

APPENDIX E

**Arctic Foundation Canada Inc.
Design**



July 24, 2002

Michel Noel
SRK
Vancouver, BC
Email mnoel@srk.com

Michel Re: Giant Mine Thermosyphons

We have prepared a preliminary estimate for the supply and installation of thermosyphons to permanently freeze 15 arsenic trioxide storage chambers as shown on the attached drawings. There are two scenarios

- 1) Create and maintain the frozen chambers using passive refrigeration only. Time to create frozen chamber would be 1-2 years.
- 2) Create the frozen chambers in 1 year using hybrid thermoprobes and mechanical refrigeration. The frozen bulb would then be maintained passively there after.

Option 1 Total Passive Freeze - \$19,500,000

- Thermoprobes set back from the chamber 6m and extend 10m below chamber bottom.
- Radiator sizes 210sf, 340sf, or 420sf as shown on the drawings; no mechanical refrigeration heat exchangers. Mechanical refrigeration could be added to individual units if unexpected conditions required it.
- Based on construction in summer.
- Drilling to be provided by owner and must suit the above time frame. Our price includes a drilling allowance of \$6,609,600 (66,096m at \$100/m). This does not include any work required to provide access on the surface.
- All equipment requirements, mobilization & room and board are included in our price.

Option 2 Hybrid Thermoprobes and Mechanical Refrigeration for 1 year – \$23,500,000

- Thermoprobes set back from the chamber perimeter 6m and extend 10m below the chamber
- Heat exchangers and mechanical refrigeration on all units. Frozen chambers created in 1 year using mechanical refrigeration. Frozen chamber maintained passively using 210sf radiators after first year. Mechanical units could be started at anytime if unexpected conditions required it.
- Based on construction in summer.
- Drilling to be provided by owner and must suit the above time frame. Our price includes a drilling allowance of \$6,609,600 (66,096m at \$100/m). This does not include any work required to provide access on the surface.
- All equipment requirements, mobilization & room and board are included in our price.
- Power to be supplied by owner. Estimated power load of 700kw for 1 yr for mechanical refrigeration freeze back.
- Power required for maintaining frozen chambers after freeze back; none.

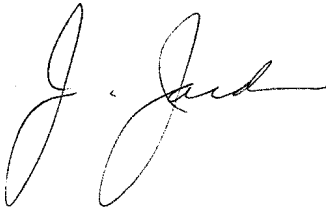
We would require a lead time of approximately 3 months prior to shipping.

We have not included a cost for instrumentation. We feel that measuring the electrical resistance of the ground between thermoprobes may be a relatively simple and effective means of determining when total freeze back occurs. This could be used in conjunction with thermistors or RTDs.

The drilling allowance of \$100/m was arrived at from estimates that we received from NWT Rock Services in Yellowknife (\$98.40/m) and Friesen Drillers out of Winnipeg (\$82.50/m).

If you have any questions or comments please do not hesitate to call.

Yours truly,
Arctic Foundations of Canada Inc.



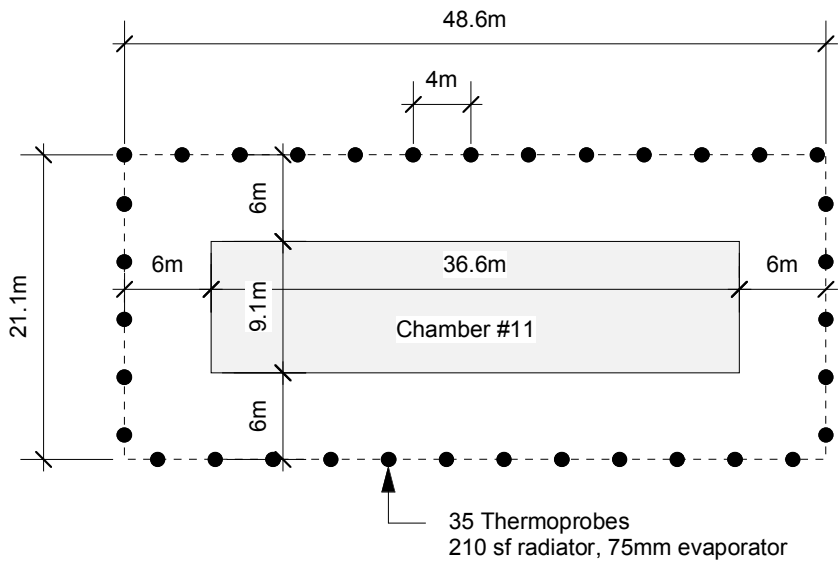
John D. Jardine
General Manager

Giant Mine

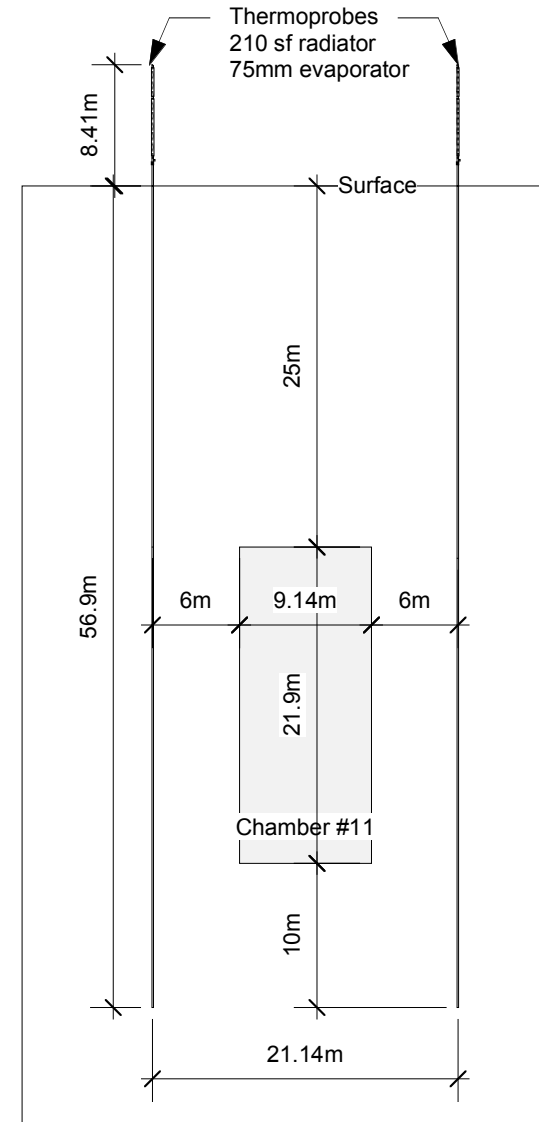
Chamber	Chamber Dimensions				Thermoprobes										Volume cf
	Length	Width	Height	Surf - Top	Probe Depth		Probe Qty	Spacing	Rad Size	Total 75mm Evaporator		Passive Radiator Sizes			
	m	m	m	m	m	Ft				m	sf	m	ft	210sf	
AR1 - #11	37.5	14.9	21.9	25	56.9	187	35	4	210	1,992	6,532	35			432,198
AR1 - #12	62.5	15.2	36	22.9	68.9	226	51	4	210	3,514	11,526	51			1,207,944
AR1 - #14	54.9	15.2	24.1	22.9	57	187	47	4	210	2,679	8,787	47			710,319
AR2 - #9	34.7	17.8	56.4	33.2	99.6	327	38	3.5	340	3,785	12,414		38		1,230,408
AR2 - #10	27.4	12.2	54.9	29.6	94.4	310	37	3.5	340	3,493	11,456		37		648,192
AR2 - C212	93	18.3	53	29.9	92.9	305	77	3.5	340	7,153	23,463		77		3,185,889
AR3 _ B208	83.4	30	54.9	32.3	97.2	319	89	3	340	8,651	28,375		89		4,851,548
AR3 _ B230	24	9.1	22	67.36	99.4	326	38	3	340	3,777	12,389		38		169,706
AR3 _ B233	36	15.2	43.9	37.2	91.1	299	50	3	340	4,555	14,940		50		848,460
AR3 _ B234	35	12.2	44.8	35.7	90.5	297	48	3	340	4,344	14,248		48		675,657
AR3 _ B235 & B236	36.6	15	54.9	33.5											1,064,548
	35.1	13.7	51.8	39	100.8	331	80	3	340	8,064	26,450		80		879,788
AR4 - B212, 213, 214	103	45	61	31.1	102.1	335	138	2.5	420	14,090	46,215			138	9,986,200
							728			66,096	216,795	133	457	138	25,890,857

