNae Edwards, City Clerk
City Hall
100 E. First Street
Grand Island, NE 68801

Any Proposal received after the specified date will not be considered. No verbal Proposal will be considered.

Proposals will be evaluated by the Purchaser based on Contractor's response to the proposal, experience of the company and project personnel, commercial terms, and pricing to perform the project required.

The successful contractor will be required to comply with fair labor standards as required by Nebraska R.R.S.73-102 and comply with Nebraska R.R.S. 48-657 pertaining to contributions to the Unemployment Compensation Fund of the State of Nebraska. Contractor shall maintain a drug free workplace policy. Every public contractor and his, her or its subcontractors who are awarded a contract by the City for the physical performance of services within the State of Nebraska shall register with and use a federal immigration verification system to determine the work eligibility status of new employees physically performing services within the State of Nebraska.

The invoice for Contractor's services will be paid after approval at the next regularly scheduled City Council meeting and occurring after departmental approval of invoice; the City Council typically meets the second and

fourth Tuesday of each month. Invoices must be received well in advance of Council date to allow evaluation and processing time.

The City reserves the right to reject any or all proposals and to select the proposal, which is deemed to be in the City's best interest, at its sole discretion.

All Proposals shall be valid for at least thirty (30) working days after the Proposal deadline for evaluation purposes.

All Proposals must be signed and dated to be accepted. Please contact Darrell Dorsey at 308-385-5492, for questions concerning this specification.

Request for Proposals
Pulverizer Steam Inerting System

DETAILED SPECIFICATIONS

SCOPE: The Grand Island Utilities Department is soliciting proposals for Pulverizer Steam Inerting System engineering services for the Platte Generating Station.

DESCRIPTION: The Platte Generating Station is located at 1035 West Wildwood Drive, approximately two (2) miles south of Grand Island, Nebraska.

The Unit 1 steam generator is a tangential fired, natural circulation, superheat/reheat, pulverized coal-fired boiler manufactured by ABB-CE (CE Contract No. 13477). The steam generator produces 765,000 lb/hr (MCR) of steam at 1000 F and 1800 psi which is delivered to a 100,000 kw steam turbine. Steam generator auxiliary equipment includes a vertical rotor, Ljungstrom regenerative air heater (type 27-VI-90), a United Conveyor water impounded "W" type bottom ash storage hopper, and four CE-Raymond pulverizers (type 683 RS).

A steam inerting system was installed for controlling pulverizer fires with the original construction of the unit. Included with this proposal are the original system descriptions, principles of operation, Simplified Block Diagram, system drawings and Bailey Controls Company program file drawings as related to the existing system. These are included solely to provide the Engineer with a preliminary understanding of the existing system for bidding purposes.

Inerting system activations were originally based solely upon pulverizer temperatures or operator actions. It has been used exclusively for controlling mill fires and has not historically been used for routine mill startups and shutdowns. A CO monitoring system was also installed as an additional indication of possible pulverizer fires. The current monitoring system utilizes a single analyzer that polls each mill every 3-5 minutes. High CO will activate the inerting system for the mill being sampled.

ISSUES: New low NOx burner systems with Separate Over Fire Air were installed on the unit in the fall of 2012. This required various operational changes to optimize the control of NOx and CO. The optimization effort also called for pulverizer adjustments to increase the coal fineness. In parallel with these efforts, the Utility entered into new coal contracts. Past fuel typically ranged in the 8000-8400 btu/lb range whereas the plant now receives Black Thunder coal at 8800 btu/lb.

There have been two (2) major mill puffs since these modifications were implemented, one on March 21, 2013 and one on April 25, 2013. Both events occurred while removing the mill from service. Both events blew out the atmospheric damper, requiring shut down and repair of the effected mill. Neither event involved mill temperatures nor CO levels sufficient to activate the steam inerting system.

PROJECT REQUIREMENTS: The Engineer shall review strategies and options to mitigate future mill puffs and provide for the safe and effective operation of the pulverizers and associated equipment. The Engineer shall have specialized experience and capabilities in steam inerting systems for power generation facilities with systems as are in use at this facility. The Owner specifically requires a focus on the potential use of steam inerting during mill startups and shutdowns. It is anticipated that the result of this project will be the modification of monitoring and control equipment, operating procedures and related DCS control program modifications.

Along with the focus on the steam inerting system utilization, the Owner also requires an additional focus on the related mill primary air flow control. The current control philosophy used the exhaustor static discharge pressure set point function curve to position the exhaustor inlet damper. At a minimum, the Owner requires the evaluation of controlling the exhaustor inlet damper as a linear function of the associated coal feeder speed to determine if such alternate control would provide better primary air flow control, coal line velocities and acceptable air to coal ratios throughout the operating range of the pulverizer.

The following is a list of general activities the Owner anticipates will be required of the Engineer over the course of the project:

1. Site visits to obtain detailed information on systems, equipment, operational procedures, observation of unit operations and project coordination meetings.
2. Assessment and evaluation of past system performance.
3. Consultations with equipment and system OEMs.
4. Review and application of current Code requirements and recommendations.
5. Identification and evaluation of options available for system improvements.
6. Perform conceptual engineering evaluation, including control methods, system specifications and operational procedures for selected alternatives.
7. Provide conceptual engineering cost estimates, performance data, schedules and project approach for modifications recommended.
8. Provide project reports, drawings, files and correspondence.
9. Prepare control equipment specifications and issue for bids.
10. Evaluate specification bids and assist in contract administration.
11. Perform detailed engineering and prepare installation drawings and lists.
12. Assist in construction management, training and equipment startup.

Note that this scope is not intended to be limited to the steam inerting equipment but rather to be inclusive of all related systems associated with the use of steam inerting and the safe combustion of the full range of coals available from the Powder River Basin. This includes, but is not limited to, feeders, pulverizers, temperature and CO monitoring systems, steam delivery systems, pulverizer fuel and air flow, combustion

impacts from use of the inerting system's including coordinated control with burner management systems and flame scanners, coal quality and conditioning considerations, operational procedures, DCS programming, operator HMI counsel graphics and data acquisition, alarm and SOE reporting considerations.

PROPOSAL FORMAT: The Engineer shall provide a proposal that breaks the project down into a minimum of two (2) phases. The Owner would generally anticipate that Phase I would consist of items 1-7 above and Phase II would consist of items 8-10 above. The Engineer may, however, submit such proposals as deemed appropriate based on their experience implementing projects of this nature.

The Owner requires all proposed Phase I work to be submitted in detail as follows:

Phase I

Introduction – Introductory letters and general company information.

Tab A – Project Approach

Tab B - Experience - related systems and equipment.

Tab C – Experience - personnel proposed for project.

Tab D – Schedule

Tab E – Engineering Fees with 'Not to Exceed' Proposal

Tab F – Exceptions and Engineer's Terms and Conditions

Appendices

Phase II

All proposed Phase II work should be generally described so as to clearly identify the separation in work between the phases. The Engineer may provide such additional information as may reasonably be determined at the time of submitting the Engineering Proposal for the project.

