THEORETICAL TEMPERATURE FIELDS
FOR THE STRIPA HEATER PROJECT
VOL. 2

Tin Chan, Neville G.W. Cook, and Chin-Fu Tsang

Lawrence Berkeley Laboratory
University of California
Berkeley, California 94720

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APPENDIX

COMPLETE SET OF FIGURES

This appendix contains a complete set of figures illustrating the detailed results of the various cases studied in the following order:

Test case: Fig. 6-12

Field cases

Model Series 1 (average granite properties): Fig. 13-48.

See Table 4, p. 26 above, for an index to the different cases in this series.

Model Series 2 (Stripa granite properties): Fig. 49-59.

Full-Scale Experiment 1 (3.6 kW): Fig. 49, 51, 52.

Full-Scale Experiment 2 (5 kW main heater with eight 0.72 kW peripheral heaters): Fig. 50, 53, 54.

Time-Scaled Experiment: Fig. 55-59.

Refer to Sections 7.1 and 7.2 of Volume 1 for discussion of the results.

FIGURE CAPTIONS

- Fig. 1. Temperature rise at various distances from point, infinite line and plane heat sources. Subscript indicates time (years) after emplacement of the heat source. Thermal conductivity = $2.5 \text{ W/m}^\circ\text{C}$, thermal diffusivity = $1.1 \times 10^{-6} \text{ m}^2/\text{s}$.
- Fig. 2. Cut-away views of the LBL full-scale (a) and time-scaled (b) heater experiments at Stripa (after Witherspoon and Degerman, 1978).
- Fig. 3. Configuration of full-scale Experiment 2.
- Fig. 4. Configuration of time-scaled heater experiment (Experiment 3) illustrating the coordinate system adopted.
- Fig. 5. System geometry and boundary conditions for CCC model of the test case. ABC - Newton's Law of Cooling with heat transfer coefficient $3.4 \text{ W/m}^2^\circ\text{C}$; CDEF - isothermal or adiabatic boundary.
- Fig. 6. Temperature rise in an infinite medium as a function of radial distance from a 1 kW, 2.5 m-long line heater at different times. Thermal conductivity = $2.5 \text{ W/m}^\circ\text{C}$, thermal diffusivity = $1.078 \times 10^{-6} \text{ m}^2/\text{s}$.
- Fig. 7. Temperature rise in an infinite medium due to a 1 kW, 2.5 m-long line heater as a function of time at various radial distances. Thermal conductivity = $2.5 \text{ W/m}^\circ\text{C}$, thermal diffusivity = $1.078 \times 10^{-6} \text{ m}^2/\text{s}$.
- Fig. 8. Temperature rise in an infinite medium as a function of axial distance from the mid-plane of a 1 kW, 2.5 m-long line heater at various radial distances two years after emplacement. Thermal conductivity = $2.5 \text{ W/m}^\circ\text{C}$, thermal diffusivity = $1.078 \times 10^{-6} \text{ m}^2/\text{s}$.
- Fig. 9. Isotherms of temperature rise on day 88 and day 364 for the model depicted in Fig. 5 with CDEF as isothermal boundary; vertical section. Thermal conductivity = $2.5 \text{ W/m}^\circ\text{C}$, thermal diffusivity = $1.15 \times 10^{-6} \text{ m}^2/\text{s}$.

Fig. 10. Temperature rise as a function of radial distance along heater mid-plane for the same model as in Fig. 9, (a) linear scale, (b) semilog scale. Thermal conductivity = $2.5 \text{ W/m}^\circ\text{C}$, thermal diffusivity = $1.15 \times 10^{-6} \text{ m}^2/\text{s}$.

Fig. 11. Axial profile of temperature rise near heater for the same model as Fig. 9. Thermal conductivity = $2.5 \text{ W/m}^\circ\text{C}$, thermal diffusivity = $1.15 \times 10^{-6} \text{ m}^2/\text{s}$.

Fig. 12. Comparison of mid-plane radial profiles of temperature rise on day 364 as predicted by different models. Thermal conductivity = $2.5 \text{ W/m}^\circ\text{C}$, thermal diffusivity = $1.078 \times 10^{-6} \text{ m}^2/\text{s}$.

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Fig. 14. Isotherms of temperature rise ($^\circ\text{C}$) in granite caused by one 3.6 kW full-scale heater at time = 1, 7, 30, 90, 365 and 730 days; vertical section, isothermal boundary model (1B). Thermal conductivity = $2.5 \text{ W/m}^\circ\text{C}$, thermal diffusivity = $1.078 \times 10^{-6} \text{ m}^2/\text{s}$.

