

BACKUP BOOK K
WATANA DAM - QUANTITIES/BORROW AREAS
A, D

Task 9 - Group 12

BOOK K

WATANA DAM
QUANTITIES/BORROW AREA A, D

00025

(K) UNIT PRICES - BACKUP CALCULATIONS
WATANA DAM
QUANTITIES/BORROW AREA A, D

1

K1



Calculations

BORROW AREA "A"

SUBJECT:

SUMMARY SHEET

A) VOLUME OF WASTE

B) VOLUME OF USABLE MATERIAL

JOB NUMBER P5700.06

FILE NUMBER

SHEET

OF

BY Dave O

DATE 10/06/21

APP

DATE

A) VOLUME OF WEATHERED ROCK.

40,150,000 yd³

B) VOLUME OF USABLE MATERIAL

152,500,000 yd³C) TOTAL EXCAVATED MATERIAL
TO CLEAR HILL TO ELEVATION 2350'192,650,000 yd³

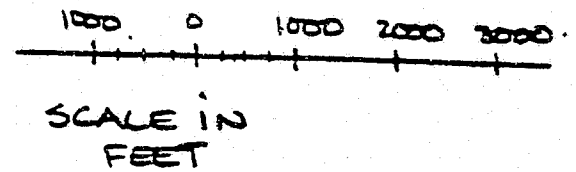
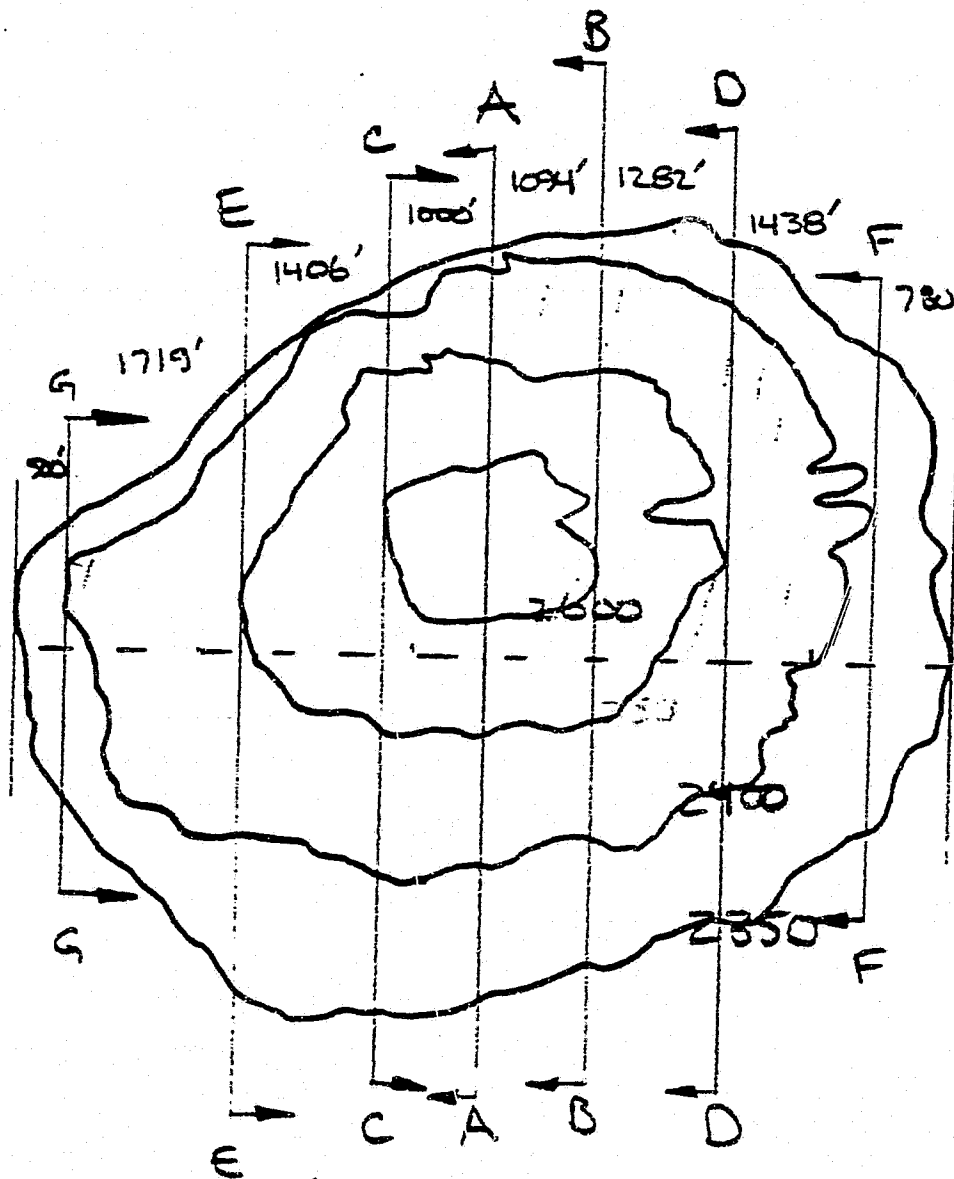
QUARRY "A"

K2

Date 10/06/81
SHEET 1

- 1) HILL REMOVED TO ELEVATION 2350'
- 2) 20' OF WEATHERED ROCK IS REMOVED.

9219.



* NOTE: THE CONTOURS DRAWN BELOW
THE DOTTED LINE ARE INTERPOLATED

SECTION A-A

SECTION C-C

2700
2600
2500
2400
2300

2700
2600
2500
2400
2300

1000 2000 3000 4000 5000 6000 7000 8000

1000 2000 3000 4000 5000

EL 2350
(CLEARING)

SECTION B-B

SECTION D-D

2700
2500
2400
2300

2600
2500
2400
2300

1000 2000 3000 4000 5000 6000 7000 8000

1000 2000 3000 4000 5000

EL 2350
(CLEARING)

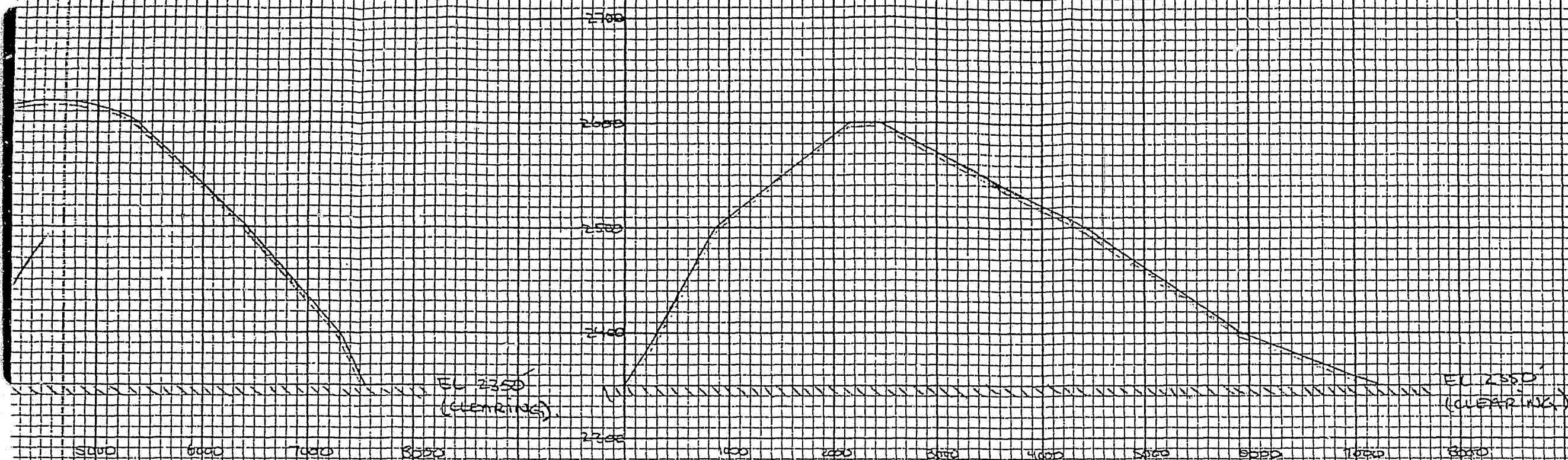
NOTALIA LTD COMPANY LIMITED
LONDON
LA COMPAGNIE GENERALE D'IMPRIMERIE
PARIS

FOLD LENGTH
12
11
8.5
8
AUTO
MANUAL
FEED

A-A

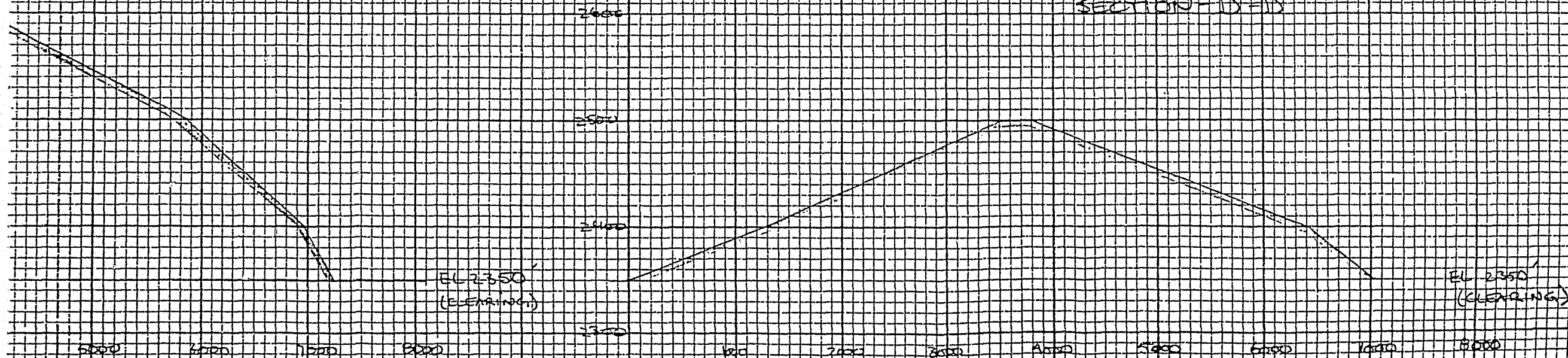
SECTION C-C

13

0/06/81
SHEET 2

B-B

SECTION D-D

FOLD
LENGTH

12

11

8.5

8

AUTO

MANUAL

FEED

12

11

SECTION E-E

SECTION E-F

2500

2450

2400

2350

2300

2400

2350

2300

1000

2000

3000

4000

5000

6000

7000

1000

2000

3000

SECTION G-G

1000

2000

3000

4000

5000

EL 2350'
(CLEARING)

EL 2350'
(CLEARING)

FOLD LENGTH

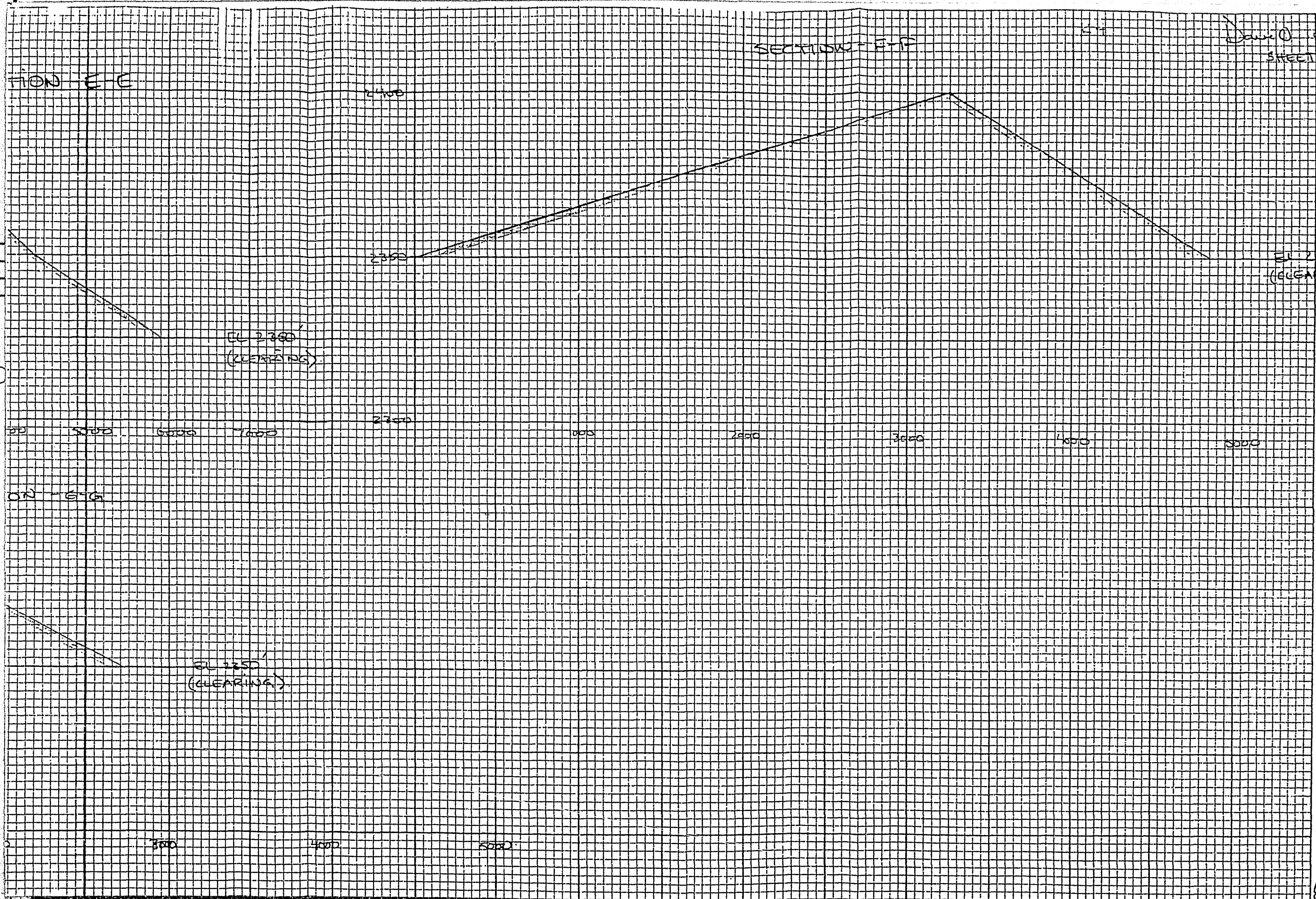
12
11
8.5
8

AUTO

MANUAL

FEED

FEET
MANUAL
AUTOMATIC
8
8.5
11
12
FOLI
LENG
1
2



David O. 9/06/21
SHEET 3

EL 2350
(CLEARING)

EL 2350
(CLEARING)

11
12

K5



Calculations

BORROW AREA "A"

SUBJECT: VOLUME OF 20' LAYER
OF WEATHERED ROCK.