PROPOSAL EVALUATION: The proposals will be evaluated on the following criteria. Also indicated are the weighting factors which will be used in tabulating the evaluation scores.

1. Proposal Responsiveness & Scope (x 1)
2. Company Experience (x 2)
3. Personnel Experience (x 2)
4. Commercial Terms (x 1)
5. Engineering Fees (x 1)

SITE INSPECTION: **The Engineer is encouraged to visit the Platte Generating facilities prior to submittal of the Proposal to become familiar with the project scope.** Site inspections can be arranged by contacting Darrell Dorsey, 308-385-5492, for an appointment.

PROPOSAL QUALIFICATIONS: The Contractor shall be a consulting engineering firm with experience in the design and construction of Steam Inerting systems for municipal utility electric generation facilities as described in these specifications. All work is to be performed by or under the direct supervision of experienced engineers registered in the State of Nebraska, in accordance with all applicable codes and standards.

FEE INFORMATION: The Proposal shall provide a Phase I, T&M, Cost Not to Exceed estimate covering all proposed Phase I work. Also provide all hourly fees by personnel classification, fee multipliers, a schedule of applicable expenses and any other charges applicable to the project.

INSURANCE REQUIREMENTS: The Contractor shall comply with the attached "INSURANCE REQUIREMENTS".

PAYMENT: Payment for the engineering services will be determined by hours worked plus miscellaneous expenses, up to a predetermined "not to exceed" amount on a project phase basis. Time estimates for various portions of projects, man-hours by classification, and miscellaneous expense details may be requested.

MINIMUM INSURANCE REQUIREMENTS
CITY OF GRAND ISLAND, NEBRASKA

The successful bidder shall obtain insurance from companies authorized to do business in Nebraska of such types and in such amounts as may be necessary to protect the Bidder and the interests of the City against hazards or risks of loss as hereinafter specified. This insurance shall cover all aspects of the Bidder's operations and completed operations. Failure to maintain adequate coverage shall not relieve Bidder of any contractual responsibility or obligation. Minimum insurance coverage shall be the amounts stated herein or the amounts required by applicable law, whichever are greater.

1. WORKERS COMPENSATION AND EMPLOYER'S LIABILITY

This insurance shall protect the Bidder against all claims under applicable State workers compensation laws. This insurance shall provide coverage in every state in which work for this project might be conducted. The liability limits shall not be less than the following:

Workers Compensation	Statutory Limits
Employers Liability	\$100,000 each accident
	\$100,000 each employee
	\$500,000 policy limit

2. BUSINESS AUTOMOBILE LIABILITY

This insurance shall be written in comprehensive form and shall protect the Bidder, Bidder's employees, or subcontractors from claims due to the ownership, maintenance, or use of a motor vehicle. The liability limits shall not be less than the following:

Bodily Injury & Property Damage	\$ 500,000 Combined Single Limit
---------------------------------	----------------------------------

3. COMPREHENSIVE GENERAL LIABILITY

The comprehensive general liability coverage shall contain no exclusion relative to explosion, collapse, or underground property. The liability limits shall not be less than the following:

Bodily Injury & Property Damage	\$ 500,000 each occurrence
	\$1,000,000 aggregate

4. UMBRELLA LIABILITY INSURANCE

This insurance shall protect the Bidder against claims in excess of the limits provided under employer's liability, comprehensive automobile liability, and commercial general liability policies. The umbrella policy shall follow the form of the primary insurance, including the application of the primary limits. The liability limits shall not be less than the following:

Bodily Injury & Property Damage	\$1,000,000 each occurrence
	\$1,000,000 general aggregate

5. ADDITIONAL REQUIREMENTS

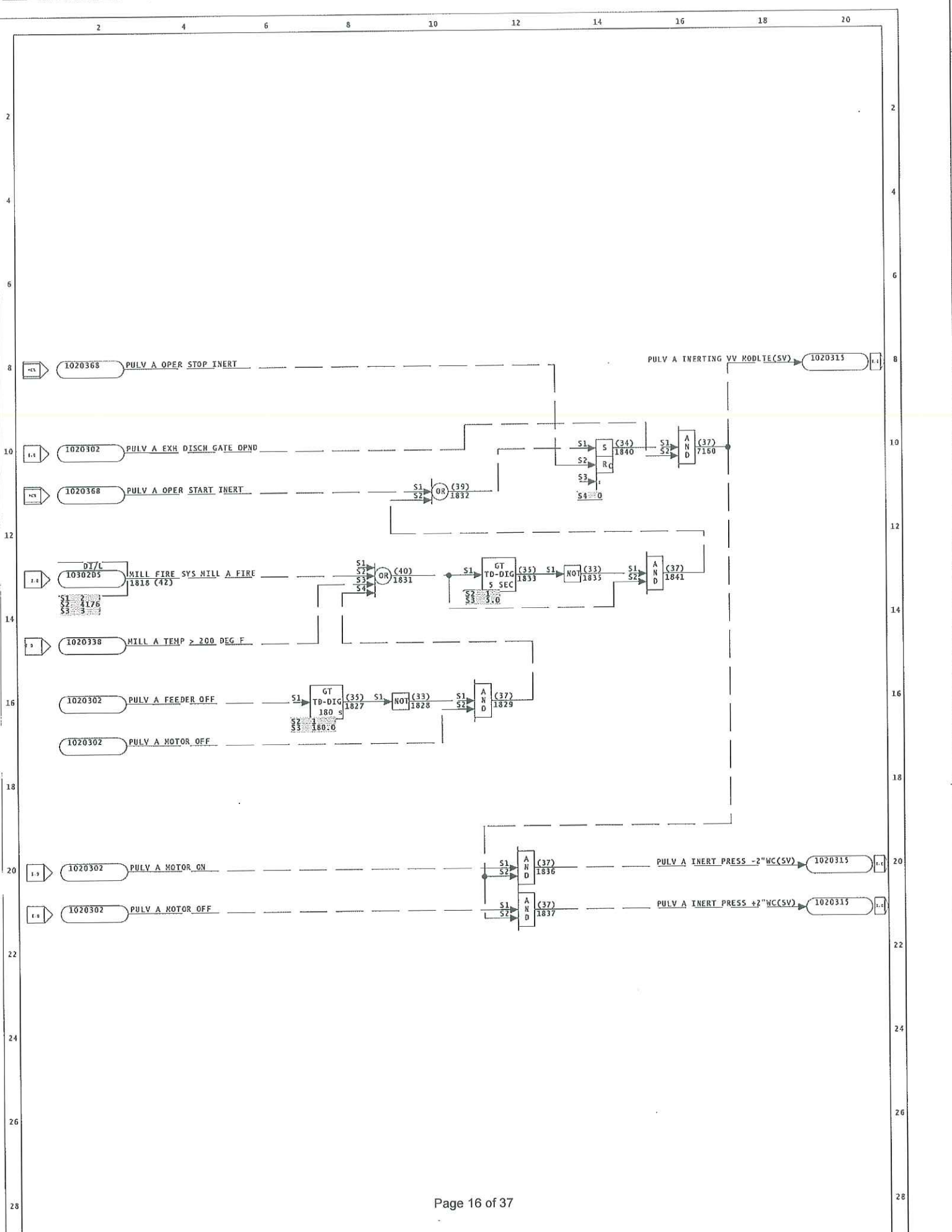
The City may require insurance covering a Bidder or subcontractor more or less than the standard requirements set forth herein depending upon the character and extent of the work to be performed by such Bidder or subcontractor.

