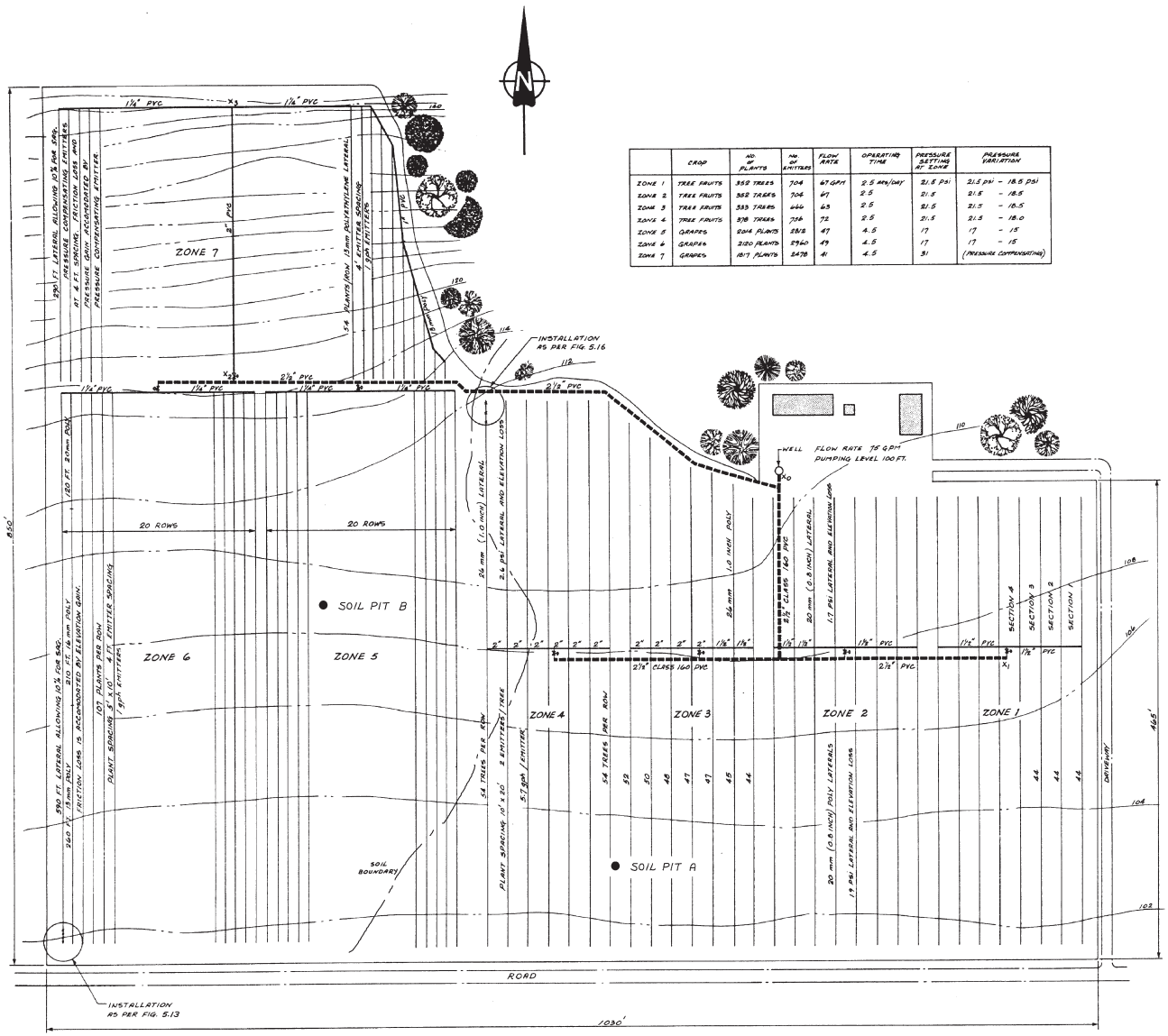


	CROP	NO. OF PLANTS	NO. OF EMITTERS	FLOW RATE	OPERATING TIME	PRESSURE SETTING AT ZONE	PRESSURE VARIATION
ZONE 1	TREE FRUITS	352 TREES	704	67 GPH	2.5 HRS/DAY	21.5 PSI	21.5 PSI - 18.5 PSI
ZONE 2	TREE FRUITS	352 TREES	704	67	2.5	21.5	21.5 - 18.5
ZONE 3	TREE FRUITS	333 TREES	666	63	2.5	21.5	21.5 - 18.5
ZONE 4	TREE FRUITS	378 TREES	756	72	2.5	21.5	21.5 - 18.0
ZONE 5	GRAPES	2014 PLANTS	2014	47	4.5	17	17 - 15
ZONE 6	GRAPES	2130 PLANTS	2960	49	4.5	17	17 - 15
ZONE 7	GRAPES	1817 PLANTS	2478	41	4.5	31	(PRESSURE COMPENSATING)

CAUTION! THIS SAMPLE IRRIGATION PLAN IS FOR A SPECIFIC CROP, SOIL TYPE AND FARM LAYOUT AND IS TO BE USED FOR ILLUSTRATION PURPOSES ONLY.

TRICKLE IRRIGATION DESIGN INFORMATION

CROP AND SOILS REPORT

Pit	Crop	Root Depth (ft)	Availability Coefficient	Soil Texture	A.W.S.C. (in/ft)	Max Lateral Water movement radius (ft)	
A	tree fruits	4		0.40	loam	2.1	3.5
B	grapes	3		0.40	sandy loam	1.5	2.5
C							

DESIGN PARAMETERS

	Tree Fruits		Grapes
Evapotranspiration Rate (ET)	0.24	in/day	0.24
Effective Soil Water Storage Capacity	3.4	inches	1.8
Effective Soil Water Storage Factor (S)	0.75		0.80
Plant Spacing	10 x 20	ft²	5 X 10
