

DMH

# READING BUSINESS PARK

## AXIOM 4

### FOUDRY BROOK – FLOOD STORAGE PROPOSALS

For

### RICKWORTH SECURITIES

D. B. Ramsay B.S.c., C.Eng., M.I.C.E.  
Chartered Civil Engineer  
Odimbo  
Gipsy Lane  
Wokingham  
Berkshire  
RG11 2HP

Lewin, Fryer and Partners  
Consulting Engineers  
Hermitage Chambers  
Church Terrace  
Richmond  
Surrey  
TW10 6SQ

AXIOM 4

FOUDRY BROOK - FLOOD STORAGE PROPOSALS

LIST OF CONTENTS

|                                                        | <u>Page No.</u> |
|--------------------------------------------------------|-----------------|
| 1. INTRODUCTION.                                       | 1               |
| 2. HISTORY OF FLOOD STORAGE PROPOSALS FOR THE SITE.    | 2               |
| 3. PROPOSED FLOOD STORAGE SITE - RICKWORTH SECURITIES. | 5               |
| 4. STORAGE VOLUMES.                                    | 6               |
| 5. RIVER KENNET FLOODS.                                | 8               |
| 6. FOUDRY BROOK FLOODS.                                | 10              |
| 7. WORKS REQUIRED TO THE SITE.                         | 15              |
| 8. SUMMARY.                                            | 16              |
| DRAWING 315.1A - PROPOSED REINSTATEMENT LEVELS         | 17              |

AXIOM 4

(READING BUSINESS PARK)

Foudry Brook - Flood Storage Proposals

Rickworth Securities

1. INTRODUCTION

1.1 Development of the Axiom 4 (formerly Reading Business Park) area will require the filling in of part of the Foudry Brook Flood Plain. In order to ensure that such filling will not worsen flooding, a scheme has been proposed by Peter Brett Associates which includes construction of a flood relief channel through the site. An area of 16 Ha of land, at or below existing ground level, is also to be provided in order to retain some flood storage capacity.

1.2 The Axiom 4 business park development is to be carried out by two Companies, Rickworth Securities Ltd and Bucknell Bros. (Holdings) Ltd. These developers have agreed that each will accommodate 50% of the required flood storage area, which means that at least 8 Ha of each development must be at a level and a location that will permit such floodwater storage.

1.3 Peter Brett Associates have submitted details of the scheme to Thames Water requesting scheme approval under the Land Drainage Act. The actual locations of the flood storage areas are not, however, required to be specified in that submission.

1.4 The next stage in hydraulics approvals is for details of the flood storage areas to be submitted to Thames Water. The purpose of this report is to set out the details of the storage proposals for Rickworth Securities' part of the development.

2.✓

## HISTORY OF FLOOD STORAGE PROPOSALS FOR THE SITE

2.1. In 1983 only part of the area now known as the Axiom 4 site was scheduled for imminent development. This was land owned by The Englefield Estate, and is shown hatched on the plan on page 3.

2.2. The development of this smaller site required that land levels be raised above maximum flood level, which meant a loss of flood plain storage volume. It was proposed that three adjacent sites (A, B and C on the plan) should be used as compensatory flood storage areas. All these sites were also on land owned by The Englefield Estate.

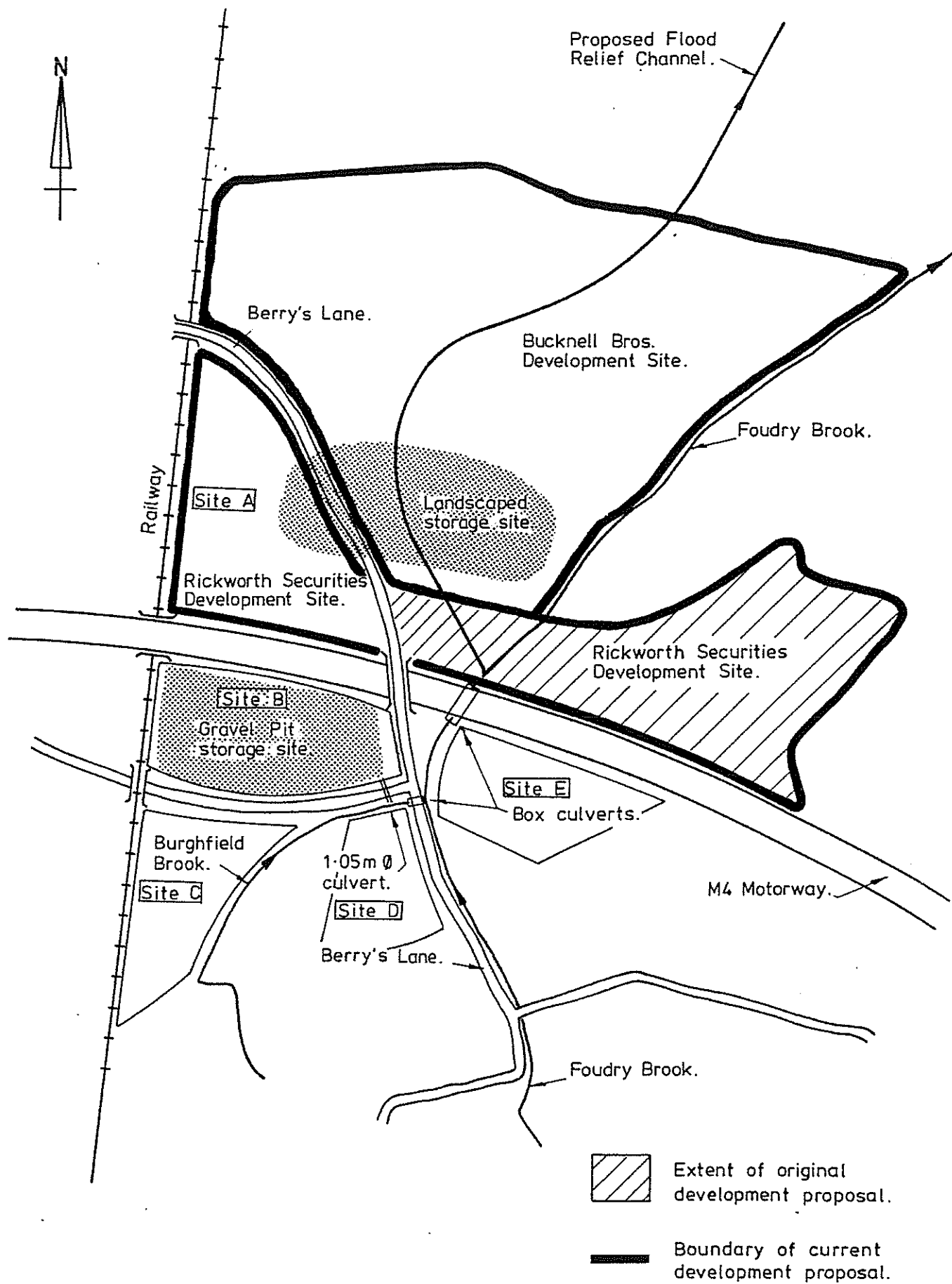
2.3. These three sites were therefore to be regraded such that at any flood level they would provide at least as much flood storage capacity as was available in the flood plain at the development site. Site A was north of the M4 motorway, while sites B and C were to the south. Site B was a former gravel pit, with sites A and C being farmland.

