

**CoDa Structures**

Consulting Civil & Structural Engineers  
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Guiseley  
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**FLOODING RISK ASSESSMENT  
FOR A PROPOSED RESIDENTIAL CONVERSION OF A  
LOWER GROUND FLOOR AREA OF  
THE CORNMILL, RAILWAY STREET, MALTON**

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FOR A PROPOSED RESIDENTIAL CONVERSION OF A  
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RAILWAY STREET, MALTON**

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Client: IMPACT LIVING  
Project No: 7993  
Date: 23 December 2020 revA

## 1.0 INTRODUCTION

- 1.01 Following instructions from Walter and Partners on behalf of Impact Living on 7 October 2020, CoDA Structures have undertaken a Flooding Risk Assessment in relation to a proposed residential conversion of a lower ground floor area of The Cornmill, Railway Street, Malton.
- 1.02 It is proposed to develop an area of the lower ground floor area with 3 apartments, an office area and store rooms. The proposed development plan is attached in Appendix A.
- 1.03 This report has been prepared to accompany a planning application on the site. The report examines any potential flooding issues in relation to the proposed development and outlines solutions, where necessary, to deal with the identifiable issues.
- 1.04 The local authority is Ryedale District Council.
- 1.05 The Local Lead Flood Authority is North Yorkshire County Council.

## 2.0 POLICY CONSIDERATIONS AND OBJECTIVES

### 2.01 National Planning Policy Framework:

Section 10 of the National Planning Policy Framework (NPPF) published in February 2019 sets out Government policy on development and flood risk for England. It aims to ensure that flood risk is taken into account at all stages of the planning process, to avoid inappropriate developments in areas at risk of flooding, and to direct development away from areas of highest risk. Where new development is thought necessary in areas of flood risk, the NPPF aims to make it safe, without increasing flood risk elsewhere, and, where possible, reduce the overall flood risk.

The NPPF promotes a sequential risk-based approach to determine the suitability of land for development in flood risk areas. The broad aim of the NPPF is to reduce the number of people and properties within the natural and built environment at risk of flooding. To achieve this aim, planning authorities are required to ensure that flood risk is properly assessed during the initial planning stages of any development.

### 2.02 Consideration and Objectives:

This Flooding and Drainage Assessment Report will consider the following:-

- whether the proposed development is likely to be affected by flooding.
- whether the proposed development will increase flood risk to adjacent properties.

The report will also demonstrate that any existing flood risk or flood risk associated with the proposed development can satisfactorily managed. This will include:-

- whether the proposed development is likely to be affected by flooding and whether it will increase flood risk elsewhere.
- specifying the measures proposed to deal with the identified risks, including, where appropriate, proposals to reduce existing and/or future flood risk levels.
- satisfy the Local Authority that any flood risk to the development or additional risk arising from the proposal will be successfully managed so the site can be developed and occupied safely without risk to adjacent properties.

### 3.0 FLOODING ISSUES

#### 3.01 The Site:

The site is located to the east of Railway Street and lies approximately 0.5km from the centre of Malton. A site location plan (Fig 1) attached in Appendix B.

The Ordnance Survey co-ordinates for the centre of the site are 478716mE, 471518mN.

The site is occupied by The Cornmill, the majority of which, including lower ground floor areas, has been converted to apartments. It is proposed to convert a lower ground floor area currently used for storage to 3 apartments, an office area and store rooms.

Current external site levels vary between 18.57m AOD and 21.20m AOD.

The lower ground floor finished floor level of the mill is 18.690m AOD.

The top of the river wall on the site is at 19.600m AOD.

The site topographical survey is attached in Appendix B.

A site aerial photograph is attached in Appendix C.

The River Derwent lies adjacent the southern boundary of the site.

From the inspection of OS maps there are watercourses in the surrounding area (within 500m) of the site as follows:-

- Unnamed watercourse approximately 200m to the south
- Unnamed watercourse approximately 450m to the southeast.

The location of the water courses are indicated on the site location plan attached in Appendix B.

**3.02 Flood Zone Classification:**

The site is located within Flood Zone 3 on the Environment Agency (EA) website flood map. This zone comprises land as having a greater than 1 in 100 (1.0%) probability of river flooding in any year. However, the site is located in an area which benefits from flood defences.

A copy of the EA website flood map is attached in Appendix E.

**3.03 Sources of Flood Risk:**

The following table shows a summary of the forms of flood and the potential issues in relation to the site that require further assessment:

Flood Source	Applicable	Comment
Fluvial	✓	The site lies in Flood Zone 3.
Run Off	✓	Potential for run off from higher land to the north and west of the site.
Groundwater	x	The BGS have assessed the maximum groundwater susceptibility for the site as medium.
Sewers	✓	There is a public combined sewer in Carpenter's Yard and a public combined rising main sewer in Railway Street adjacent the site. There is also a pumping station to the east of the site in Carpenter's Yard.
Reservoirs, Canals, etc.	x	No such features in the vicinity of the site.

**3.04 Flood Risk Assessment:**

Flood modelling data has been obtained from the EA for the River Derwent adjacent the site. The modelled flood levels for node point Model MALT037 adjacent the Railway Street bridge are as follows:-

Event	Interpolated Flood Level at the Site (m AOD)
1:100 year – undefended	18.810
1:100 year – Defended	19.193
1:100 year + cc – undefended	#
1:100 year + cc - Defended	19.498
1:200 year – undefended	19.049
1:200 year – Defended	19.327
1:1000 year – undefended	19.816
1:1000 year – Defended	19.978

# Not available

It should be noted that the defended modelled flood levels are actually higher than the corresponding undefended modelled flood levels.

The EA historic flood information indicates the following has occurred at the site:-

December 1978: over topping of defences  
February 1991: over topping of defences  
March 1999: over topping of defences  
Autumn 2000: over topping of defences  
December 2015: channel capacity exceeded (no raised defences).

The data provided by the EA is attached in Appendix F.

The modelled flood levels in relation to the site confirm the site is in Flood Zone 2 and 3.

The actual flood defences to the site are the river wall which is at 19.600m AOD.

From inspection of the EA website Risk of Flooding from Surface Water Maps it would appear there is:-

- A low (between 1 in 1000 [0.1%] risk of surface water flooding affecting the site.
- there is a low risk of less than 300mm depth of flooding affecting the site.

The EA website Risk of Flooding from Surface Water Maps are attached in Appendix G.