Plant Area (A)	200	ft²	50
Crop Coefficient Factor (K)	0.40		0.70
Leaching Factor (L)	1.10		1.10
Application Efficiency (E) (Plastic Mulch)	0.85		0.90
Emission Uniformity (Eu)	0.90		0.90

PLANT WATER REQUIREMENTS

Gallons/Plant/Day = 0.623 x 0.24 in/day x 0.75 x 200 ft² x 0.90 = 20.2 G/P/D 4.2
(ET) S A K

Trickle System Design Requirement TC = G/P/D x L = 20.2 x 1.1 = 29 G/P/D 5.7
E x Eu 0.85 x 0.90

DESIGN DATA

	SPRAY		POINT SOURCE
Emitter Type			
Emitter Operating Pressure	20	psi	15
Emitter Discharge	5.7	gph	1.0
Emitter Spacing	2 @ 10	ft	4
Emitters per Plant	2		1.25
Zone Operating Time per Day	2.5	hrs/day	4.5
Zone Flow Rate	72	gpm	49
Water Source Capacity	75	gpm	
Pressure at Water Source	85	psi	

Total System Operating Time = 2.5 hrs/zone x 4 zones = 10 hrs = 23.5 hrs
4.5 hrs/zone x 3 zones = 13.5 hrs

FILTRATION REQUIREMENTS

Water Source: IRRIG. DISTRICT
Water Quality: Ca, Mg, Na, K: 5
Fe: - mg/l
S: - mg/l
pH: 6 - 8 mg/l
Screen Mesh Size or Sand Media Selection: 150 MESH

ZONE FRICTION LOSS CALCULATION (FOR ZONE 1)

Maximum Pressure Variation in Zone: 3.0 psi
Maximum Lateral Length: 290 ft

Average Flow per foot = emitter flow rate = 5.7 gph / emitter spacing 5 ft = 1.12 gph/ft
in lateral