2.4. Thames Water accepted these proposals for flood plain compensation in November 1983, but subsequently it was felt by the developers that site A should not be used for flood plain compensation, and also Berkshire County Council advised that there are archeological interests which would have to be satisfied in that area.

2.5. Details for two more sites (D and E) were then proposed to replace site A. These two sites were also on the Englefield Estate land, and were both south of the M4 motorway.

2.6. In 1984 Thames Water accepted these revised proposals for flood plain compensation, thus establishing the important principle that - from a hydraulic and hydrological viewpoint - it was acceptable to fill flood plain land north of the M4 motorway on condition that compensatory flood storage areas were provided just upstream, albeit south of the motorway.

2.7. This approval by Thames Water is still valid today, although subsequent events have altered the flood alleviation proposals to a certain extent.



AXIOM 4 BUSINESS PARK  
FLOOD STORAGE LOCATION PLAN

(Scale 1:10 000 approx.)

2.8. During 1984 Rickworth Securities, the Company wishing to develop The Englefield Estate land, agreed to work with Bucknell Bros. (Holdings) Ltd to submit a joint proposal for what has become Axiom 4. Bucknell Bros. (Holdings) Ltd are the landowners for much of the business park area to the north of the development originally proposed on The Englefield Estate land.

2.9. Peter Brett Associates subsequently designed a flood alleviation scheme (Section 1.1.) for the whole Axiom 4 business park site as an entity, as the agreement between developers now meant that a flood channel could be constructed right through the site, discharging floodwater directly to the River Kennet.

2.10. This scheme was approved in principle by Thames Water in 1984, with specific details to be approved at subsequent stages of progress.

2.11. The proposed scheme would permit development to be carried out by Rickworth Securities and Bucknell Bros. (Holdings) Ltd on the entire Axiom 4 area, providing that the new flood relief channel was constructed prior to any land filling, and that the 16 Ha of flood storage was available in stages before filling had been completed.

2.12. Thames Water confirmed in January 1985 that the sites originally proposed for compensatory flood storage (Section 2.6.) would not be necessary if the scheme proposed by Peter Brett Associates proceeded; although the original agreement for these sites remained valid, and could be utilised if the newer proposals were not, in fact, carried out.

### 3. PROPOSED FLOOD STORAGE SITE - RICKWORTH SECURITIES

3.1. Peter Brett Associates proposals for the entire Axiom 4 site include 16 Ha of flood storage area, at a level no higher than 37.80m O.D. Although no firm decision had been made regarding the location of such an area, for the initial calculations all storage was assumed to be immediately adjacent to the proposed flood relief channel, at approximately 350m downstream of the M4 motorway culvert.

3.2. In practice, the flood storage volume to be made available is likely to be spread among several separate areas, all with good hydraulic links to the Foudry Brook or the Relief Channel. However, as Thames Water have already accepted the calculations based on the original single site, the total flood storage volume to be made available must not be less than that originally proposed.

3.3. The remainder of this report details the flood storage site proposed by Rickworth Securities in order to fulfil its obligation of providing not less than 50% of the required flood storage capacity for Axiom 4.

3.4. The site proposed is the former gravel pit previously referred to as site B. It is immediately south of the M4 motorway, being bounded on its other three sides by Berry's Lane, an unclassified road parallel to the motorway, and the Reading - Basingstoke railway line. At present bunds around the excavation prevent floodwater from entering the site.

3.5. The excavation is currently partly full of water, which is probably ponded rainwater, as the pit water level is about 0.75m higher than the water levels in adjacent brooks. A 1.05m diameter culvert connects the site (although not, at present, the ponded water) to the Burghfield Brook, and immediately downstream of this pipe culvert a 2.25m x 2.10m box culvert carries the Burghfield Brook under Berry's Lane to join the Foudry Brook.

3.6. This confluence of Burghfield Brook and Foudry Brook is 250m from the southern boundary of the Reading Business Park, and approximately 600m from the originally indicated flood storage area on the Relief Channel (Section 3.1.).

4.