From the inspection of the topographic survey the development is unlikely to be at risk from potential overland flood waters from higher ground to the west as any such flood waters would tend to flow past the site along Railway Street to the south.

From the inspection of the topographic survey the development may be at risk from potential overland flood waters from higher ground to the north as any such flood waters on Carpenter's Yard may tend to flow into the car park through the car park entrance.

The BGS have assessed the maximum groundwater susceptibility for the site as medium.

The development may be at risk from the potential overloading public combined sewer in Carpenter's Yard adjacent the site as any such flood waters may tend to flow into the car park through the car park entrance.

### 3.05 **Sequential Test:**

The Sequential Test should be applied at all stages of planning. Its aim is to steer new development to areas at the lowest probability of flooding.

Table 2 of the Technical Guidance to the NPPF (which categorises the flood risk vulnerability of land uses) indicates the proposed development is categorised as a 'more vulnerable' land use.

Table 3 of the Technical Guidance to the NPPF indicates where the proposed land use is 'more vulnerable' development is appropriate in Flood Zone 2 and 3, subject to the exception test.

### 3.06 Exception Test:

Table 3 of the Technical Guidance to the NPPF indicates where the proposed land use is 'more vulnerable' development is considered appropriate in Flood Zone 3, subject to the Exception Test.

The Exception Test is a method to demonstrate and help ensure that flood risk to people and property will be managed satisfactorily while allowing necessary development to go ahead in a situation where suitable site's lower risk of flooding are not available.

The following sections of this report will demonstrate that the proposed development will be safe from flooding and will not increase flood risk elsewhere.

### 3.07 Effect of Development on the Wider Catchment:

The proposed development will not increase the impermeable area on the site so there will be no increase in flood risk to the receiving sewers and rivers in the wider catchment.

### 3.08 Flood Risk Mitigation:

The proposed apartments and office are accessed from the upper ground floor level on Railway Street at 21.20m AOD and not directly from the adjacent car park.

The proposed window cill level to the apartments will be set at 19.600m AOD.

The river wall is at a level of 19.600m AOD which provides the following free boards when compared to the modelled defended flood levels:-

Event (Defended)	Freeboard to river wall and window cill level (m)
1:100 year	0.407
1:100 year + cc	0.102
1:200 year	0.273
1:1000 year	-0.378

As the lower ground floor level is below the modelled floor level and there is less than 0.600m of free board for the 1:100 year event and less than 0.300m of free board to the 1:100 year and climate change event to both the river wall and proposed window

cill level, the following flood resilient measures will be incorporated into the conversion works:-

- the lower ground floor should be full tanked with the tanking extending up the walls to a minimum level of 20.100m AOD.
- the windows should be water tight and the bottom of any opening lights should be above 20.100m AOD.
- there should be non-return valves on the foul drainage connections to the apartments and office
- electricity supply cables to enter building at 'high level' and wired downwards; electric sockets to be positioned at least 1400mm above floor level.
- flood sensitive equipment raised 1400mm above floor level wherever possible.
- lime based plaster should be used on the internal face of the external walls
- water resilient ground floor coverings (e.g. tiles) and skirtings should be utilised.

In addition reference should be made to the following document:-

- 'Improving the Flood Performance of New Building – Flood Resilient Construction' – Communities and Local Government,  
([www.communities.gov.uk/publications/planningandbuilding/improvingflood](http://www.communities.gov.uk/publications/planningandbuilding/improvingflood))

The occupiers of the development should sign up to the EA flood warning information service and a Flood Evacuation Plan should be prepared for the building.

With regard to potential overland flow into the car park the building owners have advised that there is already a submersible pump installed on the site adjacent the river wall which pumps water into the river should this occur. The location of the pump is indicated on the Site Topographical Survey attached in Appendix C.

### 3.09 **Safe Access and Egress:**

Railway street adjacent the access to the development is at 20.25m AOD which is above the 1:1000 year defended modelled flood level. Therefore, the proposed apartments and office can be accessed or evacuated in a major flood event.

Notwithstanding this, a Flood Evacuation Plan should be prepared for the building.

It should also be noted, as the existing use of the building is supported residential accommodation for young people, there is 24 hour safety/security provision in the building.

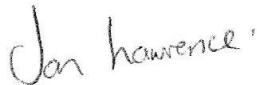
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**5.0 CAVEATS**

- 5.01 The comments given in this report and recommendations made are based on the information that could be obtained from reasonably accessible sources. Detailed discussions have not yet been held with statutory bodies and the local authority.
- 5.02 This report has been prepared for the sole use of Impact Living unless agreed otherwise in writing by CoDA Structures.



Signed: .....  
J Lawrence B Eng C Eng M I Struct E



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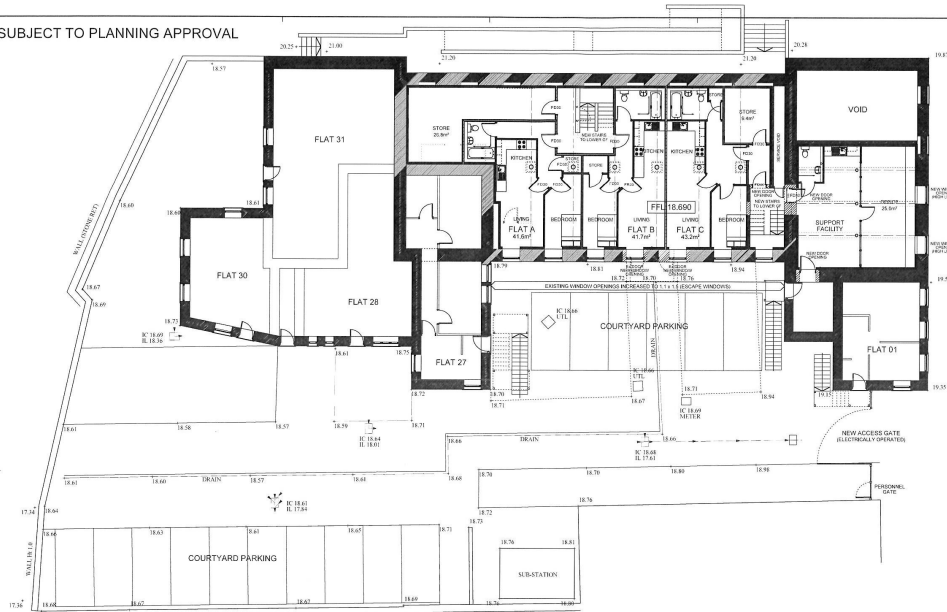
## **APPENDIX A**

### **SITE DEVELOPMENT PLAN**

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Client: IMPACT LIVING  
Project No: 7993  
Date: 23 December 2020 revA

SUBJECT TO PLANNING APPROVAL



**NOTES**  
 1. ALL WORK SHALL BE IN ACCORDANCE WITH BS 8000 AND BS 5696. ALL FINISHES SHALL BE IN ACCORDANCE WITH BS 2699. ALL WORK SHALL BE IN ACCORDANCE WITH BS 5696. ALL WORK SHALL BE IN ACCORDANCE WITH BS 2699. ALL WORK SHALL BE IN ACCORDANCE WITH BS 5696. ALL WORK SHALL BE IN ACCORDANCE WITH BS 2699.