JOB NUMBER P5700.06

FILE NUMBER

SHEET 1

OF 6

BY

JWC

DATE

10/06/81

APP

DATE

SECTION - A-A:

1376'
2,408'
1,600'
1,030'
906'
255'

$$7575' \times 20' = 151,500 \text{ ft}^2$$

SECTION - B-B:

1251'
1154'
1304'
300'
1853'
1105'
304'

$$7271' \times 20' = 145,420 \text{ ft}^2$$

SECTION - C-C:

863'
1304'
300'
2002'
1453'
1301'

$$7223' \times 20' = 144,460 \text{ ft}^2$$

SECTION - D-D:

3503'
300'
2602'
602'

$$7007' \times 20' = 140,140 \text{ ft}^2$$

SECTION - E-E:

502'
1653'
100'
2152'
1501'

$$5908' \times 20' = 118,160 \text{ ft}^2$$

K6

ACRES**Calculations****BORROW AREA "A"**

SUBJECT:

VOLUME OF 20' LAYER
OF WEATHERED ROCK.JOB NUMBER 95700.66

FILE NUMBER _____

SHEET 2OF 6BY Dave ODATE 10/06/81

APP _____

DATE _____

SECTION - F-F:

$$\begin{array}{r} 3250' \\ 1601' \\ \hline \end{array}$$

$$4851' \times 20' = \boxed{97,020 \text{ ft}^2}$$

SECTION - G-G:

$$\begin{array}{r} 378' \\ 500' \\ 1826' \\ \hline \end{array}$$

$$2704' \times 20' = \boxed{54,080 \text{ ft}^2}$$

$$\frac{151,500 + 145,420}{2} \times 1094 = 162,415,240 \text{ ft}^3$$

$$\frac{145,420 + 140,140}{2} \times 1282 = 183,043,960 \text{ ft}^3$$

$$\frac{140,140 + 97,020}{2} \times 1438 = 170,518,040 \text{ ft}^3$$

$$\frac{151,500 + 144,460}{2} \times 1000 = 147,980,000 \text{ ft}^3$$

$$\frac{144,460 + 118,160}{2} \times 1406 = 184,621,860 \text{ ft}^3$$

$$\frac{118,160 + 54,080}{2} \times 1719 = 148,040,280 \text{ ft}^3$$

$$2500' \times 20' \times 500' = 25,000,000 \text{ ft}^3$$

$$4000' \times 20' \times 780' = 62,400,000 \text{ ft}^3$$

$$\text{TOTAL:} = 1,084,019,380 \text{ ft}^3$$

$$= \boxed{40,150,000 \text{ yd}^3}$$

VOLUME OF
WEATHERED ROCK

00023

K7



Calculations

BORROW AREA "A"

SUBJECT: VOLUME OF USABLE MATERIAL TO ELEVATION 2350'

JOB NUMBER P5700.06	
FILE NUMBER	
SHEET 3	OF 6
BY [Signature]	DATE 10/06/81
APP	DATE

SECTION A-A:

$$\frac{1}{2} \times 1375 \times 50 = 34,375 \text{ ft}^2$$

$$\left(\frac{50 + 250}{2}\right) \times 2400 = 360,000 \text{ ft}^2$$

$$1600 \times 250 = 400,000 \text{ ft}^2$$

$$1925 \times \left(\frac{250 + 50}{2}\right) = 288,750 \text{ ft}^2$$

$$\frac{1}{2} \times 50 \times 250 = 6250 \text{ ft}^2$$

TOTAL: $1,089,375 \text{ ft}^2 - 151,500 \text{ ft}^2$
 $= \boxed{937,875 \text{ ft}^2}$

WEATHERED ROCK AREA

SECTION B-B:

$$\frac{1}{2} \times 50 \times 1250 = 31,250 \text{ ft}^2$$

$$150 \times 2450 = 367,500 \text{ ft}^2$$

$$250 \times 300 = 75,000 \text{ ft}^2$$

$$\left(\frac{250 + 150}{2}\right) \times 1850 = 370,000 \text{ ft}^2$$

$$\left(\frac{150 + 50}{2}\right) \times 1125 = 112,500 \text{ ft}^2$$

$$\frac{1}{2} \times 50 \times 250 = 6250 \text{ ft}^2$$

TOTAL: $962,500 \text{ ft}^2 - 145,420 \text{ ft}^2$
 $= \boxed{817,080 \text{ ft}^2}$

SECTION C-C:

$$\frac{1}{2} \times 150 \times 850 = 63,750 \text{ ft}^2$$

$$\left(\frac{150 + 250}{2}\right) \times 1300 = 260,000 \text{ ft}^2$$

$$300 \times 250 = 75,000 \text{ ft}^2$$

$$\left(\frac{150 + 250}{2}\right) \times 1975 = 395,000 \text{ ft}^2$$

$$\left(\frac{150 + 50}{2}\right) \times 1475 = 147,500 \text{ ft}^2$$

$$\frac{1}{2} \times 50 \times 1300 = 32,500 \text{ ft}^2$$

K8



Calculations

SUBJECT: VOLUME OF USABLE
MATERIAL TO
ELEVATION 2350'

BORROW AREA "A"

JOB NUMBER P5700.06

FILE NUMBER

SHEET 4 OF 6

BY Dave O DATE 10/06/81

APP DATE

SECTION C-C (CONTINUED):

$$\text{TOTAL: } 973,750 \text{ ft}^2 - 144,460 \text{ ft}^2 \\ = \boxed{829,290 \text{ ft}^2}$$

SECTION D-D:

$$\frac{1}{2} \times 150 \times 3500 = 262,500 \text{ ft}^2$$

$$300 \times 150 = 45,000 \text{ ft}^2$$

$$\left(\frac{150 + 50}{2} \right) \times 2600 = 260,000 \text{ ft}^2$$

$$\frac{1}{2} \times 50 \times 600 = 15,000 \text{ ft}^2$$

$$\text{TOTAL: } 582,500 \text{ ft}^2 - 140,140 \text{ ft}^2 \\ = \boxed{442,360 \text{ ft}^2}$$

SECTION E-E:

$$\frac{1}{2} \times 500 \times 50 = 12,500 \text{ ft}^2$$

$$\left(\frac{50 + 150}{2} \right) \times 1650 = 165,000 \text{ ft}^2$$

$$100 \times 150 = 15,000 \text{ ft}^2$$

$$2150 \times \left(\frac{150 + 50}{2} \right) = 215,000 \text{ ft}^2$$

$$\frac{1}{2} \times 50 \times 1500 = 37,500 \text{ ft}^2$$

$$\text{TOTAL: } 445,000 \text{ ft}^2 - 118,160 \text{ ft}^2 \\ = \boxed{326,840 \text{ ft}^2}$$

00025

K9



Calculations

BORROW AREA "A"

SUBJECT: VOLUME OF USABLE MATERIAL TO ELEVATION 2350'

JOB NUMBER	P5700.06.		
FILE NUMBER			
SHEET	5	OF	6
BY	Dave O	DATE	10/06/81
APP		DATE	

SECTION FF:

$$\frac{1}{2} \times 50 \times 3250 = 81,250 \text{ ft}^2$$

$$\frac{1}{2} \times 50 \times 1600 = 40,000 \text{ ft}^2$$

TOTAL: $121,250 \text{ ft}^2 - 97,020 \text{ ft}^2$

= $24,230 \text{ ft}^2$

SECTION G-G:

$$\frac{1}{2} \times 50 \times 375 = 9375 \text{ ft}^2$$

$$500 \times 50 = 25,000 \text{ ft}^2$$

$$\frac{1}{2} \times 1825 \times 50 = 45,625 \text{ ft}^2$$

TOTAL: $80,000 \text{ ft}^2 - 54,080 \text{ ft}^2$

= $25,920 \text{ ft}^2$

K10



Calculations

BORROW AREA "A"

SUBJECT: VOLUME OF USABLE
MATERIAL TO
ELEVATION 2350'

JOB NUMBER P5700.66

FILE NUMBER

SHEET 6 OF 6

BY Dave O DATE 10/06/81

APP DATE

$$\left(\frac{937,875 + 817,080}{2} \right) \times 1094 = 959,960,385 \text{ ft}^3$$

$$\left(\frac{817,080 + 442,360}{2} \right) \times 1282 = 807,301,040 \text{ ft}^3$$

$$\left(\frac{442,360 + 24,230}{2} \right) \times 1438 = 335,478,210 \text{ ft}^3$$

$$\left(\frac{937,875 + 829,290}{2} \right) \times 1000 = 883,582,500 \text{ ft}^3$$

$$\left(\frac{829,290 + 326,840}{2} \right) \times 1406 = 812,759,390 \text{ ft}^3$$

$$\left(\frac{326,840 + 25,920}{2} \right) \times 1719 = 303,197,220 \text{ ft}^3$$

$$480' \times \frac{25,920}{2} = 6,220,800 \text{ ft}^3$$

$$760' \times \frac{24,230}{2} = 9,207,400 \text{ ft}^3$$

TOTAL: 4,117,706,945 ft³

152,500,000 yd³

USABLE
MATERIAL

00023

K11

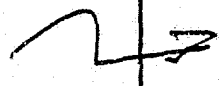


Calculations
SUBJECT:
VOLUME OF ORGANIC MATERIAL TO BE REMOVED.

JOB NUMBER PS700.06
FILE NUMBER _____
SHEET 1 OF 2
BY [Signature] DATE 9/08/31
APP _____ DATE _____

SECTION	AREA (FT ²)	DISTANCE APART	VOLUME (ft ³)
D	4,734	500'	2,857,500
E	6,576	"	3,372,000
F	6,912	"	3,672,750
G	7,779	"	4,308,000
H	9,453	"	4,764,000
I	9,603	"	4,917,750
J	10,068	"	4,995,750
K	9,915	"	4,866,750
L	9,552	"	4,794,000
M	9,624	"	5,539,500
N	12,534	"	6,435,750
O	13,209	"	7,017,000
P	14,859	"	7,317,000
Q	14,409	"	6,645,750
R	12,174	"	5,713,500
S	10,680	"	4,800,000
T	8,520	"	3,953,250
U	7,293	"	3,761,250
V	7,752	"	3,378,000
W	5,760	"	2,531,250
X	4,365	"	1,518,750
Y	1710	"	

Start.



$3,000 \times 500 = 1,500,000 \text{ ft}^3$
 $\frac{1710 \times 500}{2} = 457,500 \text{ ft}^3$
 $97,159,500 \text{ ft}^3$

FOR SECTIONS A,B,C $750,000 \times 3 = 2,250,000 \text{ ft}^3$

TOTAL: $101,367,000 \text{ ft}^3$

3,754,000 Yd³

ORGANIC MATERIAL



Calculations BORROW AREA "D"

SUBJECT: VOLUME OF USABLE MATERIAL

JOB NUMBER 5700.06
 FILE NUMBER _____
 SHEET 2 OF 2
 BY David D DATE 9/06/61
 APP _____ DATE _____

SECTION	AREA (FT ²)	DISTANCE APART	VOLUME (ft ³)
D	65,000	500	32,500,000
E	85,000		42,250,000
F	104,000		52,000,000
G	128,000		64,000,000
H	145,500		72,750,000
I	147,400		73,700,000
J	140,300		70,150,000
K	154,600		77,300,000
L	162,450		81,225,000
M	171,400		85,700,000
N	207,500		103,750,000
O	223,300		111,650,000
P	252,200		126,100,000
Q	246,600		123,300,000
R	220,000		110,000,000
S	186,300		93,150,000
T	146,500		73,250,000
U	144,700		72,350,000
V	122,250		61,125,000
W	101,300		50,650,000
X	71,600		35,800,000
Y	23,300		11,650,000
			<u>1,602,526,000 ft³</u>

$$\begin{aligned} \text{VOLUME FOR SECTIONS A, B, C} &= 60' \times 750,000 \\ &= 45,000,000 \text{ ft}^3 \\ &= \underline{1,670,000 \text{ yd}^3} \end{aligned}$$

$$\frac{23,300}{2} \times 500 = 5,825,000 \text{ ft}^3$$

$$= \underline{215,700 \text{ yd}^3}$$

$$48,750 \times 500 = 24,375,000 \text{ ft}^3$$

$$= \underline{903,000 \text{ yd}^3}$$

$$\underline{\underline{\text{TOTAL: } 1,677,726,000 \text{ ft}^3}} \approx \boxed{62,138,000 \text{ yd}^3}$$

CONDO



SUBJECT: SUSITNA, WATANA
BORROW SITES

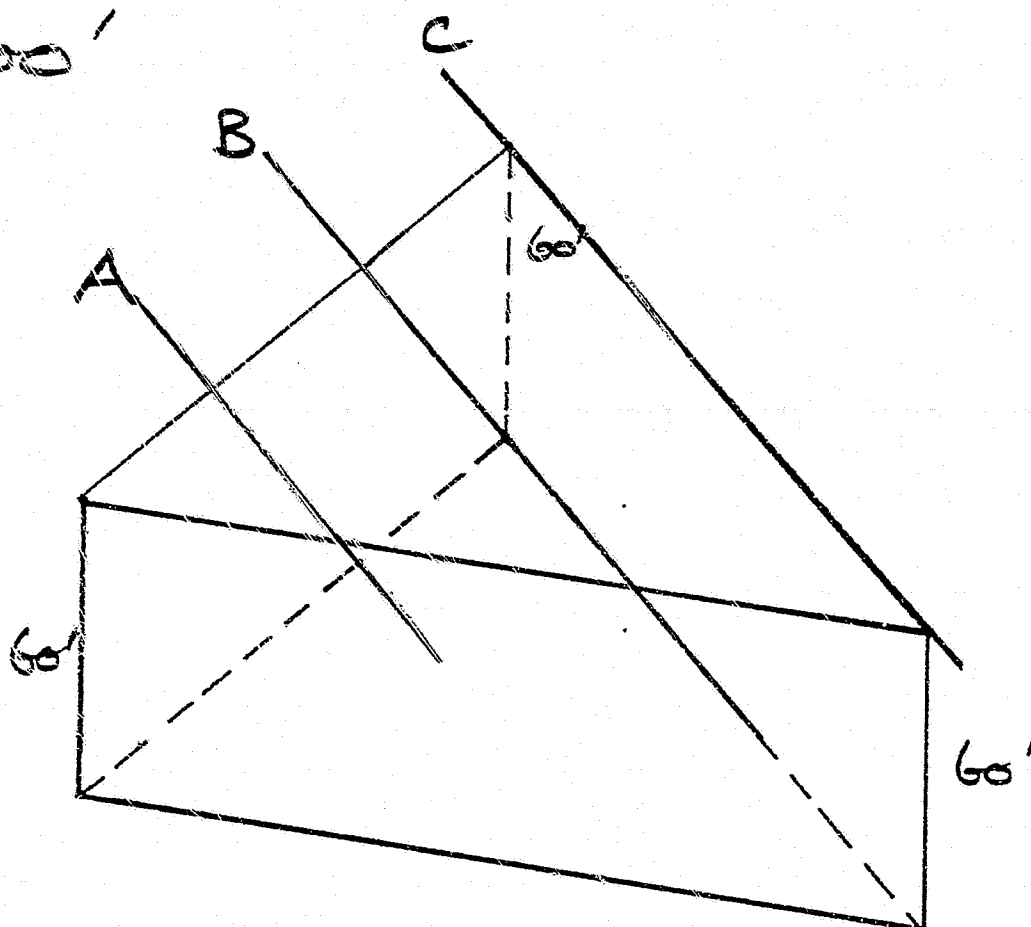
FILE NUMBER

SHEET 1 OF

BY Lawrence D DATE 8/06/81

APP DATE

SECTION A, B, C ARE ALL AT ELEVATION 2200'

