



Gainesville Regional Utilities

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SYSTEMS PLANNING DEPARTMENT
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**DIV. ENVIRONMENTAL
PERMITTING**



Mr. Buck Oven
Department of Environmental Regulation
Twin Towers Office Building
2600 Blair Stone Road
Tallahassee, Florida 32301

Dear Mr. Oven:

In accord with the Site Certification requirements for Deerhaven Unit II, attached are the technical specs for the particulate emissions control devices from the coal handling facility.

Please contact me should you have any questions or comments.

Respectfully,

Robert L. Guyer
Utility Systems Environmental Engineer

RLG/kv
Attachment

cc: Mike Kurtz w/o attachment

4-9 BELT TRIPPER: continued

- (2) Cable reels shall be suitable for use in a Class II, Division 1, Group F area with hydraulic (self-contained) motor reel drive.
- (3) Manufacturer shall be Aero-Motive, Gleason, Industrial Electric or approved equal.
- b. Construction:
 - (1) Cable reel frame shall be of welded steel construction.
 - (2) Bearings shall be heavy-duty ball or roller type antifriction.
 - (3) Cable reel and pump assembly may be remotely mounted on tripper for weight distribution.
- c. Electrical:
 - (1) Hydraulic pump motor shall meet the requirements of DIVISION 8.
 - (2) Collector ring assembly shall meet the requirements of Class II, Division 1, Group F.
 - (3) Furnish suitable length and conductor cable for each reel meeting cable reel manufacturer's recommendations.
 - (4) Provide cable tray(s) for protection and support of cable.
- d. Accessories:
 - (1) Provide a NEMA 9 junction box with terminal blocks and cable grips for each fixed point location.
 - (2) Provide cable guides for each reel.
4. Furnish and install insertable bag-type dust collector as specified in SECTION 4-13 in tripper discharge head chute.
5. Furnish and install a heavy-duty hose reel as manufactured by Aero-Motive, Gleason, or Industrial Electric for compressed air supply to dust collector on tripper.
6. Furnish and install cable and hose trays to support electrical cable and compressed air hose.

4-10 DUST COLLECTION SYSTEM:

A. GENERAL:

1. Design, fabricate, assemble, erect and test three (3) dust collection systems, one (1) system for the Crusher/Sampler House, one (1) for the Coal Bunkers, and one (1) for the tripper, as specified herein and as indicated on the drawings. In general, this work includes:
 - a. Dust Collectors:
 - (1) Reverse jet, or
 - (2) Reverse air.
 - b. Ductwork.
 - c. Fans and Motors.
 - d. Rotary Air Valves.
 - e. Screw Conveyors if gravity flow discharge is not provided.
2. Experience:
 - a. All equipment and materials furnished shall have an acceptable history of satisfactory reliable service in central station use for a period of at least five years at a comparable installation.
3. Related work specified elsewhere:
 - a. Personnel Access Requirements: SECTION 6-3.
 - b. Painting: DIVISIONS 5 and 9.
 - c. Structural Design Criteria: SECTION 6-4.
 - d. Structural and Miscellaneous Steel: DIVISION 5.
 - e. Motors: DIVISION 8.

4-10 DUST COLLECTION SYSTEM: continued

4. Quality Assurance:
 - a. General:
 - (1) All equipment and material shall be the latest design and the first-quality standard product of manufacturers regularly engaged in the production of such equipment and material.
 - (2) When two or more units of the same class of equipment are required, they shall be products of a single manufacturer.
 - b. Applicable Codes and Standards:
 - (1) Environmental Protection Agency (EPA):
 - (a) Regulation 8 (allowable emissions).
 - (2) American Conference of Governmental Industrial Hygienists:
 - (a) Industrial Ventilation (latest edition).
 - (3) Federal Occupational Safety and Health Standard.
 - (4) Underwriters' Laboratories (UL):
 - (a) 508 - Industrial Control Equipment.
 - (b) Fire Protection Equipment List.
 - (5) State and Local Codes:
 - (a) State of Florida.
5. Submittals:
 - a. Compliance Submittals:
 - (1) General:
 - (a) Submit as specified in DIVISION 1.
 - (b) Furnish outline drawing and equipment and material lists for all equipment and materials specified.
 - (2) Ductwork:
 - (a) Show ductwork dimensioned to scale in-plan view with additional section views as required to clarify congested areas and as requested by the Engineer. Show the actual equipment furnished, equipment location by dimension and connections.
 - (b) Dimension and locate in elevation.
 - (c) Shop drawings shall be complete in detail indicating all accessories, balancing dampers, turning vanes and access doors.
 - (3) Motors and Drives:
 - (a) Submit shop drawings for all electric motors furnished with equipment. Identify motor with equipment designation.
 - (b) List all motor nameplate data on shop drawings including full load amps, locked rotor amps for the motor voltage specified.
 - (c) Furnish dimensioned motor drawing.
 - (d) Provide shop drawings for shop or field fabricated belt guards.
 - (e) Comply with DIVISION 8.