CARPENTERS YARD



ENTRANCE GATE ELEVATION  
SCALE 1:50



EAST ELEVATION (COURTYARD)



NORTH ELEVATION (CARPENTERS YARD)

ENTRANCE GATES GALVANISED & POWDER COATED BLACK RAL 9005

W&P  
**Waller & Partners**  
 ARCHITECTS  
 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.

LOWER GF CONVERSION  
**CORNMILL**  
 MALTON  
 IMPACT LIVING  
 PROPOSED  
 PLAN AND ELEVATIONS  
 1:50 SCALE IN METRES  
 DATE: 07/07/2010  
 DRAWN BY: W&P  
 CHECKED BY: W&P  
 PROJECT NO: 4770/07  
 SHEET NO: C

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## **APPENDIX B**

### **SITE LOCATION PLAN**

---

Client: IMPACT LIVING  
Project No: 7993  
Date: 23 December 2020 revA



Produced on 17 March 2020 from the Ordnance Survey National Geographic Database  
 This map shows the area bounded by 478641,471443 478641,471585 478783,471585 478  
 Reproduction in whole or part is prohibited without the prior permission of Ordnance  
 Crown copyright 2020. Supplied by copla ltd trading as UKPlanningMaps.com a licensee  
 Data licenced for 1 year, expiring 17 March 2021. Unique plan reference: v2c/441



1:1250 SCALE IN METRES

CONTRACT/DRAWING

**LOCATION PLAN  
 CORNMILL, MALTON**

SCALE 1:1250	DRAWN AC	DATE 17:03:20
AT A4	CHECKED	
DRAWING NUMBER <b>4770/01</b>	REVISION	



GROUND FLOOR  
 1 MILLFIELD LODGE  
 COTTINGLEY BUSINESS PARK  
 COTTINGLEY BINGLEY  
 BD16 1PY  
 TEL 01274 561645  
 FAX 01274 561696

ARCHITECTS PROJECT MANAGERS  
 INTERIOR DESIGNERS PRINCIPAL DESIGNERS

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## **APPENDIX C**

### **SITE TOPGRAPHICAL SURVEY**

---

Client: IMPACT LIVING  
Project No: 7993  
Date: 23 December 2020 revA



**NOTES**

1. ALL WORK SHALL BE IN ACCORDANCE WITH THE BUILDING REGULATIONS 2010 AND THE BUILDING ACT 2000.
2. THE ARCHITECT HAS CONDUCTED VISUAL SURVEILLANCE OF THE PROPOSED DEVELOPMENT AND HAS TAKEN INTO ACCOUNT THE IMPACT OF THE PROPOSED DEVELOPMENT ON THE SURROUNDING ENVIRONMENT.
3. THE ARCHITECT HAS CONDUCTED VISUAL SURVEILLANCE OF THE PROPOSED DEVELOPMENT AND HAS TAKEN INTO ACCOUNT THE IMPACT OF THE PROPOSED DEVELOPMENT ON THE SURROUNDING ENVIRONMENT.
4. THE ARCHITECT HAS CONDUCTED VISUAL SURVEILLANCE OF THE PROPOSED DEVELOPMENT AND HAS TAKEN INTO ACCOUNT THE IMPACT OF THE PROPOSED DEVELOPMENT ON THE SURROUNDING ENVIRONMENT.

DRAWN BY: [Name]  
 CHECKED BY: [Name]  
 DATE: 15/06/2023  
 SCALE: 1:100  
 SHEET: 1 OF 1

**W&P**  
 Widdows & Partners  
 ARCHITECTS  
 PROJECT MANAGERS  
 INTERIOR DESIGNERS

**LOWER GF CONVERSION**  
**CORNMILL**  
**MALTON**  
**IMPACT LIVING**  
 EXISTING  
 PLAN AND ELEVATIONS  
 DATE: 15/06/2023  
 DRAWN: [Name]  
 CHECKED: [Name]  
 SCALE: 1:100  
 SHEET: 1 OF 1

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## **APPENDIX D**

### **SITE AERIAL PHOTOGRAPH**



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Client: IMPACT LIVING  
Project No: 7993  
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**Untitled Map**  
Write a description for your map.

**Legend**

-  Railway St
-  Yates R & Sons Lt



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## **APPENDIX E**

### **ENVIRONMENT AGENCY FLOOD MAP**

---

Client: IMPACT LIVING  
Project No: 7993  
Date: 23 December 2020 revA

## Flood map for planning

Your reference  
The Cornmill

Location (easting/northing)  
478716/471518

Created  
6 Apr 2020 11:10

**Your selected location is in flood zone 3 – an area with a high probability of flooding that benefits from flood defences.**

### This means:

- you may need to complete a flood risk assessment for development in this area
- you should ask the Environment Agency about the level of flood protection at your location and request a Flood Defence Breach Hazard Map (You can email the Environment Agency at: [enquiries@environment-agency.gov.uk](mailto:enquiries@environment-agency.gov.uk))
- you should follow the Environment Agency's standing advice for carrying out a flood risk assessment (find out more at [www.gov.uk/guidance/flood-risk-assessment-standing-advice](http://www.gov.uk/guidance/flood-risk-assessment-standing-advice))

### Notes

The flood map for planning shows river and sea flooding data only. It doesn't include other sources of flooding. It is for use in development planning and flood risk assessments.









This information relates to the selected location and is not specific to any property within it. The map is updated regularly and is correct at the time of printing.

