

IRRIGATION PLANS



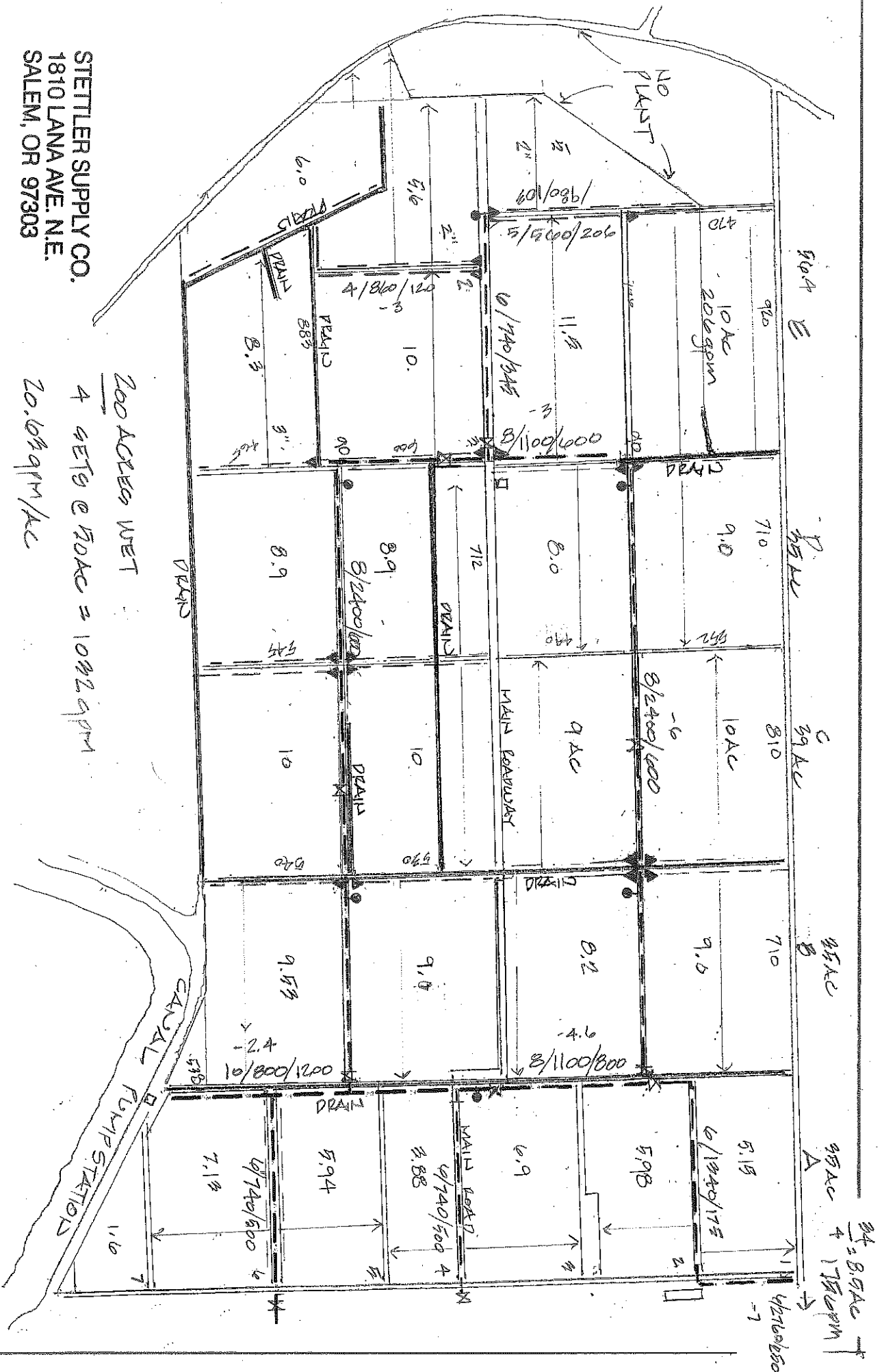
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STETTLER SUPPLY CO.
1810 LANANA AVE. N.E.
SALEM, OR 97303

40 SCALE
12.2709
1" = 490.836'

200 ACRES WET
4 SETS @ 50 AC = 1032.9 PM
20.639 PM/AC
Zones 23+6=29

THRU/NE FARMCO
COLUMBIA W/BOAT
MASTER PLAN



Stettler Supply Company

Committed to Service Excellence

1810 Lana Avenue NE • Salem, Oregon 97303
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drip
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pump stations
water & sewer
treatment