B. EQUIPMENT AND MATERIALS:

1. Bag-Type Dust Collectors:

a. General:

- (1) It is the intent of these specifications to allow either reverse air or reverse jet bag type dust collectors to be employed with the limitations and design considerations, as indicated and specified.

4-10 DUST COLLECTION SYSTEM: continued

- (2) Collectors shall be suitable for outdoor installation, completely weatherproof with adequate structural support for installation.
- (3) Collectors shall be of low-carbon steel nominal 10 gauge all welded construction, reinforced as required to withstand pressures of operation, and not less than 150 percent of the maximum capacity of the fan serving the unit.
- (4) Paint on the internal surface with two (2) coats of epoxy paint, HI-Build Epoxy 78-F-34, as manufactured by Mobil Chemical or equal. Final dry film thickness approximately 5 mils. Tube sheet epoxy painted to approximately 5 mils dry thickness. Bag collars shall not be painted to assure a positive bag to tube sheet seal.
- (5) All holes and penetrations of collector shell and hopper shall be factory cut in order to maintain the integrity of the epoxy coating.
- (6) Service Platforms: 30" wide walkway at plenum access door level. Constructed of 1-1/4" x 3/16" grating. Bearing bars spaced 1-3/16" on center with twisted type cross rods 4" on center. Bar and rod handrail complete with 4" high kick plate. Grating and walkway to be galvanized and conform to DIVISION 5.
- (7) Access Ladders: Caged ladder(s) to provide access to the service platform level from the support steel base plate level and conform to OSHA regulations. Rungs are 3/4" diameter bar spaced at 12" on center countersunk into side rails with mounting clips. Ladder to be hot dipped galvanized per DIVISION 5.
- (8) Explosion and Fire Protection:
 - (a) The unit shall be equipped with sealed and gasketed explosion relief vents sized for a pressure relief ratio of one square foot of vent area for each 30 cubic feet of collector volume. Explosion doors shall be provided with spring clips and door weights to prevent dust leakage. Explosion vents shall be caged to provide for personnel protection.
 - (b) Fire Protection:
 1. The unit shall be equipped with a fire protection system complete with spray nozzles and all piping to a single owner connection.
 2. Provide 250° F fusible link sprinklers within the inlet plenum, covering the entire plenum area with extra hazard sprinkler loading, considering 80 psi water pressure available at the Owner's connection. Sprinkler heads to be Grinnell or equal.
- (9) Support Steel: Support structure designed to support module(s) with 6'-0" clearance under hopper discharge flange. Steel designed with cross bracing for 100 mph wind load, seismic zone 1, and 33 percent hopper loaded with material of 90 PCF density. Painted as specified in DIVISIONS 5 and 9. Conform to Art. 6-4.

4-10 DUST COLLECTION SYSTEM: continued

- (10) Hoppers shall be provided to collect dust. Hoppers shall have a minimum 60 degree included angle, on seams, from horizontal.
- (a) Hoppers to be, all welded, nominal 10 gauge mild steel, with all interior welds ground smooth.
 - (b) Paint hoppers with 5 mils of HI-Build Epoxy specified in this article.
 - (c) Hopper Access Doors:
 - 1 Collectors with hoppers 36 inches square or less shall be provided with one quick-opening hinged access door of similar material and coating as hopper.
 - 2 Collectors with hoppers over 36 inches shall have two quick-opening hinged access doors of similar material and coating as hoppers.
 - (d) Provide 10" x 10" square, flanged opening at bottom of hopper to accommodate rotary air locks.
- b. Reverse Jet Bag-Type Dust Collectors:
- (1) Collectors shall be as manufactured by Wheelabrator-Frye, Carborundum, United States Filter Corp./Mikro Pul, or American Air Filter.
 - (2) Filter Cleaning Mechanism: Air jet cleaning of filter bags shall be continuous while the dust collector is in operation. Back-blowing shall be accomplished with 60 to 80 psig compressed air directed through venturi sections into the open, clean air end of the bags.