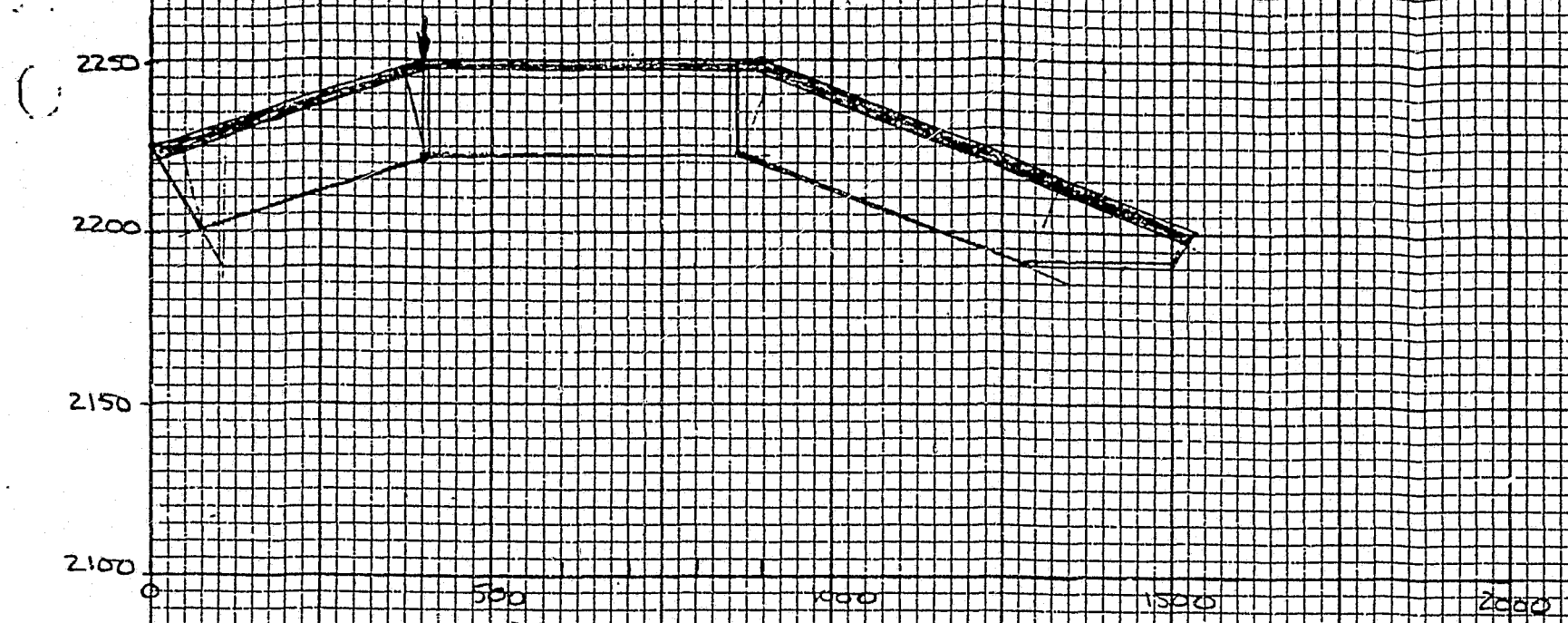


SCALE 1:50'

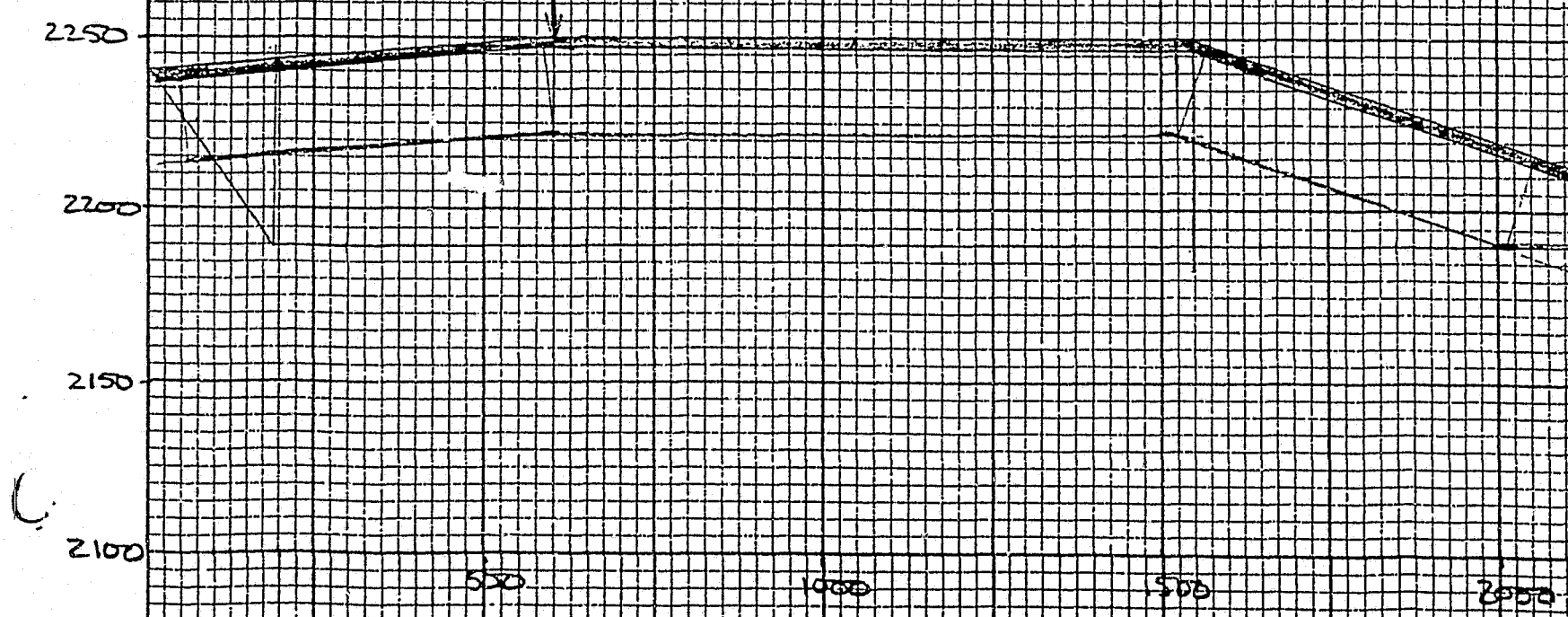
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SECTION - D



