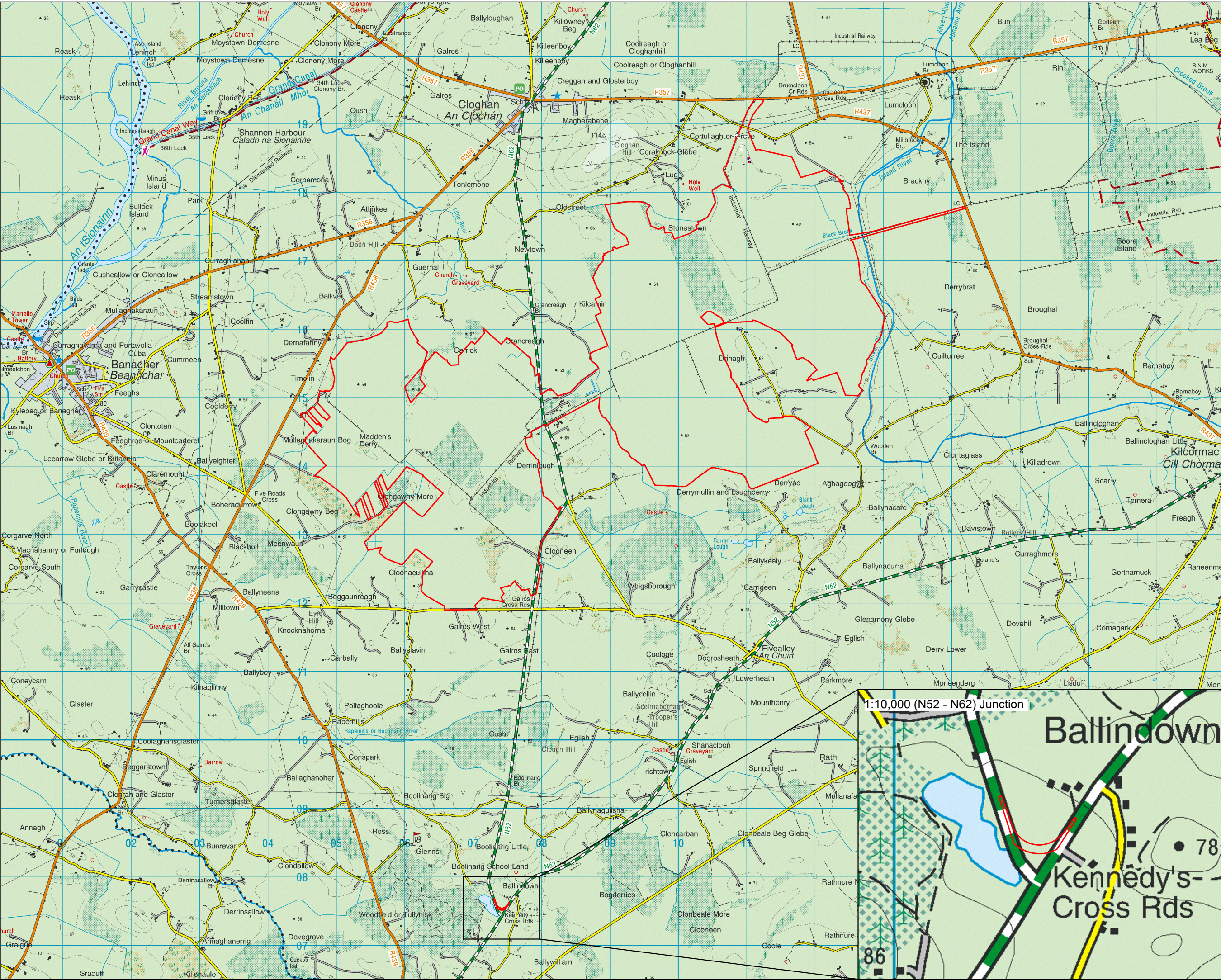


Schedule of Drawings

Drawing No.	Drawing Title	Scale	Page Size
171221 – 01	Location Context Map	1:50,000	A3
171221 – 02	Site Location Map	1:50,000	A3
171221 – 03	Site Layout (1:5,000) Key Plan	1:20,000	A1
171221 – 04	Site Layout Plan – Sheet 1 of 8	1:5,000	A1
171221 – 05	Site Layout Plan – Sheet 2 of 8	1:5,000	A1
171221 – 06	Site Layout Plan – Sheet 3 of 8	1:5,000	A1
171221 – 07	Site Layout Plan – Sheet 4 of 8	1:5,000	A1
171221 – 08	Site Layout Plan – Sheet 5 of 8	1:5,000	A1
171221 – 09	Site Layout Plan – Sheet 6 of 8	1:5,000	A1
171221 – 10	Site Layout Plan – Sheet 7 of 8	1:5,000	A1
171221 – 11	Site Layout Plan – Sheet 8 of 8 (N52 - N62)	1:5,000	A3
171221 – 12	Proposed Drainage Layout Sheet 1 of 9	1:2,000	A0
171221 – 13	Proposed Drainage Layout Sheet 2 of 9	1:2,000	A0
171221 – 14	Proposed Drainage Layout Sheet 3 of 9	1:2,000	A0
171221 – 15	Proposed Drainage Layout Sheet 4 of 9	1:2,000	A0
171221 – 16	Proposed Drainage Layout Sheet 5 of 9	1:2,000	A0
171221 – 17	Proposed Drainage Layout Sheet 6 of 9	1:2,000	A0
171221 – 18	Proposed Drainage Layout Sheet 7 of 9	1:2,000	A0
171221 – 19	Proposed Drainage Layout Sheet 8 of 9	1:2,000	A0
171221 – 20	Proposed Drainage Layout Sheet 9 of 9	1:2,000	A0
171221 – 21	Drainage Details 1	As Shown	A1
171221 – 22	Drainage Details 2	As Shown	A1
171221 – 23	Temporary Construction Compound 1	1:500	A3
171221 – 24	Temporary Construction Compound 2	1:500	A3
171221 – 25	Temporary Construction Compound 3	1:500	A3
171221 – 26	Temporary Construction Compound 4	1:500	A3
171221 – 27	Temporary Construction Compound 5	1:500	A3
171221 – 28	Substation Layout	1:500	A1
171221 – 29	Substation Sections	1:500	A3
171221 – 30	IPP Control Building	1:200	A3
171221 – 31	TSO Control Building	1:200	A3
171221 – 32	110 kV Overhead Line Tower Unshielded Arrangement	1:100	A3
171221 – 33	110 kV Overhead Line - Line Cable Interface Tower	1:150	A3
171221 – 34	Tower Foundation	1:25	A3
171221 – 35	110 kV Joint Bay, C2 Chamber & Link Box Arrangement Details	1:50	A1
171221 – 36	Internal Collector Network Typical Trench Arrangement Detail	1:20	A1
171221 – 37	Palisade Fence And Gate Details	1:50	A3
171221 – 38	Grid Connection Infrastructure Options	1:500	A1
171221 – 39	Typical Free Standing Anemometry Mast	1:500	A3
171221 – 40	Typical Wind Turbine Hardstanding & Elevations	1:500	A1
171221 – 41	Type A Upgrade of Existing Excavated Access Tracks	1:50	A3
171221 – 42	Type B Upgrade of Existing Floated Access Tracks	1:50	A3
171221 – 43	Type C New Excavate and Replace Access Road	1:50	A3
171221 – 44	Type D New Floated Access Road	1:50	A3
171221 – 45	Typical Underpass Details	1:100	A3
171221 – 46	Security Compound 1	1:250	A3
171221 – 47	Security Compound 2	1:250	A3
171221 – 48	Typical Security Cabin Detail	1:100	A3
171221 – 49	Typical Wheel Wash Detail	1:50	A3
171221 – 50	Pedestrian/Cyclist Amenity Entrance Typical Detail	As Shown	A3
171221 – 51	Typical Signage Detail	1:20	A3



- Project Design Drawing Notes**
1. Drawings issued are for planning application purposes only.
 2. Drawings not to be used for construction/contract conditions.
 3. Copyright, all rights reserved. No part hereof may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
 4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
 5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
 6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
 8. Final levels may vary depending on local ground conditions.

Drawing Legend

— Planning Application Boundary



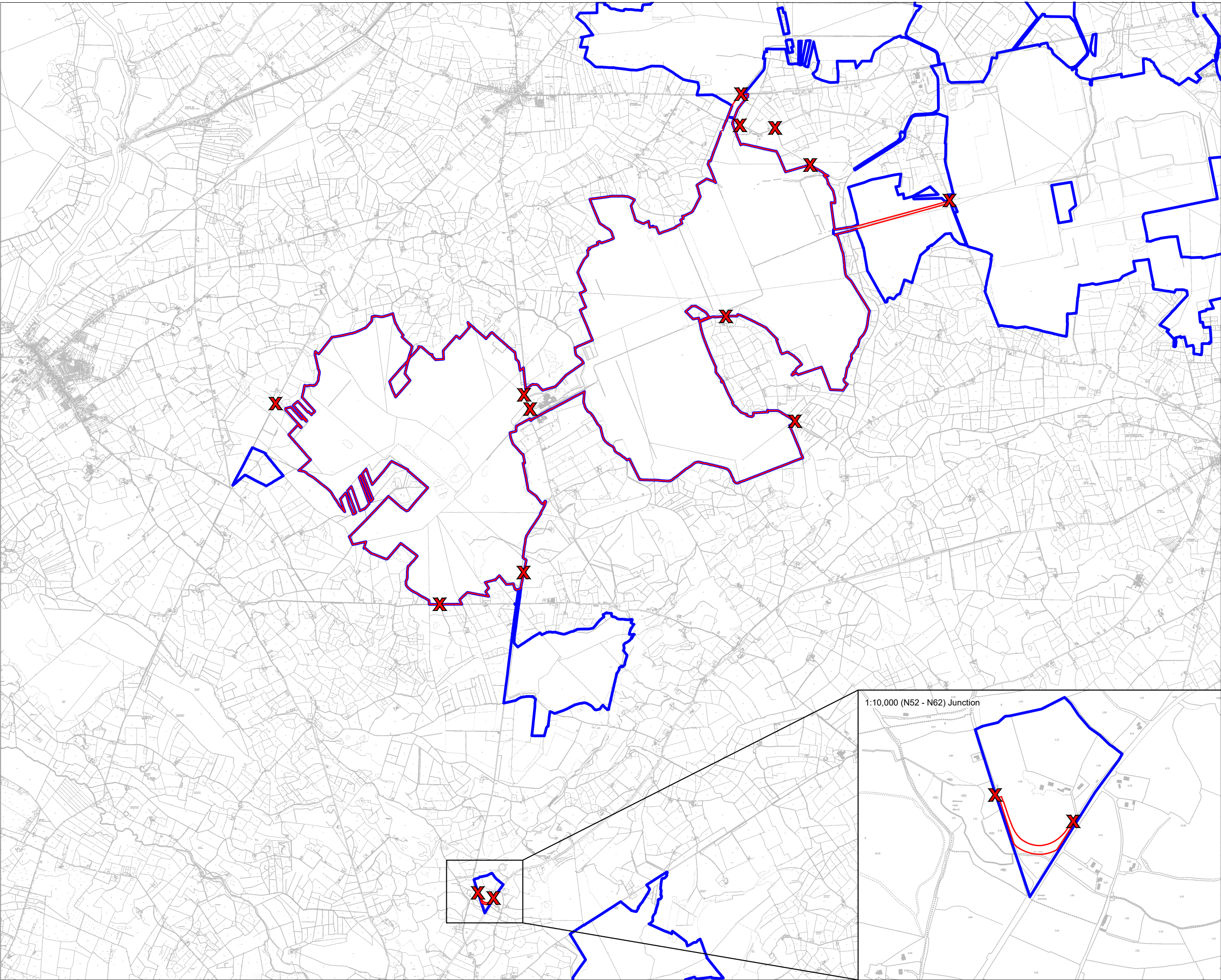
Location Context Map

DRAWING TITLE: **Derrinlough Wind Farm, Co. Offaly**

PROJECT TITLE: **Derrinlough Wind Farm, Co. Offaly**

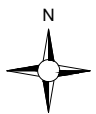
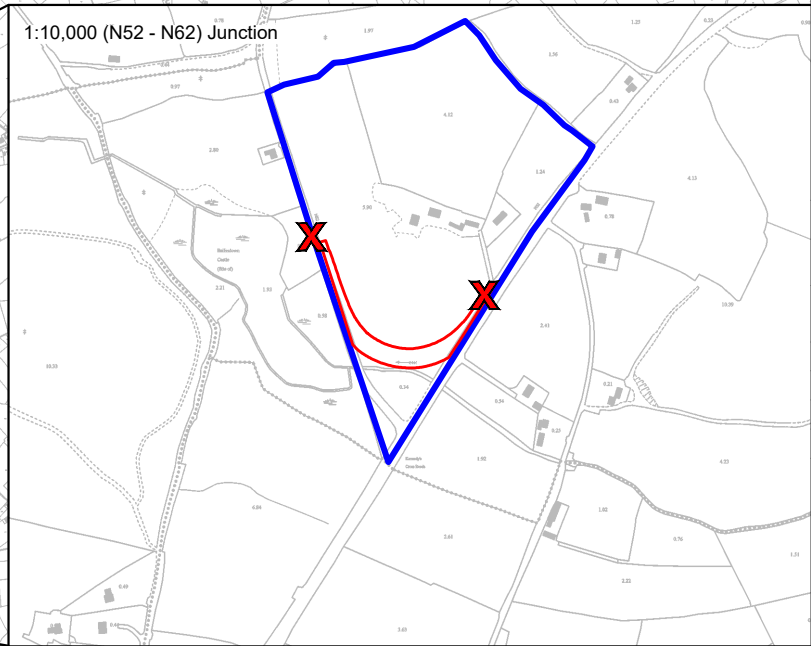
DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
PROJECT No.: 171221	DRAWING No.: 171221 - 01
SCALE: 1:50,000 @ A3	DATE: 19.02.2020
OS SHEET No.: OS2020, OS2022	

MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW94
 +353 (0) 91 735611
 email: info@mkofireland.ie
 Website: www.mkofireland.ie



- Project Design Drawing Notes**
1. Drawings issued are for planning application purposes only.
 2. Drawings not to be used for construction/contract conditions.
 3. Copyright, all rights reserved. No part hereof may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
 4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
 5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
 6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
 8. Final levels may vary depending on local ground conditions.

- Drawing Legend**
- Planning Application Boundary
 - Landowners Boundary
 - X Site Notice




Ordnance Survey Ireland Licence No. AR0021820© Ordnance Survey Ireland/Government of Ireland

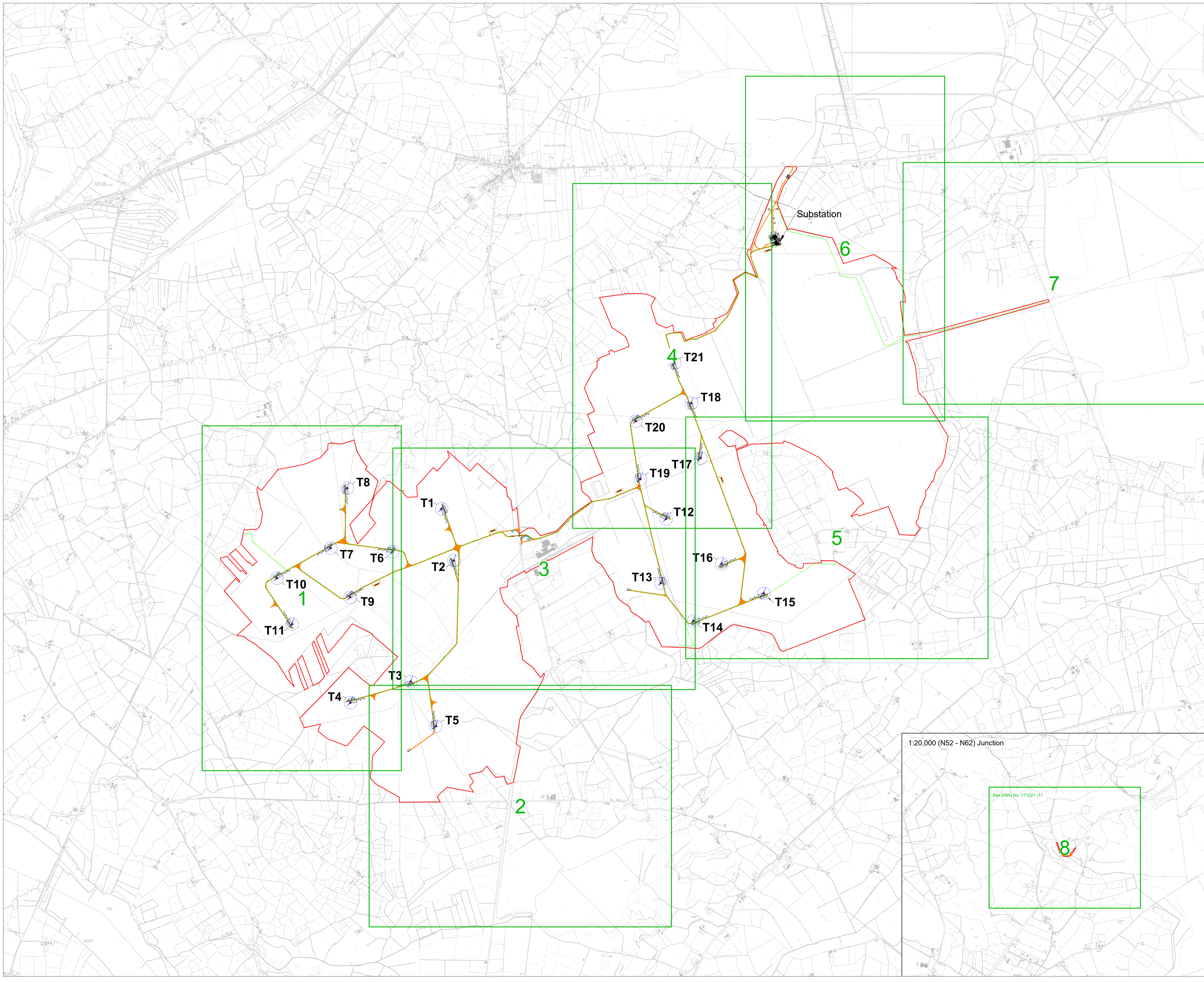
Site Location Map

PROJECT TITLE:
Derrinlough Wind Farm, Co. Offaly

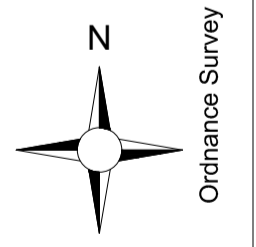
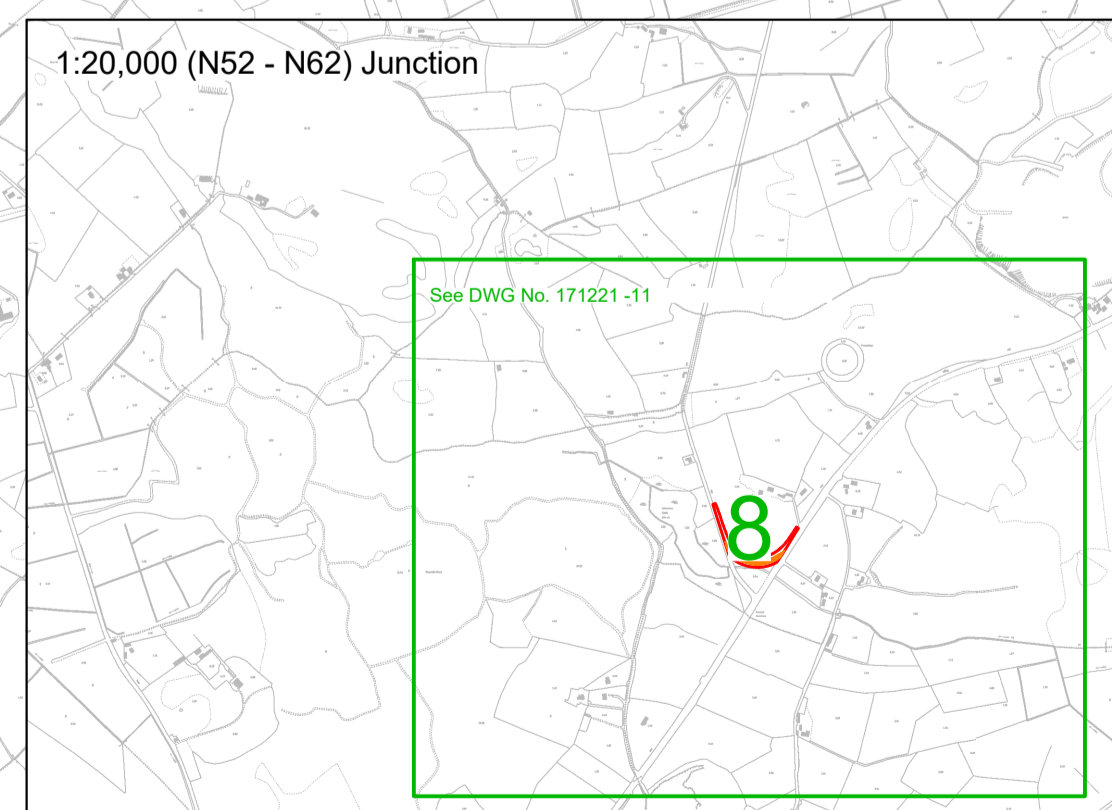
DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
PROJECT NO: 171221	DRAWING NO: 171221 - 02
SCALE: 1:50,000 @ A3	DATE: 19.02.2020


MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VV64
 +353 (0) 91 735611
 email: info@www.mkofireland.ie
 Website: www.mkofireland.ie

- Project Design Drawing Notes**
1. Drawings issued are for planning application purposes only.
 2. Drawings not to be used for construction/contract conditions.
 3. Copyright, all rights reserved. No part herewith may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
 4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
 5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
 6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
 8. Final levels may vary depending on local ground conditions.



- Drawing Legend**
- Planning Application Boundary
 - Proposed Road
 - ▨ Underpass Road
 - ▨ 30mX3m Passing Bay
 - ▨ Works Area for Internal Cabling
 - ▨ Crane Pad Hardstanding Area
 - Turbine Foundation
 - ⊙ Turbine Blade Swept Area
 - Amenity Pathway



Ordnance Survey Ireland Licence No. AR0021820 © Ordnance Survey Ireland/Government of Ireland

DRAWING TITLE:
Site Layout (1:5,000) Key Plan

PROJECT TITLE:
Derrinlough Wind Farm, Co. Offaly

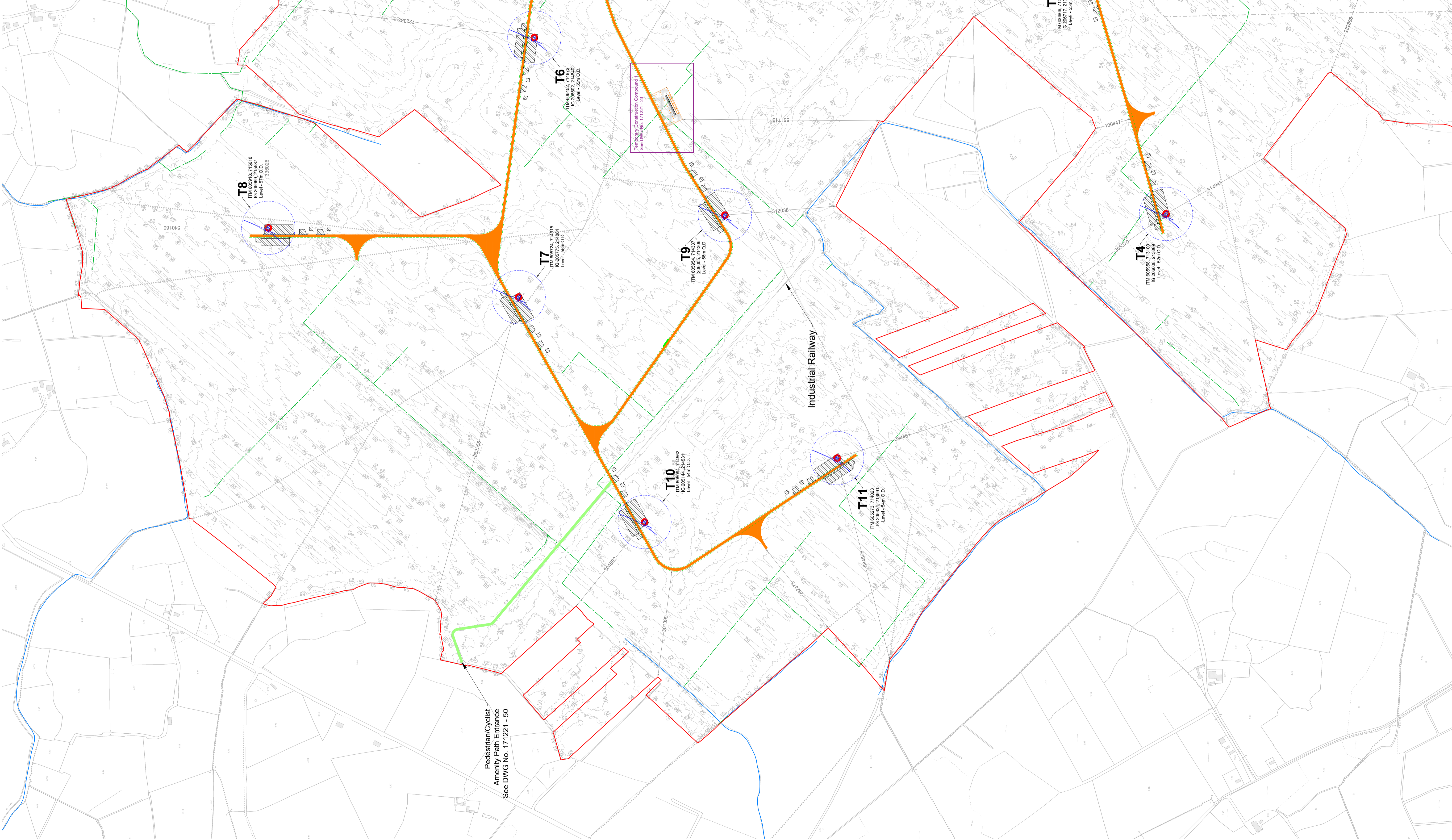
DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
PROJECT No.: 171221	DRAWING No.: 171221 - 03
SCALE: 1:20,000 @ A1	DATE: 19.02.2020

OS SHEET No. 3487, 3488, 3489, 3490, 3491, 3537, 3538, 3539, 3540, 3541, 3586, 3587, 3588, 3589, 3590, 3643, 3644, 3645, 3646, 3700, 3701, 3702, 3703, 3704, 3756, 3757, 3758, 3761, 3762

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email: info@www.mkoireland.ie
Website: www.mkoireland.ie

Project Design Drawing Notes

1. Drawings issued are for planning application purposes only.
2. Drawings not to be used for construction/contract conditions.
3. Copyright, all rights reserved. No part hereof may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
8. Final levels may vary depending on local ground conditions.



Drawing Legend

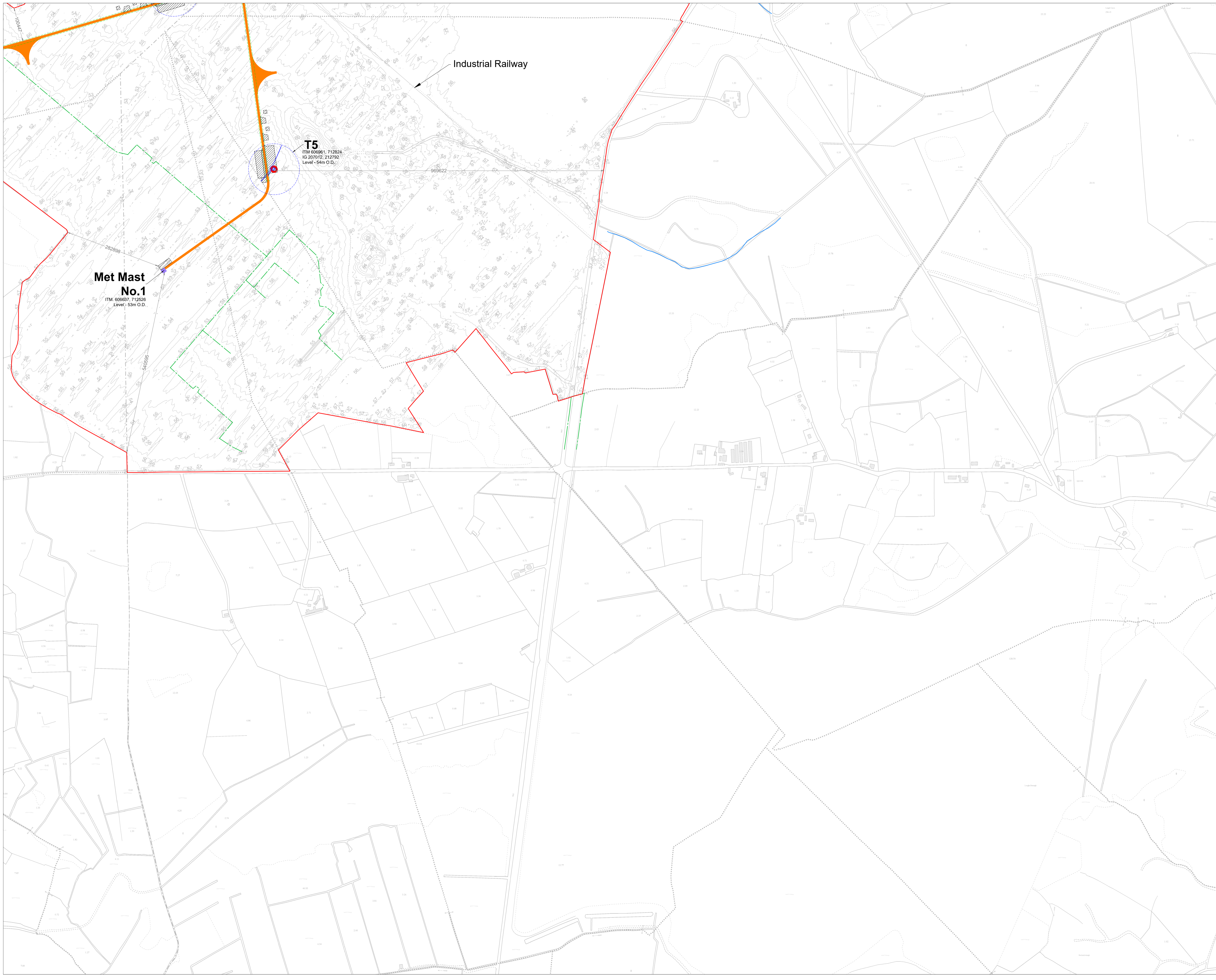
- Planning Application Boundary
- Proposed Road
- 30m x 3m Passing Bay
- River/Stream
- Existing Drains
- Works Area for Internal Cabling
- Crane Pad Handstanding Area
- Turbine Foundation
- Turbine Blade Swept Area
- Amenity Pathway

Site Layout Plan - Sheet 1 of 8

DERRINLOUGH WIND FARM, CO. OFFALY
DRAWING NO: 171221
PROJECT NO: 171221 - 04
CHECKED BY: Eoin McCarthy
DATE: 19.02.2020
SCALE: 1:5,000 @ A1

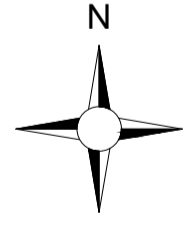
OS SHEET No. J63, J64, J65, J66, J67, J68, J69, J70, J71, J72, J73, J74, J75, J76, J77, J78, J79, J80, J81, J82, J83, J84, J85, J86, J87, J88, J89, J90, J91, J92, J93, J94, J95, J96, J97, J98, J99, J00

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW84
+353 (0) 91 735611
email: info@www.mkofireland.ie
Website: www.mkofireland.ie



- Project Design Drawing Notes**
1. Drawings issued are for planning application purposes only.
 2. Drawings not to be used for construction/contract conditions.
 3. Copyright, all rights reserved. No part herewith may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
 4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
 5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
 6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
 8. Final levels may vary depending on local ground conditions.

