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**FUNCTIONAL DESCRIPTION
OF OPERATION**

56-1100 56-1150
56-1110 56-1160
56-1120 56-1170
56-1130 56-1180
56-1140

DAISHOWA AMERICA CO. LTD.

Port Angeles, Washington
Recycled Paper Handling
Order No. 910315 -30

**FINAL DRAWING
CORRECT FOR CONSTRUCTION**

Tim M. Bartel
Lamb-Grays Harbor
Electrical Project Engineer

56-1100

FOR SIMONS/CLIENT REVIEW

H.A. SIMONS LTD.

P.3995C

FUNCTION DESCRIPTION 001 OF 026

--- DAISHOWA AMERICA CO. ---
PORT ANGELES - RECYCLED PAPER

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REVIEWED

FOR GENERAL COMPLIANCE WITH THE DESIGN CONCEPT
OF THE PROJECT AND CONTRACT DOCUMENTS.
NO RESPONSIBILITY IS ASSUMED FOR CORRECTNESS
OF DIMENSIONS OR DETAILS.

BY DATE

- NOT ACCEPTABLE - NOT RELEASED FOR PRODUCTION - REVISE AND RESUBMIT.
- SUBJECT TO REVISION AS INDICATED, RELEASED FOR PRODUCTION - SUBMIT CERTIFIED DRAWINGS.
- NO EXCEPTION TAKEN - RELEASED FOR PRODUCTION - SUBMIT CERTIFIED DRAWING.
- CERTIFIED DRAWING ACCEPTED - RELEASED FOR PRODUCTION.
- NOT REQUIRED BY SIMONS FOR ENGINEERING DESIGN.

FUNCTIONAL DESCRIPTION

DAISHOWA AMERICA
PORT ANGELES, WA

FINAL REV. 1
DATE: JUNE 6, 1991

LAMB ORDER NUMBER 910315

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FUNCTIONAL DESCRIPTION

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The Functional Description is used by both Lamb and our customers as a general guideline for the design of the system sold. Each machine supplied for the Daishowa America project is briefly described and the function of the operator controls are explained.

DESIGN & PRODUCTION DATA

Production: 242ADST/24 hours

Bale size: Length: 84 inches
Width: 44 inches
Height: 30 inches
Weight: 2170 lbs.

Continuous Feed Pulper:

All loose materials such as phone directories, magazines, and broken waste bales are handled on the old directory conveyor.

The operators can vary the bale and loose material mix by adjusting the rate at which they load the conveyors. The operators are required to maintain the production rate by providing an adequate supply of bales and loose material to the system.

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SYSTEM OVERVIEW:

Loose Materials

Loose materials such as phone directories, magazines, and broken waste bales are manually loaded onto the moving -001 Old Directory Conveyor. The -002 Product Spreader helps maintain a uniform level of material on the conveyor. The loose material is conveyed and dropped onto the -010 Pulper Feed Conveyor.

Bale Handling

Bales are manually loaded onto the -004 Feed Conveyor. The baling wire, holding the individual bales together, must be orientated parallel to conveyor travel. The operator is required to pull a rope switch to initiate conveying the bales into the dewiring station. The -005 Wire Wolf Dewiring station removes the baling wire and coils it into a ball.

Once the bales have been dewired, they are automatically conveyed by the -007 Baled Paper Conveyor to the Bale Breaker. The bales are dropped into a chute feeding the Bale Breaker. The -007 Baled Paper Conveyor's flow rate will be controlled by level sensors in the feeding chute. The broken bales will drop from the Bale Breaker to the -010 Pulper Feed Conveyor.

The -010 Pulper Feed Conveyor will automatically convey the material up an incline to the -012 Scale Conveyor. The -011 Load Leveler will help maintain a uniform level of material on the -010 Pulper Feed Conveyor. The conveyor speed will vary in order to maintain a specified material feed rate. The conveyors will stop if the level of material in the pulper infeed chute is too high.

The -012 Scale will provide an isolated 4-20ma signal to the PLC, as a measure of material weight being fed to the pulper. An interface to the DCS, through a G.E. CCM3 communication card, will allow the DCS to monitor and set the material feed rate. A low mass flow alarm from the scale will signal if material flow drops below an acceptable level.

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Functional Design Number: 257-01

Functional Title: OLD DIRECTORY CONVEYOR

-001 OLD DIRECTORY CONVEYOR

CONVEYOR GENERAL OPERATION

Loose materials such as phone directories, magazines, and broken waste bales are manually loaded onto the moving -001 Old Directory Conveyor. The loose material is automatically conveyed and dropped onto the -010 Pulper Feed Conveyor. A full length rope switch is provided for safety along the north side of the -001 Old Directory Conveyor.