SECTION - F

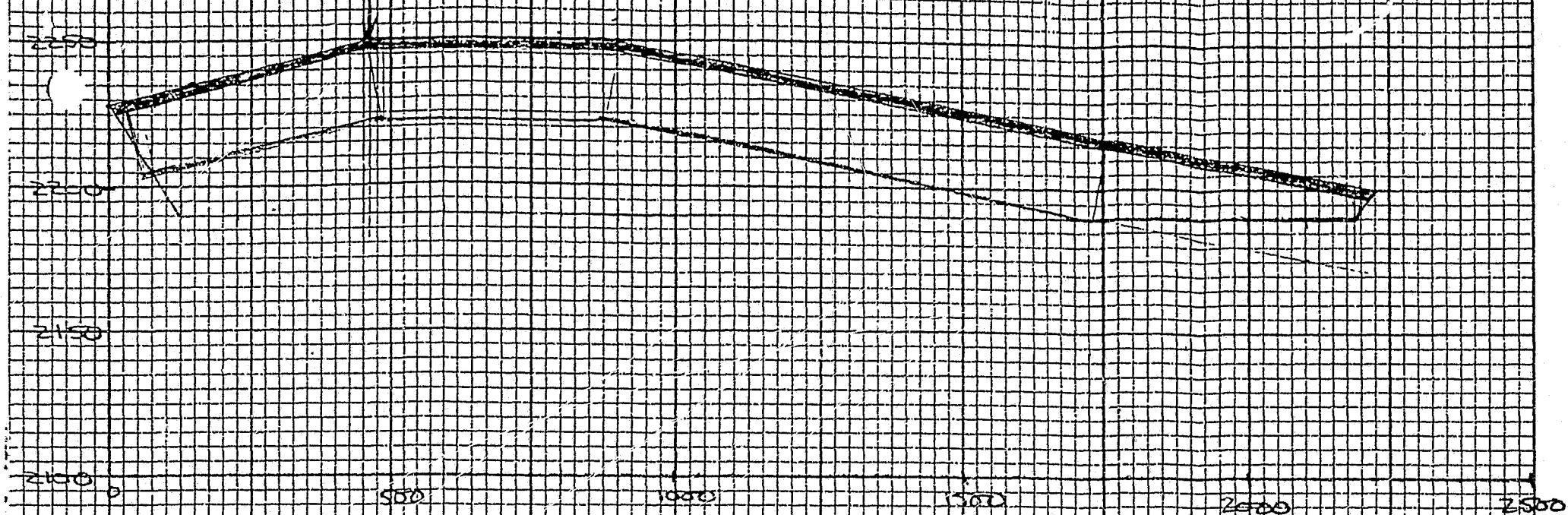


NOTE: ALL SLOPES 3H:1V & ALL BERMS 2H:1V

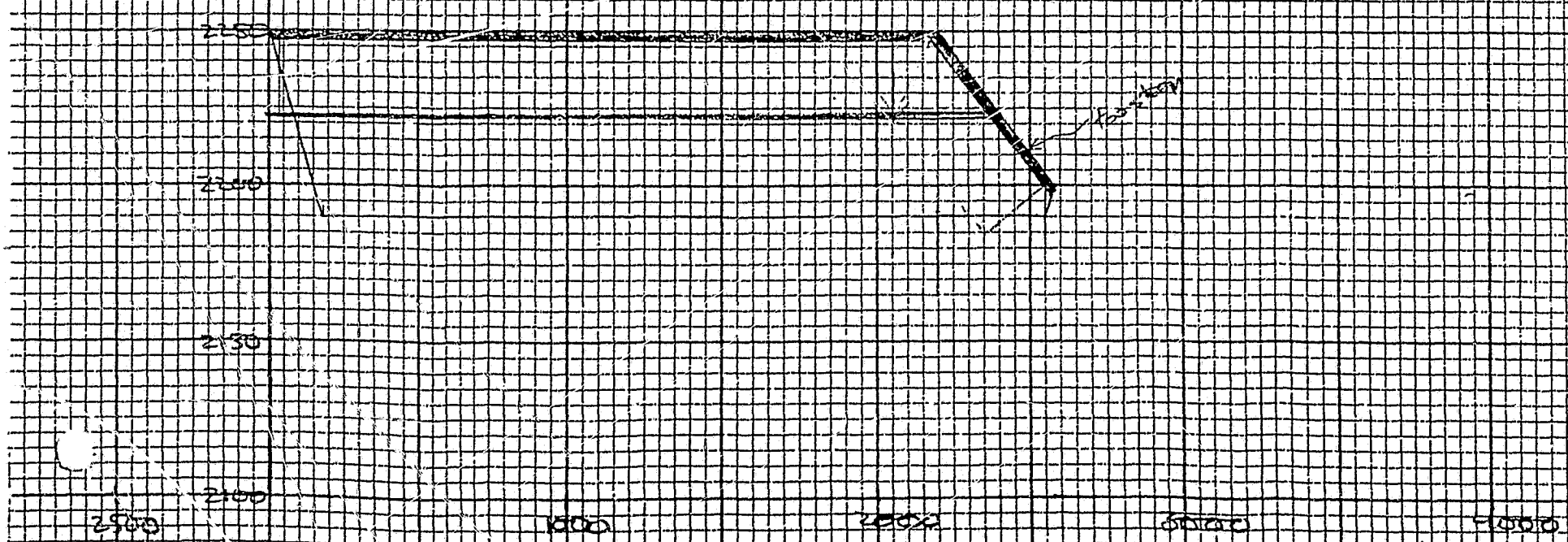
SECTION - E

CE

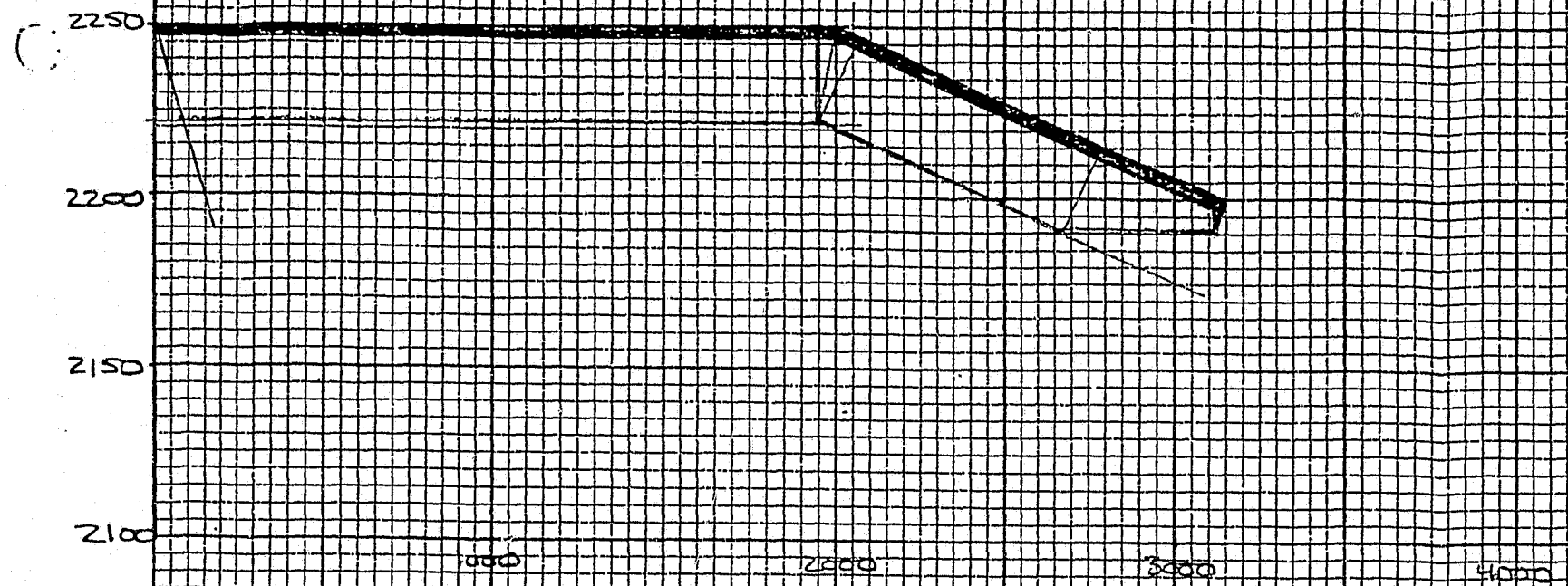
Date 8/06/8
SHEET 2



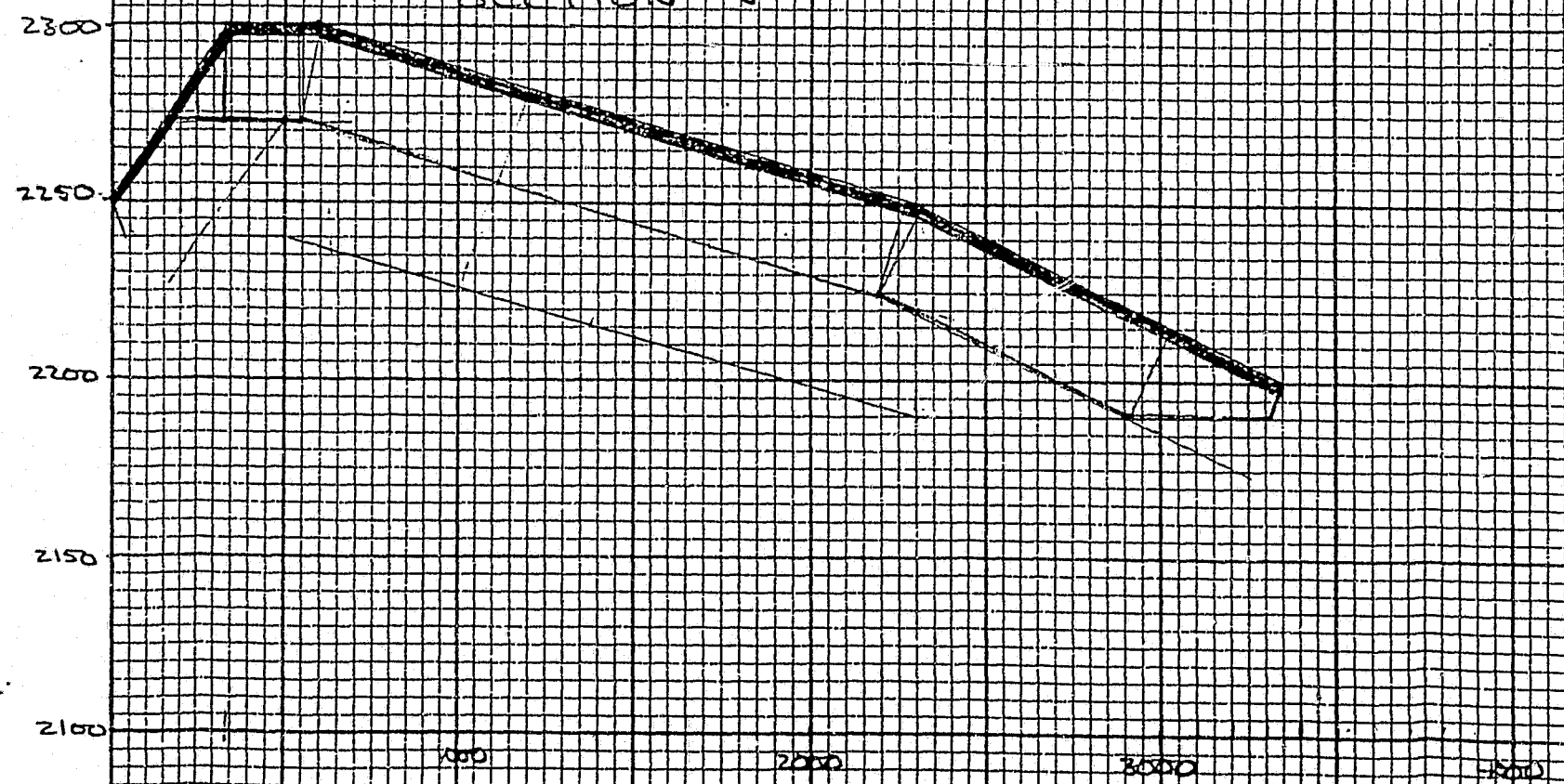
SECTION - G



SECTION H



SECTION H

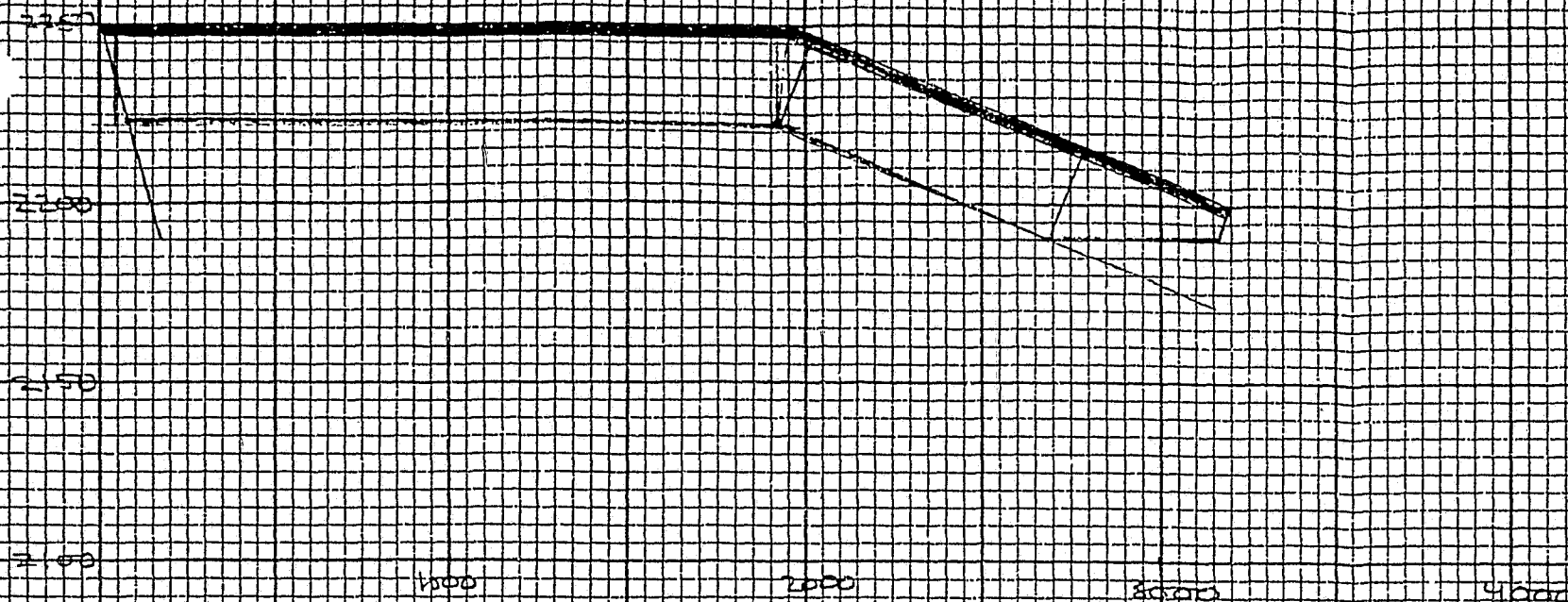


NOTE: ALL SLOPES ARE 3H:1V & ALL PERMS ARE 30'