- Drawing Legend**
- Planning Application Boundary
 - Proposed Road
 - River/Stream
 - Existing Drains
 - Works Area for Internal Cabling
 - ▨ Crane Pad Hardstanding Area
 - Turbine Foundation
 - ⊗ Turbine Blade Swept Area
 - Met Mast Hardstanding



Ordnance Survey Ireland Licence No. AR002182 © Ordnance Survey Ireland/Government of Ireland

DRAWING TITLE:
Site Layout Plan - Sheet 2 of 8

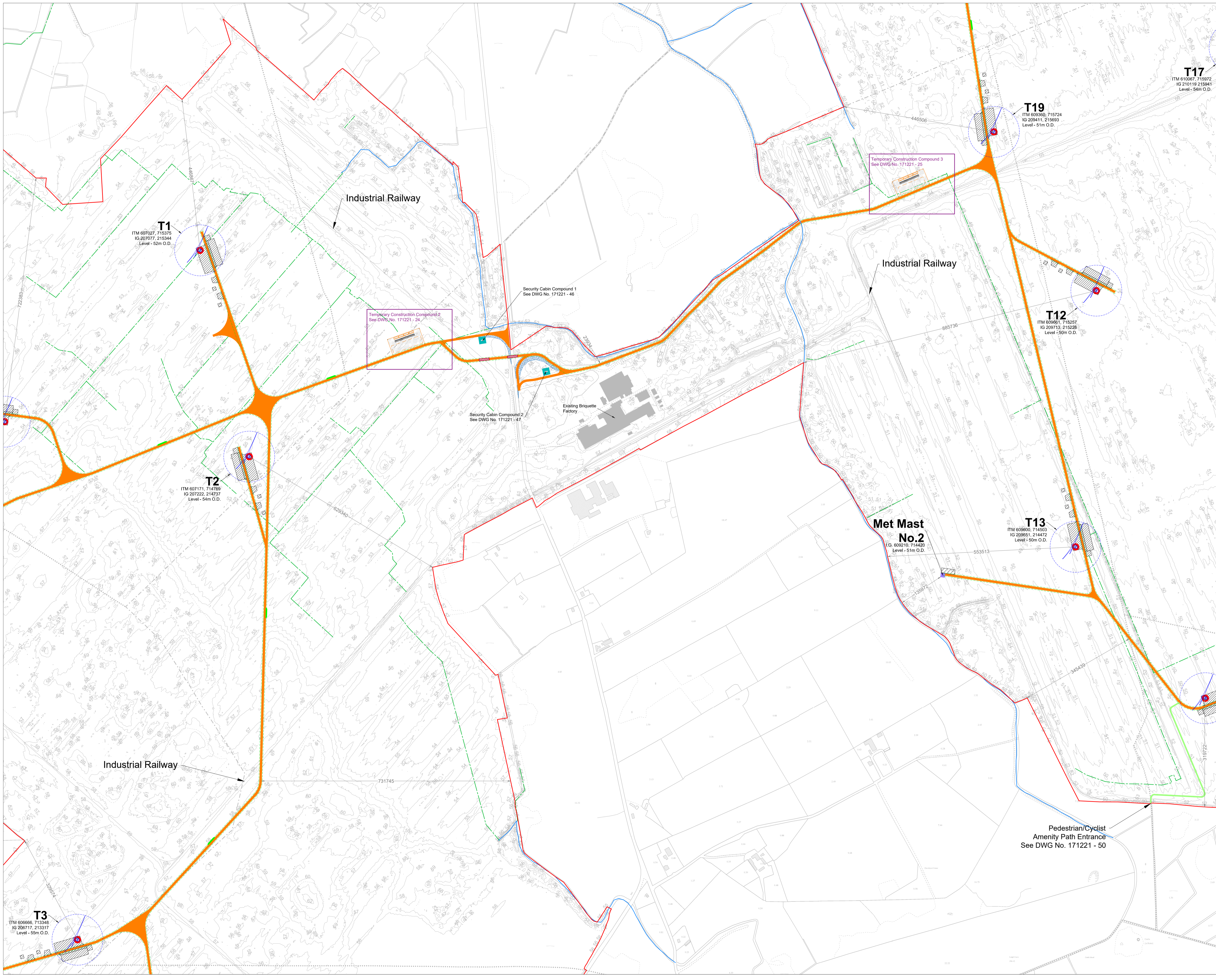
PROJECT TITLE:
Derrinlough Wind Farm, Co. Offaly

DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
--------------------------------------	-------------------------------------

PROJECT No.: 171221	DRAWING No.: 171221 - 05
-------------------------------	------------------------------------

SCALE: 1:5,000 @ A1	DATE: 19.02.2020
-------------------------------	----------------------------

MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW84
 +353 (0) 91 735611
 email: info@www.mkofireland.ie
 Website: www.mkofireland.ie



Project Design Drawing Notes

1. Drawings issued are for planning application purposes only.
2. Drawings not to be used for construction/contract conditions.
3. Copyright, all rights reserved. No part herewith may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
7. Layout plans show the turbine rotor diameter as per turbine drawing.
8. Final levels may vary depending on local ground conditions.

Drawing Legend

	Planning Application Boundary
	Proposed Road
	Underpass Road
	30mx3m Passing Bay
	River/Stream
	Existing Drains
	Existing Culvert/Watercourse Crossing
	Works Area for Internal Cabling
	Crane Pad Hardstanding Area
	Turbine Foundation
	Turbine Blade Swept Area
	Amenity Pathway
	Met Mast Hardstanding
	Security Cabin Compound
	Temporary Abnormal Load Delivery Vehicle Overrun



DRAWING TITLE:
Site Layout Plan - Sheet 3 of 8

PROJECT TITLE:
Derrinlough Wind Farm, Co. Offaly

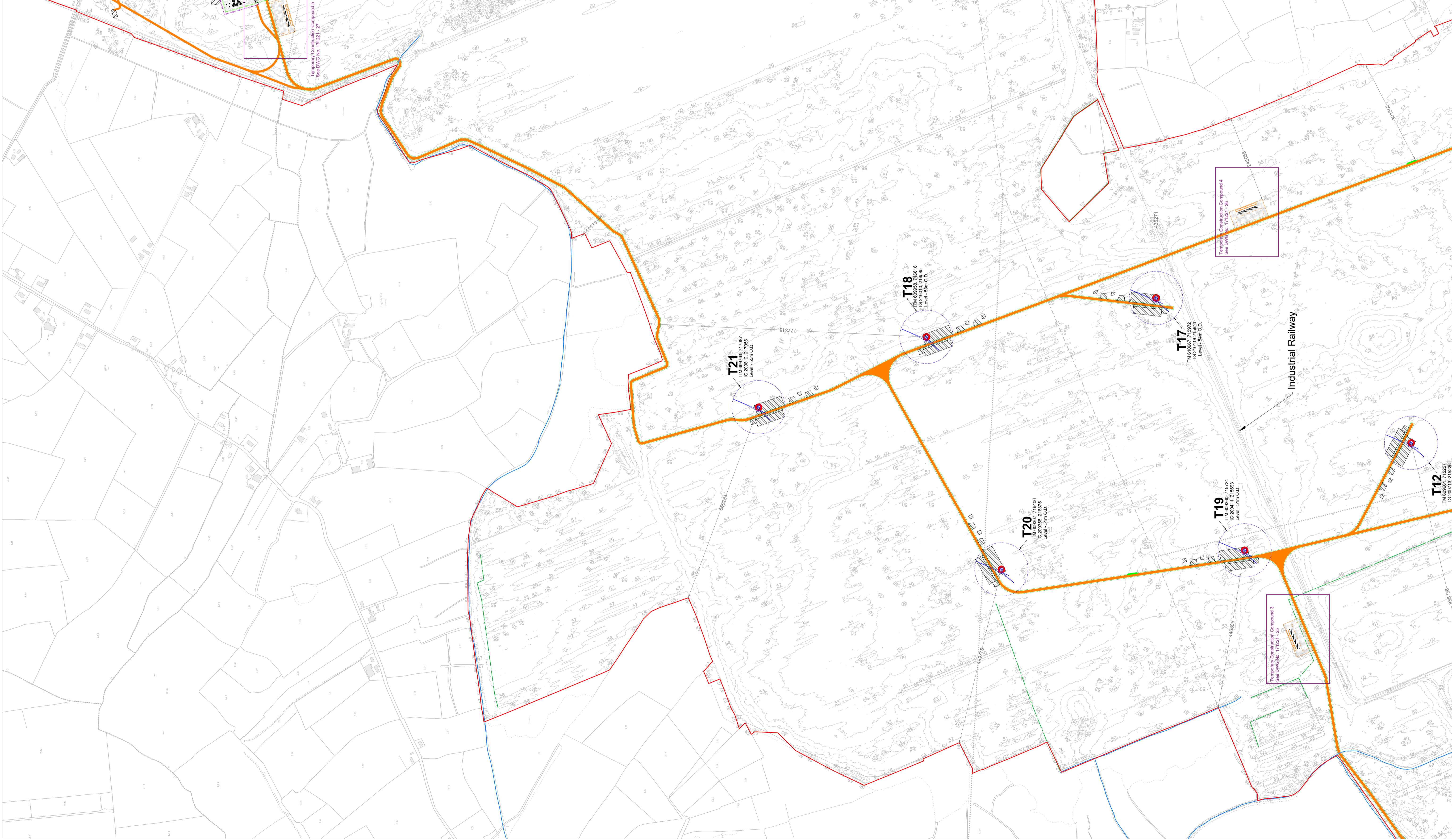
DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
PROJECT No.: 171221	DRAWING No.: 171221 - 06
SCALE: 1:5,000 @ A1	DATE: 19.02.2020

OS SHEET: 3490, 3490, 3491, 3537, 3538, 3539, 3540, 3541, 3586, 3587, 3588, 3589, 3590, 3643, 3644, 3645, 3646, 3700, 3701, 3702, 3703, 3704, 3756, 3759, 3760, 3761, 3762

MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW84
 +353 (0) 91 735611
 email: info@www.mkofireland.ie
 Website: www.mkofireland.ie

Project Design Drawing Notes

1. Drawings issued are for planning application purposes only.
2. Drawings not to be used for construction/contract conditions.
3. Copyright, all rights reserved. No part hereof may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
6. The use of or reliance upon this drawing shall be deemed to be in acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
8. Final levels may vary depending on local ground conditions.



Drawing Legend

- Planning Application Boundary
- Proposed Road
- 30m x 3m Passing Bay
- River/Stream
- Existing Drains
- Existing Culvert/Watercourse Crossing
- Works Area for Internal Cabling
- Crane Pad Handstanding Area
- Turbine Foundation
- Turbine Blade Swept Area

Site Layout Plan - Sheet 4 of 8

Derrinlough Wind Farm, Co. Offaly

CHECKED BY: **Eoin McCarthy**

DRAWING No: **171221**

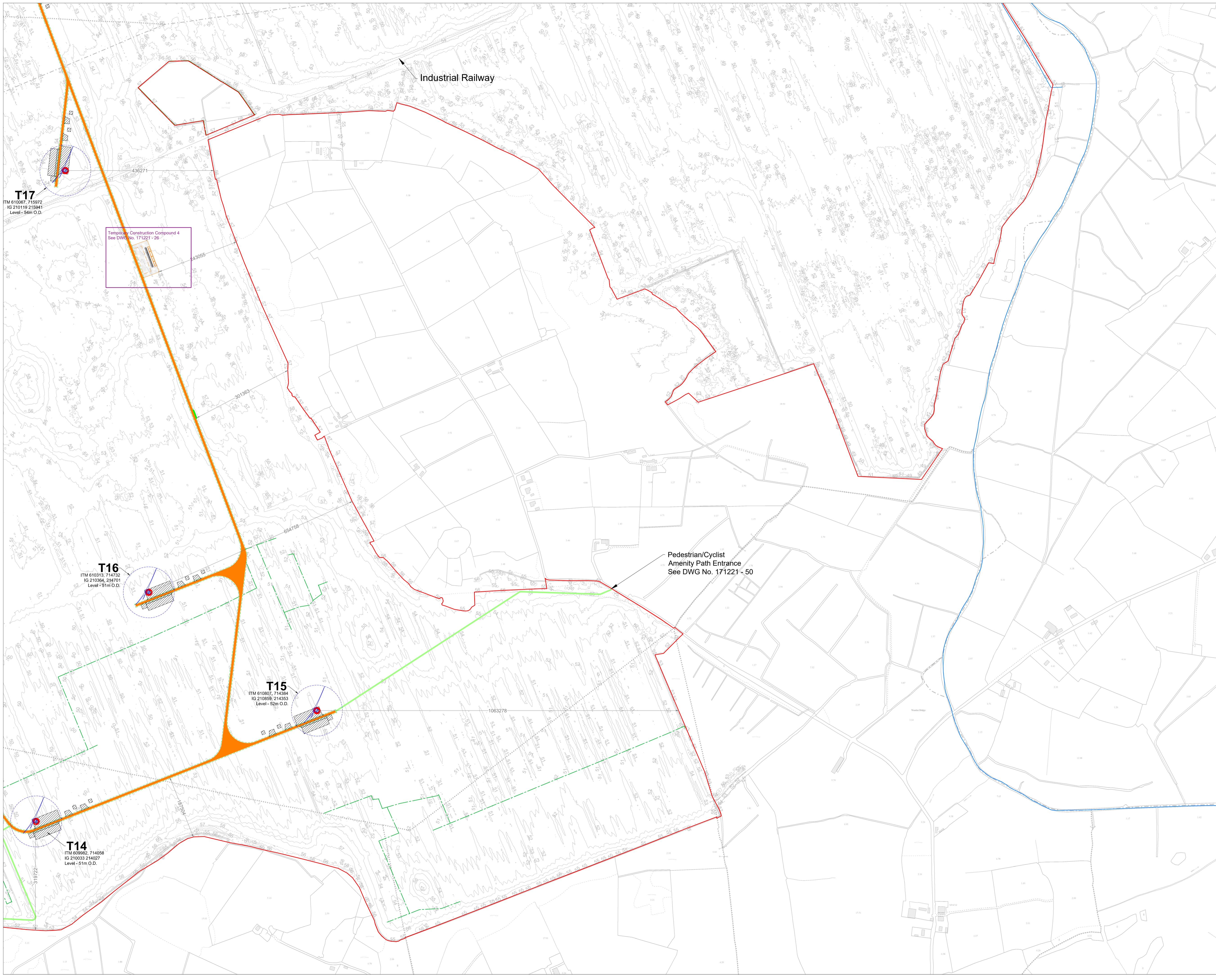
PROJECT No: **171221 - 07**

DATE: **19.02.2020**

SCALE: **1:5,000 @ A1**

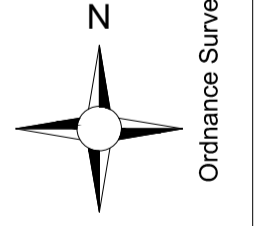
ORANDE CONSULTANTS LTD. 100, 101, 102, 103, 104, 105, 106, 107, 108, 109, 110, 111, 112, 113, 114, 115, 116, 117, 118, 119, 120, 121, 122, 123, 124, 125, 126, 127, 128, 129, 130, 131, 132, 133, 134, 135, 136, 137, 138, 139, 140, 141, 142, 143, 144, 145, 146, 147, 148, 149, 150, 151, 152, 153, 154, 155, 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.

MKO
Planning and Environmental Consultants
Team Road, H91 VW84
Ireland, H91 VW84
+353 (0) 91 735611
email: info@www.mkofireland.ie
Website: www.mkofireland.ie



- Project Design Drawing Notes**
1. Drawings issued are for planning application purposes only.
 2. Drawings not to be used for construction/contract conditions.
 3. Copyright, all rights reserved. No part herewith may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
 4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
 5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
 6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
 8. Final levels may vary depending on local ground conditions.

- Drawing Legend**
- Planning Application Boundary
 - Proposed Road
 - 30m x 3m Passing Bay
 - River/Stream
 - - - Existing Drains
 - - - Works Area for Internal Cabling
 - ▨ Crane Pad Hardstanding Area
 - Turbine Foundation
 - Turbine Blade Swept Area
 - Amenity Pathway



Ordnance Survey Ireland Licence No. AR002182 © Ordnance Survey Ireland/Government of Ireland

DRAWING TITLE:
Site Layout Plan - Sheet 5 of 8

PROJECT TITLE:
Derrinlough Wind Farm, Co. Offaly

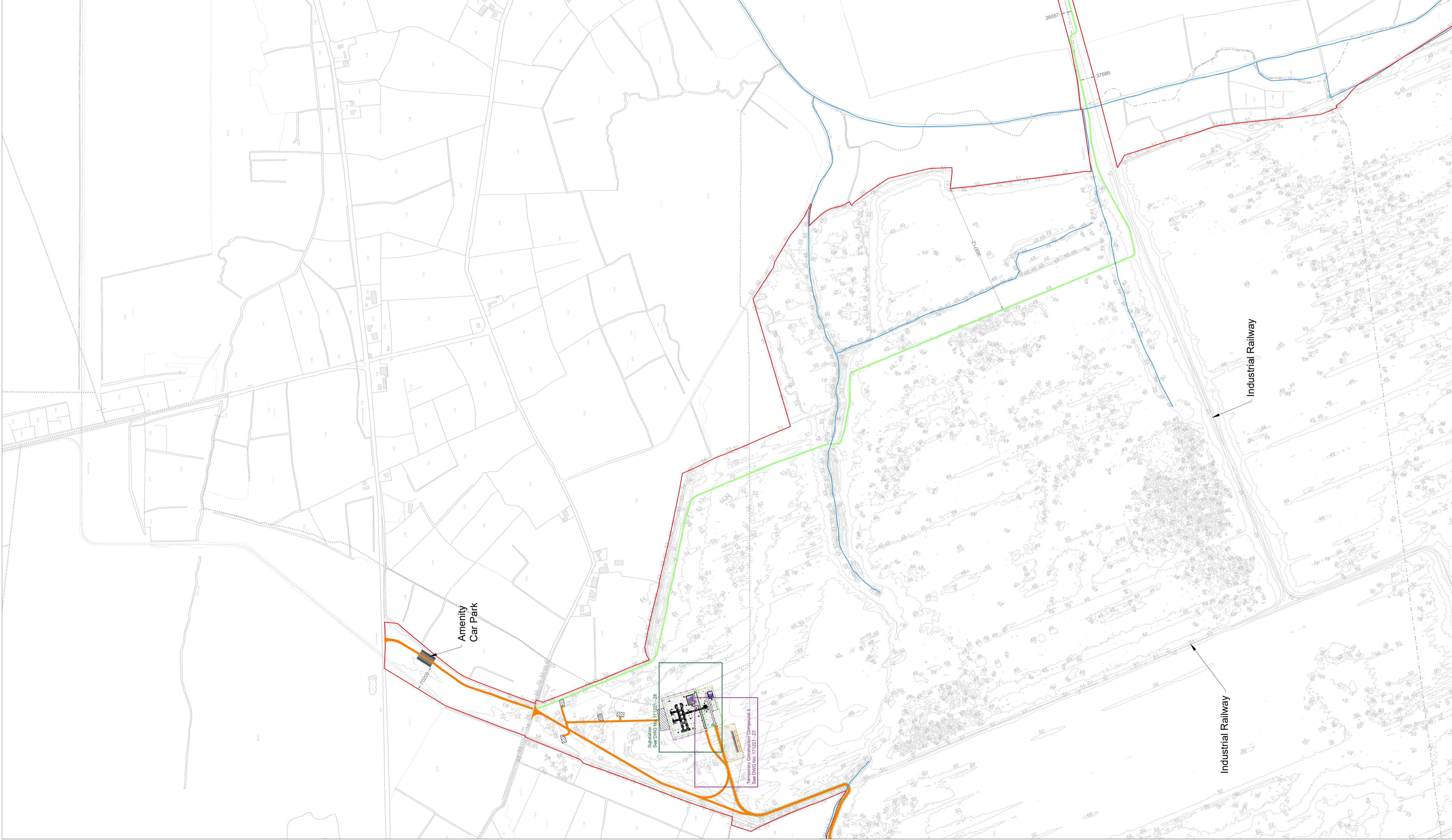
DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
PROJECT No.: 171221	DRAWING No.: 171221 - 08
SCALE: 1:5,000 @ A1	DATE: 19.02.2020

OS SHEET: 3480, 3490, 3491, 3537, 3538, 3539, 3540, 3541, 3586, 3587, 3588, 3589, 3590, 3643, 3644, 3645, 3646, 3700, 3701, 3702, 3703, 3704, 3756, 3759, 3760, 3761, 3762

MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW84
 +353 (0) 91 735611
 email: info@mkofireland.ie
 Website: www.mkofireland.ie

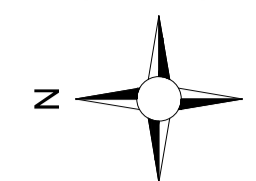
Project Design Drawing Notes

1. Drawings issued are for planning application purposes only.
2. Drawings not to be used for construction/contract conditions.
3. Copyright, all rights reserved. No part hereof may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
8. Final levels may vary depending on local ground conditions.



Drawing Legend

- Planning Application Boundary
- Proposed Road
- River/Stream
- Existing Culvert/Watercourse Crossing
- Works Area for Internal Cabling
- Crane Pad Handstanding Area
- Amenity Pathway

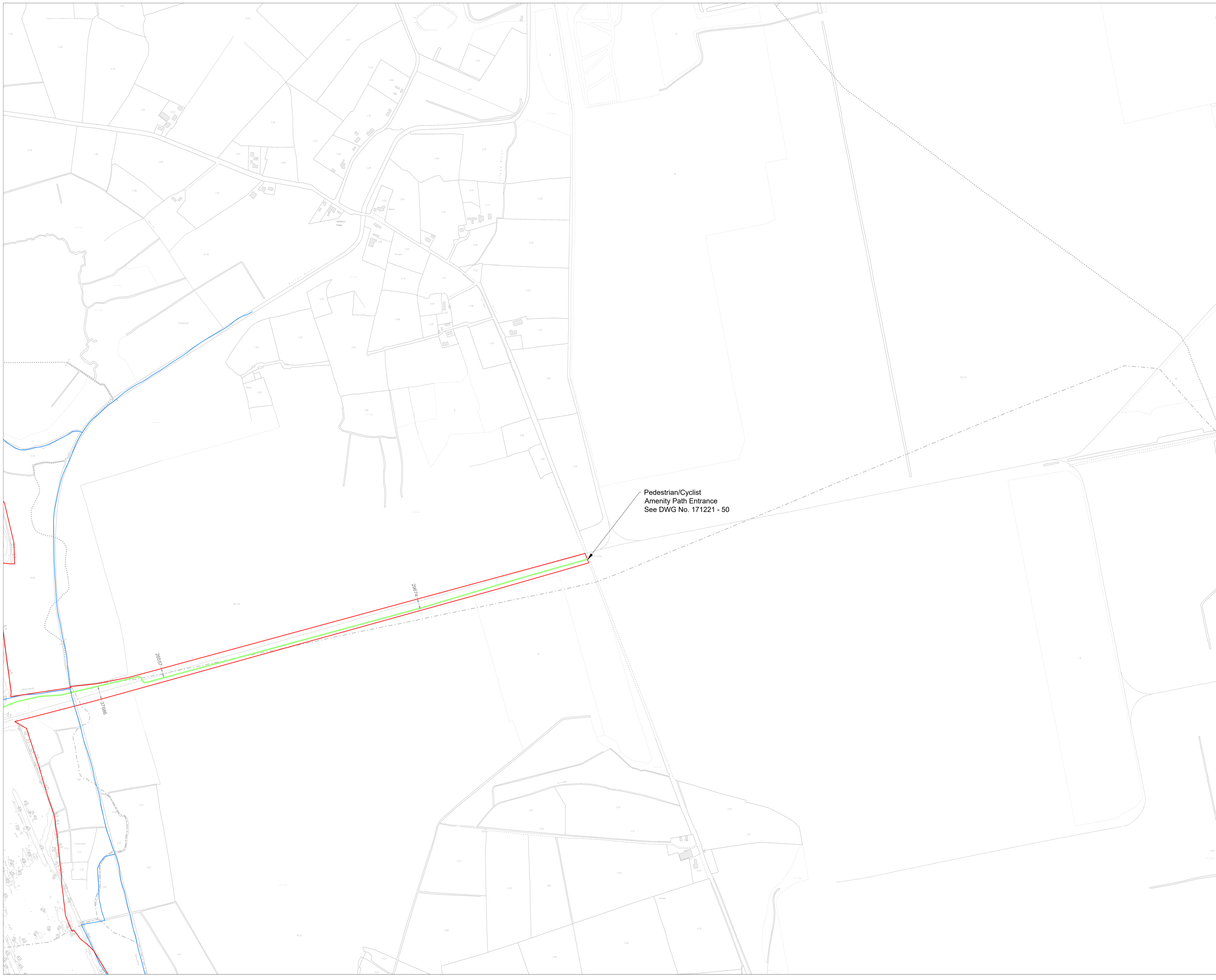


Site Layout Plan - Sheet 6 of 8

PROJECT TITLE	
Derrinlough Wind Farm, Co. Offaly	
CHECKED BY:	Eoin McCarthy
DRAWING NO:	171221
PROJECT NO:	171221 - 09
SCALE:	1:5,000 @ A1
DATE:	19.02.2020

Ordnance Survey Ireland Licence No. AR0021820@ Ordnance Survey Ireland/Government of Ireland

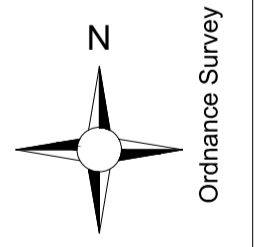
MKO
Planning and Environmental Consultants
Team Road, Galway
Ireland, H91 VV84
+353 (0) 91 735611
email: info@www.mkofireland.ie
Website: www.mkofireland.ie



Pedestrian/Cyclist
Amenity Path Entrance
See DWG No. 171221 - 50

- Project Design Drawing Notes**
1. Drawings issued are for planning application purposes only.
 2. Drawings not to be used for construction/contract conditions.
 3. Copyright, all rights reserved. No part herewith may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
 4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
 5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
 6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
 8. Final levels may vary depending on local ground conditions.

- Drawing Legend**
- Planning Application Boundary
 - River/Stream
 - Existing Culvert/Watercourse Crossing
 - Amenity Pathway

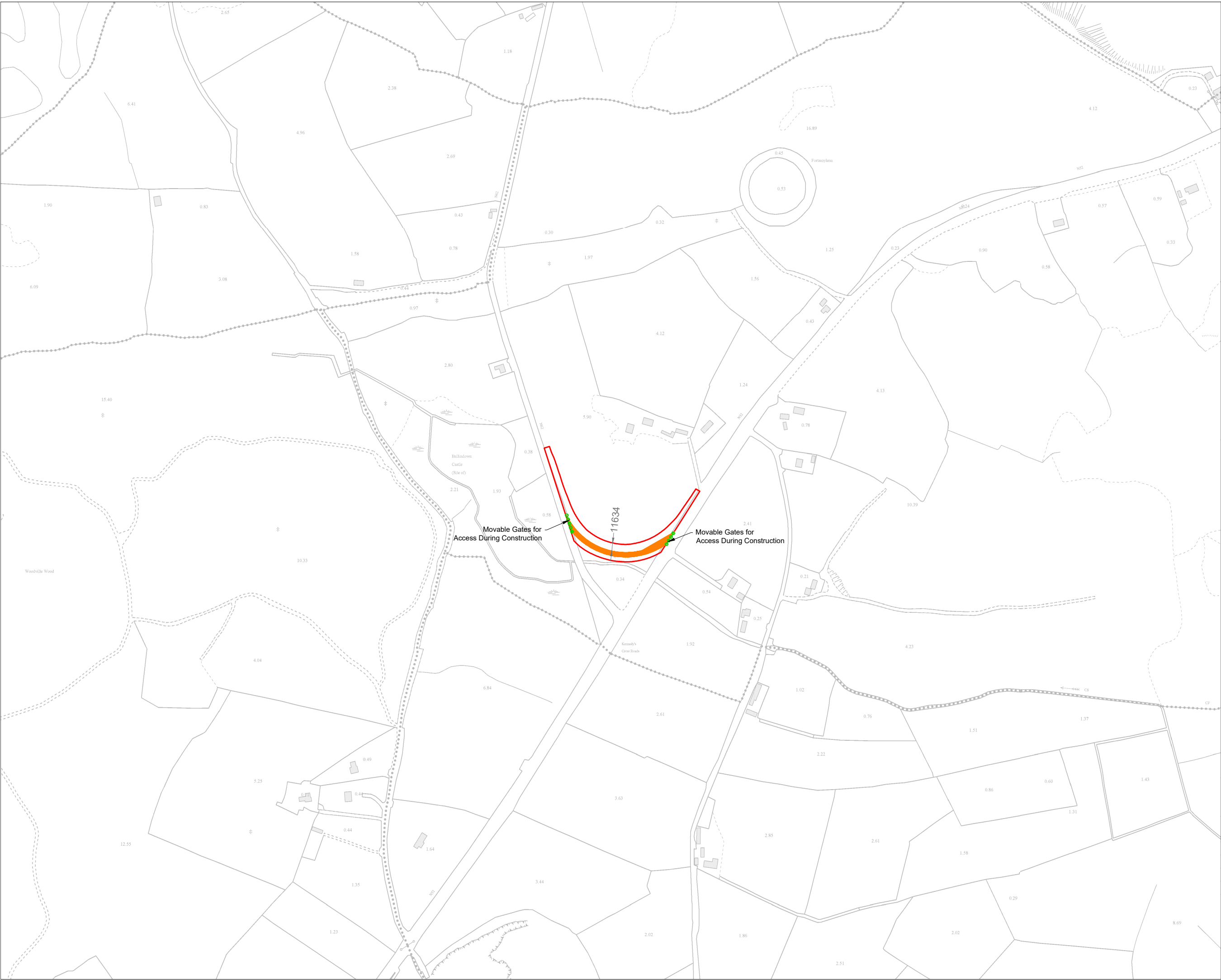


Ordnance Survey Ireland Licence No. AR0021820 © Ordnance Survey Ireland/Government of Ireland

Site Layout Plan - Sheet 7 of 8	
PROJECT TITLE: Derrinlough Wind Farm, Co. Offaly	
DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
PROJECT No.: 171221	DRAWING No.: 171221 - 10
SCALE: 1:5,000 @ A1	DATE: 19.02.2020

OS SHEET No. 3487, 3488, 3489, 3490, 3491, 3537, 3538, 3539, 3540, 3541, 3586, 3587, 3588, 3589, 3590, 3643, 3644, 3645, 3646, 3700, 3701, 3702, 3703, 3704, 3756, 3759, 3760, 3761, 3762

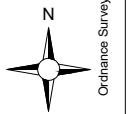
MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW84
 +353 (0) 91 735611
 email: info@www.mkofireland.ie
 Website: www.mkofireland.ie



- Project Design Drawing Notes**
1. Drawings issued are for planning application purposes only.
 2. Drawings not to be used for construction/contract conditions.
 3. Copyright, all rights reserved. No part hereof may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
 4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
 5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
 6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
 8. Final levels may vary depending on local ground conditions.