PUMPS

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centrifugal
engine drive
controls

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flow tests
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Mr. Bill Sabol
Trinity Willamette Growers, Inc.
PO Box 98
St Paul, Oregon 97137
Re: Hopville Farms, Inc. - Columbia West, Clatskanie

August 3, 2011

Dear Bill,

Stettler Supply Company proposes to design, supply and deliver materials to extend the 8" PVC mainline in a loop to the west as shown on the drawing including the following:

<u>Quantity</u>	<u>Description</u>
4400 ft	8" Cl 160 PVC pipe, Gasket mainline
40 ft	6" Cl 160 PVC pipe, Gasket mainline
4	Steel Sleeve for 8" Drain Crossing
1	Steel Sleeve for 6" Drain Crossing
2	8" Epoxy Steel Elbow
2	8" Epoxy Steel Couplers
12	8" x 4" Epoxy Steel Saddle, Plug
3	8" Isolation Gate Valve, 2" op nut
1	6" Isolation Gate Valve, 2" op nut
1	6" PVC Cap
4	Wade 4" Hydrant, Air/Vac Relief assembly
12500 FT	14-1 UF Control Wire, 6 Boxes
1	Lot PVC Fittings, Glue, Primer, Teflon, Cans/Daubers
1	Drawings, Details, Pre-Construction Review

Total \$35,169.00

Availability: 7-10 days ARO
Terms: Net 30 Days
F.O.B: Delivered to Site
Valid: 15 Days
Acceptance Date: _____


Stettler Supply Co.
Val J. Tancredi, Sales

Trinity Willamette Growers
Bill Sabol, President

Drip Irrigation System Profile

Hopville Farms, Inc.

Summary

Automatically controlled, pressure compensating drip irrigation system for blueberries at 10 ft row spacing with self-cleaning pump suction screens, self-flushing disc filtration, flow meter and totalizer, provision for fertilizer injection from multiple centrifugal pump station outfitted with VFD controls to provide 0-1600 gpm.

Pump Station

- Clemons Clearwater Self-cleaning OWFD approved suction screen with foot valve mounted on aluminum suction pipe at each pump.
- Cornell centrifugal pumps were chosen because of their quality and high efficiency. Each is mounted on steel bases with easy forklift ability. Each outfitted with hand priming pump, butterfly valve, chemigation check valve, liquid filled pressure gauge and female ringlock discharge fitting. Heavy duty discharge hose connects the pump to steel mainline with ringlock fittings allowing the pumps to be stored in doors during the non-irrigation season.
- 25 hp jockey pump with pressure tank is the lead pump for low flow start-up and system flow demand up to 400 gpm. As field demand for water increases beyond 400 gpm a 50 Hp (up to 600 gpm) pump comes on line and the jockey is disabled unless demand exceeds 600 gpm. As field flow demand nears 1000 gpm the second 50 Hp pump comes online with the ability to supply up to 1600 gpm. As flow is reduced the pumps shut down with the jockey providing interval flow requirements and is the last to shut off when field demand ceases.
- Yaskawa VFD pump control panels are installed for each pump and were selected for quality and local service. A pressure transducer connected to each pump allows the VFD to maintain constant pump discharge pressure by varying the motor speed thereby saving energy by not producing higher pressure than required by the system.

Filter Station

- Netafim Apollo Automatic Disc-Kleen Filter was selected to meet the water quality standard required by the manufacturer of the drip equipment. The Apollo filter provides 130 micron (120 mesh) filtration with disc technology specially developed for surface water. Auto Disc-Kleen filters are 45% more efficient with backwash water than commonly used media filters. Each filter has a computer controller that is programmed for timed backwash and also includes a pressure differential switch that calls for backwash if water quality changes. Each filter battery was sized for the maximum flow output from each pump as “very poor” water quality as specified in Netafim product brochure. While all pumps share a common mainline the system was designed with a dedicated filter battery for each centrifugal pump so that if

Filter Station, continued

either or both are inoperable the system may still be supplied by the other pump-filter combination.

- All above ground inlet and outlet piping of the filter station is .25" wall standard weight steel for strength and longevity. All above ground PVC pipe is Schedule 80 grey for strength and UV resistance. The filter station has 2" constant air and vacuum relief vents and quick acting 2" brass pressure relief valves for failsafe protection.
- Each pump-filter pairing has a line size butterfly valve on the filter discharge to isolate it from the common PVC mainline to provide ease of service.
- A Data Industrial digital flow meter to provide instantaneous and totalizing flow of water to the common PVC mainline is installed immediately downstream of the filter station. A 2" brass turbine transducer mounted in a steel saddle mounted on the mainline and the digital meter has been programmed with the ID of the 10" class 160 PVC pipe to display the flow rate.