#### STORAGE VOLUMES

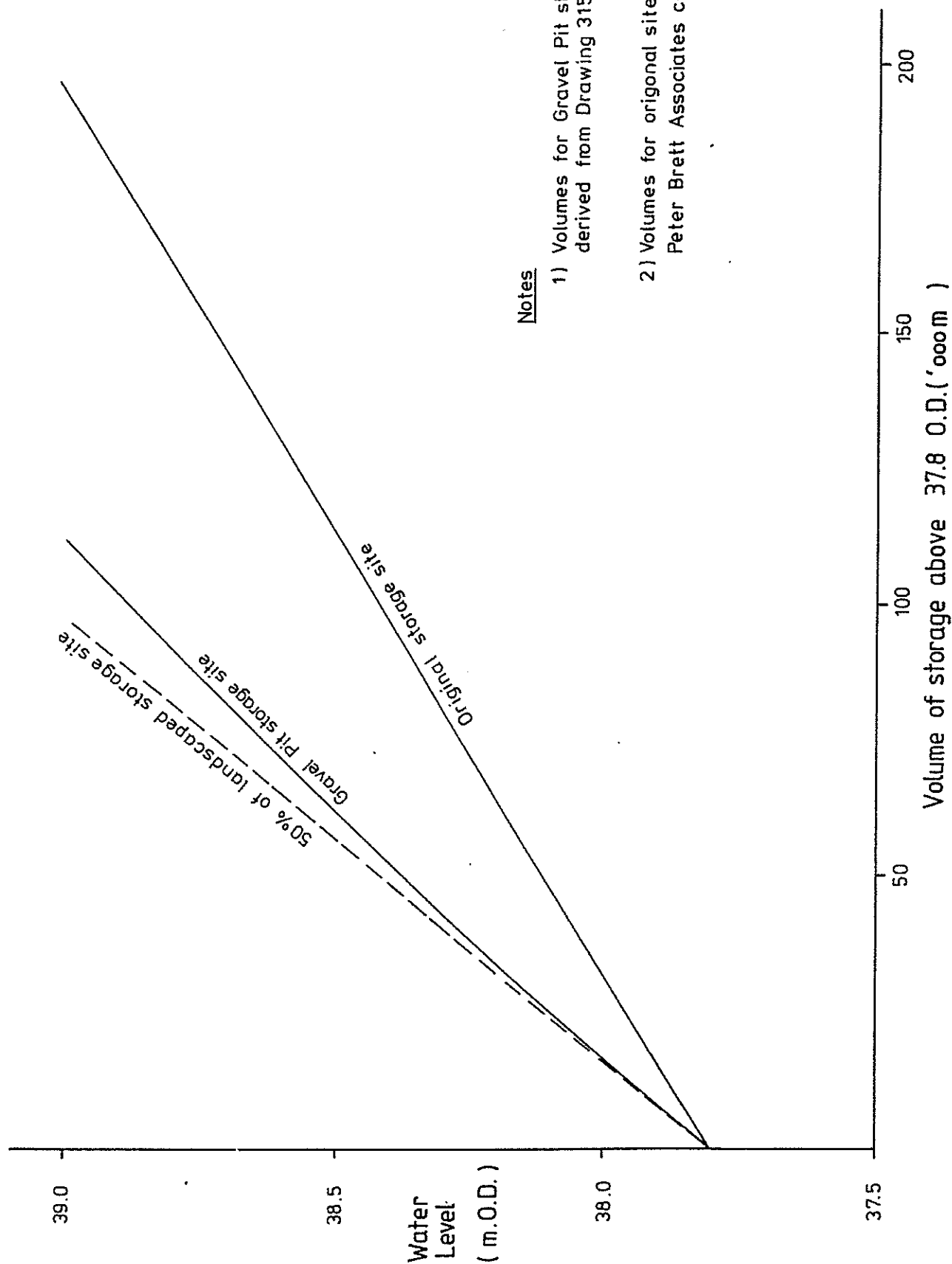
4.1. The gravel extractors, Tarmac, have a duty to reinstate the gravel pit, and it is understood that they wish to carry out such works in the near future.

4.2. The proposed reinstatement levels and works for the site to be used for flood storage are shown on drawing 315/1 (page 17). When thus regraded the site will be able to provide an area of just over 8.4 Ha for flood storage, all of which would be no higher than 37.80m O.D., the level used for the storage calculations by Peter Brett Associates on their original site.

4.3. The volumes of storage available at different water levels are shown on page 7, for both the original 16 Ha storage area and the gravel pit site. In both cases only the volume above a level of 37.80m O.D. has been shown, as this is the proposed finished level of the original flood storage area, and so any volumes below this level in the gravel pit site have been ignored.

4.4. The area of available flood storage in the gravel pit is never less than 53% of the 16Ha. required, and with rising flood levels this proportion increases.

# Foudry Brook - Level / Storage Volume Relationships



## Notes

- 1) Volumes for Gravel Pit storage site derived from Drawing 315/1A.
- 2) Volumes for original site from Peter Brett Associates calculations.

5.

RIVER KENNET FLOODS

5.1. The Axiom 4 business park site is within the River Kennet flood plain, and as such is liable to flood from the river even with no flow in the Foudry Brook. Therefore any flood storage site must be able to accept River Kennet floodwater as well as floodwater from the Foudry Brook.

5.2. With no flow in the Foudry Brook, however, peak levels in the vicinity of the M4 could not exceed the peak River Kennet level. In the 1971 flood event the peak recorded level of the River Kennet near the Foudry Brook confluence was 38.67m O.D., with the peak Foudry Brook level at the M4 motorway being 38.80m O.D. Had the proposed scheme been in operation at that time the level at the M4 would have been much closer to the River Kennet level, although as no Foudry Brook flow records are available the actual level cannot be calculated.