Giant Mine Preliminary Estimate of Drilling Requirements

Area	Chamber	Spacing Between Holes m	Number of holes	Depth of Holes ft	Total Length ft	Overburden Conditions
AR1	B11	4	35	187	6,545	No overburden
	B12	4	51	226	11,526	No overburden
	B14	4	47	187	8,789	No overburden
AR2	C9	3.5	38	327	12,426	15 ft, water table @ 0.5 ft below surface
	C10	3.5	37	310	11,470	Estimated to 15 ft (no drill info)
	C212	3.5	77	284	21,868	25 to 35 ft
AR3	B208	3	89	319	28,391	Up to 50ft of clay, with sand and gravel
	B230	3	39	303	11,817	No overburden
	B233	3	50	299	14,950	No overburden
	B234	3	48	297	14,256	Minor till at contact, clay up to 30 ft thick
	B235 & 236	3	80	318	25,440	Up to 30 ft
AR4	B212, 213 & 214	2.5	142	335	47,570	Up to 60ft of clay, with sand and gravel
Total			733		215,048	



Plan



Section



**ARCTIC FOUNDATIONS
OF CANADA INC.**

#15 Elie St. E. Elie, MB R0H 0H0
Ph. 204-353-2510 Fax. 204-353-2610

CLIENT

SRK

PROJECT

Giant Mine Freeze Wall

DRAWING TITLE

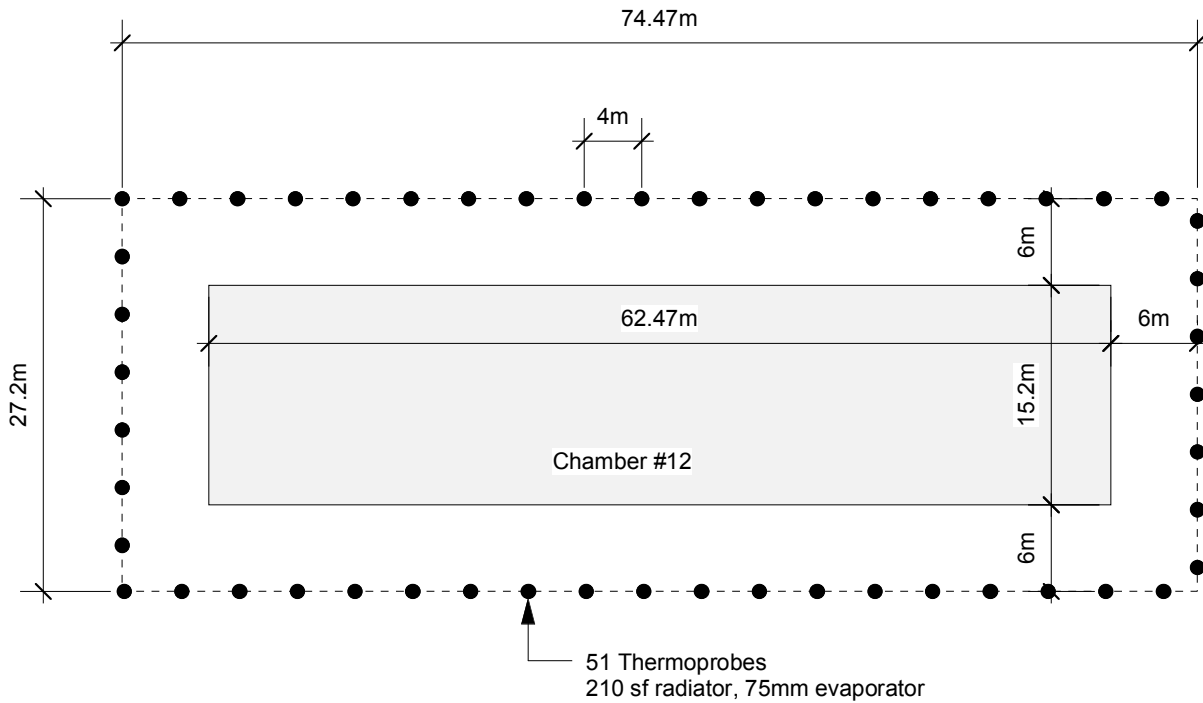
Preliminary Chamber #11

SCALE

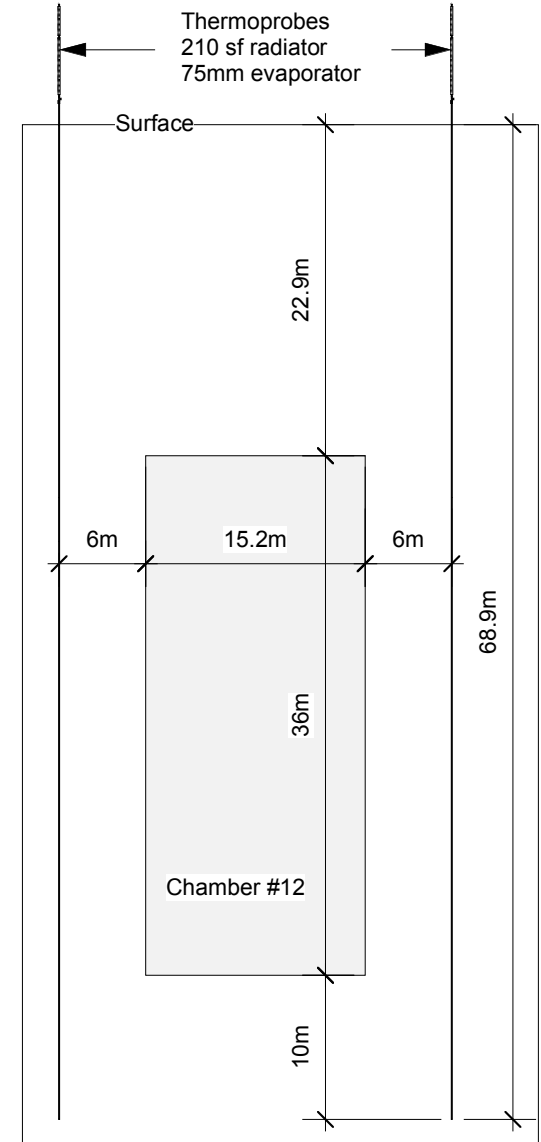
DATE

July 2002

DRAWING NO.



Plan View



Section View



ARCTIC FOUNDATIONS
OF CANADA INC.