Lateral line friction loss = 290 ft - 0.8 inch poly pipe @ 1.14 gph = 3.5 psi

Emitter Barb Loss (30% of Lateral Line loss) = 1.0 psi
Elevation Difference: -6 ft = -2.6 psi
Total Lateral Pressure Loss = 1.9 psi
Header Line Friction Loss

Section	Flow	Pipe Length	Pipe Size	Friction Loss
1	8.4 gpm	20 ft	1 1/2 in	0.03 psi
2	16.8	20	1 1/2	0.19
3	25.2	20	1 1/2	0.41
4	33.6	20	1 1/2	0.19

Total Friction: 0.82 psi
Header Line Fitting Loss (additional 20%): 0.16 psi
Elevation Difference: 0 ft = 0 psi
Total Header Line Pressure Loss: 0.98 psi
Total Zone Pressure Loss
Header Loss 0.98 psi + Lateral Line Loss 1.9 psi = 2.88 psi

MAINLINE FRICTION LOSS CALCULATION

X_0 - X_2	590	2 1/2	PVC @ 49 gpm	5.9 x 0.52 =		3.0 psi
X_2 - X_3	270	2	PVC @ 41 gpm	2.7 x 0.86 =		2.3 psi
x - x			@ gpm	x =		psi
x - x			@ gpm	x =		psi
Total Friction Loss in Mainline						5.3 psi

SYSTEM PRESSURE REQUIREMENT

Pressure Required at Zone Control	20	psi
Total Friction Loss in Mainline	5.3	psi
Elevation 130 ft.	= 56	psi
Miscellaneous Losses (Mainline valves, fittings,etc.)	3	psi
Total Pressure Requirement	= 85	psi
	= 196	ft

SYSTEM FLOW REQUIREMENT

72 gpm/zone x 1 zones operating at one time = 72 gpm

HORSEPOWER REQUIREMENT

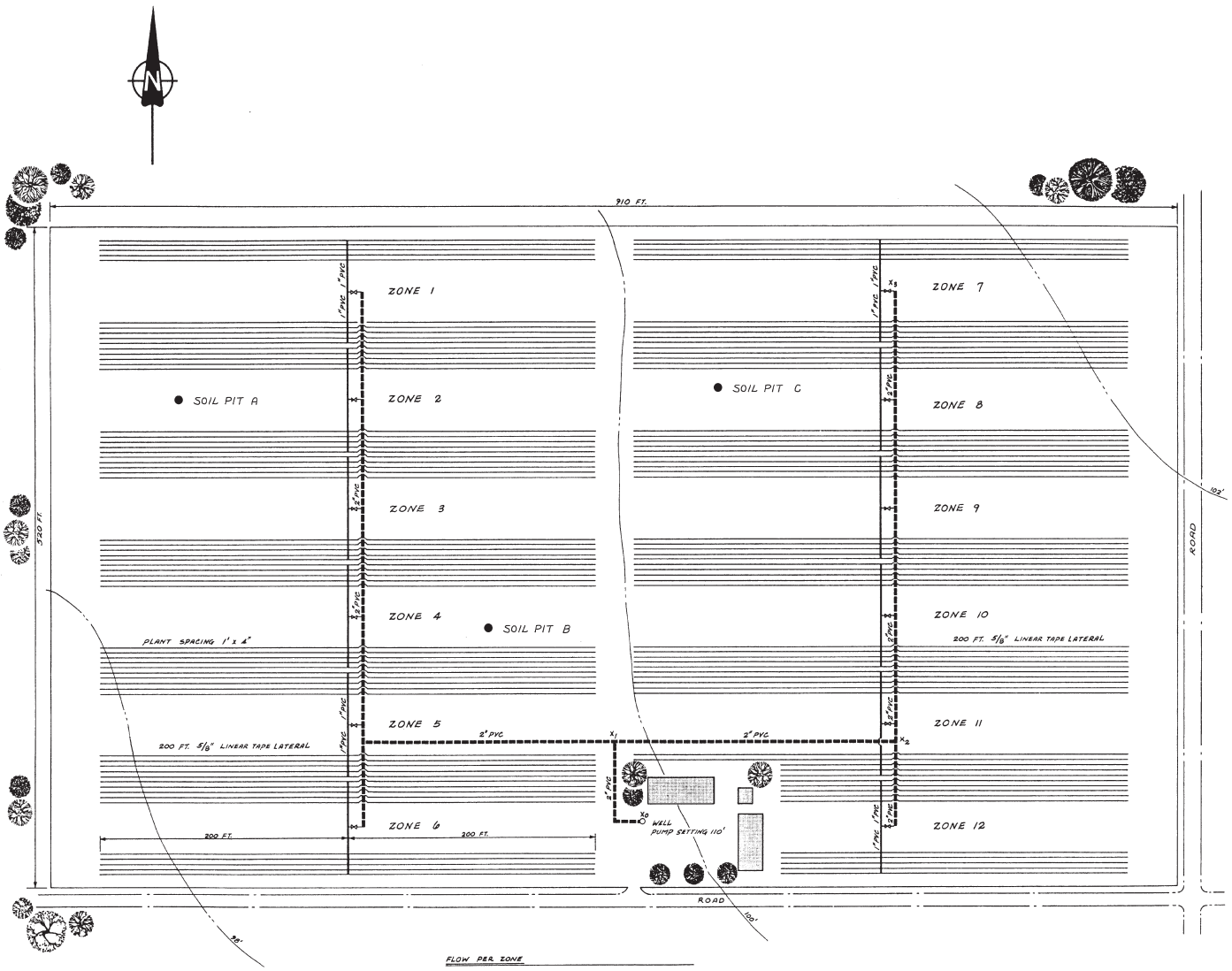
H.P. = 200 ft x 75 gpm / 3960 x 0.65% = 6 h.p.

