

Protection Survey



Fire Protection Solution
668 N. Coast Highway, Suite 518
Laguna Beach, CA 92651
(866) 777-FIRE

Location Surveyed

Modern Papeles

**500 North Fourth Street
Bruton Town, SD 43812**

Survey By **John Doe**
12503 Honor Park Drive
Houston, TX 77065
Phone: 832-237-9646
Fax: 832-237-9647

Conferred With

John Renbourn, Operations Manager
Bert Jansch, General Mill Supt.
Jackie McShee, General Maintenance Supt.
Terry Cox, Safety Director

Survey: **July 16, 2002**

New Recommendations Resulting From This Survey

There are no new items to submit.

Recommendations Observed Completed This Survey

- 99.01 (Protection impairment Procedures)
- 99.02 (Smoking)
- 99.03 (Plan Review)
- 99.04 (Sprinkler System Maintenance)
- 99.05 (Extinguishing System Maintenance)

Human Element Recommendations

02.03 Provide Infrared Testing on Electrical Equipment

Management Programs

Provide infrared scanning on major electrical equipment, such as switchgear and MCCs. This should be done with a camera rather than a handheld heat scanner for more reliable results. Recommended frequency is annually, but if equipment shows good performance, less frequent inspections could be scheduled. (Mr. Kane requested information on infrared scanning.)

02.10 Fire Hydrant Maintenance

Management Programs

Perform annual maintenance of fire hydrants to include:

- Operation of each hydrant and key valve to assure good working condition, and to assure the hydrant drains properly.
- Lubrication of both valves.
- Lubrication of the threads of the cap.
- Clean and paint as needed.
- Assure good condition of bollard protection, weed control, and access.

98.01 Screen and Chip Building: Dust Control and Housekeeping

Management Programs

Increase the cleaning schedule for the chip screening building from quarterly to weekly. Modify equipment to reduce dust release and spills. Thick layers of wood dust from the machinery in the building are covering motors, electrical switches, and the structural steel. (Per Mr. Renbourn, the frequency of cleaning is every 4-6 weeks and is a situation they will continue to monitor.)

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Physical Recommendations

02.01 Repair Fire Wall, Engine Room 3

Construction

Repair the hole in the concrete block fire partition wall between Engine Room 3 and the grinding room. The hole is approximately 6' x 3' and was made to allow temporary access to the vacant space between the walls. (Mr. Kane indicated that this was in process.)

02.02 Smoke Detection in Electrical Rooms

Alarm Service

Install smoke detectors in electrical rooms arranged to sound at a constantly attended location. Some of the rooms are in separate detached enclosures, and a few are located inside buildings, such as in the grinding room and in the fabrication room. Smoke detection inside these rooms will provide early warning of a potential loss.

02.04 Smoke Detection in Computer Room

Alarm Service

Provide a smoke detector in the computer/telephone room arranged to sound at a constantly attended location. Due to the value of this equipment to the corporation, providing quick response to a fire condition could reduce not only property damage but business interruption. Although there are smoke detectors in the office area, there is no detector in the computer room itself. Additionally, the offices are not continuously occupied nor does the guard tour include the interior of the offices.

02.05 Freezer Protection

Special Hazards

Provide automatic sprinkler protection throughout the finished product storage freezer on a double interlock preaction system. Design the system for 28' rack storage of Class II materials, providing in-rack sprinkler protection and ceiling densities in accordance with one of protection schemes provided in NFPA 13. This will likely require an improved water supply, such as a fire pump and tank installation.

Until such time as sprinklers are to be provided, provide detection in the freezer to allow prompt response in the event of a fire in this area. Detection devices should be a fixed temperature on a single zone Class A circuit and should report to a constantly attended location. They should have a temperature rating as low as possible, given the ambient temperature. Rate of rise detectors should not be used. If using electric HADs or heat detection wire at ceiling only, space at one half of the listed detector spacing.

02.06 Box Cooler Protection

Private Protection

Provide automatic sprinkler protection throughout the finished product storage box cooler on a double interlocked preaction system. Design the system for 28' rack storage of Class II materials, providing in-rack sprinkler protection and ceiling densities in accordance with one of protection schemes provided in NFPA 13. This will likely require an improved water supply, such as a fire pump and tank installation.

Until such time as sprinklers are to be provided, provide detection in the box cooler to allow prompt response in the event of a fire in this area. Detection devices should be a fixed temperature on a single zone Class A circuit and should report to a constantly attended location. They should have a

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Physical Recommendations

02.06 Box Cooler Protection

Private Protection

temperature rating as low as possible, given the ambient temperature. Rate of rise detectors should not be used due to temperature fluctuations typically experienced in these areas. If using electric HADs or heat detection wire at ceiling only, space at one half of the listed detector spacing.

02.07 Staging Cooler Protection

Private Protection

Provide automatic sprinkler protection throughout the finished product storage staging cooler on a double interlocked preaction system. Design the system for 28' rack storage of Class II materials, providing in-rack sprinkler protection and ceiling densities in accordance with one of protection schemes provided in NFPA 13. This will likely require an improved water supply, such as a fire pump and tank installation.

Until such time as sprinklers are to be provided, provide detection in the freezer to allow prompt response in the event of a fire in this area. Detection devices should be a fixed temperature on a single zone Class A circuit and should report to a constantly attended location. They should have a temperature rating as low as possible, given the ambient temperature. Rate of rise detectors should not be used. If using electric HADs or heat detection wire at ceiling only, space at one half of the listed detector spacing.

02.08 Materials Storage Building Protection

Private Protection

Provide automatic sprinkler protection throughout the detached materials storage building on a wet pipe system. Design the system for 18' rack storage of Class IV commodities, providing a density of 0.40 gpm/ft² over 2000 ft², using 286 °F heads. This provides protection in accordance with NFPA 13, Sprinkler Systems. Alternative designs, using alternative sprinklers, are acceptable if installed in accordance with NFPA 13.

Until such time as sprinklers are to be provided, provide detection in the building to allow prompt response in the event of a fire in this area. Detectors should report to a constantly attended location.

02.09 Repair Fire Hydrant

Private Protection

Repair the fire hydrant just south of the Freezer Building. At the time of this survey, the hydrant appeared to have been hit, and it could not be opened. (Mr. Carrillo said that he would take care of this immediately.)

99.07 Paper Machine Oil Tanks

Special Hazards

Improve protection for the oil tanks for the paper machines as follows:

- a. Sprinkler the area over and 20 ft. beyond the lube oil tank for paper machine #2. Design the sprinkler system to deliver a density of 0.20 gpm/ft² either over 3000 ft² or over the tank area and 20 ft. beyond, whichever is least. Assessment of the sprinkler arrangement for paper machine #2 oil tank reveals the duct work and related piping in the area would block the operation and discharge of the roof sprinklers.
- b. Provide containment around the oil tanks for paper machines 1 and 2 in order to stop the flow of oil in

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Physical Recommendations

99.07 Paper Machine Oil Tanks

Special Hazards

the areas. Size the containment for the capacity of the oil tanks and 30 minutes of sprinkler discharge at 0.30 gpm/ft².

99.08 Baled Paper Canopy

Private Protection

(Revised 2/00) A 60 ft. x 40 ft. metal canopy was constructed over the loading dock for the 20-foot pulper. Near the canopy, there are two motor control centers: one for the 20 foot pulper and one for paper machine #1. The exterior walls for these centers are not of completely noncombustible construction. Bales of paper are stored next to and on the dock. To reduce the potential damage from a baled paper fire in the area, the following should be completed.