Compressed air flow shall be controlled by solenoid valves. A solenoid valve shall be furnished for each blow tube of filter bags. Solenoid valves shall be designed such that upon failure of the valve operating mechanism or drive, the valve will return to, or remain in, the closed position.
 - (3) Filter Bags: The dust collector shall be provided with a sufficient quantity of polyester bags so as to have 8:1 air to cloth ratio as required for the separation of the coal dust from the entering air while performing at an efficiency of 99.9 percent. In addition, the filter bag elements shall be grounded with a copper or stainless steel wire sewn in the seam of the filter element. All filter bags are to be polyester or Nomex, 16 ounce per square yard, with a porosity of approximately 25-30 cfm per square foot at .5" W.G. All filter bags are to be 10'-0" long maximum, and shall be supported internally on manufacturer's standard caged type retainer. Bags shall be top removable style through access doors at the top of each unit. Bags and bag cleaning system shall be of a type having a minimum of three-year average bag life before replacement in similar service. Provide spare bags as specified in SECTION 2-7. Bag seams to be at least double stitched.

4-10 DUST COLLECTION SYSTEM: continued

- (4) Each blow pipe shall have a positive means of alignment subject to Engineer's approval.
 - (5) Interstitial or rising velocities shall be limited to 6 fps. Interstitial velocity shall be calculated by taking the total collector cfm divided by the following; (the collector cross-sectional area, minus inlet plenum or baffle area for high inlet, minus the cross-sectional area of the bags) times 60.
 - (6) A control panel and all necessary components shall be provided for a completely automatic bag cleaning operation. Control panel shall be mounted outdoors local to the dust collection and shall be furnished in NEMA 4 weathertight enclosure. System shall be piped so that only one compressed air connection by Owner is required. All control wiring on the dust collector shall be complete to a single NEMA 4 junction box with terminal block. Control panel shall be completely prewired, requiring only interconnection to power, dust collector, and the necessary owner furnished control contacts to indicate that the equipment being served by the dust collector is in operation. All internal wiring requiring interconnection with field devices shall be brought to terminal blocks with terminal numbers marked on identification strip. Control system shall incorporate an adjustable, all solid-state cyclic timer, for the bag cleaning cycle. Hopper outlet drives shall be incorporated into the control system, and interlocked with the bag cleaning control. Cycle timer shall have adjustable pulse rate to permit 5-minute pulsing cycle and 10.1 adjustment.
- c. Reverse Air Bag Type Collectors: (includes DC-3 in general)
- (1) Collectors shall be as manufactured by Peabody Engineering Corp., Sly Corp. or Engineer approved equal.
 - (2) Filter cleaning mechanism shall be such that bags are cleaned continuously while the dust collector is in operation. Cleaning shall be accomplished by reversing the air flow through bags either isolated, individually or as a group or module from the main collection air flow.
 - (3) Filter bags shall be of the envelope design. Provide a sufficient quantity of polyester bags so as to have a 6:1 air to cloth ratio as required for the separation of the coal dust from the entering air while performing at an efficiency of 99.9 percent. In addition, the filter bag elements shall be ground with a copper or stainless steel wire sewn in the seam of the filter element. All filter bags are to be polyester, 16 ounce per square yard, with a porosity of approximately 25-30 cfm per square foot at .5" W.G. All filter bags are to be supported internally on manufacturer's standard retainers. Bags and bag cleaning system shall be of a type having a minimum of three-year average bag life before replacement in similar service. Provide one spare bag for each 10 bags furnished. Bags shall be at least double stitched.
 - (4) Interstitial or rising velocities shall be limited to 6 fps. Interstitial velocity shall be calculated by taking the total collector cfm divided by the following; (the collector cross-