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- Fig. 18. Comparison of isotherms of temperature rise on day 730 as predicted by Models 1A, 1B and 1C. Legend: 1A (infinite medium); ——— 1B (isothermal boundary); ---- 1C (adiabatic boundary). Thermal conductivity = $2.5 \text{ W/m}^\circ\text{C}$, thermal diffusivity = $1.078 \times 10^{-6} \text{ m}^2/\text{s}$.
- Fig. 19. Comparison of radial profiles of temperature rise along heater mid-plane as predicted by Models 1A, 1B and 1C. Thermal conductivity = $2.5 \text{ W/m}^\circ\text{C}$, thermal diffusivity = $1.078 \times 10^{-6} \text{ m}^2/\text{s}$.
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Fig. 26. Migration of 50°C (vertical section) and 100°C (horizontal section), incremental isotherms as predicted by Model 2B. Thermal conductivity = $2.5 \text{ W/m}^{\circ}\text{C}$, thermal diffusivity = $1.078 \times 10^{-6} \text{ m}^2/\text{s}$.

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Fig. 29. Comparison of isotherms of temperature rise on day 365 as predicted by Models 2A, 2B and 2C. Legend: 2A (infinite medium); — 2B (isothermal boundary); ---- 2C (adiabatic boundary). Thermal conductivity = $2.5 \text{ W/m}^\circ\text{C}$, thermal diffusivity = $1.778 \times 10^{-6} \text{ m}^2/\text{s}$.

Fig. 30. Comparison of isotherms of temperature rise on day 730 as predicted by Models 2A, 2B and 2C. Legend: 2A (infinite medium); — 2B (isothermal boundary); ---- 2C (adiabatic boundary). Thermal conductivity = $2.5 \text{ W/m}^\circ\text{C}$, thermal diffusivity = $1.078 \times 10^{-6} \text{ m}^2/\text{s}$.

Fig. 31. Comparison of radial profiles of temperature rise along heater mid-plane as predicted by Models 2A, 2B and 2C. Thermal conductivity = $2.5 \text{ W/m}^\circ\text{C}$, thermal diffusivity = $1.078 \times 10^{-6} \text{ m}^2/\text{s}$.

Fig. 32. Isotherms of temperature rise ($^\circ\text{C}$) in granite caused by a ring of eight 1 kW peripheral heaters at time = 1, 7, 30, 90, 365 and 730 days; vertical section through axis of one peripheral heater and the central axis of the ring; infinite medium model (2D). Thermal conductivity = $2.5 \text{ W/m}^\circ\text{C}$, thermal diffusivity = $1.078 \times 10^{-6} \text{ m}^2/\text{s}$.

Fig. 33. Isotherms of temperature rise ($^\circ\text{C}$) in granite caused by a ring of eight 1 kW peripheral heaters at time = 1, 7, 30, 90, 365 and 730 days; vertical section bisecting angle between two peripheral heaters; infinite medium model (2D). Thermal conductivity = $2.5 \text{ W/m}^\circ\text{C}$, thermal diffusivity = $1.078 \times 10^{-6} \text{ m}^2/\text{s}$.

Fig. 34. Isotherms of temperature rise ($^\circ\text{C}$) in granite caused by a ring of eight 1 kW peripheral heaters at time = 1, 7, 30, 90, 365 and 730 days; horizontal section through mid-plane of heaters; infinite medium model (2D). Thermal conductivity = $2.5 \text{ W/m}^\circ\text{C}$, thermal diffusivity = $1.078 \times 10^{-6} \text{ m}^2/\text{s}$.

Fig. 35. Radial profile of temperature rise along mid-plane of ring of peripheral heaters at various times as predicted by Model 2D (infinite medium). Thermal conductivity = $2.5 \text{ W/m}^\circ\text{C}$, thermal diffusivity = $1.078 \times 10^{-6} \text{ m}^2/\text{s}$.

- Fig. 36. Isotherms of temperature rise ($^{\circ}\text{C}$) in granite caused by a ring of eight 1 kW peripheral heaters at time = 1, 7, 20, 90, 365 and 730 days; vertical section through one peripheral heater and the central axis of the ring; isothermal boundary model (2E). Thermal conductivity = $2.5 \text{ W/m}^{\circ}\text{C}$, thermal diffusivity = $1.078 \times 10^{-6} \text{ m}^2/\text{s}$.
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- Fig. 39. Isotherms of temperature rise ($^{\circ}\text{C}$) in granite caused by a ring of eight 1 kW peripheral heaters at time = 1, 7, 30, 90, 365 and 730 days; vertical section bisecting angle between two heaters; adiabatic boundary model (2F). Thermal conductivity = $2.5 \text{ W/m}^{\circ}\text{C}$, thermal diffusivity = $1.078 \times 10^{-6} \text{ m}^2/\text{s}$.
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- Fig. 42. Isotherms of temperature rise ($^{\circ}\text{C}$) in granite caused by an array of eight constant 1.125 kW time-scaled heaters; horizontal section 0.2025 m above mid-plane of heaters; Model 3A. Thermal conductivity = $2.5 \text{ W/m}^{\circ}\text{C}$, thermal diffusivity = $1.078 \times 10^{-6} \text{ m}^2/\text{s}$.
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- Fig. 49. Temperature rise ($^{\circ}\text{C}$) as a function of time at various radial distances along heater mid-plane, Stripa full-scale Experiment 1 (3.6 kW), Model Series 2, infinite medium model. Thermal conductivity = $3.2 \text{ W/m}^{\circ}\text{C}$, thermal diffusivity = $1.47 \times 10^{-6} \text{ m}^2/\text{s}$.