- a. Sprinkler the canopy using a dry pipe system designed to deliver a density of 0.15 gpm/ft² over the entire canopy. Use 17/32 inch orifice sprinklers, rated for 286 °F. Include 750 gpm for hose streams in the design. (Mr. Renbourn wishes other options as the nearest automatic sprinkler protection is several hundred feet away. A quote of over \$20,000 was obtained, which does not seem cost effective.)
- b. Provide a UL listed fire-rated coating for the elevated power supply cable trays above the canopy.
- c. Move the baled paper presently stored next to the dock so that it is at least 50 feet away from any building.

99.09 Mill's Water System

Private Protection

The current water supply arrangement requires the mill's fire protection system water pressure to drop too low before the two fire pumps would start. This delay in starting could increase fire damage or damage the underground main system. The following improvements should be made in the mill's fire pump installation.

- a. Install a pressure maintenance (jockey) pump in the fire pump room. Use a pump rated at least 20 gpm at 110 psi. Arrange the jockey pump to take suction from the suction tank. Arrange all installation features to meet Chapter 2-19 of the current edition of NFPA 20, "Standard on the Installation of Centrifugal Fire Pumps." (Per Mr. Renbourn, this will be investigated and settings adjusted as needed during our next visit in 5-6 months.)
- b. Once the jockey pump is installed, arrange the pump start and stop pressures as follows:
 - Jockey pump stop: 150 psi
 - Jockey pump start: 140 psi
 - Electric fire pump start: 130 psi
 - Diesel fire pump start: 120 psi

99.11 Cable Tray Protection

Special Hazards

Provide a fire proof coating to all power supply cable trays throughout the mill. Seal each penetration where cables penetrate rated walls or floors. The power supply cable trays for the mill operation pass through areas with combustible operations or combustible construction, areas that are both sprinklered and unsprinklered. (Per Mr. Renbourn, this will be handled as a part of the mill's electrical system upgrade if funds are available.)

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Physical Recommendations

99.12 Main Power Control Room

Special Hazards

Provide protection for the new 13.8 KV room either by sprinklering the room or by installing a total flood gaseous agent extinguishing system. Design sprinklers to provide 0.27/3000 gpm/ft²/ft² arranged either as a wet-pipe system, or as a pre-action system actuated by heat detection. Arrange the gaseous agent extinguishing system to have a main and reserve supply of extinguishing agent with actuation by cross-zoned photoelectric smoke detection. This room is important for continuity of mill operation. (Per Mr. Renbourn, this will be handled as a part of the mill's electrical system upgrade and quotes obtained.)

99.13 Flammable Paint Storage Room

Special Hazards

The sprinkler system for the paint storage room and the area immediately outside the room should be replaced by a system following the extra hazard pipe schedule in NFPA 13, "Standard for the Installation of Sprinklers." The 6 ft. x 8 ft. cut off room has about 15-20 containers of different types paints and solvents. The storage room has a single sprinkler fed by a ¾ inch pipe. (Per Mr. Renbourn, the quote of \$900 is not cost effective to simply change 3-4 heads for a cut-off room with combustible liquids and minimal flammable liquids.)

98.05 Motor Control Centers Construction

Construction

(Revised 12/98) Provide noncombustible construction for all motor control centers and seal cable and ventilation exhaust duct penetrations. Replace all doors with doors that have a fire resistance rating of at least 1½ hours. Most of the motor control centers are not properly arranged to prevent smoke or fire from entering the centers. (Per Mr. Renbourn, these items will be completed as a part of the electrical system upgrade for the mill; however, presently funds are on hold for such projects.)

98.09 Ventilation System Combustion Control Monitoring

Special Hazards

Monitor the combustion gas/burner control panels for the new heating system for Paper Machine #1. These heating units and controls are on the roof. The remote location of controls could cause a burner failure on a heating unit to go unnoticed by the machine operators. (Per Mr. Renbourn, this will be investigated and completed by the end of the year 2000.)

96.02 Power House Motor Control Room and Cable Tray Protection

Special Hazards

(Revised 12/98) Install either a carbon dioxide or a FM 200 extinguishing system for the cable spreading room, the bailey room, and the switchgear area below the control room of the Waste Boiler. The extinguishing system should be designed to have a main and reserve supply of extinguishing agent. (Per Mr. Renbourn, a funding request has been submitted. Funding should allow the item to be completed in 2000.)

96.04 Fire Pump Power Supply

Private Protection

(Revised 06/99) Remove the disconnect and circuit breaker from the main power feed to the electric fire pump. Size and arrange this power supply circuit according to Chapter 6, of the current edition NFPA 20, "Standard on the Installation of Centrifugal Fire Pumps," and Article 695, of the current

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Physical Recommendations

96.04 Fire Pump Power Supply

Private Protection

edition NFPA 70, "National Electric Code." Lock the disconnect in the pump house with nonbreakable lock until the disconnect has been removed. The power supply wiring to the electric fire pump and controller was replaced without a review of the design. The power supply circuit is a 200-amp supply and has a circuit breaker in the power house. (Per Dave Chart, E & I Superintendent, the reliability power supply has been improved. The particular items will be investigated further. The disconnect in the pump house has been locked with nonbreakable lock.)

95.02 Fire Alarm System

Alarm Service

(Revised 12/98) Install a UL listed and FM approved proprietary alarm panel either at the constantly attended guard house or at the power house control room. Presently, all sprinkler systems use only water motor gongs for water flow identification. The fire suppression systems annunciate only at their local control panel. Arrange the panel to monitor the following conditions.

- Water flow for all sprinkler systems.
- System discharge for the fire suppression systems.
- Heat or smoke detection for the Motor Control Centers and the transformer rooms. (Per Mr. Renbourn, part of this will be considered as the mill's electrical upgrade project progresses. Otherwise, there are no plans to complete. Not seen as a priority, no funding request submitted.))

Recommendation Loss Expectancies

	Loss Expectancy Before Completion	Estimated Cost to Complete	Loss Expectancy After Completed
98.05	\$2,500,000	\$250,000	\$1,000
96.02	\$2,500,000	\$40,000	\$50,000
99.08 b	\$2,500,000	\$25,000	\$50,000
a	\$2,500,000	\$7,500	\$50,000
c	\$2,500,000	\$0	\$0
96.04	\$2,000,000	\$10,000	\$10,000
02.08	\$1,500,000	\$150,000	\$10,000
99.11	\$1,250,000	\$250,000	\$50,000
02.05	\$1,200,000	\$300,000	\$10,000
02.06	\$1,000,000	\$300,000	\$10,000
95.02	\$1,000,000	\$100,000	\$50,000
99.12	\$500,000	\$25,000	\$10,000
02.07	\$400,000	\$250,000	\$10,000
98.09	\$250,000	\$5,000	\$50,000
02.01	\$150,000	\$2,500	\$50,000
99.13	\$100,000	\$8,000	\$0
02.02	\$50,000	\$0	\$10,000
02.04	\$50,000	\$0	\$10,000
99.09 a		\$10,000	
99.07 a		\$2,000	
b		\$2,000	
02.03		\$0	
02.09		\$0	
02.10		\$0	
98.01		\$0	
99.09 b		\$0	

Items are blank where no predictable loss expectancy event can be formulated, such as with human element recommendation. Blank loss expectancy does not imply low loss potential--it can be just the opposite.

Recent Changes and Comments

- A pilot study for installing a second turbine/generator unit has been started. Preliminary plans will be forwarded for FPS' review as soon as they are available.
- A fire occurred in the No. 1 Paper Machine hood on November 2. The fire was extinguished with the operation of 2 sprinklers. The facility intends to increase the cleaning frequency for this machine to reduce future fire potential.