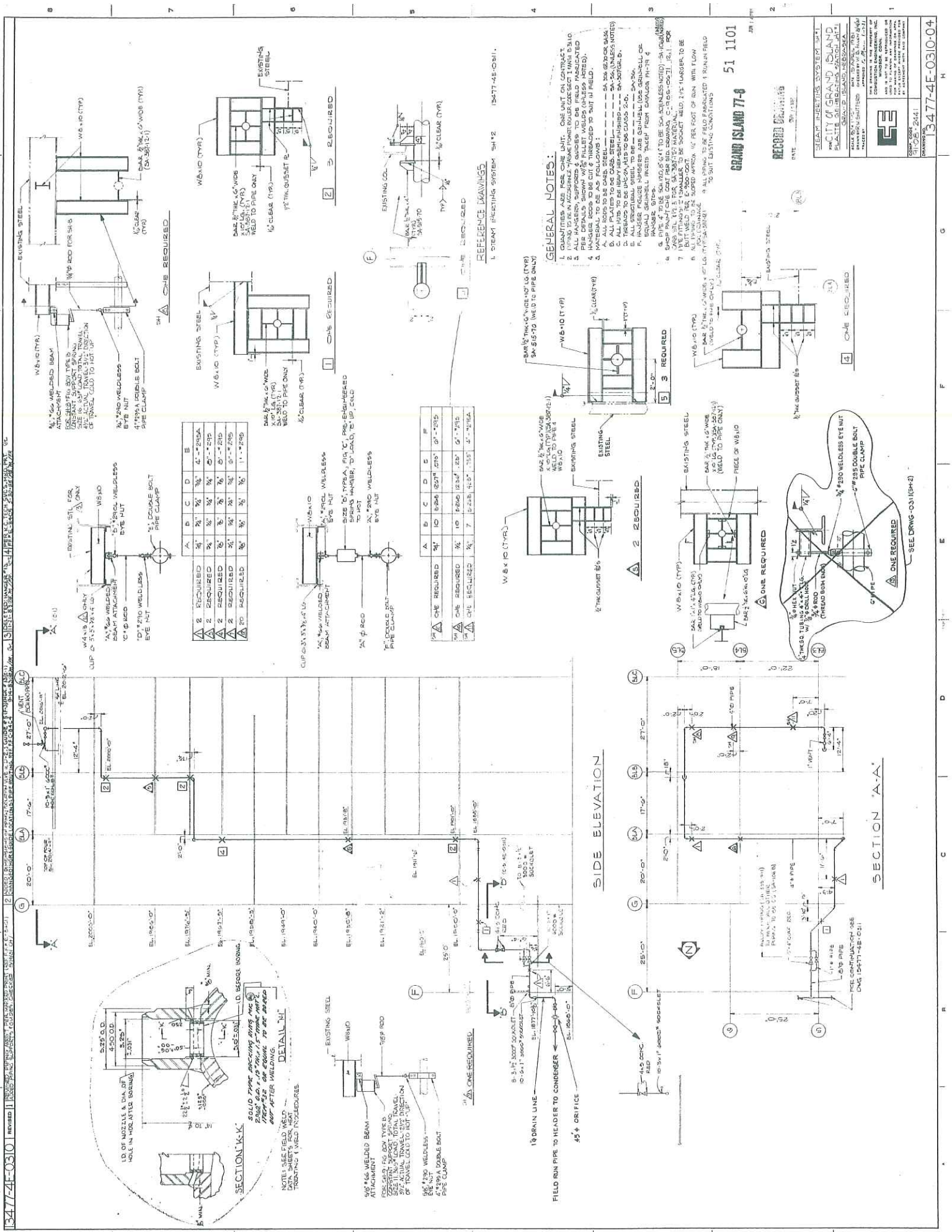
Insurance as herein required shall be maintained in force until the City releases the Bidder of all obligations under the Contract.

The Bidder shall provide and carry any additional insurance as may be required by special provisions of these specifications.

6. CERTIFICATE OF INSURANCE

Satisfactory certificates of insurance shall be filed with the City prior to starting any work on this Contract. **The certificates shall show the City as an additional insured on all coverage except Workers Compensation. The certificate shall state that thirty (30) days written notice shall be given to the City before any policy is cancelled (strike the "endeavor to" wording often shown on certificate forms). If the Bidder cannot have the "endeavor to" language stricken, the Bidder may elect to provide a new certificate of insurance every thirty (30) days during the contract. Bidder shall immediately notify the City if there is any reduction of coverage because of revised limits or claims paid which affect the aggregate of any policy.**





	A	B	C	D	E
1	2 REQUIRED	2	2	2	2
2	2 REQUIRED	2	2	2	2
3	2 REQUIRED	2	2	2	2
4	2 REQUIRED	2	2	2	2
5	2 REQUIRED	2	2	2	2
6	2 REQUIRED	2	2	2	2
7	2 REQUIRED	2	2	2	2
8	2 REQUIRED	2	2	2	2

	A	B	C	D	E	F
1	ONE REQUIRED	1	1	1	1	1
2	ONE REQUIRED	1	1	1	1	1
3	ONE REQUIRED	1	1	1	1	1
4	ONE REQUIRED	1	1	1	1	1
5	ONE REQUIRED	1	1	1	1	1
6	ONE REQUIRED	1	1	1	1	1
7	ONE REQUIRED	1	1	1	1	1
8	ONE REQUIRED	1	1	1	1	1

GENERAL NOTES:

- QUANTITIES ARE FOR ONE UNIT. ONE UNIT ON CONTRACT.
- FIELD CONDITIONS SHALL BE AS SHOWN UNLESS OTHERWISE NOTED.
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51 1101
GRAND ISLAND 77-8

RECORD DATE: 11/18/18
DATE: 11/18/18

COMP CODE: 41-05-2441
DRAWING: 13477-4E-0310-04

51 1101

SECTION A-A

SECTION K-K

SOLID PIPE INCLUDING BEAM AND ATTACHMENT SHALL BE EQUAL TO OR GREATER THAN AFTER WELDING.

NOTE: SEE FIELD WELD DETAIL 'H' FOR WELDING REQUIREMENTS.