Drawing Legend

- Planning Application Boundary
- Proposed Road



**Site Layout Plan -
Sheet 8 of 8 (N52 - N62)**

Derrinlough Wind Farm, Co. Offaly

DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
PROJECT No: 171221	DRAWING No.: 171221 - 11
SCALE: 1:5,000 @ A3	DATE: 19.02.2020

OS Grid: 3488, 3489, 3490, 3491, 3537, 3538, 3539, 3540, 3541, 3586, 3587, 3588, 3589, 3590, 3643, 3644, 3645, 3646, 3700, 3701, 3702, 3703, 3704

MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW94
+353 (0) 91 735611
email: info@www.mkofireland.ie
Website: www.mkofireland.ie

DRAINAGE NOTES:

- ROADWAY SURFACING DESIGN AND CONSTRUCTION TO ENGINEER'S SPECIFICATION (I.E. BY OTHERS).
- SHAPE STRAW BALES/SILT FENCING/ OR SIMILAR, TO BE STORED ON SITE. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE TEMPORARILY MANAGED BY PLACING SILT FENCES, STRAW BALES / OR SIMILAR OR ADDITIONAL CHECK DAMS AT THE PROBLEM AREAS. PORTABLE SILTTRUSTER SYSTEM TO BE AVAILABLE ON-SITE FOR USE AS REQUIRED ALSO.
- SUDS SYSTEM TO BE CONSTRUCTED PRIOR TO, OR AT THE SAME TIME AS THE ACCESS TRACKS. INTERIM MEASURES SUCH AS THE PLACEMENT OF STRAW BALES/SILT FENCING/ OR SIMILAR APPROVED METHOD OR ADDITIONAL CHECK DAMS AND SILT FENCES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS TRACKS IS LIKELY TO CAUSE ADVERSE ENVIRONMENTAL EFFECTS THROUGH INCREASED SILT LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
- SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO RECEIVING WATER COURSES. SEE NOTES ON POLLUTION PREVENTION.
- INTERCEPTOR SWALES / DITCHES TO BE USED TO COLLECT UPSTREAM SURFACE WATER FLOWS. REGULAR CROSS DRAINS / DISCHARGE TO FIELD DITCHES WILL BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER IN INTERCEPTOR DRAINS TO SUITABLE FIELD DRAIN OUTFALL POINTS.
- DRAINAGE SWALES / DITCHES TO BE EXCAVATED ADJACENT TO THE ACCESS TRACKS. REGULAR CROSS DRAINS TO BE LOCATED ALONG ACCESS TRACKS TO PREVENT EXCESSIVE VOLUMES OF WATER COLLECTING IN THE SWALES / DITCHES. LOCATION OF CROSS DRAINS TO BE AGREED WITH THE ENGINEER ON SITE. SURFACE WATER WILL NOT BE ALLOWED TO DISCHARGE DIRECTLY INTO EXISTING WATERCOURSES.
- WHERE POSSIBLE, A BUFFER ZONE OF >50M TO ANY EXISTING WATERCOURSE WILL BE REQUIRED WHERE OVER LAND DISCHARGES ARE PROPOSED FROM ACCESS TRACK SWALES / DITCHES.
- BATTERS OF ALL PROPOSED SWALES / DITCHES TO HAVE A SLOPE OF BETWEEN 1:1.5 TO 1:2 DEPENDING UPON SOPTH OF SWALE/DITCH AND WILL BE LEFT AS CUT TO RE-VEGETATE WITH LOCAL SPECIES.
- TRACK SIDE SWALES / DITCHES TO BE SHALLOW WITH MODERATE GRADIENTS TO PREVENT SCOURING. STEEP CHECK DAMS SHOULD BE INSTALLED TO REDUCE FLOW VELOCITIES AND PROVIDE SOURCE CONTROL OF SILT CONTAMINANT. WHERE NECESSARY THESE HAVE BEEN DESIGNATED IN CONJUNCTION WITH SETTLEMENT PONDS AND SILT TRAPS. PRIOR TO DISCHARGE.
- SETTLEMENT PONDS TO BE CONSTRUCTED FOR SILT REMOVAL AT TURBINE BASES AND HAND STAND AREAS. POND SIZES DEPENDS ON CATCHMENT AREA SERVED. SAMPLE POND SIZES SHOWN ON DRAWING D501.
- STRAW BALES / OR SIMILAR AND SILT FENCES TO BE USED ALSO AROUND STOPS NEARS TO MITIGATE SILT RUNOFF. SILT FENCES MAY BE REMOVED WHEN SUITABLE VEGETATION COVER IS ESTABLISHED.
- SILT FENCES TO BE PROVIDED ALONG EDGE OF EXISTING WATERCOURSE WHERE WORKS COMES WITHIN 15M OF EDGE OF ANY DITCH / EMBANKMENT CHANNELS.
- SLOPES OF THE SWALES / DITCHES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATE LAYER (PEAT AND/OR SOIL) FROM EXCAVATIONS TO BE STORED LOCALLY AND USED TO LINE SLOPES AND BASE OF SWALES / DITCHES OR LONGITUDINAL MOUNDS OF VEGETATION SWALES AT FIELD DRAIN DISCHARGE POINTS.
- AREAS STRIPPED OF VEGETATION SHOULD BE KEPT TO A MINIMUM.
- CLEAN STONE FLOW CONTROL CHECK DAMS TO BE MADE OF LOCALLY WON / GEOLOGICALLY SIMILAR WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 20-40MM CLEAN STONE. ON SLOPING SECTIONS OF THE ACCESS TRACKS, 40MM CHECK DAMS TO BE PROTECTED FROM WASHING AWAY THROUGH THE PLACEMENT OF 100M STONE ON THE DOWNHILL FACE OF THE CHECK DAM AND BY WRAPPING IN GEOTEXTILE.
- BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING DRAINAGE MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAM TO BE REMOVED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT.
- SPACING AND FREQUENCY OF CHECK DAMS WILL BE DEPENDENT UPON LONGITUDINAL GRADIENT OF SWALE.
- LOCATION OF FILTRATION CHECK DAMS (IF REQUIRED) TO BE AGREED ON SITE WITH ENGINEER. SETTLEMENT PONDS TO BE CONSTRUCTED IN A MANNER WHERE THEY MAY BE EASILY INFILLED AT A LATER DATE (POST COMPLETION OF THE TURBINE BASE AND HANDSTAND CONSTRUCTION). ONLY SUITABLE MATERIALS EXCAVATED FROM THE POND TO BE USED TO FORM PART OF THE DRAINAGE AROUND THE POND.
- OIL FUEL SHOULD BE STORED WITHIN BLANDED CONTAINMENT STRUCTURES.
- SILT BAGS WILL BE USED ON SITE AT FIELD DRAIN DISCHARGE LOCATIONS, AS NECESSARY.

POLLUTION PREVENTION NOTES:

- SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
- SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO OFF SITE RECEIVING WATERCOURSES.
- SILT WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/DISTURBED GROUND, TEMPORARY STOCKPILES, PLANT AND WHEEL WASH, SITE ROAD/TRACKS, AND DISTURBANCE OF EXISTING FIELD DRAINS AND DITCHES.

DISCHARGES

- WATER CONTAINING SILT WILL NOT BE PUMPED DIRECTLY TO ANY NATURAL WATERCOURSE. ALL DISCHARGES TO BE MADE OVER OPEN GROUND OR INTO EXISTING FIELD DRAIN WITH SILT TRAP & MINIMUM 20M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
- NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
- PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE.
- TYPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN FIELD DRAINS/DITCHES/STREAMS WILL BE COMPLETED IN A MANNER THAT DOES NOT CAUSE SCOUR OR EROSION AT THE POINT OF RELEASE/DISCHARGE. THIS WILL BE DONE BY REDUCING THE FLOW VELOCITIES OR BY USE OF SPLASH PLATES, AND OTHER SIMILAR DISCHARGE CONTROLS.
- VEGETATION WILL NOT BE STRIPPED FROM EXISTING FIELD DRAINS/DITCHES UNLESS ABSOLUTELY NECESSARY.

EXCAVATIONS

- WHERE DEEP EXCAVATIONS ARE PROPOSED CUT-OFF DRAINS WILL BE USED TO REDUCE THE AMOUNT OF SURFACE WATER ENTERING THE EXCAVATION. THIS WILL BE THE CASE AROUND TURBINE BASE EXCAVATIONS.

EXPOSED GROUND & STOCKPILES

- THE AMOUNT OF EXPOSED GROUND AND TEMPORARY STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED, AS FAR AS PRACTICABLE.

SILT TRAPS

- USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR FILTRATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER AS REQUIRED.
- CHECK DAMS TO BE INSPECTED AND CLEANED REGULARLY.

REFUELLING

- REFUELLING OF MOBILE PLANT WILL BE COMPLETED IN DESIGNATED REFUELLING AREAS ONLY, PREFERABLY ON AN IMPERMEABLE SURFACE AND AWAY FROM FIELD DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.
- SPILL KITS AND DRIP TRAYS WILL BE AVAILABLE ON SITE FOR USE AS REQUIRED.

CONCRETE

- CARE WILL BE TAKEN WHEN COMPLETING CONCRETE WORKS ON SITE TO ENSURE NO DISCHARGES OCCUR.
- CONCRETE WASH WATER, AND WASTE CONCRETE WILL BE MANAGED APPROPRIATELY ON SITE.

IF WATER POLLUTION IS IDENTIFIED THE FOLLOWING STEPS WOULD BE ADHERED TO:

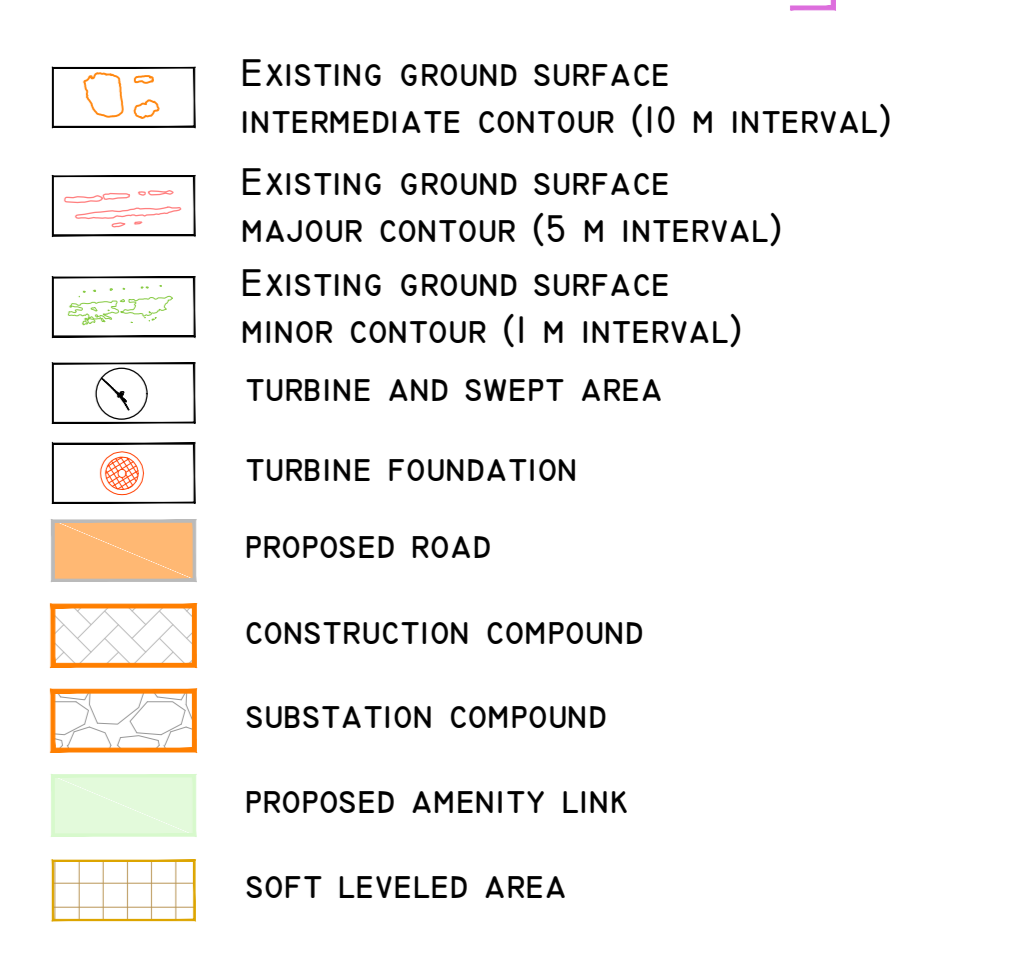
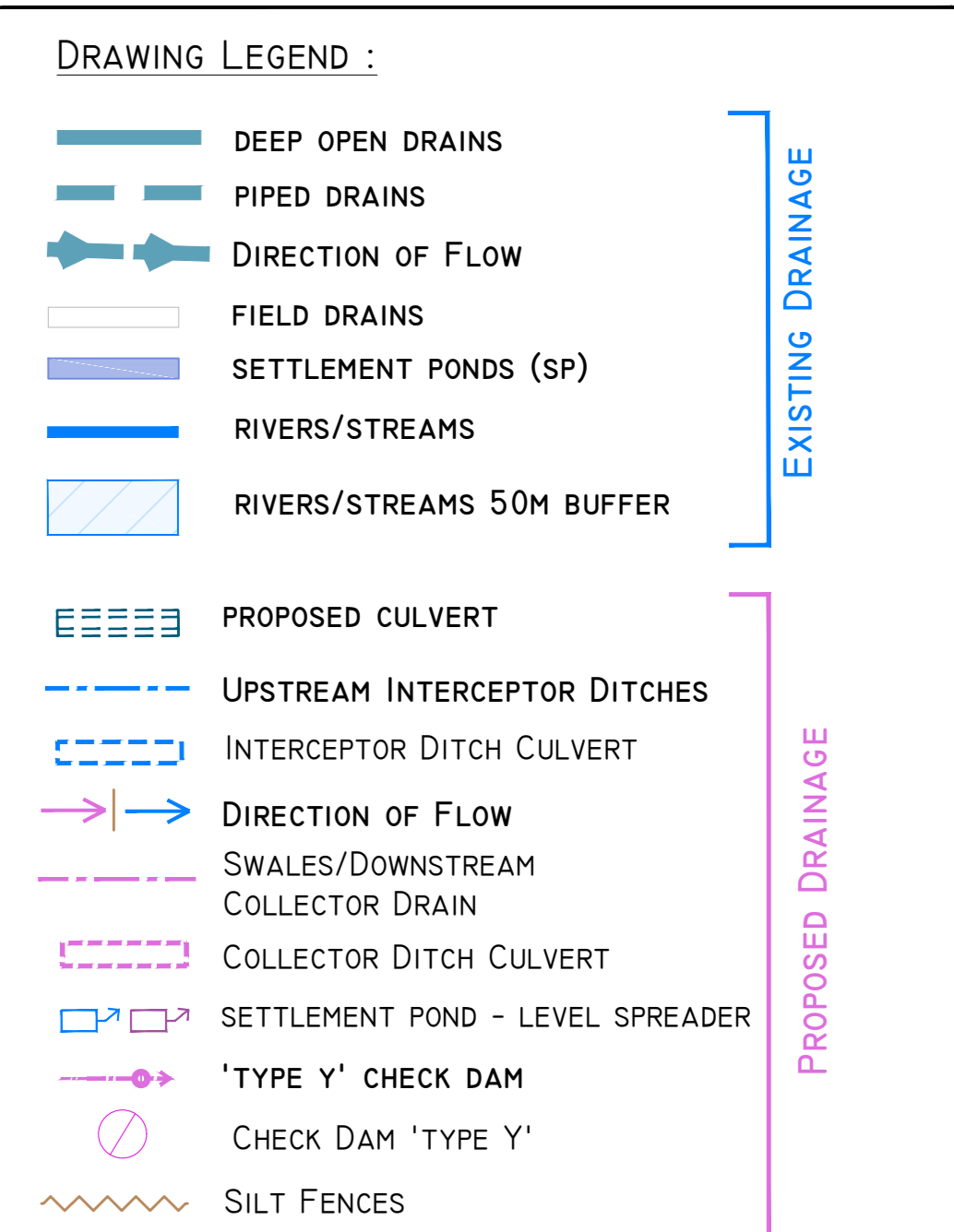
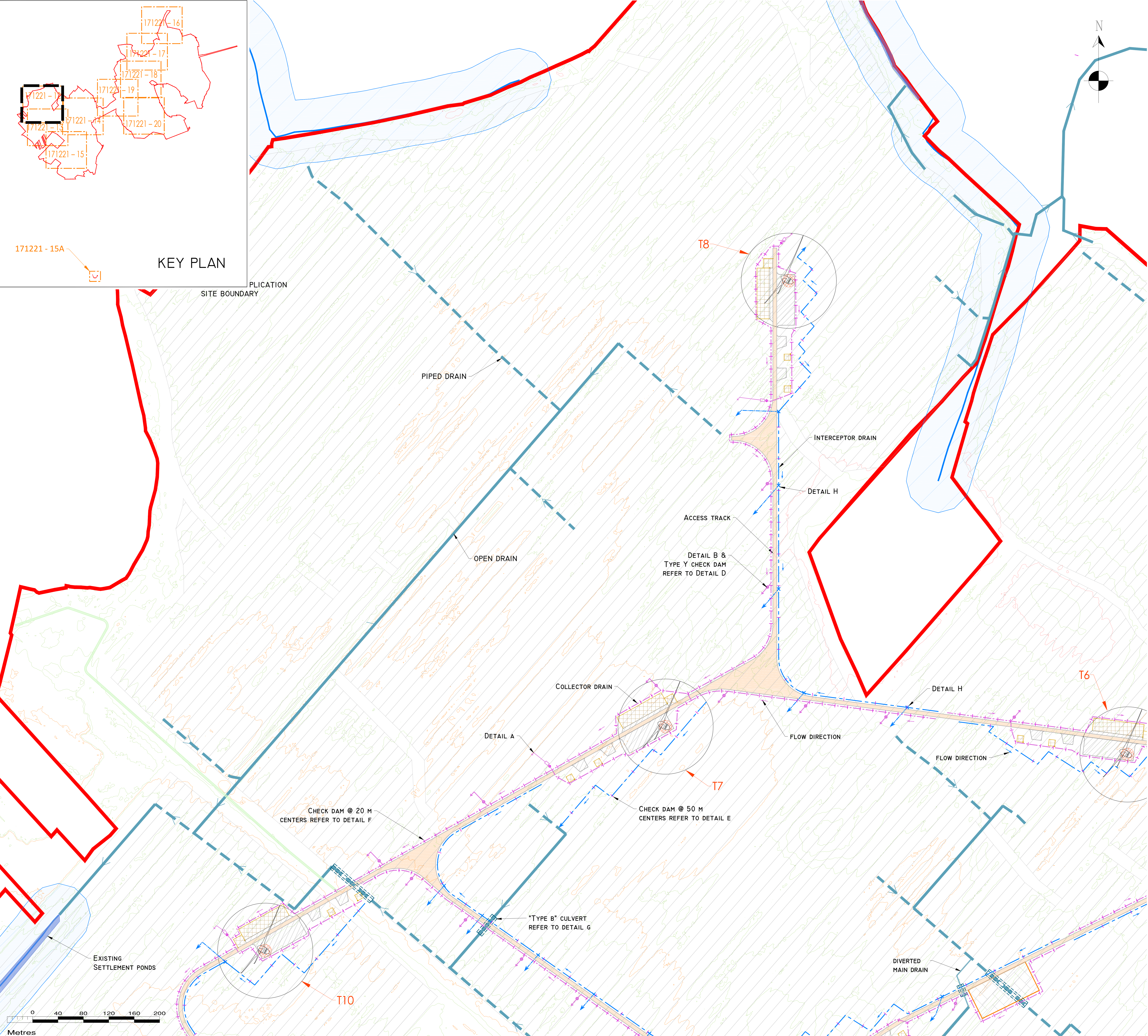
STOP - WORK IN THE IMMEDIATE AREA SHOULD BE STOPPED AND THE SOURCE OF THE POLLUTION IDENTIFIED.

CONTAIN - THE SOURCE OF THE POLLUTION SHOULD BE BLANDED USING A SUITABLE METHOD. NATURAL WATERCOURSES SHOULD BE TEMPORARILY DIVERTED AROUND THE SOURCE OF POLLUTION.

NOTIFY - THE RELEVANT AUTHORITIES (SITE MANAGER / FISHERIES / NPWS / LOCAL AUTHORITY ETC.) SHOULD BE NOTIFIED IMMEDIATELY TO ENSURE THAT MEASURES CAN BE IMPLEMENTED DOWNSTREAM TO PROTECT FISHERIES AND OTHER SENSITIVE AREAS.

MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE

MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS	<ol style="list-style-type: none"> APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE. APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE. WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHERS.
SOURCE CONTROLS:	<ol style="list-style-type: none"> USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE-DRAINS, DIVERSION DRAINS, FLUMES AND CULVERT PIPES. EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> SAND BAGS OSTER BAGS FILLED WITH GRAVEL FILTER FABRICS AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHERS. COVERING STOCKPILES WEATHERING OFF / SEALING PEAT STOCKPILES
IN-LINE CONTROLS:	<ol style="list-style-type: none"> INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED SWALES/COLLECTOR DRAINS EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> SAND BAGS OSTER BAGS FILLED WITH GRAVEL FILTER FABRICS AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS FLOW LIMITERS WEIR OR BAPPLIES AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. IN STREAM SEDIMENTS COLLECTION SUDS, TEMPORARY SUDS, PUMPING SYSTEMS ATTENUATION LAGOONS SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
WATER TREATMENT CONTROLS:	<ol style="list-style-type: none"> TEMPORARY SUDS ATTENUATION PONDS TEMPORARY STORAGE LAGOONS SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTTRUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. SILT DEWATERING BAGS
OUTFALL CONTROLS:	<ol style="list-style-type: none"> LEVELSPREADERS SUFFICED OUTFALLS VEGETATION FILTERS SILT DEWATERING BAGS FLOW LIMITERS AND WEIRS



DRAWING NOTES

- DRAWINGS ISSUED ARE FOR PLANNING APPLICATION PURPOSES ONLY.
- COPYRIGHT, ALL RIGHTS RESERVED. NO PART HERE WITH MAY BE COPIED OR REPRODUCED PARTIALLY OR WHOLLY IN ANY FORM WHATSOEVER WITHOUT THE PRIOR NOTICE OF THE COPYRIGHT OWNER HYDRO-ENVIRONMENTAL SERVICES.
- DO NOT SCALE OFF THIS DRAWING. FIGURED METRIC DIMENSIONS ONLY SHOULD BE TAKEN OFF THIS DRAWING.
- ALL DIMENSIONS ARE IN METRES.

Ordnance Survey Ireland Licence No. EN 0044720
© Ordnance Survey Ireland/Government of Ireland

Date	Description	Chkd	Signed

Revisions

HYDRO ENVIRONMENTAL SERVICES

22 Lower Main St
Dungarvan
Co. Waterford
Ireland

tel: +353 (0) 58-44122
tel: +353 (0) 58-44244
email: info@hydroenvironmental.ie
web: www.hydroenvironmental.ie

Client: **BORD NA MONA POWERGEN LTD**

Job: **DERRINLOUGH WF, CO. OFFALY**

Title: **PROPOSED DRAINAGE LAYOUT**

Figure No: **171221 - 12**

Drawing No: P1463-0-0220-A0-171221-12-00A

Sheet Size: A0 Project No.: P1463-0

Scale: 1:2,000 (A0) Drawn By: MG / GD

Date: 14/02/2020 Checked By: MG

DRAINAGE NOTES:

ROADWAY SURFACING DESIGN AND CONSTRUCTION TO ENGINEER'S SPECIFICATION (I.E. BY OTHERS).

- SHALE STRAW BALE/SILT FENCING/ OR SIMILAR, TO BE STORED ON SITE. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE TEMPORARILY MANAGED BY PLACING SILT FENCES, STRAW BALES / OR SIMILAR ON ADDITIONAL CHECK DAMS AT THE PROBLEM AREAS. MOBILE SILT/STRENGTH SYSTEM TO BE AVAILABLE ON SITE FOR USE AS REQUIRED ALSO.
- SLEETS SYSTEM TO BE CONSTRUCTED PRIOR TO, OR AT THE SAME TIME AS THE ACCESS TRACKS. INTERIOR MEASURES SUCH AS THE POSITIONING OF STRAW BALES/SILT FENCING/ OR SIMILAR APPROVED METHOD OR ADDITIONAL CHECK DAMS AND SILT FENCES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIES OUT TO CONSTRUCT THE ACCESS TRACKS IS LIKELY TO CAUSE ADVERSE ENVIRONMENTAL EFFECTS THROUGH INCREASED SILT LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
- SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO RECEIVING WATER COURSES. SEE NOTES ON POLLUTION PREVENTION.
- INTERCEPTOR SWALES / DITCHES TO BE USED TO COLLECT UPSTREAM SURFACE WATER FLOWS. REGULAR CROSS SWALES / DITCHES TO FIELD DITCHES WILL BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER IN INTERCEPTOR DRAINS TO SUITABLE FIELD DRAIN OUTFALL POINTS.
- DRAINAGE SWALES / DITCHES TO BE EXCAVATED ADJACENT TO THE ACCESS TRACKS. REGULAR CROSS SWALES TO BE LOCATED ALONG ACCESS TRACKS TO PREVENT EXCESSIVE VOLUMES OF WATER COLLECTING IN THE SWALES / DITCHES. LOCATIONS OF CROSS SWALES TO BE AGREED WITH THE ENGINEER ON SITE. SURFACE WATER WILL NOT BE ALLOWED TO DISCHARGE DIRECTLY INTO EXISTING WATERCOURSES.
- WHERE POSSIBLE A BUFFER ZONE OF >50M TO ANY EXISTING WATERCOURSE WILL BE REQUIRED WHERE OVER LAND DISCHARGES ARE PROPOSED FROM ACCESS TRACK SWALES / DITCHES.
- BATTERS OF ALL PROPOSED SWALES / DITCHES TO HAVE A SLOPE OF BETWEEN 1:1.5 TO 1:2 DEPENDING UPON DEPTH OF SWALE/DITCH AND WILL BE LEFT OUT TO RE-VEGETATE WITH LOCAL SPECIES.
- TRACK SIDE SWALES / DITCHES TO BE SHALLOW WITH MODERATE GRADIENTS TO PREVENT SCOURING. IN STEEP AREAS CHECK DAMS SHOULD BE INSTALLED TO REDUCE FLOW VELOCITIES AND PROVIDE SOURCE CONTROL OF SILT CONTAMINANT. WHERE NECESSARY THESE HAVE BEEN DESIGNATED FOR CONSTRUCTION WITH SETTLEMENT PONDS AND SILT TRAPS PRIOR TO DISCHARGE.
- SETTLEMENT PONDS TO BE CONSTRUCTED FOR SILT REMOVAL AT TURBINE BASES AND HARD STAND AREAS. POND SIZES DEPEND ON CATCHMENT AREA SERVED. SAMPLE POND SIZES SHOWN ON DRAWING D001.
- STRAW BALES / OR SIMILAR AND SILT FENCES TO BE USED ALSO AROUND SPILL HEAPS TO MITIGATE SILT RUNOFF. SILT FENCES MAY BE REMOVED WHEN SUITABLE VEGETATION COVER IS ESTABLISHED.
- SILT FENCES TO BE PROVIDED ALONG EDGE OF EXISTING WATERCOURSE WHERE WORKS COMES WITHIN VIEW OF EDGE OF ANY DITCH / EMBANKMENT CHANNELS.
- SLOPES OF THE SWALES / DITCHES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER (HEAT 'SOO' OR 'SCRAW') FROM EXCAVATIONS TO BE STORED LOCALLY AND USED TO LINE SLOPES AND BASE OF SWALES / DITCHES OR LONGITUDINAL BARRIERS OF VEGETATION SWALES AT FIELD DRAIN DISCHARGE POINTS.
- AREAS STRIPPED OF VEGETATION SHOULD BE KEPT TO A MINIMUM.
- CLEAN STONE FLOW CONTROL CHECK DAMS TO BE MADE OF LOCALLY SOWN GEOLOGICALLY SIMILAR HILL GRASS STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 20-100MM CLEAN STONE. ON SLOPING SECTIONS OF THE ACCESS TRACKS, 40MM CHECK DAMS TO BE PROTECTED FROM WASHING AWAY THROUGH THE PLACEMENT OF 100MM STONE ON THE DOWNHILL FACE OF THE CHECK DAM AND BY WRAPPING IN GEOTEXTILE.
- BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY MONITORED AS PART OF AN ONGOING GRASSLAND MAINTENANCE PROGRAMME.
- REMOVAL OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT.
- SPACING AND FREQUENCY OF CHECK DAMS WILL BE DEPENDENT UPON LONGITUDINAL GRADIENT OF SWALE.
- LOCATION OF FILTRATION CHECK DAMS (IF REQUIRED) TO BE AGREED ON SITE WITH ENGINEER. SETTLEMENT PONDS TO BE CONSTRUCTED IN A MANNER WHERE THEY MAY BE EASILY INFILLED AT A LATER DATE (POST COMPLETION OF THE TURBINE BASE AND HARDSTAND CONSTRUCTION). ONLY SUITABLE MATERIALS EXCAVATED FROM THE POND TO BE USED TO FORM PART OF THE EMBANKMENT AROUND THE POND.
- DIESEL FUEL SHOULD BE STORED WITHIN BUNDED CONTAINMENT STRUCTURES.
- SILT BAGS WILL BE USED ON SITE AT FIELD DRAIN DISCHARGE LOCATIONS, AS NECESSARY.

POLLUTION PREVENTION NOTES:

- SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
- SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO OFF SITE RECEIVING WATERCOURSES.
- SILT WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/STRIPPED GROUND, TEMPORARY STOCKPILES, PLANT AND WHEEL WASH, SITE ROADS/TRACKS, AND DISTURBANCE OF EXISTING FIELD DRAINS AND DITCHES.

DISCHARGES:

- WATER CONTAINING SILT WILL NOT BE PUMPED DIRECTLY TO ANY NATURAL WATERCOURSE. ALL DISCHARGES TO BE MADE OVER OPEN GROUND OR INTO EXISTING FIELD DRAIN WITH SILT TRAP A MINIMUM 50M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
- NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
- PUMPED WATER WILL BE DIRECTED INTO TRAP SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE.
- PUMPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN FIELDS (DITCHES/STREAMS) WILL BE COMPLETED IN A MANNER THAT DOES NOT CAUSE SCOUR OR EROSION AT THE POINT OF RELEASE/DISCHARGE. THIS WILL BE DONE BY REDUCING THE FLOW VELOCITIES OR BY USE OF BRUSH PLATES / OTHER SIMILAR DISCHARGE CONTROLS.
- VEGETATION WILL NOT BE STRIPPED FROM EXISTING FIELD DRAINS/DITCHES UNLESS ABSOLUTELY NECESSARY.

EXCAVATIONS:

- WHERE DEEP EXCAVATIONS ARE PROPOSED CUT-OFF DRAINS WILL BE USED TO REDUCE THE AMOUNT OF SURFACE WATER ENTERING THE EXCAVATION. THIS WILL BE THE CASE AROUND TURBINE BASE EXCAVATIONS.

EXPOSED GROUND & STOCKPILES:

- THE AMOUNT OF EXPOSED GROUND AND TEMPORARY STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED, AS FAR AS PRACTICABLE.

SITE TRACKS:

- USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR FILTRATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER AS REQUIRED.
- CHECK DAMS TO BE INSPECTED AND CLEANED REGULARLY.

REFUELLING:

- REFUELLING OF MOBILE PLANT WILL BE COMPLETED IN DESIGNATED REFUELLING AREAS ONLY, PREFERABLY ON AN IMPROVED SURFACE AND AWAY FROM FIELD DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.
- DIESEL TANKS AND OIL TRAYS WILL BE AVAILABLE ON SITE FOR USE AS REQUIRED.

CONCRETE:

- CARE WILL BE TAKEN WHEN COMPLETING CONCRETE WORKS ON SITE TO ENSURE NO DISCHARGE OCCURS.
- CONCRETE WASH WATER, AND WASTE CONCRETE WILL BE MANAGED APPROPRIATELY ON SITE.