5.3. Assuming this extreme case of no flow in the Foudry Brook, Kennet floodwater would have to flow back up the Foudry Brook channel before entering storage. Flood level records provided by Thames Water indicate that the maximum rate of rise of the River Kennet is not more than 65mm/hr. For the proposed gravel pit storage site to fill at this rate of rise a flow of 1.9 cumecs will be required into the site. ←

8.4 ho 45

5.4. This rate of flow is small when compared to even the 1 in 1 year flood flow of 10 cumecs. Velocities through the M4 culvert would be less than 0.30m/s, and through the Burghfield Brook Berry's Lane culvert less than 0.45m/s. An additional culvert would be required to connect the Burghfield Brook to the storage site, (details of this are dealt with in Section 7) and velocities here would be about 0.9m/s.

5.5. With such velocities, head losses between the River Kennet and the storage site would be small, enabling the storage levels to generally reflect River Kennet levels. The gravel pit site is thus capable of providing a major proportion of the flood storage required for River Kennet floods, even if that floodwater has to flow from the River Kennet itself.

5.6. In practice it is unrealistic to anticipate no flow in the Foudry Brook when the River Kennet is at a sufficiently high level to utilise its flood plain. A more probable situation is that high River Kennet levels would hold up water in Foudry Brook, and it is the Brook's water that would flow into storage.

5.7. In such a situation there would be little or no flow between the River Kennet and the storage site. There would thus be negligible difference in water levels between the river and either the original storage area or the gravel pit site.

5.8. Whether the water being stored actually comes from the River Kennet, or whether it flows from the Foudry Brook prior to reaching the River Kennet, the effect on flood flows is the same. The flow into storage will attenuate flood flows in the River Kennet downstream of the Foudry Brook confluence.

5.9. Therefore the gravel pit storage site, when fully restored as on drawing 315/1A, could accommodate at least 53% of the River Kennet floodwater which it is proposed be stored in the original flood area on the Axiom 4 business park.

6. FOUDRY BROOK FLOODS

6.1. In order to provide equivalent flood storage at two different sites on a river, the change in the volume of flood storage available for a change in flood between two given flow values should be identical for both sites. Additionally, the effect of the storage will only be similar if the peak flows are similar.

6.2. For the Foudry Brook the two storage sites being compared are located only 600m apart, and there are no significant tributaries joining the Foudry Brook downstream of the Burghfield Brook. The peak flows of any flood may therefore be considered identical at both sites.

6.3. In order to determine the volume of storage available at various flows, the water levels attained by these flows must first be known. These stage/discharge relationships are shown on page 11 for each site, and for each of three River Kennet levels.

6.4. For the gravel pit site the stage/discharge rating was derived by backwater calculations from the downstream side of the M4 culvert, using Peter Brett Associates' levels at that point. Backwatering to the Burghfield Brook confluence was carried out using Manning's 'n' of 0.020 for the M4 culvert and 0.035 for the surveyed Foudry Brook sections.

6.5. These levels of the Foudry Brook at the Gravel Pit site are thus those that may be expected on completion of the scheme, and for the 1 in 50 year event are approximately 0.30m lower than the flood levels that would be achieved under existing conditions.

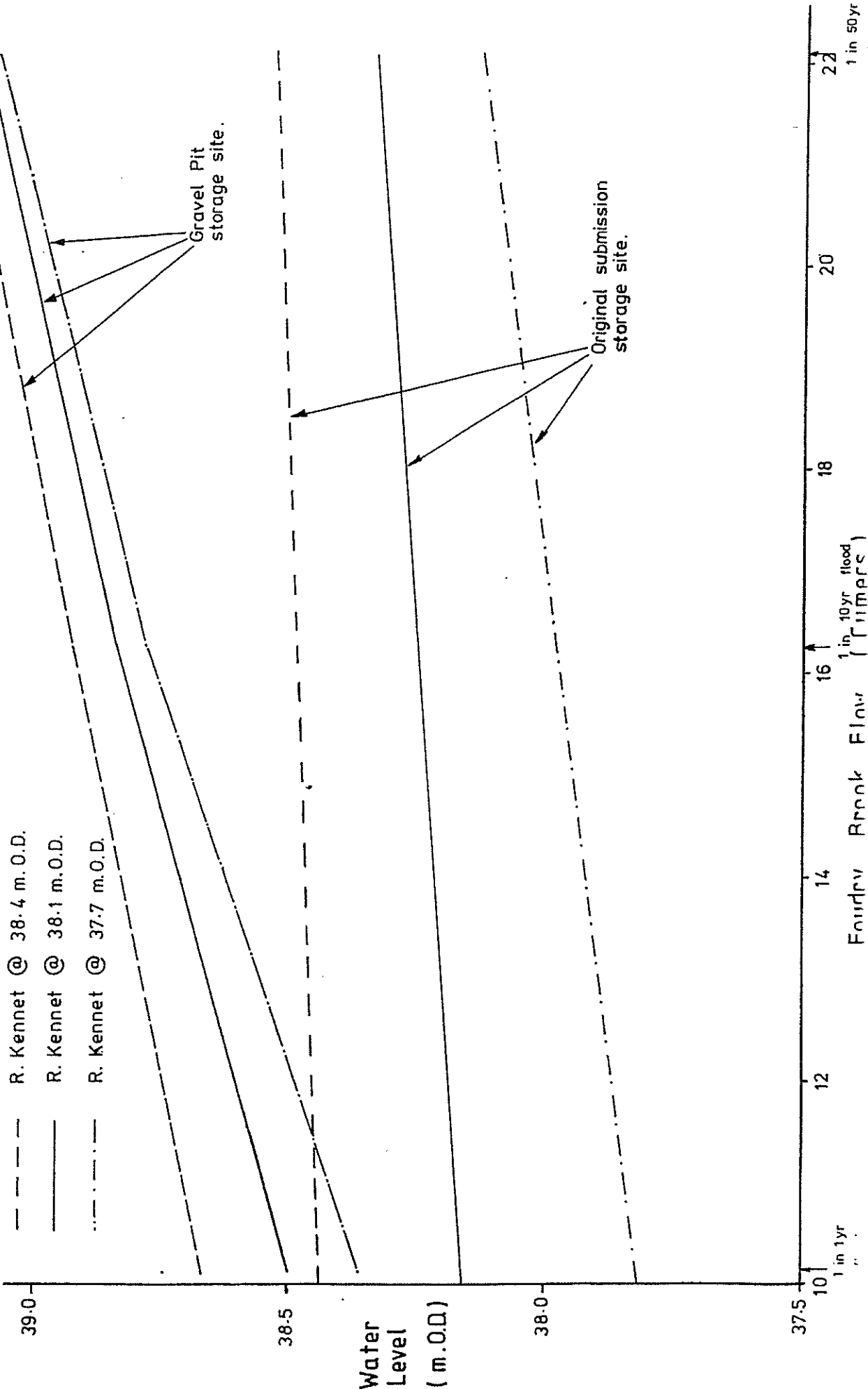
6.6. It should be noted that the River Kennet level has a significant effect on these relationships, especially for the original flood storage site. This area is closer to the River Kennet than the gravel pit site, and so would be influenced by water backing up from the river to a greater extent.