SIDE ELEVATION

GRAND ISLAND 77-8

RECEIVED
LOB RE

FEB 16 1982

System Description for the CE Manual/
Automatic Steam Inerting System
(Suction Pulverizers)

ANSWERED

SEP 03 1981

51-1114

The Manual/Automatic steam inerting system is designed to allow the injection steam into a pulverizer.

System Components

A System Valve is provided to shut off the inerting steam to the inerting system. This valve is remotely opened and closed by the operator. This valve also serves as a trip stop valve - tripping when the steam pressure downstream of the PRV's is excessively high. The valve must be open for the inerting system to be operational.

Steam pressure is reduced from the supply pressure through a Main Pressure Reducing Valve (PRV). This valve is automatic in operation and controls the pressure in the distribution header to the mills.

All piping associated with the inerting system must be maintained at a temperature established to prevent thermal shock when the system is in operation. A smaller Bypass PRV is installed in parallel with the main PRV to control the small amount of steam required to accomplish this. This valve is automatic in operation. Thermal Drain Valves are located at each end of the distribution header to allow for a small steam flow through the system and for condensate removal.

A Manual Isolation Valve is provided for each pulverizer to isolate its associated pulverizer from the inerting system. This valve must be fully open for the pulverizer to be inerted. The valve should be closed and tagged any time maintenance is being done on the pulverizer.

Pulverizer Inerting Valve is provided in the inerting steam line to each pulverizer. When inerting is in progress this valve is modulated to maintain either a negative pressure in the pulverizer when the pulverizer is running or a positive pressure in the pulverizer when it is not running. The Pressure Control System furnished with each pulverizer monitors the pressure in the pulverizer and compares this pressure with the desired pressure set point and positions the valve to maintain this pressure. The Pulverizer Inerting Valve is closed when there is no requirement for inerting.

Pushbuttons or switches are provided for the remote operation of the Main Steam Shutoff Valve and the Pulverizer Inerting Valve(s). Position indication is provided by backlighting the pushbuttons or switches.

System Operation

- A. Fire control - one pulverizer at a time.
 - 1. Operator first follows normal recommendations for controlling fires.
 - a. Continue feeding coal
 - b. Close hot air gate
 - 2. If the normal recommendations do not control the fire, the operator:
 - a. Continues feeding coal
 - b. Leaves the hot air gate closed
 - c. Depresses the "Start Pressure Inert" pushbutton
 - 1. The hot air damper and hot air gate are automatically closed if not already closed.
 - 2. The inert valve is released to modulate to maintain the desired mill pressure.
 - d. The feeder is tripped by the operator.
 - e. Allow a sufficient time for the pulverizer to empty and trip the pulverizer.
 - f. Depress the "Stop Inert" pushbutton for the pulverizer inerting valve.
- B. Pulverizer Trip - If a pulverizer trips while still containing coal, inerting will be automatically initiated.
 - 1. The hot air damper and hot air gate are automatically closed if not already closed.
 - 2. The inert valve is released to modulate to maintain the desired mill pressure with steam.
 - 3. The operator depresses the "Stop Inert" pushbutton.
- C. Pulverizer Start - If a pulverizer has been tripped laden with coal, it is recommended that the operator admit steam to the pulverizer before starting the pulverizer.
 - 1. The operator depresses the "start inert" pushbutton.
 - 2. The inert valve is released to modulate to maintain the desired pulverizer pressure with steam.
 - 3. The operator starts the pulverizer.
 - 4. The operator depresses the "Stop Inert" pushbutton.

Note:

If the pulverizer has been down forty-five (45) minutes or more with coal in it, the pulverizer must be opened and inspected prior to restarting if the inerting valve has been opened. In addition to following other normal safety precautions, the inerting valve and the manual isolation valve must be proven closed before opening the pulverizer.

CITY OF GRAND ISLAND
 PLATTE #1, CONTRACT #13477

MILL INERTING PIPING

Revision #3

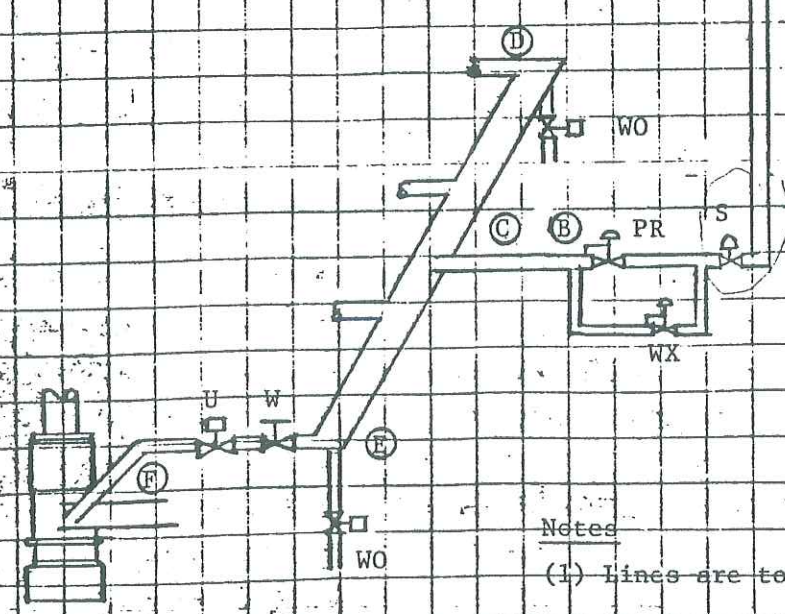
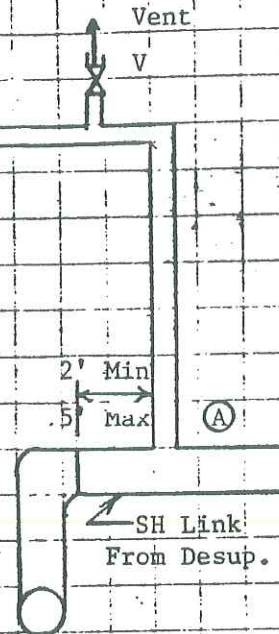
LINK	PIPE SIZE	SCH.	MATERIAL	DESIGN PRESS.	DESIGN TEMP.
(A)-(B)	4	160	SA-335 P12	2250	960
(B)-(C)	8	30	SA-106B	400	750
(D)-(E)	8	30	SA-106B	400	750
(E)-(F)	6	30	SA-106B	400	750

120

804 F

REVISED 6/1/81
 RWD

VALVE	RESPONSIBLE DEPT.	Cv MIN.	NAME
U	8202		Inerting Control, Auto
W	9801		Manual Block Valve
WO	8202		Auto-Drain
WX	8202		Pressure Reducing Bypass
PR	8202		Pressure Reducing Valve
V	9801		Vent
S	8202		Trip Stop and Inerting System Valve