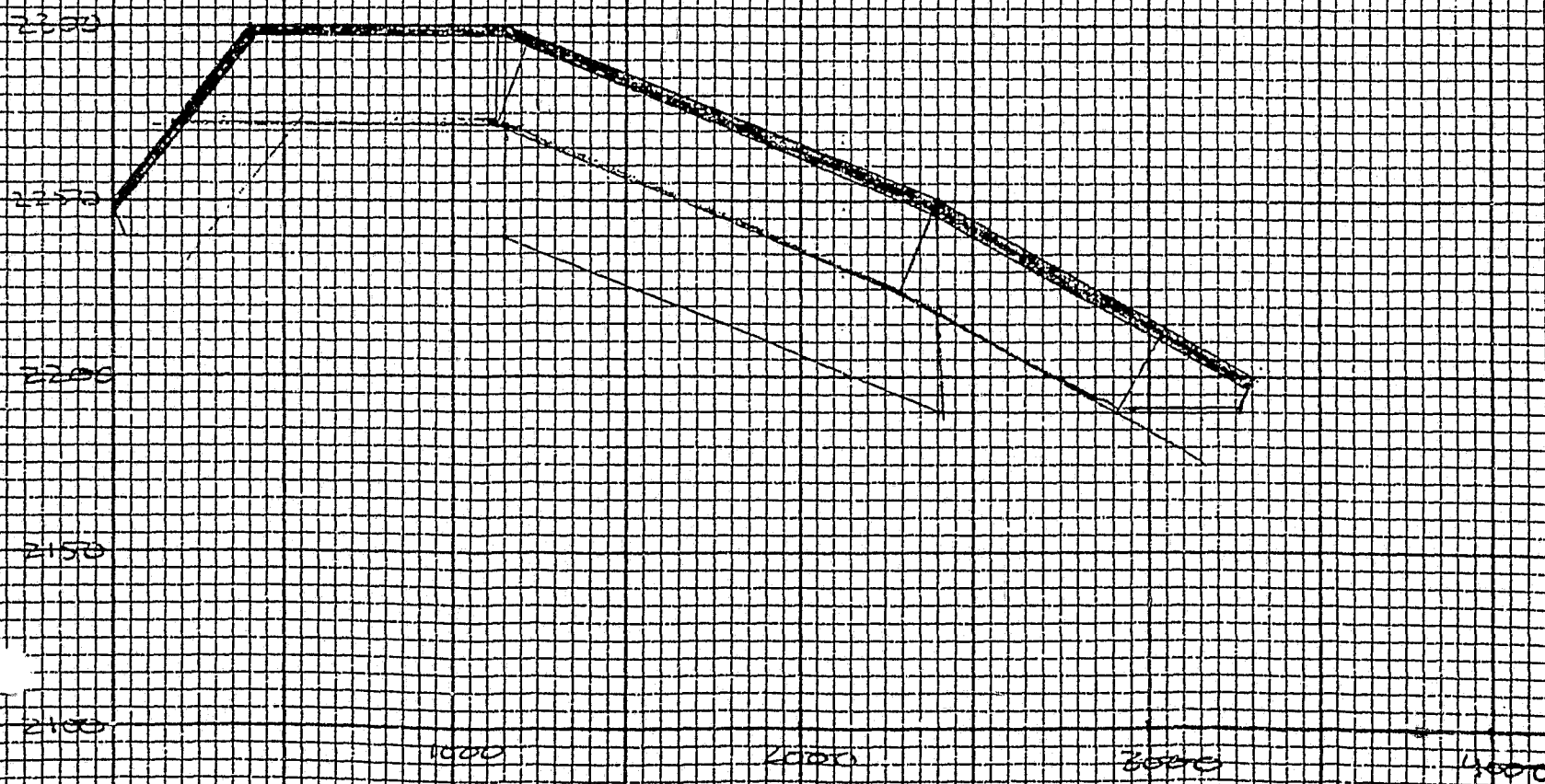
SECTION - i

1:1

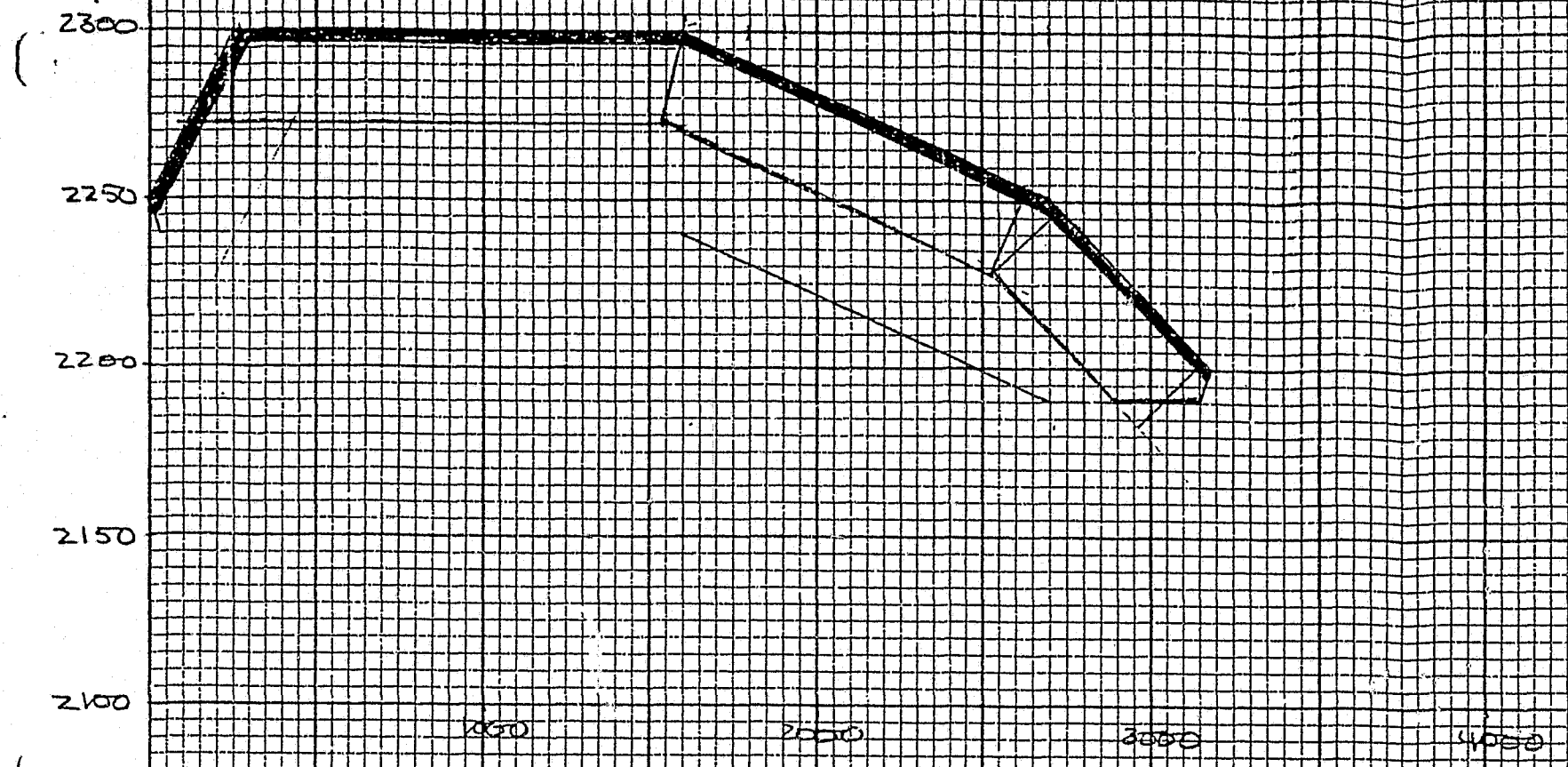
8/06/81
SHEET 3



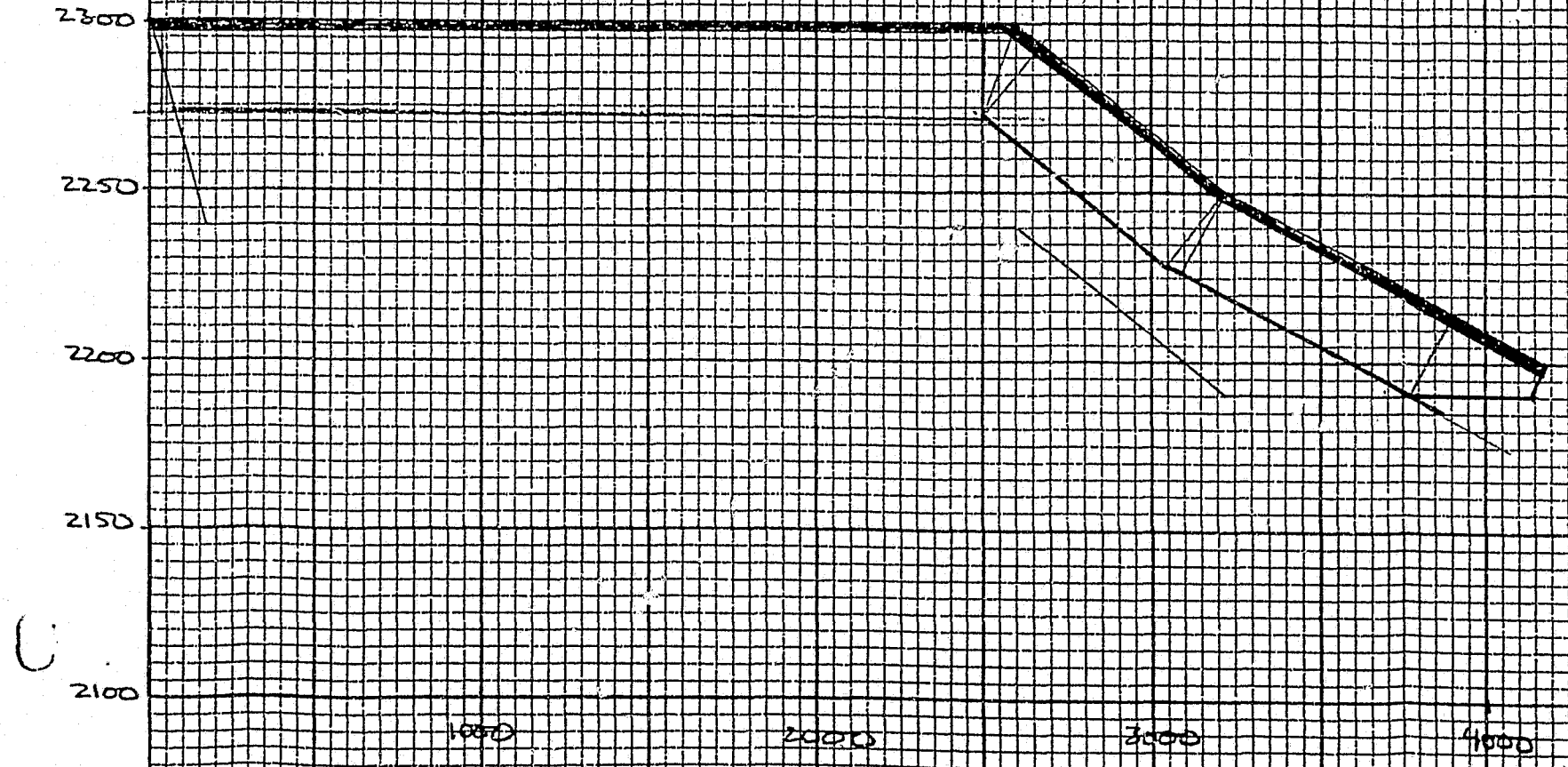
SECTION - K



SECTION - L

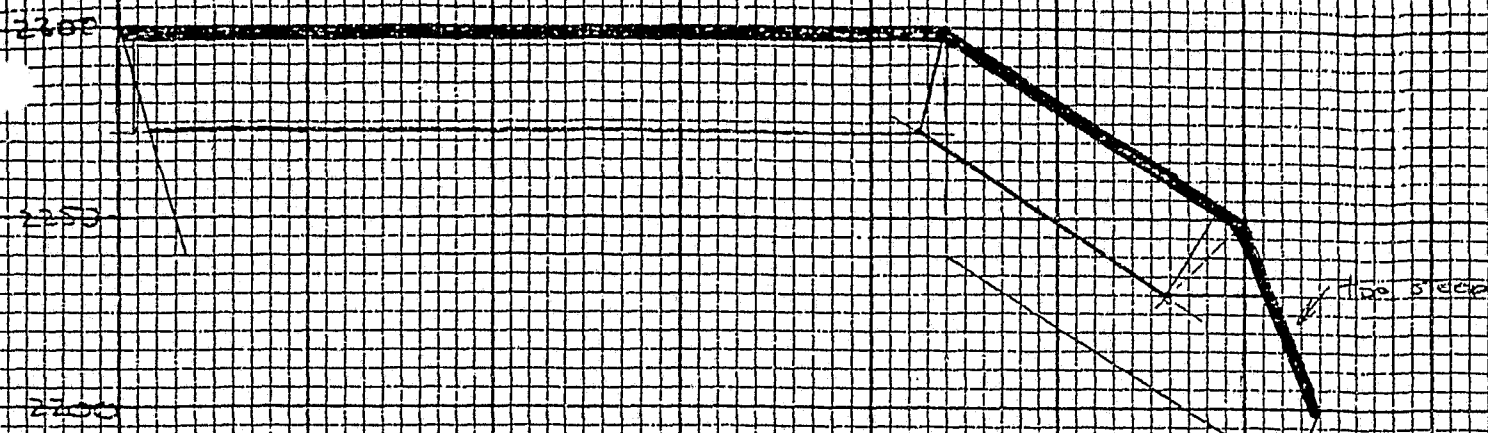


SECTION - N

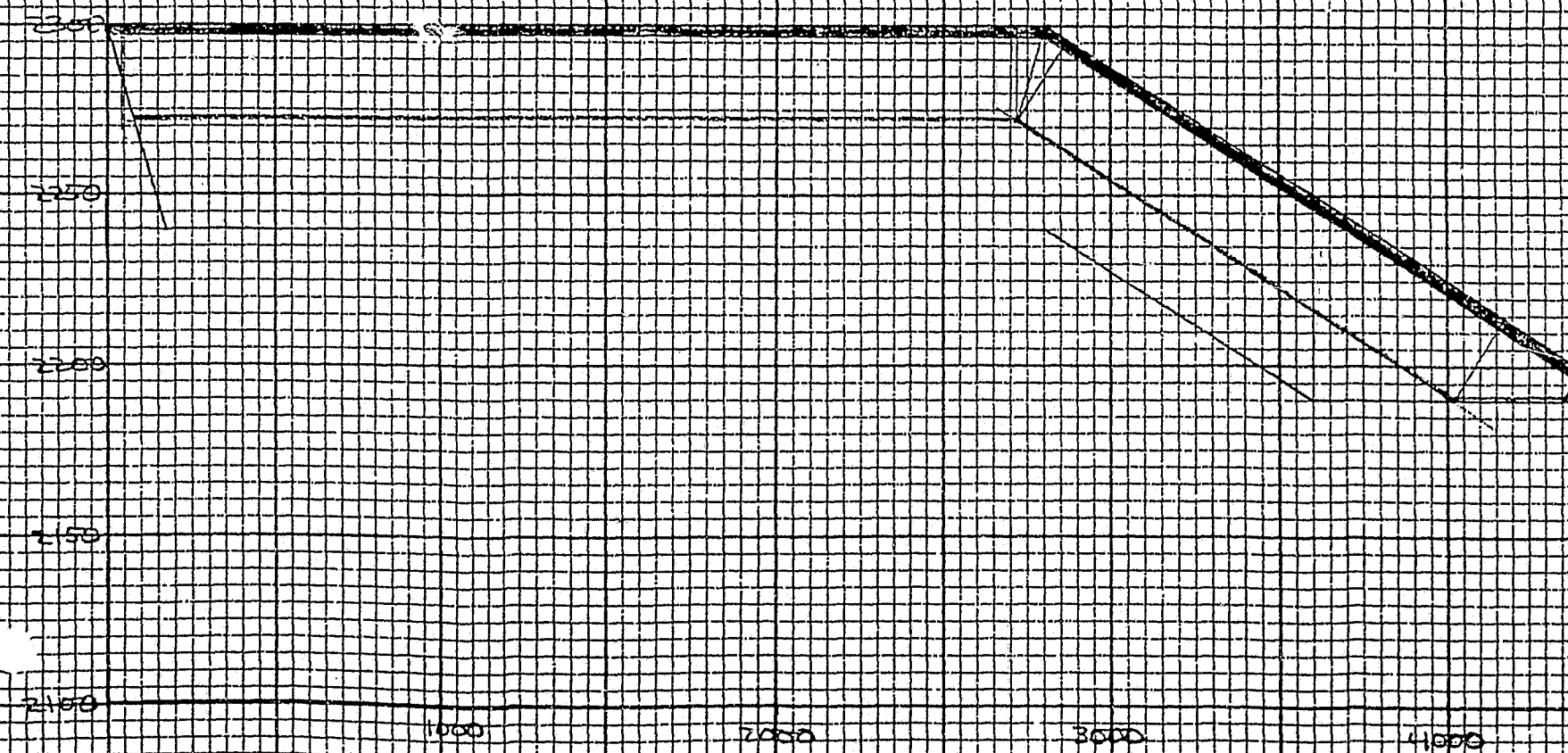


SECTION - M

Date 8/66/81
SHEET 4



SECTION - O



2350

SECTION - A

2300

2250

2200

2150

1000

2000

3000

4000

2400

SECTION - B

2350

2300

2250

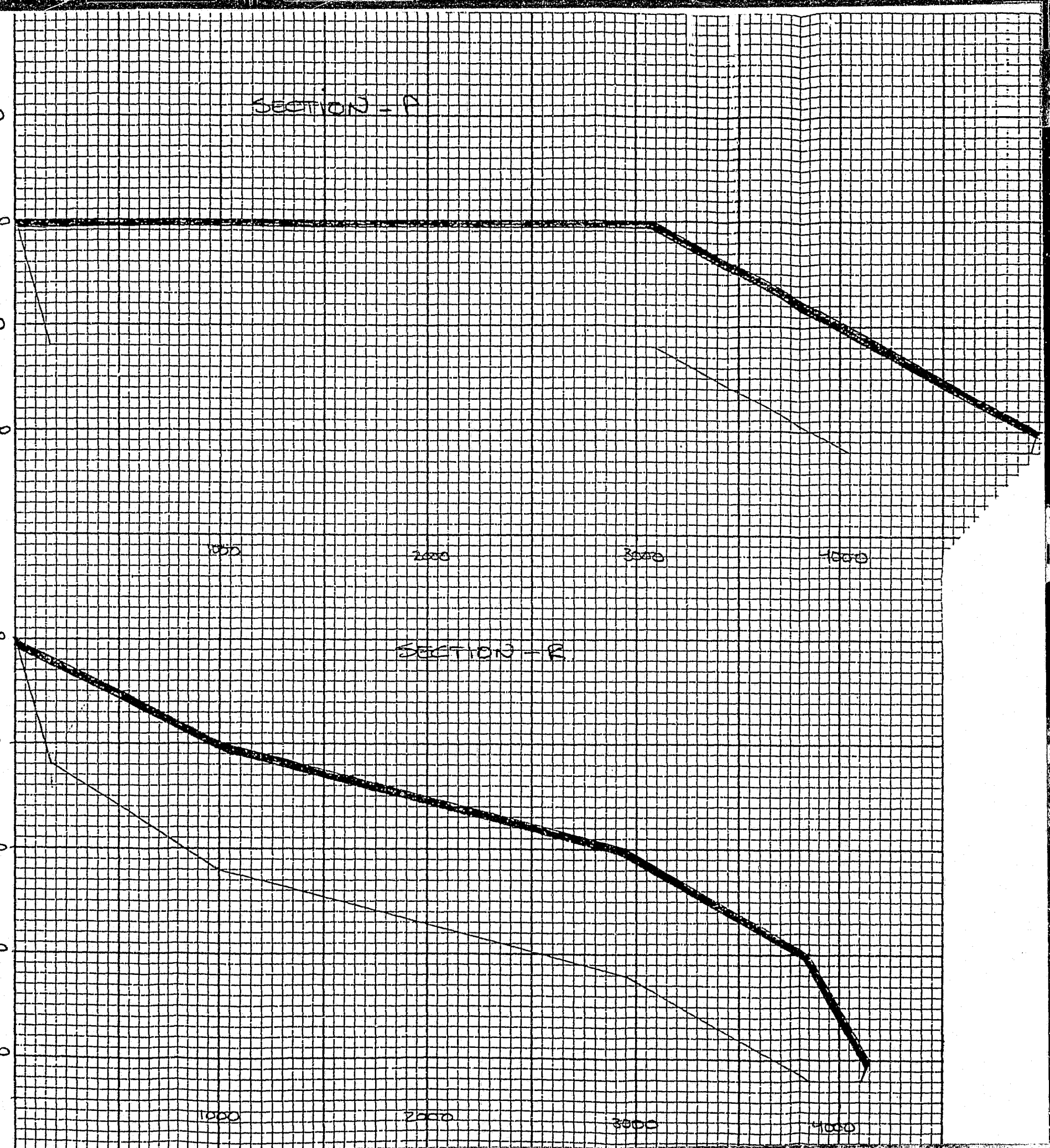
2200

1000

2000

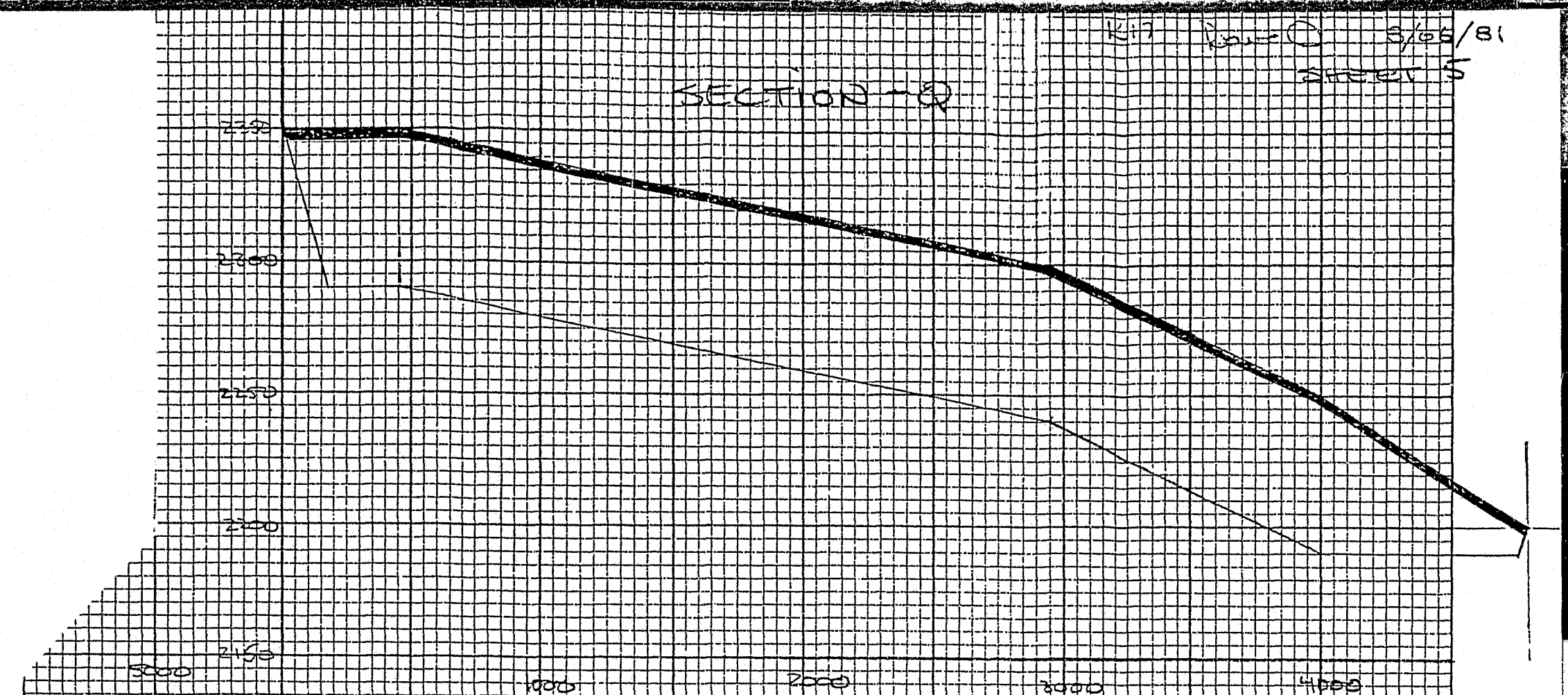
3000

4000

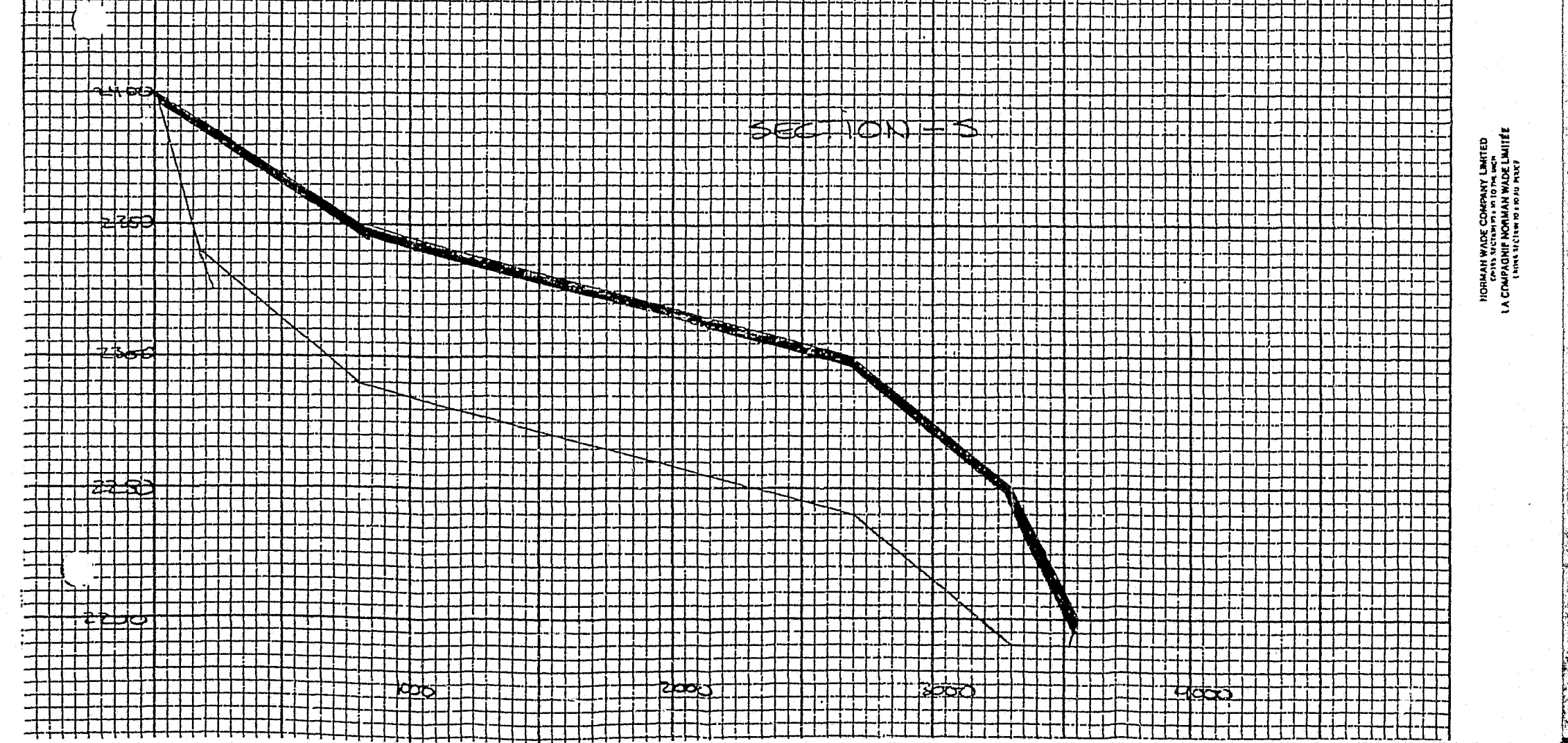


KF 151-0 3/65/81
sheet 5

SECTION - Q

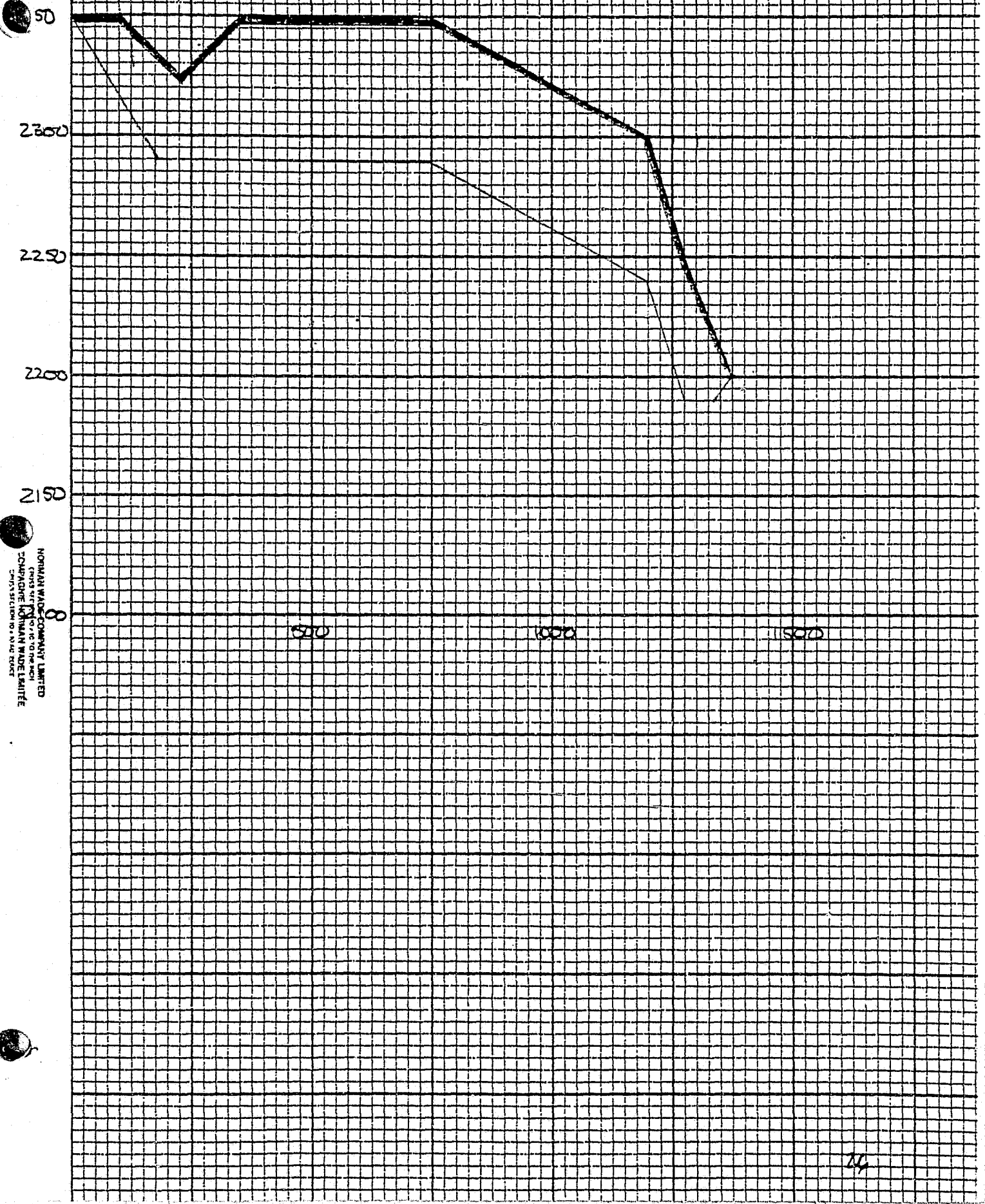


SECTION - S



NORMAN WADE COMPANY LIMITED
LA COMPAGNIE NORMAN WADE LIMITEE
(SHEET 5 OF 5)

SECTION-X



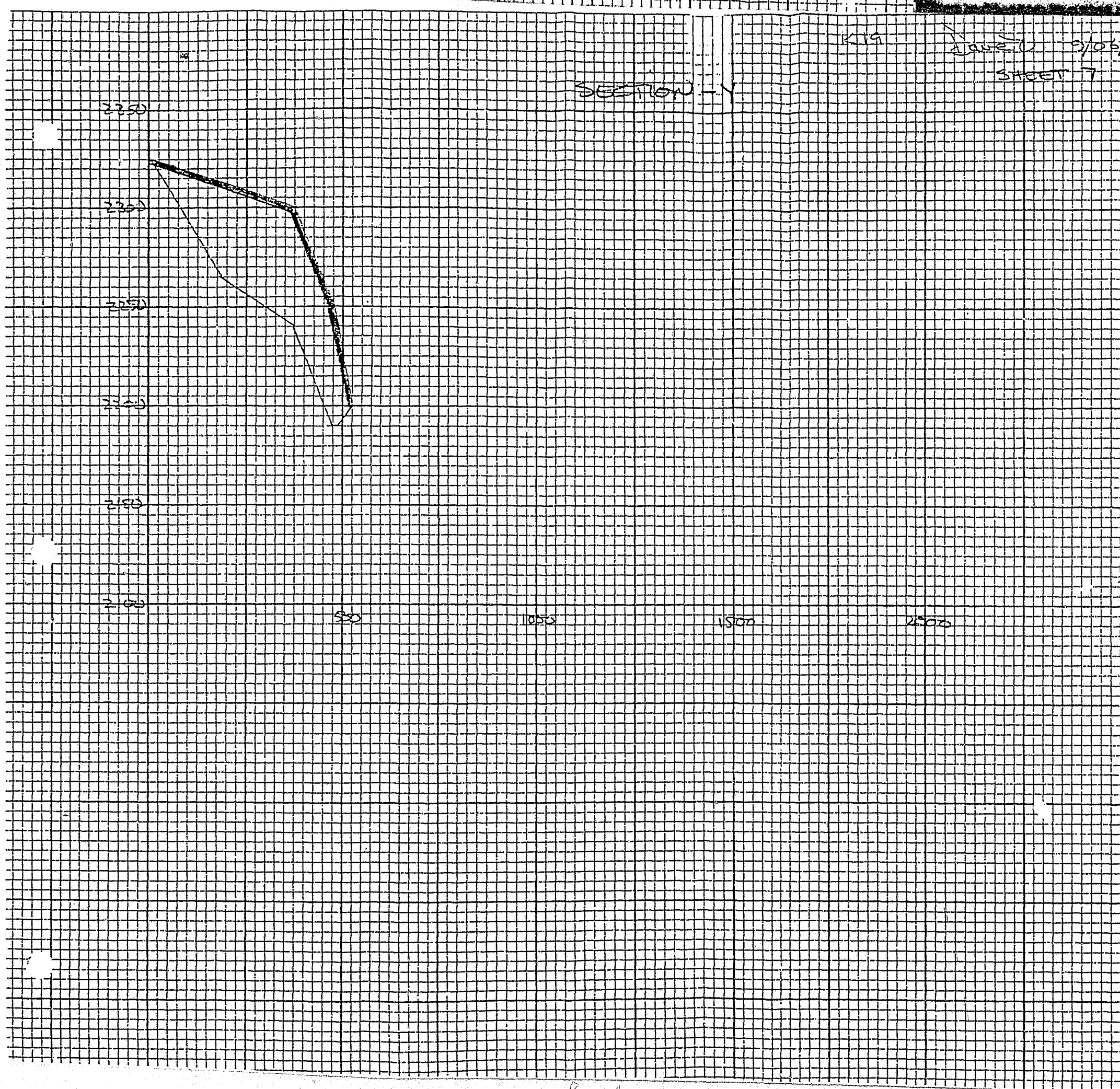
8
NORMAN WILSON COMPANY LIMITED
CHAS. WILSON & CO. LTD. 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 156, 157, 158, 159, 160, 161, 162, 163, 164, 165, 166, 167, 168, 169, 170, 171, 172, 173, 174, 175, 176, 177, 178, 179, 180, 181, 182, 183, 184, 185, 186, 187, 188, 189, 190, 191, 192, 193, 194, 195, 196, 197, 198, 199, 200, 201, 202, 203, 204, 205, 206, 207, 208, 209, 210, 211, 212, 213, 214, 215, 216, 217, 218, 219, 220, 221, 222, 223, 224, 225, 226, 227, 228, 229, 230, 231, 232, 233, 234, 235, 236, 237, 238, 239, 240, 241, 242, 243, 244, 245, 246, 247, 248, 249, 250, 251, 252, 253, 254, 255, 256, 257, 258, 259, 260, 261, 262, 263, 264, 265, 266, 267, 268, 269, 270, 271, 272, 273, 274, 275, 276, 277, 278, 279, 280, 281, 282, 283, 284, 285, 286, 287, 288, 289, 290, 291, 292, 293, 294, 295, 296, 297, 298, 299, 300, 301, 302, 303, 304, 305, 306, 307, 308, 309, 310, 311, 312, 313, 314, 315, 316, 317, 318, 319, 320, 321, 322, 323, 324, 325, 326, 327, 328, 329, 330, 331, 332, 333, 334, 335, 336, 337, 338, 339, 340, 341, 342, 343, 344, 345, 346, 347, 348, 349, 350, 351, 352, 353, 354, 355, 356, 357, 358, 359, 360, 361, 362, 363, 364, 365, 366, 367, 368, 369, 370, 371, 372, 373, 374, 375, 376, 377, 378, 379, 380, 381, 382, 383, 384, 385, 386, 387, 388, 389, 390, 391, 392, 393, 394, 395, 396, 397, 398, 399, 400, 401, 402, 403, 404, 405, 406, 407, 408, 409, 410, 411, 412, 413, 414, 415, 416, 417, 418, 419, 420, 421, 422, 423, 424, 425, 426, 427, 428, 429, 430, 431, 432, 433, 434, 435, 436, 437, 438, 439, 440, 441, 442, 443, 444, 445, 446, 447, 448, 449, 450, 451, 452, 453, 454, 455, 456, 457, 458, 459, 460, 461, 462, 463, 464, 465, 466, 467, 468, 469, 470, 471, 472, 473, 474, 475, 476, 477, 478, 479, 480, 481, 482, 483, 