The Open Government Licence sets out the terms and conditions for using government data. <https://www.nationalarchives.gov.uk/doc/open-government-licence/version/3/>



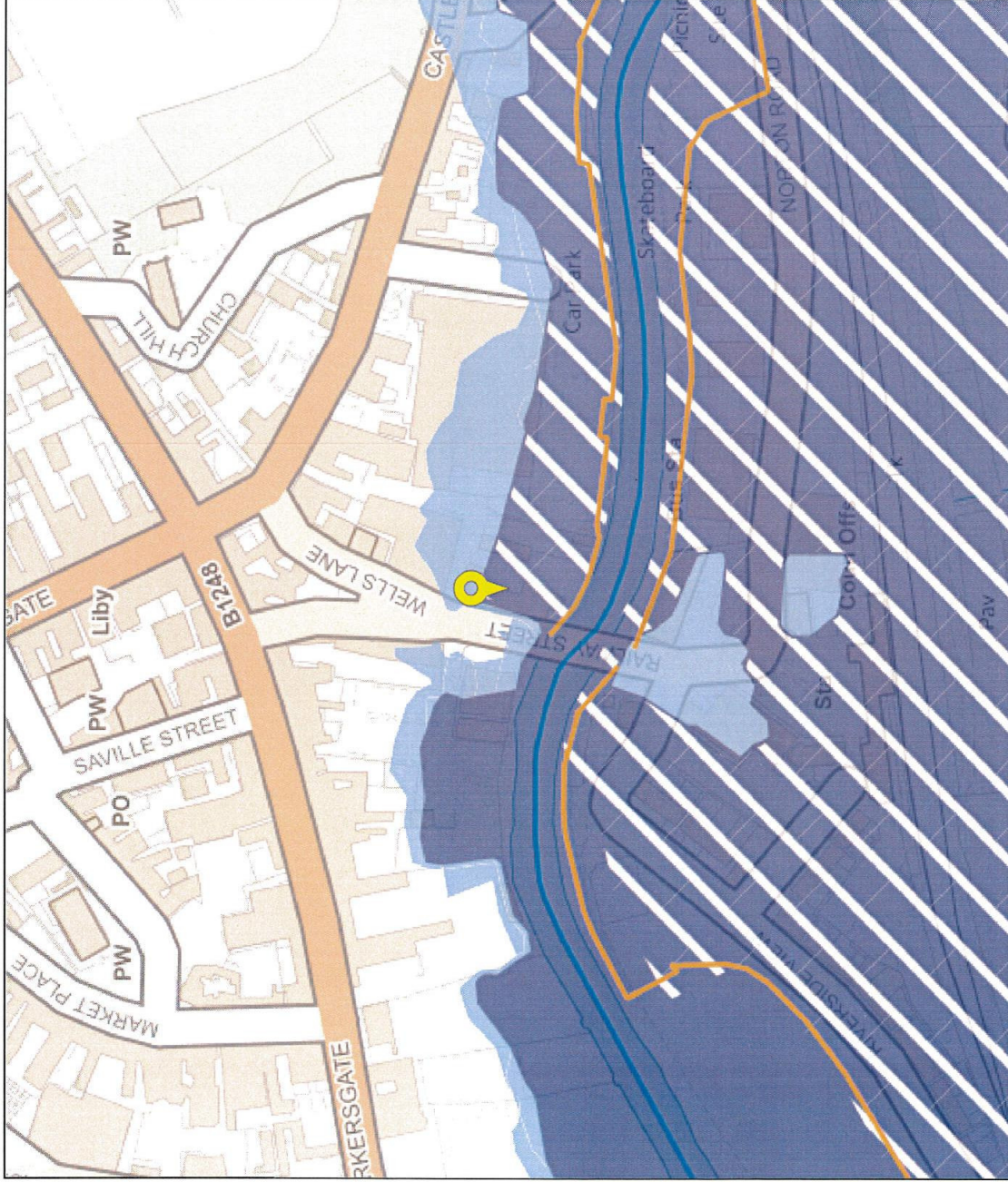
### Flood map for planning

Your reference  
**The Cornmill**  
Location (easting/northing)  
**478716/471518**  
Scale  
**1:2500**  
Created  
**6 Apr 2020 11:10**

-  Selected point
-  Flood zone 3
-  Flood zone 3: areas benefiting from flood defences
-  Flood zone 2
-  Flood zone 1
-  Flood defence
-  Main river
-  Flood storage area



Page 2 of 2



**CoDa Structures**

Consulting Civil & Structural Engineers  
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**FLOODING RISK ASSESSMENT  
FOR A PROPOSED RESIDENTIAL CONVERSION OF A  
LOWER GROUND FLOOR AREA OF  
THE CORNMILL, RAILWAY STREET, MALTON**

## **APPENDIX F**

### **DATA PROVIDED BY THE ENVIRONMENT AGENCY**

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Client: IMPACT LIVING  
Project No: 7993  
Date: 23 December 2020 revA

RFI/174893 Modelled Flood Levels Defended

Node point	Annual Exceedance Probability (AEP)																			
	20% AEP (1 in 5)		10% AEP (1 in 10)		4% AEP (1 in 25)		2% AEP (1 in 50)		1.0% AEP (1 in 100)		0.5% AEP (1 in 200)		0.2% AEP (1 in 500)		0.1% AEP (1 in 1000)					
	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow				
NodeMAL:TD36	17.536	81.072	18.261	95.644	18.983	112.912	19.699	136.433	19.973	156.432	19.206	149.271	19.826	170.909	19.339	187.522	19.973	180.348		
NodeMAL:TD37	17.536	81.119	18.251	95.596	18.971	112.930	19.980	136.512	19.966	156.511	19.193	149.355	19.456	168.555	19.327	187.112	19.973	178.341		
NodeMAL:TD38	17.907	81.119	18.220	95.7	18.959	112.988	19.953	136.511	19.956	156.514	19.192	149.350	19.457	168.511	19.325	187.115	19.977	178.292		
NodeMAL:TD39	17.976	81.119	18.234	95.7	18.949	112.968	19.919	136.515	19.919	156.514	19.124	149.353	19.379	168.511	19.231	187.115	19.944	178.292		
NodeMAL:TD40	17.969	81.136	18.228	95.716	18.941	113.211	19.907	136.539	19.911	156.54	19.116	149.386	19.37	168.346	19.221	187.147	19.937	177.996		
NodeMAL:TD41	17.969	81.159	18.223	95.737	18.937	113.212	19.902	136.551	19.905	156.567	19.111	149.418	19.366	168.127	19.225	187.16	19.934	177.206		