IF WATER POLLUTION IS IDENTIFIED THE FOLLOWING STEPS WOULD BE ADHERED TO:

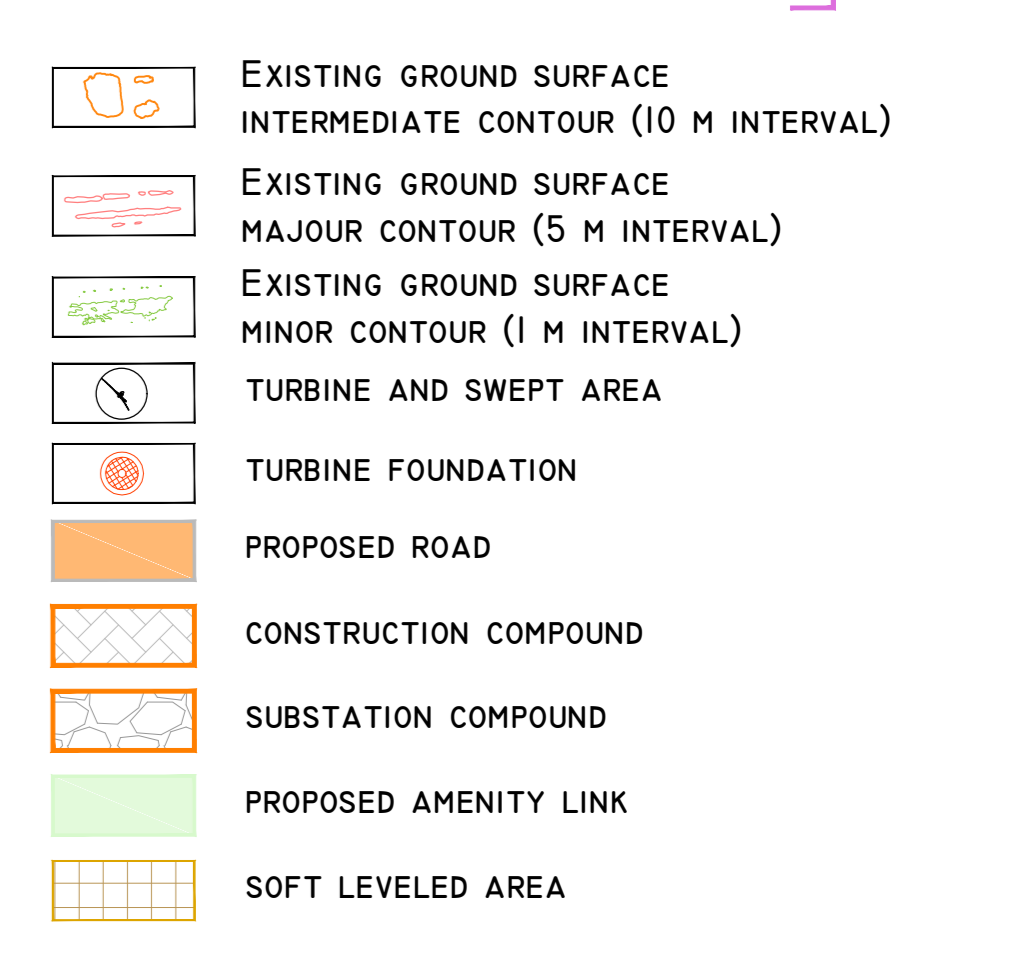
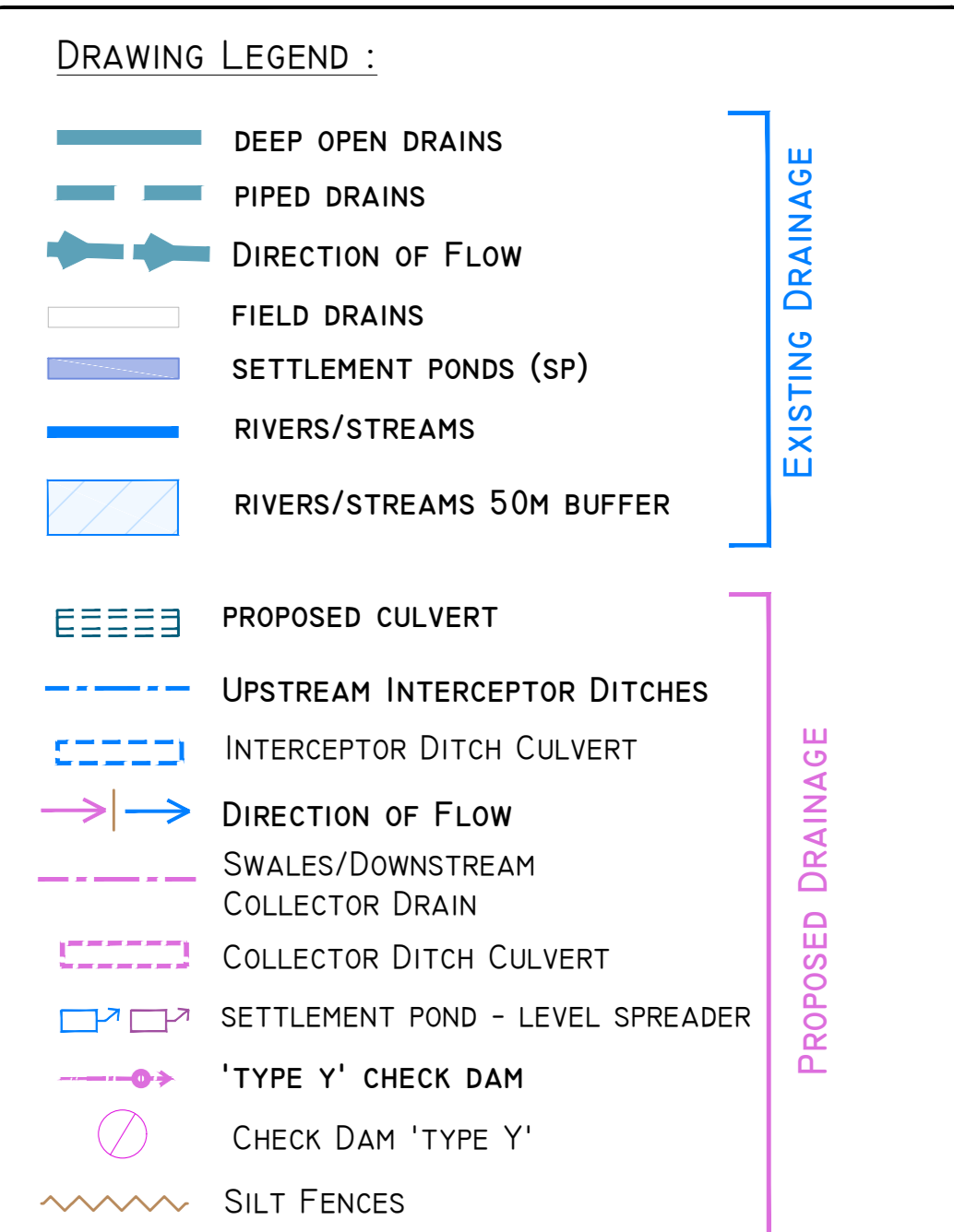
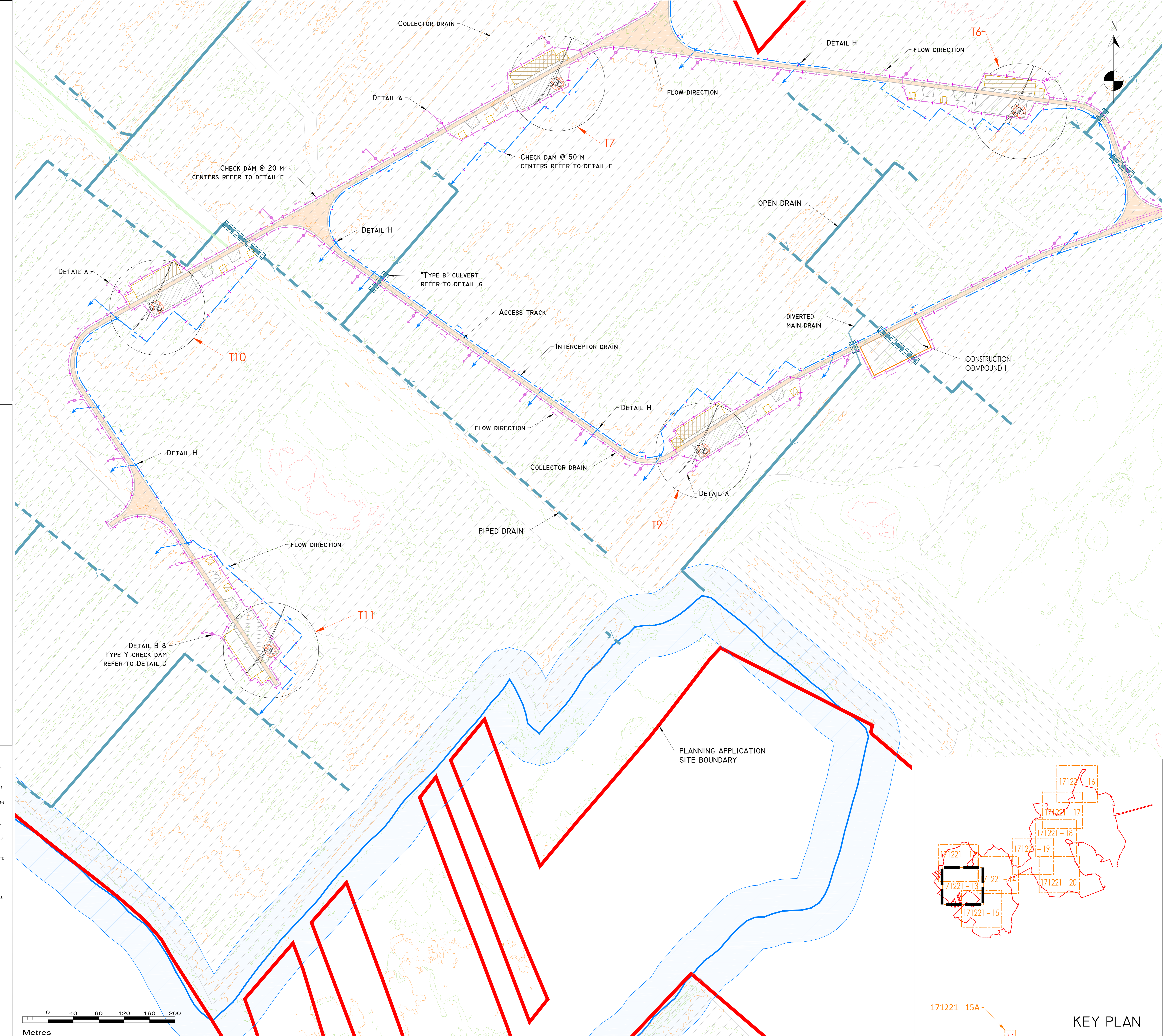
STOP - WORK IN THE IMMEDIATE AREA SHOULD BE STOPPED AND THE SOURCE OF THE POLLUTION IDENTIFIED.

CONTAIN - THE SOURCE OF THE POLLUTION SHOULD BE BUNDED USING A SUITABLE METHOD. NATURAL WATERCOURSES SHOULD BE TEMPORARILY DIVERTED AROUND THE SOURCE OF POLLUTION.

NOTIFY - THE RELEVANT AUTHORITIES (EPH, MAJORS / FISHERIES / NPWS / LOCAL AUTHORITY ETC.) SHOULD BE NOTIFIED IMMEDIATELY TO ENSURE THAT FISHERIES CAN BE IMPLEMENTED DOWNSTREAM TO PROTECT FISHERIES AND OTHER SENSITIVE AREAS.

MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE:

MANAGEMENT TYPE	DESCRIPTION OF SLEDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS	<ol style="list-style-type: none"> APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE USING SMALL WORKING AREAS WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED 'HOT' WEATHER.
SOURCE CONTROLS	<ol style="list-style-type: none"> USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE-DRAINS, DIVERSION DRAINS, FLUMES AND CULVERT PIPES EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> SAND BAGS OSTER BAGS FILLED WITH GRAVEL FILTER FABRICS AND OTHER SIMILAR/EQUIVALENT ON APPROPRIATE SYSTEMS USING SMALL WORKING AREAS COVERING STOCKPILES WEATHERING OFF / SEALING PEAT STOCKPILES
IN-LINE CONTROLS	<ol style="list-style-type: none"> INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED SWALES/COLLECTOR DRAINS EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> SAND BAGS OSTER BAGS FILLED WITH GRAVEL FILTER FABRICS STRAW BALES FLOW LIMITERS WEIRS OR BARRIERS AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. SILT FENCES, FILTER FABRICS IN STREAM SEDIMENTS COLLECTION SUMPS, TEMPORARY SUMPS, PUMPING SYSTEMS ATTENUATION LAGOONS SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
WATER TREATMENT CONTROLS	<ol style="list-style-type: none"> TEMPORARY SUMPS ATTENUATION PONDS TEMPORARY STORAGE LAGOONS SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTBOGGER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. SILT DEWATERING BAGS
OUTFALL CONTROLS	<ol style="list-style-type: none"> LEVELSPREADERS BUFFERED OUTFALLS VEGETATION FILTERS SILT DEWATERING BAGS FLOW LIMITERS AND WEIRS



DRAWING NOTES:

- DRAWINGS ISSUED ARE FOR PLANNING APPLICATION PURPOSES ONLY.
- COPYRIGHT, ALL RIGHTS RESERVED. NO PART HERE WITH MAY BE COPIED OR REPRODUCED PARTIALLY OR WHOLLY IN ANY FORM WHATSOEVER WITHOUT THE PRIOR NOTICE OF THE COPYRIGHT OWNER HYDRO-ENVIRONMENTAL SERVICES.
- DO NOT SCALE OFF THIS DRAWING. FIGURED METRIC DIMENSIONS ONLY SHOULD BE TAKEN OFF THIS DRAWING.
- ALL DIMENSIONS ARE IN METRES.

Ordnance Survey Ireland Licence No. EN 004420
© Ordnance Survey Ireland/Government of Ireland

Date	Description	Chkd	Signed

HYDRO ENVIRONMENTAL SERVICES

22 Lower Main St
Dunganavan
Co. Waterford
Ireland

tel: +353 (0) 58-44122
tel: +353 (0) 58-44244
email: info@hydroenvironmental.ie
web: www.hydroenvironmental.ie

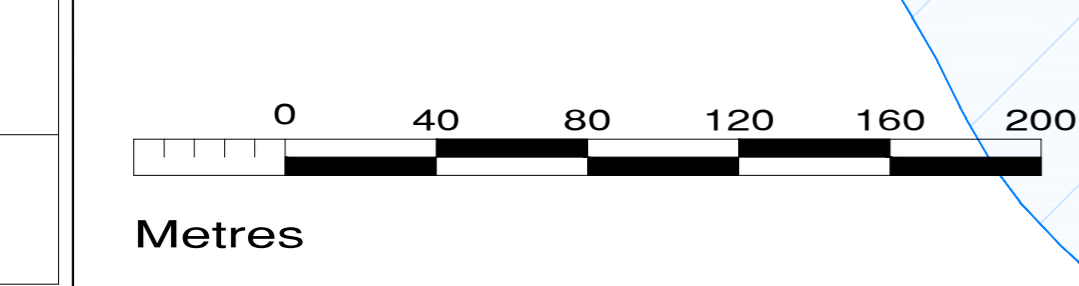
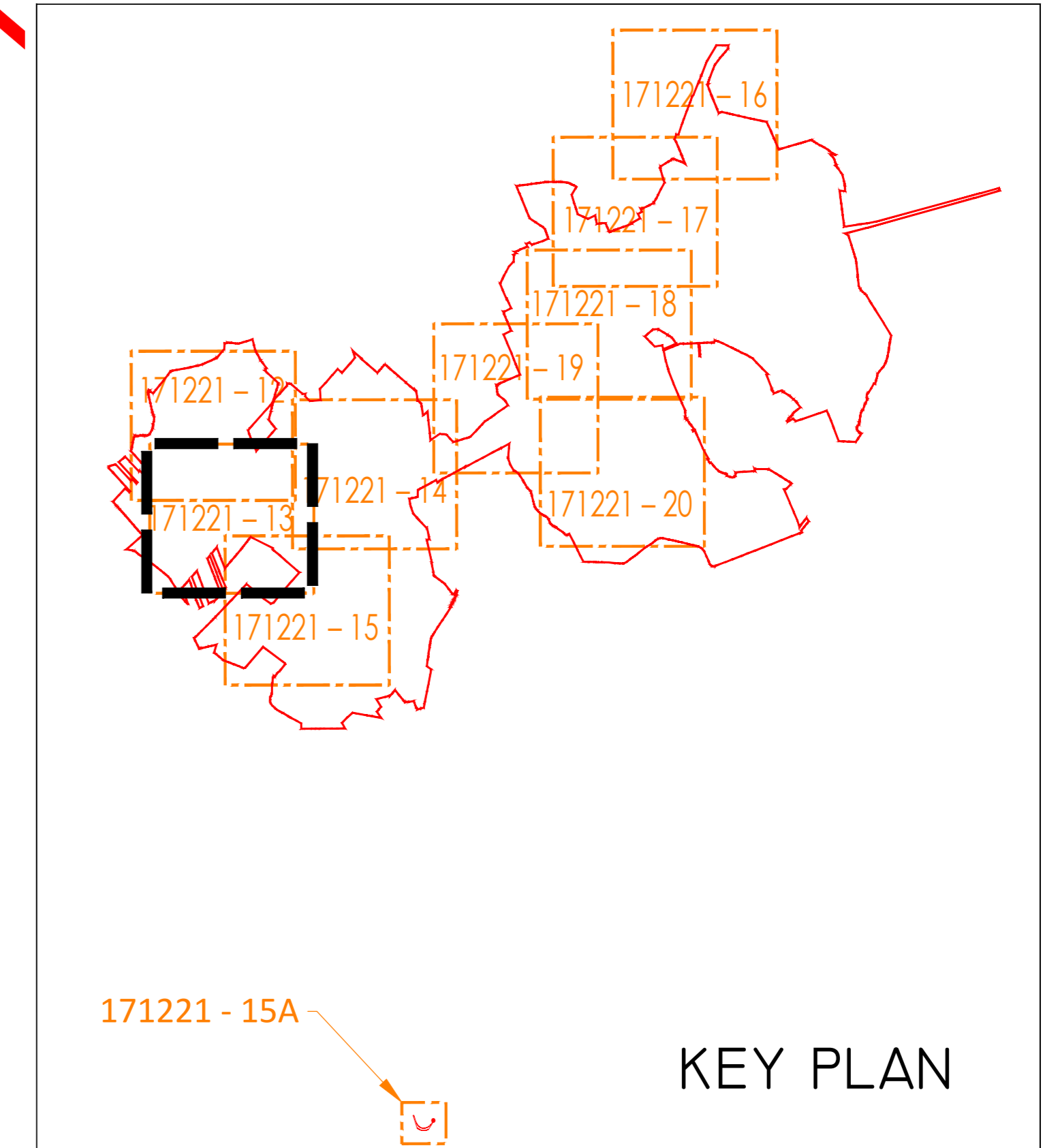
Client: **BORD NA MONA POWERGEN LTD**

Job: **DERRINLOUGH WF, CO. OFFALY**

Title: **PROPOSED DRAINAGE LAYOUT**

Figure No: **171221 - 13**

Drawing No: P1463-0-0220-A0-171221-12-00A
Sheet Size: A0 Project No.: P1463-0
Scale: 1:2,000 (A0) Drawn By: MG / GD
Date: 14/02/2020 Checked By: MG



DRAINAGE NOTES:

- ROADWAY SURFACING DESIGN AND CONSTRUCTION TO ENGINEER'S SPECIFICATION (I.E. BY OTHERS).
- STRAW BALE/SILT FENCING OR SIMILAR TO BE STORED ON SITE. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE TEMPORARILY MANAGED BY PLACING SILT FENCES, STRAW BALES / OR SIMILAR ON ADDITIONAL CHECK DAMS AT THE PROBLEM AREAS. MOBILE SILT BARRIER SYSTEM TO BE AVAILABLE ON SITE FOR USE AS REQUIRED ALSO.
- SILT FENCING TO BE CONSTRUCTED PRIOR TO, OR AT THE SAME TIME AS ACCESS TRACKS. INTERIOR MEASURES SUCH AS THE PLACEMENT OF STRAW BALES/SILT FENCING OR SIMILAR APPROVED METHOD OR ADDITIONAL CHECK DAMS AND SILT FENCES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIES OUT TO CONSTRUCT THE ACCESS TRACKS IS LIKELY TO CAUSE ADVERSE ENVIRONMENTAL EFFECTS THROUGH INCREASED SILT LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
- SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO RECEIVING WATER COURSES. SEE NOTES ON POLLUTION PREVENTION.
- INTERCEPTOR SWALES / DITCHES TO BE USED TO COLLECT UPSTREAM SURFACE WATER FLOWS. REGULAR CROSS DRAINS / DISCHARGE TO FIELD DITCHES WILL BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER IN INTERCEPTOR DRAINS TO SUITABLE FIELD DRAIN OUTFALL POINTS.
- DRAINAGE SWALES / DITCHES TO BE EXCAVATED ADJACENT TO THE ACCESS TRACKS. REGULAR CROSS DRAINS TO BE LOCATED ALONG ACCESS TRACKS TO PREVENT EXCESSIVE VOLUMES OF WATER COLLECTING IN THE SWALES / DITCHES. LOCATIONS OF CROSS DRAINS TO BE AGREED WITH THE ENGINEER ON SITE. SURFACE WATER WILL NOT BE ALLOWED TO DISCHARGE DIRECTLY INTO EXISTING WATERCOURSES.
- WHERE POSSIBLE, A BUFFER ZONE OF 50M TO ANY EXISTING WATERCOURSE WILL BE REQUIRED WHERE OVER LAND DISCHARGES ARE PROPOSED FROM ACCESS TRACK SWALES / DITCHES.
- BATTERS OF ALL PROPOSED SWALES / DITCHES TO HAVE A SLOPE OF BETWEEN 1:5 TO 1:2 DEPENDING UPON DEPTH OF SWALE/DITCH AND WILL BE LEFT AS CUT TO BE VEGETATED WITH LOCAL SPECIES.
- TRACK SIDE SWALES / DITCHES TO BE SHALLOW WITH MODERATE GRADIENTS TO PREVENT SCOURING. IN STEEP AREAS CHECK DAMS SHOULD BE INSTALLED TO REDUCE FLOW VELOCITIES AND PROVIDE SOURCE CONTROL OF SILT CONTAMINANT. WHERE NECESSARY THESE HAVE BEEN DESIGNATED IN CONSTRUCTION WITH SETTLEMENT PONDS AND SILT TRAPS. PRIOR TO DISCHARGE.
- SETTLEMENT PONDS TO BE CONSTRUCTED FOR SILT REMOVAL AT TURBINE BASES AND HARD STAND AREAS. POND SIZES DEPENDING ON CATCHMENT AREA SERVED. SAMPLE POND SIZES SHOWN ON DRAWING 0001.
- STRAW BALES / OR SIMILAR AND SILT FENCES TO BE USED ALSO AROUND SPOIL HEAPS TO MITIGATE SILT RUNOFF. SILT FENCES MAY BE REMOVED WHEN SUITABLE VEGETATION COVER IS ESTABLISHED.
- SILT FENCES TO BE PROVIDED ALONG COSE OF EXISTING WATERCOURSE WHERE WORKS COMES WITHIN 10M OF EDGE OF ANY DITCH / EMBANKMENT CHANNELS.
- SLOPES OF THE SWALES / DITCHES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER (PEAT 'SOO' OR 'SCRAW') FROM EXCAVATIONS TO BE STORED LOCALLY AND USED TO LINE SLOPES AND BASE OF SWALES / DITCHES OR LONGITUDINAL BARRIERS OF VEGETATION SWALES AT FIELD DRAIN DISCHARGE POINTS.
- AREAS STRIPPED OF VEGETATION SHOULD BE KEPT TO A MINIMUM.
- CLEAN STONE FLOW CONTROL CHECK DAMS TO BE MADE OF LOCALLY SOWN / OCCASIONALLY BRAMBLE HEDGES STONE. ADEQUATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 20-100M CLEAN STONE. ON SLOPING SECTIONS OF THE ACCESS TRACKS, DOWN CHECK DAMS TO BE PROTECTED FROM WASHING AWAY THROUGH THE PLACEMENT OF 100M STONE ON THE DOWNHILL FACE OF THE CHECK DAM AND BY WRAPPING IN GEOTEXTILE.
- SHOULDER OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY MONITORED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS TO BE REMOVED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT.
- SPACING AND FREQUENCY OF CHECK DAMS WILL BE DEPENDENT UPON LONGITUDINAL GRADIENT OF SWALE.
- LOCATION OF FILTRATION CHECK DAMS (IF REQUIRED) TO BE AGREED ON SITE WITH ENGINEER. SETTLEMENT PONDS TO BE CONSTRUCTED IN A MANNER WHERE THEY MAY BE EASILY INFILLED AT A LATER DATE. POST COMPLETION OF THE TURBINE BASE AND HARDSTAND CONSTRUCTION. ONLY SUITABLE MATERIALS EXCAVATED FROM THE POND TO BE USED TO FORM PART OF THE EMBANKMENT AROUND THE POND.
- DIESEL FUEL SHOULD BE STORED WITHIN BUNDED CONTAINMENT STRUCTURES.
- SILT BAGS WILL BE USED ON SITE AT FIELD DRAIN DISCHARGE LOCATIONS, AS NECESSARY.

POLLUTION PREVENTION NOTES:

- SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
- SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO OFF SITE RECEIVING WATERCOURSES.
- SILT WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/DISTURBED GROUND, TEMPORARY STOCKPILES, PLANT AND WHEEL WASH, SITE ROAD/TRACKS, AND DISTURBANCE OF EXISTING FIELD DRAINS AND DITCHES.

DISCHARGES:

- NO UNCOLLECTED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
- PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO DISCHARGE.
- TIPPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN FIELD DRAINS/DITCHES/STREAMS WILL BE COMPLETED IN A MANNER THAT DOES NOT CAUSE SCOUR OR EROSION AT THE POINT OF DISCHARGE/RELEASE. THIS WILL BE DONE BY REDUCING THE FLOW VELOCITIES OR BY USE OF SILT PLATES AND OTHER SIMILAR DISCHARGE CONTROL.
- VEGETATION WILL NOT BE STRIPPED FROM EXISTING FIELD DRAINS/DITCHES UNLESS ABSOLUTELY NECESSARY.

EXCAVATIONS:

- WHERE DEEP EXCAVATIONS ARE PROPOSED CUT-OFF DRAINS WILL BE USED TO REDUCE THE AMOUNT OF SURFACE WATER ENTERING THE EXCAVATION. THIS WILL BE THE CASE AROUND TURBINE BASE EXCAVATIONS.

EXPOSED GROUND & STOCKPILES:

- THE AMOUNT OF EXPOSED GROUND AND TEMPORARY STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED, AS FAR AS PRACTICABLE.

SILT TRAPS:

- USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR FILTRATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER AS REQUIRED.
- CHECK DAMS TO BE INSPECTED AND CLEANED REGULARLY.
- REFUELLING OF MOBILE PLANT WILL BE COMPLETED IN DESIGNATED REFUELLING AREAS ONLY. REFUELLING ON AN IMPERMEABLE SURFACE AND AWAY FROM FIELD DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.
- SILT TRAPS AND DRIP TRAYS WILL BE AVAILABLE ON SITE FOR USE AS REQUIRED.

CONCRETE:

- CARE WILL BE TAKEN WHEN COMPLETING CONCRETE WORKS ON SITE TO ENSURE NO DISCHARGE OCCUR.
- CONCRETE WASH WATER, AND WASTE CONCRETE WILL BE MANAGED APPROPRIATELY ON SITE.