484, 485, 486, 487, 488, 489, 490, 491, 492, 493, 494, 495, 496, 497, 498, 499, 500, 501, 502, 503, 504, 505, 506, 507, 508, 509, 510, 511, 512, 513, 514, 515, 516, 517, 518, 519, 520, 521, 522, 523, 524, 525, 526, 527, 528, 529, 530, 531, 532, 533, 534, 535, 536, 537, 538, 539, 540, 541, 542, 543, 544, 545, 546, 547, 548, 549, 550, 551, 552, 553, 554, 555, 556, 557, 558, 559, 560, 561, 562, 563, 564, 565, 566, 567, 568, 569, 570, 571, 572, 573, 574, 575, 576, 577, 578, 579, 580, 581, 582, 583, 584, 585, 586, 587, 588, 589, 590, 591, 592, 593, 594, 595, 596, 597, 598, 599, 600, 601, 602, 603, 604, 605, 606, 607, 608, 609, 610, 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, 623, 624, 625, 626, 627, 628, 629, 630, 631, 632, 633, 634, 635, 636, 637, 638, 639, 640, 641, 642, 643, 644, 645, 646, 647, 648, 649, 650, 651, 652, 653, 654, 655, 656, 657, 658, 659, 660, 661, 662, 663, 664, 665, 666, 667, 668, 669, 670, 671, 672, 673, 674, 675, 676, 677, 678, 679, 680, 681, 682, 683, 684, 685, 686, 687, 688, 689, 690, 691, 692, 693, 694, 695, 696, 697, 698, 699, 700, 701, 702, 703, 704, 705, 706, 707, 708, 709, 710, 711, 712, 713, 714, 715, 716, 717, 718, 719, 720, 721, 722, 723, 724, 725, 726, 727, 728, 729, 730, 731, 732, 733, 734, 735, 736, 737, 738, 739, 740, 741, 742, 743, 744, 745, 746, 747, 748, 749, 750, 751, 752, 753, 754, 755, 756, 757, 758, 759, 760, 761, 762, 763, 764, 765, 766, 767, 768, 769, 770, 771, 772, 773, 774, 775, 776, 777, 778, 779, 780, 781, 782, 783, 784, 785, 786, 787, 788, 789, 790, 791, 792, 793, 794, 795, 796, 797, 798, 799, 800, 801, 802, 803, 804, 805, 806, 807, 808, 809, 810, 811, 812, 813, 814, 815, 816, 817, 818, 819, 820, 821, 822, 823, 824, 825, 826, 827, 828, 829, 830, 831, 832, 833, 834, 835, 836, 837, 838, 839, 840, 841, 842, 843, 844, 845, 846, 847, 848, 849, 850, 851, 852, 853, 854, 855, 856, 857, 858, 859, 860, 861, 862, 863, 864, 865, 866, 867, 868, 869, 870, 871, 872, 873, 874, 875, 876, 877, 878, 879, 880, 881, 882, 883, 884, 885, 886, 887, 888, 889, 890, 891, 892, 893, 894, 895, 896, 897, 898, 899, 900, 901, 902, 903, 904, 905, 906, 907, 908, 909, 910, 911, 912, 913, 914, 915, 916, 917, 918, 919, 920, 921, 922, 923, 924, 925, 926, 927, 928, 929, 930, 931, 932, 933, 934, 935, 936, 937, 938, 939, 940, 941, 942, 943, 944, 945, 946, 947, 948, 949, 950, 951, 952, 953, 954, 955, 956, 957, 958, 959, 960, 961, 962, 963, 964, 965, 966, 967, 968, 969, 970, 971, 972, 973, 974, 975, 976, 977, 978, 979, 980, 981, 982, 983, 984, 985, 986, 987, 988, 989, 990, 991, 992, 993, 994, 995, 996, 997, 998, 999, 1000