DATE	REVISION
	Appendix F

B.C. Ministry of Agriculture and Food
RESOURCE MANAGEMENT BRANCH

SAMPLE TRICKLE IRRIGATION PLAN
SPRAY AND POINT SOURCE
EMITTER SYSTEM

DATE 1999 | SCALE N.T.S.
DESIGNED T. VAN DER GULIK | SHEET 1 OF 1
DRAWN L. HOKANSON | PLAN No. 565.015
CHECKED



CAUTION! THIS SAMPLE IRRIGATION PLAN IS FOR A SPECIFIC CROP, SOIL TYPE AND FARM LAYOUT AND IS TO BE USED FOR ILLUSTRATION PURPOSES ONLY.

FLOW PER ZONE

200 FT. LINEAR TAPE	= 66 gph/200 FT.
21 ROWS PER ZONE @ 400 FT. LENGTH	= 8400 FT.
ALLOW 5% FOR EXPANSION	= 420 FT.
	= 8820 FT./ZONE
8820 FT. x 66 gph/200 FT. = 2910 gph	= 48.5 gpm
	= 50 gpm APPROX.

TRICKLE IRRIGATION DESIGN INFORMATION

CROP AND SOILS REPORT

Pit	Crop	Root Depth (ft)	Availability Coefficient	Soil Texture	A.W.S.C. (in/ft)	Max Lateral Water movement radius (ft)
A	strawberries	2.0	0.50	sandy loam	1.5	2.0
B	strawberries	2.0	0.50	sandy loam	1.5	2.0
C	strawberries	2.0	0.50	sandy loam	1.5	2.0

DESIGN PARAMETERS

Evapotranspiration Rate (ET)	0.15 in/day
Effective Soil Water Storage Capacity	1.5 inches
Effective Soil Water Storage Factor (S)	0.80
Plant Spacing	1 x 4 ft²
Plant Area (A)	4 ft²
Crop Coefficient Factor (K)	0.75
Leaching Factor (L)	1.10
Application Efficiency (E) (Plastic Mulch)	0.95
Emission Uniformity (Eu)	0.85