PVC Pipeline, Fittings and Appurtenances

- All PVC pipe used for mainline in the system is Class 160 rated with rubber gaskets eliminate damage to connections by allowing for ground movement.
- All mainline fittings are fusion bonded epoxy coated steel with bolted o-ring gaskets. All tees, elbows and end caps are properly restrained with poured in place concrete thrust blocks.
- The system is outfitted with 2" constant air and vacuum relief vents at pipeline high points and approximately every 1000 ft of mainline. 4" Wade Rain hydrants are strategically field located to allow pipeline flushing, provide water for field spray tanks and fire control if required.
- Irrigation zones vary in size but were planned not to exceed 10 acre blocks as directed by owner. Row lengths and thereby Dripline lengths were limited so as to maintain high water application of uniformity by limiting friction loss.
- All planted zones are 24 volt solenoid control valves manufactured by Bermad and were selected for quality, low friction loss and reliability. Each control valve is preceded by a brass isolation gate valve and housed in a jumbo valve box installed flush to grade.
- Activated zone valves provide water to the block via a submain located at the edge of the block. PVC tapping saddles (glued) are mounted on the submain PVC pipe. PVC flex hose (1/2") is connected between the saddle and a 3/4" MHT fitting installed on the ground surface. A hose thread ball valve provides for isolation of individual rows. Drip fittings from the ball valve feed a tee and two 90 degree elbows to provide double driplines for each plant row. Figure eight end closures are located a row ends.

PVC Pipeline, Fittings and Appurtenances, continued

- All PVC pipe used as submains downstream of zone control valves is Class 160 rated, with solvent weld (glue) connections. All fittings are Schedule 40 rated. Each submain has a brass ball valve installed at the end enabling the submain to be periodically flush of silt by manually opening the valve while the zone is operated.
- Toro Ag “BlueLine” Pressure Compensating Dripline was specified for quality of materials, emitter design, $C_v \leq 3\%$, USA manufacture, and superior resistance to plugging when used with surface water. 20 mm ID tubing was selected to minimize friction loss. All emitters are .43 GPH flow rate and preinstalled at the factory at 18 inches for overlapping wetted pattern down the plant row.
- Line size butterfly valves are installed in strategic locations on the pvc pipeline to allow for isolation of mainline sections should repair become necessary.
- System winterization may be easily accomplished by pressurizing the system with compressed air and cycling the control valves. A portable compressor can be connected at one of many outlets on the pumps or filter station.

System Application Rate and Performance

- The Drip system has the capability of applying the following Gross amount of water to the crop per hour:

<u>Row Spacing</u>	<u>2 Driplines</u>	<u>1 Dripline</u>	<u>GPM/Acre</u>
10 ft	.092"/Hr		42.26
10 ft		.046"/Hr	21.12
11 ft	.084"/Hr	.042"/Hr	38.41
11 ft			19.20

- System application uniformity is estimated to be in excess of 95%
- System application efficiency is estimated to be in excess of 95%

Irrigation System Execution

- All Steel piping from the pumps thru the Filter Stations as well as all 10" and 8" PVC mainline and fittings and concrete thrust blocks, isolation valves, air vents, 24 volt zone control valve wiring were installed by Emery and Sons Construction of Stayton, Oregon. Emery was chosen because of their reputation for quality work, the proof is not one call back was necessary.
- All submain valves, piping and drip tubing was installed by Trinity Willamette Services, Salem, Oregon.
- The irrigation system design and all materials were supplied by Stettler Supply Company, Salem, Oregon.



Hopville Farms
COLUMBIA WEST

ACE 20

Stettler Supply Company

"Committed to Service Excellence"

Since 1948

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COLUMBIA WEST FARM

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industrial
commercial
residential
treatment
conditioning