4-10 DUST COLLECTION SYSTEM: continued

- sectional area, minus inlet plenum or baffle area for high inlet, minus the cross-sectional area of the bags) times 60.
- (5) A control panel and all necessary components shall be provided for a completely automatic bag cleaning operation. Control panel shall be mounted outdoors local to the dust collector and shall be furnished in NEMA 4 weathertight enclosure. System shall be piped so that only one compressed air connection by owner is required. All control wiring on the dust collector shall be complete to a single NEMA 4 junction box with terminal block. Control panel shall be completely prewired, requiring only interconnection to power, dust collector, and the necessary owner furnished control contacts to indicate that the equipment being served by the dust collector is in operation. All internal wiring requiring interconnection with field devices shall be brought to terminal blocks with terminal numbers marked on identification strip. Control system shall incorporate an adjustable, all solid-state cyclic timer, for the bag cleaning cycle. Hopper outlet drives shall be incorporated into the control system, and interlocked with the bag cleaning control. Cycle timer shall have adjustable pulse rate to permit 5-minute pulsing cycle and 10/1 adjustment.
- d. **Insertable Collector:** (Mounted on Tripper - DC-3)
- (1) Collectors shall be as manufactured by D.C.E. Vokes or Engineer approved equal.
 - (2) Collectors shall follow specifications for reverse air bag type collectors specified in this section.
 - (3) Unit shall be mounted atop the discharge chute on the tripper conveyor, with the envelope bags extending into the chute area.
 - (4) Collector operation will be interlocked to operate with the operation of the conveyor.
- e. **Rotary Air Lock Feeder:** (Applies to DC-1 and DC-2 only)
- (1) Lock shall be as manufactured by Meyer Inc. or Engineer approved equal.
 - (2) Locks shall be 10" x 10" heavy-duty, with cast iron housing with a six vane machined rotor with replaceable stainless steel seal strip. Rotary air lock shall be driven by a 1 horsepower, 10 rpm, TEFC, gearhead motor connected to the rotor shaft through a roller chain drive.
 - (3) Rotary air lock to be mounted at hopper discharge.
 - (4) Motor shall conform to DIVISION 8.
- f. **Screw Conveyors:** (Applies to DC-1 and DC-2 only)
- (1) Wherever possible gravity discharge from hopper shall be used. If gravity discharge cannot be used, screw conveyors shall be used to gather dust from collector hoppers and also to discharge collected dust to the closest point of coal storage or conveyor. Location to be approved by Engineer.
 - (2) Screw conveyors shall have flights of 9" outside diameter. Conveyor shaft end seals shall be felt, contained in sheet metal housings bolted to the outside of the trough ends. The driving end of the conveyor drive shall have a roller bearing, flanged cast iron block with drive shaft, and deep groove ball bearings.

4-10 DUST COLLECTION SYSTEM: continued

- (3) Troughs shall be constructed of 1/4" carbon steel or 14 gauge stainless steel. Screw flights shall be 1/4" carbon steel or 14 gauge stainless steel minimum.

Gear reducers may be shaft mounted with V-belt drive to motors. Provide antifriction bearings for thrust bearings and hardened cast iron intermediate support bearing.

- (4) It shall be complete with grease seals, grease fitting, and shall bolt to the trough end seal housing. Conveyors designed for 30 percent trough loading and maximum rpm (50).

g. Controls:

- (1) Controls shall be such that collector fans shall operate when the devices they are serving are in operation, with the exception of the dust collector ventilating the bunkers which shall run continuously.
- (2) Rotary air lock and screw conveyor if provided shall start simultaneously with dust collector on the Crusher/Sampler House Collection System. Rotary air lock and screw conveyor for DC-2 shall start when conveyor 6A starts. Rotary air lock and screw conveyor shall continue running after dust collection has stopped until hopper has been evacuated of coal dust under the control of an adjustable time delay relay field set 0 to 30 min.
- (3) Supply all necessary contacts, timers, etc., within the control panel to accomplish control sequence specified.

h. Fans:

- (1) Fans shall be licensed to bear the Air Moving and Conditioning Association, Inc.'s certified ratings seal.
- (2) Provide fan manufacturer's constant speed performance curves for the rpm of the fans furnished indicating brake horsepower and cfm at all static pressures along the fan curve.
- (3) Shop drawing shall indicate the actual fan cfm and list the fan brake horsepower at the condition indicated.
- (4) Fans shall be material handling type as manufactured by Chicago, Buffalo Forge, Aerovent, or Champion.
 - (a) Furnish V-belt drive, using multiple belts, rated for at least double the driven fan horsepower requirements. Fan shall be suitable for a minimum of 25 percent additional fan capacity and 40 percent additional fan head by changeout of pulleys and motors. Furnish belt guard.
 - (b) Provide outdoor service motors. Motor shall be loaded to no more than 1.0 service factor rating of the motor at any point on the fan curve at the speed of the drive system furnished and comply with DIVISION 8.
 - (c) Furnish spark-resistant AMCA Type B construction with all parts exposed to air stream of nonferrous metal.
 - (d) Furnish outlet discharge with outlet guard, back draft damper and scroll drain connection.