Construction

Total Building Area: 263,900 ft²
Percentage Sprinklered: 57%
Percent Needing Sprinklers: 4%

The main part of this complex houses the paper mill. The paper mill consists of a group of communicating buildings. These buildings house paper machines 1 and 2, roll storage area, rail siding, the old power house, pulp and chemical mixing mills and the offices. This group of buildings is about 200,000 ft², all of noncombustible construction.

Individual major buildings are:

- The Cogen Building is 15% sprinklered, 100% non-combustible with approximately 142,000 ft².
- The No. 1 & 2 Paper Machine Building is 50% sprinklered, 100% noncombustible with approximately 133,000 ft².
- The No. 3 Paper Machine Building is 50% sprinklered, 100% noncombustible with approximately 78,000 ft².
- The Roll Paper Warehouse is 100% sprinklered, 100% noncombustible with approximately 45,000 ft².
- The Biomass Building is 10% sprinklered, 100% noncombustible with approximately 63,000 ft².
- The Bale Storage Building is 100% sprinklered, 100% noncombustible with approximately 40,000 ft².
- There are several detached buildings: the power house (24,000 ft² ground floor, 54,000 ft² total), the screen building (3,500 ft²), the hogger building, the Copeland building (4,000 ft²), and evaporator building (2,400 ft²). These buildings are of noncombustible construction.

Occupancy

This paper mill processes wood chips and recycled paper to produce medium paper both for use in its domestic corrugator plants and for outside sales. This plant has two 550 TPD continuous digesters for chips. Pulping is accomplished using a semichemical process using mechanical separation and green liquor and a black liquor recovery process using a fluidized bed furnace. The black liquor is processed in a Copeland Reactor to recover sodium carbonate. Paper is produced on two fourdrinier type machines producing a total of 450 tons/day. Finished rolls are stored in a holding area and shipped by rail or by truck.

Protection

Private

- The main building sprinkler systems are hydraulically designed: The south three bays (200') of the building, excluding the west two bays (80'), use 17/32", 286°F sprinklers with original design of 0.35/4500 gpm/ft²/ft². The present water supply shows this area can provide 0.32/4500 gpm/ft²/ft² with no hose stream use. All of the 20' high roll paper storage is within this area.
- The rest of the building uses 1/2", 212 F sprinklers with original design of 0.25/3000 gpm/ft²/ft². This density is available with 500 gpm hose stream use. Most of the building has palletized cardboard flats storage to 18' high.
- Water supply is via a well-gridded yard main system fed by three fire pumps taking suction from an open-top 1,000,000 gallon divided reservoir. 95% of the mains are new 10" ductile iron. Most of the areas needing sprinkler protection have protection. Systems are both wet and dry; conveyors have deluge protection. There are 217 control valves and 72 risers.

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Protection

Public

- The plant is 1 mile from a full-time paid fire department station.
- The city water system is a gravity-fed system supplemented by automatic booster pumps. Mains are 10" and well-gridded. Hydrants are dry-barrel, spaced every 300' along all public streets. There are hydrants near each of the 2 plant fire department connections.

Exposure

The north end of the property borders a privately owned forest with potential for fire during the late summer months. There are no other exposures.

Surveillance

Surveillance: Watchman w/ partial signaling system Surveillance Adequate? No

The location's fire alarm service consists of monitoring fire pump running alarms, suction tank level, and temperature. The signals are monitored in the power house control room. The control room is attended 24 hours/day, 365 days/year. No alarms are automatically transmitted off-sight or to the Coshocton full time fire department.

The contracted guard service (Moline Security Systems) makes recorded rounds which includes 45 locations throughout the mill. One round is done during the first shift (7 AM to 4 PM) and two rounds are performed per shift after 4 PM (2nd and 3rd shifts). During each round, special hazards are noted, the fire pump house is inspected, and eleven sprinkler riser pressure readings are taken.

Other Perils Flood, tornado, hurricane, earthquake, leakage, vehicle damage, vandalism, riot, settling, collapse. No comment indicates no exposure.

Survey Testing

- No water testing was possible this survey due to freezing weather. All fire system valves and risers were visited to confirm they are in service.

Plant Loss Control Programs

Normally, the sprinkler system valves are inspected and physically tried monthly. The fire pumps are run at churn weekly. Water flow alarms are tested monthly at the risers. The two-inch main drains are flowed monthly. Fire extinguishers are being visually inspected monthly but not necessarily serviced monthly, annually nor periodically (every 5 years hydro-tested) per corporate standards. The building and the operations are being inspected monthly for housekeeping and safety issues. Documentation has revealed that frequencies have not been maintained and improvements are necessary (Rec 02.01). The cutting and welding program is well maintained with documentation maintained within the maintenance department. Sparing practices and emergency repair plans are in written form and maintained periodically.

Flood Exposure

Flood Zone: C Flood Elevation: 754.0 Plant Elevation: _____ Flood PML _____ \$0

The mill is located in a Zone X unshaded and is not subject to flooding per FIRM Map 390089-0005B, Effective Date of 12/18/86. However, the north baled waste paper yard is located in a Zone AE (100 year Elevated Zone) where the area has been elevated or built-up to equal or be above the 100 year flood occurrence level (754 ft. ASL). Water damage (if any) would be minimal to any yard storage.

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Special Hazards

Roll Paper Storage

Location: Roll paper warehouse in the main building.

Description: Corrugated medium paper is banded, vertically stored in a standard array to a height of 12 ft. The ceiling height of the area is 21 ft. high.

Protection: The storage area has a dry pipe sprinkler system (System 4) designed to deliver 0.30 gpm/ft² over the most remote 2600 ft². The system meets minimum NFPA 13(1999), Table 7-8.2.2.3a and is adequate for this storage arrangement. Manual hose connections and handheld fire extinguishers are available throughout the storage area.

Deficiencies: The arrangement is satisfactory.

Solid Pile Paper Storage

Location: Northwest section of the yard.

Description: Presently there are about 4000 tons in solid piles, baled waste paper and corrugated flats stored to 12 ft. high. The storage is on a concrete pad and detached at least 75 ft. north of the Paper Machine #1 Building. The storage is divided into smaller piles with about 25 ft. between the piles. A 60 ft. x 30 ft. metal canopy was constructed over the loading dock for the 20 ft. pulper. The main power feed to the OCC System and pump house is located on an exposed cable tray immediately above the canopy.

Protection:

- The paper storage is detached 75 to 100 ft. feet from major structures.
- Manually operated, fixed, monitor nozzles have been provided along the north, west and east sides of the pile.
- The yard has an eight-inch fire main with hydrants every 300 feet, each with hose equipment.
- The combined city and mill water supplies can supply 4,021 gpm at 56 psi. The Fifth Street connection contributes significantly to the supply.
- The canopy is sprinklered using a dry pipe system (System 12) designed to provide a density of 0.15 gpm/ft² over the entire (1,956 ft²) area.

Deficiencies: The cable tray leading to the 460 & 5 KW MCC rooms should be fire proofed. See Recommendations 99.08.

Chip Piles

Location: Northeast section of the yard area.

Description: The chip piles are about 25 ft. high x 450 ft. long x 250 ft. wide, about 30,000 tons (seasonal inventory). The current inventory was estimated to be eight to nine days. Handling is by conveyors (stackers and reclaimers) and bulldozers. The chips are in two piles of unequal size. The piles are separated by a clear space of fifty feet. The piles are packed by heavy equipment. One pile is used while the other is being replenished. The piles expose all of the conveyors that transport the materials and the hogger building at the north side of the piles. The power house is less than fifty feet from the piles with the other mill buildings at 250 feet to the south.