PLANT WATER REQUIREMENTS

Gallons/Plant/Day = 0.623 x 0.15 (ET) in/day x 0.80 (S) x 4 (A) ft² x 0.75 (K) = 0.22 G/P/D

Trickle System Design Requirement TC = G/P/D x L / E x Eu = 0.22 x 1.1 / 0.95 x 0.85 = 0.30 G/P/D

DESIGN DATA

Emitter Type	LINEAR TAPE
Emitter Operating Pressure	12 psi
Emitter Discharge	66 gph/200 ft.
Emitter Spacing	1 ft
Emitters per Plant	1
Zone Operating Time per Day	0.90 hrs/day
Zone Flow Rate	50 gpm
Water Source Capacity	50 gpm
Pressure at Water Source	40 psi

Total System Operating Time = 0.90 hrs/zone x 12 zones = 10.8 hrs

FILTRATION REQUIREMENTS

Water Source		WELL
Water Quality	Ca, Mg, Na, K	10
	Fe	5 mg/l
	S	0.01 mg/l
	pH	7
Screen Mesh Size or Sand Media Selection		150 MESH

ZONE FRICTION LOSS CALCULATION

Maximum Pressure Variation in Zone		1.8 psi
Maximum Lateral Length		200 ft
Lateral line friction loss =		
200 ft - 5/8" inch TAPE pipe @ 1.10/200 gpm/ft	=	0.4 psi
Emitter Barb Loss (30% of Lateral Line loss)	=	psi
Elevation Difference 0 ft	=	0 psi
Total Lateral Pressure Loss	=	0.4 psi
Header Line Friction Loss		

1" Class 160 PVC @ gpm has a friction loss of 6.96 psi
40 ft. @ 6.96 psi / 100 ft. = 2.78 psi
For 10 outlets (on this 40 ft. section) friction factor = 0.385
Header Friction Loss 2.78 psi x 0.385 = 1.07

Total Friction		1.07 psi
Header Line Fitting Loss (additional 20%)		0.21 psi
Elevation Difference 0 ft	=	0 psi
Total Header Line Pressure Loss		1.28 psi
Total Zone Pressure Loss		
Header Loss 1.28 psi + Lateral Line Loss 0.4 psi	=	1.68 psi

MAINLINE FRICTION LOSS CALCULATION

X_0 - X_1	65	- 2 "	PVC @	50 gpm -	0.65	x 1.31	=	0.85 psi
X_1 - X_2	220	- 2 "	PVC @	50 gpm -	2.2	x 1.31	=	2.88 psi
X_2 - X_3	350	- 2 "	PVC @	50 gpm -	3.5	x 1.31	=	2.19 psi
x - x		- "	@	gpm -		x	=	psi

Total Friction Loss in Mainline 5.92 psi

SYSTEM PRESSURE REQUIREMENT

Pressure Required at Zone Control		13.7 psi
Total Friction Loss in Mainline		6.0 psi
Elevation 110 ft.	=	47.6 psi
Miscellaneous Losses (Mainline valves, fittings, etc.)		5 psi
Total Pressure Requirement	=	72.3 psi
	=	167 ft

SYSTEM FLOW REQUIREMENT

50 gpm/zone x 1 zones operating at one time = 50 gpm

HORSEPOWER REQUIREMENT

H.P. = 167 ft x 50 gpm / 3960 x 0.62 % = 3.5 h.p.

DATE	REVISION
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B.C. Ministry of Agriculture and Food
RESOURCE MANAGEMENT BRANCH

SAMPLE TRICKLE IRRIGATION PLAN
LINEAR TAPE SYSTEM
STRAWBERRIES

DATE	1999	SCALE	N.T.S.
DESIGNED	T. VAN DER GULIK	SHEET	1 OF 1
DRAWN	L. HOKANSON	PLAN No.	565.016
CHECKED			