IF WATER POLLUTION IS IDENTIFIED THE FOLLOWING STEPS WOULD BE ADHERED TO:

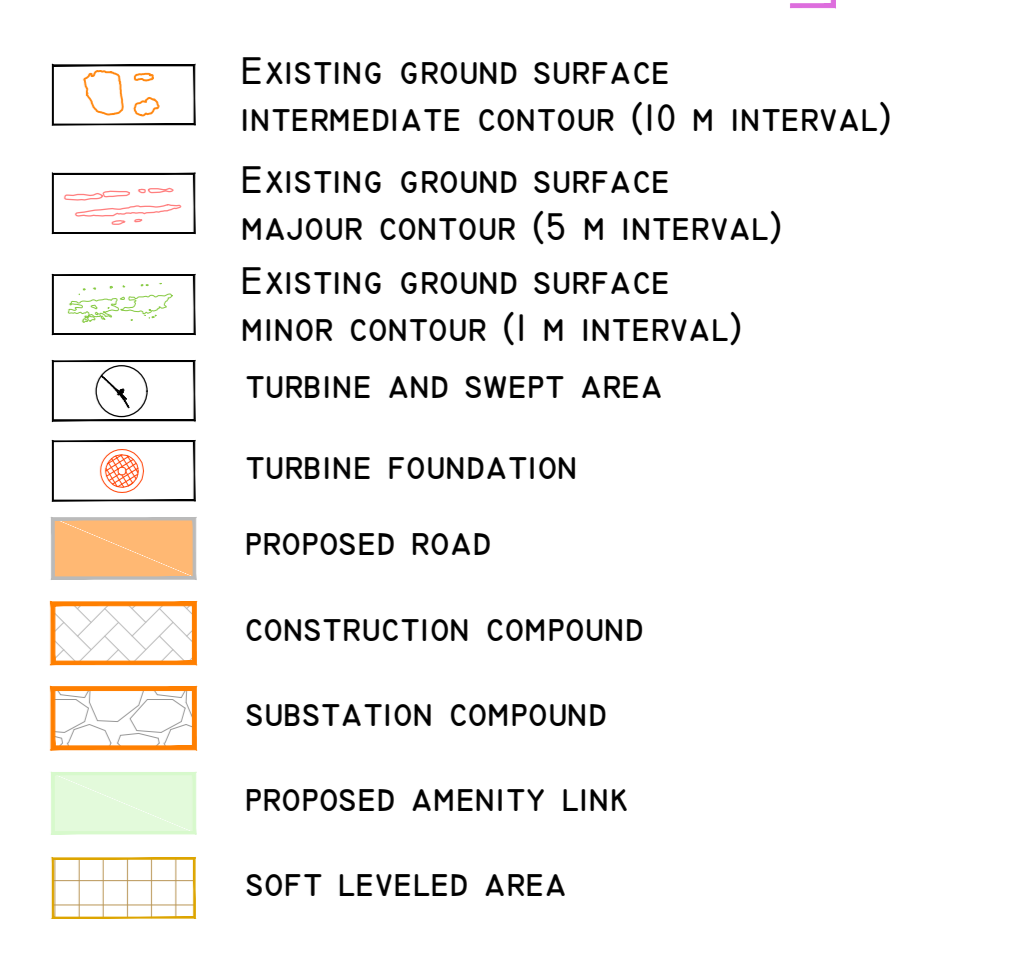
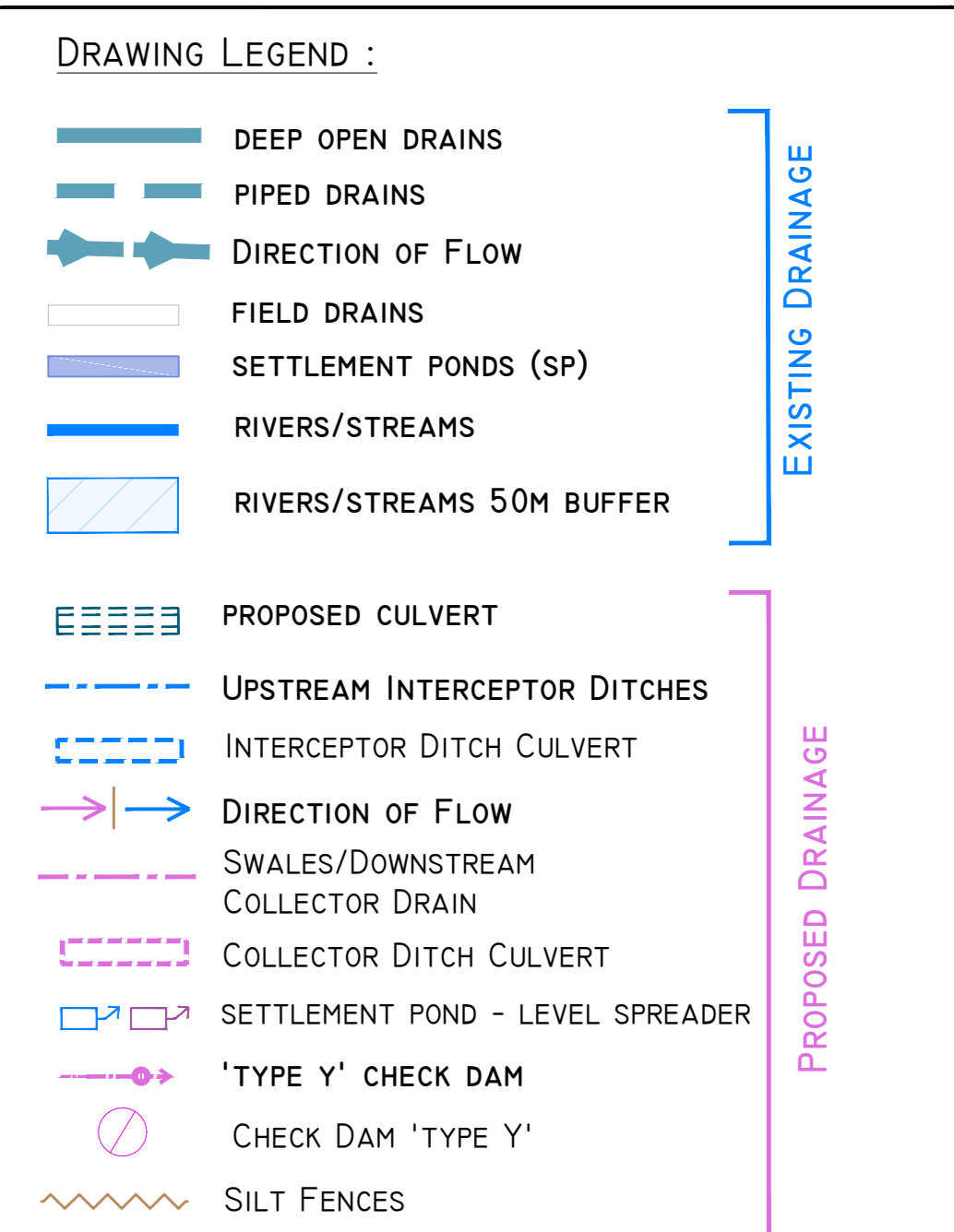
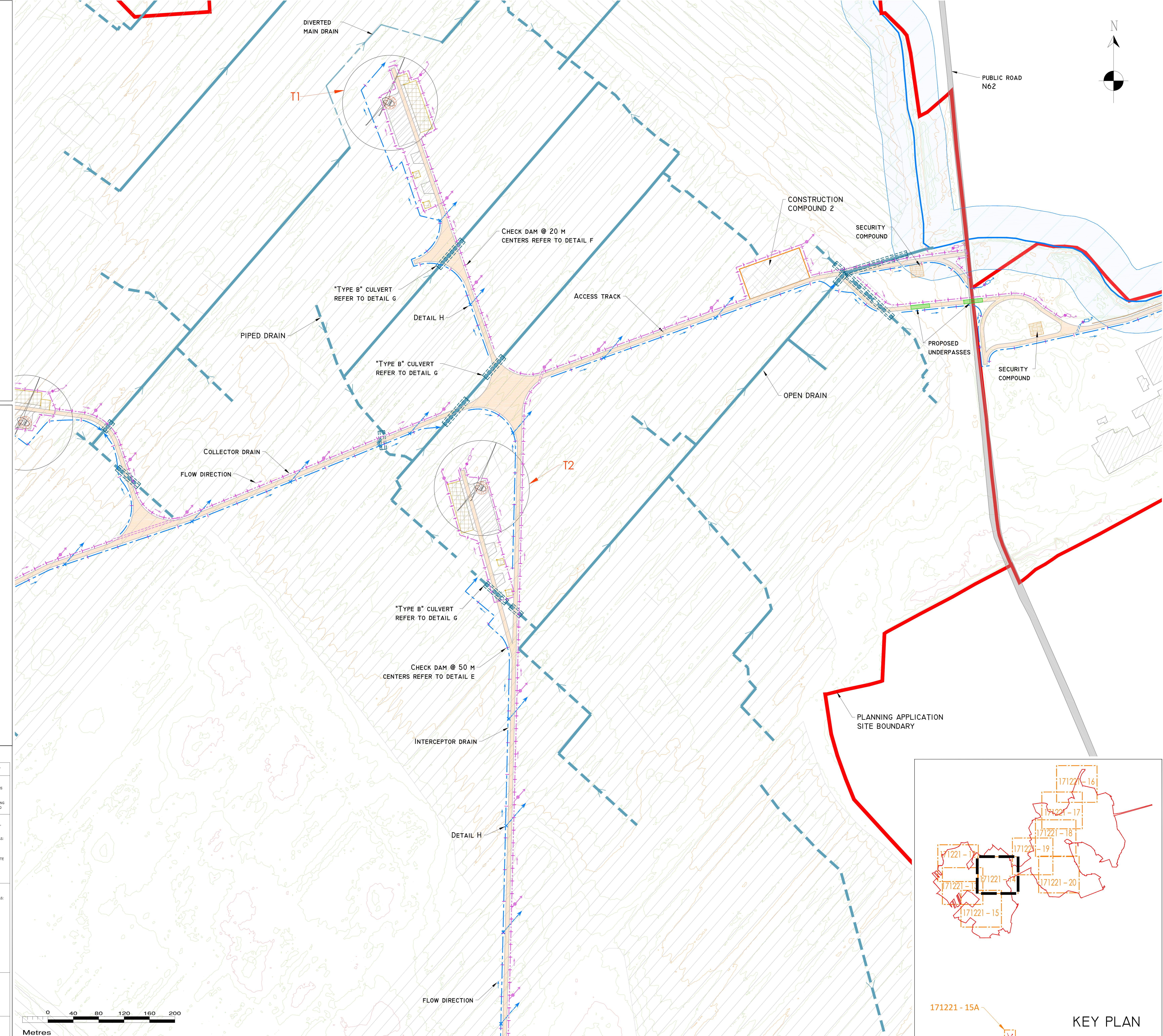
STOP - WORK IN THE IMMEDIATE AREA SHOULD BE STOPPED AND THE SOURCE OF THE POLLUTION IDENTIFIED.

CONTAIN - THE SOURCE OF THE POLLUTION SHOULD BE BUNDED USING A SUITABLE METHOD. NATURAL WATERCOURSES SHOULD BE TEMPORARILY DIVERTED AROUND THE SOURCE OF POLLUTION.

NOTIFY - THE RELEVANT AUTHORITIES (SITE MANAGER / FISHERIES / NPWS / LOCAL AUTHORITY ETC.) SHOULD BE NOTIFIED IMMEDIATELY TO ENSURE THAT MEASURES CAN BE IMPLEMENTED DOWNSTREAM TO PROTECT FISHERIES AND OTHER SENSITIVE AREAS.

MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE:

MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS:	<ol style="list-style-type: none"> APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE. APPLICATION OF BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE.
SOURCE CONTROLS:	<ol style="list-style-type: none"> EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> SAND BAGS OSTER BAGS FILLED WITH GRAVEL FILTER FABRICS AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS USING SMALL WORKING AREAS COVERING STOCKPILES WEATHERING OFF / SEALING PEAT STOCKPILES
IN-LINE CONTROLS:	<ol style="list-style-type: none"> INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED SWALES/COLLECTOR DRAINS EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> SAND BAGS OSTER BAGS FILLED WITH GRAVEL FILTER FABRICS STRAW BALES FLOW LIMITERS WEIRS OR BARRIERS AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS SILT FENCES, FILTER FABRICS IN STREAM SEDIMENTS COLLECTION SUPPS, TEMPORARY SUPPS, PUMPING SYSTEMS ATTENUATION LAGOONS
WATER TREATMENT CONTROLS:	<ol style="list-style-type: none"> TEMPORARY SUPPS ATTENUATION PONDS TEMPORARY STORAGE LAGOONS SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTTRUBER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS SILT DEWATERING BAGS
OUTFALL CONTROLS:	<ol style="list-style-type: none"> LEVEL SPREADERS BUFFERS/SWALES VEGETATION FILTERS SILT DEWATERING BAGS FLOW LIMITERS AND WEIRS



DRAWING NOTES:

- DRAWINGS ISSUED ARE FOR PLANNING APPLICATION PURPOSES ONLY.
- COPYRIGHT, ALL RIGHTS RESERVED. NO PART HERE WITH MAY BE COPIED OR REPRODUCED PARTIALLY OR WHOLLY IN ANY FORM WHATSOEVER WITHOUT THE PRIOR NOTICE OF THE COPYRIGHT OWNER HYDRO-ENVIRONMENTAL SERVICES.
- DO NOT SCALE OFF THIS DRAWING. FIGURED METRIC DIMENSIONS ONLY SHOULD BE TAKEN OFF THIS DRAWING.
- ALL DIMENSIONS ARE IN METRES.

Ordnance Survey Ireland Licence No. EN 0044720
© Ordnance Survey Ireland/Government of Ireland

Date	Description	Chkd	Signed

HYDRO ENVIRONMENTAL SERVICES

22 Lower Main St
Dungarvan
Co. Waterford
Ireland

tel: +353 (0) 58-44122
tel: +353 (0) 58-44244
email: info@hydroenvironmental.ie
web: www.hydroenvironmental.ie

Client: BORD NA MONA POWERGEN LTD

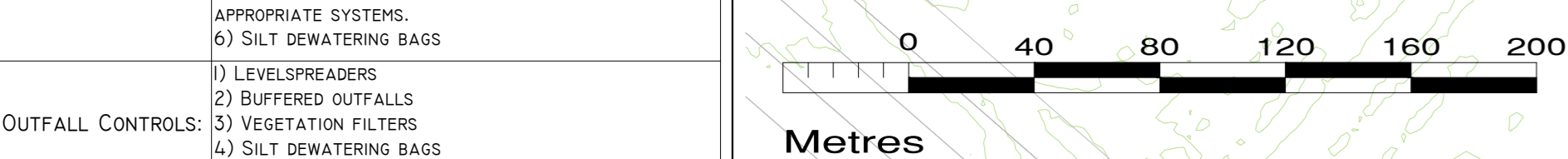
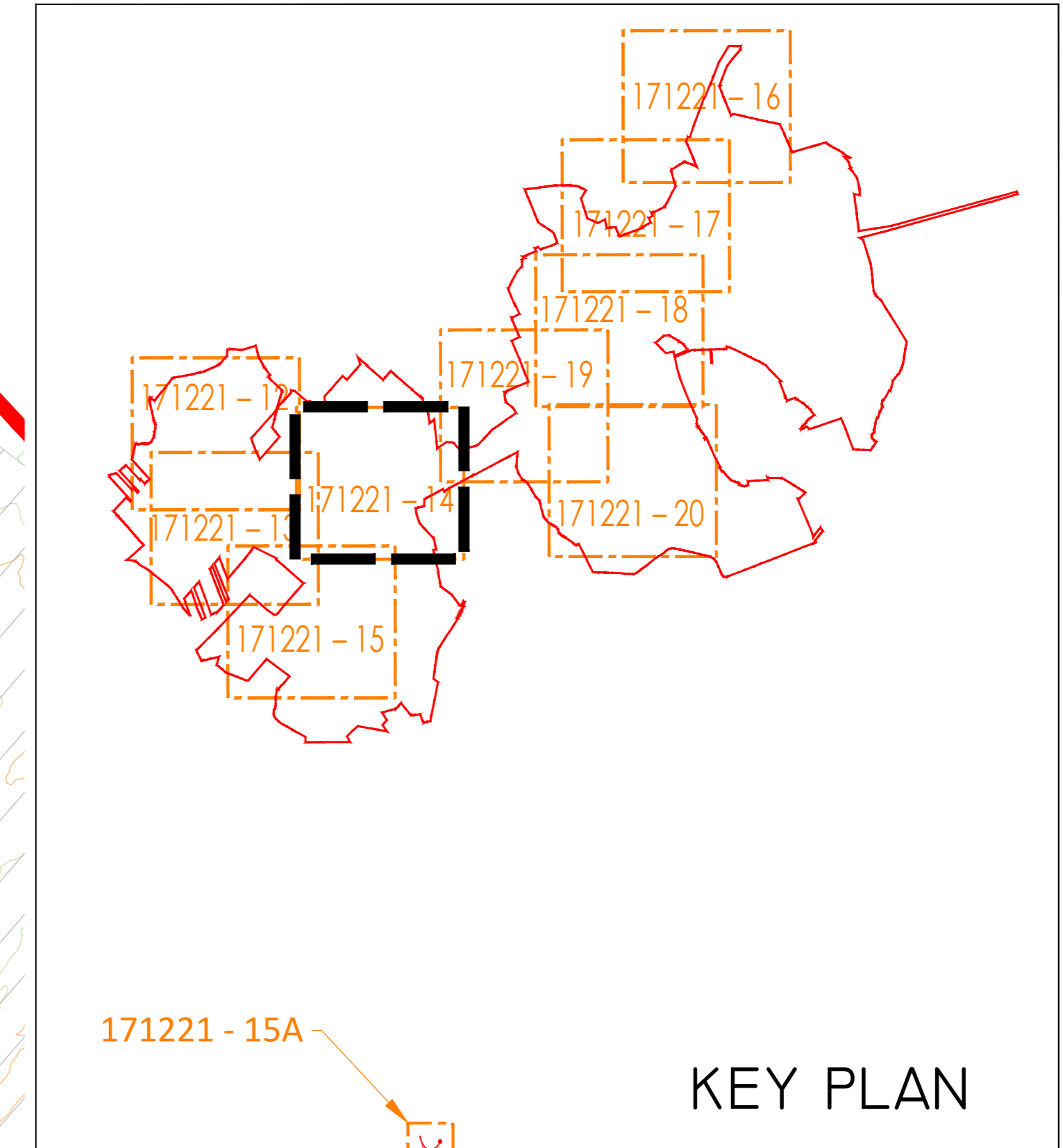
Job: DERRINLOUGH WF, CO. OFFALY

Title: PROPOSED DRAINAGE LAYOUT

Figure No: 171221 - 14

Drawing No: P1463-0-0220-A0-171221-14-00A

Sheet Size: A0 **Project No.:** P1463-0
Scale: 1:2,000 (A0) **Drawn By:** MG / GD
Date: 14/02/2020 **Checked By:** MG



DRAINAGE NOTES:

- ROADWAY SURFACING DESIGN AND CONSTRUCTION TO ENGINEER'S SPECIFICATION (I.E. BY OTHERS).
- STRAP STRAW BALE/SILT FENCING OR SIMILAR, TO BE STORED ON SITE. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE TEMPORARILY MANAGED BY PLACING SILT FENCES, STRAW BALES / OR SIMILAR ON ADDITIONAL CHECK DAMS AT THE PROBLEM AREAS. PORTABLE SILTTRUSTER SYSTEM TO BE AVAILABLE ON SITE FOR USE AS REQUIRED ALSO.
- SLEDS SYSTEM TO BE CONSTRUCTED PRIOR TO, OR AT THE SAME TIME AS THE ACCESS TRACKS. INTERIM MEASURES SUCH AS THE PLACEMENT OF STRAW BALES/SILT FENCING OR SIMILAR APPROVED METHOD OR ADDITIONAL CHECK DAMS AND SILT FENCES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIES OUT TO CONSTRUCT THE ACCESS TRACKS IS LIKELY TO CAUSE ADVERSE ENVIRONMENTAL EFFECTS THROUGH INCREASED SILT LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
- SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO RECEIVING WATER COURSES. SEE NOTES ON POLLUTION PREVENTION.
- INTERCEPTOR SWALES / DITCHES TO BE USED TO COLLECT UPSTREAM SURFACE WATER FLOWS. REGULAR CROSS DRAINS / DISCHARGE TO FIELD DITCHES WILL BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER IN INTERCEPTOR DRAINS TO SUITABLE FIELD DRAIN OUTFALL POINTS.
- DRAINAGE SWALES / DITCHES TO BE EXCAVATED ADJACENT TO THE ACCESS TRACKS. REGULAR CROSS DRAINS TO BE LOCATED ALONG ACCESS TRACKS TO PREVENT EXCESSIVE VOLUMES OF WATER COLLECTING IN THE SWALES / DITCHES. LOCATIONS OF CROSS DRAINS TO BE AGREED WITH THE ENGINEER ON SITE. SURFACE WATER WILL NOT BE ALLOWED TO DISCHARGE DIRECTLY INTO EXISTING WATERCOURSES.
- WHERE POSSIBLE A BUFFER ZONE OF >50M TO ANY EXISTING WATERCOURSE WILL BE REQUIRED WHERE OVER LAND DISCHARGES ARE PROPOSED FROM ACCESS TRACK SWALES / DITCHES.
- BATTERS OF ALL PROPOSED SWALES / DITCHES TO HAVE A SLOPE OF BETWEEN 1:5 TO 1:2 DEPENDING UPON DEPTH OF SWALE/DITCH AND WILL BE LEFT AS CUT TO BE VEGETATED WITH LOCAL TREES.
- TRACK SIDE SWALES / DITCHES TO BE SHALLOW WITH MODERATE GRADIENTS TO PREVENT SCOURING. IN STEEP AREAS CHECK DAMS SHOULD BE INSTALLED TO REDUCE FLOW VELOCITIES AND PROVIDE SOURCE CONTROL OF SILT CONTAMINANT. WHERE NECESSARY THESE HAVE BEEN DESIGNATED IN CONJUNCTION WITH SETTLEMENT PONDS AND SILT TRAPS PRIOR TO DISCHARGE.
- SETTLEMENT PONDS TO BE CONSTRUCTED FOR SILT REMOVAL AT TURBINE BASES AND HARD STAND AREAS. POND SIZES DEPEND ON CATCHMENT AREA SERVED. SAMPLE POND SIZES SHOWN ON DRAWING D001.
- STRAW BALES / OR SIMILAR AND SILT FENCES TO BE USED ALSO AROUND SPOIL HEAPS TO MITIGATE SILT RUNOFF. SILT FENCES MAY BE REMOVED WHEN SUITABLE VEGETATION COVER IS ESTABLISHED.
- SILT FENCES TO BE PROVIDED ALONG EDGE OF EXISTING WATERCOURSE WHERE WORKS COMES WITHIN 150M OF EDGE OF ANY DITCH / EMBANKMENT CHANNELS.
- SLOPES OF THE SWALES / DITCHES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER (HEAT 'SOO' OR 'SCRAW') FROM EXCAVATIONS TO BE STORED LOCALLY AND USED TO LINE SLOPES AND BASE OF SWALES / DITCHES OR LONGITUDINAL MOUNDS OF VEGETATION WALLS AT FIELD DRAIN DISCHARGE POINTS.
- AREAS STRIPPED OF VEGETATION SHOULD BE KEPT TO A MINIMUM.
- CLEAN STONE FLOW CONTROL CHECK DAMS TO BE MADE OF LOCALLY SOWN / GEOLOGICALLY SIMILAR WELL GRADED SILT SANDS. SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 20-100MM CLEAN STONE. ON SLOPING SECTIONS OF THE ACCESS TRACKS, 40MM CHECK DAMS TO BE PROTECTED FROM WASHING AWAY THROUGH THE PLACEMENT OF 100M STONE ON THE DOWNHILL FACE OF THE CHECK DAM AND BY WRAPPING IN GEOTEXTILE.
- BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY MONITORED AS PART OF AN ONGOING DRAINAGE MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAM TO BE REMOVED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT.
- SPACING AND FREQUENCY OF CHECK DAMS WILL BE DEPENDENT UPON CONDITIONAL GRADIENT OF SWALE.
- LOCATION OF FILTRATION CHECK DAMS (IF REQUIRED) TO BE AGREED ON SITE WITH ENGINEER. SETTLEMENT PONDS TO BE CONSTRUCTED IN A MANNER WHERE THEY MAY BE EASILY INFILLED AT A LATER DATE (POST COMPLETION OF THE TURBINE BASE AND HARDSTAND CONSTRUCTION). ONLY SUITABLE MATERIALS EXCAVATED FROM THE POND TO BE USED TO FORM PART OF THE EMBANKMENT AROUND THE POND.
- DIL FUEL SHOULD BE STORED WITHIN BUNDED CONTAINMENT STRUCTURES.
- SILT BAGS WILL BE USED ON SITE AT FIELD DRAIN DISCHARGE LOCATIONS, AS NECESSARY.

POLLUTION PREVENTION NOTES:

- SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
- SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO OFF SITE RECEIVING WATERCOURSES.
- SILT WATER CAN ARISE FROM DEWATERING EXCAVATIONS. EROSION OF EXPOSED/DISTURBED GROUND, TEMPORARY STOCKPILES, PLANT AND WHEEL WASH, SITE ROAD TRACKS, AND DISBURSANCE OF EXISTING FIELD DRAINING AND DITCHES.

DISCHARGES:

- WATER CONTAINING SILT WILL NOT BE PUMPED DIRECTLY TO ANY NATURAL WATERCOURSE. ALL DISCHARGES TO BE MADE OVER OPEN GROUND OR INTO EXISTING FIELD DRAIN WITH SILT TRAP A MINIMUM 20M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
- NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
- PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO FLOW AND DISCHARGE.
- TURNING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN FIELD DRAINS/DITCHES/STREAMS WILL BE COMPLETED IN A MANNER THAT DOES NOT CAUSE SCOUR OR EROSION. AT THE POINT OF DISCHARGE/TURNING THIS WILL BE DONE BY REDUCING THE FLOW VELOCITIES OR BY USE OF SPLASH PLATES, AND OTHER SIMILAR DISBURSANCE CONTROLS.
- VEGETATION WILL NOT BE STRIPPED FROM EXISTING FIELD DRAINS/DITCHES UNLESS ABSOLUTELY NECESSARY.

EXCAVATIONS:

- WHERE DEEP EXCAVATIONS ARE PROPOSED CUT-OFF DRAINS WILL BE USED TO REDUCE THE AMOUNT OF SURFACE WATER ENTERING THE EXCAVATION. THIS WILL BE THE CASE AROUND TURBINE BASE EXCAVATIONS.

EXPOSED GROUND & STOCKPILES:

- THE AMOUNT OF EXPOSED GROUND AND TEMPORARY STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED, AS FAR AS PRACTICABLE.

SILT TRAPS:

- USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR FILTRATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER AS REQUIRED.
- CHECK DAMS TO BE INSPECTED AND CLEANED REGULARLY.

REFUELLING:

- REFUELLING OF MOBILE PLANT WILL BE COMPLETED IN DESIGNATED REFUELLING AREAS ONLY. PREFERABLY ON AN IMPERMEABLE SURFACE AND AWAY FROM FIELD DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.
- SPILL KITS AND DRIP TRAYS WILL BE AVAILABLE ON SITE FOR USE AS REQUIRED.

CONCRETE:

- CARE WILL BE TAKEN WHEN COMPLETING CONCRETE WORKS ON SITE TO ENSURE NO DISCHARGE OCCUR.
- CONCRETE WASH WATER, AND WASTE CONCRETE WILL BE MANAGED APPROPRIATELY ON SITE.

IF WATER POLLUTION IS IDENTIFIED THE FOLLOWING STEPS WOULD BE ADHERED TO:

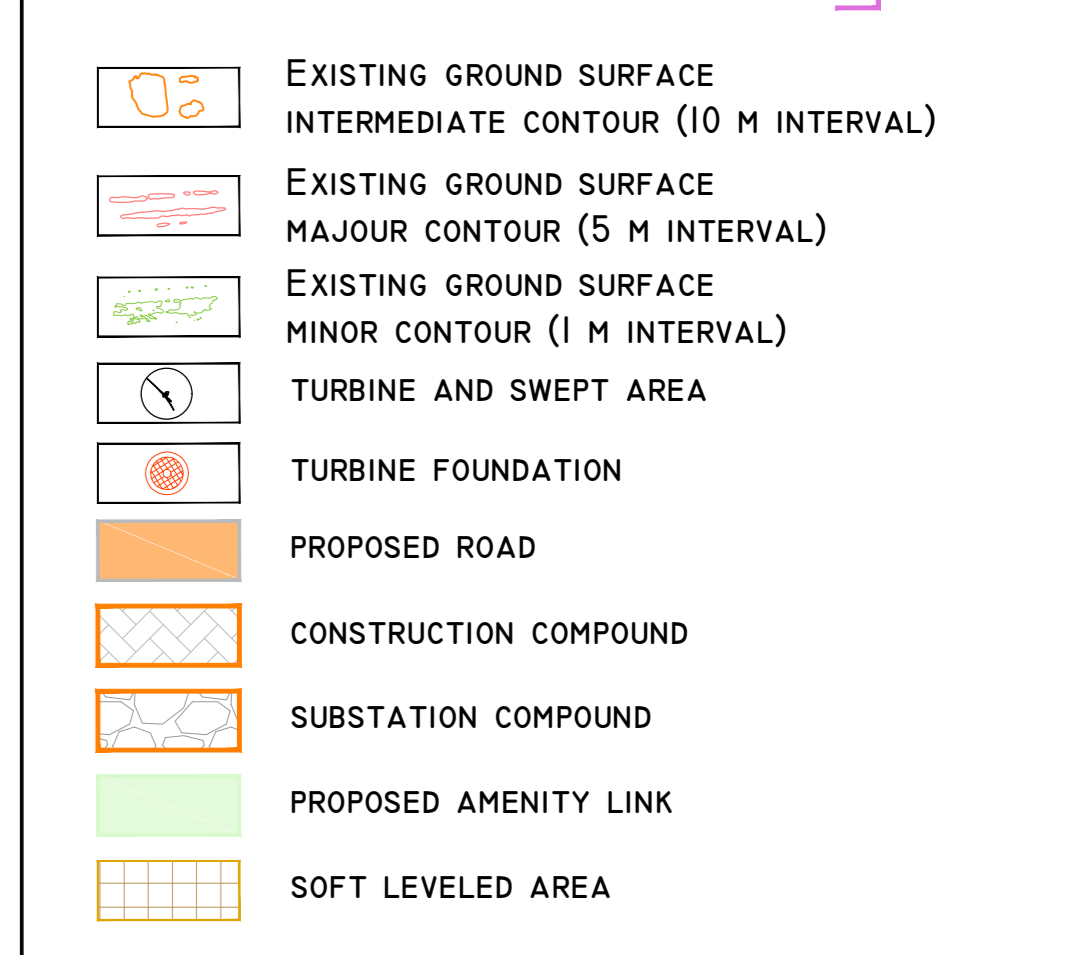
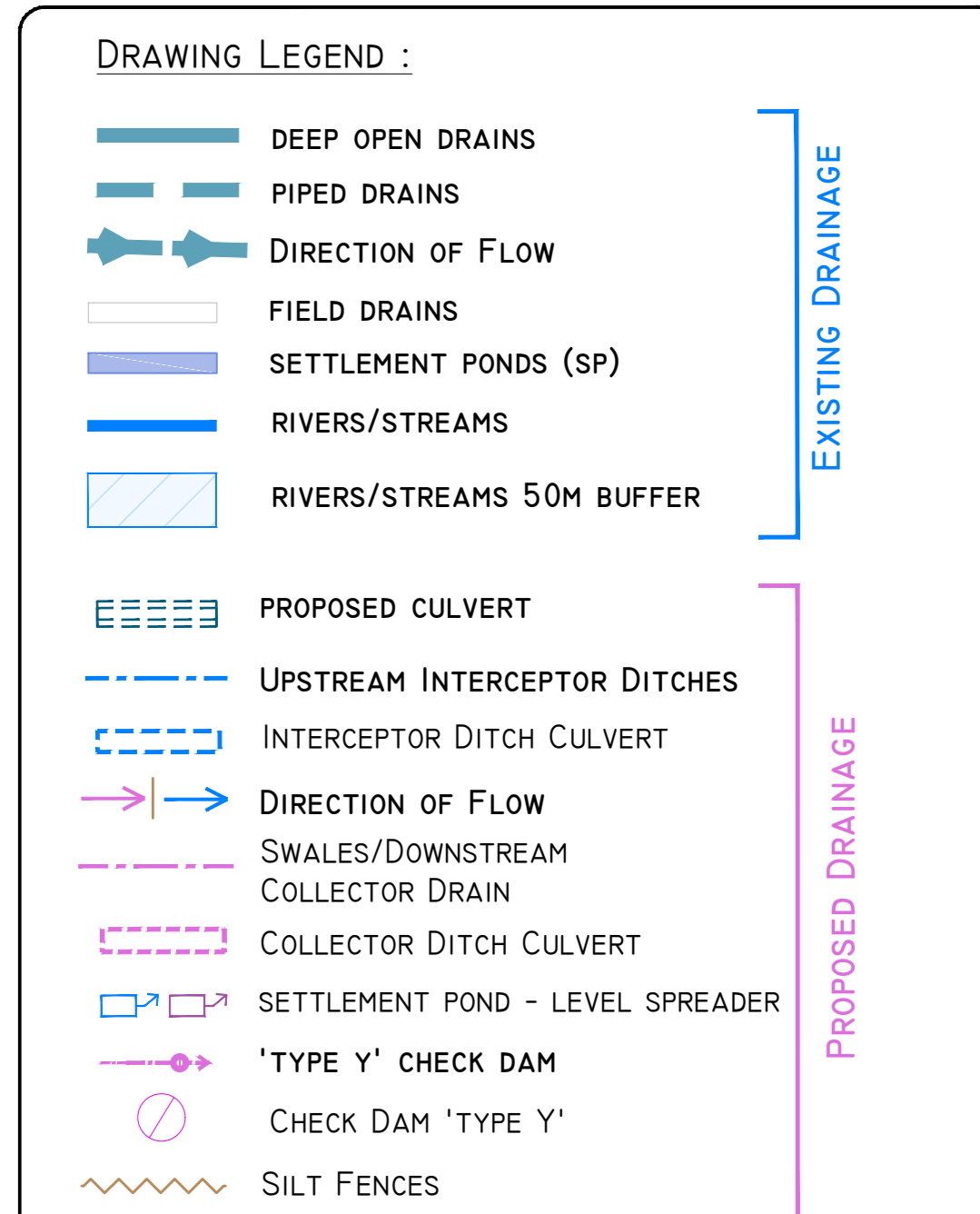
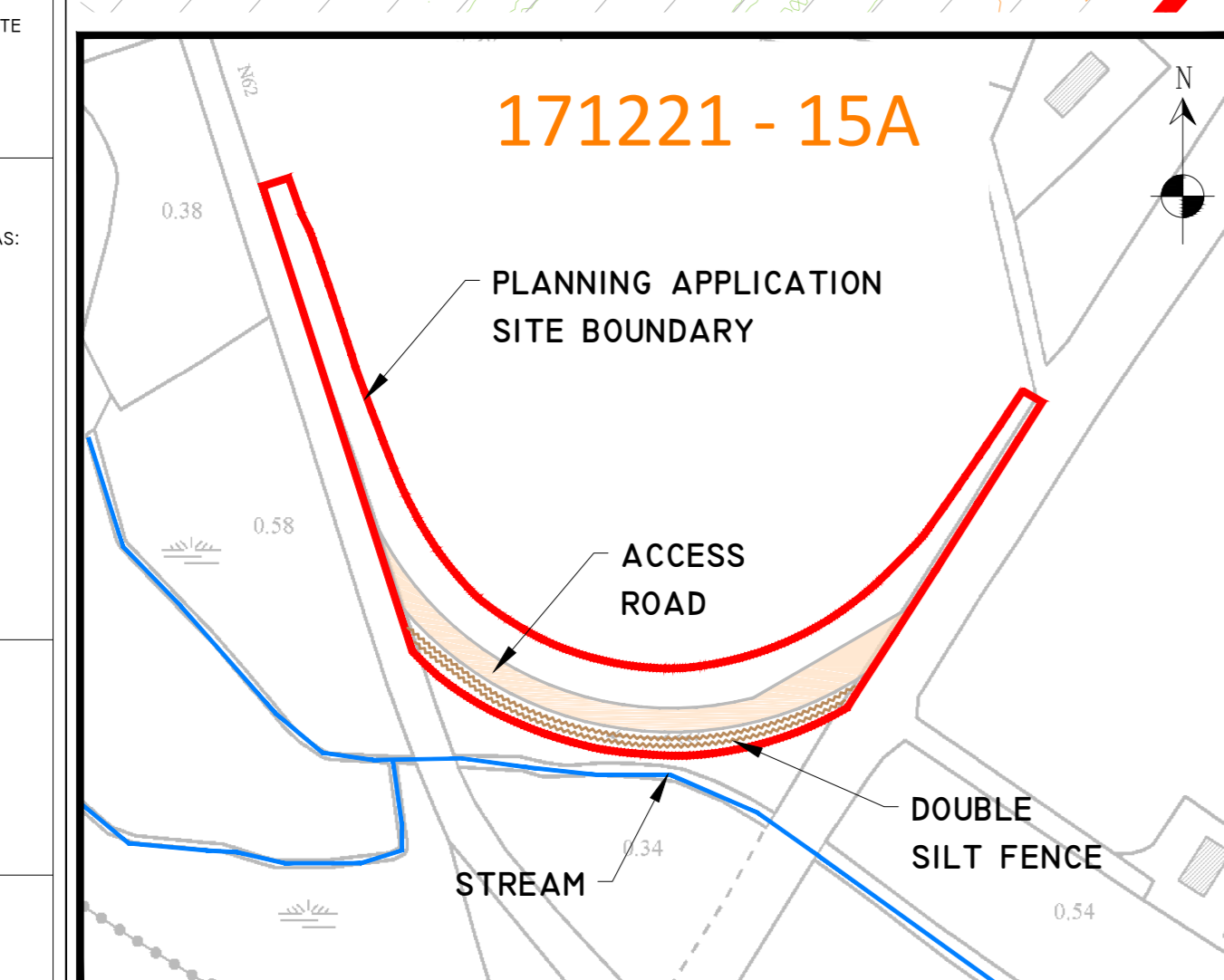
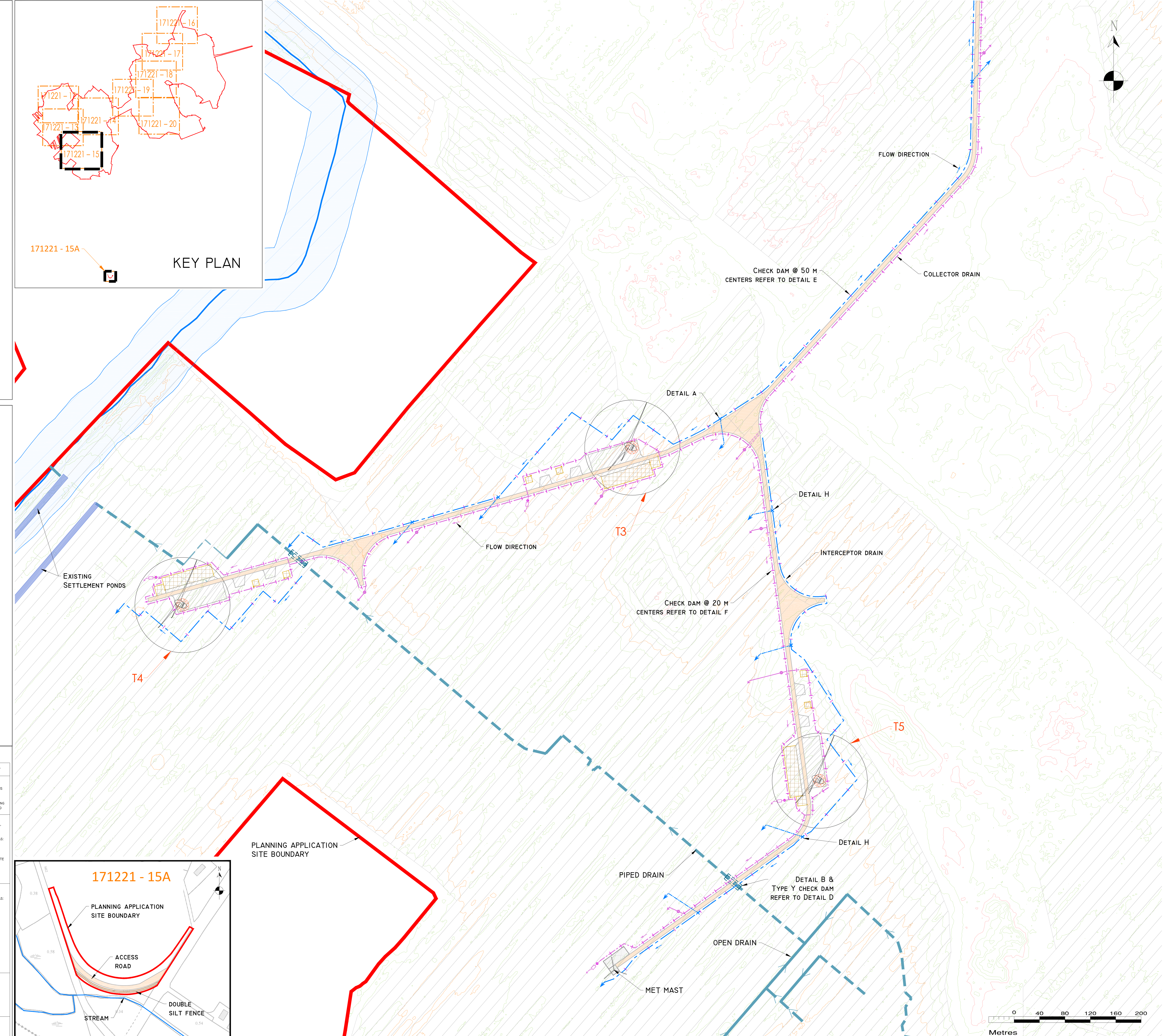
STOP - WORK IN THE IMMEDIATE AREA SHOULD BE STOPPED AND THE SOURCE OF THE POLLUTION IDENTIFIED.