MUNICIPAL-INDUSTRIAL

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treatment

PUMPS

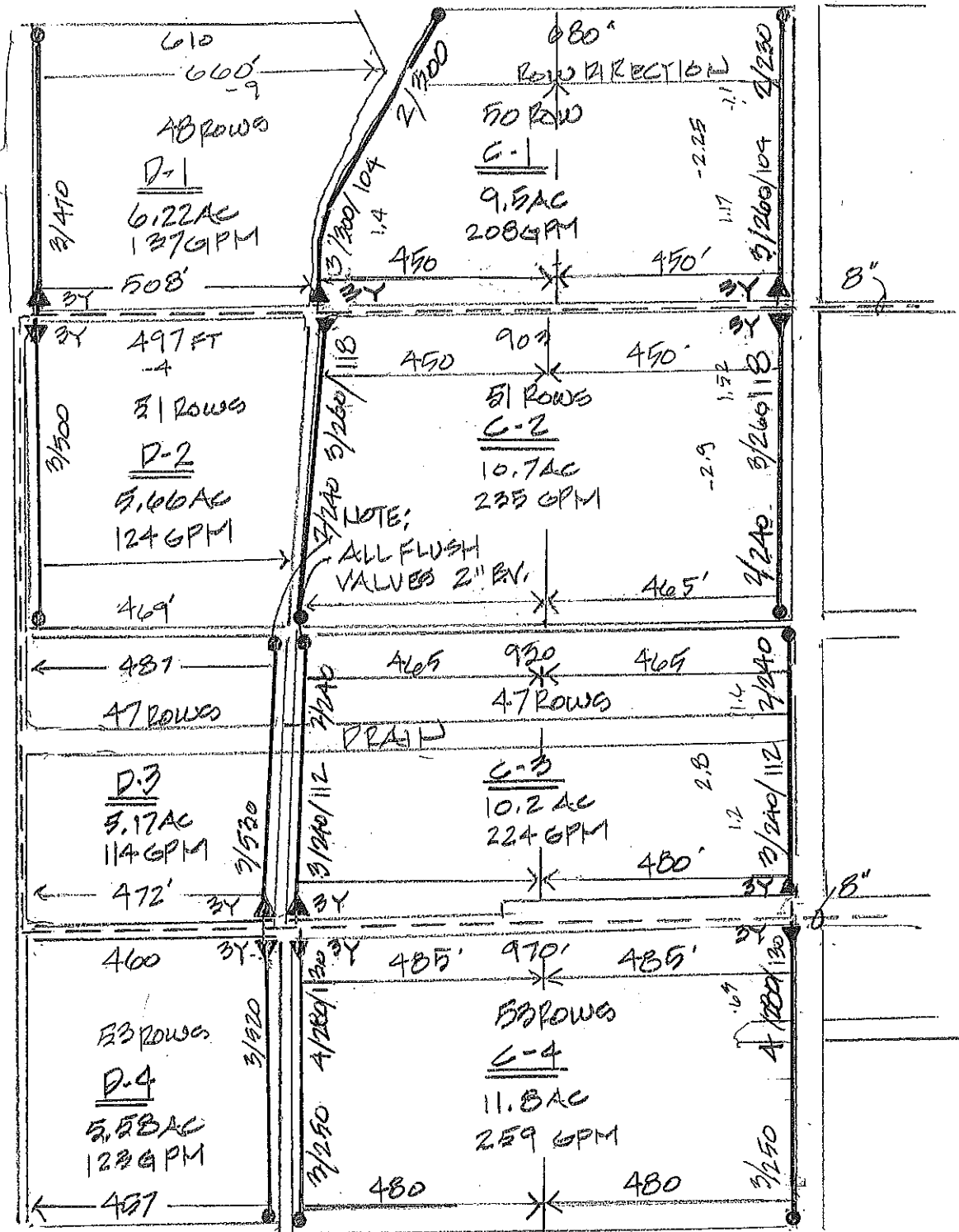
submersible
vertical turbine
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engine drive
contractor
chemical feed
controls

EVALUATION

well tests
flow tests
water quality

SERVICES

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NOTE: ALL 10 FT ROWS
SINGLE DRIP LINE
20-.42-18"

Irrigation Equipment Review

Fixed Asset #	Description	Tax Cost	Allocation	Columbia West
54	Water Conditioner	3,000	100%	3,000
55	Pump Station Electrical	7,313	100%	7,313
56	Pump Station Building	3,640	100%	3,640
57	Mainline Extension	111,939	100%	111,939
62	Irrigation Installation	29,900	100%	29,900
100	Pump & Filter Station	37,924	100%	37,924
142	2012 Irrigation Equipment	99,539	50%	49,769
144	Water Treatment System	5,400	100%	5,400
170	Irrigation Installation	18,268	100%	18,268
198	20,000 dripper line	2,680	100%	2,680
199	Yaskawa 40 hp pump	2,688	100%	2,688
200	Yaskawa 40 hp pump	2,688	100%	2,688
201	Irrigation System Automation	1,847	100%	1,847
211	Irrigation Installation	13,440	25%	3,360
				280,416