6.7. At the gravel pit site the hydraulic capacity of the single channel of the 'natural' Foudry Brook plays a major part in determining the level of flood water at that point. There is a difference of 0.71m between the water level of a 1 in 1 year flood and that of a 1 in 50 year event when considering the River Kennet at the lower level of 37.70m O.D. At the higher

# Foudry Brook - Stage / Discharge Relationships

(after construction of flood relief channel)

- R. Kennet @ 38.4 m. O.D.
- R. Kennet @ 38.1 m. O.D.
- .- R. Kennet @ 37.7 m. O.D.



River Kennet level of 38.40m O.D., however, the 1 in 1 year Foudry Brook flood level is slightly raised due to River Kennet influence, and the difference between 1 in 1 year and 1 in 50 year flood levels at the Gravel Pit site is reduced to 0.49m.

6.8. By contrast, the proposals for the downstream side of the motorway create a situation where the flow is split between two large channels. The resulting increase in hydraulic capacity means a much reduced difference in flood levels between the 1 in 1 year and 1 in 50 year flood flows. The calculated differences, at the original flood storage site, are 0.30m with the River Kennet at the lower level, and only 0.10m when the River Kennet is at the higher level being considered. The latter difference is very small as the high River Kennet level holds both the relief channel and the Foudry Brook at much higher levels than would be achieved with uniform flow. The large waterway cross-sectional area and resulting low velocities mean very flat hydraulic gradients, and flood levels at the original flood storage site that - especially for the 1 in 1 year Foudry Brook flood - are only just above the River Kennet flood level.

6.9. It is assumed that no storage is required for the 1 in 1 year Foudry Brook flood flow - indeed virtually none would be utilised in the original flood storage area proposals with the River Kennet at a low level. At the higher River Kennet levels flood storage would be utilised in the 1 in 1 year event, but that may be considered as River Kennet flood storage. (Section 5).

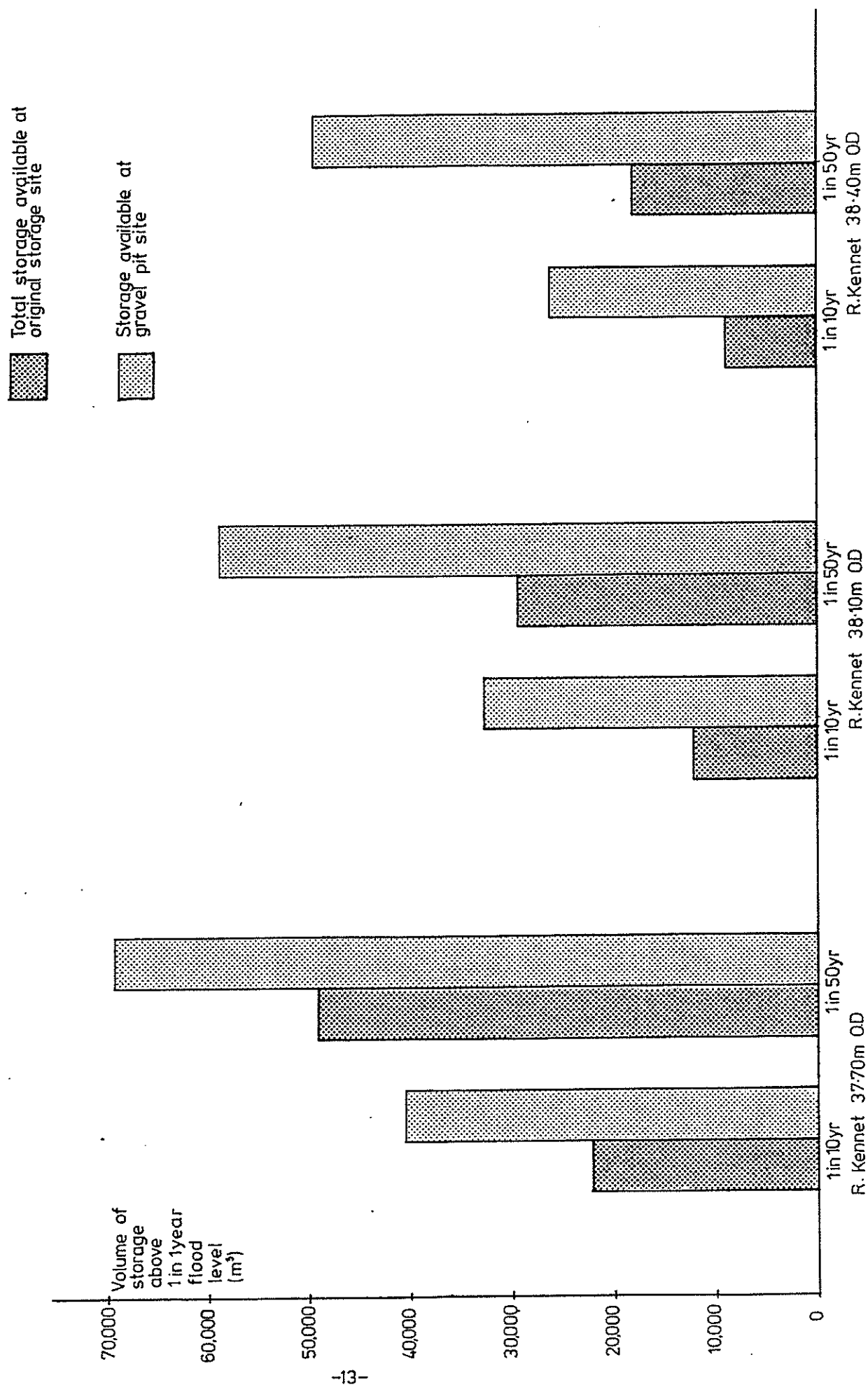
6.10. The storage available to flows above the 1 in 1 year flood level has therefore been determined for both possible storage sites, and for three River Kennet levels. The results are shown on the bar chart on page 13.