CONTAIN - THE SOURCE OF THE POLLUTION SHOULD BE RAISED USING A SUITABLE METHOD. NATURAL WATERCOURSES SHOULD BE TEMPORARILY DIVERTED AROUND THE SOURCE OF POLLUTION.

NOTIFY - THE RELEVANT AUTHORITIES (SITE MANAGER / FISHERIES / NPWS / LOCAL AUTHORITY ETC) SHOULD BE NOTIFIED IMMEDIATELY TO ENSURE THAT MEASURES CAN BE IMPLEMENTED DOWNTHEAM TO PROTECT FISHERIES AND OTHER SENSITIVE AREAS.

MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE

MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS:	<ol style="list-style-type: none"> APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE. APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE. USING SMALL WORKING AREAS. WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHER.
SOURCE CONTROLS:	<ol style="list-style-type: none"> USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNTHEAM COLLECTOR DRAINS / OVERSIZED SWALES, VEGETATION, DIVERSION DRAINS, FLUMES AND GULCHET PIPES. EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> SAND BAGS OSTER BAGS FILLED WITH GRAVEL FILTER FABRICS AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. USING SMALL WORKING AREAS COVERING STOCKPILES
IN-LINE CONTROLS:	<ol style="list-style-type: none"> INTERCEPTOR DRAINS, VEGETATION, OVERSIZED SWALES/COLLECTOR DRAINS EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> SAND BAGS OSTER BAGS FILLED WITH GRAVEL FILTER FABRICS STRAW BALES FLOW LIMITERS WEIRS OR BAPPLERS AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. SILT FENCES, FILTER FABRICS IN STREAM SEDIMENTS COLLECTION SUMPS, TEMPORARY SUMPS, PUMPING SYSTEMS ATTENUATION LAGOONS SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
WATER TREATMENT CONTROLS:	<ol style="list-style-type: none"> TEMPORARY SUMPS TEMPORARY STORAGE LAGOONS SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTTRUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. SILT DEWATERING BAGS
OUTFALL CONTROLS:	<ol style="list-style-type: none"> LEVELSPREADERS BUFFERED OUTFALLS VEGETATION FILTERS SILT DEWATERING BAGS FLOW LIMITERS AND WEIRS



DRAWING NOTES:

- DRAWINGS ISSUED ARE FOR PLANNING APPLICATION PURPOSES ONLY.
- COPYRIGHT, ALL RIGHTS RESERVED. NO PART HERE WITH MAY BE COPIED OR REPRODUCED PARTIALLY OR WHOLLY IN ANY FORM WHATSOEVER WITHOUT THE PRIOR NOTICE OF THE COPYRIGHT OWNER HYDRO-ENVIRONMENTAL SERVICES.
- DO NOT SCALE OFF THIS DRAWING. FIGURED METRIC DIMENSIONS ONLY SHOULD BE TAKEN OFF THIS DRAWING.
- ALL DIMENSIONS ARE IN METRES.

Ordnance Survey Ireland Licence No. EN 0044720
© Ordnance Survey Ireland/Government of Ireland

Date	Description	Chkd	Signed

HYDRO ENVIRONMENTAL SERVICES

22 Lower Main St
Dungarvan
Co. Waterford
Ireland

tel: +353 (0) 58-44122
tel: +353 (0) 58-44244
email: info@hydroenvironmental.ie
web: www.hydroenvironmental.ie

Client: **BORD NA MONA POWERGEN LTD**

Job: **DERRINLOUGH WF, CO. OFFALY**

Title: **PROPOSED DRAINAGE LAYOUT**

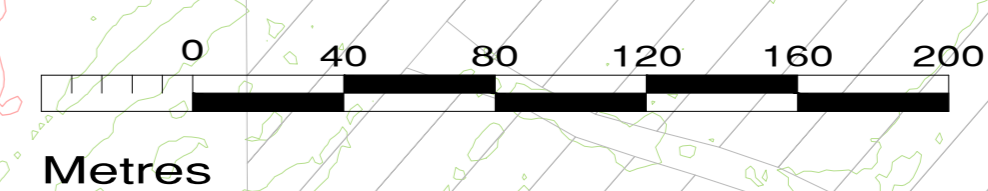
Figure No: **171221 - 15**

Drawing No: P1463-0-0220-A0-171221-15-00A

Sheet Size: A0 Project No.: P1463-0

Scale: 1:2,000 (A0) Drawn By: MG / GD

Date: 14/02/2020 Checked By: MG



DRAINAGE NOTES:

- ROADWAY SURFACING DESIGN AND CONSTRUCTION TO ENGINEER'S SPECIFICATION (I.E. BY OTHERS).
- SHAPE STRAW BALE/SILT FENCING/ OR SIMILAR, TO BE STORED ON SITE. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE TEMPORARILY MANAGED BY ALIGNED SILT FENCES, STRAW BALES / OR SIMILAR OR ADDITIONAL CHECK DAMS AT THE PROBLEM AREAS. MOBILE SILTTRUSTER SYSTEM TO BE AVAILABLE ON SITE FOR USE AS REQUIRED ALSO.
- SLEDS SYSTEM TO BE CONSTRUCTED PRIOR TO, OR AT THE SAME TIME AS THE ACCESS TRACKS. INTERIM MEASURES SUCH AS THE PLACEMENT OF STRAW BALES/SILT FENCING/OR SIMILAR APPROVED METHOD OR ADDITIONAL CHECK DAMS AND SILT FENCES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS TRACKS IS LIKELY TO CAUSE ADVERSE ENVIRONMENTAL EFFECTS THROUGH INCREASED SILT LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
- SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO RECEIVING WATER COURSES. SEE NOTES ON POLLUTION PREVENTION.
- INTERCEPTOR SWALES / DITCHES TO BE USED TO COLLECT UPSTREAM SURFACE WATER FLOWS. REGULAR CROSS DRAINS / DISCHARGE TO FIELD DITCHES WILL BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER IN INTERCEPTOR TRACKS TO SUITABLE FIELD DRAIN OUTFALL POINTS.
- DRAINAGE SWALES / DITCHES TO BE EXCAVATED ADJACENT TO THE ACCESS TRACKS. REGULAR CROSS DRAINS TO BE LOCATED ALONG ACCESS TRACKS TO PREVENT EXCESSIVE VOLUMES OF WATER COLLECTING IN THE SWALES / DITCHES. LOCATIONS OF CROSS DRAINS TO BE AGREED WITH THE ENGINEER ON SITE. SURFACE WATER WILL NOT BE ALLOWED TO DISCHARGE DIRECTLY INTO EXISTING WATERCOURSES.
- WHERE POSSIBLE A BUFFER ZONE OF >50M TO ANY EXISTING WATERCOURSE WILL BE REQUIRED WHERE OVER LAND DISCHARGES ARE PROPOSED FROM ACCESS TRACK SWALES / DITCHES.
- BATTERS OF ALL PROPOSED SWALES / DITCHES TO HAVE A SLOPE OF BETWEEN 1:1.5 TO 1:2 DEPENDING UPON DEPTH OF SWALE/DITCH AND WILL BE LEFT AS CUT TO BE VEGETATED WITH LOCAL SPECIES.
- TRACK SIDE SWALES / DITCHES TO BE SHALLOW WITH MODERATE GRADIENTS TO PREVENT SCOURING. IN STEEP AREAS CHECK DAMS SHOULD BE INSTALLED TO REDUCE FLOW VELOCITIES AND PROVIDE SOURCE CONTROL OF SILT CONTAMINANT. WHERE NECESSARY THESE HAVE BEEN DESIGNATED IN CONJUNCTION WITH SETTLEMENT PONDS AND SILT TRAPS, PRIOR TO DISCHARGE.
- SETTLEMENT PONDS TO BE CONSTRUCTED FOR SILT REMOVAL AT TURBINE BASES AND HARD STAND AREAS. POND SIZES DEPENDING ON CATCHMENT AREA SERVED. SAMPLE POND SIZES SHOWN ON DRAWING D001.
- STRAW BALES / OR SIMILAR AND SILT FENCES TO BE USED ALSO AROUND SPOIL HEAPS TO MITIGATE SILT RUNOFF. SILT FENCES WILL BE REMOVED WHEN SUITABLE VEGETATION COVER IS ESTABLISHED.
- SILT FENCES TO BE PROVIDED ALONG EDGE OF EXISTING WATERCOURSE WHERE WORKS COMES WITHIN 150M OF EDGE OF ANY DITCH / EPIHEMERAL CHANNELS.
- SLOPES OF THE SWALES / DITCHES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER (HEAT 'SOO' OR 'SCRAW') FROM EXCAVATIONS TO BE STORED LOCALLY AND USED TO LINE SLOPES AND BASE OF SWALES / DITCHES OR LONGITUDINAL MOUNDS OF VEGETATION SWALES AT FIELD DRAIN DISCHARGE POINTS.
- AREAS STRIPPED OF VEGETATION SHOULD BE KEPT TO A MINIMUM.
- CLEAN STONE FLOW CONTROL CHECK DAMS TO BE MADE OF LOCALLY MIN. GEOLOGICALLY SIMILAR WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 20-100MM CLEAN STONE. ON SLOPING SETTINGS OF THE ACCESS TRACKS, LOW CHECK DAMS TO BE PROTECTED FROM WASHING AWAY THROUGH THE PLACEMENT OF 100M STONE ON THE DOWNHILL FACE OF THE CHECK DAM AND BY WRAPPING IN GEOTEXTILE.
- BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY MONITORED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAM TO BE REMOVED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT.
- SPACING AND FREQUENCY OF CHECK DAMS WILL BE DEPENDENT UPON LONGITUDINAL GRADIENT OF SWALE.
- LOCATION OF FILTRATION CHECK DAMS (IF REQUIRED) TO BE AGREED ON SITE WITH ENGINEER. SETTLEMENT PONDS TO BE CONSTRUCTED IN A MANNER WHERE THEY MAY BE EASILY INFILLED AT A LATER DATE (POST COMPLETION OF THE TURBINE BASE AND HARDSTAND CONSTRUCTION). ONLY SUITABLE MATERIALS EXCAVATED FROM THE POND TO BE USED TO FORM PART OF THE EMBANKMENT AROUND THE POND.
- DIL FUEL SHOULD BE STORED WITHIN BUNDED CONTAINMENT STRUCTURES.
- SILT BAGS WILL BE USED ON SITE AT FIELD DRAIN DISCHARGE LOCATIONS, AS NECESSARY.

POLLUTION PREVENTION NOTES:

- SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
- SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO OFF SITE RECEIVING WATERCOURSES.
- SILTY WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/DISTURBED GROUND, TEMPORARY STOCKPILES, PLANT AND WHEEL WASH, SITE ROAD TRACKS, AND DISTURBANCE OF EXISTING FIELD DRAINS AND DITCHES.

DISCHARGES

- WATER CONTAINING SILT WILL NOT BE PUMPED DIRECTLY TO ANY NATURAL WATERCOURSE. ALL DISCHARGES TO BE MADE OVER OPEN GROUND OR INTO EXISTING FIELD DRAIN WITH SILT TRAP A MINIMUM 50M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
- NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
- PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE.
- PUMPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN FIELD DRAINS/DITCHES/STREAMS WILL BE COMPLETED IN A MANNER THAT DOES NOT CAUSE SCOUR OR EROSION AT THE POINT OF RELEASE/DISCHARGE. THIS WILL BE DONE BY REDUCING THE FLOW VELOCITIES OR BY USE OF SPLASH PLATES, AND OTHER SIMILAR DISCHARGE CONTROLS.
- VEGETATION WILL NOT BE STRIPPED FROM EXISTING FIELD DRAINS/DITCHES UNLESS ABSOLUTELY NECESSARY.

EXCAVATIONS

- WHERE DEEP EXCAVATIONS ARE PROPOSED CUT-OFF DRAINS WILL BE USED TO REDUCE THE AMOUNT OF SURFACE WATER ENTERING THE EXCAVATION. THIS WILL BE THE CASE AROUND TURBINE BASE EXCAVATIONS.

EXPOSED GROUND & STOCKPILES

- THE AMOUNT OF EXPOSED GROUND AND TEMPORARY STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED, AS FAR AS PRACTICABLE.

SILT TRAPS

- USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR FILTRATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER AS REQUIRED.
- CHECK DAMS TO BE INSPECTED AND CLEANED REGULARLY.

REFUELLING

- REFUELLING OF MOBILE PLANT WILL BE COMPLETED IN DESIGNATED REFUELLING AREAS ONLY. REFUELLING ON AN IMPROPER SURFACE AND AWAY FROM FIELD DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.
- SPELL SITES AND DRIP TRAYS WILL BE AVAILABLE ON SITE FOR USE AS REQUIRED.

CONCRETE

- CARE WILL BE TAKEN WHEN COMPLETING CONCRETE WORKS ON SITE TO ENSURE NO DISCHARGE OCCUR.
- CONCRETE WASH WATER, AND WASTE CONCRETE WILL BE MANAGED APPROPRIATELY ON SITE.

IF WATER POLLUTION IS IDENTIFIED THE FOLLOWING STEPS WOULD BE ADHERED TO:

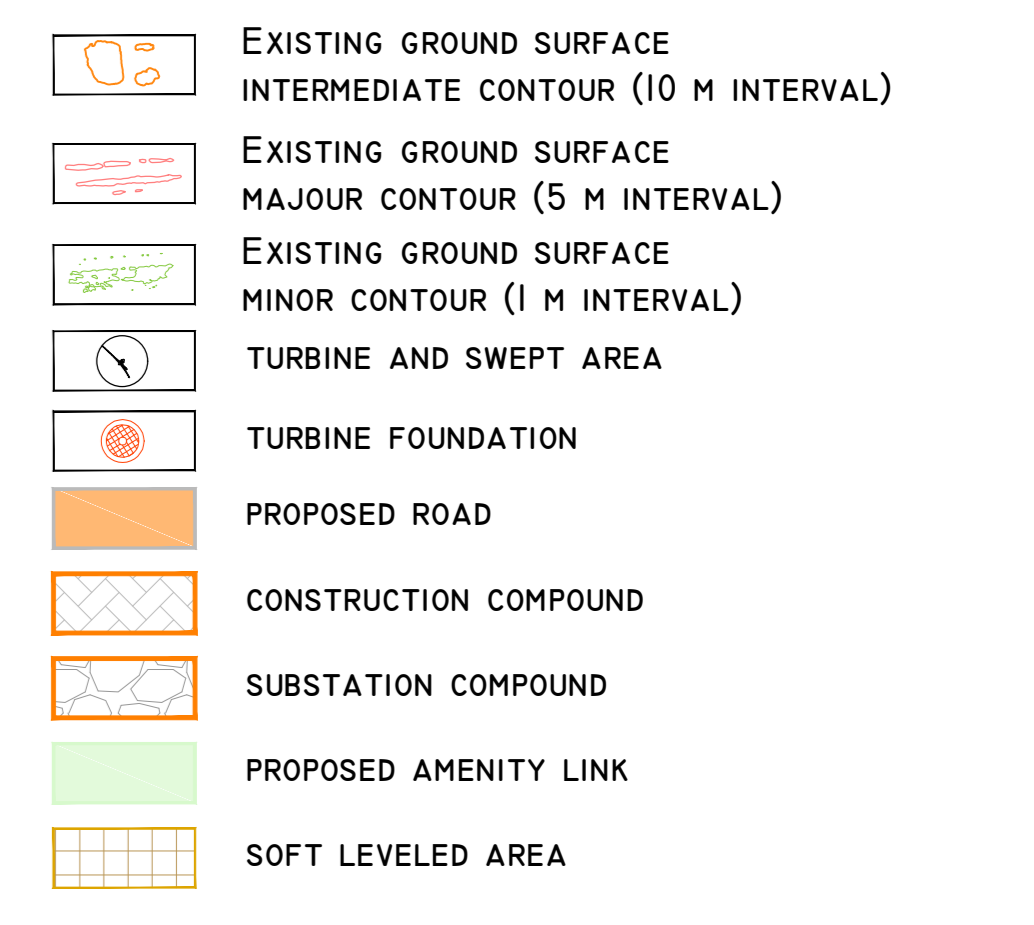
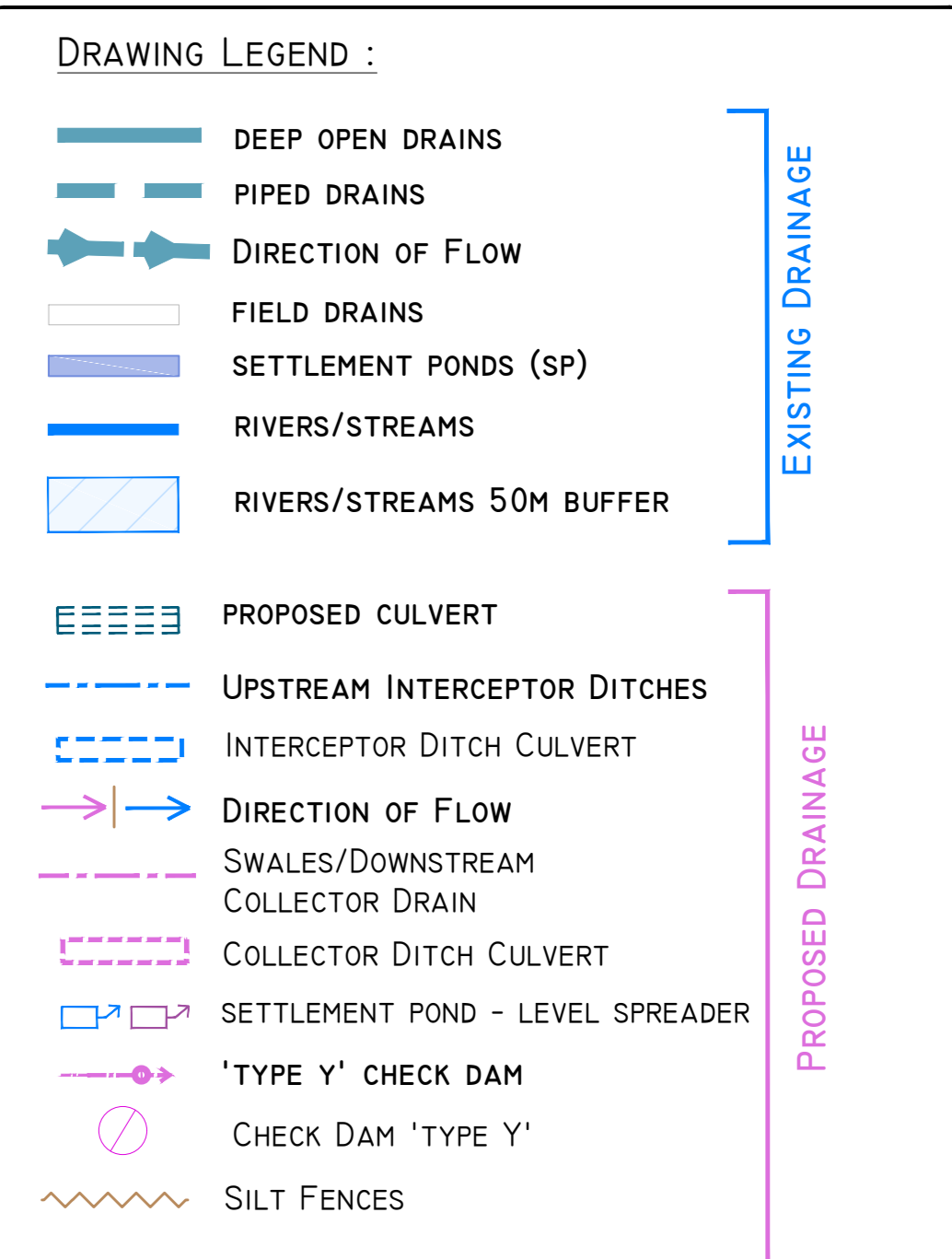
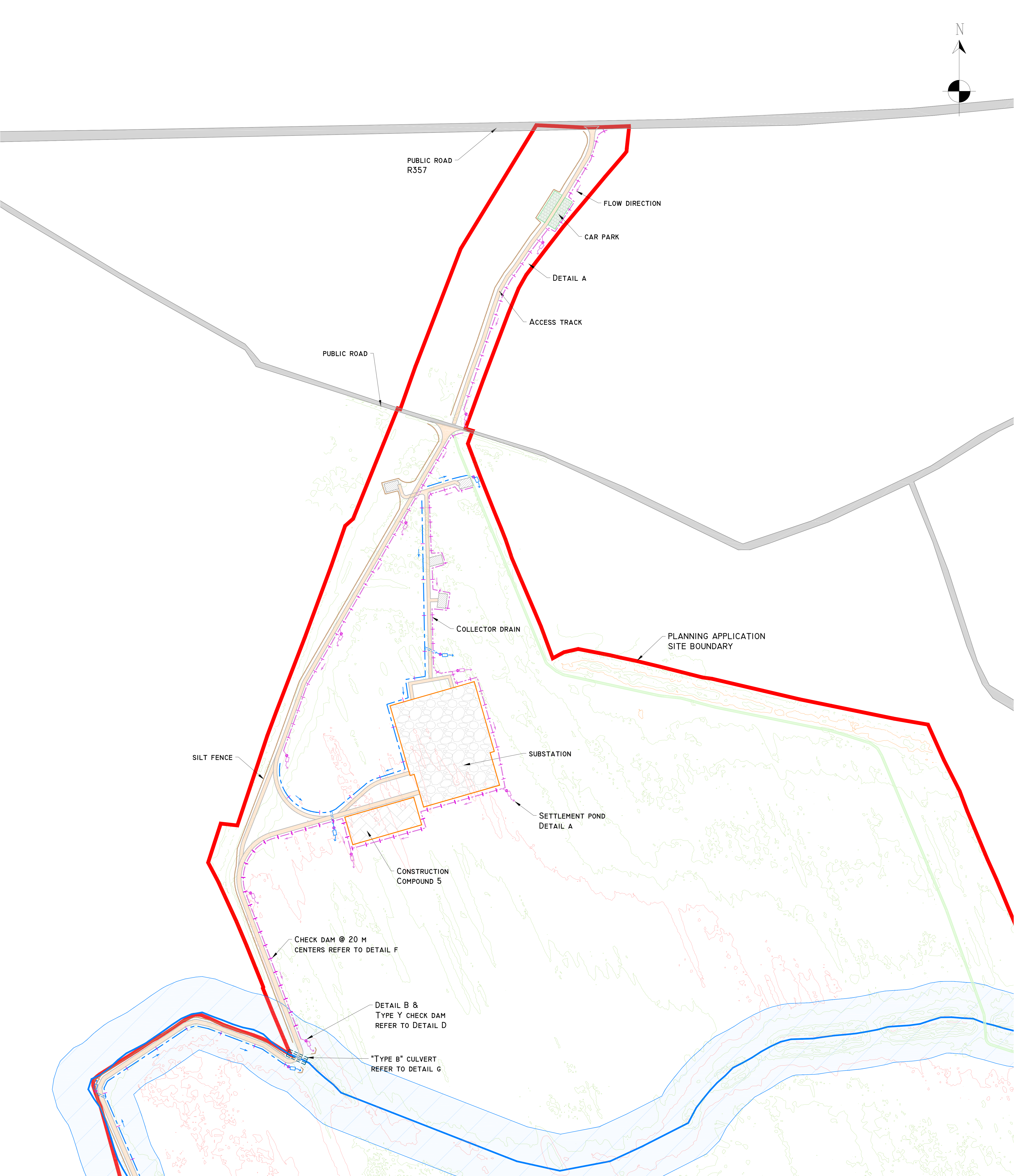
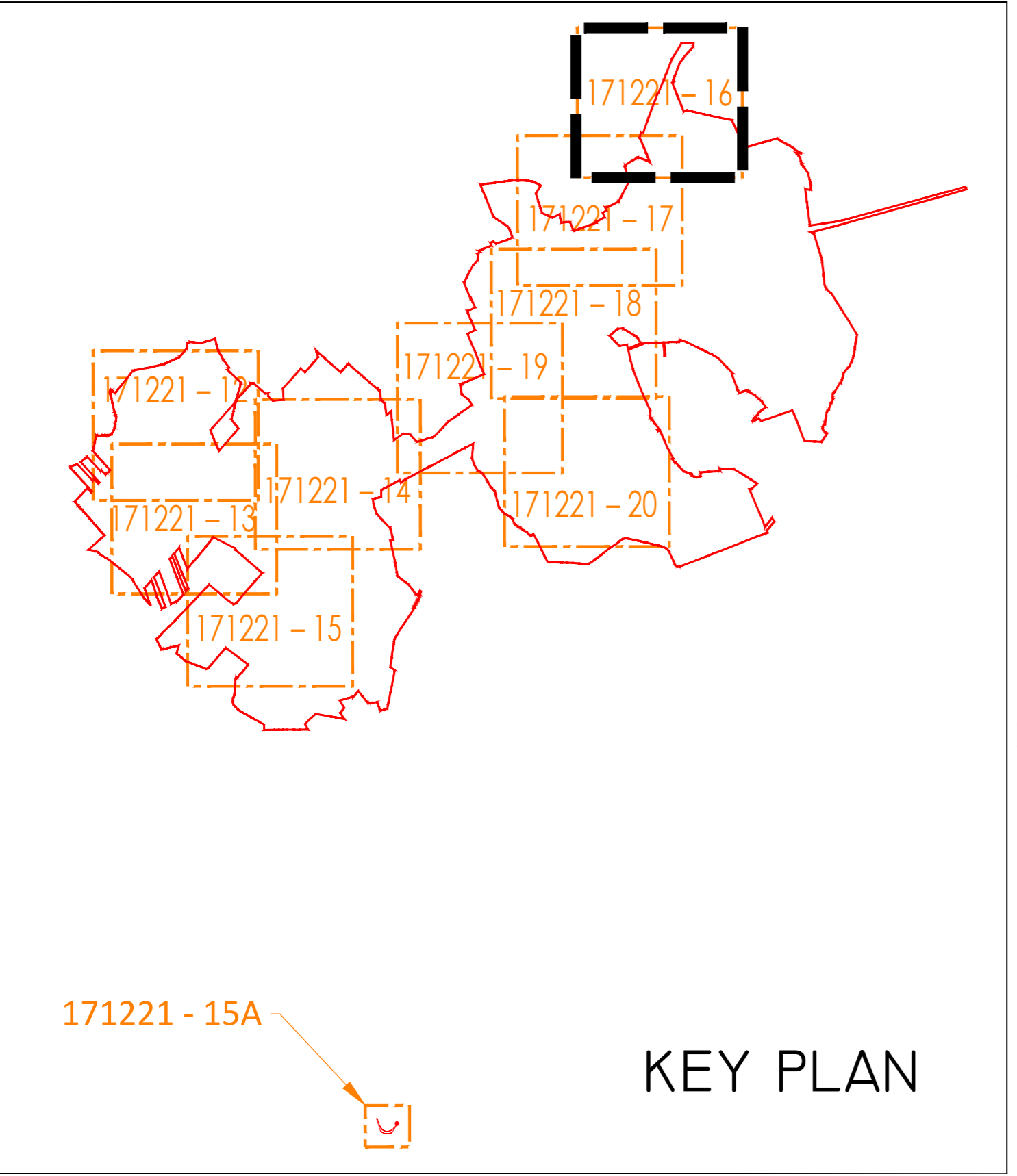
STOP - WORK IN THE IMMEDIATE AREA SHOULD BE STOPPED AND THE SOURCE OF THE POLLUTION IDENTIFIED.