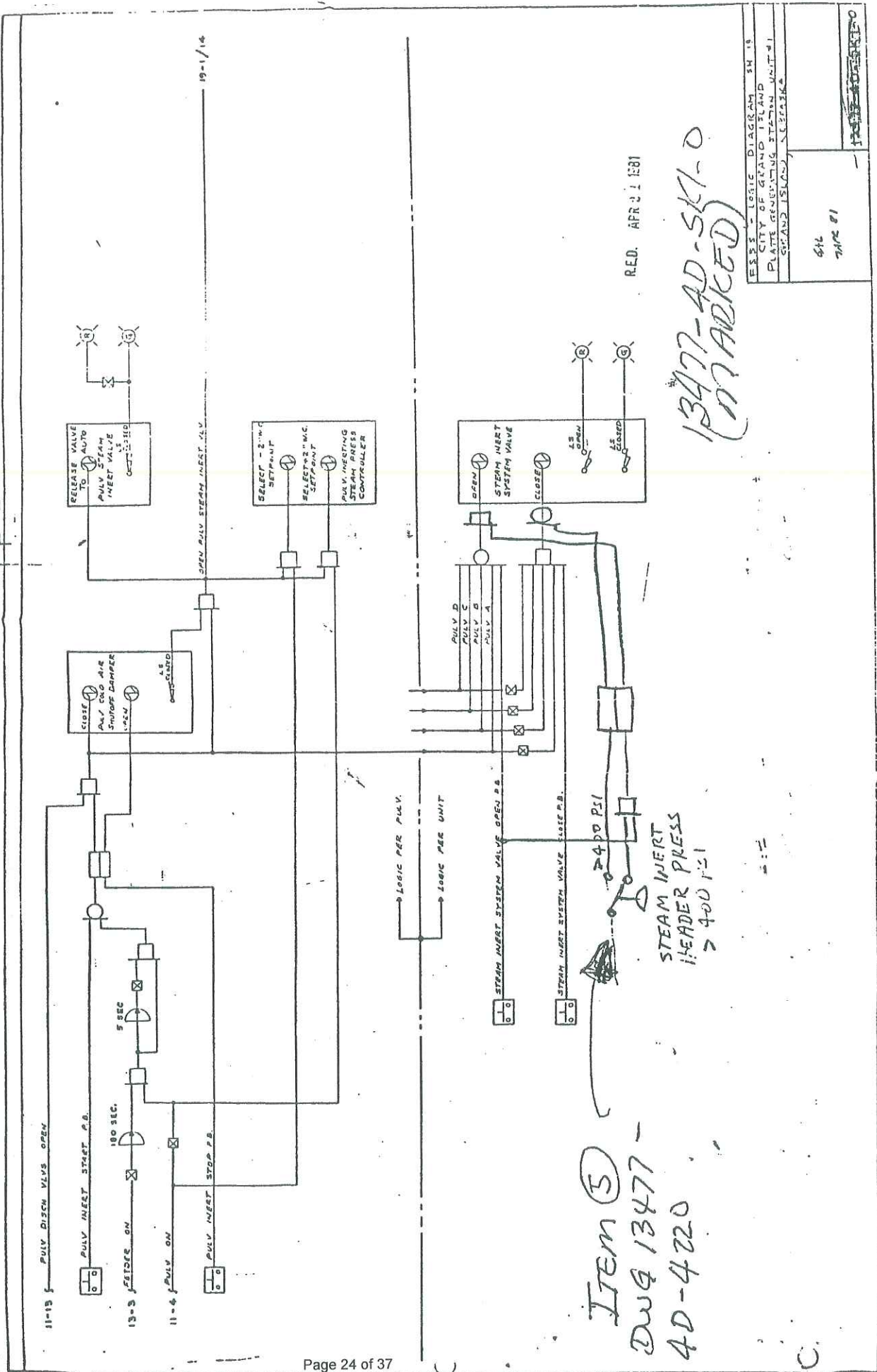


Notes
 (1) Lines are to be drainable.

J.D.R. MAY 18 1981

J.D.R. MAY 08 1981

J.D.R. APR 21 1981



REC. APR 21 1981

13477-AD-SK1-0
(MARKED)

ESS - LOGIC DIAGRAM SH 19
CITY OF GRAND ISLAND
PLATE GENERATING STATION UNIT #1
GRAND ISLAND, NEBRASKA
642
MAR 81
13477-AD-SK1-0

Item 5
DWG 13477 -
4D-4220

STEAM INERT
HEADER PRESS
> 400 PSI

FEB 20 1979

STEAM INERTING CONTROL SYSTEM FOR
SUCTION BOWL MILLS - TYPES RS & RB

1.0 Prerequisites

1.1 The Company's recommendations for steam inerting of suction type BOWL MILLS for controlling a pulverizer fire are included in the following descriptive matter and referenced drawings. These recommendations are offered for assistance in applying the material to be furnished by the Company and as a guide for the selection by the Purchaser of the material he must procure. (Refer to contract documents for scope of the Company's supply.) The recommendations are based on the assumptions that:

- 1.1.1 The inerting procedures contained within this standard will be used only on suction type pulverizers. These recommendations are a supplement to the Instruction Manual.
- 1.1.2 Each pulverizer and its exhauster is driven by a common motor.
- 1.1.3 Coal drying is performed in the pulverizer by hot air under a negative pressure.
- 1.1.4 A shut-off gate and a control damper is provided in the hot air duct along with a tempering air damper.
- 1.1.5 An exhauster discharge valve is provided at the exhauster outlet.
- 1.1.6 The pulverizer and feeder motors are interlocked in accordance with the referenced standards.

2.0 "INSTRUMENTS" and VALVES Required:

- | | | |
|-----|--|--------------------|
| 2.1 | One (1) Steam Temperature Device |] Per
Pulverize |
| 2.2 | One (1) Steam Pressure Device | |
| 2.3 | One (1) Maximum Inerting Open-Close, Automatic Valve | |
| 2.4 | One (1) Minimum Inerting Open-Close, Automatic Valve | |
| 2.5 | One (1) Manual Block Valve |] Per
Unit |
| 2.6 | One (1) Pressure Reducing Station | |
| 2.7 | One (1) Safety Valve(s) | |

51-395

- 2.8 One (1) Automatic Open-Close System Valve
- 2.9 One (1) Manual Isolation Valve
- 2.10 Automatic Drain Valve(s) and/or Orifices,
as required

Per
Unit

3.0 Steam Inerting Recommendations

3.1 Usual Causes of Pulverizer Fires Are:

- 3.1.1 EXCESSIVE MILL TEMPERATURES. The bowl mill outlet temperature should not be allowed to exceed 200°F (93.33C) irrespective of the material being pulverized.
- 3.1.2 FOREIGN MATERIAL SUCH AS PAPER, RAGS, STRAW, WOOD EXCELSIOR, ETC., COLLECTING IN THE INNER CONE AND OTHER POINTS IN THE MILL. These materials do not pulverize and, therefore, should be kept out of the raw fuel supply. When they enter the system, they collect and might possibly ignite. During mill inspection, remove any such debris from the air inlet, inner cone, bowl, etc.
- 3.1.3 EXCESSIVE ACCUMULATIONS OF PYRITES OR COAL ON THE MILL BASE PLATE OR IN THE AIR INLET TO THE MILL. The gate or valve on the tramp iron discharge should be open at all times to allow the free discharge of pyrites, etc., into the pyrites collection system. The valve may be closed momentarily, if required, for the removal of pyrites from the collecting hopper. Accumulations of debris in the air inlet should be removed when the mill is opened for inspection.