CONVEYOR CONTROLS

MANUAL/AUTO, amber illuminated, normally open pushbutton. This control is located at CS-A.

In "AUTO", the light will glow amber, and the Conveyor will operate as described above without any operator intervention. If the light is flashing, the machine is in "MANUAL" mode; a push of the button will switch the mode to "AUTO".

In "MANUAL", the light will flash, and the operator may use the "FORWARD" pushbutton to jog the Conveyor forward. If the light is on solid, the machine is in "AUTO" mode; a push of the button will switch the mode to "MANUAL". If the safety stop rope, mounted on the north side of the conveyor is pulled, the mode will return to "MANUAL" mode, stopping the conveyor.

FORWARD, normally open pushbutton located at CS-A.

When the "FORWARD" pushbutton is engaged, and if "MANUAL" mode is selected, the Conveyor will run in the forward direction.

STOP, a red, maintained, mushroom head pushbutton. This control is located at CS-A.

When the STOP button is pushed, the Conveyor will stop and remain stopped, until the STOP button is reset (pulled).

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Functional Design Number: 251-02

Functional Title: PRODUCT SPREADER

-002 PRODUCT SPREADER

SPREADER GENERAL OPERATION

The manually adjustable Spreader helps maintain a uniform level of material on the conveyor. The operator is required to set the level for this machine.

SPREADER CONTROLS

No controls are required for this station.

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Functional Design Number: 189-05

Functional Title: ENTRY/EXIT STATION

-003 EXIT/ENTRY STATION

EXIT/ENRTY STATION GENERAL OPERATION

The -003 Exit/Entry Station provides a physical barrier to protect the -004 Feed Conveyor from trucks that load the baled paper onto it.

ENTRY/EXIT STATION CONTROLS

No controls are required for this station.

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LAMB ORDER NUMBER 910315

Functional Design Number: 257-01

Functional Title: CHAIN CONVEYOR

-004 CHAIN CONVEYOR

CONVEYOR GENERAL OPERATION

The bales are manually loaded onto the -004 Feed Conveyor. The baling wire, holding the individual bales together, must be orientated parallel to conveyor travel. The bales must be properly set on the conveyor to insure that they do not tip over between the conveyor chains. Up to three bales may be placed on the Chain Conveyor at once. The operator is required to pull a rope switch to initiate conveying the bales into the dewiring station.

CONVEYOR CONTROLS

MANUAL/AUTO, amber illuminated, normally open pushbutton. This control is located at CS-A.

In "AUTO", the light will glow amber, and the Conveyor will operate as described above without any operator intervention. If the light is flashing, the machine is in "MANUAL" mode; a push of the button will switch the mode to "AUTO". (NOTE: once the conveyor has run its full length, the conveyor will stop until it is loaded with bales and the rope switch is pulled.)

In "MANUAL", the light will flash, and the operator may use the "FORWARD" or "REVERSE" pushbutton to run the Conveyor. If the light is on solid, the machine is in "AUTO" mode; a push of the button will switch the mode to "MANUAL".

FORWARD, normally open pushbutton located at CS-A.

When the "FORWARD" pushbutton is engaged, and if "MANUAL" mode is selected, the Conveyor will run in the forward direction.

REVERSE, normally open pushbutton located at CS-A.

When the "REVERSE" pushbutton is engaged, if the "MANUAL" mode is selected, the Conveyor will run in the reverse direction.

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-004 CHAIN CONVEYOR (continued)

STOP, a red, maintained, mushroom head pushbutton. This control is located at CS-A.

When the STOP button is pushed, the Conveyor will stop and remain stopped, until the STOP button is reset (pulled).

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Functional Design Number: 150-07

Functional Title: WIRE WOLF-DEWIRING

-005 WIRE WOLF

WIRE WOLF GENERAL OPERATION

The baled paper automatically enters the Wire Wolf-Dewiring station and stops. The Wire Wolf-Dewiring machine cycles and pulls the baling wire from the baled paper. The wire is rolled up into a coil and dispensed. Once the baling wire has been removed from the bale, the bale is conveyed to the -007 Baled Paper Conveyor.

WIRE WOLF CONTROLS

MANUAL/AUTO, amber illuminated, normally open pushbutton. This control is located at CS-A.

In "AUTO", the light will glow amber, and the Wire Wolf will operate as described above without any operator intervention. If the light is flashing, the machine is in "MANUAL" mode; a push of the button will switch the mode to "AUTO".