- Fig. 50. Temperature rise ($^{\circ}\text{C}$) as a function of time at various radial distances from axis of central heater along a radius passing through one peripheral heater, Stripa full-scale Experiment 2 (5 kW with eight 0.72 kW peripheral heaters), Model Series 2, infinite medium model. Thermal conductivity = $3.2 \text{ W/m}^{\circ}\text{C}$, thermal diffusivity = $1.47 \times 10^{-6} \text{ m}^2/\text{s}$.
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- Fig. 52. Isotherms of temperature rise ($^{\circ}\text{C}$) in Stripa full-scale Experiment 1 (3.6 kW) at time = 1, 7, 30, 90, 360 and 730 days; vertical section, Model Series 2, isothermal boundary model. Thermal conductivity = $3.2 \text{ W/m}^{\circ}\text{C}$, thermal diffusivity = $1.47 \times 10^{-6} \text{ m}^2/\text{s}$.
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Fig. 56. Isotherms of temperature rise ($^{\circ}\text{C}$) in Stripa time-scaled experiment (constant power 1.125 kW) at the end of 730 days; horizontal section at vertical distances of 1, 2, 3, 4, 6, 7, 8 m from mid-plane, Model Series 2. Thermal conductivity = $3.2 \text{ W/m}^{\circ}\text{C}$, thermal diffusivity = $1.47 \times 10^{-6} \text{ m}^2/\text{s}$.

Fig. 57. Isotherms of temperature rise ($^{\circ}\text{C}$) in Stripa time-scaled experiment (constant power 1.125 kW) at time $\approx 1, 7, 30, 90, 180, 360, 730$ days; vertical section ($y = 0$ plane) through major axis of heaters (i.e., through H1, H2, H3 and H4), Model Series 2. Thermal conductivity = $3.2 \text{ W/m}^{\circ}\text{C}$, thermal diffusivity = $1.47 \times 10^{-6} \text{ m}^2/\text{s}$.

Fig. 58. Isotherms of temperature rise ($^{\circ}\text{C}$) in Stripa time-scaled experiment (constant power 1.125 kW) at time $\approx 1, 7, 30, 90, 180, 360, 730$ days; vertical section through H3, H6 and H8 (i.e., $x = 3.5 \text{ m}$ plane), Model Series 2. Thermal conductivity = $3.2 \text{ W/m}^{\circ}\text{C}$, thermal diffusivity = $1.47 \times 10^{-6} \text{ m}^2/\text{s}$.

Fig. 59. Isotherms of temperature rise ($^{\circ}\text{C}$) in Stripa time-scaled experiment (constant power 1.125 kW) at time = 730 days, vertical section (a) through H5 and H6 ($y = 3 \text{ m}$ plane), and (b) through E1 and E4 ($x = 0$ plane), Model Series 2. Thermal conductivity = $3.2 \text{ W/m}^{\circ}\text{C}$, thermal diffusivity = $1.47 \times 10^{-6} \text{ m}^2/\text{s}$.

