HOTFOIL-EHS

FREEZE PROTECTION FOR COAL HANDLING SYSTEMS

FM Approvals

Class I, Division 2, Groups B, C, D

Class II, Divisions 1 & 2, Groups F, G

Class III, Divisions 1 & 2

Ordinary Areas

FM

APPROVED

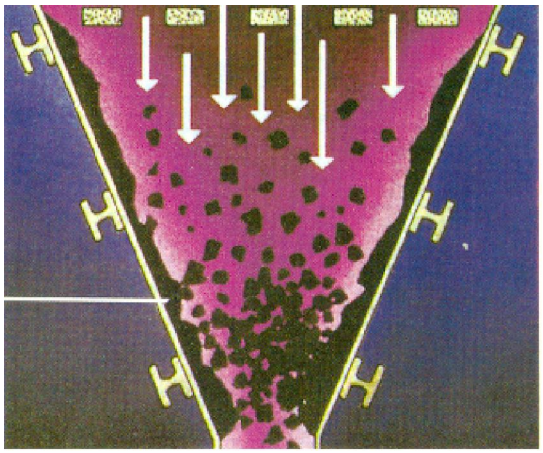
PROBLEM:

- **Coal stored outdoors on the stockpile or delivered by unit train or barges picks up moisture from rain and snow. When this wet or frozen coal is conveyed, it inevitably comes into contact with the plate steel of the various hoppers and chutes within the coal handling system. During winter, this plate steel is below freezing for extended periods.**

- **When wet or frozen coal encounters steel at sub freezing temperatures an instantaneous bond is formed. This bond causes immediate and often catastrophic blockage of the hopper and chutes. The bond and resultant blockage is so severe that pneumatic drilling equipment and explosives are often required to free up the system.**

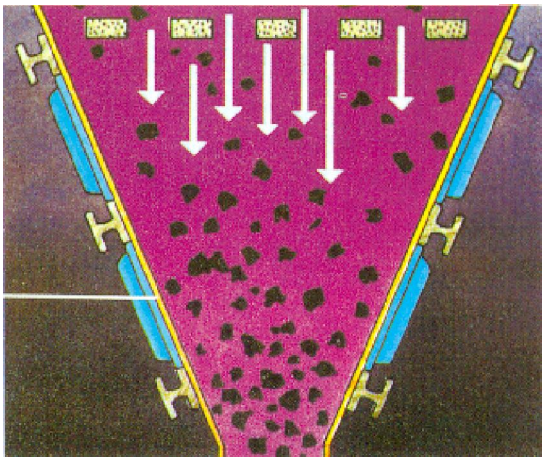
- **This problem, known as *FLASH FREEZING*, is extremely inconvenient and very costly. Several cases are documented where utility and industrial boilers have been shut down due to blocked conveying systems.**

The Hotfoil FRP heating panel system specifically addresses the flash freezing problem.



CROSS SECTION OF UNHEATED HOPPER

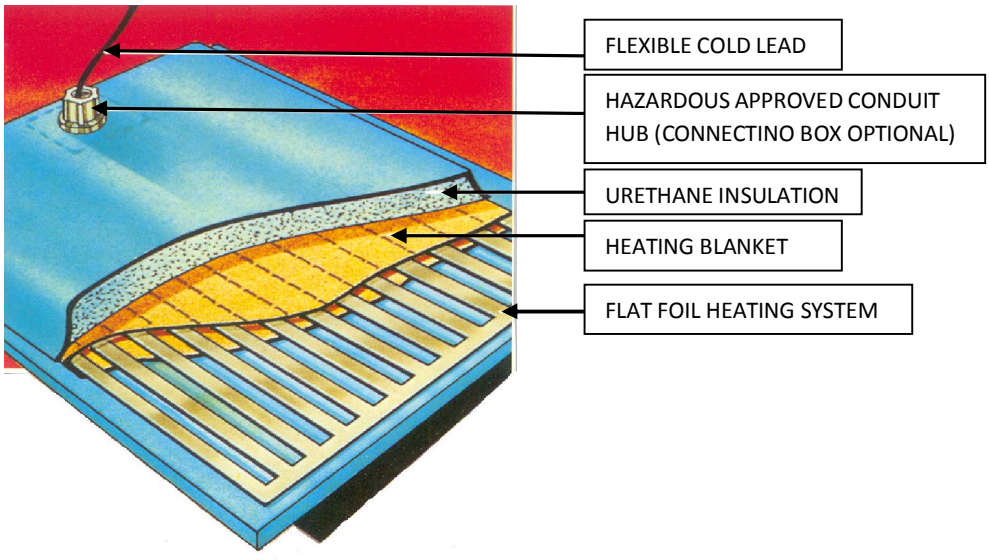
Plate steel is at ambient, sub freezing temperature causing flash freezing and hopper blockage.



CROSS SECTION OF HEATED HOPPER USING HOTFOIL FRP PANELS

Plate steel is at 40°F eliminating potential for flash freezing and hopper blockage.