Protection:

- The storage yard has an eight-inch fire main with hydrants every 300 feet. The hydrants have hose equipment. A manually operated monitor nozzle was installed at the north end of the baled paper yard. The combined city and mill water supplies can supply 4,021 gpm at 50 psi.
- The piles are detached from the bulk of the mill buildings.
- Hot work and no smoking policies are in force.
- Pile turnover is less than three months.

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Special Hazards

Chip Piles

- All tunnels handling chips have Class 2, Division 1 electrical devices.
- Adequate number of hydrants and fixed monitor nozzles available.
- Truck dozers equipped with engine compartment dry chemical extinguishing systems. Trucks are well maintained.
- Access roads are well maintained.

Deficiencies: None

Copeland Reactor

Location: In the Copeland building.

Description: Waste liquor produced from the pulping operation is disposed by burning in the Copeland reactor. The liquor is concentrated by passing through four evaporators. These evaporators are rising film type. The liquor begins as 7% solids. In the evaporators, the liquor is concentrated to 39-40% solids. The black liquor is pumped from the evaporators to a storage tank. From the storage tank, the liquor is pumped to the Copeland. The black liquor is pumped to the top of the reactor. Using a special gun, the black liquor is sprayed into the reactor vessel. In the middle of the reactor, there is a fluidized bed of a soda ash mixture. The Copeland uses a natural gas heater to maintain the fluidized bed at 1250 or 1290 F. When the liquor hits the bed, there is combustion. The combustion rate is controlled by how much liquor is introduced. The exhaust gases pass through a venturi type scrubber. The scrubber collects solid materials that are recycled back into the reactor. The gases and heat are sent to the RTO unit through a water wash precipitator to collect smaller solids. The pellets of soda carbonate are collected from the reactor. These pellets are recovered and recycled into the pulp mill. The control room is attended continuously.

A gas-fired RTO (regenerative thermal oxidizer) unit was installed in 1997 and was installed for pollution control. The material in the RTO reacts with the emissions from the Copeland to remove the remaining organic solids. The RTO is 60 ft x 27 ft x 16 ft high in size. It has a burner input rating of 28 million BTU/hr. It is designed to handle a maximum fume input of 6367 lb/hr that is comprised of carbon monoxide, volatile organic compounds, and traces of other materials. The RTO is self sustaining without the natural gas burner. The waste heat from the RTO is sent through a heat exchanger to warm the combustion air.

Should either the reactor or the RTO units encounter any disruptions in operations, black liquor could be diverted to on-site storage tanks capable of holding 7 days of liquor production.

Protection:

- The Copeland's fluidized bed heater natural gas train has the following trips: high and low fuel pressure, flame failure, and loss of combustion air. The Copeland is monitored for high temperature, liquid level, rise in pressure, rise in temperature, bearing failure, air interlocks that stop the liquor feed, and combustion air flow. The burners are interlocked to shutdown on loss of combustion air. Monthly routine preventive maintenance tasks are performed per manufacturer's guidelines and the reactor undergoes annual NDT testing. The refractory lining is inspected/replaced annually.
- The RTO unit is monitored with alarms and shutdowns for high chamber temperature, high inlet temperature to the wet electrostatic precipitator, high inlet temperature to the exhaust fan, high fan bearing temperature, high fan motor winding temperature, loss of electric power, loss of hydraulic power, low chamber temperature, loss of exhaust fan flow. High temperature alarms are provided at many points along the process. These shutdowns would divert the exhaust from the Copeland to atmosphere. The RTO natural gas train is monitored (with trips) for loss of flame, high or low gas pressure, and loss of combustion air flow. The scrubber has an interlock to stop the liquor flow to the scrubber, shuts down the reactor, and stops the flow of

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Special Hazards

Copeland Reactor

hot gases into the scrubber.

Deficiencies: The arrangement is satisfactory.

Power Boiler

Location: In the north end of the power house building.

Description: A 1982 Babcock and Wilcox steam boiler designed to produce 400,000 lb. steam/hr. at 950 psi at 850°F. The boiler burns 90% waste wood and 10% natural gas through four primary burners. The steam load for the mill ranges between 300-350,000 lb. steam/hr through three headers (65, 165 and 400 psi). This boiler is needed to operate the paper machines. The location has four other boilers in the old power house and those are maintained in a backup state because they do not have the capacity to operate the paper machines. Waste steam is used for all process heat for the two paper machines and associated operations.

Protection: The boiler has natural gas train with double air operated safety shutoff valves with a vent to atmosphere between, high and low fuel pressure supervision and interlocks, loss of forced and induced draft fans supervision and interlocks, high stack temperature supervision and interlock, UV flame detection on the igniters, interlocked to shut off the particular array, and high combustibles (gases) alarm. Shutoff valves close upon loss of combustion air. The boiler purge cycle during start-up is 30% for 5 minutes. The respective control is constantly attended.

Deficiencies: The arrangement is satisfactory.

Steam Turbine

Location: In the south end of the power house building.

Description: The location burns wood scrap to produce steam. The steam from the boiler is used to turn the turbine. The turbine generator is a 16 MW unit manufactured by GE. The unit generates about 45% of the mill's power needs. The remaining is purchase from AEP. The mill's power load averages between 27 and 30 MW. The connection to AEP's grid can supply the mill. If the location has the turbine out, AEP can make up the difference.

The unit is mounted on a concrete floor over a concrete basement area. The basement contains the service piping to the equipment, and the lubricating oil reservoir. The unit has its own oil reservoir below the generator. Hydraulic and lubricating oil systems are on the first floor of the Boiler House, one story below the turbine generator. The hydraulic system contains approximately 40-gallons of less hazardous synthetic hydraulic oil manufactured by Stauffer Chemical Company. The hydraulic system operates at approximately 1600 psi. The lubricating oil system is located next to the hydraulic tank. The hydraulic system has a capacity 1,450-gallons of oil. This oil is pumped to the turbine bearings at pressures of 20 to 30 psi. Oil piping is single wall steel. Steam piping exists in the basements.

Protection:

- Automatic sprinklers are provided below the operating floor of the turbine, along the perimeter of the unit using sprinkler System 6. The hydraulic reservoir area has sprinklers designed to deliver 0.15 gpm/ft² over the remote 2500 ft². A hydraulic review of the sprinkler system showed that with available water supply, the system can deliver 0.30 gpm/ft² over the reservoir area.
- The turbine bearings have been provided with a manual water spray system. The bearings have UV/IR flame detection and Fenwal heat detectors with alarm to the control room. There are two nozzles that can deliver 30 gpm to the bearings; the control valve for the spray system is in the control room. The operators have been trained how to operate the water spray

[Fire Protection Solutions 668 N. Coast Highway Ste 518, Laguna Beach, CA 92651](#)

Special Hazards

Steam Turbine

system.

- The lubricating oil system has a carbon dioxide system as well as ceiling mounted wet pipe sprinkler protection. The system is released by a heat detector above the tanks. The carbon dioxide protection system is monitored by the control panel in the main control room. A connected reserve supply of carbon dioxide is provided and can be activated from within the control room.
- The hydraulic reservoir area has a concrete dike to contain fluid spills.
- The control room is constantly attended. Turbine/Generator instrumentation includes trips for manual emergency shutoff, high vibration in bearings, low lube oil pressure, high temperature in generator windings, turbine over speed, generator high voltage, generator loss of synchronization, thrust bearing position, and excess steam pressure and temperature. Alarms include oil pumps failure (one steam driven and one electric), excess temperature at oil coolers inlet and outlet, excess oil temperature at bearings, and water in oil cooler.
- The turbine was rebuilt 1998.