CONTAIN - THE SOURCE OF THE POLLUTION SHOULD BE BUNDED USING A SUITABLE METHOD. NATURAL WATERCOURSES SHOULD BE TEMPORARILY DIVERTED AROUND THE SOURCE OF POLLUTION.

NOTIFY - THE RELEVANT AUTHORITIES (SITE MANAGER / FIGURERS / NPWS / LOCAL AUTHORITY ETC.) SHOULD BE NOTIFIED IMMEDIATELY TO ENSURE THAT MEASURES CAN BE IMPLEMENTED DOWNSTREAM TO PROTECT FISHERIES AND OTHER SENSITIVE AREAS.

MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE

MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS	<ol style="list-style-type: none"> APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE USING SMALL WORKING AREAS WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET PERIODS USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE-DRAINS, DIVERSION DRAINS, FLUPES AND GALVANIZED PIPES EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> SAND BAGS OSTER BAGS FILLED WITH GRAVEL FILTER FABRICS AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS USING SMALL WORKING AREAS COVERING STOCKPILES WEATHERING OFF / SEALING PEAT STOCKPILES
SOURCE CONTROLS	<ol style="list-style-type: none"> INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED SWALES/COLLECTOR DRAINS EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> SAND BAGS OSTER BAGS FILLED WITH GRAVEL FILTER FABRICS STRAW BALES FLOW LIMITERS WEIRS OR BAFFLES AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS SILT FENCES, FILTER FABRICS IN STREAM SEDIMENTS COLLECTION SUMPS, TEMPORARY SUMPS, PUMPING SYSTEMS ATTENUATION LAGOONS SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
IN-LINE CONTROLS	<ol style="list-style-type: none"> TEMPORARY SUMPS TEMPORARY STORAGE LAGOONS TEMPORARY STORAGE LAGOONS SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTTRUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS SILT DEWATERING BAGS
WATER TREATMENT CONTROLS	<ol style="list-style-type: none"> LEVEL SPREADERS BUFFERED OUTFALLS VEGETATION FILTERS SILT DEWATERING BAGS FLOW LIMITERS AND WEIRS
OUTFALL CONTROLS	<ol style="list-style-type: none"> LEVEL SPREADERS BUFFERED OUTFALLS VEGETATION FILTERS SILT DEWATERING BAGS FLOW LIMITERS AND WEIRS



DRAWING NOTES

- DRAWINGS ISSUED ARE FOR PLANNING APPLICATION PURPOSES ONLY.
- COPYRIGHT, ALL RIGHTS RESERVED. NO PART HERE WITH MAY BE COPIED OR REPRODUCED PARTIALLY OR WHOLLY IN ANY FORM WHATSOEVER WITHOUT THE PRIOR NOTICE OF THE COPYRIGHT OWNER HYDRO-ENVIRONMENTAL SERVICES.
- DO NOT SCALE OFF THIS DRAWING. FIGURED METRIC DIMENSIONS ONLY SHOULD BE TAKEN OFF THIS DRAWING.
- ALL DIMENSIONS ARE IN METRES.

Ordnance Survey Ireland Licence No. EN 0044720
© Ordnance Survey Ireland/Government of Ireland

Date	Description	Chkd	Signed
Revisions			

HYDRO ENVIRONMENTAL SERVICES

22 Lower Main St
Dungarvan
Co. Waterford
Ireland

tel: +353 (0) 58-44122
tel: +353 (0) 58-44244
email: info@hydroenvironmental.ie
web: www.hydroenvironmental.ie

Client: BORD NA MONA POWERGEN LTD

Job: DERRINLOUGH WF, CO. OFFALY

Title: PROPOSED DRAINAGE LAYOUT

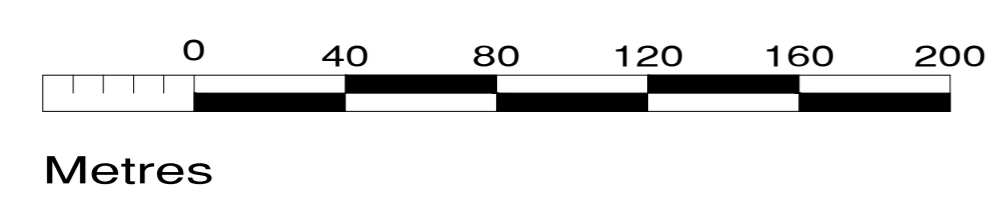
Figure No: 171221 - 16

Drawing No: P1463-0-0220-A0-171221-16-00A

Sheet Size: A0 **Project No.:** P1463-0

Scale: 1:2,000 (A0) **Drawn By:** MG / GD

Date: 14/02/2020 **Checked By:** MG



DRAINAGE NOTES:

- ROADWAY SURFACING DESIGN AND CONSTRUCTION TO ENGINEER'S SPECIFICATION (I.E. BY OTHERS).
- SHARP STRAW BALE/SILT FENCING/ OR SIMILAR, TO BE STORED ON SITE. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE TEMPORARILY MANAGED BY PLACING SILT FENCES, STRAW BALES / OR SIMILAR ADDITIONAL CHECK DAMS AT THE PROBLEM AREAS. MOBILE SILTTRUSTER SYSTEM TO BE AVAILABLE ON SITE FOR USE AS REQUIRED ALSO.
- SLEETS SYSTEM TO BE CONSTRUCTED PRIOR TO, OR AT THE SAME TIME AS THE ACCESS TRACKS. INTERIM MEASURES SUCH AS THE PLACEMENT OF STRAW BALES/SILT FENCING/ OR SIMILAR APPROVED METHOD OR ADDITIONAL CHECK DAMS AND SILT FENCES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS TRACKS IS LIKELY TO CAUSE ADVERSE ENVIRONMENTAL EFFECTS THROUGH INCREASED SILT LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
- SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO RECEIVING WATER COURSES. SEE NOTES ON POLLUTION PREVENTION.
- INTERCEPTOR SWALES / DITCHES TO BE USED TO COLLECT UPSTREAM SURFACE WATER FLOWS. REGULAR CROSS SWALES / DISCHARGE TO FIELD DITCHES WILL BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER IN INTERCEPTOR DRAINS TO SUITABLE FIELD DRAIN OUTFALL POINTS.
- DRAINAGE SWALES / DITCHES TO BE EXCAVATED ADJACENT TO THE ACCESS TRACKS. REGULAR CROSS DRAINS TO BE LOCATED ALONG ACCESS TRACKS TO PREVENT EXCESSIVE VOLUMES OF WATER COLLECTING IN THE SWALES / DITCHES. LOCATIONS OF CROSS DRAINS TO BE AGREED WITH THE ENGINEER ON SITE. SURFACE WATER WILL NOT BE ALLOWED TO DISCHARGE DIRECTLY INTO EXISTING WATERCOURSES.
- WHERE POSSIBLE A BUFFER ZONE OF >50M TO ANY EXISTING WATERCOURSE WILL BE REQUIRED WHERE OVER LAND DISCHARGES ARE PROPOSED FROM ACCESS TRACK SWALES / DITCHES.
- BATTERS OF ALL PROPOSED SWALES / DITCHES TO HAVE A SLOPE OF BETWEEN 1:1.5 TO 1:2 DEPENDING UPON DEPTH OF SWALE/DITCH AND WILL BE LEFT AS CUT TO BE VEGETATED WITH LOCAL SPECIES.
- TRACK SIDE SWALES / DITCHES TO BE SHALLOW WITH MODERATE GRADIENTS TO PREVENT SCOURING. IN STEEP AREAS CHECK DAMS SHOULD BE INSTALLED TO REDUCE FLOW VELOCITIES AND PROVIDE SOURCE CONTROL OF SILT CONTAMINANT. WHERE NECESSARY THESE HAVE BEEN DESIGNATED IN CONJUNCTION WITH SETTLEMENT PONDS AND SILT TRAPS, FROM TO DISCHARGE.
- SETTLEMENT PONDS TO BE CONSTRUCTED FOR SILT REMOVAL AT TURBINE BASES AND HARD STAND AREAS. POND SIZES DEPEND ON CATCHMENT AREA SERVED. SAMPLE POND SIZES SHOWN ON DRAWING D001.
- STRAW BALES / OR SIMILAR AND SILT FENCES TO BE USED ALSO AROUND SPOIL HEAPS TO MITIGATE SILT RUNOFF. SILT FENCES MAY BE REMOVED WHEN SUITABLE VEGETATION COVER IS ESTABLISHED.
- SILT FENCES TO BE PROVIDED ALONG EDGE OF EXISTING WATERCOURSE WHERE WORKS COMES WITHIN 150M OF EDGE OF ANY DITCH / EPIHEMERAL CHANNELS.
- SLOPES OF THE SWALES / DITCHES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER (PEAT 'SOO' OR 'SCRAW') FROM EXCAVATIONS TO BE STORED LOCALLY AND USED TO LINE SLOPES AND BASE OF SWALES / DITCHES OR LONGITUDINAL MOUNDS OF VEGETATION SWALES AT FIELD DRAIN DISCHARGE POINTS.
- AREAS STRIPPED OF VEGETATION SHOULD BE KEPT TO A MINIMUM.
- CLEAN STONE FLOW CONTROL CHECK DAMS TO BE MADE OF LOCALLY SOWN / GEOLOGICALLY SIMILAR WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 20-100MM CLEAN STONE. ON SLOPING SECTIONS OF THE ACCESS TRACKS, 40MM CHECK DAMS TO BE PROTECTED FROM WASHING AWAY THROUGH THE PLACEMENT OF 100M STONE ON THE DOWNHILL FACE OF THE CHECK DAM AND BY WRAPPING IN GEOTEXTILE.
- BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY MONITORED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS TO BE REMOVED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT.
- SPACING AND FREQUENCY OF CHECK DAMS WILL BE DEPENDENT UPON LONGITUDINAL GRADIENT OF SWALE.
- LOCATION OF FILTRATION CHECK DAMS (IF REQUIRED) TO BE AGREED ON SITE WITH ENGINEER. SETTLEMENT PONDS TO BE CONSTRUCTED IN A MANNER WHERE THEY MAY BE EASILY INFILTRATED AT A LATER DATE (POST COMPLETION OF THE TURBINE BASE AND HARDSTAND CONSTRUCTION). ONLY SUITABLE MATERIALS EXCAVATED FROM THE POND TO BE USED TO FORM PART OF THE EMBANKMENT AROUND THE POND.
- DIL FUEL SHOULD BE STORED WITHIN BUNDED CONTAINMENT STRUCTURES.
- SILT BAGS WILL BE USED ON SITE AT FIELD DRAIN DISCHARGE LOCATIONS, AS NECESSARY.

POLLUTION PREVENTION NOTES:

- SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
- SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO OFF SITE RECEIVING WATERCOURSES.
- SILTY WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/DISTURBED GROUND, TEMPORARY STOCKPILES, PLANT AND WHEEL WASH, SITE ROAD/TRACKS, AND DISTURBANCE OF EXISTING FIELD DRAINS AND DITCHES.

DISCHARGES:

- WATER CONTAINING SILT WILL NOT BE PUMPED DIRECTLY TO ANY NATURAL WATERCOURSE. ALL DISCHARGES TO BE MADE OVER OPEN GROUND OR INTO EXISTING DRAIN WITH SILT TRAP & MINIMUM 20M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
- NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
- PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE.
- PUMPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN FIELD DRAINS/DITCHES/STREAMS WILL BE COMPLETED IN A MANNER THAT DOES NOT CAUSE SCOUR OR EROSION AT THE POINT OF DISCHARGE/OUTFALL. THIS WILL BE DONE BY REDUCING THE FLOW VELOCITIES OR BY USE OF SPLASH PLATES, AND OTHER SIMILAR DISCHARGE CONTROLS.
- VEGETATION WILL NOT BE STRIPPED FROM EXISTING FIELD DRAINS/DITCHES UNLESS ABSOLUTELY NECESSARY.

EXCAVATIONS:

- WHERE DEEP EXCAVATIONS ARE PROPOSED CUT-OFF DRAINS WILL BE USED TO REDUCE THE AMOUNT OF SURFACE WATER ENTERING THE EXCAVATION. THIS WILL BE THE CASE AROUND TURBINE BASE EXCAVATIONS.

EXPOSED GROUND & STOCKPILES:

- THE AMOUNT OF EXPOSED GROUND AND TEMPORARY STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED, AS FAR AS PRACTICABLE.

SILT TRAPS:

- USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR FILTRATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER AS REQUIRED.
- CHECK DAMS TO BE INSPECTED AND CLEANED REGULARLY.

REFUELLING:

- REFUELLING OF MOBILE PLANT WILL BE COMPLETED IN DESIGNATED REFUELLING AREAS ONLY. REFUELLING ON AN IMPERMEABLE SURFACE AND AWAY FROM FIELD DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.
- SILT TRAPS AND DRIP TRAYS WILL BE AVAILABLE ON SITE FOR USE AS REQUIRED.

CONCRETE:

- CARE WILL BE TAKEN WHEN COMPLETING CONCRETE WORKS ON SITE TO ENSURE NO DISCHARGE OCCUR.
- CONCRETE WASH WATER, AND WASTE CONCRETE WILL BE MANAGED APPROPRIATELY ON SITE.

IF WATER POLLUTION IS IDENTIFIED THE FOLLOWING STEPS WOULD BE ADHERED TO:

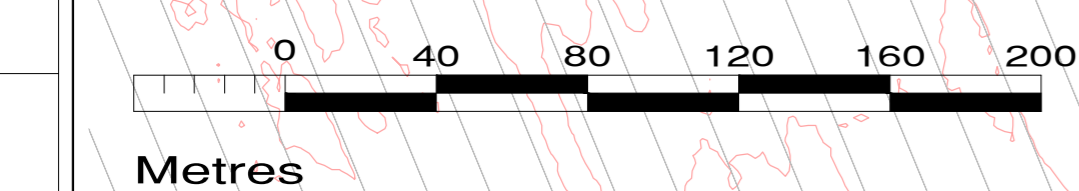
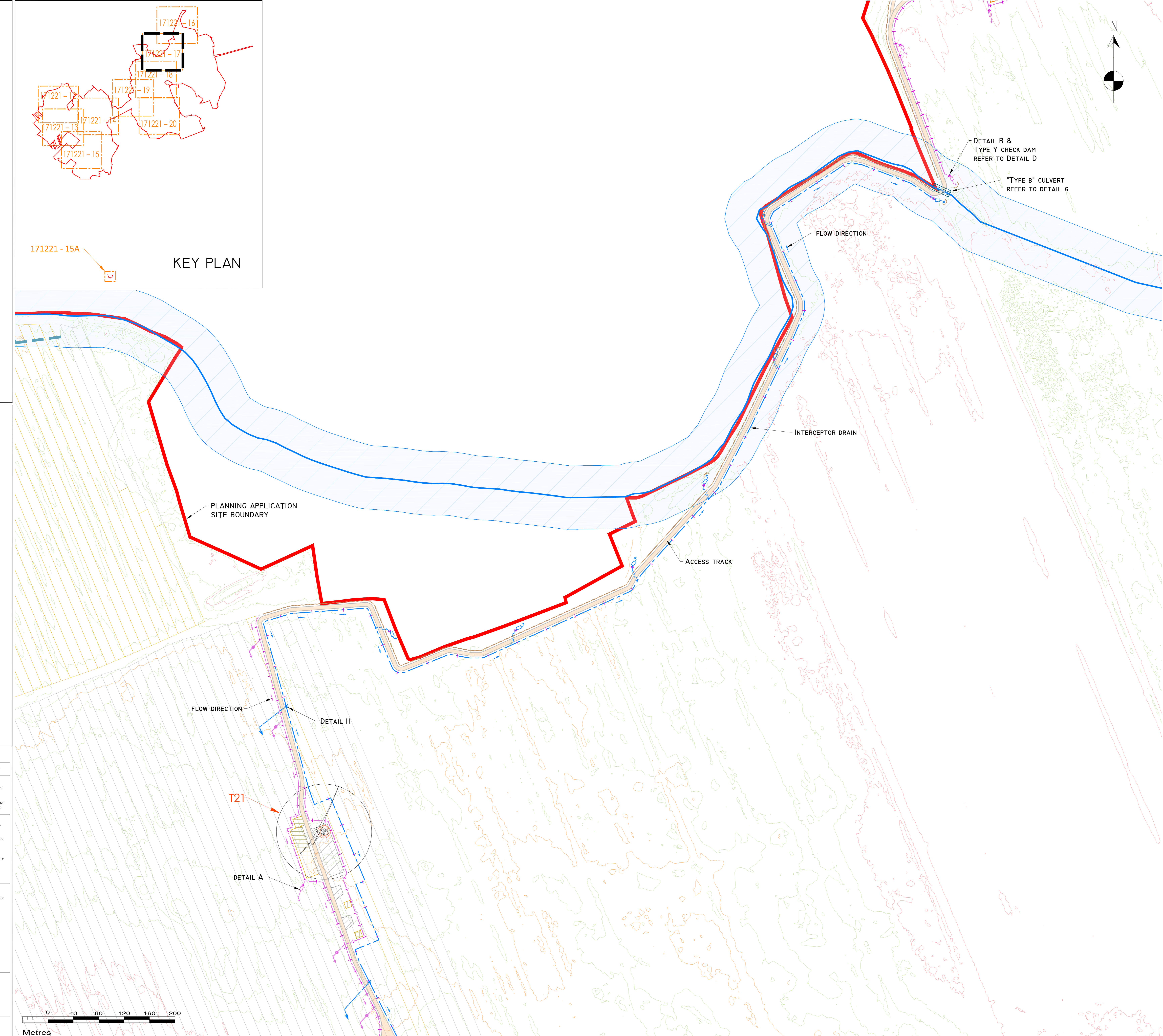
STOP - WORK IN THE IMMEDIATE AREA SHOULD BE STOPPED AND THE SOURCE OF THE POLLUTION IDENTIFIED.

CONTAIN - THE SOURCE OF THE POLLUTION SHOULD BE BUNDED USING A SUITABLE METHOD. NATURAL WATERCOURSES SHOULD BE TEMPORARILY DIVERTED AROUND THE SOURCE OF POLLUTION.

NOTIFY - THE RELEVANT AUTHORITIES (SITE MANAGER / FIGURES / NPWS / LOCAL AUTHORITY ETC.) SHOULD BE NOTIFIED IMMEDIATELY TO ENSURE THAT MEASURES CAN BE IMPLEMENTED DOWNTHEM TO PROTECT FISHERIES AND OTHER SENSITIVE AREAS.

MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE

MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS	<ol style="list-style-type: none"> APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE. APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE. USING SMALL WORKING AREAS. WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHER.
SOURCE CONTROLS:	<ol style="list-style-type: none"> USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE-DRAINS, DIVERSION DRAINS, FLUMES AND COLLETT PIPES. EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> SAND BAGS OSTER BAGS FILLED WITH GRAVEL FILTER FABRICS AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS USING SMALL WORKING AREAS COVERING STOCKPILES WEATHERING DRIP / SEALING PEAT STOCKPILES
IN-LINE CONTROLS:	<ol style="list-style-type: none"> INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED SWALES/COLLECTOR DRAINS EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> SAND BAGS OSTER BAGS FILLED WITH GRAVEL FILTER FABRICS STRAW BALES FLOW LIMITERS WEIRS OR BAPPLERS AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. SILT FENCES, FILTER FABRICS IN STREAM SEGMENTS COLLECTION SUMPS, TEMPORARY SUMPS, PUMPING SYSTEMS ATTENUATION LAGOONS SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
WATER TREATMENT CONTROLS:	<ol style="list-style-type: none"> TEMPORARY SUMPS ATTENUATION PONDS TEMPORARY STORAGE LAGOONS SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTTRUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. SILT DEWATERING BAGS
OUTFALL CONTROLS:	<ol style="list-style-type: none"> LEVELSPREADERS BUFFERED OUTFALLS VEGETATION FILTERS SILT DEWATERING BAGS FLOW LIMITERS AND WEIRS



DRAWING LEGEND :

- DEEP OPEN DRAINS
- PIPED DRAINS
- DIRECTION OF FLOW
- FIELD DRAINS
- SETTLEMENT PONDS (SP)
- RIVERS/STREAMS
- RIVERS/STREAMS 50M BUFFER
- PROPOSED CULVERT
- UPSTREAM INTERCEPTOR DITCHES
- INTERCEPTOR DITCH CULVERT
- DIRECTION OF FLOW
- SWALES/DOWNSTREAM COLLECTOR DRAIN
- COLLECTOR DITCH CULVERT
- SETTLEMENT POND - LEVEL SPREADER
- 'TYPE Y' CHECK DAM
- CHECK DAM 'TYPE Y'
- SILT FENCES

EXISTING DRAINAGE

- EXISTING GROUND SURFACE
- INTERMEDIATE CONTOUR (10 M INTERVAL)
- EXISTING GROUND SURFACE MAJOR CONTOUR (5 M INTERVAL)
- EXISTING GROUND SURFACE MINOR CONTOUR (1 M INTERVAL)
- TURBINE AND SWEEP AREA
- TURBINE FOUNDATION
- PROPOSED ROAD
- CONSTRUCTION COMPOUND
- SUBSTATION COMPOUND
- PROPOSED AMENITY LINK
- SOFT LEVELED AREA

DRAWING NOTES

- DRAWINGS ISSUED ARE FOR PLANNING APPLICATION PURPOSES ONLY.
- COPYRIGHT, ALL RIGHTS RESERVED. NO PART HERE WITH MAY BE COPIED OR REPRODUCED PARTIALLY OR WHOLLY IN ANY FORM WHATSOEVER WITHOUT THE PRIOR NOTICE OF THE COPYRIGHT OWNER HYDRO-ENVIRONMENTAL SERVICES.
- DO NOT SCALE OFF THIS DRAWING. FIGURED METRIC DIMENSIONS ONLY SHOULD BE TAKEN OFF THIS DRAWING.
- ALL DIMENSIONS ARE IN METRES.

Ordnance Survey Ireland Licence No. EN 0044720
© Ordnance Survey Ireland/Government of Ireland

Date	Description	Chkd	Signed
Revisions			

HYDRO ENVIRONMENTAL SERVICES

22 Lower Main St
Dungarvan
Co. Waterford
Ireland

tel: +353 (0) 58-44122
tel: +353 (0) 58-44244
email: info@hydroenvironmental.ie
web: www.hydroenvironmental.ie

Client: **BORD NA MONA POWERGEN LTD**

Job: **DERRINLOUGH WF, CO. OFFALY**

Title: **PROPOSED DRAINAGE LAYOUT**

Figure No: **171221 - 17**

Drawing No: P1463-0-0220-A0-171221-17-00A

Sheet Size: A0 Project No.: P1463-0

Scale: 1:2,000 (A0) Drawn By: MG / GD

Date: 14/02/2020 Checked By: MG

DRAINAGE NOTES:

- ROADWAY SURFACING DESIGN AND CONSTRUCTION TO ENGINEER'S SPECIFICATION (I.E. BY OTHERS).
- SHARP STRAW BALE/SILT FENCING OR SIMILAR, TO BE STORED ON SITE. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE TEMPORARILY MANAGED BY ALONG SILT FENCES, STRAW BALES / OR SIMILAR OR ADDITIONAL CHECK DAMS AT THE PROBLEM AREAS. MOBILE SILTTRUSTER SYSTEM TO BE AVAILABLE ON SITE FOR USE AS REQUIRED ALSO.
- SLEETS SYSTEM TO BE CONSTRUCTED PRIOR TO, OR AT THE SAME TIME AS THE ACCESS TRACKS. INTERIM MEASURES SUCH AS THE ERECTION OF STRAW BALES/SILT FENCING OR SIMILAR APPROVED METHOD OR ADDITIONAL CHECK DAMS AND SILT FENCES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS TRACKS IS LIKELY TO CAUSE ADVERSE ENVIRONMENTAL EFFECTS THROUGH INCREASED SILT LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
- SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO RECEIVING WATER COURSES. SEE NOTES ON POLLUTION PREVENTION.
- INTERCEPTOR SWALES / DITCHES TO BE USED TO COLLECT UPSTREAM SURFACE WATER FLOWS. REGULAR CROSS DRAINS / DISCHARGE TO FIELD DITCHES WILL BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER IN INTERCEPTOR DRAINS TO SUITABLE FIELD DRAIN OUTFALL POINTS.
- DRAINAGE SWALES / DITCHES TO BE EXCAVATED ADJACENT TO THE ACCESS TRACKS. REGULAR CROSS DRAINS TO BE LOCATED ALONG ACCESS TRACKS TO PREVENT EXCESSIVE VOLUMES OF WATER COLLECTING IN THE SWALES / DITCHES. LOCATIONS OF CROSS DRAINS TO BE AGREED WITH THE ENGINEER ON SITE. SURFACE WATER WILL NOT BE ALLOWED TO DISCHARGE DIRECTLY INTO EXISTING WATERCOURSES.
- WHERE POSSIBLE, A BUFFER ZONE OF >50M TO ANY EXISTING WATERCOURSE WILL BE REQUIRED WHERE OVER LAND DISCHARGES ARE PROPOSED FROM ACCESS TRACK SWALES / DITCHES.
- BATTERS OF ALL PROPOSED SWALES / DITCHES TO HAVE A SLOPE OF BETWEEN 1:1.5 TO 1:2 DEPENDING UPON DEPTH OF SWALE/DITCH AND WILL BE LEFT AS CUT TO BE VEGETATED WITH LOCAL SPECIES.
- TRACK SIDE SWALES / DITCHES TO BE SHALLOW WITH MODERATE GRADIENTS TO PREVENT SCOURING. IN STEEP AREAS CHECK DAMS SHOULD BE INSTALLED TO REDUCE FLOW VELOCITIES AND PROVIDE SOURCE CONTROL OF SILT CONTAMINANT. WHERE NECESSARY THESE HAVE BEEN DESIGNATED IN CONJUNCTION WITH SETTLEMENT PONDS AND SILT TRAPS, PRIOR TO DISCHARGE.
- SETTLEMENT PONDS TO BE CONSTRUCTED FOR SILT REMOVAL AT TURBINE BASES AND HAND STAND AREAS. POND SIZES DEPEND ON CATCHMENT AREA SERVED. SAMPLE POND SIZES SHOWN ON DRAWING D001.
- STRAW BALES / OR SIMILAR AND SILT FENCES TO BE USED ALSO AROUND SPOIL HEAPS TO MITIGATE SILT RUNOFF. SILT FENCES MAY BE REMOVED WHEN SUITABLE VEGETATION COVER IS ESTABLISHED.
- SILT FENCES TO BE PROVIDED ALONG EDGE OF EXISTING WATERCOURSE WHERE WORKS COMES WITHIN 15M OF EDGE OF ANY DITCH / EMBANKMENT CHANNELS.
- SLOPES OF THE SWALES / DITCHES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER (PEAT 'SOO' OR 'SCRAW') FROM EXCAVATIONS TO BE STORED LOCALLY AND USED TO LINE SLOPES AND BASES OF SWALES / DITCHES OR LONGITUDINAL BARRIERS OF VEGETATION SWALES AT FIELD DRAIN DISCHARGE POINTS.
- AREAS STRIPPED OF VEGETATION SHOULD BE KEPT TO A MINIMUM 15% CLEAN STONE FLOW CONTROL CHECK DAMS TO BE MADE OF LOCALLY MINIMALLY GEOLOGICALLY SIMILAR WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 20-100MM CLEAN STONE. ON SLOPING SECTIONS OF THE ACCESS TRACKS, LOW CHECK DAMS TO BE PROTECTED FROM WASHING AWAY THROUGH THE PLACEMENT OF 100M STONE ON THE DOWNHILL FACE OF THE CHECK DAM AND BY WRAPPING IN GEOTEXTILE.
- BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY MONITORED AS PART OF AN ONGOING DRAINAGE MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAM TO BE REMOVED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT.
- SPACING AND FREQUENCY OF CHECK DAMS WILL BE DEPENDENT UPON CONTINGENTIAL GRADIENT OF SWALE.
- LOCATION OF FILTRATION CHECK DAMS (IF REQUIRED) TO BE AGREED ON SITE WITH ENGINEER. SETTLEMENT PONDS TO BE CONSTRUCTED IN A MANNER WHERE THEY MAY BE EASILY INFILLED AT A LATER DATE (POST COMPLETION OF THE TURBINE BASE AND HANDSTAND CONSTRUCTION). ONLY SUITABLE MATERIALS EXCAVATED FROM THE POND TO BE USED TO FORM PART OF THE EMBANKMENT AROUND THE POND.
- DIL FUEL SHOULD BE STORED WITHIN BUNDED CONTAINMENT STRUCTURES.
- SILT BAGS WILL BE USED ON SITE AT FIELD DRAIN DISCHARGE LOCATIONS, AS NECESSARY.

POLLUTION PREVENTION NOTES:

- SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
- SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO OFF SITE RECEIVING WATERCOURSES.
- SILTY WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/DISTURBED GROUND, TEMPORARY STOCKPILES, PLANT AND WHEEL WASH, SITE ROAD TRACKS, AND DISCHARGE TESTING OF FIELD DRAINING AND DITCHES.

DISCHARGES:

- WATER CONTAINING SILT WILL NOT BE PUMPED DIRECTLY TO ANY NATURAL WATERCOURSE. ALL DISCHARGES TO BE MADE OVER OPEN GROUND OR INTO EXISTING FIELD DRAIN WITH SILT TRAP A MINIMUM 20M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
- NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
- PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE.
- PUMPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN FIELD DRAINS/DITCHES/STREAMS WILL BE COMPLETED IN A MANNER THAT DOES NOT CAUSE SCOUR OR EROSION AT THE POINT OF DISCHARGE. THIS WILL BE DONE BY REDUCING THE FLOW VELOCITIES OR BY USE OF SPLASH PLATES, AND OTHER SIMILAR DISCHARGE CONTROLS.
- VEGETATION WILL NOT BE STRIPPED FROM EXISTING FIELD DRAINS/DITCHES UNLESS ABSOLUTELY NECESSARY.

EXCAVATIONS:

- WHERE DEEP EXCAVATIONS ARE PROPOSED CUT-OFF DRAINS WILL BE USED TO REDUCE THE AMOUNT OF SURFACE WATER ENTERING THE EXCAVATION. THIS WILL BE THE CASE AROUND TURBINE BASE EXCAVATIONS.

EXPOSED GROUND & STOCKPILES:

- THE AMOUNT OF EXPOSED GROUND AND TEMPORARY STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED, AS FAR AS PRACTICABLE.

SILT TRAPS:

- USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR FILTRATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER AS REQUIRED.
- CHECK DAMS TO BE INSPECTED AND CLEANED REGULARLY.

REMEDIATION:

- REFUELLING OF MOBILE PLANT WILL BE COMPLETED IN DESIGNATED REFUELLING AREAS ONLY. REFUELLING ON AN IMPERMEABLE SURFACE AND AWAY FROM FIELD DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.
- DRILL SITES AND SHIP TRAYS WILL BE AVAILABLE ON SITE FOR USE AS REQUIRED.