6.11. In each case shown there would be considerably more volume available to attenuate Foudry Brook floods if the gravel pit site were used instead of the original flood storage area, although this proposal has only to consider the location of 50% of the required storage.

6.12. The main reason for the extra storage being available is that at the gravel pit site the rate of rise of water levels is more than twice that at the landscaped site, (Sections 6.5 - 6). For high River Kennet levels, the rates of water level rise differ by a factor of almost five.

# FOUDRY BROOK

## Flood storage volumes available above 1 in 1 year flood level



6.13.           Therefore the proposed gravel pit storage site is able to provide greatly improved flood storage facilities for the Foudry Brook, compared to the same area of land located in the original flood storage area.

7.

WORKS REQUIRED TO THE SITE

7.1. The gravel pit site currently holds water at a higher level than the adjacent Burghfield Brook, as spoil from the gravel extraction has blocked the drain leading to the existing 1.05m diameter culvert under the unclassified road.

7.2. The restoration proposals for the site will rectify this problem, and ensure that all parts of site will be able to drain to the culvert. However, the invert of this culvert is slightly higher than low flow water levels in the Burghfield Brook, and so could not satisfactorily drain the site completely.

7.3. The maximum storage inflow from River Kennet flooding is 1.9 cumecs (Section 5.2.), and the maximum storage inflow to the original site from Foudry Brook flooding is a similar value (from Peter Brett Associates calculations). The additional culvert to connect the site to Burghfield Brook should therefore be not less than 1.20m diameter, and the proposed location is near the centre of the southern boundary of the site. This location will provide the shortest flow path to drain the site, and will also entail the shortest length of culvert, as this is the lowest point on the unclassified road.

7.4. The 150m long ditch connecting the new culvert to the Burghfield Brook will require excavation, as will 150m of the Burghfield Brook itself, to ensure a good hydraulic connection with the River Kennet. All existing culverts will need to be cleaned out, with headwalls to the 1.05m diameter culvert modified to improve inlet and outlet conditions.

7.5. With the above works carried out to the site it could be used for flood storage for both River Kennet and Foudry Brook floods, yet would drain out completely when lower water levels in the Foudry Brook prevailed. Normal grassland vegetation would thus be able to grow on the site.

7.6. However, as it is recognised that the land resulting from this reclamation exercise would be of lower agricultural value than the original field prior to gravel extraction, it has been suggested by the landowner that a better use for the site would be as a "wetland" wildlife conservation area. This use of the site would provide better hydraulic characteristics for the flood storage function, and this proposal is being examined in conjunction with M.A.F.F. and the Planning Authorities.

8.

SUMMARY

8.1. The gravel pit site adjacent to the M4 motorway could be used as a flood storage site if the site were restored to the levels shown on drawing 315/1A, and if the additional ditch and culvert works were carried out; or alternatively if the "wetland" proposal were adopted.

8.2. It would be capable of replacing 53% of the original flood storage area proposed for the Axiom 4 business park by Peter Brett Associates.

8.3. Use of this site will attenuate Foudry Brook floods to a greater degree that could be achieved by using the original flood storage area, and therefore locating part of the required River Kennet flood storage volume in the gravel pit will provide more than the minimum volume required for Foudry Brook storage on Rickworth Securities development.

LEWIN, FRYER AND PARTNERS

SEPTEMBER 1985

Report LFP/315/R1

NOTES

This drawing is prepared and issued on the property of the Consulting Engineers. It is their duty to ensure that the work is done in accordance with the instructions given. Any discrepancies must be reported immediately to the Engineer for instructions.

1. Existing level (AOD) generally at edge of gravel excavation.
2. New planting minimum with 15m spacing to assist with 100mm x 500mm of soil.
3. Existing lanes to be retained as far as possible.
4. Limits of excavation.
5. Proposed level contour (AOD).
6. 20m cable laid out with 10m spacing with 60cm cover.
7. Filling to be with approved material, submitted and tested.
8. Prior to landscaping minimum of 100mm substrate.
9. Minimum of 200mm topsoil to be laid over the substrate to finish level.
10. Topsoil to be seeded with agricultural grass seed mixture, and this used for large crops.
11. All planting to be incorporated at completion of reclamation.

|                          |        |
|--------------------------|--------|
| A. Site complete revised | Aug 85 |
| By                       |        |