RFI/174893 Modelled Flood Levels Undefended

Node point	Annual Exceedance Probability (AEP)															
	20%AEP (1 in 5)		10%AEP (1 in 10)		4%AEP (1 in 25)		2%AEP (1 in 50)		1.33%AEP (1 in 75)		1%AEP (1 in 100)		0.6%AEP (1 in 200)		0.1%AEP (1 in 1000)	
	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow	Level	Flow
Node MALTD38	17.548	82.992	18.013	95.593	18.273	110.14	18.538	124.405	18.821	124.314	18.824	130.835	18.961	150.061	19.818	150.318
Node MALTD37	17.834	83.038	18.001	95.655	18.261	110.261	18.526	124.807	18.808	124.723	18.81	131.428	18.948	150.048	19.816	150.178
Node MALTD38	17.833	83.04	18	95.656	18.26	110.263	18.524	124.809	18.807	124.726	18.809	131.432	18.948	150.048	19.816	150.178
Node MALTD39	17.828	83.04	17.989	95.656	18.244	110.263	18.506	124.806	18.777	124.726	18.78	131.432	18.923	150.023	19.711	150.178
Node MALTD40	17.822	83.055	17.983	95.675	18.237	110.271	18.498	124.673	18.769	124.55	18.772	131.191	18.957	150.057	19.707	149.456
Node MALTD41	17.516	83.071	17.978	95.654	18.233	110.27	18.454	124.485	18.765	124.403	18.768	130.85	18.953	150.053	19.704	148.725

**RFI/2020/168934**

### **The Flood Map for Planning**

The Flood Map for Planning (Rivers and Sea) can be viewed and downloaded as a PDF file on GOV.UK by following this link: <https://flood-map-for-planning.service.gov.uk> or downloaded in GIS format under an open data licence from the following

address: <https://data.gov.uk/publisher/environment-agency>

Please type Flood Map for Planning in the search box.

What is the Flood Map for Planning?

The Flood Map for Planning provides information on flooding from rivers and the sea for England and Wales. The Flood Map also has information on flood defences and the areas benefiting from those flood defences.

The Flood Map for Planning shows the following:

1. Flood Zone 3 (dark blue area on the enclosed map): natural flood plain area that could be affected by flooding from rivers and/or the sea – not taking into account the presence of any flood defences
    - For flooding from rivers the map indicates the extent of a flood with a 1% (1 in 100) chance of happening each year;
    - For flooding from the sea the map shows the extent of a flood with a 0.5% (1 in 200) chance of happening each year.
  2. Flood Zone 2 (light blue area): natural flood plain area that could be affected by flooding from rivers and/or the sea – not taking into account the presence of any flood defences. Flood Zone 2:
    - indicates the extent of a flood with a 0.1% (1 in 1000) chance of happening each year.
    - and/or indicates the greatest recorded historic flood, whichever is greater.
  3. Flood defences built in the last five years to protect against river floods with a 1% (1 in 100) chance of happening each year, together with some natural or constructed entities which retain, store or channel water and which may protect against smaller floods.
-

4. Areas benefiting from flood defences - areas that benefit from the flood defences shown, in the event of a river flood with a 1% (1 in 100) chance of happening each year, or a flood from the sea with a 0.5% (1 in 200) chance of happening each year. If the defences were not there, these areas would flood.

### **Flood History**

#### **Flood History**

See the attached map showing the flood history for this site. The extent of flooding, and/or flood level information is only shown for those watercourses surveyed after the flood. Other flooding may have occurred which is not shown. This is the best information currently available.

Please refer to the following table detailing the causes of those past floods.

NAME	START_DATE	END_DATE	FLOOD_SOURCE	FLOOD_CAUSE
Derwent March 1999 Event	02/03/1999	16/03/1999	unknown	overtopping of defences
1978 Flood Event	01/12/1978	31/12/1978	unknown	overtopping of defences
1991 Flood Event	21/02/1991	27/02/1991	unknown	overtopping of defences
December 2015 Flood Event	25/12/2015	29/12/2015	main river	channel capacity exceeded (no raised defences)
Autumn 2000 Event	30/01/2000	15/11/2000	unknown	overtopping of defences

*Water causing flooding can come from different places, for example from rivers or the sea; surface water (i.e. rainwater flowing over or accumulating on the ground before it is able to enter rivers or the drainage system); overflowing or backing up of sewers or drainage systems which have been overwhelmed or from groundwater rising up from underground aquifers.*

***Please note that this record doesn't include any flood extents that may have occurred since October 2019. Given the process of recording, verifying and updating our record from major floods is extensive and may take a considerable amount of time.***



## **Assets**

### **Asset Location Map**

Please find attached asset map(s) showing location of all (Agency and non Agency maintained) flood defences and channels.

### **Description of Works**

See attached table with description of the defences and structures shown on the above drawing, including condition ratings, upstream and downstream crest levels, where available.

### **Risk of Flooding – Environment Agency Defences**

The risk of flooding in this area is now reduced by the presence of flood defences that we maintain, but there still is a residual risk of flooding if these were to breach or be overtopped by a flood greater than that for which they were designed.

### **Risk of Flooding – Privately Maintained Defences**

You will see that the Environment Agency does not maintain any of those defences. However we undertake regular risk based visual inspections. We do not hold design levels and have no height information on these defences or structures.

### **Asset Condition Ratings**

The performance of a flood defence asset is recorded as the condition of the asset. Our asset inspectors subjectively assess the conditions of assets (during visual inspection site visits) with reference to a national standard template. Each asset is given a rating between one and five with one being very good condition and five being very poor. A condition rating of 3, or 'fair' is the minimal acceptable standard for a critical asset, such as a defence wall that protects properties. We are striving to improve all assets below 'fair' to an acceptable standard.

Asset inspections are done on average every six months, although some critical assets are assessed on a more regular basis. It is possible that adjacent assets are inspected on different dates, which may result in two assets of a similar state of repair having different condition ratings.

Condition ratings of assets may also be affected by the time of year the surveys are conducted, as vegetation may obscure the asset in the summer months, or accessibility may be an issue during winter months. These factors would not usually affect the recorded condition rating of an asset unless the asset is on a borderline between two ratings.

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**Asset Standard of Protection**

Please note that the provided Design Standard of Protection is an estimate and should not be relied on. Please note that where available the defended flood extents provide more reliable information relating to the protection offered by the defence (i.e. at which return period the water levels are likely to overtop the defence). If available and required the defended flood extents can be provided on request.