- i. Fan and motor combined sound power ratings shall not exceed 90 dBA measured free field at five feet from fan and motor.

4-10 DUST COLLECTION SYSTEM: continued

j. Ductwork:

- (1) All hoods, ducts, blast gates, and hangers shall conform to standards set forth in SECTIONS 6 and 8 of the latest edition of the "Industrial Ventilation" manual of the American Conference of Governmental Industrial Hygienists.
- (2) Design velocities shall be 3500 fpm minimum in main and branches. Air quantities shall be as indicated on CH-1.
- (3) Ductwork shall be all welded, round duct with long radius elbows, galvanized steel, 12-gauge minimum. Provide flanged removable sections above all collecting locations to permit removal of hoods for maintenance access.
- (4) Provide balancing dampers and blast gates. Provide plugged 1/4-inch NPT pressure test connections on each side of each balancing damper or shut-off gate.
- (5) Provide 1-inch NPT taps in each branch and at inlet to each dust collector, suitable for use with an Ellison flow meter. Provide one Ellison flow meter (impact tube) and an Eagle Eye meter for each size duct used.
- (6) Provide acceptable ductwork to bunker connections provided by others on conveyor floor.
- (7) Provide connecting ductwork as indicated schematically.
- (8) Provide offsets and fittings as required for acceptable installation.
- (9) Provide flashings at roofs and walls where penetrations are made.

k. Accessories and appurtenances:

- (1) Provide all required ductwork hangers appurtenances and accessories required for conveying dust from indicated transfer points to the dust collectors.
- (2) Provide all supports, base plates, anchor bolts, etc., required to support the equipment provided in locations as follows:
 - (a) DC-1: Mounted on concrete slab at grade level adjacent to Conveyor 5A but not in space allocated to future conveyor 5B.
 - (b) DC-2: Mounted on Power Plant structure about elevation 310 ft. as indicated on reference drawing GA-7.
 - (c) DC-3: Mounted on Tripper.
- (3) Provide all required chutes to deposit collected dust on conveyor belts without causing excessive reintrainment, as in coal bunkers.

4-11 COAL SAMPLE SYSTEM:

A. GENERAL:

1. Furnish and install a complete coal sample system to sample coal discharged from conveyors as shown on plans.
2. Applicable Codes and Standards:
 - a. As specified in DIVISION 2.
 - b. ASTM D2234.
 - c. ASTM D2013.
3. Coal characteristics to be as specified in DIVISION 3.
4. All parts in contact with sample shall be stainless steel.
5. Paint shall be as specified in DIVISION 5 and 9.
6. Sample system shall be dust and moisture tight.

4-12 TELESCOPING CHUTES: continued

C. ELECTRICAL:

1. Provide TEFC motor in accordance with DIVISION 8.
2. Provide adjustable cam-type rotary limit switches driven off the drum shaft to stop the chute at upper and lower travel limits.
3. On the lower ends of the chutes, furnish two paddle switches to sense the coal pile level to actuate the drive for automatic indexing. Index to be in 3 foot increments.
4. Provide separate baffle-operated or tilt switches to stop the system in event the above indexing sensor fails to operate.
5. Furnish cable reels with necessary conductors to switches. Furnish cable guides for cable reels. Furnish a NEMA 4 junction box with terminal blocks for fixed end of cable reels. Installation shall be complete to junction box for interconnection with field wiring by others.
6. All electrical apparatus to be in NEMA 4 enclosures.
7. Provide slack cable limit switches.
8. Brake shall be mechanically applied, electrically released, 460 volt, single phase.