REK NORTH SECURITIES

**LEWIN, FRYER & PARTNERS**

CONSULTING ENGINEERS

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, 1001, 1002, 1003, 1004, 1005, 1006, 1007, 1008, 1009, 1010, 1011, 1012, 1013, 1014, 1015, 1016, 1017, 1018, 1019, 1020, 1021, 1022, 1023, 1024, 1025, 1026, 1027, 1028, 1029, 1030, 1031, 1032, 1033, 1034, 1035, 1036, 1037, 1038, 1039, 1040, 1041, 1042, 1043, 1044, 1045, 1046, 1047, 1048, 1049, 1050, 1051, 1052, 1053, 1054, 1055, 1056, 1057, 1058, 1059, 1060, 1061, 1062, 1063, 1064, 1065, 1066, 1067, 1068, 1069, 1070, 1071, 1072, 1073, 1074, 1075, 1076, 1077, 1078, 1079, 1080, 1081, 1082, 1083, 1084, 1085, 1086, 1087, 1088, 1089, 1090, 1091, 1092, 1093, 1094, 1095, 1096, 1097, 1098, 1099, 1100, 1101, 1102, 1103, 1104, 1105, 1106, 1107, 1108, 1109, 1110, 1111, 1112, 1113, 1114, 1115, 1116, 1117, 1118, 1119, 1120, 1121, 1122, 1123, 1124, 1125, 1126, 1127, 1128, 1129, 1130, 1131, 1132, 1133, 1134, 1135, 1136, 1137, 1138, 1139, 1140, 1141, 1142, 1143, 1144, 1145, 1146, 1147, 1148, 1149, 1150, 1151, 1152, 1153, 1154, 1155, 1156, 1157, 1158, 1159, 1160, 1161, 1162, 1163, 1164, 1165, 1166, 1167, 1168, 1169, 1170, 1171, 1172, 1173, 1174, 1175, 1176, 1177, 1178, 1179, 1180, 1181, 1182, 1183, 1184, 1185, 1186, 1187, 1188, 1189, 1190, 1191, 1192, 1193, 1194, 1195, 1196, 1197, 1198, 1199, 1200, 1201, 1202, 1203, 1204, 1205, 1206, 1207, 1208, 1209, 1210, 1211, 1212, 1213, 1214, 1215, 1216, 1217, 1218, 1219, 1220, 1221, 1222, 1223, 1224, 1225, 1226, 1227, 1228, 1229, 1230, 1231, 1232, 1233, 1234, 1235, 1236, 1237, 1238, 1239, 1240, 1241, 1242, 1243, 1244, 1245, 1246, 1247, 1248, 1249, 1250, 1251, 1252, 1253, 1254, 1255, 1256, 1257, 1258, 1259, 1260, 1261, 1262, 1263, 1264, 1265, 1266, 1267, 1268, 1269, 1270, 1271, 1272, 1273, 1274, 1275, 1276, 1277, 1278, 1279, 1280, 1281, 1282, 1283, 1284, 1285, 1286, 1287, 1288, 1289, 1290, 1291, 1292, 1293, 1294, 1295, 1296, 1297, 1298, 1299, 1300, 1301, 1302, 1303, 1304, 1305, 1306, 1307, 1308, 1309, 1310, 1311, 1312, 1313, 1314, 1315, 1316, 1317, 1318, 1319, 1320, 1321, 1322, 1323, 1324, 1325, 1326, 1327, 1328, 1329, 1330, 1331, 1332, 1333, 1334, 1335, 1336, 1337, 1338, 1339, 1340, 1341, 1342, 1343, 1344, 1345, 1346, 1347, 1348, 1349, 1350, 1351, 1352, 1353, 1354, 1355, 1356, 1357, 1358, 1359, 1360, 1361, 1362, 1363, 1364, 1365, 1366, 1367, 1368, 1369, 1370, 1371, 1372, 1373, 1374, 1375, 1376, 1377, 1378, 1379, 1380, 1381, 1382, 1383, 1384, 1385, 1386, 1387, 1388, 1389, 1390, 1391, 1392, 1393, 1394, 1395, 1396, 1397, 1398, 1399, 1400, 1401, 1402, 1403, 1404, 1405, 1406, 1407, 1408, 1409, 1410, 1411, 1412, 1413, 1414, 1415, 1416, 1417, 1418, 1419, 1420, 1421, 1422, 1423, 1424, 1425, 1426, 1427, 1428, 1429, 1430, 1431, 1432, 1433, 1434, 1435, 1436, 1437, 1438, 1439, 1440, 1441, 1442, 1443, 1444, 1445, 1446, 1447, 1448, 1449, 1450, 1451, 1452, 1453, 1454, 1455, 1456, 1457, 1458, 1459, 1460, 1461, 1462, 1463, 1464, 1465, 1466, 1467, 1468, 1469, 1470, 1471, 1472, 1473, 1474, 1475, 1476, 1477, 1478, 1479, 1480, 1481, 1482, 1483, 1484, 1485, 1486, 1487, 1488, 1489, 1490, 1491, 1492, 1493, 1494, 1495, 1496, 1497, 1498, 1499, 1500, 1501, 1502, 1503, 1504, 1505, 1506, 1507, 1508, 1509, 1510, 1511, 1512, 1513, 1514, 1515, 1516, 1517, 1518, 1519, 1520, 1521, 1522, 1523, 1524, 1525, 1526, 1527, 1528, 1529, 1530, 1531, 1532, 1533, 1534, 1535, 1536, 1537, 1538, 1539, 1540, 1541, 1542, 1543, 1544, 1545, 1546, 1547, 1548, 1549, 1550, 1551, 1552, 1553, 1554, 1555, 1556, 1557, 1558, 1559, 1560, 1561, 1562, 1563, 1564, 1565, 1566, 1567, 1568, 1569, 1570, 1571, 1572, 1573, 1574, 1575, 1576, 1577, 1578, 1579, 1580, 1581, 1582, 1583, 