3.2 Fire Detection

The mill outlet temperature thermocouple in its highly sensitive well is the best indicator available for determining if a fire is present and when all evidence of a fire has disappeared. Paint peeling from the mill or fuel piping is also a direct indication of fire. (IF A FIRE DOES OCCUR, DO NOT SHUT DOWN THE MILL AND NEVER OPEN ANY MILL INSPECTION DOOR UNTIL ALL EVIDENCE OF FIRE HAS DISAPPEARED).

3.3 General Description

- 3.3.1 Steam, at a maximum pressure of 50 psig (.344MPa) and with a minimum of 100°F (55.6°C) superheat is utilized as the inerting medium and is introduced through two pipes into the air inlet of each bowl mill. Refer to TABLE I and TABLE IA for nozzle and flow

data. These tables are the tabulations of expected air flow and corresponding steam flow to permit inerting to 9% O₂. It is assumed that both the minimum flow steam nozzle and maximum flow steam nozzle will be used to admit the inerting steam. The flow nozzles should be designed to pass at least the flows indicated assuming 100°F (55.6°C) superheat at 50 psig (.344 MPa) at the nozzle.

3.3.2 C-E recommends steam for the inerting for the following reasons:

3.3.2.1 Steam sources within the plant can generally provide large quantities of steam for extended periods.

3.3.2.2 Eliminates the danger of having available only a partial inert supply in the interim between usage and refill of compressed inert gases.

3.3.2.3 Lower installation and operating costs.

3.3.3 The system is designed to inert one (1) bowl mill at a time:

3.3.3.1 A maximum inerting nozzle and a minimum inerting nozzle, at each pulverizer, are sized according to the required flow rates determined by pulverizer type, coal and design characteristics. (Refer to Table I and IA). Each nozzle is equipped with an automatic, open-close pulverizer steam inerting valve and is operated from the Control Console. (Item U, Maximum Valve; Item V, Minimum Valve).

3.3.3.2 A manual block valve at each pulverizer, Item W, isolates both the maximum and the minimum inerting valves from the steam source during maintenance.

3.3.3.3 A pressure reducing valve, for the system, Item PR, reduces the steam source such that steam at 50 psig (.344MPa) will be available for inerting at the mill. Either a bleed through this valve or a bypass line, as practical, will keep the piping hot.

- 3.3.3.4 A safety valve, Item Y, vents excessive pressure.
- 3.3.3.5 An inerting system shut-off valve, Item UU, which should normally remain open via the operator controlled switch, isolates the steam source from the inerting system piping.
- 3.3.3.6 A manual block valve, Item WP, isolates the steam source from the inerting system valve.
- 3.3.3.7 Auto-operated drain valve(s) on the header, Item WO, permit a small amount of steam flow to keep the piping hot.
- 3.3.3.8 Maximum inerting is normally required on an operating pulverizer to extinguish an existing fire or a strong source of ignition energy.
- 3.3.3.9 Inerting flow for approximately five (5) minutes should be adequate for inerting purposes.
- 3.3.3.10 The minimum inerting nozzle can be utilized for inerting and cooling when the pulverizer is shutdown.

3.4 General Operating Procedure Upon Detection of a Pulverizer Fire

The operator should initially follow the normal recommendations for controlling fires per the Instruction Manual. If the operator should then decide to use the steam inerting system, the procedure is as follows:

- 3.4.1 Place the pulverizer maximum steam inert switch in "Start".
 - 3.4.1.1 With the pulverizer operating and the exhauster discharge valve open, the following will occur simultaneously:
 - 1) The hot air damper will be rejected from automatic control;
 - 2) the hot air damper will receive a "Close" signal;
 - 3) a 30-second timer will be activated.

- 3.4.1.2 The hot air blast gate will receive an automatic "Close" signal (if not already closed), either when the hot air damper closes or from expiration of the 30-second timer, whichever occurs first.
- 3.4.1.3 With the pulverizer operating, the exhauster discharge valve open, the hot air gate closed and the inerting system valve open, the following will occur simultaneously:
- 1) The maximum and minimum inerting valves will receive an "open" command;
 - 2) the drain valve will receive a "close" command.
- 3.4.1.4 With the maximum and minimum inerting valves open and with steam flow "Proven", (steam flow is "proven" when the inerting valve is open and both steam pressure and steam temperatures are confirmed by control instrumentation), the feeder will receive an automatic trip command following a 1 to 2 minute time delay.
- 3.4.1.5 The operator should allow a minimum of 2 minutes after the feeder trips for the pulverizer to empty and then manually trip the pulverizer.

NOTE: The pulverizer must be opened and inspected prior to restarting if the maximum inerting valve has been opened. In addition to following other normal safety precautions, the inerting valves must be proven closed before opening the pulverizer.

- 3.5 Sequence of a Normal Shutdown (Refer to Instruction Manual for Detailed Instructions)
- 3.5.1 The operator should reduce feeder speed and close the hot air blast gate.
- 3.5.2 The operator should allow the feeder to run until the pulverizer has cooled and then stop the feeder.
- 3.5.3 The operator should stop the pulverizer motor after allowing the pulverizer to empty.

3.6 Sequence of an Emergency Shutdown (Refer to Instruction Manual for Detailed Instructions)

3.6.1 An emergency shutdown is defined as a pulverizer trip while still containing coal. If this should occur:

- a) The pulverizer "stop" switch or a fuel "trip" interlock will stop the pulverizer motor.
- b) Interlocks will provide the shutdown of the feeder and closing of the hot air blast gate.
- c) With the hot air blast gate closed, the exhauster discharge valve open and the inerting system valve open, the minimum inert valve will automatically receive an "open" command and the drain valve will receive a "close" command.
- d) The maximum inert valve will remain closed. (The only time the maximum inert valve should be opened by the operator is when the pulverizer is operating and there is a fire).

NOTE: Upon introduction of the minimum inerting steam with the pulverizer motor off, the pulverizer base will pressurize, thereby fully closing the tempering air damper.

CAUTION: To avoid the possibility of a personnel hazard from steam escaping via the tempering air damper, blocks or other devices which would prevent the tempering air damper from fully closing are not to be used; that is, the damper must be allowed to fully close.