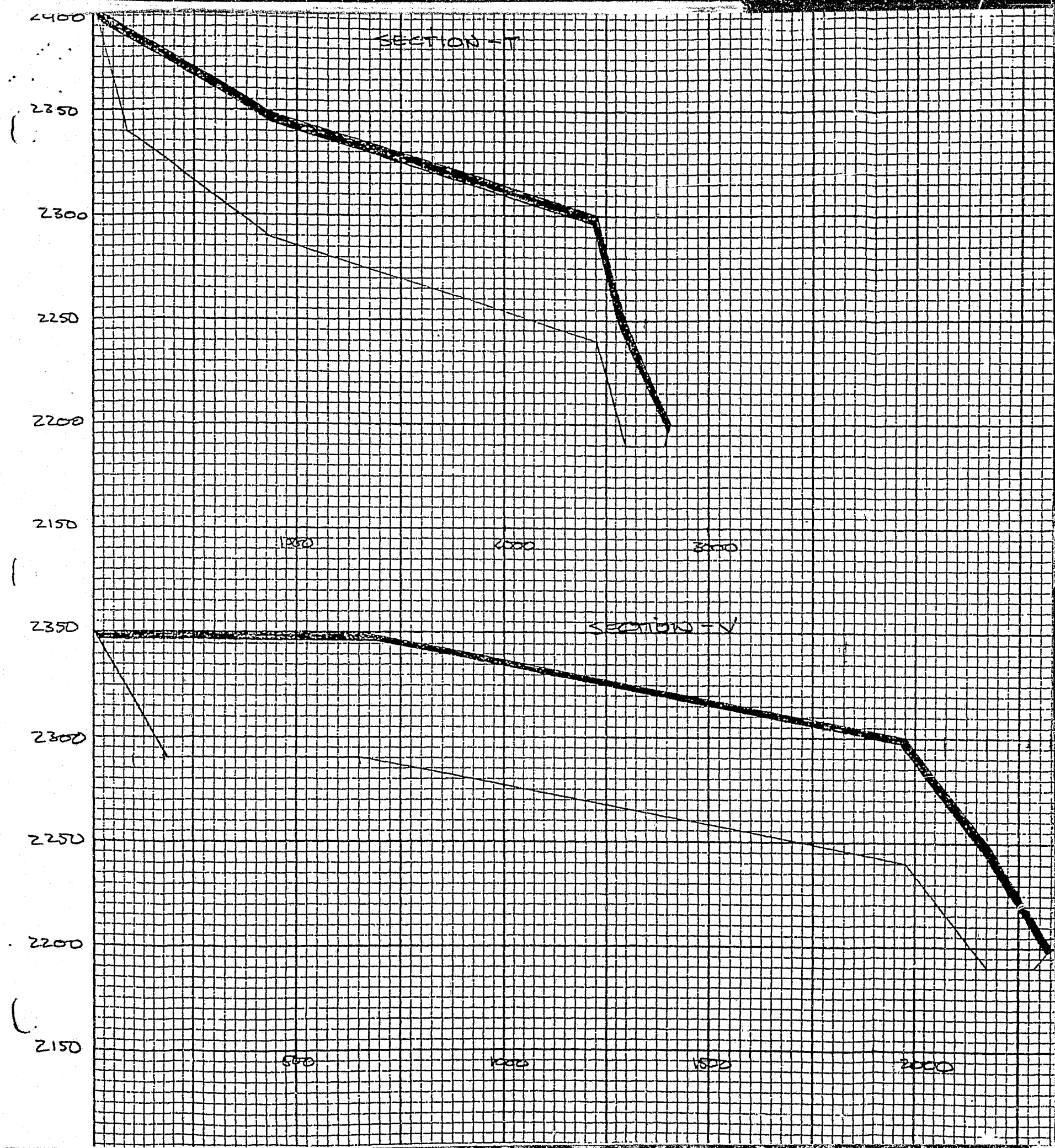
K19

DATE 2/06/81

SHEET 7

SECTION



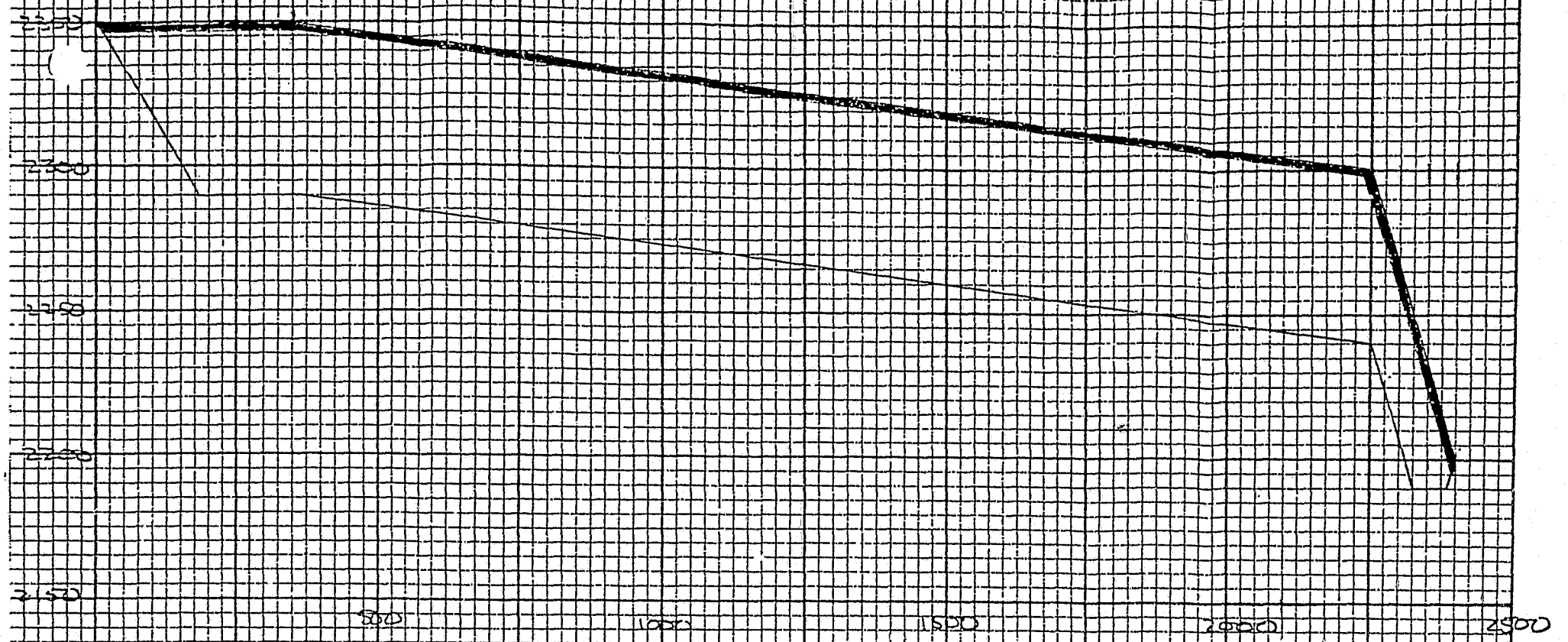


2400

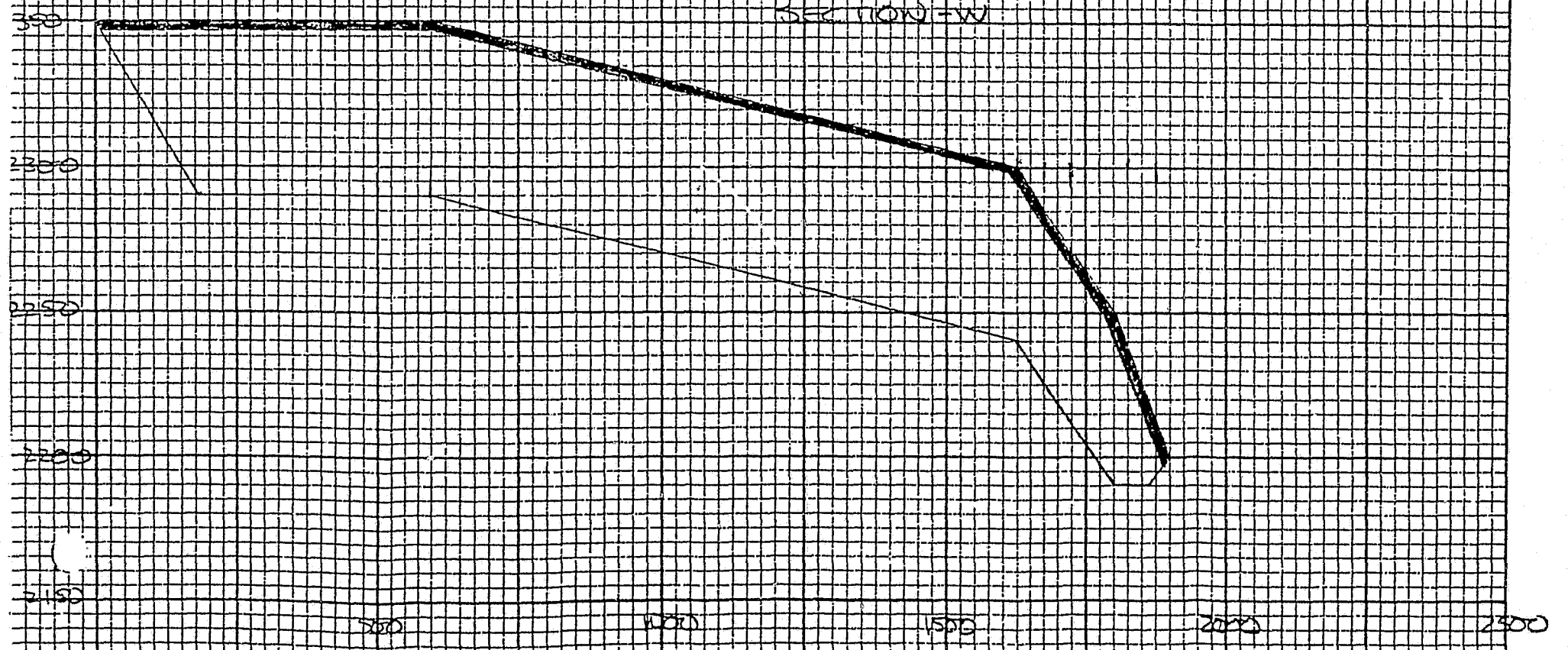
5-10

Date 8/06/81
Sheet 6

SECTION = U



SECTION = W



000025

K 20



Calculations

SUBJECT: WATANNA

ALASKA

JOB NUMBER	15700
FILE NUMBER	
SHEET	1 OF 8
BY	CK
DATE	9/22/81
APP	
DATE	

- SUM -

OVERBURDEN

1.134×10^6 cy
 1.9×10^5 cy
 7.1×10^5 cy

2.024×10^6 cy

15' WITHOUT DEWATERING

5.65×10^6
 1.03×10^6
 4.12×10^6

10.80×10^6 cy

DOWN TO 50'

21.47×10^6 cy

TOTAL: USABLE: 32.27×10^6 c.y.

K 21



Calculations

SUBJECT: WATANA

ALASKA

JOB NUMBER D57006

FILE NUMBER

SHEET 2 OF 3

BY EC DATE 9/2/81

APP DATE

OVERBOROEN (3 ft)

PART 1 (SECTIONS 1-10)

0
1/ 900
1400
1750
2050
2300
2550
2700
2800
2700
2250

SPACING 500

SIMPSON'S $\frac{1}{3}$

1 + 2 + 2 + 2 + ...

$$V = \frac{1}{3} 500 \left(4 \times 900 + 2 \times 1400 + 4 \times 1750 + 2 \times 2050 + 4 \times 2300 + 2 \times 2550 + 4 \times 2700 + 2 \times 2800 + 2250 \right) \times 3'$$

$$= \frac{1}{3} 500 \left(\begin{array}{l} 3600 \\ 2800 \\ 7000 \\ 4100 \\ 9200 \\ 5100 \\ 10,800 \\ 5600 \\ 10,800 \\ 2250 \end{array} \right)$$

$$= \frac{1}{3} 500 (41250) \times 3$$

$$= 30,425,000 \text{ cubic ft}$$

$$\approx 30.63 \times 10^6 \text{ ft}^3$$

$$1.134 \times 10^6 \text{ cy}$$

K22



Calculations

SUBJECT: WATANA
ALASKA

JOB NUMBER P57001

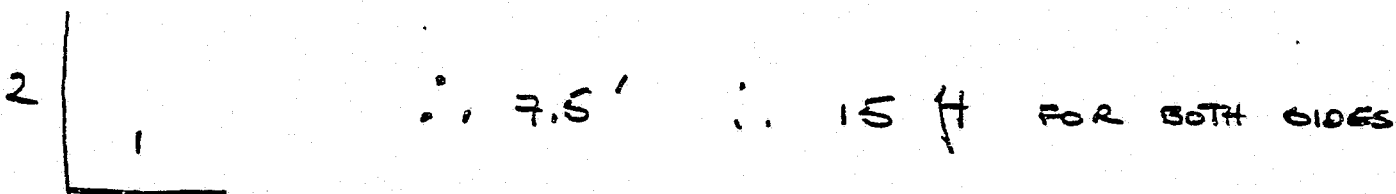
FILE NUMBER 8

SHEET 3 OF 8

BY EC DATE 7/6/81

APP DATE

2/ EXCAVATION OF 15' LAYER WITHOUT DEWATERING.