#15 Elie St. E. Elie, MB R0H 0H0
Ph. 204-353-2510 Fax. 204-353-2610

CLIENT

SRK

PROJECT

Giant Mine Freeze Wall

DRAWING TITLE

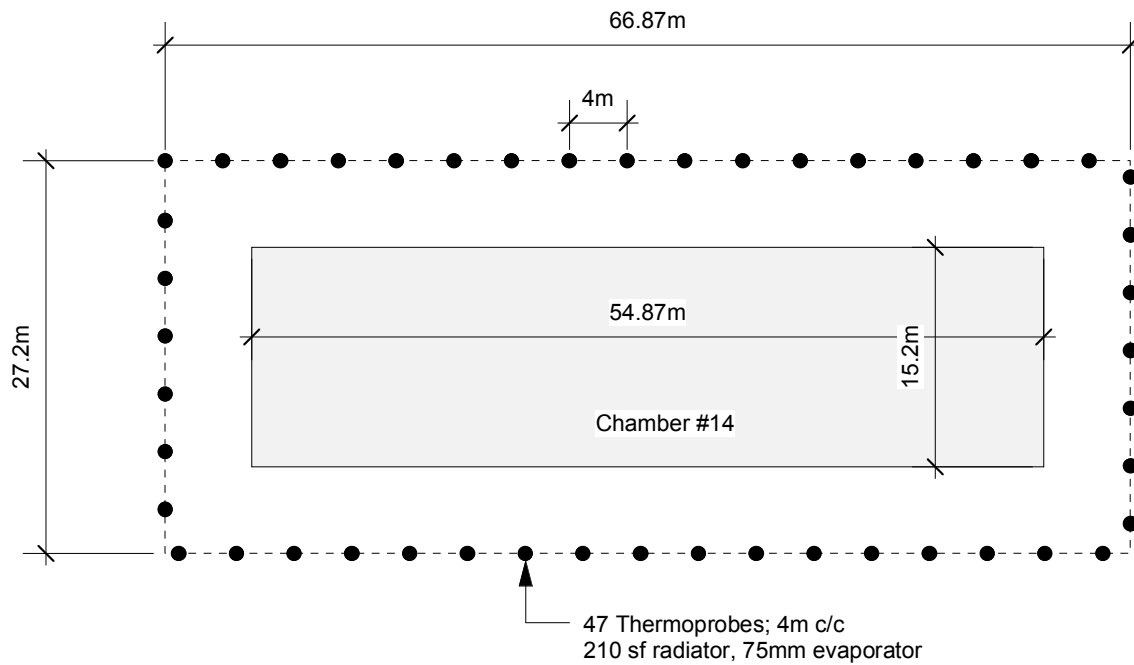
Preliminary Chamber #12

SCALE

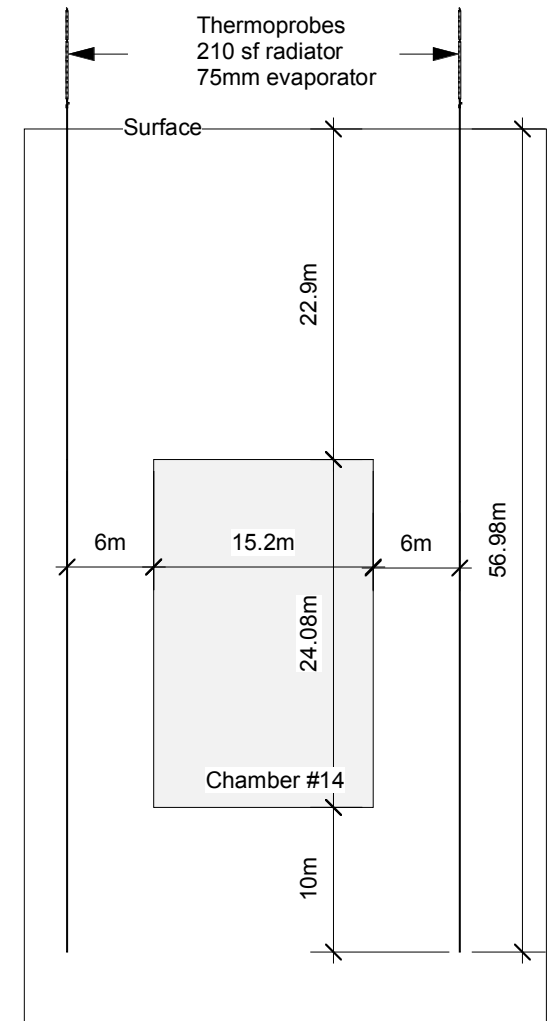
DATE

July 2002

DRAWING NO.



Plan



Section



ARCTIC FOUNDATIONS
OF CANADA INC.

#15 Elie St. E. Elie, MB R0H 0H0
Ph. 204-353-2510 Fax. 204-353-2610

CLIENT

SRK

PROJECT

Giant Mine Freeze Wall

DRAWING TITLE

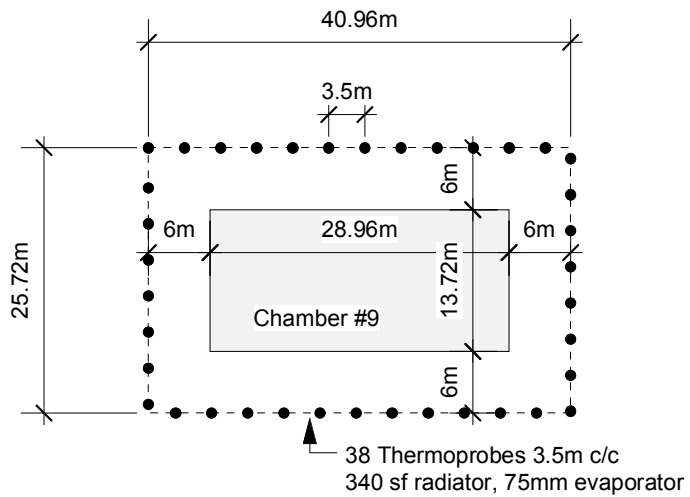
Preliminary Chamber #14

SCALE

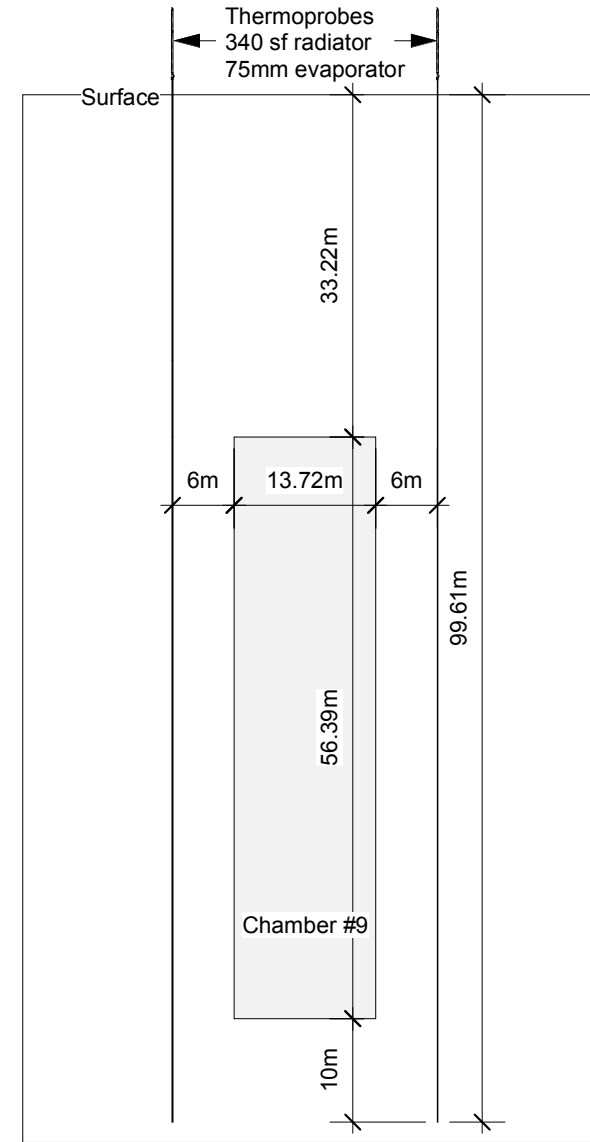
DATE

July 2002

DRAWING NO.