3.7 Sequence in Restarting a Pulverizer in Either a Full or Empty Condition (Refer to Instruction Manual for Detailed Instructions)

3.7.1 To start a pulverizer, the following conditions are necessary:

No boiler trip condition present, ignition energy available and exhauster discharge valve open. Once these conditions are satisfied, the operator closes the pulverizer "start" switch and the pulverizer motor starts.

NOTE: If there is a significant delay following an emergency shutdown and coal remains in the pulverizer, before any firing is initiated and the pulverizer cleared, the pulverizer subsystem should be inerted. The time delay for inerting will depend on the coal characteristics, pulverizer temperature, and size and arrangement of the pulverizer equipment. If firing can't be initiated for an extended time period, the pulverizer should be cleared manually, if required, but only after the pulverizers have been cooled to ambient temperature and have been inerted before opening.

The operator should:

- 3.7.1.1 Insure that the maximum and minimum inerting valves are closed.
- 3.7.1.2 Open the hot air blast gate and position the hot air damper to obtain proper pulverizer outlet air temperature.
- 3.7.1.3 Start the feeder.

TABLE 1

TABULATION OF STEAM AND AIR FLOW RATES TO PERMIT INERTING

MILL SIZE	MAX MILL AIR FLOW LB/MIN	FLOW RATE THRU MINIMUM AND MAXIMUM NOZZLES				FLOW RATE THRU MINIMUM NOZZLE	
		BY WEIGHT		BY VOLUME		BY WEIGHT	BY VOLUME
		54% AIR LB/HR	46% STEAM LB/HR	54% AIR @ 70°F CFM	46% STEAM @ 400°F, 50 PSIG CFM	STEAM LB/HR	STEAM @ 400°F, 50 PSIG CFM
RS 863	2,650	85,860	73,140	19,100	9,380	7,314	938
† 843	2,500	81,000	69,000	18,000	8,850	6,900	885
823	2,400	77,760	66,240	17,300	8,500	6,624	850
803	2,180	70,620	60,180	15,700	7,720	6,018	772
783	2,000	64,800	55,200	14,400	7,080	5,520	708
763	1,925	62,400	53,100	13,900	6,810	5,310	681
743	1,710	55,380	47,220	12,300	6,060	4,722	606
723	1,570	50,880	43,320	11,300	5,560	4,332	556
703	1,450	46,980	40,020	10,400	5,140	4,002	514
683	1,325	42,960	36,540	9,500	4,690	3,654	469
663	1,250	40,500	34,500	9,000	4,430	3,450	443
643	1,160	37,560	32,040	8,350	4,110	3,204	411
623	1,060	34,320	29,280	7,620	3,760	2,928	376
603	950	30,780	26,220	6,840	3,370	2,622	337
583	835	27,060	23,040	6,020	2,960	2,304	296
563	750	24,300	20,700	5,400	2,660	2,070	266
543	675	21,900	18,600	4,870	2,390	1,860	239
523	600	19,440	16,560	4,320	2,130	1,656	213
503	550	17,820	15,180	3,960	1,950	1,518	195
† 483	485	15,720	13,380	3,500	1,720	1,338	172
RS 463	440	14,280	12,120	3,180	1,560	1,212	156

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TABLE 1 (CONT'D)

TABULATION OF STEAM AND AIR FLOW RATES TO PERMIT INERTING

MILL SIZE	MAX MILL AIR FLOW LB/MIN	FLOW RATE THRU MINIMUM AND MAXIMUM NOZZLES		FLOW RATE THRU MINIMUM NOZZLE	
		BY WEIGHT	BY VOLUME	BY WEIGHT	BY VOLUME
		54% AIR LB/HR	54% AIR @ 700F CFM	STEAM LB/HR	@ 400°F, 50 PSIG CFM
RB 753	1,500	48,600	10,800	4,140	531
+ 733	1,340	43,400	9,650	3,696	474
713	1,250	40,500	9,000	3,450	443
673	1,070	34,680	7,710	2,952	379
633	950	30,780	6,840	2,622	337
613	850	27,540	6,120	2,346	301
593	750	24,300	5,400	2,070	266
573	660	21,360	4,750	1,824	234
533A	600	19,440	4,320	1,656	213
533	550	17,820	3,960	1,518	195
493	450	14,580	3,240	1,242	160
473A	425	13,800	3,070	1,170	150
473	400	12,960	2,880	1,104	142
453	350	11,340	2,520	966	124
452	310	10,020	2,230	858	110
412	250	8,100	1,800	690	89
+ 372A	225	7,320	1,630	618	80
RB 372	200	6,480	1,440	552	71

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TABLE 1A
TABULATION OF STEAM AND AIR FLOW RATES TO PERMIT INERTING

MILL SIZE	MAX MILL AIR FLOW Kg/SEC	FLOW RATE BY WEIGHT THRU MINIMUM & MAXIMUM NOZZLES		FLOW RATE BY VOLUME THRU MINIMUM AND MAXIMUM NOZZLES		FLOW RATE THRU MINIMUM NOZZLE BY VOLUME	
		54% AIR Kg/SEC	46% STEAM Kg/SEC	54% AIR @ 210C DM ³ /SEC	46% STEAM @ 204°C, .344 MPa DM ³ /SEC	STEAM Kg/SEC	STEAM @ 204°C, .344 MPa DM ³ /SEC
RS 863	20.03	10.81	9.21	9014	4427	.92	443
+ 843	18.90	10.20	8.69	8495	4177	.87	418
823	18.14	9.79	8.34	8165	4012	.83	401
803	16.48	8.89	7.58	7410	3643	.76	364
783	15.12	8.16	6.95	6796	3341	.70	334
763	14.55	7.86	6.69	6560	3214	.67	321
743	12.93	6.97	5.95	5805	2860	.60	286
723	11.87	6.41	5.45	5333	2624	.55	262
703	10.96	5.92	5.04	4908	2426	.50	243
683	10.02	5.41	4.60	4484	2213	.46	221
663	9.45	5.10	4.34	4248	2091	.43	209
643	8.77	4.73	4.03	3941	1940	.40	194
623	8.01	4.32	3.69	3596	1774	.37	177
603	7.18	3.88	3.30	3228	1591	.33	159
583	6.31	3.41	2.90	2841	1397	.29	140
563	5.67	3.06	2.61	2549	1255	.26	126
543	5.10	2.76	2.34	2298	1128	.23	113
523	4.54	2.45	2.09	2039	1005	.21	101
503	4.16	2.24	1.91	1869	920	.19	92
+ 483	3.67	1.98	1.69	1652	812	.17	81
RS 463	3.33	1.80	1.53	1501	736	.15	74

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TABLE 1A (CONT'D)