Deficiencies: The arrangement is satisfactory.

Hydraulic Systems

Location: Throughout the paper machine buildings.

Description: The two paper machines are lubricated by enclosed systems. Paper machine 1 has a 5,000-gallon tank. The tank is in the basement area below the machine. Paper machine 2 has a 1,000-gallon oil tank on the paper machine floor. The oil tank and piping are under the sprinklered machine hood. On the paper machine floor by the paper winders, there are 50-gallon oil tanks. Hydraulic systems have welded steel schedule 80 pipe for the equipment supply lines. The remaining oil systems were reported to have tanks with capacities less than 100 gallons.

Protection:

- The oil tank areas for both paper machines are sprinkler protected by extended heads directly over their immediate areas.
- The No. 1 Paper Machine has containment around its lube and hydraulic tanks. The No 2 Paper Machine does not have containment due to its tank position to its dryer section.
- The No. 1 Paper Machine Winder hydraulic system is protected with automatic sprinklers having water shields.
- The systems either have low tank level cutouts for the pumps or have a low pressure cutout.
- Manual hose stations are readily available in all areas of concern and portable fire extinguishers strategically mounted throughout.
- Good housekeeping was noted in the oil tank areas.

Deficiencies: See recommendation 99.07.

Digesters

Location: In the pulp mill building.

Description: From the wood chip yard, chips are fed through screens in the screen building to divide the chips by size. From the screen building, chips are moved by conveyor to a chip silo. From the silo, the chips are moved by screw conveyor to the top of the pulp mill building. The chips are washed before being fed to one of two forty-two-inch diameter digesters. The digesters are Black and Clawson continuous digesters utilizing the semi-chemical process. The digesters are heated with 165 psi steam. In the digesters, white liquor (sodium hydroxide and sodium sulfide)

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Special Hazards

Digesters

is added to produce pulp. From the digesters, the pulp is processed through two blow through tanks, French presses, and pulp washing units to remove spent liquor. From the digesters, the spent liquor (used process chemicals) and wood fibers are sent to a blow tank, then transferred to pulp washers. The spent liquors are separated from the pulp and sent to a storage tank. From the washers, the pulp is pumped to the refiners. The pulp stock is moved to the primary tank. From the tank, the pulp is fed to the paper machines. This location blends wood pulp and recycled corrugate on a 60-40 ratio, depending upon the quality of the available wood and corrugated waste paper.

Protection: The digester area has been sprinklered. The sprinkler System 11 protects this building and is hydraulically designed to deliver 0.20 gpm/ft² over 3576 ft². NDT readings are conducted annually on the digesters. The digester screws are replaced every other outage. The digesters are scanned annually. Rupture disks and pressure relief devices are provided on the digesters and the steam supply lines. The Chip Silo is its bucket conveyor are sprinkler protected using a dry pipe system.

Deficiencies: The arrangement is satisfactory.

Paper Machines

Location: Buildings number 1 and 2.

Description: Two machines produce 30 lb. to 40 lb. medium paper.

- Paper machine 1 is 169 inches wide. The machine has the speed to produce 2,250 FPM. Both machines are direct driven by electric motors (all under 750 hp). Machine 1 was installed above a concrete basement.
- Machine 2 was installed at ground floor level. Machine 2 is 158 in. wide with a paper speed of 1,725 FPM.
- The dry ends of the machines are enclosed with metal hoods. At the top of the machine 2, the excess heat is exhausted directly outdoors. For machine 1, the excess heat is directed outdoors to the side by five metal ducts. The paper dryer exhaust ducts are about 18 feet long and are connected directly to the exhaust metal hood.
- Paper Machine 1 has a hydraulic tilting systems on its winder and rewinder machines. The brake system for Paper Machine 1 uses an electric drive motor which would shut down upon loss of hydraulic pressure. Paper Machine 2 uses a mechanical/pneumatic system to engage its brake pads onto the existing spool. Sparks resulting from a spool and brake system out-of-sequence occurrence would be limited to the operating floor area only as no floor penetrations exist leading to the broke pit and no hydraulic lines are present.

Protection: For both paper machines, there are automatic dry pipe sprinklers within the dryer hoods, exhaust ducts, and in broke pits. The No. 1 Paper Machine is supplemented with a deluge system (6 heads) at the end of the dryer section near the hydropulper area. The remaining areas have portable fire extinguishers and are accessible by at least two manual hose stream connections. Sprinklers are provided over the hydraulic reservoirs (lube & hydraulic) for the No. 1 Paper Machine with adequate containment provided for each tank. The hydraulic reservoir for the No. 1 Paper Machine winder is about 300 gallons and is protected by ceiling sprinklers (at 30 ft. level) and extend lines where heads have water shields. The No. 2 Paper Machine has a pneumatic operated press section and has automatic sprinklers over its lube tank; however, containment is lacking. The winder for the No. 2 Paper Machine has a hydraulic reservoir less than 5 gallons. The dryer drums are routinely inspected annually such that all adhere to a 5 year schedule. Good housekeeping was noted in the broke pit areas.

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Special Hazards

Paper Machines

Deficiencies: Sprinklers should be extended to above the dryer hoods for both machines. See Recommendations 99.07 and 01.01.

Motor Control Centers

Location: Throughout the facility.

Description: The walls of the centers are constructed of either light metal or concrete block. The rooms have low combustible loading. Consoles have substantial quantity of wiring inside. Wiring is either in rigid conduit or rated cable. As a part of the overall electrical replacement project for the mill, the centers are being rebuilt and sealed.

Protection: Nearly 95% of all the MCC have adequate cut-off and 1½ hour rated entry fire doors. The MCC rooms in the Power House are equipped with automatic smoke detection transmitting to the constantly attended Power House Control Room. The areas have portable fire extinguishers.

Deficiencies: See Recommendation 98.05. The 13.8 MW room should have a CO2 extinguishing system. The extinguishing system should be designed to have a main and reserve supply of extinguishing agent. See recommendation 99.12.

Conveyor Belts

Location: Near the chip piles.

Description: There are four conveyors (rubber belt type). The conveyors connect the wood chip piles to the hogger, screening building, and the power house.

Protection: There is a dry pipe type sprinkler system for the belts on the hogger building conveyor. The conveyor motors are monitored for zero speed and are interlocked to shutdown upon sprinkler activation.

Deficiencies: The arrangement is satisfactory.

Combustible Liquid Storage

Location: In a detached mechanical storage building.

Description: About 50 drums of various lubrication and hydraulic oils are stored in the building. The building is over 100 feet from the production mill.

Protection: The building is not sprinklered. There are fire extinguishers and hydrant houses in the area.

Deficiencies: The arrangement is satisfactory.

Flammable Liquid Storage

Location: Near the wet end of the No. 2 Paper Machine on the 1st floor.

Description: In a 6 ft. x 8 ft. cut off room, there are about 10-15 cases of flammable enamel paints and solvents. The materials are in one gallon or less metal containers. The room is used for storage and apparently some dispensing.

Protection:

- The room is cut-off with masonry walls and ceiling, and steel entry door.
- There is a single sprinkler, fed by a 1 inch pipe located at the ceiling level.
- The room has a sunken floor adequate to provide containment.

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Special Hazards

Flammable Liquid Storage

- Two UL Listed Flammable Liquids cabinets are located within the room.
- There are fire extinguishers in the area.

Deficiencies: No deficiencies at this time.