Plan



Section



ARCTIC FOUNDATIONS
OF CANADA INC.

#15 Elie St. E. Elie, MB R0H 0H0
Ph. 204-353-2510 Fax. 204-353-2610

CLIENT

SRK

PROJECT

Giant Mine Freeze Wall

DRAWING TITLE

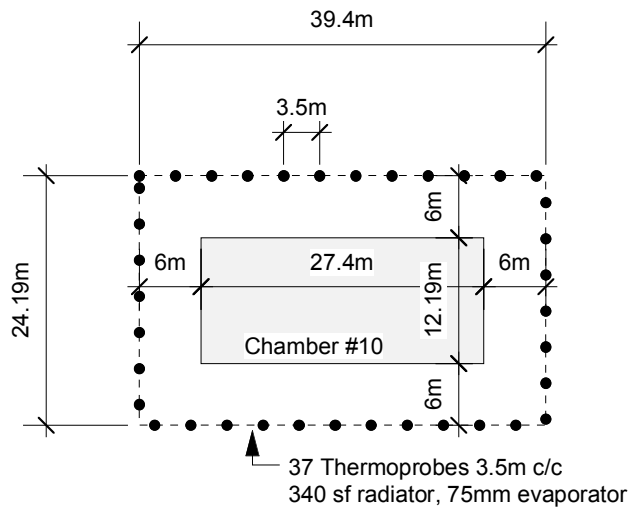
Preliminary Chamber #9

SCALE

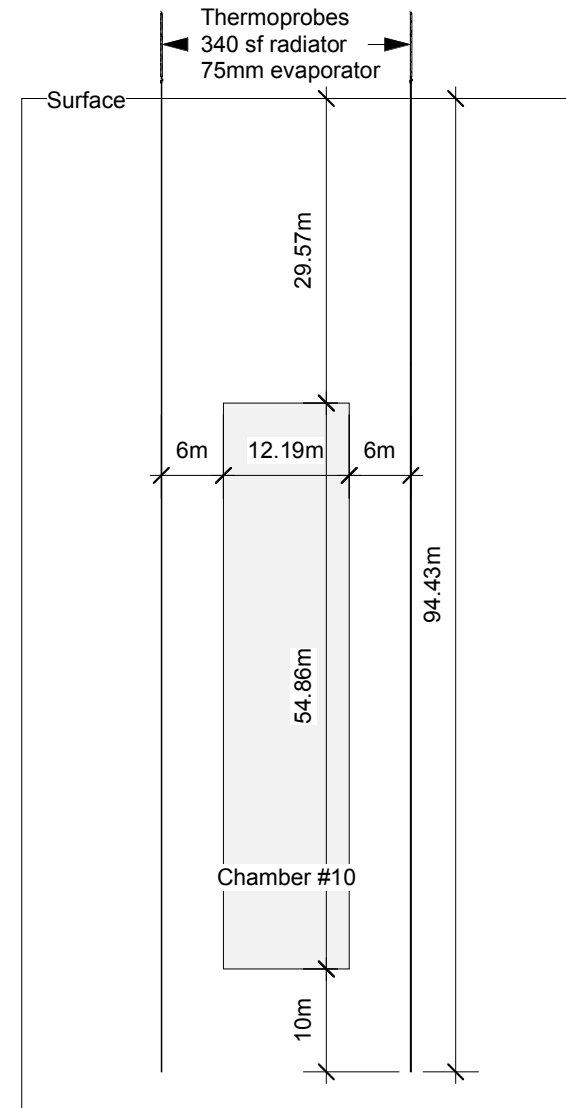
DATE

July 2002

DRAWING NO.