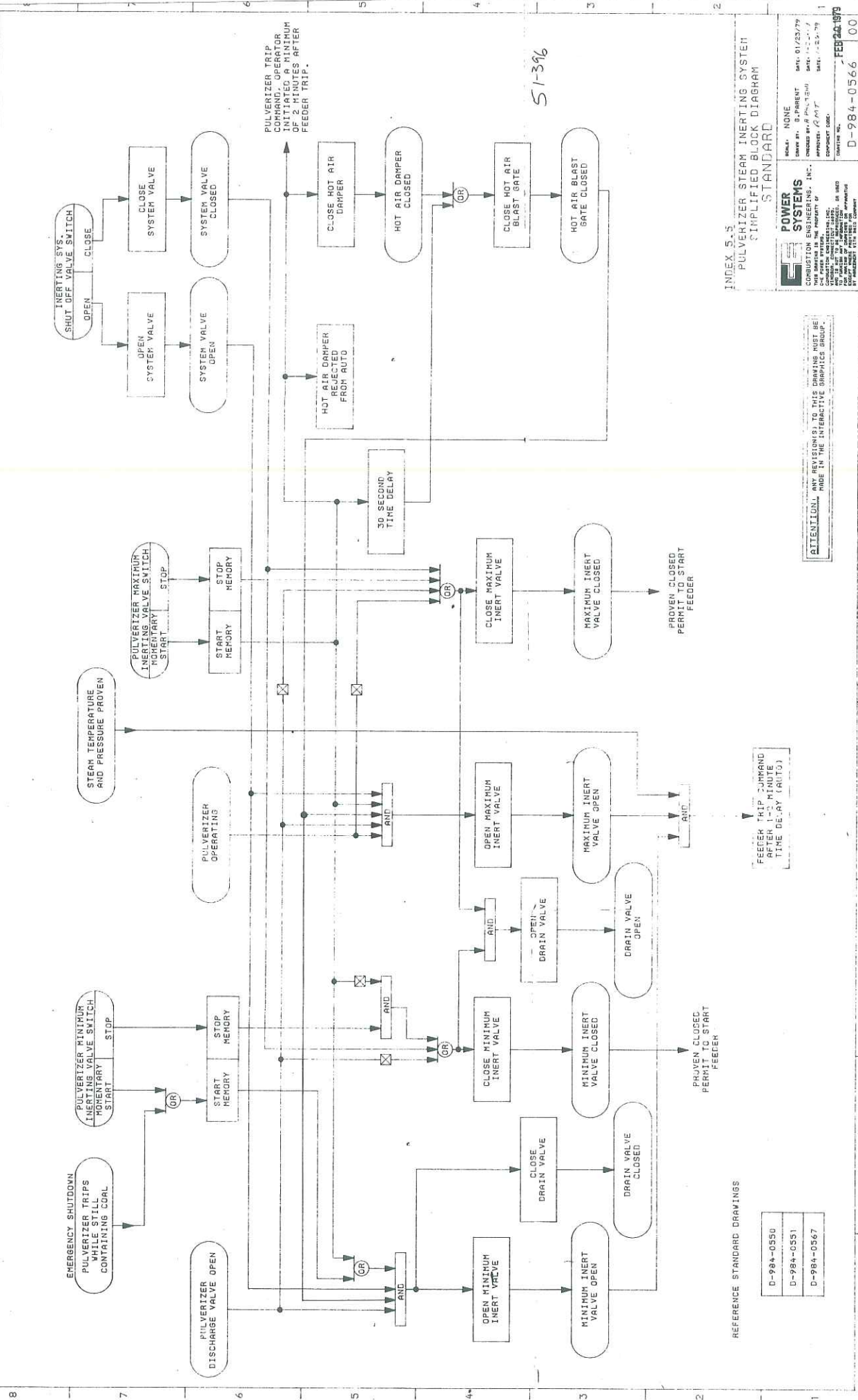
TABULATION OF STEAM AND AIR FLOW RATES TO PERMIT INERTING

MILL SIZE	MAX MILL AIR FLOW Kg/SEC	FLOW RATE BY WEIGHT THRU MINIMUM & MAXIMUM NOZZLES		FLOW RATE BY VOLUME THRU MINIMUM AND MAXIMUM NOZZLES		FLOW RATE THRU MINIMUM NOZZLE BY WEIGHT		FLOW RATE THRU MINIMUM NOZZLE BY VOLUME	
		54% AIR Kg/SEC	46% STEAM Kg/SEC	54% AIR @ 21°C DM ³ /SEC	46% STEAM @ 204°C, DM ³ /SEC	STEAM Kg/SEC	STEAM @ 204°C, DM ³ /SEC	STEAM Kg/SEC	STEAM @ 204°C, DM ³ /SEC
RB 753	11.34	6.12	5.21	5097	2506	.52	251	.52	251
+ 733	10.13	5.46	4.65	4554	2237	.47	224	.47	224
713	9.45	5.10	4.34	4248	2091	.43	209	.43	209
673	8.09	4.37	3.72	3639	1789	.37	179	.37	179
633	7.18	3.88	3.30	3228	1591	.33	159	.33	159
613	6.43	3.47	2.95	2888	1421	.30	142	.30	142
593	5.67	3.06	2.61	2549	1255	.26	126	.26	126
573	4.99	2.69	2.30	2242	1104	.23	110	.23	110
533A	4.54	2.45	2.09	2039	1005	.21	101	.21	101
533	4.16	2.24	1.91	1869	920	.19	92	.19	92
493	3.40	1.84	1.56	1529	755	.16	76	.16	76
473A	3.21	1.74	1.47	1449	708	.15	71	.15	71
473	3.02	1.63	1.39	1359	670	.14	67	.14	67
453	2.65	1.43	1.22	1189	585	.12	59	.12	59
452	2.34	1.26	1.08	1052	519	.11	52	.11	52
412	1.89	1.02	.87	850	420	.09	42	.09	42
+ 372A	1.70	.92	.78	769	378	.08	38	.08	38
RB 372	1.51	.82	.70	680	335	.07	34	.07	34

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REVISION



51-396

INDEX 5.5
 PULVERIZER STEAM INERTING SYSTEM
 SIMPLIFIED BLOCK DIAGRAM
 STANDARD

POWER SYSTEMS
 CONSTRUCTION ENGINEERING, INC.
 1000 WEST 10TH AVENUE, SUITE 100
 DENVER, COLORADO 80202
 PHONE: (303) 733-1100
 FAX: (303) 733-1101
 TELETYPE: (303) 733-1102
 CIRCLE NO. 100
 DATE: 01/23/79
 CHECKED BY: J. P. BENTON
 DESIGNED BY: J. P. BENTON
 APPROVED BY: J. P. BENTON
 D-984-0566
 FEB 20 1979

ATTENTION: ANY REVISIONS TO THIS DRAWING MUST BE MADE IN THE INTERACTIVE GRAPHICS GROUP.

D-984-0550
D-984-0551
D-984-0567

REFERENCE STANDARD DRAWINGS

142.SBI

OTTA 00 CHATT 00 C.E.C. 00