XBL 782-234

Fig. 1

XBL 785-970 A

Fig. 2a

Fig. 2b

XBL 785-969

Fig. 3

Fig. 4a

XBL 782-230

XBL78I-2347A

Fig. 4b

XBL782-232

Fig. 5

-71-

24

XBL781-2346

Fig. 6

XBL781-6696

Fig. 7

Fig. 8

XBL 781-6697

XBL78I-6691

Fig. 9a

XBL 786-9156

Fig. 9b

Fig. 10a

XBL7712 -6677

-77-

XBL7712-6675

Fig. 10b

XBL 788-2022

Fig. 11

Fig. 12

XBL 782-228

XBL 785-8547

Fig. 13a

XBL 785-8548

Fig. 13b

XBL 785-8549

Fig. 13c

Fig. 13d

XBL 785-8650

Fig. 13e

Fig. 13f

XBL 785-8535

Fig. 14a

XBL 785-8536

Fig. 14b

Fig. 14c

XBL 785-9537

XBL 785-8538

Fig. 14d

Fig. 14e

XBL 785-8540

Fig. 14f

XBL 735-3541

Fig. 15a

Fig. 15b

XBL 785-5542

Fig. 15c

XBL 785-8543

XBL 785-8544

Fig. 15d

Fig. 15e

Fig. 15f

XBL 735-8546

Fig. 16

XBL782-231

XBL 786-1083

Fig. 17

XBL796-1085

Fig. 18

XBL786-1088

Fig. 19

XBL 785-8453

Fig. 20a

Fig. 20b

XBL 765-8454

XBL 785-8455

Fig. 20c

XBL 785-8456

Fig. 20d

Fig. 20e

XBL 785-8457

XBL 785-8458

Fig. 20f

Fig. 21a

XBL 785-8459

Fig. 21b

XBL 785-8460

XBL 785-8461

Fig. 21c

Fig. 21d

XBL 785-8463

Fig. 21e

Fig. 21f

XBL 795-8464

XBL 785-8477

Fig. 22a

XBL 785-8478

Fig. 22b

XBL 785-8479

Fig. 22c

XBL 785-8480

Fig. 22d

XBL 785-8481

Fig. 22e

XBL 785-8482

Fig. 22f

Fig. 23

XBL 781 - 6699

Fig. 24a

XBL 785-8489

Fig. 24b

XBL 785-8490

Fig. 24c

XBL 785-8491

Fig. 24d

XBL 785-9492

Fig. 24e

XBL 785-8493

Fig. 24f

XBL 783-7741

XBL 785-8500

Fig. 25a

XBL 785-8501

Fig. 25b

Fig. 25c

XBL 785-8502

XBL 785-8503

Fig. 25d

XBL 785-8504

Fig. 25e

XBL 785-8505

FIG. 25f

XBL 786-1084

Fig. 26a

XBL 786-1095

Fig. 26b

Fig. 27a

XBL 785-8494

Fig. 27b

XBL 785-8495

Fig. 27c

XBL 785-8496

XBL 785-8497

Fig. 27d

Fig. 27e

XBL 785-8496

XBL 785-8499

Fig. 27f

Fig. 28a

XBL 785-8507

Fig. 28b

XBL 785-8508

Fig. 28c

Fig. 284

XBL 795-8509

XBL 785-8510

Fig. 28e

XBL 785-8571

Fig. 28f

XBL786-1086

Fig. 29

XBL786-1082

Fig. 30

XBL 78B-2024

Fig. 31a

XBL 788-2023

Fig. 31b

Fig. 32a

XBL 785-8465

XBL 785-8466

Fig. 32b

Fig. 32c

XBL 785-8468

Fig. 32d

Fig. 32e

XBL 785-8469

XBL 785-8470

Fig. 32f

XBL 785-8471

Fig. 33a

Fig. 33b

XBL 785-e472

Fig. 33c

XBL 785-8473

Fig. 33d

XBL 785-8474

XBL 785-8475

Fig. 33e

Fig. 33f

XBL 785-6476

XBL 785-8483

Fig. 34a

XBL 785-8484

Fig. 34b

XBL 785-8485

Fig. 34c

XBL 785-8486

Fig. 34d

XBL 785-8487

Fig. 34e

YBL 785-8488

Fig. 34f

Fig. 35

XBL 781-229

Fig. 36a

XBL 785-8512

XBL 785-8513

Fig. 36b

Fig. 36c

XBL 785-8514

Fig. 36d

XBL 785-8515

Fig. 36e

XBL 785-8516

XBL 785-8517

Fig. 36f

XBL 785-8523

Fig. 37a

XBL 785-8524

Fig. 37b

XBL 785-8525

Fig. 37c

XBL 785-8526

Fig. 37d

XBL 785-8527

Fig. 37e

Fig. 37f

XBL 785-8528

XBL 785-8518

Fig. 38a

XBL 785-8519

Fig. 38b

XBL 783-7742

Fig. 38c

Fig. 38d

Fig. 38e

XBL 785-9521

XBL 785-8522

Fig. 38f

Fig. 39a

XRL 785-8529

Fig. 39b

XBL 785-8530

Fig. 39c

XBL 785-8531

XBL 785-8532

Fig. 39d

XBL 785-8533

Fig. 39e

XBL 785-8534

Fig. 39f

XBL 786-9256

Fig. 40

XSL 755-6553

Fig. 41a

Fig. 41b

XBL 785-8554

XBL 783-7739

Fig. 41c

Fig. 41d

Fig. 41f

XBL 783-7740

XBL 785-8557

Fig. 42a

NBL 785-8558

Fig. 42b

Fig. 42c

-204-

Fig. 42d

XBL 785-8560

XBL 785-856T

Fig. 42e

Fig. 42f

Fig. 43a

-208-

XBL 785-8564

Fig. 43b

NBL 785-8565

Fig. 43c

XBL 785-8566

Fig. 43d

Fig. 43e

XBL 785-8567

XBL 785-8568

Fig. 43f

Fig. 44b

NBL 785-8573

Fig. 44c

XBL 785-9572

Fig. 44d

Fig. 44e

XBL 782-227

Fig. 45a

XBL 782-233

Fig. 45b

Fig. 46a

XBL 7712 - 11120

Fig. 46b

-222-

XBL7712-11114

Fig. 47a

XBL7712-11116

Fig. 47b

Fig. 48a

XBL7712-11117

XBL7712-11118

Fig. 48b

TEMPERATURE PROFILES FOR
STRIPA FULL-SCALE EXPERIMENT 1
 $Z = 0$ M, $\theta = 0$ DEG., $R = 0.203$ TO 0.881
INFINITE MEDIUM MODEL