Loss Estimates

Estimated Values: PD: \$350,000,000 BI: \$35,000,000 TIV: \$385,000,000

Property Damage Estimates

PML PD:

Assume a fire under Paper Machine No. 2 (larger of two paper machines which are on separate ends of the mill) involving broke and hydraulics with damage to the entire dry end resulting in 15% damage to the machine. No. 2 Machine is 169" wide x \$200,000/inch x 0.15 (dryer section) = \$5,070,000. The fire would spread to adjoining storage area and involve \$5,000,000 of stock, equipment, and building damage. The total loss would then be \$10,000,000 or $10/208 = 4.8\%$.

MFL PD:

In the remote occurrence of the Copeland Reactor experiencing an explosion, its replacement and peripheral damage to adjacent equipment would constitute a maximum foreseeable loss of \$60,000,000.

Business Interruption Estimates

PML BI:

The paper machine could take 3 months to repair, depending upon the number of dryer rolls damaged. There are 2 paper machines, so there would be a 50% interruption for 3 months = $0.50 \times 0.25 \times 52,601,000 = \$6,575,125$ or $6.6/52.6 = 12.5\%$.

MFL BI:

The replacement of the Copeland Reactor would require at least 6 months. This equate to \$15,000,000.

Estimates Summary

<u>Probable Maximum Loss</u>		<u>Maximum Forseeable Loss</u>	
PDPML:	\$10,000,000	PD MFL:	\$60,000,000
BIPML:	\$6,575,000	BI MFL:	\$15,000,000
Total Probable Maximum Loss:	\$16,575,000	Total Maximum Forseeable Loss:	\$75,000,000

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Sprinkler System Design

SysNo	Building	Calculated Density				Available Density			
		Density/Area (gpm/sq.ft.)	(sq.ft)	BOR Demand (gpm)	(psi)	EndHd - Avg	BOR Demand		
4	<u>Main Building</u>	0.30	2600	1,629.0	82.0	0.38	0.79	2053	121
	Type: <u>Dry</u>	BOR elevation: <u>0</u>	Line Slope: <u>0.00</u>	Flow Date: <u>7/16/02</u>					
	PipeSchedule: <u>Tree/hydraulic</u>	Head Height: <u>20.0</u>	Head-to-head: <u>10.0</u> ft.	Static PSI: <u>150</u>					
	SprinklerType: _____	Sprinkler K: <u>8.0</u>	Line-to-Line <u>10.0</u> ft.	Flow GPM: <u>4021</u>					
		Temperature: <u>286</u>	Area Spacing: <u>100.0</u> sq.ft.	Resid PSI: <u>50</u>					
	Column Region:								
	Building Region: <u>Shipping Rail Dock located between Paper Machine Buildings 1 & 2.</u>								
6	<u>Power House</u>	0.15	2500	490.0	46.0	0.30	0.39	974	143
	Type: <u>Wet</u>	BOR elevation: <u>0</u>	Line Slope: <u>0.00</u>	Flow Date: <u>7/16/02</u>					
	PipeSchedule: <u>Extra Hazard</u>	Head Height: <u>19.0</u>	Head-to-head: <u>9.1</u> ft.	Static PSI: <u>150</u>					
	SprinklerType: _____	Sprinkler K: <u>5.6</u>	Line-to-Line <u>9.8</u> ft.	Flow GPM: <u>4021</u>					
		Temperature: <u>286</u>	Area Spacing: <u>89.2</u> sq.ft.	Resid PSI: <u>50</u>					
	Column Region:								
	Building Region: <u>Below operating floor of Steam Turbine Generator.</u>								
11	<u>Pulp Mill</u>	0.20	3576	920.0	48.0				
	Type: <u>Dry</u>	BOR elevation: <u>0</u>	Line Slope: <u>0.00</u>	Flow Date: _____					
	PipeSchedule: <u>Tree/hydraulic</u>	Head Height: <u>39.0</u>	Head-to-head: <u>10.0</u> ft.	Static PSI: <u>0</u>					
	SprinklerType: _____	Sprinkler K: <u>5.6</u>	Line-to-Line <u>10.0</u> ft.	Flow GPM: <u>0</u>					
		Temperature: <u>165</u>	Area Spacing: <u>100.0</u> sq.ft.	Resid PSI: <u>0</u>					
	Column Region:								
	Building Region: <u>Pulp Mill and Washer building</u>								
12	<u>Baled Waste Canopy</u>	0.15	1956	519.9	50.9	0.23	0.41	800	101
	Type: <u>Dry</u>	BOR elevation: <u>0</u>	Line Slope: <u>0.00</u>	Flow Date: <u>12/5/01</u>					
	PipeSchedule: <u>Tree/hydraulic</u>	Head Height: <u>23.0</u>	Head-to-head: <u>10.0</u> ft.	Static PSI: <u>140</u>					
	SprinklerType: _____	Sprinkler K: <u>8.2</u>	Line-to-Line <u>12.0</u> ft.	Flow GPM: <u>716</u>					
		Temperature: <u>286</u>	Area Spacing: <u>120.0</u> sq.ft.	Resid PSI: <u>108</u>					
	Column Region:								
	Building Region: <u>Northeast corner of the Paper Machine No. 1 Building</u>								

Water Supply Description

Bruton Town, SI, Location 101

Supply has backflow preventer? Yes

Two 8" connections to two public mains: one 8" in Fourth Street and a 10" in Fifth Street. Public supplies connect to the plant's 8 inch underground main system, which is augmented by two fire pumps taking suction from a single 400,000 gallon tank which has been de-rated (for structural reasons in 1999 by adding 2nd overflow) to 250,000 gallons. There is a devoted 6 inch fill line connected to the 8 inch public water main in 4th Street.

<u>Description of flow</u>	<u>Gage Location</u>	<u>Static/Res PSI</u>	<u>GPM</u>	<u>Flow Location</u>	<u>Date/Observer</u>	
Both city connections and pumps	Pump house	130	70	4,226	Five yard hydrants	6/16/99 EA
Fourth Street connection	Pump house	108	43	1,234	Pump test header	6/16/99 EA
Electric Only without City Supplies. Diesel truned off. Valve North of Copeland Bldg and 4th Street Pit Closed	R-6 in Power House	125	25	2,482	Hydt at SE Truck Dump and Hydt East of Chip & Screening Bldg.	7/11/01 FPS/SMG
All City Connencions Open, Both Fire Pumps Operating, and All Valve Open	ASR 8	125	56	3,808	H.11	7/11/01 FPS/SMG
Both Fire Pumps Operating without City Supplies. Valve North of Copeland Bldg and 4th Street Pit Closed	R-6 in Power House	125	34	2,734	Hydt at NW Truck Dump and Hydt East of Chip & Screening Bldg.	7/11/01 FPS/SMG
5th Street Conn, And Both Fire Pumps Operating. Valve North of Copeland Bldg Closed	R-6 in Power House	125	55	3,776	Hydt at NW Truck Dump and Hydt East of Chip & Screening Bldg.	7/11/01 FPS/SMG
4th Street Only And Upstream of City Pit. 8 inch pipe	Riser in Roll Stge Building	100	90	1,232	Hydt along 4th Street	7/11/01 FPS/SMG
Public supply	ASR 32	100	85	2,323	H.10	7/11/01 FPS/SMG
5th Street Conn, And Both Fire Pumps Operating. Valve North of Copeland Bldg Closed	Riser 6 in Power House	150	50	3,908	Hydt at NW Truck Dump and Hydt East of Chip & Screening Bldg.	7/16/02 FPS/SMG
4th Street Conn, And Both Fire Pumps Operating.	Riser 6 in Power House	150	20	2,595	Hydt at NW Truck Dump and Hydt East of Chip & Screening Bldg.	7/16/02 FPS/SMG
Both Fire Pumps Operating without City Supplies. Valve North of Copeland Bldg and 4th Street Pit Closed	Riser 6 in Power House	150	20	2,416	Hydt at NW Truck Dump and Hydt East of Chip & Screening Bldg.	7/16/02 FPS/SMG
All City Connencions Open, Both Fire Pumps Operating, and All Valve Open	ASR 7	150	50	4,021	H.11	7/16/02 FPS/SMG