1584, 1585, 1586, 1587, 1588, 1589, 1590, 1591, 1592, 1593, 1594, 1595, 1596, 1597, 1598, 1599, 1600, 1601, 1602, 1603, 1604, 1605, 1606, 1607, 1608, 1609, 1610, 1611, 1612, 1613, 1614, 1615, 1616, 1617, 1618, 1619, 1620, 1621, 1622, 1623, 1624, 1625, 1626, 1627, 1628, 1629, 1630, 1631, 1632, 1633, 1634, 1635, 1636, 1637, 1638, 1639, 1640, 1641, 1642, 1643, 1644, 1645, 1646, 1647, 1648, 1649, 1650, 1651, 1652, 1653, 1654, 1655, 1656, 1657, 1658, 1659, 1660, 1661, 1662, 1663, 1664, 1665, 1666, 1667, 1668, 1669, 1670, 1671, 1672, 1673, 1674, 1675, 1676, 1677, 1678, 1679, 1680, 1681, 1682, 1683, 1684, 1685, 1686, 1687, 1688, 1689, 1690, 1691, 1692, 1693, 1694, 1695, 1696, 1697, 1698, 1699, 1700, 1701, 1702, 1703, 1704, 1705, 1706, 1707, 1708, 1709, 1710, 1711, 1712, 1713, 1714, 1715, 1716, 1717, 1718, 1719, 1720, 1721, 1722, 1723, 1724, 1725, 1726, 1727, 1728, 1729, 1730, 1731, 1732, 1733, 1734, 1735, 1736, 1737, 1738, 1739, 1740, 1741, 1742, 1743, 1744, 1745, 1746, 1747, 1748, 1749, 1750, 1751, 1752, 1753, 1754, 1755, 1756, 1757, 1758, 1759, 1760, 1761, 1762, 1763, 1764, 1765, 1766, 1767, 1768, 1769, 1770, 1771, 1772, 1773, 1774, 1775, 1776, 1777, 1778, 1779, 1780, 1781, 1782, 1783, 1784, 1785, 1786, 1787, 1788, 1789, 1790, 1791, 1792, 1793, 1794, 1795, 1796, 1797, 1798, 1799, 1800, 1801, 1802, 1803, 1804, 1805, 1806, 1807, 1808, 1809, 1810, 1811, 1812, 1813, 1814, 1815, 1816, 1817, 1818, 1819, 1820, 1821, 1822, 1823, 1824, 1825, 1826, 1827, 1828, 1829, 1830, 1831, 1832, 1833, 1834, 1835, 1836, 1837, 1838, 1839, 1840, 1841, 1842, 1843, 1844, 1845, 1846, 1847, 1848, 1849, 1850, 1851, 1852, 1853, 1854, 1855, 1856, 1857, 1858, 1859, 1860, 1861, 1862, 1863, 1864, 1865, 1866, 1867, 1868, 1869, 1870, 1871, 1872, 1873, 1874, 1875, 1876, 1877, 1878, 1879, 1880, 1881, 1882, 1883, 1884, 1885, 1886, 1887, 1888, 1889, 1890, 1891, 1892, 1893, 1894, 1895, 1896, 1897, 1898, 1899, 1900, 1901, 1902, 1903, 1904, 1905, 1906, 1907, 1908, 1909, 1910, 1911, 1912, 1913, 1914, 1915, 1916, 1917, 1918, 1919, 1920, 1921, 1922, 1923, 1924, 1925, 1926, 1927, 1928, 1929, 1930, 1931, 1932, 1933, 1934, 1935, 1936, 1937, 1938, 1939, 1940, 1941, 1942, 1943, 1944, 1945, 1946, 1947, 1948, 1949, 1950, 1951, 1952, 1953, 1954, 1955, 1956, 1957, 1958, 1959, 1960, 1961, 1962, 1963, 1964, 1965, 1966, 1967, 1968, 1969, 1970, 1971, 1972, 1973, 1974, 1975, 1976, 1977, 1978, 1979, 1980, 1981, 1982, 1983, 1984, 1985, 1986, 1987, 1988, 1989, 1990, 1991, 1992, 1993, 1994, 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024, 2025, 2026, 2027, 2028, 2029, 2030, 2031, 2032, 2033, 2034, 2035, 2036, 2037, 2038, 2039, 2040, 2041, 2042, 2043, 2044, 2045, 2046, 2047, 2048, 2049, 2050, 2051, 2052, 2053, 2054, 2055, 2056, 2057, 2058, 2059, 2060, 2061, 2062, 2063, 2064, 2065, 2066, 2067, 2068, 2069, 2070, 2071, 2072, 2073, 2074, 2075, 2076, 2077, 2078, 2079, 2080, 2081, 2082, 2083, 2084, 2085, 2086, 2087, 2088, 2089, 2090, 2091, 2092, 2093, 2094, 2095, 2096, 2097, 2098, 2099, 2100, 2101, 2102, 2103, 2104, 2105, 2106, 2107, 2108, 2109, 2110, 2111, 2112, 2113, 2114, 2115, 2116, 2117, 2118, 2119, 2120, 2121, 2122, 2123, 2124, 2125, 2126, 2127, 2128, 2129, 2130, 2131, 2132, 2133, 2134, 2135, 2136, 2137, 2138, 2139, 2140, 2141, 2142, 2143, 2144, 2145, 2146, 2147, 2148, 2149, 2150, 2151, 2152, 2153, 2154, 2155, 2156, 2157, 2158, 2159, 2160, 2161, 2162, 2163, 2164, 2165, 2166, 2167, 2168, 2169, 2170, 2171, 2172, 2173, 2174, 2175, 2176, 2177, 2178, 2179, 2180, 2181, 2182, 2183, 2184, 2185, 2186, 2187, 2188, 2189, 2190, 2191, 2192, 2193, 2194, 2195, 2196, 2197, 2198, 2199, 2200, 2201, 2202, 2203, 2204, 2205, 2206, 2207, 2