AREAS:

$$\frac{2(900) - 15}{2} = 892.5$$

$$\frac{2(1400) - 15}{2} = 1392.5$$

$$\frac{2(1700) - 15}{2} = 1742.5$$

$$\frac{2(2050) - 15}{2} = 2042.5$$

$$\frac{2(2200) - 15}{2} = 2292.5$$

$$\frac{2(2550) - 15}{2} = 2542.5$$

$$\frac{2(2700) - 15}{2} = 2692.5$$

$$\frac{2 \times (2800) - 15}{2} = 2792.5$$

$$\frac{2 \times 2700 - 15}{2} = 2692.5$$

$$\frac{2 \times 2250 - 15}{2} = 2242.5$$

SIMPSON'S $\frac{1}{3}$

$$V = \frac{1}{3} 500 (4(892.5) + 2(1392.5) + 4(1742.5) + 2(2042.5) + 4(2292.5) + 2(2542.5) + 4(2692.5) + 2(2792.5) + 4(2692.5) + 2242.5) \times 15$$

$$= 2500 \times 61,032.5$$

$$= 152,581,250 \text{ ft}^3$$

$$\sim \frac{5.65 \times 10^6 \text{ cu y.}}{2} \quad 30$$

K 23



Calculations

SUBJECT: WATANNA

ALASKA

JOB NUMBER 1037001

FILE NUMBER

SHEET 1 OF 2

BY EC DATE 9/4/01

APP DATE

SECTIONS 10 → 12

OVER BORDEN: (3 ft)

2250

1850

1500

$$V = \frac{1}{3}(500) \times 3 (2250 + 4(1850) + 1500)$$

$$= 500(2250 + 7400 + 1500)$$

$$= 500(11,150)$$

$$= 5.575 \times 10^6 \text{ ft}^3$$

$$\sim 2.07 \times 10^5 \text{ cy}$$

SUBTRACT $\frac{1}{4}$ DUE TO CREEK

$$\sim 6.13 \times 10^6 \text{ ft}^3$$

$$\sim 190,020 \text{ cy}$$

$$\sim \underline{1.9 \times 10^5 \text{ cy}}$$

15 ft WITHOUT DEWATERING

$$\frac{2 \times (2250) - 15}{2} = 2242.5$$

$$\frac{2 \times (1850) - 15}{2} = 1842.5$$

$$\frac{2 \times (1500) - 15}{2} = 1492.5$$

$$V = \frac{1}{3}(500) 15 (2242.5 + 4(1842.5) + 1492.5)$$

$$= 2500(11,105) = 27,762,500 \text{ ft}^3$$

$$\sim 1.03 \times 10^6 \text{ cy}$$

31

00025

K24



Calculations

SUBJECT: WATANA
ALASKA

JOB NUMBER P57006

FILE NUMBER

SHEET 5 OF 8

BY EL DATE 9/6/91

APP DATE

SECTION 12 → 23

OVERBORDEN

12/ 1500 x 3

13/ 1450 x 3

14/ 1500 x 3

15 1550 x 3

16/ 1600 x 3

17/ 1550 x 3

18/ 1600 x 3

19/ 1400 x 3

20/ 900 x 3

21/ 400 x 3

22/ 200 x 3

$$V = \frac{1}{3}(500)(3)(1500 + 4(1450) + 2(1500) + 4(1550) + 2(1600) + 4(1550) + 2(1600) + 4(1400) + 2(900) + 4(400) + 200)$$

$$= 500 (1500$$

$$5900$$

$$2000$$

$$6200$$

$$3200$$

$$6200$$

$$3200$$

$$5600$$

$$1800$$

$$1600$$

$$200)$$

$$= 500(38,300)$$

$$= 19,15 \times 10^6 \text{ ft}^3$$

$$\approx 710,000 \text{ cu. y.}$$

K25



Calculations

SUBJECT: 1/4 Acre

ALACRA

JOB NUMBER 052000
 FILE NUMBER _____
 SHEET 6 OF 8
 BY EC DATE 1-1-81
 APP _____ DATE _____

SECTION 12-23

15 ft WITHOUT DEWATERING

$$\frac{2(1500) - 15}{2} = 1492.5 \quad \times 1 = 1492.5$$

$$\frac{2(1450) - 15}{2} = 1442.5 \quad \times 2 = 5770$$

$$\frac{2(1500) - 15}{2} = 1492.5 \quad \times 2 = 8985$$

$$\frac{2(1550) - 15}{2} = 1542.5 \quad \times 4 = 6170$$

$$\frac{2(1600) - 15}{2} = 1592.5 \quad \times 2 = 6385$$

$$\frac{2(1550) - 15}{2} = 1542.5 \quad \times 4 = 6170$$

$$\frac{2(1600) - 15}{2} = 1592.5 \quad \times 2 = 6385$$

$$\frac{2(1400) - 15}{2} = 1392.5 \quad \times 4 = 5570$$

$$\frac{2(1400) - 15}{2} = 1392.5 \quad \times 2 = 5785$$

$$\frac{2(1400) - 15}{2} = 1392.5 \quad \times 4 = 5570$$

$$\frac{2(200) - 15}{2} = 192.5 \quad \times 1 = 192.5$$

$$V = \frac{1}{3}(500)15 (44,475) \\ = 2500(44,475)$$

$$= 111,187,500 \text{ ft}^3$$

$$\sim 4.12 \times 10^6 \text{ cy.}$$

K 26



Calculations

SUBJECT: KATANA,
ALASKA

JOB NUMBER PS7001

FILE NUMBER

SHEET 7

OF 8

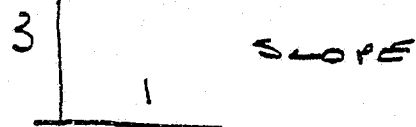
BY

DATE 7/1/81

APP

DATE

EXCAVATION TO 50' LEVEL



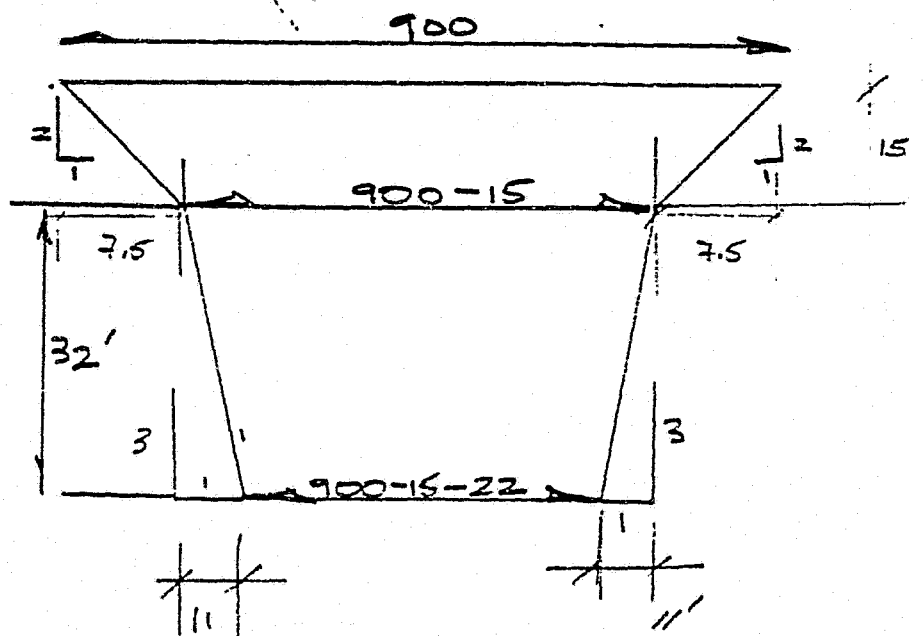
$$50 - 15 - 3 = 32'$$

$$\frac{32}{3} = 10.7 \approx 11'$$

0

- 1/ $(2(900) - 52) / 2 = 874$
- 2/ $(2(800) - 52) / 2 = 774$
- 3/ $(2(750) - 52) / 2 = 724$
- 4/ $(2(700) - 52) / 2 = 674$
- 5/ $(2(650) - 52) / 2 = 624$
- 6/ $(2(600) - 52) / 2 = 574$
- 7/ $(2(550) - 52) / 2 = 524$
- 8/ $(2(500) - 52) / 2 = 474$
- 9/ $(2(450) - 52) / 2 = 424$
- 10/ $(2(400) - 52) / 2 = 374$
- 11/ $(2(350) - 52) / 2 = 324$
- 12/ $(2(300) - 52) / 2 = 274$
- 13/ $(2(250) - 52) / 2 = 224$
- 14/ $(2(200) - 52) / 2 = 174$
- 15/ $(2(150) - 52) / 2 = 124$
- 16/ $(2(100) - 52) / 2 = 74$
- 17/ $(2(50) - 52) / 2 = 24$
- 18/ $(2(0) - 52) / 2 = -24$
- 19/ $(2(0) - 52) / 2 = -24$
- 20/ $(2(0) - 52) / 2 = -24$
- 21/ $(2(0) - 52) / 2 = -24$
- 22/ $(2(0) - 52) / 2 = -24$
- 23/

ILLUSTRATION OF CALL.



$$(900 - 15 + 900 - 15 - 22) 2$$

$$(2(900) - 52) / 2$$

K 27



Calculations

SUBJECT: WATANAWA,
ALASKA

JOB NUMBER 1057001

FILE NUMBER

SHEET 3 OF 8

BY F.C. DATE 9/28/

APP DATE

0 x 1 = 0

$$574 \times 4 = 2296$$

$$1274 \times 2 = 2548$$

$$1724 \times 4 = 6896$$

$$2024 \times 2 = 4048$$

$$2274 \times 4 = 9096$$

$$2524 \times 2 = 5048$$

$$2674 \times 4 = 10696$$

$$2774 \times 2 = 5548$$

$$2674 \times 4 = 10696$$

$$2224 \times 2 = 4448$$

$$1824 \times 4 = 7296$$

$$1474 \times 2 = 2948$$

$$1424 \times 4 = 5696$$

$$1474 \times 2 = 2948$$

$$1524 \times 4 = 6096$$

$$1574 \times 2 = 3148$$

$$1534 \times 4 = 6136$$

$$1574 \times 2 = 3148$$

$$1374 \times 4 = 5496$$

$$674 \times 2 = 1348$$

$$374 \times 4 = 1496$$

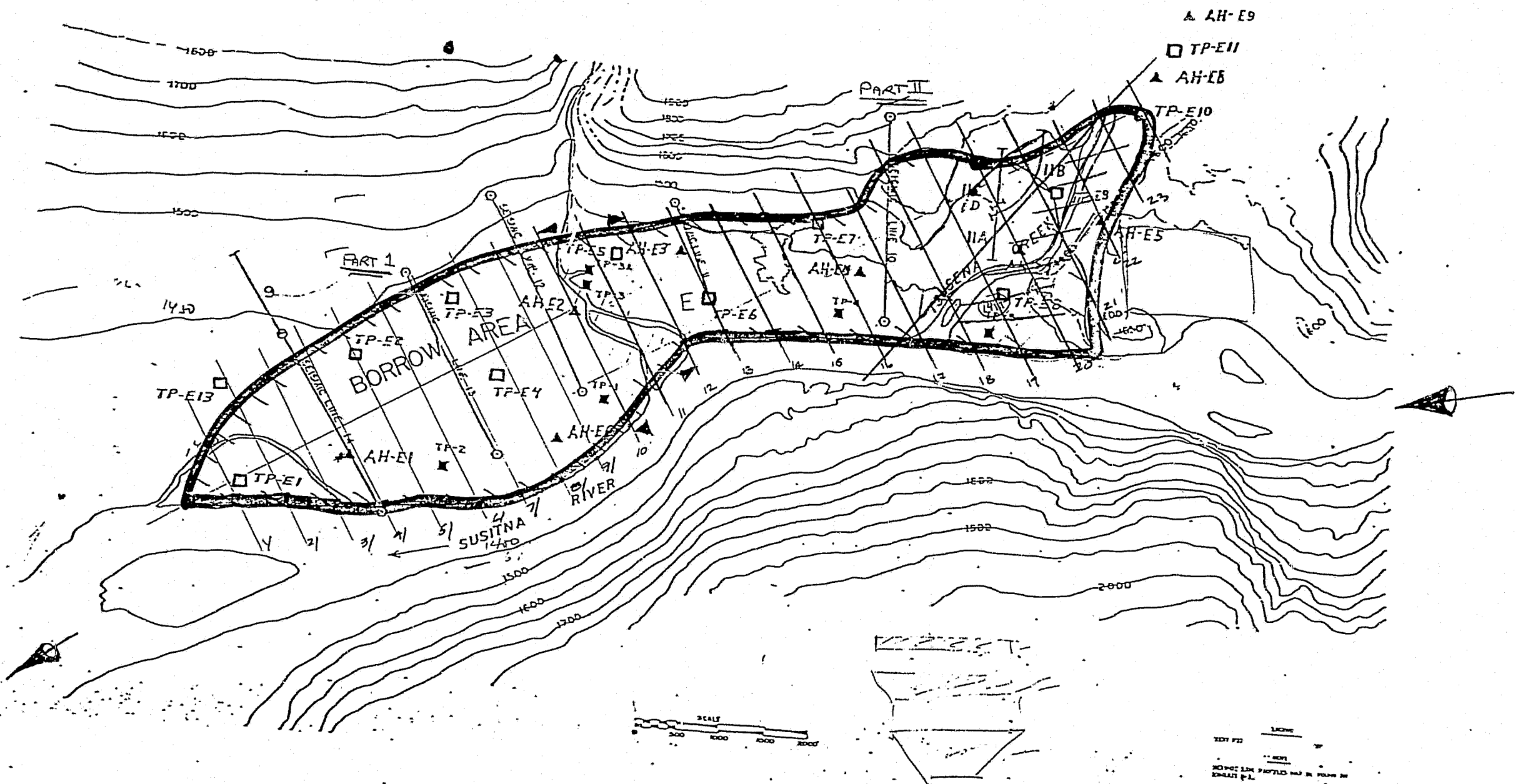
$$174 \times 1 = 174$$

108,668

$$V = \frac{1}{2} 500 \times 32 \times 108,668$$

$$= 579,562,664 \quad \uparrow^3$$

$$21.47 \times 10^6 \text{ - y}$$



NOTE:

OVERBURDEN --- 3'-0"
15'-0" WITHOUT DEWATERING
50'-0" WITH DEWATERING.

APPROXIMATE BORROW AREA BOUNDARY	
ACRES	
BORROW AREA E 3/	
TENTATIVE LOCATION	
SHEET 6 of 7 6/3/81	

FOLD LENGTH

12
11
8.5
8

AUTO

MANUAL

FEED