Plan



Section



**ARCTIC FOUNDATIONS
OF CANADA INC.**

#15 Elie St. E. Elie, MB R0H 0H0
Ph. 204-353-2510 Fax. 204-353-2610

CLIENT

SRK

PROJECT

Giant Mine Freeze Wall

DRAWING TITLE

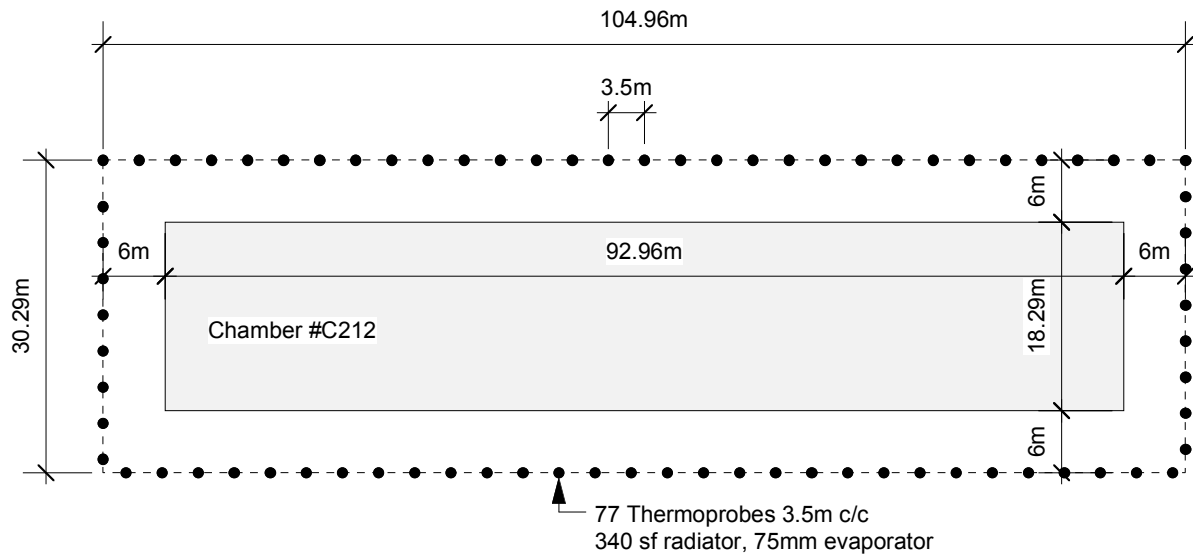
Preliminary Chamber #10

SCALE

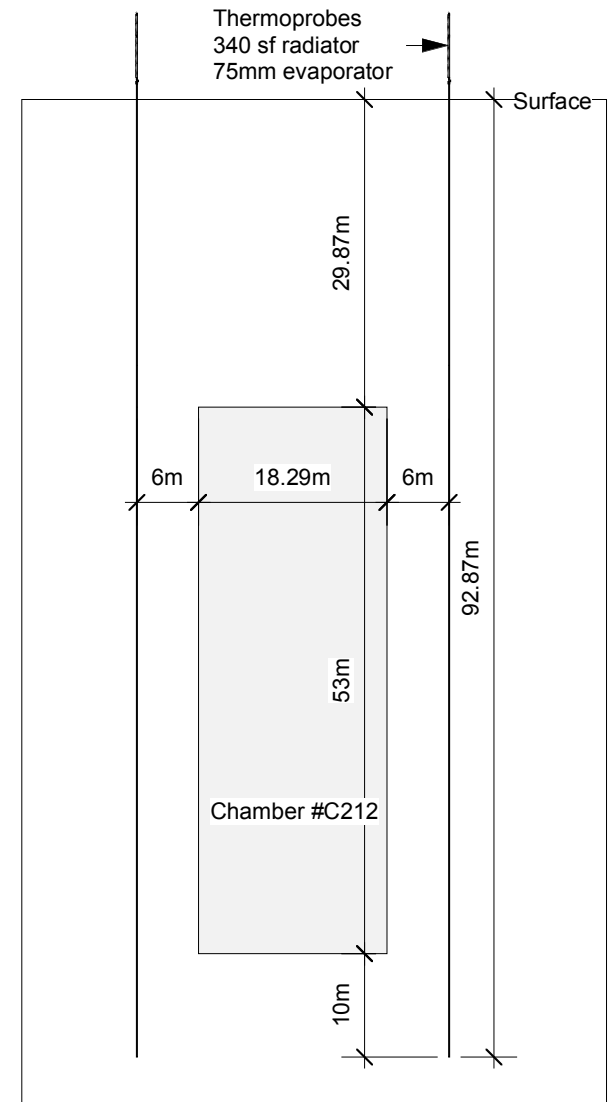
DATE

July 2002

DRAWING NO.



Plan



Section



**ARCTIC FOUNDATIONS
OF CANADA INC.**

#15 Elie St. E. Elie, MB R0H 0H0
Ph. 204-353-2510 Fax. 204-353-2610

CLIENT

SRK

PROJECT

Giant Mine Freeze Wall

DRAWING TITLE

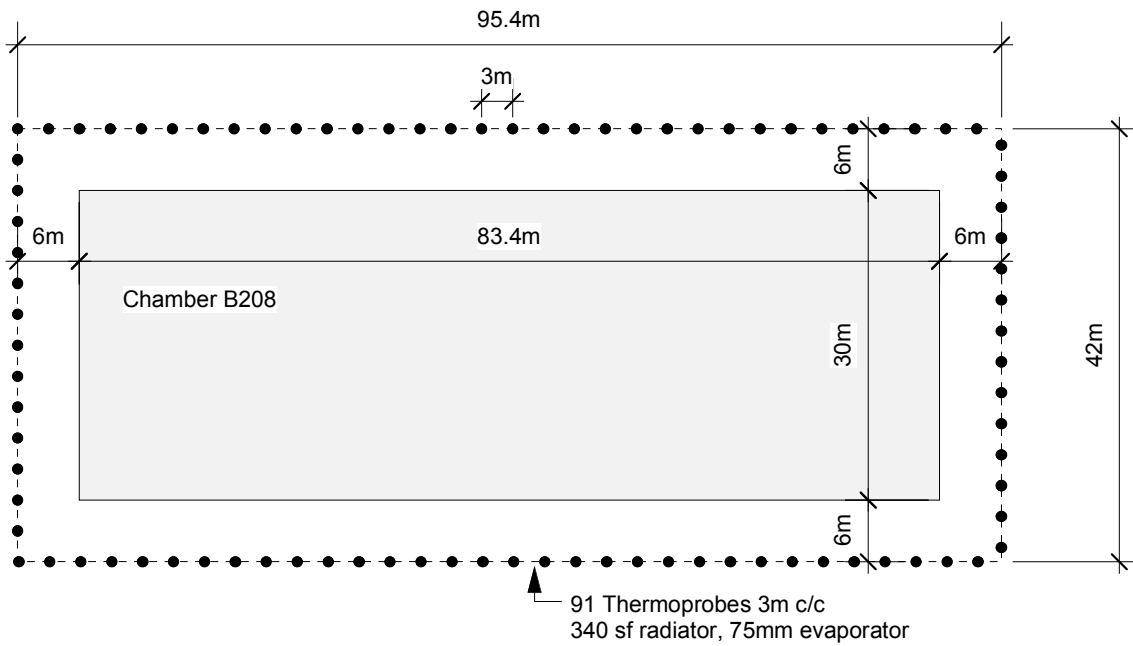
Preliminary Chamber #C212

SCALE

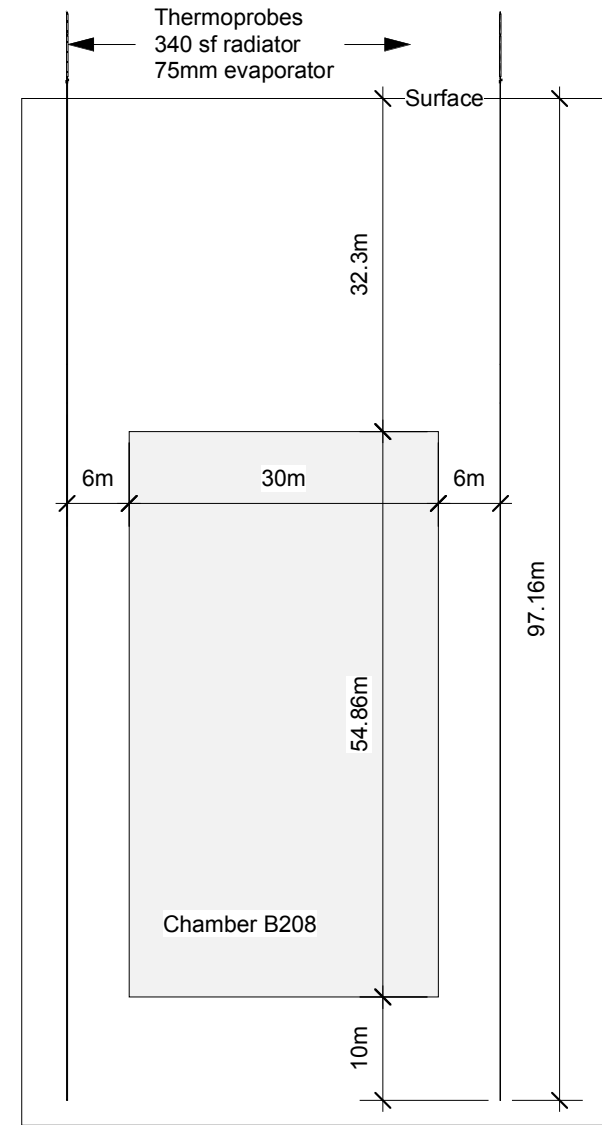
DATE

July 2002

DRAWING NO.



Plan



Section



ARCTIC FOUNDATIONS
OF CANADA INC.