<u>Asset Id</u>	<u>Asset Name</u>	<u>Asset Sub-type</u>	<u>Length (m)</u>	<u>Protection Type</u>	<u>Asset Maintainer</u>	<u>Asset Operator</u>	<u>Actual Condition</u>	<u>Design SoP</u>	<u>Actual DCL</u>	<u>Actual UCL</u>	<u>Bank</u>
28473	Malton & Norton FAS - High Ground	high_ground	1978.38	fluvial	private	unknown	3	NoData	NoData	NoData	right
<u>Asset Id</u>	<u>Asset Name</u>	<u>Asset Sub-type</u>	<u>Length (m)</u>	<u>Protection Type</u>	<u>Asset Maintainer</u>	<u>Asset Operator</u>	<u>Actual Condition</u>	<u>Design SoP</u>	<u>Actual DCL</u>	<u>Actual UCL</u>	<u>Bank</u>
330251	Malton & Norton FAS - No7 Flood Gate	flood_gate	1.45	fluvial	environment_agency	unknown	3	NoData	19.484	19.484	right
330252	Malton & Norton FAS - No6 Flood Gate	flood_gate	4.98	fluvial	environment_agency	unknown	4	NoData	19.465	19.465	right

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332574	Malton & Norton FAS - No4 Flood Gate	flood_gate	1.35	fluvial	environment_agency	environment_agency	4	50	19.672	19.672	right
77681	Malton & Norton FAS - Wall	wall	83.23	fluvial	environment_agency	unknown	3	50	19.5	19.65	right
79312	Malton & Norton FAS - Wall	wall	329	fluvial	environment_agency	unknown	3	50	19.31	19.5	right

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## **Modelling**

### **2009 Malton Data Improvements**

See attached information from Malton Data Improvements (produced by Halcrow in 2009).

Extracts consist of

- A spreadsheet showing:
  - results for peak water levels and flows for the 0.1% (1 in 1000), 0.5% (1 in 200), 1% (1 in 100), 1.3% (1 in 75), 2% (1 in 50), 4% (1 in 25), 10% (1 in 10), and 20% (1 in 5) annual chance events for the defended and undefended scenarios
  - results for the 1% (1 in 100) plus Climate change (+20% increase in flow) (101 RP) peak water levels and flows for the defended scenario
  - An associated map showing the location of the model node points.

Please note that there are no depth grids available with this model.

Please note that no breaches scenarios were modelled for this study.

### **Climate Change**

Updated guidance on how climate change could affect flood risk to new development - 'Flood risk assessments: climate change allowances' was published on gov.uk on 19 February 2016. You should confirm the flood risk vulnerability classification and lifetime of your proposed development in line with NPPF and apply the appropriate climate change allowances.

### **Bespoke Flood Risk Assessment (FRA) advice:**

If the pre-application advice is required with regards the preparation of a site-specific Flood Risk Assessment, this can be requested via the Yorkshire Sustainable Places team (email: [sp-yorkshire@environment-agency.gov.uk](mailto:sp-yorkshire@environment-agency.gov.uk)). Charges may apply for any advice that is provided, this currently stands at £100 per hour per person. The [gov.uk](http://www.gov.uk) pages provide a good starting point on what to include within a site-specific Flood Risk Assessment and can be accessed via <https://www.gov.uk/guidance/flood-risk->

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assessment-for-planning-applications. A site-specific Flood Risk Assessment will need to consider flood risks from all sources, including those associated with defence failure (e.g. breach) and accounting for the predicted impacts as a result of climate change. Please contact the Sustainable Places team if you require advice on how to include these within a Flood Risk Assessment.

### **Other**

#### **Surface Water Map**

Lead Local Flood Authorities (LLFA) are responsible for managing local flood risk from surface water flooding and groundwater flooding. You should check with the LLFA as they may have more up to date information regarding this type of flooding.

The Risk of Flooding from Surface Water Flood Map can be viewed and downloaded as a PDF file on GOV.UK by following this link: <https://flood-warning-information.service.gov.uk/long-term-flood-risk>

#### **Surface Water Drainage**

The Lead Local Flood Authority is the statutory consultee for planning matters relating to surface water drainage, therefore it is recommended they should be consulted separately regarding this.

Surface water discharge from new development should ideally 'mimic' the pre-development situation using a sustainable drainage system so that the flow and volume of water in watercourses is not increased.

A permit may be required, under the Environmental Permitting Regulations 2016 from the Environment Agency for any proposed works or structures in, under, over or within eight metres of a 'main river' (e.g. a new outfall). A permit is separate to and in addition to any planning permission granted. Further details and guidance are available on the GOV.UK website: <https://www.gov.uk/guidance/flood-risk-activities-environmental-permits>

#### **Risk of Flooding from Reservoirs Map**

Outlines and simplified depth and velocity maps can be viewed on our website:

<https://flood-warning-information.service.gov.uk/long-term-flood-risk/#x=438988&y=406600&scale=2>

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Please, zoom into the location of interest, and then click on the inundated location for details. As a result a list of reservoirs will be provided with supporting information and a links to other data, such as estimated depths and speed of flooding, at the bottom of the result page.

A map showing the outlines can also be provided on request.

### **Flood Warning**

The site is covered by a Flood Warning. To register to receive this service, you can call Floodline 24 hours a day on 0845 988 1188.

### **LIDAR Data**

Please note that our LiDAR data is now available free of charge (Open Data) from <http://environment.data.gov.uk/ds/survey/index.jsp#/survey> (once zoomed to the relevant location the available LiDAR products will be listed below the map).

Two LIDAR products are available:

1. Tiled LIDAR data - The full tiled dataset consists of historic LIDAR data which has been gathered since 1998. For some areas we have carried out repeat surveys and data is available in a range of resolutions.
2. Composite LIDAR data - The composite dataset is derived from a combination of our full tiled dataset which has been merged and re-sampled to give the best possible spatial coverage.

Light Detection and Ranging (LIDAR) is an airborne mapping technique, which uses a laser to measure the distance between the aircraft and the ground. This technique results in the production of an accurate, cost-effective terrain model suitable for assessing flood risk and other environmental applications.

The Environment Agency owns two LIDAR systems, which are installed in a survey aircraft along with its other operational remote sensing instruments.

The aircraft is positioned and navigated using Global Positioning System (GPS) corrected to known ground reference points. The aircraft typically flies at a height of about 800 metres above ground level and a scanning mirror allows a swath width of about 600 metres to be surveyed during a flight.

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### **The Rights & Responsibilities of a Riverside Owner**

The owner of property adjacent to a watercourse is usually deemed to be the riparian owner and, as such, has both riparian rights and responsibilities with regard to the watercourse within their ownership.