XBL 788-10521

Fig. 49a

TEMPERATURE PROFILES FOR
STRIPA FULL-SCALE EXPERIMENT 1
Z = 0 M, THETA = 0 DEG., R = 0.919 TO 5.0 M
INFINITE MEDIUM MODEL

XBL 788-10520

Fig. 49b

TEMPERATURE PROFILES FOR
STRIPA FULL-SCALE EXPERIMENT 2
Z = 0 M, THETA = 0 DEG., R = 0.203 TO 0.881
INFINITE MEDIUM MODEL

XBL 788-10522

Fig. 50a

TEMPERATURE PROFILES FOR
STRIPA FULL-SCALE EXPERIMENT 2
 $Z = 0$ M, $\theta = 0$ DEG., $R = 0.919$ TO 5.0 M
INFINITE MEDIUM MODEL

XBL 788-10519

Fig. 50b

temperature rise ($^{\circ}\text{C}$)

STRIPA FULL SCALE 1 - ONE HEATER 3.6KW

time	=	1.000	θ	=	0.000 $^{\circ}$
		<u>contour interval</u>			<u>lowest level</u> <u>highest level</u>
		20.00			20.00 40.00

model: INFI SSET3

calculated 08/10/78

XBL 788-10571

Fig. 51a

temperature rise ($^{\circ}\text{C}$)

STRIPA FULL SCALE 1 - ONE HEATER 3.6KW

time = 7.000 θ = 0.000 $^{\circ}$
contour interval lowest level highest level
 20.00 20.00 100.0

model: INF1

SSET3

calculated 08/18/78

XBL 788-10570

Fig. 51b

STRIPA FULL SCALE I - ONE HEATER 3.6KW

time = 30.000 θ = 0.000 °
contour interval lowest level highest level
 20.00 20.00 120.0

model: INFI

SSET3

calculated 06/18/78

XBL 788-10572

Fig. 51c

temperature rise (°C)

STRIPA FULL SCALE 1 - ONE HEATER 3.6KW

time = 90.000 θ = 0.000 °
contour interval lowest level highest level
 20.00 20.00 140.0

model: 1NF1

SSET3

calculated 08/18/78

XBL 788-10569

Fig. 51d

temperature rise ($^{\circ}\text{C}$)

STRIPA FULL SCALE 1 - ONE HEATER 3.6KW

time = 360.000 θ = 0.000 $^{\circ}$
contour interval lowest level highest level
 20.00 20.00 140.0

model: INF1 SSET3

calculated 08/18/78

XBL 788-10564

Fig. 51e

temperature rise (°C)

STRIPA FULL SCALE 1 - ONE HEATER 3.6KW

time = 730.000 θ = 0.000 °

<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
20.00	20.00	140.0

model: INF1 SSET3

calculated 08/18/78

XBL 788-10561

Fig. 51f

temperature rise ($^{\circ}\text{C}$)

STRIPA FULL SCALE 1 - ONE HEATER 3.6KW

time = 1.000 θ = 0.000 $^{\circ}$
contour interval lowest level highest level
 20.00 20.00 40.00

model: ISOT

SSET3

calculated 08/18/78

XBL 788-10562

Fig. 52a

STRIPA FULL SCALE 1 - ONE HEATER 3.6KW

time = 7.000 θ = 0.000 $^{\circ}$
contour interval lowest level highest level
 20.00 20.00 100.0

model: ISOT

SSET3

calculated 08/18/78

XBL 788-10557

Fig. 52b

temperature rise (°C)

STRIPA FULL SCALE 1 - ONE HEATER 3.6KW

time = 30.000 θ = 0.000 °
contour interval lowest level highest level
 20.00 20.00 120.0

model: ISOT

SSET3

calculated 08/10/78

XBL 788-10560

Fig. 52c

temperature rise ($^{\circ}\text{C}$)

STRIPA FULL SCALE 1 - ONE HEATER 3.6KW

time = 90.000 θ = 0.000 $^{\circ}$
contour interval lowest level highest level
 20.00 20.00 140.0

model: ISOT

SSET3

calculated 08/18/78

XBL 788-10558

Fig. 52d

temperature rise ($^{\circ}\text{C}$)

STRIPA FULL SCALE 1 - ONE HEATER 3.6KW

time = 360.000 θ = 0.000 $^{\circ}$

<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
20.00	20.00	140.0

model: ISOT SSET3

calculated 08/18/78

L

XBL 788-10590

Fig. 52e

temperature rise ($^{\circ}\text{C}$)

STRIPA FULL SCALE 1 - ONE HEATER 3.6KW

time = 730.000 θ = 0.000 $^{\circ}$
contour interval lowest level highest level
 20.00 20.00 140.0

model: ISOT SSET3

calculated 08/18/78

XBL 788-10592

Fig. 52f

temperature rise ($^{\circ}\text{C}$)