In "MANUAL", the light will flash, and the operator may use the "FORWARD", "REVERSE", "CYCLE" or "RESET" pushbutton to run the Wire Wolf. If the light is on solid, the machine is in "AUTO" mode; a push of the button will switch the mode to "MANUAL".

CYCLE, normally open pushbutton. This control is located at CS-A.

If in "MANUAL" mode, pressing the "CYCLE" pushbutton will cycle the Wire Wolf-Dewiring machine.

RESET, normally open pushbutton. This control is located at CS-A.

Pressing the "RESET" pushbutton aborts the machine cycle and place the Wire Wolf into "MANUAL" mode. Pressing the "RESET" button a second time homes all devices and enables the operator to cycle the machine.

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-005 WIRE WOLF (continued)

FORWARD, normally open pushbutton located at CS-A.

When the "FORWARD" pushbutton is engaged, and if "MANUAL" mode is selected, the Wire Wolf's chain conveyor will run in the forward direction.

REVERSE, normally open pushbutton located at CS-A.

When the "REVERSE" pushbutton is engaged, if the "MANUAL" mode is selected, the Wire Wolf's chain conveyor will run in the reverse direction.

STOP, a red, maintained, mushroom head pushbutton. This control is located at CS-A.

When the STOP button is pushed, the Wire Wolf-Dewiring machine will stop and remain stopped, until the STOP button is reset (pulled).

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Functional Description: 010-02

Functional Title: HYDRAULIC UNIT

-006 HYDRAULIC UNIT

HYDRAULIC UNIT GENERAL OPERATION

The -006 Hydraulic Unit provides hydraulic pressure for the -005 Wire Wolf Dewiring machine.

HYDRAULIC UNIT CONTROLS

PULL START-PUSH STOP, red illuminated three position mushroom head pushbutton (momentary up, maintained in the middle and down). This control is located at CS-A

When the "PULL START-PUSH STOP" button is pulled up, the button will illuminate and the Hydraulic Unit motor will start. As long as hydraulic pressure is required, the motor will continue to run. If hydraulic pressure is not required, the Hydraulic Unit motor will stop after a two minute time delay. When hydraulic pressure is again required, the selected motor will restart automatically.

When the "PULL START-PUSH STOP" button is pushed, the light will extinguish and the Hydraulic Unit motor will stop (if not already) and remain stopped until the button is pulled.

During operation, if the Hydraulic Unit motor starter should trip, or a hydraulic fluid low level or high temperature fault is detected, the Hydraulic Unit's motor will stop, and the "PULL START-PUSH STOP" button's light will flash. This will signal the operator that a fault condition exist, and that the Hydraulic Unit will not restart until the fault is cleared. Upon clearing the fault, the operator will be required to pull the "PULL START-PUSH STOP" button to restart the Hydraulic Unit.

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Functional Design Number: 257-01

Functional Title: BALED PAPER CONVEYOR

-007 BALED PAPER CONVEYOR

CONVEYOR GENERAL OPERATION

Once the bales have been dewired, they are automatically conveyed by the -007 Baled Paper Conveyor to the Bale Breaker. The bales are dropped into a chute feeding the Bale Breaker. The -007 Baled Paper Conveyor's flow rate will be controlled by level sensors in the feeding chute. A full length rope switch is provided for safety along the east side of the -007 Baled Paper Conveyor.

CONVEYOR CONTROLS

MANUAL/AUTO, amber illuminated pushbutton. This control is located at CS-A.

In "AUTO", the light will glow amber, and the Conveyor will operate as described above without any operator intervention. If the light is flashing, the machine is in "MANUAL" mode; a push of the button will switch the mode to "AUTO".

In "MANUAL", the light will flash, and the operator may use the "FORWARD" or "REVERSE" pushbutton to cycle the Conveyor. If the light is on solid, the machine is in "AUTO" mode; a push of the button will switch the mode to "MANUAL". If the safety stop rope, mounted on the east side of the conveyor is pulled, the mode will return to "MANUAL" mode, stopping the conveyor.

STORE-RUN, two positioned, maintained selector. This control is located at CS-A.

When "STORE" is selected, the conveyor will receive bales from the Wire Wolf and convey them a short distance, storing bales the length of the conveyor. The feed rate to the Bale Breaker may be interrupted while in this mode.

When "RUN" is selected, the conveyor will operate as described above.

FORWARD, normally open pushbutton located at CS-A.

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When the "FORWARD" pushbutton is engaged, and if "MANUAL" mode is selected, the Conveyor will run in the forward direction.

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-007 BALED PAPER CONVEYOR (continued)

REVERSE, normally open pushbutton located at CS-A.