For more information on Rights and Responsibilities of a riverside owner, you can visit our website at:

<https://www.gov.uk/guidance/owning-a-watercourse>

### **Ordnance Survey Data**

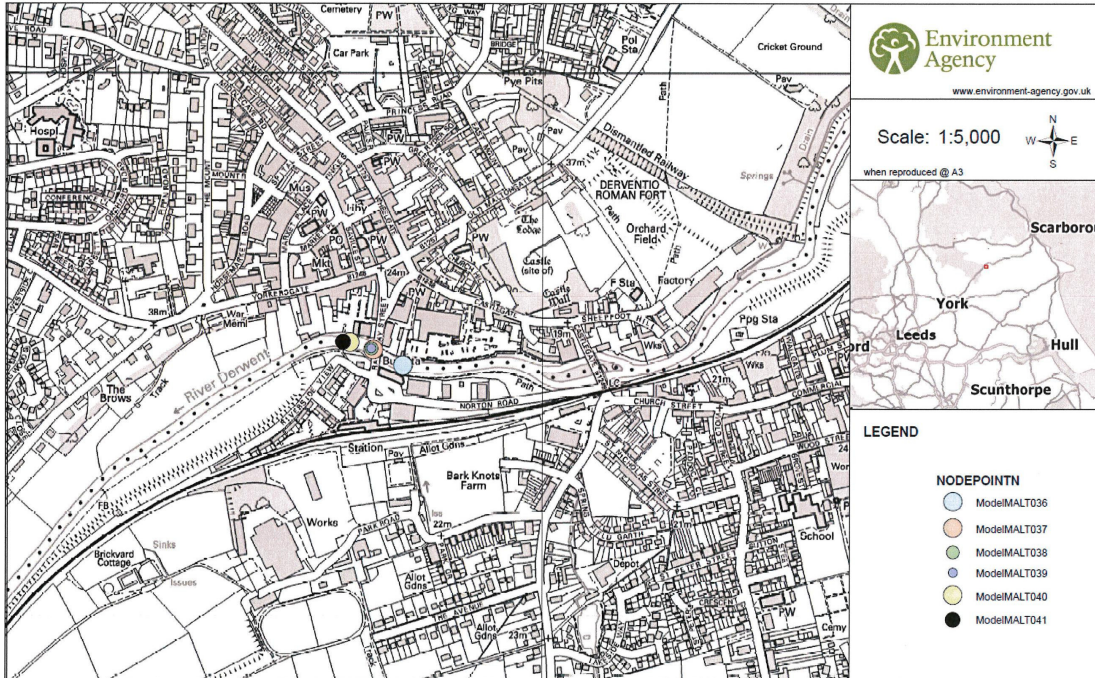
Under the terms of our licence agreement with the Ordnance Survey, we are unable to supply the OS data. Under this agreement we can only supply OS data to consultants/contractors carrying out work on our behalf.

### **Flood Portal**

It's a new 'one-stop shop' web portal providing guidance and information on flood risk management in the UK. Arup have written and designed the site, in conjunction with CIRIA, the Local Government Association, the EA and Defra, primarily as a resource for local authority officers, flood risk management professionals, and others with an interest in flood risk. It's a part of the Capacity Building Strategy. <http://www.local.gov.uk/floodportal>

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RFI/174893 Modelled Flood Level Node Point Location Map



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 Contact Us: National Customer Contact Centre, PO Box 544, Rotherham, S60 1BY. Tel: 08706 506 506 (Mon-Fri 8-6). Email: enquiries@environment-agency.gov.uk



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**APPENDIX G**

**ENVIRONMENT AGENCY WEBSITE RISK OF  
FLOODING FROM SURFACE WATER MAPS**

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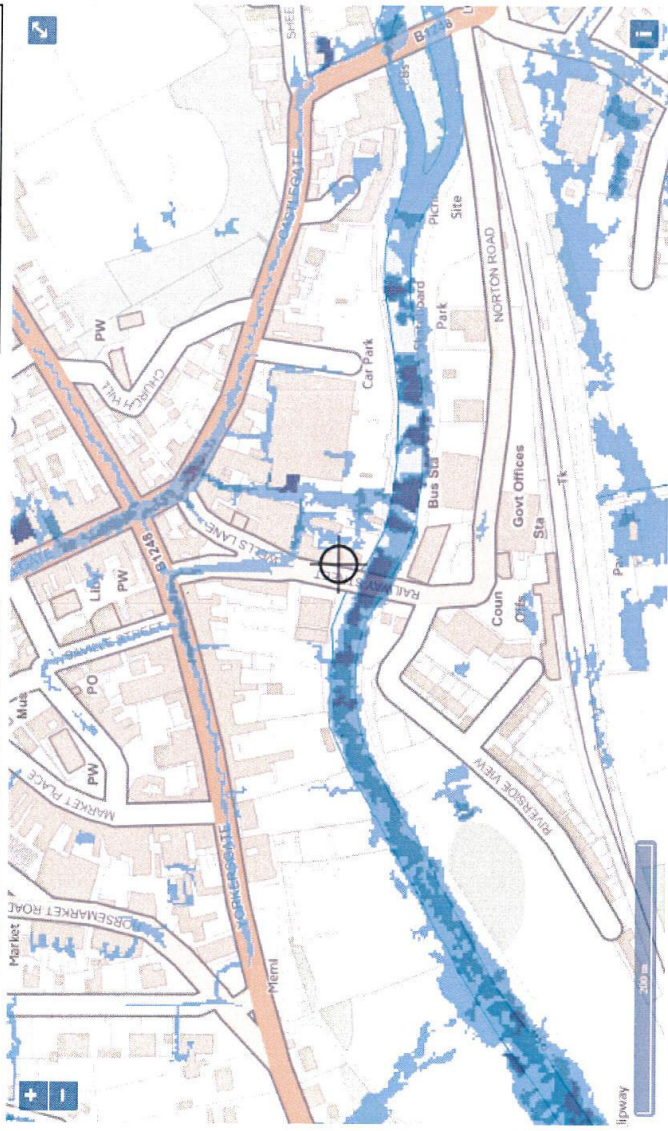
Client: IMPACT LIVING  
Project No: 7993  
Date: 23 December 2020 revA