4-13 DUST SUPPRESSION SYSTEM:

A. GENERAL:

1. Description:
 - a. Furnish and install two (2) separate dust suppression systems complete with auxiliaries, appurtenances and accessories, as specified and as indicated. One dust suppression system shall be for the Stockout Tower area and the other system shall be for the Track Hopper area as indicated on the Coal Handling flow diagram.
 - b. Systems shall be completely piped and wired ready for Owners connections.
 - c. Minimum number of application points are shown on the coal handling flow diagram.
 - d. Dust suppression system supply pipes shall be sized for the following future additions:
 - (1) Unloading system:
 - (a) One 3000 TPH loading area on future 60-inch episode pile stock-out conveyor.
 - (2) Reclaim system:
 - (a) Six (6) 750 TPH loading areas on future Conveyor No. 4B.
 - (b) Four (4) 500 TPH loading areas on future extension of Conveyor No. 4A.
2. Quality Assurance:
 - a. Applicable Codes and Standards:
 - (1) As specified in DIVISION 2.
 - (2) ANSI B31.1 - Code for Pressure Piping.
 - b. Manufacturer shall be Dust Suppression Systems, Inc., Johnson-March, or Engineer approved equal.
 - c. Factory Test and Reports:
 - (1) All standard factory tests.
 - (2) As specified in DIVISION 1.
3. Submittals:
 - a. Submit as specified in DIVISION 1.
 - b. In addition, submit the following:
 - (1) Complete one-line flow diagrams.

4-13 DUST SUPPRESSION SYSTEM: continued

4. Delivery:

- a. Ship equipment as completely assembled as possible.
- b. Factory pipe and wire control panels whenever possible.
- c. Protect motors, electrical equipment and machinery of all kinds against corrosion, moisture deterioration, mechanical injury and accumulation of dirt or other foreign matter during shipment and storage.

B. EQUIPMENT AND MATERIALS:

1. Piping:

- a. Piping shall be designed and fabricated in accordance with ANSI B31.1.
- b. Piping materials shall be as follows:
 - (1) 2½-inch and larger - Standard weight seamless carbon steel ASTM A53 Gr. A or electric resistance welded carbon steel ASTM A53 Gr. B.
 - (2) 2-inch and smaller - Schedule 80 seamless galvanized carbon steel ASTM A106 Gr. B.
- c. Piping 2½-inches and larger shall have flanged or butt-welded joints. Piping 2-inches and smaller shall have threaded joints using 2000 pound forged steel fittings. Flanges shall be 150-pound weld neck, flat faced per ANSI B16.5.
- d. Gaskets shall be compressed asbestos.

2. Valves:

- a. Stop valves.
 - (1) Valves 2½-inches and larger shall be 150 lb. carbon steel ASTM A216 WCB gate type manufactured by Crane, Powell, Walworth, Lunkenheimer, RP&C, or Rockwell.
 - (2) Valves 2-inches and smaller shall be ball type 600 lb. bronze or carbon steel with teflon seats manufactured by Powell, Lunkenheimer, Contromatics, or Jamesbury.
- b. Check valves.
 - (1) Valves 2½-inches and larger shall be 150 lb. carbon steel ASTM A216 WCB swing checks.
 - (2) Valves 2-inches and smaller shall be 600 lb. carbon steel ASTM A105 lift checks.
 - (3) Valve shall be manufactured by Crane, Powell, Walworth, Lunkenheimer, RP&C, or Rockwell.
- c. Solenoid valves.
 - (1) Solenoid valves shall be manufactured by ASCO or Mac.
 - (2) Provide with soft seats for tight shutoff.
 - (3) Solenoid valves shall be suitable for Class II, DIVISION 1, Group F with 120 V encapsulated coils.
 - (4) Provide with manual operator.

3. Strainers:

- a. Strainers 2½-inches and larger shall be 150 lb. carbon steel ASTM A-216 WCB Y-type with 3/4" blowdown connection.
- b. Strainers 2 inches and smaller shall be 600 lb. carbon steel ASTM A-216 WCB Y-type with screwed ends and ½" blowdown connection.
- c. Provide all strainers with 20 mesh stainless steel baskets.
- d. Strainers shall be manufactured by Armstrong, Leslie, McAlear, Page-Mueller, or Yarway.

4. Freeze Protection:

- a. Dust suppression systems shall be furnished with manual valves for system drainage.