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time = 1.000 θ = 0.000 $^{\circ}$
contour interval lowest level highest level
 20.00 20.00 60.00

model: INFI

SSET3

calculated 08/18/78

XBL 788-10580

Fig. 53a

temperature rise ($^{\circ}\text{C}$)

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time	=	7.000	θ	=	0.000 $^{\circ}$
		<u>contour interval</u>			<u>lowest level</u> <u>highest level</u>
		20.00			20.00 140.0

model: INF1 SSET3

calculated 08/18/79

XBL 788-10579

Fig. 53b

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time = 30.000 θ = 0.000 °

<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
20.00	20.00	180.0

model: INF1 SSET3

calculated 08/18/78

L

XBL 788-10577

Fig. 53c

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time = 90.000 θ = 0.000 °

contour interval	lowest level	highest level
20.00	20.00	200.0

model: INFI SSET3

calculated 08/18/78

L

XBL 788-10575

Fig. 53d

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time = 180.000 θ = 0.000 $^{\circ}$
contour interval lowest level highest level
 20.00 20.00 200.0

model: INF1 SSET3

calculated 08/18/78

XBL 788-10573

Fig. 53e

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time = 181.000 θ = 0.000 °
 contour interval lowest level highest level
 20.00 20.00 200.0

model: INF1

SSET3

calculated 08/18/78

XBL 788-10574

Fig. 53f

temperature rise ($^{\circ}C$)

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time = 187.000 θ = 0.000 $^{\circ}$
 contour interval lowest level highest level
 20.00 20.00 240.0

model: INFI

SSET3

calculated 08/18/78

XBL 788-10576

Fig. 53g

temperature rise ($^{\circ}C$)

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time = 210.000 θ = 0.000 $^{\circ}$

contour interval

20.00

lowest level

20.00

highest level

260.0

model: INF1 SSET3

calculated 08/18/78

L

XBL 788-10595

Fig. 53h

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time = 270.000 θ = 0.000 $^{\circ}$
contour interval lowest level highest level
 20.00 20.00 280.0

model: INF1 SSET3

calculated 08/18/78

XBL 788-10594

Fig. 531

temperature rise ($^{\circ}\text{C}$)

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time =	360.000	θ =	0.000 $^{\circ}$
	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
	20.00	20.00	300.0

model: INFI SSET3

calculated 08/18/78

L

XBL 788-10593

Fig. 53j

temperature rise ($^{\circ}\text{C}$)

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time = 730.000 θ = 0.000 $^{\circ}$
contour interval lowest level highest level
 20.00 20.00 300.0

model: INFI

SSET3

calculated 08/18/78

XBL 788-10596

Fig. 53k

temperature rise ($^{\circ}\text{C}$)

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time =	1.000	θ =	0.000 $^{\circ}$
	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
	20.00	20.00	60.00

model: ISOT SSET3

calculated 08/18/78

L

XBL 788-10591

Fig. 54a

temperature rise ($^{\circ}\text{C}$)

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time = 7.000 θ = 0.000 $^{\circ}$
contour interval lowest level highest level
 20.00 20.00 140.0

model: ISOT

SSET3

calculated 08/18/78

XBL 788-10589

Fig. 54b

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time = 30.000 θ = 0.000 $^{\circ}$
contour interval lowest level highest level
 20.00 20.00 180.0

model: ISOT SSET3

calculated 08/18/78

L

XBL 788-10586

Fig. 54c

temperature rise ($^{\circ}\text{C}$)

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time	=	90.000	θ	=	0.000 $^{\circ}$
		<u>contour interval</u>			<u>lowest level</u> <u>highest level</u>
		20.00			20.00 200.0

model: ISOT SSET3 - calculated 08/18/78

XBL 788-10588

Fig. 54d

temperature rise ($^{\circ}\text{C}$)

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time =	180.000	θ =	0.000 $^{\circ}$
	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
	20.00	20.00	200.0

model: ISOT

SSET3

calculated 08/18/78

L

XBL 788-10585

Fig. 54e

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time = 181.000 θ = 0.000 $^{\circ}$
contour interval lowest level highest level
 20.00 20.00 200.0

model: ISOT

SSET3

calculated 08/18/78

XBL 788-10587

Fig. 54f

temperature rise (°C)

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time = 187.000 θ = 0.000 °

contour interval
20.00

lowest level
20.00

highest level
240.0

model: ISOT SSET3

calculated 08/18/78

L

XBL 788-10581

Fig. 54g

temperature rise ($^{\circ}\text{C}$)

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time = 210.000 θ = 0.000 $^{\circ}$
contour interval lowest level highest level
 20.00 20.00 260.0

model: ISOT

SSET3

calculated 08/18/78

XBL 788-10583

Fig. 54h

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time = 270.000 θ = 0.000 °

contour interval	lowest level	highest level
20.00	20.00	280.0

model: ISOT SSET3

calculated 08/18/78

XEL 788-10584

Fig. 54i

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time = 360.000 θ = 0.000 °
contour interval lowest level highest level
 20.00 20.00 280.0

model: ISDT SSET3

calculated 08/18/78

XBL 788-10582

Fig. 54j

temperature rise (°C)