Fire Pump Information

Pump Number: **1** **Electric** Rated GPM: **1500** Rated PSI: **100** Rated RPM **1760**

Pump Suction From: 250,000 gallon tank

<u>Flow Tests</u>					<u>RPM correctec PerCent Rated</u>		Cond'n	Date	Observer
GPM	Disc.	Suct.	Net	RPM	GPM	PSI			
1512	107	4	103				G	6/22/98	ESIS
1504	104	4	100				G	6/16/99	ESIS
0	120	7	113	1789	0%	109%	G	7/11/01	FPS/SMG
757	116	7	109	1785	50%	106%	G		
1373	105	6	99	1780	91%	97%	G		
1847	90	5	85	1776	122%	83%	G		
2183	75	3	72	1760	146%	72%	G		
0	120	6	114	1760	0%	114%	G	7/16/02	FPS/SMG
757	120	6	114	1760	50%	114%	G		
1373	105	6	99	1760	92%	99%	G		
1918	95	5	90	1760	128%	90%	G		
2518	90	3	87	1760	168%	87%	G		

Fire Pump Information

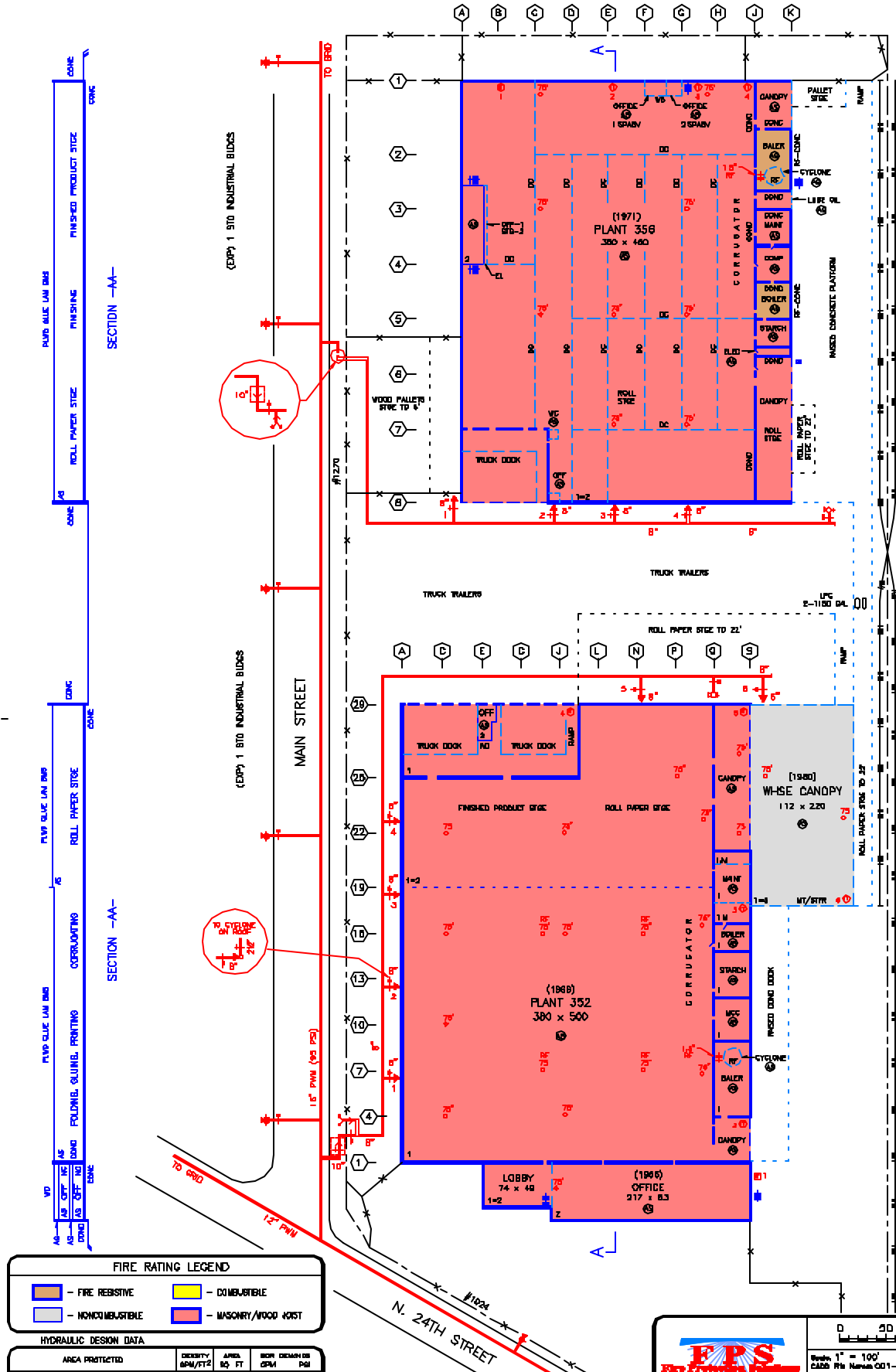
Pump Number: **2** **Diesel** Rated GPM: **1500** Rated PSI: **100** Rated RPM **1760**

Pump Suction From: 250,000 gallon tank

<u>Flow Tests</u>					<u>RPM correctec PerCent Rated</u>		Cond'n	Date	Observer
GPM	Disc.	Suct.	Net	RPM	GPM	PSI			
1480	104	4	100	1750	99%	101%	G	6/22/98	ESIS
1504	101	1	100	1786	99%	97%	G	6/16/99	ESIS
0	105	5	100	1827	0%	93%	G	7/11/01	FPS/SMG
735	115	5	110	1811	48%	104%	G		
1310	105	3	102	1800	85%	98%	G		
1649	90	1	89	1794	108%	86%	G		
2062	70	1	69	1784	136%	67%	G		
0	125	6	119	1827	0%	110%	G	7/16/02	FPS/SMG
757	120	6	114	1811	49%	108%	G		
1377	105	4	101	1800	90%	97%	G		
1993	95	3	92	1794	130%	89%	G		
2425	90	2	88	1784	159%	86%	G		

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FIRE RATING LEGEND

	- FIRE RESISTIVE		- COMBUSTIBLE
	- NONCOMBUSTIBLE		- MASONRY/WOOD JOIST

HYDRAULIC DESIGN DATA

AREA PROTECTED	DENSITY GPM/FT ²	AREA SQ. FT.	WATER DEMAND GPM	RES. DEMAND PSI
PLANT 352				
SYSTEM 1 (COLS J-Q/18-25)	0.35	2700	998.7	40.5
SYSTEM 2 (COLS K-L/25-28)	0.35	2700	1048.5	46.6
SYSTEM 3 (COLS Q-S/21-28)	0.35	2700	1003.5	31.6
SYSTEM 4 (WHSE CANOPY)	0.328	3000	1074.1	41.5
PLANT 356				
SOUTH 3 BAYS (200') EXCLUDING WEST 2 BAYS (80')	0.36	4500	1730.8	58.2
REMAINING AREAS	0.26	3000	826.6	87.0

FPS

Scale: 1" = 100'