4-13 DUST SUPPRESSION SYSTEM: continued

- b. All pipes shall be pitched to drain valves.
- 5. Electrical/Controls:
 - a. Material flow switches shall be activated by belt deflection or material profile on belt. All flow switches to be rated for Class II, DIVISION 1, Group F areas. Provide a flow switch at each load point.
 - b. Provide the necessary control circuit to cut off sprays when fully loaded belts stop. The owner can supply a contact closure when each conveyor is in operation.
 - c. Divide the Track Hopper dust suppression system into four (4) zones for control purposes.
 - d. The upper spray points in the Track Hopper are to be capable of manual and auto control from selector switch furnished by owner. Provide a separate timer panel in a NEMA 12 cabinet for control in the auto mode. A contact closure from a third rail system by owner for each zone will be furnished to actuate the timers in this timer panel. Timers shall have contacts to actuate spray solenoids upon pickup until timers have timed out. Timers shall be capable of manual adjustment from exterior of cabinet over a range of 5 to 50 seconds. Timers shall be bypassed in manual mode to give a constant spray. Timer panel shall be installed in the Track Hopper Control Room in location selected by the Field Engineer.
- 6. Spray Control Cabinets:
 - a. Provide control cabinets as required suitable for Class II, DIVISION 1, Group F atmosphere.
 - b. Cabinets shall house all necessary control components for each application point including piping, solenoid valves, inlet strainers, and manual drain valves.
 - c. Inlet strainer blowdown connections shall be piped to the outside of the cabinet. Blowdown valve and cabinet drain valve shall be mounted on the cabinet exterior.
 - d. Solenoid valves shall be factory wired to a terminal strip in a NEMA 9 enclosure ready for Owner's field wiring.
- 7. Spray Manifolds:
 - a. Manifolds shall have sufficient number of spray nozzles and spacing for each application point.
 - b. Spray manifolds shall be mounted on a hinged or bolted (quick removal) plate if required for easy inspection.
 - c. Provide sufficient length of high pressure, flexible hose for each hinged manifold.
 - d. Nozzle design shall feature appropriate shields or guards to protect from material damage.
 - e. Each manifold shall be equipped with an inlet strainer as specified above.
- 8. Proportioner:
 - a. Each dust suppression system shall be supplied by a single skid mounted proportioner.
 - b. Each proportioner skid shall include at least the following:
 - (1) Main proportioning pump with the following features.
 - (a) Size as required.
 - (b) 460 volt, 3 phase, 60 Hertz, TEFC motor in accordance with DIVISION 8.

4-13 DUST SUPPRESSION SYSTEM: continued

- (c) Thomas flexible coupling, no equal.
- (d) Approved coupling guard.
- (e) Mechanical seals.
- (2) Mixed solution reservoir with level controls and sufficient surge capacity to supply the pump suction requirements with a maximum continuous inlet water flow of 220 gpm.
- (3) Reservoir inlet piping including isolation valve, strainer with blowdown valve, constant flow control valve.
- (4) Pump suction and discharge piping including isolation valves and minimum flow recirculation valve piped to reservoir.
- (5) Metering pump and associated piping including sufficient flexible hose and fittings suitable for pumping directly from an adjacent 55 gallon drum of wetting agent.
- (6) Electrical control panel in a NEMA 4 cabinet which shall include:
 - (a) Controls, gauge(s), and a ON/REMOTE/OFF switch to allow remote control from Owner's coal handling consoles.
 - (b) Motor starters which shall have two (2) N.O. and two (2) N.C. auxiliary contacts for remote indication.
 - (c) Low drum level contact for remote alarm.
 - (d) All internal wiring to terminal blocks for interconnection with field wiring by others.
 - (e) 120 V ac strip heater with thermostat.

C. PERFORMANCE:

1. Installation: The proportioner skids will be located under the coal handling system control room located at the track hopper and in a small block building adjacent to Portal House No. 4A. All other components will be installed in outdoor and indoor coal dust atmosphere and subject to ambient weather conditions.
2. Manufacturer's Field Service: Provide manufacturer's field service personnel to inspect and adjust system during startup. Manufacturer's service personnel shall also instruct Owner's operating staff on system operation and maintenance.
3. Testing:
 - a. The dust suppression system shall meet or exceed all State and Federal requirements for particulate emissions.
 - b. Contractor shall supply all materials and labor for any modification or additions necessary to comply with particulate emission standards.

4-14 VENTILATION SYSTEM:

A. GENERAL:

1. Furnish and install ventilation system for the crusher house only. Provide rate of 10 air changes per hour.
2. Dust collector air volumes removed from space may not be considered in calculations for ventilation.
3. Provide and install all necessary support and framing steel, roof curbs, grout, shims and flashing for installation of fans, louvers, and dampers utilized in system ventilation.
4. Locations of fans, louvers, and dampers shall be subject to Engineer's approval.
5. All fan control switches, motor starters, and field wiring by others.