When the "REVERSE" pushbutton is engaged, if the "MANUAL" mode is selected, the Conveyor will run in the reverse direction.

STOP, a red, maintained, mushroom head pushbutton. This control is located at CS-A.

When the STOP button is pushed, the Conveyor will stop and remain stopped, until the STOP button is reset (pulled).

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LAMB ORDER NUMBER 910315

Functional Description: 298-01

Functional Title: ACCESS STRUCTURE

-008 ACCESS STRUCTURE

ACCESS STRUCTURE GENERAL OPERATION

The -008 Access Structure allows the operator or maintenance personnel to view the baled paper flow, on the -007 Baled Paper Conveyor and into the Bale Breaker. The -007 Baled Paper Conveyor components are accessible from the -008 Access Structure.

ACCESS STRUCTURE CONTROLS

No controls are required for this station.

FUNCTIONAL DESCRIPTION

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Functional Design Number: 271-01

Functional Title: HOPPER/BALE BREAKER

-009 HOPPER/BALE BREAKER

HOPPER GENERAL OPERATION

The -009 Hopper guides the baled paper into the Bale Breaker as it is dropped from the -007 Baled Paper Conveyor. High/Low level sensors are used to help maintain a constant level of material in the hopper.

HOPPER CONTROLS

No controls are required for this station.

FUNCTIONAL DESCRIPTION

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PORT ANGELES, WA

FINAL REV. 1
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LAMB ORDER NUMBER 910315

Functional Design Number: 257-01

Functional Title: PULPER FEED CONVEYOR

-010 PULPER FEED CONVEYOR

CONVEYOR GENERAL OPERATION

The -010 Pulper Feed Conveyor will automatically convey the material up an incline to the -012 Scale Conveyor. The -011 Load Leveler will help maintain a uniform level of material on the conveyor. The conveyor speed will vary in order to maintain a specified feed rate of product to the pulper. A full length rope switch is provided for safety along the north side of the -010 Conveyor.

CONVEYOR CONTROLS

MANUAL/AUTO, amber illuminated pushbutton. This control is located at CS-A.

In "AUTO", the light will glow amber, and the Conveyor will operate as described above without any operator intervention. If the light is flashing, the machine is in "MANUAL" mode; a push of the button will switch the mode to "AUTO".

In "MANUAL", the light will flash, and the operator may use the "FORWARD" pushbutton to run the Conveyor. If the light is on solid, the machine is in "AUTO" mode; a push of the button will switch the mode to "MANUAL". If the safety stop rope, mounted on the north side of the conveyor is pulled, the mode will return to "MANUAL" mode, stopping the conveyor.

FORWARD, normally open pushbutton located at CS-A.

When the "FORWARD" pushbutton is engaged, and if "MANUAL" mode is selected, the Conveyor will run in the forward direction.

STOP, a red, maintained, mushroom head pushbutton. This control is located at CS-A.

When the STOP button is pushed, the Conveyor will stop and remain stopped, until the STOP button is reset (pulled).

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Functional Design Number: 272-01

Functional Title: LOAD LEVELER

-011 LOAD LEVELER

LOAD LEVELER GENERAL OPERATION

The manually adjustable Load Leveler helps maintain a uniform level of material on the conveyor. A driven finned drum is used to knock back the material. The operator is required to set the level for this machine.

LOAD LEVELER CONTROLS

OFF-RUN, two positioned, maintained selector. This control is located at CS-A.

When "RUN" is selected, the Load Leveler will operate as described above.

When "OFF" is selected, the Load Leveler is disabled.

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Functional Design Number: 265-01

Functional Title: SCALE CONVEYOR

-012 SCALE CONVEYOR

SCALE CONVEYOR GENERAL OPERATION

The -012 Scale Conveyor will run at a constant speed. It will provide an isolated 4-20ma signal to the PLC, as a measure of material weight being fed to the pulper. A low mass flow alarm will signal if material flow drops below an acceptable level. A full length rope switch is provided for safety along the north side of the -012 Scale Conveyor.

SCALE CONVEYOR CONTROLS

MANUAL/AUTO, amber illuminated pushbutton. This control is located at CS-A.

In "AUTO", the light will glow amber, and the Conveyor will operate as described above without any operator intervention. If the light is flashing, the machine is in "MANUAL" mode; a push of the button will switch the mode to "AUTO".

In "MANUAL", the light will flash, and the operator may use the "FORWARD" pushbutton to run the Conveyor. If the light is on solid, the machine is in "AUTO" mode; a push of the button will switch the mode to "MANUAL". If the safety stop rope, mounted on the north side of the conveyor is pulled, the mode will return to "MANUAL" mode, stopping the conveyor.