STRIPA FULL SCALE 2 - 5KW CENTRAL HEATER + PERIPHERALS

time = 730.000 θ = 0.000 °
contour interval lowest level highest level
 20.00 20.00 280.0

model: ISOT SSET3

calculated 08/18/78

L

XBL 788-10578

Fig. 54k

temperature rise ($^{\circ}\text{C}$)

Horizontal section

STRIPA TIME SCALE

time = .980 z = 0.000 m

	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	100.0	100.0	100.0
Dashed lines:	20.00	20.00	80.00

calculated 04/19/78

XBL 788-10552

Fig. 55a

temperature rise ($^{\circ}\text{C}$)

Horizontal section

STRIPA TIME SCALE

time = 6.850 z = 0.000 m

	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	50.00	50.00	100.0
Dashed lines:	10.00	10.00	40.00

calculated 04/19/78

XBL 788-10546

Fig. 55b

temperature rise ($^{\circ}\text{C}$)

Horizontal section

STRIPA TIME SCALE

time = 29.350 z = 0.000 m

	contour interval	lowest level	highest level
Solid lines:	50.00	50.00	100.0
Dashed lines:	5.000	5.000	45.00

calculated 04/19/78

XBL 788-10543

Fig. 55c

temperature rise ($^{\circ}\text{C}$)

Horizontal section

STRIPA TIME SCALE

time = 90.000 z = 0.000 m

	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	50.00	50.00	150.0
Dashed lines:	5.000	5.000	45.00

calculated 04/19/78

XBL 788-10541

Fig. 55d

temperature rise (°C)

Horizontal section
STRIPA TIME SCALE

time = 180.000 z = 0.000 m

	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	50.00	50.00	150.0
Dashed lines:	5.000	5.000	45.00

calculated 04/19/78

XBL 788-10535

Fig. 55e

temperature rise ($^{\circ}\text{C}$)

Horizontal section
STRIPA TIME SCALE

time = 360.000 z = 0.000 m

	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	50.00	50.00	150.0
Dashed lines:	5.000	5.000	45.00

calculated 04/19/78

XBL 788-10538

Fig. 55f

temperature rise ($^{\circ}\text{C}$)

Horizontal section

STRIPA TIME SCALE

time = 730.000 z = 0.000 m

	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	50.00	50.00	150.0
Dashed lines:	5.000	5.000	45.00

calculated 04/19/78

XBL 788-10530

Fig. 55g

temperature rise ($^{\circ}\text{C}$)

Horizontal section
STRIPA TIME SCALE

time = 730.000 z = 1.000 m

	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	50.00	50.00	50.00
Dashed lines:	5.000	5.000	45.00

calculated 04/19/78

XBL 788-10529

Fig. 56a

temperature rise ($^{\circ}\text{C}$)

Horizontal section

STRIPA TIME SCALE

time = 730.000 z = 2.000 m

<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
5.000	5.000	30.00

calculated 04/19/78

XBL 788-10525

Fig. 56b

-273-

temperature rise ($^{\circ}\text{C}$)

Horizontal section

STRIPA TIME SCALE

time = 730.000 z = 3.000 m
contour interval lowest level highest level

5.000

5.000

25.00

calculated 04/19/78

XBL 788-10528

Fig. 56c

temperature rise ($^{\circ}\text{C}$)

Horizontal section
STRIPA TIME SCALE

time = 730.000 z = 4.000 m
contour interval lowest level highest level
 5.000 5.000 20.00

calculated 04/19/78

XBL 788-10523

Fig. 56d

temperature rise ($^{\circ}\text{C}$)

Horizontal section

STRIPA TIME SCALE

time =	730.000	z =	6.000 m
	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
	5.000	5.000	10.00

calculated 04/19/78

XBL 788-10527

Fig. 56e

temperature rise ($^{\circ}\text{C}$)

Horizontal section

STRIPA TIME SCALE

time =	730.000	z =	7.000 m
	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
	5.000	5.000	10.00

calculated 04/19/78

XBL 788-10526

Fig. 56f

temperature rise ($^{\circ}\text{C}$)

Horizontal section
STRIPA TIME SCALE

time = 730.000 z = 8.000 m

<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
5.000	5.000	10.00

calculated 04/19/78

XBL 788-10524

Fig. 56g

temperature rise (°C)

Vertical section through H1, H2, H3, and H4

STRIPA TIME SCALE

time =	.980	y =	0.000 m
	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	100.0	100.0	100.0
Dashed lines:	20.00	20.00	80.00

calculated 04/19/78

XBL 788-10548

Fig. 57a

temperature rise ($^{\circ}\text{C}$)