CADD File Name: 001-0001

Drawn by: FPS

Print/Plot Date: SEPTEMBER 19, 2000

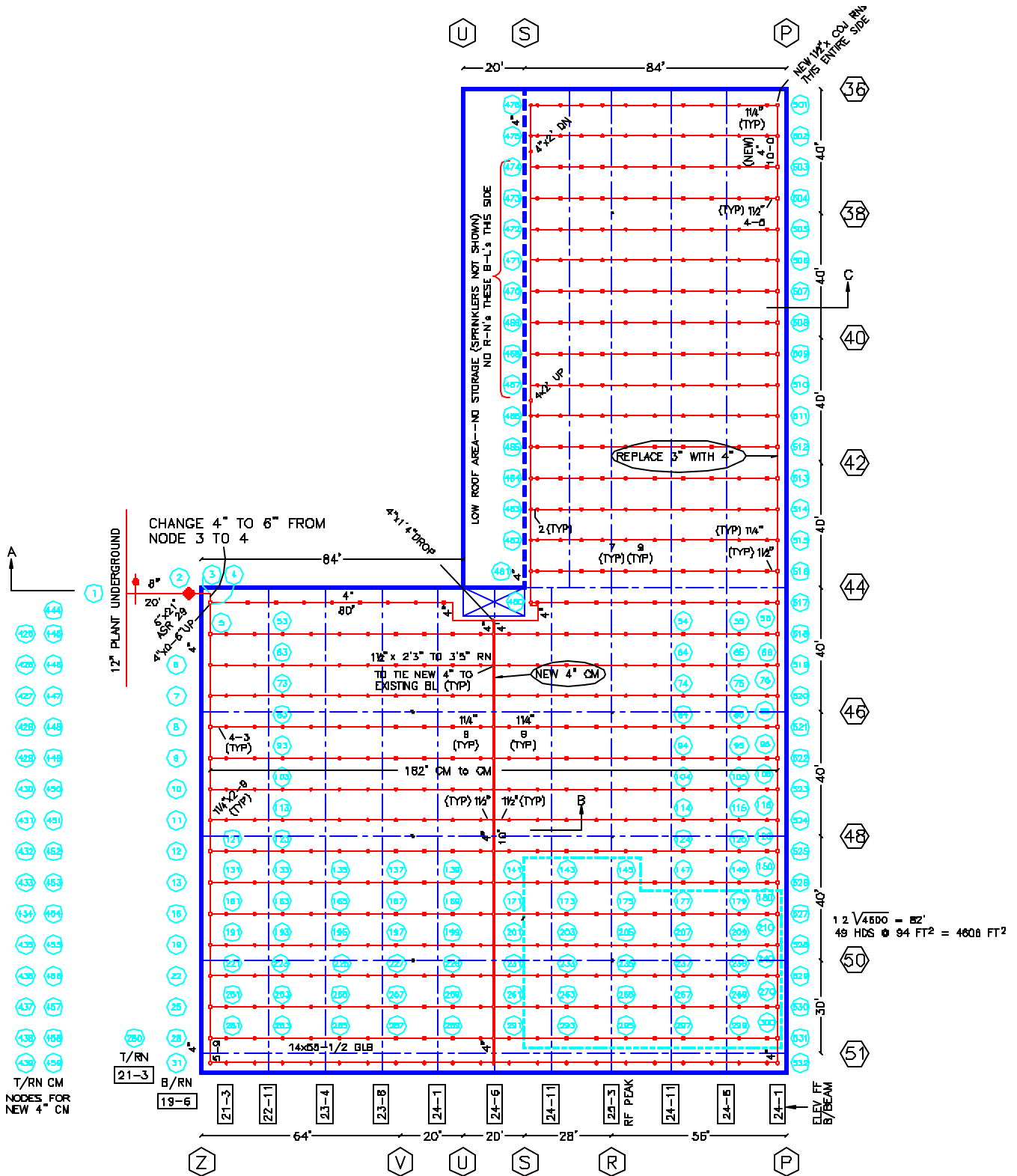
Revised Date: SEPTEMBER 6, 2000

ALL PRODUCTS MANUFACTURING, INC.

LOCATION 352 & 356

ALLENTOWN, CA

THIS PLAN SHOULD BE MADE AVAILABLE ONLY TO AUTHORIZED PERSONS IF NOT PREPARED FOR USE BY THE PERSONS FOR FIRE PROTECTION ANALYSIS ONLY AND IS NOT INTENDED TO BE AN EXACT REPRODUCTION OF THE FACILITY.



- 1 ALL DIMENSIONS ARE FROM 11/15/78 FINNELL DRAWING NO.1, CONTRACT B6333748.
- 2 COLUMNS 44-51: HEAD SPACING IS 8.4' x 10' = 84 FT² (AVERAGE)
3. COLUMNS 36-44: HEAD SPACING IS 8.4' x 10' = 84 FT² (AVERAGE)
4. EXISTING 3" & 4" PIPE IS SCHEDULE 10, PIPE 2" AND SMALLER IS SCHEDULE 40.
5. HEADS ARE ON AVERAGE 0'-8" SPRING-UPS EXCEPT BAY 44-46 WHICH HAS 1'-8" SPRING
6. EXISTING SPRINKLERS TO REMAIN, 1/2", 28&F.

222 HYDRAULIC CALCULATION NODE @ UPRIGHT 1/2" SPRINKLER ON 1" BRIC-UP

18-5 ELEVATION ABOVE FINISHED FLOOR

RN RISER NIPPLE ◊ CM CROSS MAIN
 BL BRANCH LINE B/RN BOTTOM OF RISER NIPPLE
 T/RN TOP OF RISER NIPPLE CDJ CUT ON JOB
 BDR BASE OF RISER

FOR REINFORCING TO PROVIDE 0.30/48DO WITH A DEMAND OF 1542 GPM @ 122 PSI BDR

- 1 ADD 4" GALVANIZED SCHED 10 TO TIE THE BL TOGETHER FROM COLS 44 TO 51
- 2 HANG NEW 4" TIGHT TO BOTTOM OF EAST-WEST CLU LAM BEAM USING EITHER:
 1. ADJUSTABLE SWIVEL RING ON MIN. 3/8" ROD WITH 1/2" x 3" LAG SCREW, DR
 2. U-HOOKS WITH 1/2" x 3" LAG SCREW AT EACH FLANGE.
3. HANGER FASTENERS TO BE NO CLOSER THAN 3" FROM BOTTOM OF CLU-LAM. FASTENER HOLES TO BE PRE-DRILLED
4. PROVIDE ONE HANGER BETWEEN EACH TWO BRANCH LINES
5. FITCH 4" PIPE 1/4" PER 10' DOWN TOWARDS THE SOUTH WALL AND PROVIDE DRAIN VALVE ON SOUTH WALL
6. TIE NEW 4" INTO EXISTING BL WITH 1-1/2" SCHEDULE 10 RISER NIPPLE WITH LENGTH TO VARY FROM 2'-3" TO 3'-5"
7. CHANGE EXISTING BL PIPE FROM 1-1/4" TO 1-1/2" ON EITHER SIDE OF THE NEW CM TIE-IN
8. NO REDUCING BUSHINGS ARE TO BE USED. USE REDUCER COUPLINGS AND FITTINGS ONLY.
9. CHANGE EXISTING 3" EAST CROSS MAIN (CM) TO 4" GALVANIZED SCHEDULE 10.
10. TIE THE NEW EAST 4" CM INTO BL USING 1-1/2" SCHEDULE 10 ALL THE WAY TO THE FIRST SPRINKLER.