Cross Section Showing FRP Construction



ENGINEERING AND DESIGN:

WE OFFER: ***Complete system design, FREE OF CHARGE, without a Purchase Order.***

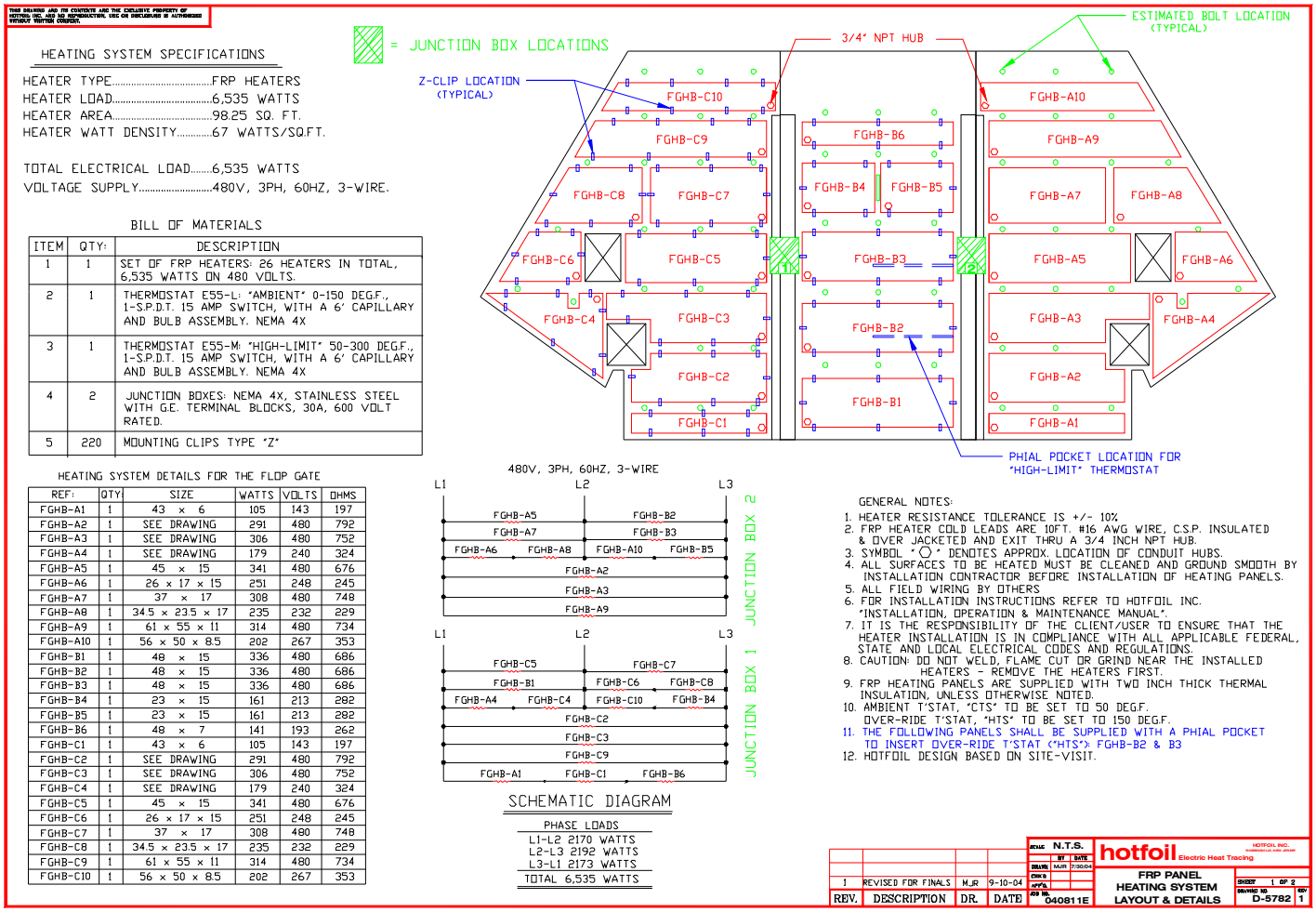
- **We are capable of designing the systems from drawings or site sketches. Once the system has been designed it will be sent to you with a formal quote. Should you choose to purchase it, we will re-issue the drawings for approval.**

- **If drawings are not available we will drive/fly to your site. We will measure and design the heating system directly on the hopper, chute, flopgate, etc… We will return to the office, design the system on CAD, and offer you a formal quote. If we design the system from the field, we will take 100% responsibility if for some reason a panel / panels don't fit.**

- **As with all of our heating systems, we offer a wide range of controls from your basic thermostat to electronic controllers. We try to keep everything simple so that you pay for only what you need and nothing more.**

- **We are available 24 hours a day, 7 days a week for any technical assistance, no exceptions.**

The drawing you see below is the design that was originally put together for the picture you see on the front.



SYSTEM DESIGN:

Several hoppers and chutes were instrumented to measure the distribution of heat throughout the plate steel. This research overwhelmingly proved that there was little to no lateral heat transfer from the heat source. In simple terms, the plate area covered by a heater was adequately freeze protected. The platework not covered by a heater was not freeze protected. For this reason, the Hotfoil-EHS system design involves *FULL HEATER COVERAGE*. All available plate area of hoppers and chutes are covered with custom built FRP heating panels. The power rating of each heating panel is approximately 70-80 Watts per square foot; a value that was empirically established to maintain 40°F inside plate temperature in -20°F ambient conditions (applicable for all mild steel plate up to 1 1/4" thickness).

PRODUCT/SYSTEM FEATURES

Custom Designed Systems:

Hotfoil engineering staff has designed many such systems both large and small. Our package will involve heater layout, installation equipment and instructions, electrical schematics, and temperature control equipment. All applications are handled on a project management basis to ensure customer and end user satisfaction.

Each client gets the assurance that the specific problem in question is being addressed with a product designed for the job

Insulated Heating Panels

This feature can save thousands of dollars through the elimination of on-site thermal insulation requirements.

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