Vertical section through H1, H2, H3, and H4

STRIPA TIME SCALE

time =	6.850	y =	0.000 m
	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	50.00	50.00	100.0
Dashed lines:	10.00	10.00	40.00

calculated 04/19/78

XBL 788-10550

Fig. 57b

temperature rise ($^{\circ}\text{C}$)

Vertical section through H1, H2, H3, and H4

STRIPA TIME SCALE

time =	29.350	y =	0.000 m
	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	50.00	50.00	150.0
Dashed lines:	5.000	5.000	45.00

calculated 04/19/78

XBL 788-10545

Fig. 57c

temperature rise ($^{\circ}\text{C}$)

Vertical section through H1, H2, H3, and H4
STRIPA TIME SCALE

time = 90.000 y = 0.000 m

	contour interval	lowest level	highest level
Solid lines:	50.00	50.00	150.0
Dashed lines:	5.000	5.000	45.00

calculated 04/19/78

XBL 788-10542

Fig. 57d

temperature rise ($^{\circ}\text{C}$)

Vertical section through H1, H2, H3, and H4
STRIPA TIME SCALE

time = 180.000 y = 0.000 m

	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	50.00	50.00	150.0
Dashed lines:	5.000	5.000	45.00

calculated 04/19/78

XBL 788-10539

Fig. 57e

temperature rise ($^{\circ}\text{C}$)

Vertical section through H1, H2, H3, and H4
STRIPA TIME SCALE

time = 360.000 y = 0.000 m

	contour interval	lowest level	highest level
Solid lines:	50.00	50.00	150.0
Dashed lines:	5.000	5.000	45.00

calculated 04/19/78

XBL 788-10537

Fig. 57f

temperature rise ($^{\circ}\text{C}$)

Vertical section through H1, H2, H3, and H4

STRIPA TIME SCALE

time = 730.000 y = 0.000 m

	contour interval	lowest level	highest level
Solid lines:	50.00	50.00	150.0
Dashed lines:	5.000	10.00	45.00

calculated 04/19/78

XBL 788-10532

Fig. 57g

temperature rise ($^{\circ}\text{C}$)

Vertical section through H3, H6, and H8

STRIPA TIME SCALE

time =	.980	x =	3.500 m
	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	100.0	100.0	100.0
Dashed lines:	20.00	20.00	80.00

calculated 04/19/78

XBL 788-10549

Fig. 58a

temperature rise ($^{\circ}\text{C}$)

Vertical section through H3, H6, and H8

STRIPA TIME SCALE

time =	6.850	x =	3.500 m
	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	50.00	50.00	100.0
Dashed lines:	10.00	10.00	40.00

calculated 04/19/78

XBL 788-10551

Fig. 58b

temperature rise ($^{\circ}\text{C}$)

Vertical section through H3, H6, and H8

STRIPA TIME SCALE

time =	29.350	x =	3.500 m
	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	50.00	50.00	150.0
Dashed lines:	5.000	5.000	45.00

calculated 04/19/78

XBL 788-10544

Fig. 58c

temperature rise ($^{\circ}\text{C}$)

Vertical section through H3, H6, and H8
STRIPA TIME SCALE

time =	90.000	x =	3.500 m
	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	50.00	50.00	150.0
Dashed lines:	5.000	5.000	45.00

calculated 04/19/78

XBL 788-10547

Fig. 58d

temperature rise ($^{\circ}\text{C}$)

Vertical section through H3, H6, and H8

STRIPA TIME SCALE

time = 180.000 x = 3.500 m

	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	50.00	50.00	150.0
Dashed lines:	5.000	5.000	45.00

calculated 04/19/78

XBL 788-10540

Fig. 58e

temperature rise ($^{\circ}\text{C}$)

Vertical section through H3, H6, and H8

STRIPA TIME SCALE

time =	360.000	x =	3.500 m
	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	50.00	50.00	150.0
Dashed lines:	5.000	10.00	45.00

calculated 04/19/78

XBL 788-10536

Fig. 58f

temperature rise ($^{\circ}\text{C}$)

Vertical section through H3, H6, and H8

STRIPA TIME SCALE

time = 730.000 x = 3.500 m

	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	50.00	50.00	150.0
Dashed lines:	5.000	10.00	45.00

calculated 04/19/78

XBL 788-10534

Fig. 58g

temperature rise ($^{\circ}\text{C}$)

Vertical section through H5 and H6

STRIPA TIME SCALE

time = 730.000 y = 3.000 m

	<u>contour interval</u>	<u>lowest level</u>	<u>highest level</u>
Solid lines:	50.00	50.00	150.0
Dashed lines:	5.000	5.000	45.00

calculated 04/19/78

XBL 788-10531

Fig. 59a

temperature rise ($^{\circ}\text{C}$)

Vertical section through E1 and E4
STRIPA TIME SCALE

time = 730.000 x = 0.000 m
contour interval lowest level highest level
 5.000 10.00 30.00
 calculated 04/19/78

XBL 788-10533

Fig. 59b