Flood risk

Extent of flooding

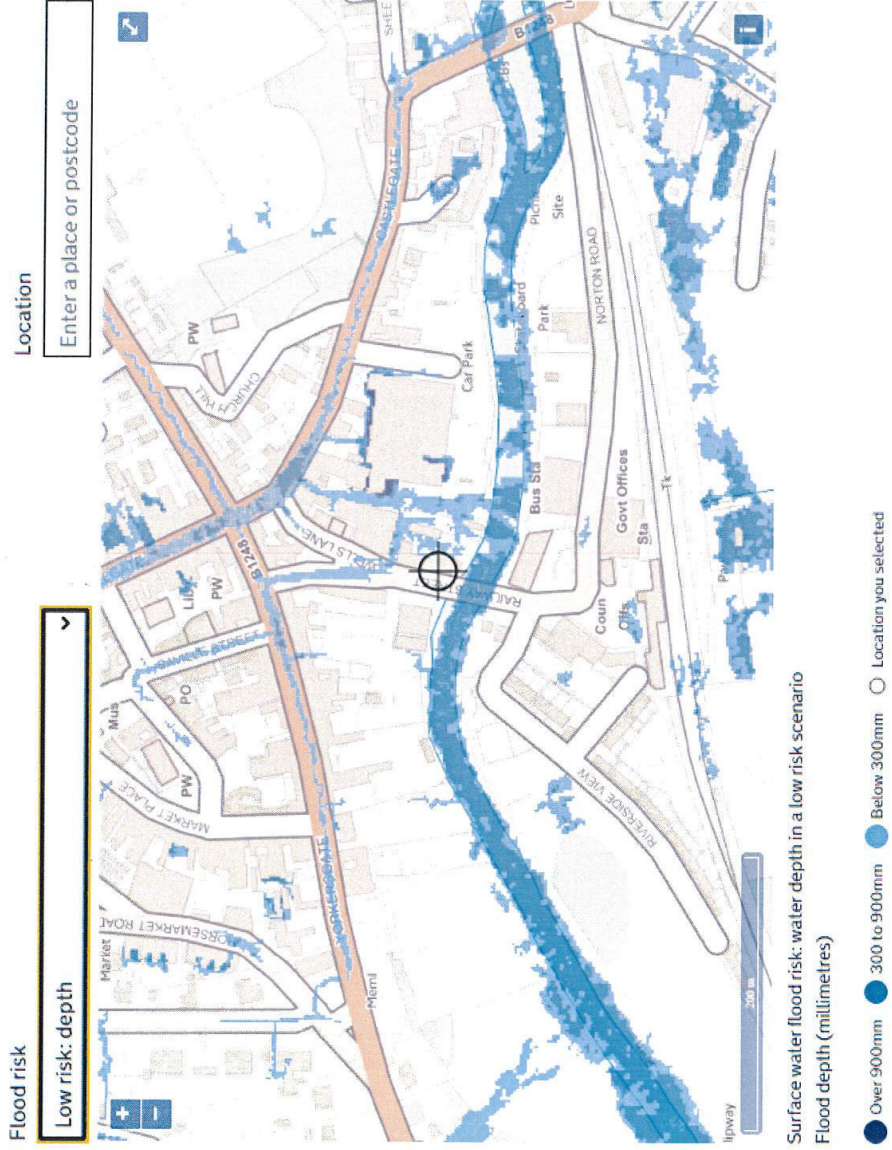
Location

Enter a place or postcode

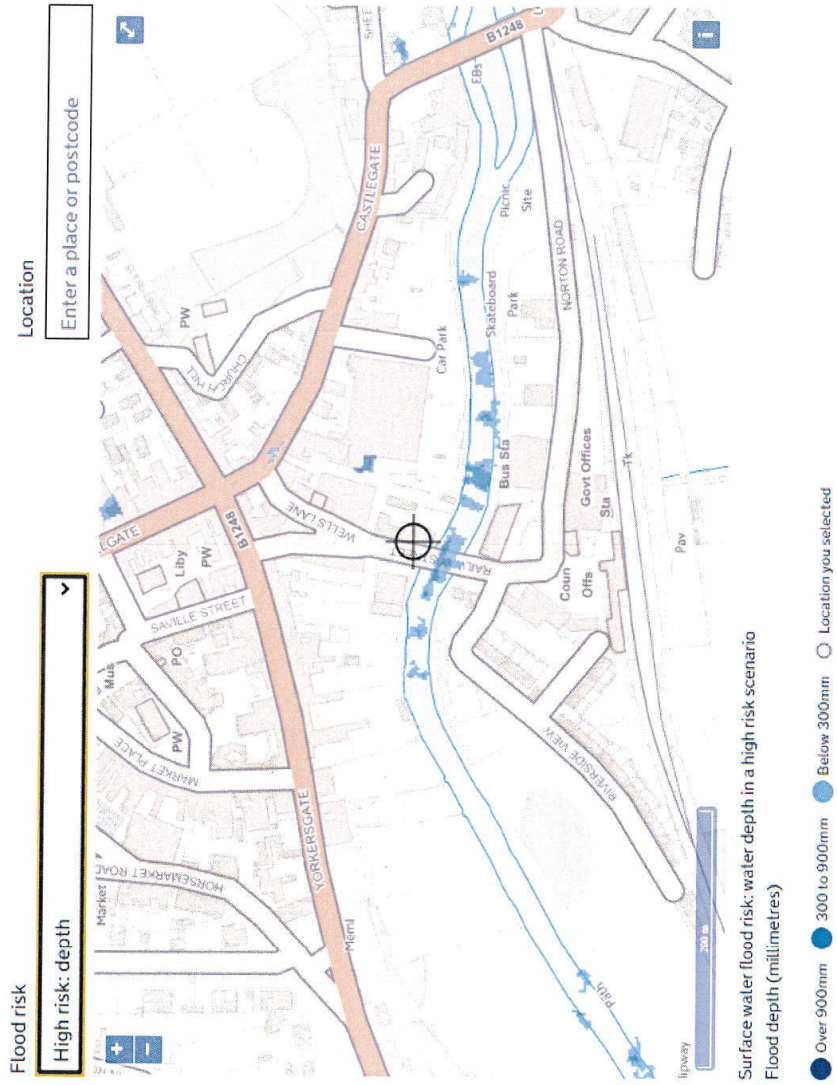


Extent of flooding from surface water

- High
- Medium
- Low
- Very Low
- Location you selected







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## **APPENDIX H**

### **EXTRACT FROM THE PUBLIC SEWER RECORD**

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Client: IMPACT LIVING  
Project No: 7993  
Date: 23 December 2020 revA