#15 Elie St. E. Elie, MB R0H 0H0
Ph. 204-353-2510 Fax. 204-353-2610

CLIENT

SRK

PROJECT

Giant Mine Freeze Wall

DRAWING TITLE

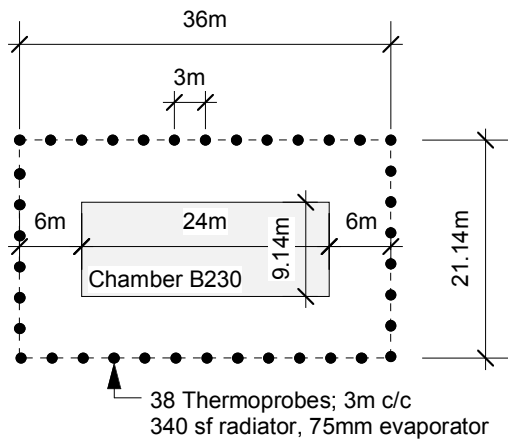
Preliminary Chamber B208

SCALE

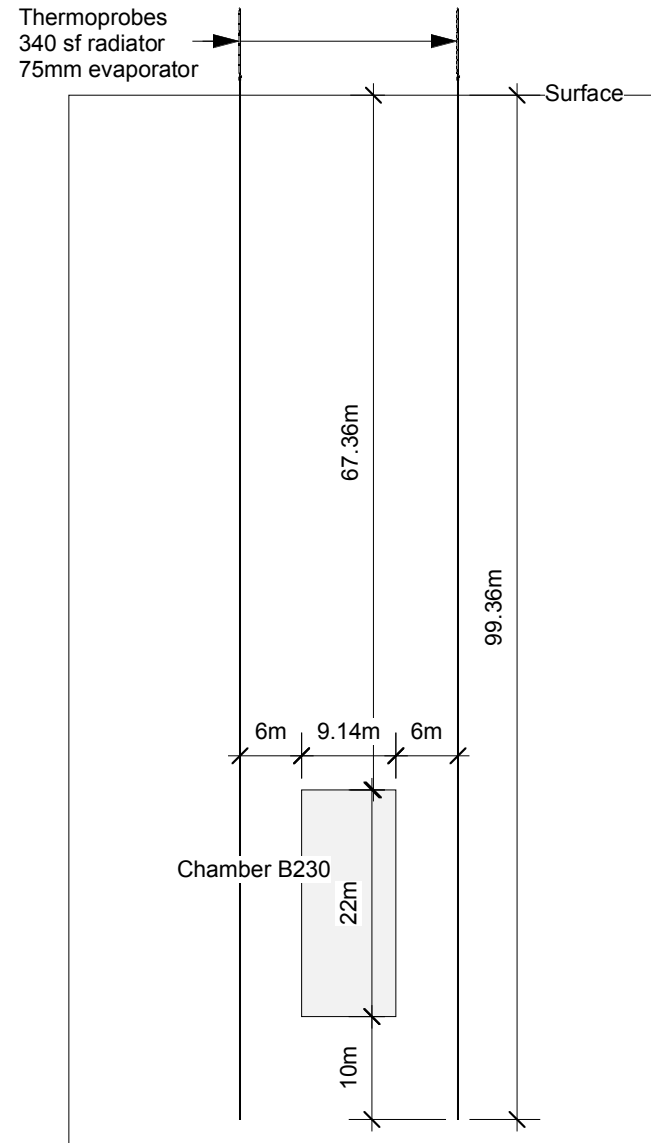
DATE

July 2002

DRAWING NO.



Plan



Section



ARCTIC FOUNDATIONS
OF CANADA INC.

#15 Elie St. E. Elie, MB R0H 0H0
Ph. 204-353-2510 Fax. 204-353-2610

CLIENT

SRK

PROJECT

Giant Mine Freeze Wall

DRAWING TITLE

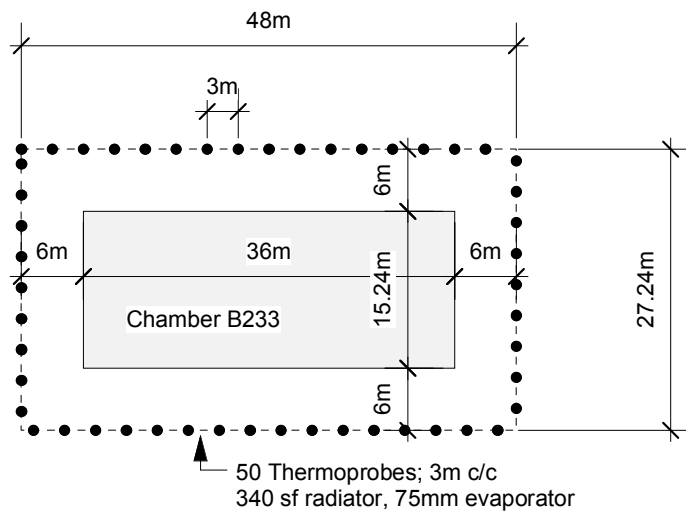
Preliminary Chamber B230

SCALE

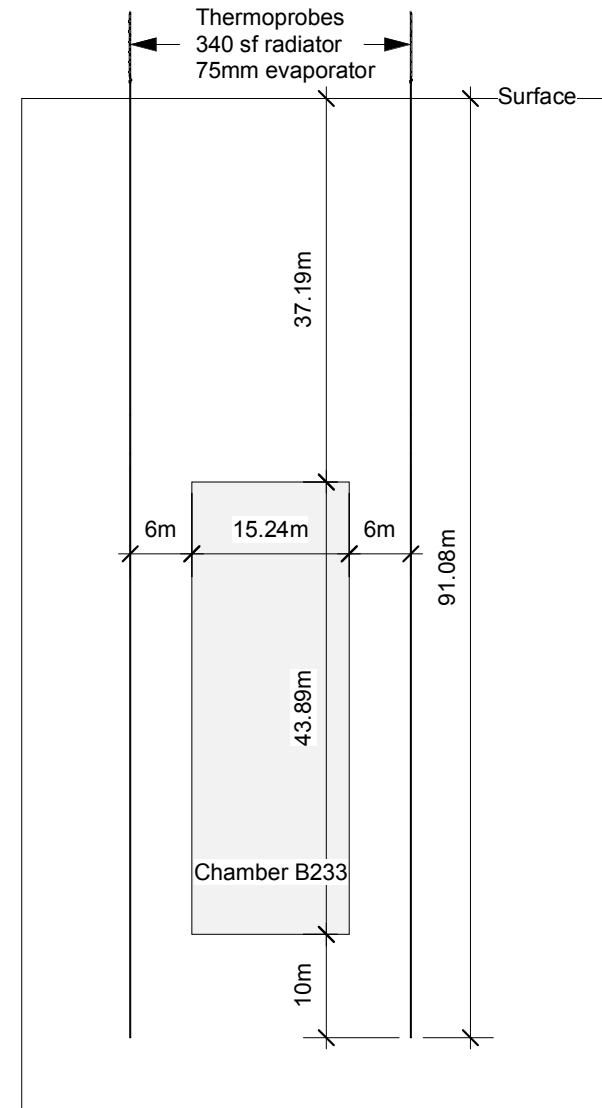
DATE

July 2002

DRAWING NO.