FORWARD, normally open pushbutton located at CS-A.

When the "FORWARD" pushbutton is engaged, and if "MANUAL" mode is selected, the Conveyor will run in the forward direction.

STOP, a red, maintained, mushroom head pushbutton. This control is located at CS-A.

When the STOP button is pushed, the Conveyor will stop and remain stopped, until the STOP button is reset (pulled).

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Functional Design Number: 271-02

Functional Title: PULPER INFEED CHUTE

-014 PULPER INFEED CHUTE

CHUTE GENERAL OPERATION

The -014 Chute guides the material into the Pulper as it is dropped from the -012 Scale Conveyor. High/Low level sensors are used to help maintain the level of material in the Chute.

CHUTE CONTROLS

No controls are required for this station.

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Functional Description: 298-01

Functional Title: ACCESS STRUCTURE

-015 ACCESS STRUCTURE

ACCESS STRUCTURE GENERAL OPERATION

The -015 Access Structure allows the operator or maintenance personnel to view the baled paper flow on the -010 Pulper Feed Conveyor. The -011 Load Leveler height is manually set by an operator from this structure. The -010 Pulper Feed Conveyor components are accessible from the -015 Access Structure.

ACCESS STRUCTURE CONTROLS

No controls are required for this station.

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Functional Description: 251-01

Functional Title: SUPPORT/WIREWOLF (-007)

-016 SUPPORT

SUPPORT GENERAL OPERATION

The -016 Support provides structural support for the Wire Wolf-Dewiring machine.

SUPPORT CONTROLS

No controls are required for this station.

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Functional Description: 013-02

Functional Title: VF DRIVE SYSTEM

-026 VF DRIVE SYSTEM

One VF drive, 10-60 FPM operation, is provided for the -001 Old Directory Conveyor. One VF drive, 10-60 FPM operation, is provided for the -010 Pulper Feed Conveyor. Both drives are wall mountable and are used to control the flow of material through the system. They are to be mounted in the electrical room.

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Functional Description: 132-99

Functional Title: ELECTRICAL CONTROL SYSTEM

-030 ELECTRICAL CONTROL SYSTEM

SYSTEM SPECIFICATIONS:

Electric Power for Motors: Up to 100HP = 480V, 3 phase, 60HZ
Over 100HP = 2400V, 3 phase, 60HZ
Control Power: 120V, single phase, 60HZ from transformer
supplied by Lamb.

DESIGN DATA

The -030 Electrical Control System, mounted in HS1P, will provide the machine control for Equipment Items -001 through -026. The customer supplied Claudis-Peters Bale Breaker contains its own General Electric series one Programmable controller, motor starters, and associated controls.

The Electrical Control System will consist of one General Electric Series 6+ Programmable Logic Controller(PLC) supplied by LAMB. The LAMB supplied PLC will be mounted in a Nema 12 cabinet with standard I/O for controlling the equipment items listed. H.A. Simons supplied Genius I/O blocks will be used for isolated MCC motor and drive control. Required D.C. power supplies, control circuit breakers, control power relays, and field wiring terminals will be completely assembled and shop tested prior to shipment.

The PLC cabinet will be located in the warehouse on the east side of the Bale Breaker.

Programming equipment will be supplied by Daishowa. General Electric Logicmaster software documentation will be used.

The Control Station (operator console) provides system control. The control station will be a Nema 12 console. The operator console will be pre-wired and shop tested prior to shipment.

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SYSTEM CONTROLS

EMERGENCY STOP, red maintained mushroom head illuminated pushbutton. All machines are stopped when this EMERGENCY STOP is pushed. The EMERGENCY STOP is located at CS-A.

When the emergency stop button is pushed, all output power from the PLC is disabled, by the drop out of a relay. The outputs will remain disabled until the EMERGENCY STOP button is enabled (pulled out), and the RESET button is pushed. The light in the EMERGENCY STOP button will flash when the button is pressed. Machines that were in mid-cycle when an EMERGENCY STOP button was pushed may require manual intervention to be restarted after the EMERGENCY STOP condition is reset.

RESET, red illuminated pushbutton. This control is located at control station CS-A.

The RESET pushbutton must be pushed to clear an EMERGENCY STOP condition. When the EMERGENCY Stop pushbutton has been enabled (pulled), a push of the RESET pushbutton will return the system to "run". The RESET button will illuminate until the EMERGENCY STOP button is pushed. The pushbutton will again illuminate after all EMERGENCY STOP buttons have been enabled, and the RESET pushbutton has been pushed.