Plan



Section



**ARCTIC FOUNDATIONS
OF CANADA INC.**

#15 Elie St. E. Elie, MB R0H 0H0
Ph. 204-353-2510 Fax. 204-353-2610

CLIENT

SRK

PROJECT

Giant Mine Freeze Wall

DRAWING TITLE

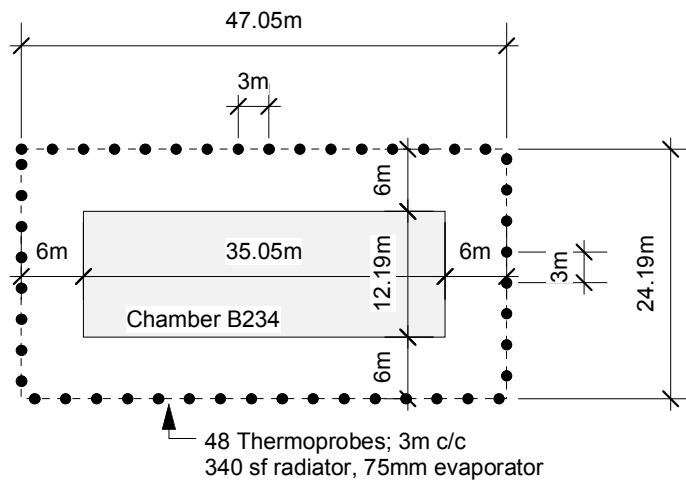
Preliminary Chamber B233

SCALE

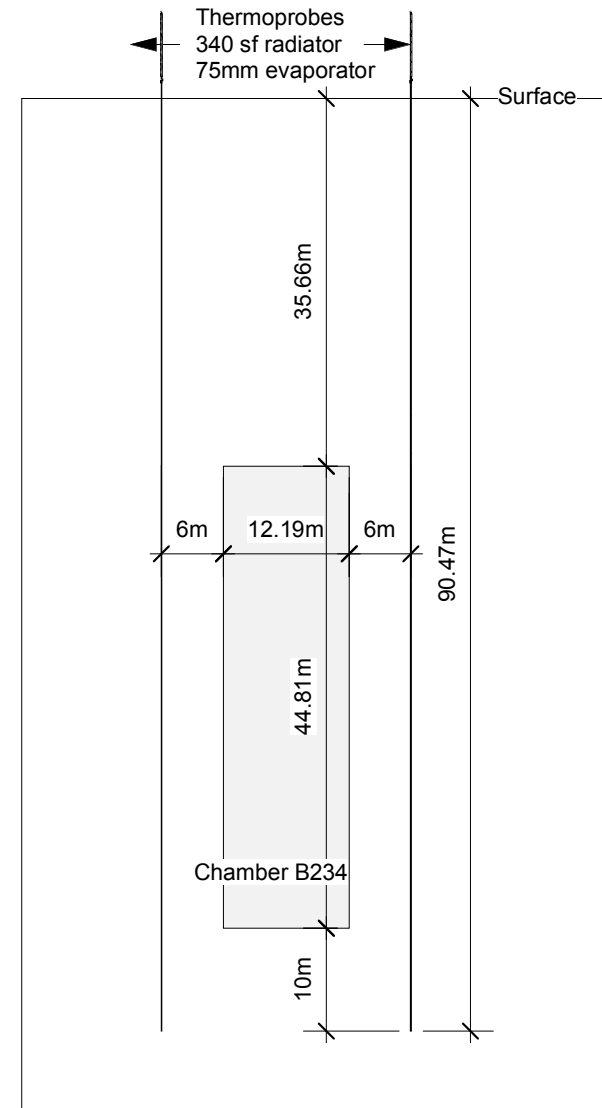
DATE

July 2002

DRAWING NO.



Plan



Section



**ARCTIC FOUNDATIONS
OF CANADA INC.**

#15 Elie St. E. Elie, MB R0H 0H0
Ph. 204-353-2510 Fax. 204-353-2610

CLIENT

SRK

PROJECT

Giant Mine Freeze Wall

DRAWING TITLE

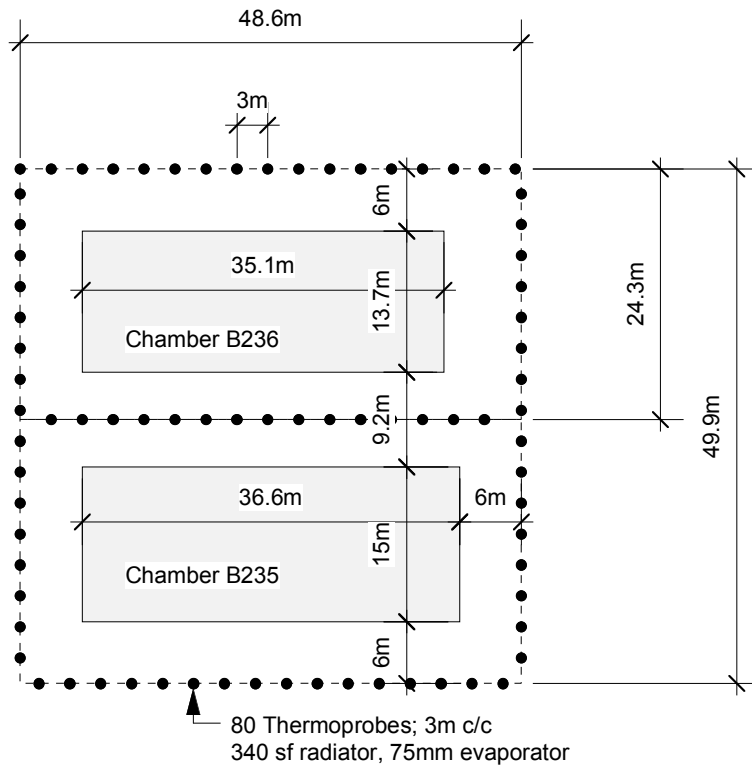
Preliminary Chamber B234

SCALE

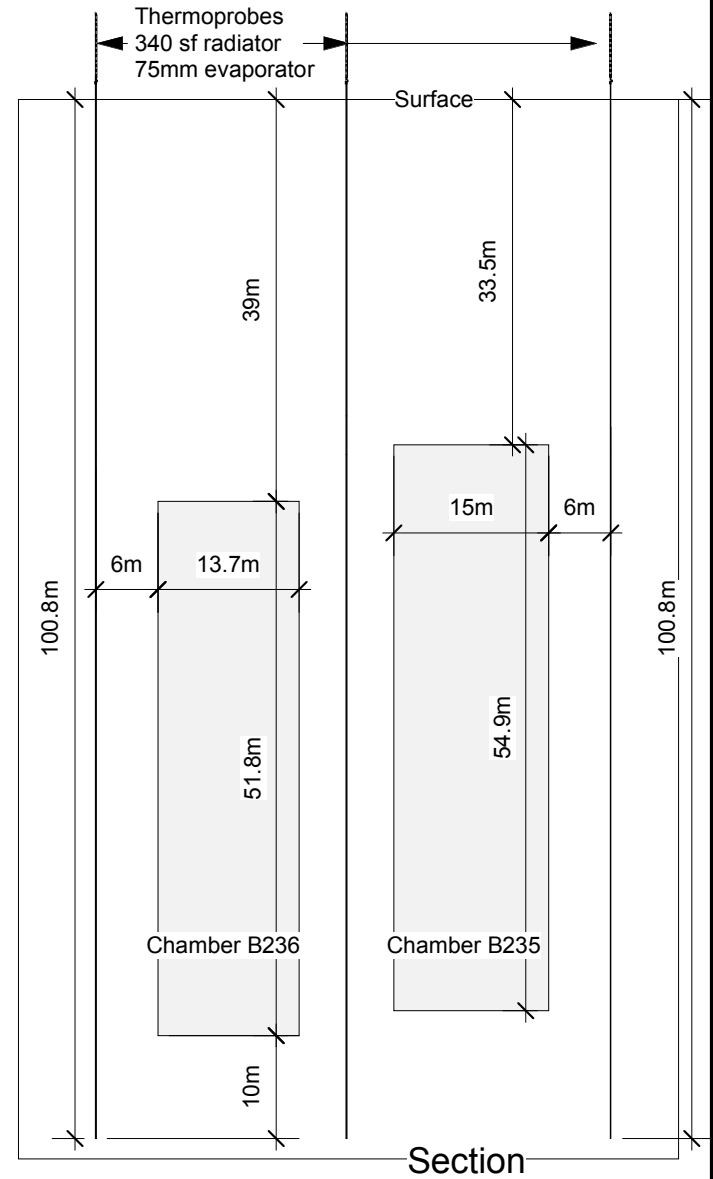
DATE

July 2002

DRAWING NO.



Plan



Section



ARCTIC FOUNDATIONS
OF CANADA INC.

#15 Elie St. E. Elie, MB R0H 0H0
Ph. 204-353-2510 Fax. 204-353-2610

CLIENT

SRK

PROJECT

Giant Mine Freeze Wall

DRAWING TITLE

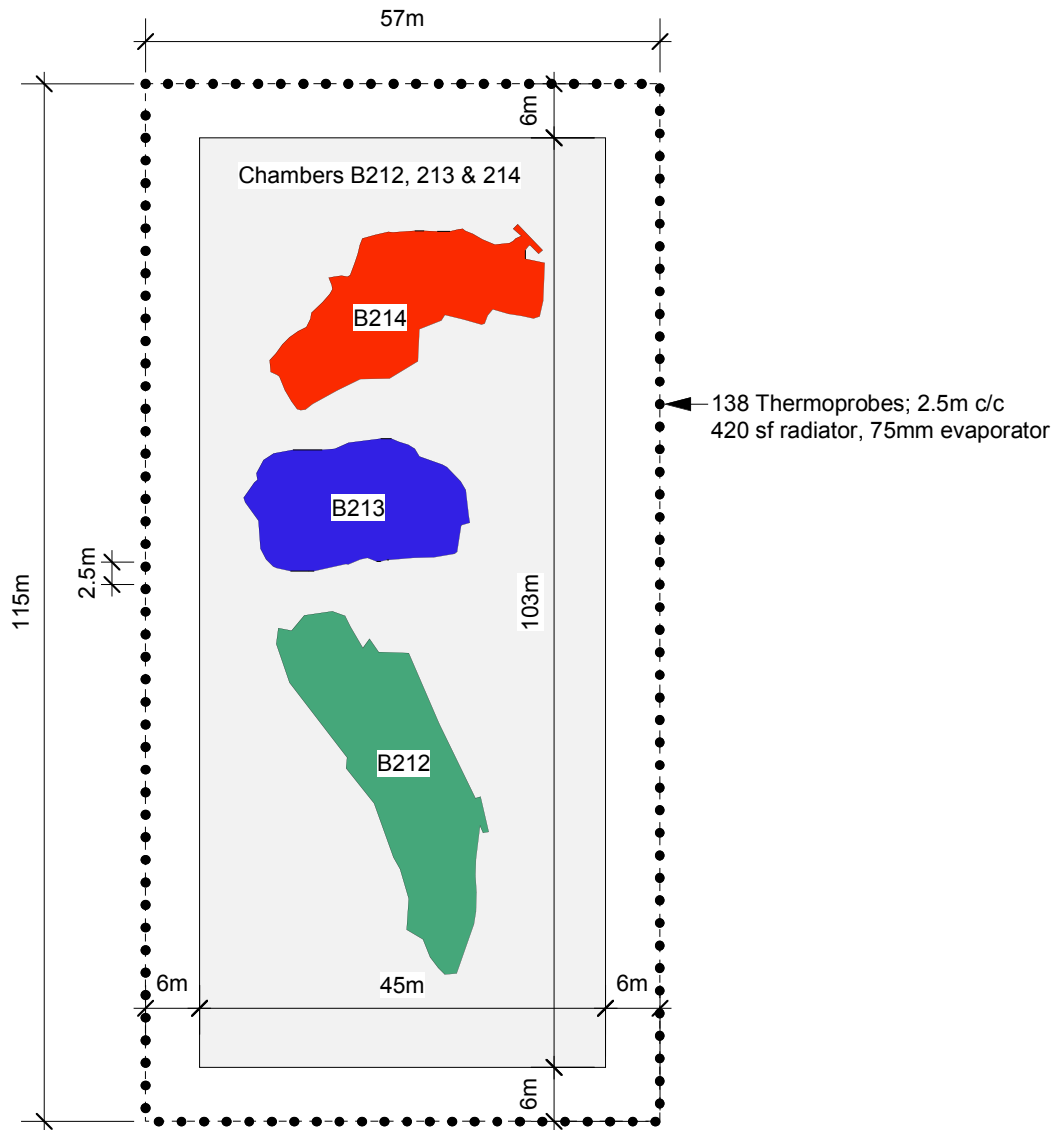
Preliminary Chamber B235 & B236

SCALE

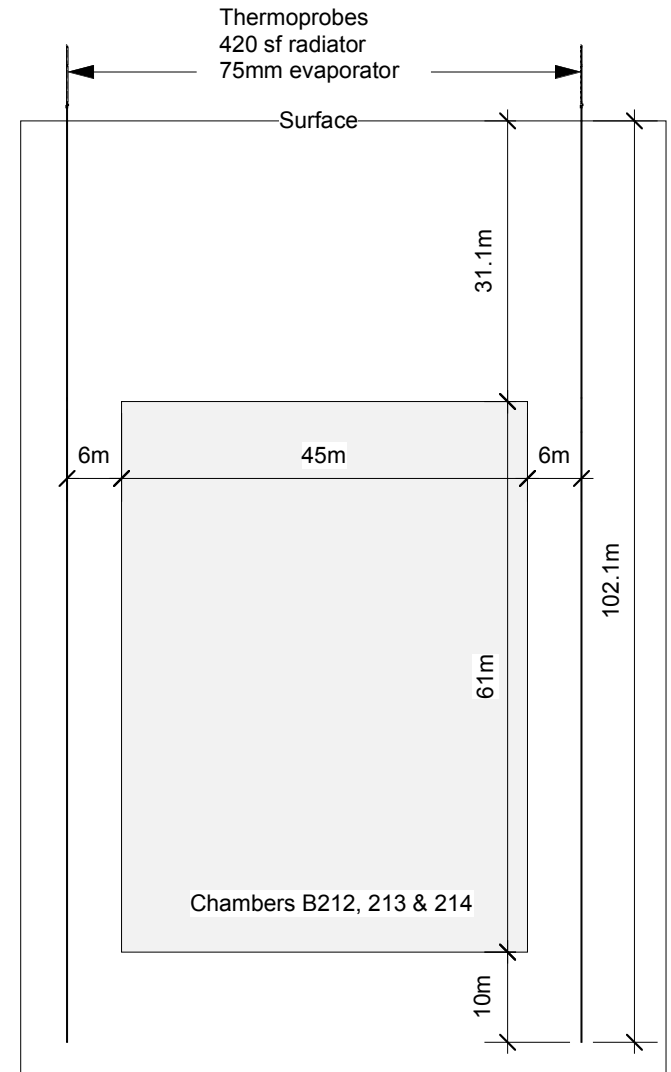
DATE

July 2002

DRAWING NO.



Plan



Section



ARCTIC FOUNDATIONS
OF CANADA INC.

#15 Elie St. E. Elie, MB R0H 0H0
Ph. 204-353-2510 Fax. 204-353-2610

CLIENT

SRK

PROJECT

Giant Mine Freeze Wall

DRAWING TITLE

Preliminary Chambers B212, 213 & 214

SCALE

DATE

July 2002

DRAWING NO.