CONCRETE:

- CARE WILL BE TAKEN WHEN COMPLETING CONCRETE WORKS ON SITE TO ENSURE NO DISCHARGES OCCUR.
- CONCRETE WASH WATER, AND WASTE CONCRETE WILL BE MANAGED APPROPRIATELY ON SITE.

IF WATER POLLUTION IS IDENTIFIED THE FOLLOWING STEPS WOULD BE ADHERED TO:

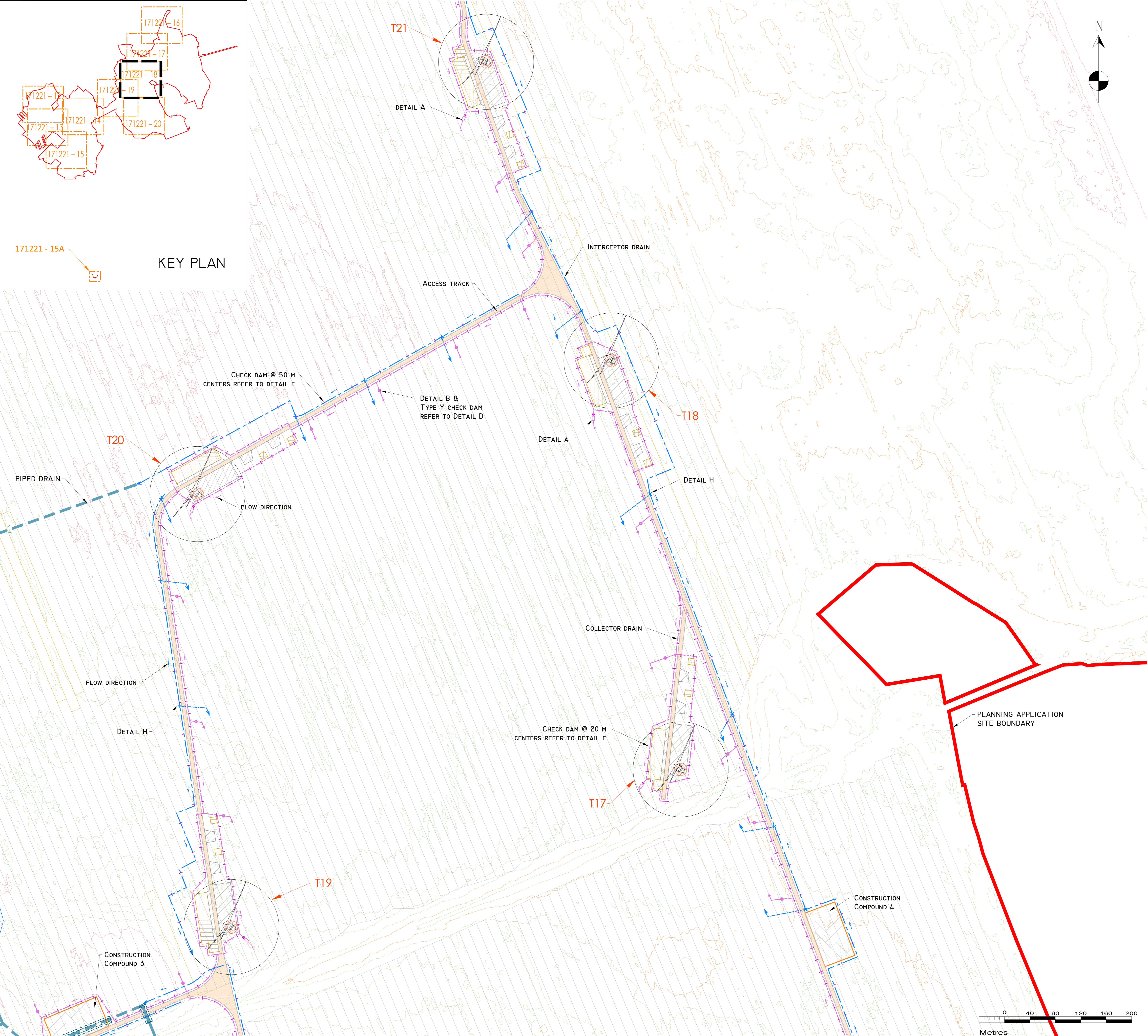
STOP - WORK IN THE IMMEDIATE AREA SHOULD BE STOPPED AND THE SOURCE OF THE POLLUTION IDENTIFIED.

CONTAIN - THE SOURCE OF THE POLLUTION SHOULD BE BUNDED USING A SUITABLE METHOD. NATURAL WATERCOURSES SHOULD BE TEMPORARILY DIVERTED AROUND THE SOURCE OF POLLUTION.

NOTIFY - THE RELEVANT AUTHORITIES (SITE MANAGER / FISHERIES / NPWS / LOCAL AUTHORITY ETC) SHOULD BE NOTIFIED IMMEDIATELY TO ENSURE THAT MEASURES CAN BE IMPLEMENTED DOWNTHEM TO PROTECT FISHERIES AND OTHER SENSITIVE AREAS.

MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE

MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS:	<ol style="list-style-type: none"> APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE. APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE. USING SMALL WORKING AREAS. WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHER.
SOURCE CONTROLS:	<ol style="list-style-type: none"> USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNTHEM COLLECTION DRAINS / OVERSIZED SWALES, VEE-DRAINS, DIVERSION DRAINS, FLUMES AND COLLECTOR PIPES. EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> SAND BAGS OYSTER BAGS FILLED WITH GRAVEL FILTER FABRICS AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. USING SMALL WORKING AREAS COVERING STOCKPILES WEATHERING DRY / SEALING PEAT STOCKPILES
IN-LINE CONTROLS:	<ol style="list-style-type: none"> INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED SWALES/COLLECTOR DRAINS EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> SAND BAGS OYSTER BAGS FILLED WITH GRAVEL FILTER FABRICS STRAW BALES FLOW LIMITERS WEIRS OR RAFFLES AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. SILT FENCES, FILTER FABRICS IN STREAM SEDIMENTS COLLECTION SUMPS, TEMPORARY SUMPS, PUMPING SYSTEMS ATTENUATION LAGOONS SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
WATER TREATMENT CONTROLS:	<ol style="list-style-type: none"> TEMPORARY SUMPS ATTENUATION PONDS TEMPORARY STORAGE LAGOONS SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTTRUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. SILT DEWATERING BAGS
OUTFALL CONTROLS:	<ol style="list-style-type: none"> LEVEL SPREADERS BUFFERED OUTFALLS VEGETATION FILTERS SILT DEWATERING BAGS FLOW LIMITERS AND WEIRS



- DRAWING LEGEND :**
- OPEN DRAINS
 - PIPED DRAINS
 - DIRECTION OF FLOW
 - FIELD DRAINS
 - SETTLEMENT PONDS (SP)
 - RIVERS/STREAMS
 - RIVERS/STREAMS 50M BUFFER
 - PROPOSED CULVERT
 - UPSTREAM INTERCEPTOR DITCHES
 - INTERCEPTOR DITCH CULVERT
 - DIRECTION OF FLOW
 - SWALES/DOWNSTREAM COLLECTOR DRAIN
 - COLLECTOR DITCH CULVERT
 - SETTLEMENT POND - LEVEL SPREADER
 - 'TYPE Y' CHECK DAM
 - CHECK DAM 'TYPE Y'
 - SILT FENCES
- EXISTING DRAINAGE** (indicated by a blue bracket)
- EXISTING GROUND SURFACE
 - INTERMEDIATE CONTOUR (10 M INTERVAL)
 - EXISTING GROUND SURFACE MAJOR CONTOUR (5 M INTERVAL)
 - EXISTING GROUND SURFACE MINOR CONTOUR (1 M INTERVAL)
 - TURBINE AND SWEEP AREA
 - TURBINE FOUNDATION
 - PROPOSED ROAD
 - CONSTRUCTION COMPOUND
 - SUBSTATION COMPOUND
 - PROPOSED AMENITY LINK
 - SOFT LEVELED AREA
- PROPOSED DRAINAGE** (indicated by a purple bracket)

DRAWING NOTES:

- DRAWINGS ISSUED ARE FOR PLANNING APPLICATION PURPOSES ONLY.
- COPYRIGHT, ALL RIGHTS RESERVED. NO PART HERE WITH MAY BE COPIED OR REPRODUCED PARTIALLY OR WHOLLY IN ANY FORM WHATSOEVER WITHOUT THE PRIOR NOTICE OF THE COPYRIGHT OWNER HYDRO-ENVIRONMENTAL SERVICES.
- DO NOT SCALE OFF THIS DRAWING. FIGURED METRIC DIMENSIONS ONLY SHOULD BE TAKEN OFF THIS DRAWING.
- ALL DIMENSIONS ARE IN METRES.

Ordnance Survey Ireland Licence No. EN 0044720
© Ordnance Survey Ireland/Government of Ireland

Date	Description	Chkd	Signed
Revisions			

HYDRO ENVIRONMENTAL SERVICES

22 Lower Main St
Dungarvan
Co. Waterford
Ireland

tel: +353 (0) 58-44122
tel: +353 (0) 58-44244
email: info@hydroenvironmental.ie
web: www.hydroenvironmental.ie

Client: **BORD NA MONA POWERGEN LTD**

Job: **DERRINLOUGH WF, CO. OFFALY**

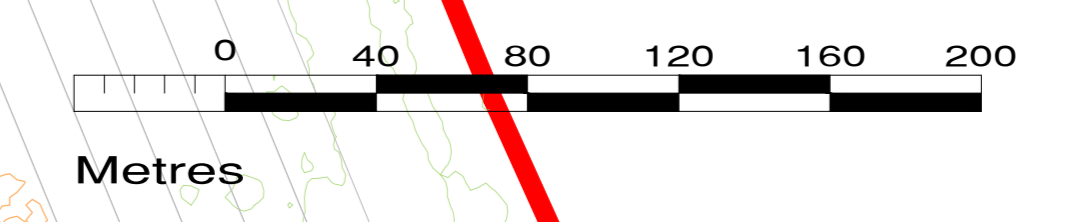
Title: **PROPOSED DRAINAGE LAYOUT**

Figure No: **171221 - 18**

Drawing No: P1463-0-0220-A0-171221-18-00A

Sheet Size: A0 Project No.: P1463-0

Scale: 1:2,000 (A0) Drawn By: MG / GD
Date: 14/02/2020 Checked By: MG



ROWAY SURFACING DESIGN AND CONSTRUCTION TO ENGINEER'S SPECIFICATION (I.E. BY OTHERS).

1. SHAPE STRAW BALE/SILT FENCING/ OR SIMILAR, TO BE STORED ON SITE. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE TEMPORARILY MANAGED BY PLACING SILT FENCES, STRAW BALES / OR SIMILAR OR ADDITIONAL CHECK DAMS AT THE PROBLEM AREAS. MOBILE SILT/STURBUSTER SYSTEM TO BE AVAILABLE ON SITE FOR USE AS REQUIRED ALSO.
2. SILT SYSTEM TO BE CONSTRUCTED PRIOR TO, OR AT THE SAME TIME AS THE ACCESS TRACKS. INTERIM MEASURES SUCH AS THE PLACEMENT OF STRAW BALES/SILT FENCING/SIMILAR APPROVED METHOD OR ADDITIONAL CHECK DAMS AND SILT FENCES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIES OUT TO CONSTRUCT THE ACCESS TRACKS IS LIKELY TO CAUSE ADVERSE ENVIRONMENTAL EFFECTS THROUGH INCREASED SILT LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
3. SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO RECEIVING WATER COURSES. SEE NOTES ON POLLUTION PREVENTION.
4. INTERCEPTOR SWALES / DITCHES TO BE USED TO COLLECT UPSTREAM SURFACE WATER FLOWS. REGULAR CROSS DRAINS / DISCHARGE TO FIELD DITCHES WILL BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER IN INTERCEPTOR DRAINS TO SUITABLE FIELD DRAIN OUTFALL POINTS.
5. DRAINAGE SWALES / DITCHES TO BE EXCAVATED ADJACENT TO THE ACCESS TRACKS. REGULAR CROSS DRAINS TO BE LOCATED ALONG ACCESS TRACKS TO PREVENT EXCESSIVE VOLUMES OF WATER COLLECTING IN THE SWALES / DITCHES. LOCATIONS OF CROSS DRAINS TO BE AGREED WITH THE ENGINEER ON SITE. SURFACE WATER WILL NOT BE ALLOWED TO DISCHARGE DIRECTLY INTO EXISTING WATERCOURSES.
6. WHERE POSSIBLE, A BUFFER ZONE OF >50M TO ANY EXISTING WATERCOURSE WILL BE REQUIRED WHERE OVER LAND DISCHARGES ARE PROPOSED FROM ACCESS TRACK SWALES / DITCHES.
7. BATTERS OF ALL PROPOSED SWALES / DITCHES TO HAVE A SLOPE OF BETWEEN 1:5 TO 1:2 DEPENDING UPON DEPTH OF SWALE/DITCH AND WILL BE LEFT AS CUT TO BE VEGETATED WITH LOCAL SPECIES.
8. TRACK SIDE SWALES / DITCHES TO BE SHALLOW WITH MODERATE GRADIENTS TO PREVENT SCOURING. IN STEEP AREAS CHECK DAMS SHOULD BE INSTALLED TO REDUCE FLOW VELOCITIES AND PROVIDE SOURCE CONTROL OF SILT CONTAMINANT. WHERE NECESSARY THESE HAVE BEEN DESIGNED IN CONJUNCTION WITH SETTLEMENT PONDS AND SILT TRAPS TO DISCHARGE.
9. SETTLEMENT PONDS TO BE CONSTRUCTED FOR SILT REMOVAL AT TURBINE BASES AND HARD STAND AREAS. POND SIZES DEPEND ON CATCHMENT AREA SERVED. SAMPLE POND SIZES SHOWN ON DRAWING D001.
10. STRAW BALES / OR SIMILAR AND SILT FENCES TO BE USED AROUND SPOIL HEAPS TO MITIGATE SILT RUNOFF. SILT FENCES MAY BE REMOVED WHEN SUITABLE VEGETATION COVER IS ESTABLISHED.
11. SILT FENCES TO BE PROVIDED ALONG EDGE OF EXISTING WATERCOURSE WHERE WORKS COMES WITHIN 15M OF EDGE OF ANY DITCH / EPIHEMERAL CHANNELS.
12. SLOPES OF THE SWALES / DITCHES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER (PEAT 'SOO' OR 'SCRAW') FROM EXCAVATIONS TO BE STORED LOCALLY AND USED TO LINE SLOPES AND BASES OF SWALES / DITCHES OR LONGITUDINAL MOUNDS OF VEGETATION SWALES AT FIELD DRAIN DISCHARGE POINTS.
13. AREAS STRIPPED OF VEGETATION SHOULD BE KEPT TO A MINIMUM.
14. CLEAN STONE FLOW CONTROL CHECK DAMS TO BE MADE OF LOCALLY MINOR GEOLOGICALLY SIMILAR WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 20-100MM CLEAN STONE. ON SLOPING SECTIONS OF THE ACCESS TRACKS, 40MM CHECK DAMS TO BE PROTECTED FROM WASHING AWAY THROUGH THE PLACEMENT OF 100M STONE ON THE DOWNHILL FACE OF THE CHECK DAM AND BY WRAPPING IN GEOTEXTILE.
15. BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY MONITORED AS PART OF AN ONGOING MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAMS TO BE REMOVED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT.
16. SPACING AND FREQUENCY OF CHECK DAMS WILL BE DEPENDENT UPON CIRCUMSTANTIAL GRADIENT OF SWALE.
17. LOCATION OF FILTRATION CHECK DAMS (IF REQUIRED) TO BE AGREED ON SITE WITH ENGINEER. SETTLEMENT PONDS TO BE CONSTRUCTED IN A MANNER WHERE THEY MAY BE EASILY INFILLED AT A LATER DATE (POST COMPLETION OF THE TURBINE BASE AND HARDSTAND CONSTRUCTION). ONLY SUITABLE MATERIALS EXCAVATED FROM THE POND TO BE USED TO FORM PART OF THE EMBANKMENT AROUND THE POND.
18. OIL FUEL SHOULD BE STORED WITHIN BUNDED CONTAINMENT STRUCTURES.
19. SILT BAGS WILL BE USED ON SITE AT FIELD DRAIN DISCHARGE LOCATIONS, AS NECESSARY.

POLLUTION PREVENTION NOTES:

1. SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
2. SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO OFF SITE RECEIVING WATERCOURSES.
3. SILTY WATER CAN ARISE FROM DEMATERING EXCAVATIONS, EROSION OF EXPOSED/DISTURBED GROUND, TEMPORARY STOCKPILES, PLANT AND WHEEL WASH, SITE ROAD TRACKS, AND DISTURBANCE OF EXISTING FIELD DRAINING AND DITCHES.

DISCHARGES

1. WATER CONTAINING SILT WILL NOT BE PUMPED DIRECTLY TO ANY NATURAL WATERCOURSE. ALL DISCHARGES TO BE MADE OVER OPEN GROUND OR INTO EXISTING FIELD DRAIN WITH SILT TRAP A MINIMUM 20M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
2. NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
3. PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE.
4. FLOWING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN FIELD DRAINS/DITCHES/STREAMS WILL BE COMPLETED IN A MANNER THAT DOES NOT CAUSE SCOUR OR EROSION AT THE POINT OF RE-RELEASE/DISCHARGE. THIS WILL BE DONE BY REDUCING THE FLOW VELOCITIES OR BY USE OF SPLASH PLATES, AND OTHER SIMILAR DISCHARGE CONTROLS.
5. VEGETATION WILL NOT BE STRIPPED FROM EXISTING FIELD DRAINS/DITCHES UNLESS ABSOLUTELY NECESSARY.

EXCAVATIONS

1. WHERE DEEP EXCAVATIONS ARE PROPOSED CUT-OFF DRAINS WILL BE USED TO REDUCE THE AMOUNT OF SURFACE WATER ENTERING THE EXCAVATION. THIS WILL BE THE CASE AROUND TURBINE BASE EXCAVATIONS.

EXPOSED GROUND & STOCKPILES

1. THE AMOUNT OF EXPOSED GROUND AND TEMPORARY STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED, AS FAR AS PRACTICABLE.

SILT TRAPS

1. USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR FILTRATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER AS REQUIRED.
2. CHECK DAMS TO BE INSPECTED AND CLEANED REGULARLY.

REVEALING

1. REVEALING OF MOBILE PLANT WILL BE COMPLETED IN DESIGNATED REVEALING AREAS ONLY. RESTRICTIONS ON AN IMPROVABLE SURFACE AND AWAY FROM FIELD DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.
2. DRILL BITS AND SHIP TRAYS WILL BE AVAILABLE ON SITE FOR USE AS REQUIRED.

CONCRETE

1. CARE WILL BE TAKEN WHEN COMPLETING CONCRETE WORKS ON SITE TO ENSURE NO DISCHARGES OCCUR.
2. CONCRETE WASH WATER, AND WASTE CONCRETE WILL BE MANAGED APPROPRIATELY ON SITE.

IF WATER POLLUTION IS IDENTIFIED THE FOLLOWING STEPS WOULD BE ADHERED TO:

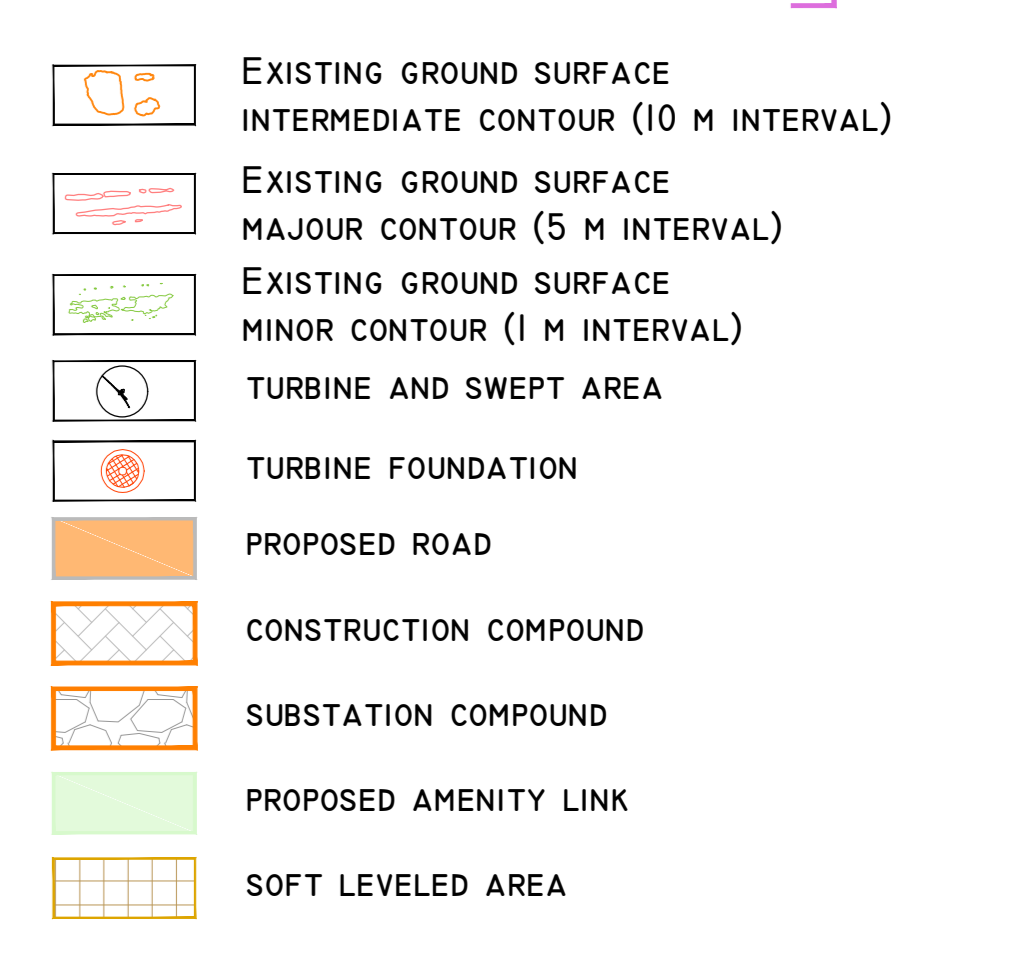
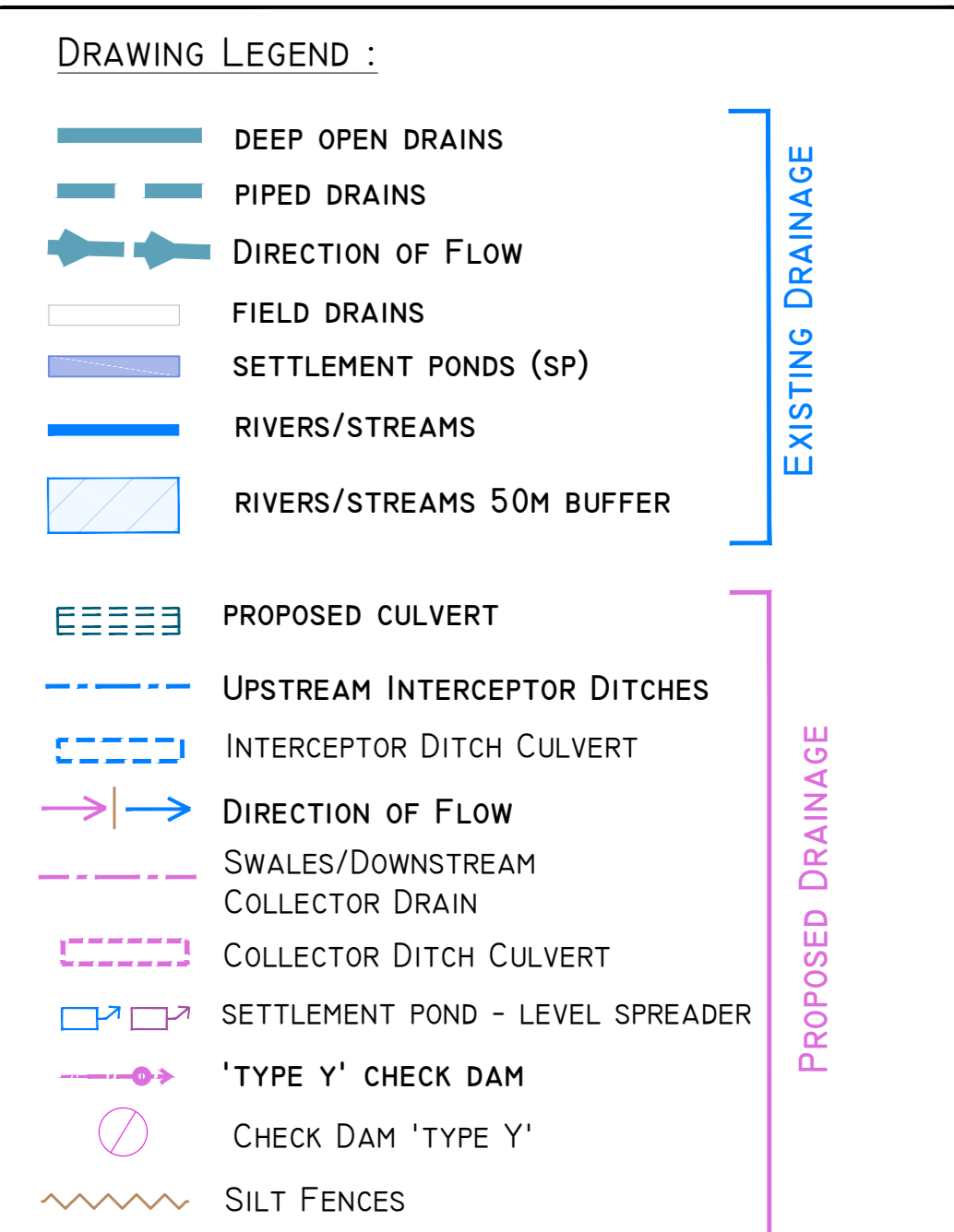
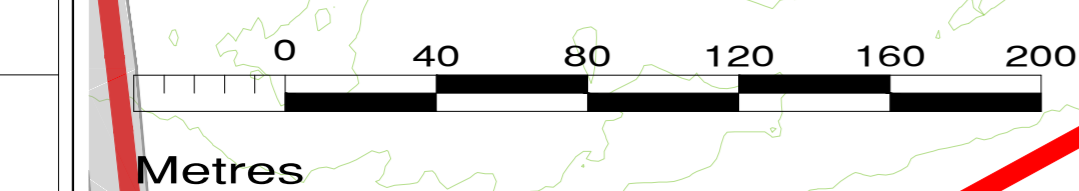
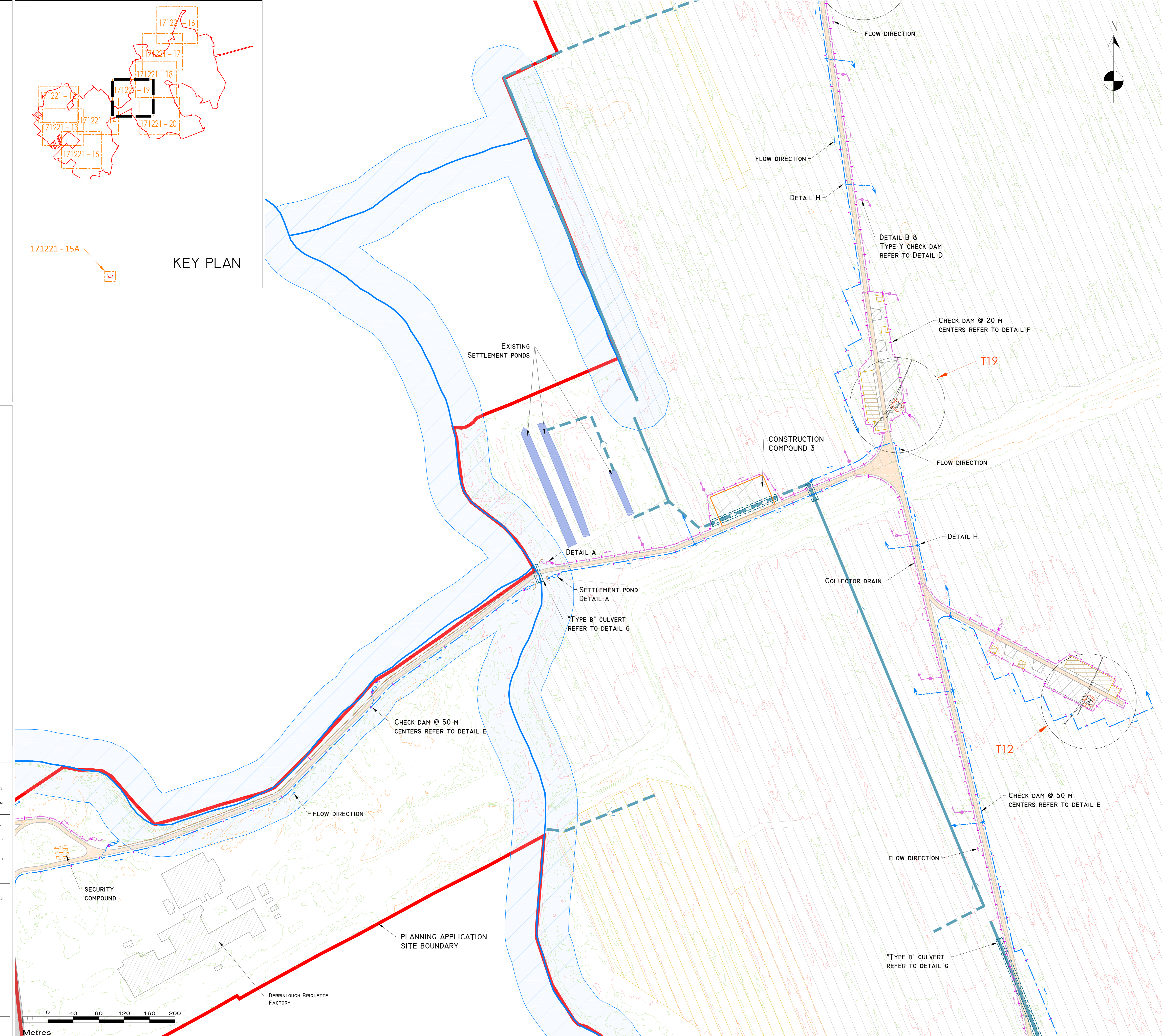
STOP - WORK IN THE IMMEDIATE AREA SHOULD BE STOPPED AND THE SOURCE OF THE POLLUTION IDENTIFIED.

CONTAIN - THE SOURCE OF THE POLLUTION SHOULD BE RAISED USING A SUITABLE METHOD. NATURAL WATERCOURSES SHOULD BE TEMPORARILY DIVERTED AROUND THE SOURCE OF POLLUTION.

NOTIFY - THE RELEVANT AUTHORITIES (SITE MANAGER / FISHERIES / NPWS / LOCAL AUTHORITY ETC) SHOULD BE NOTIFIED IMMEDIATELY TO ENSURE THAT MEASURES CAN BE IMPLEMENTED DOWNSTREAM TO PROTECT FISHERIES AND OTHER SENSITIVE AREAS.

MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE

MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS	<ol style="list-style-type: none"> 1) APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE. 2) APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE.
SOURCE CONTROLS	<ol style="list-style-type: none"> 1) USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE-DRAINS, DIVERSION DRAINS, FLUMES AND COLLECTOR PIPES. 2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> a) SAND BAGS b) OYSTER BAGS FILLED WITH GRAVEL c) FILTER FABRICS d) AND OTHER SIMILAR/EQUIVALENT ON APPROPRIATE SYSTEMS 3) USING SMALL WORKING AREAS 4) WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WEATHER
IN-LINE CONTROLS	<ol style="list-style-type: none"> 1) INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED SWALES/COLLECTOR DRAINS 2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> a) SAND BAGS b) OYSTER BAGS FILLED WITH GRAVEL c) FILTER FABRICS d) STRAW BALES e) FLOW LIMITERS f) WEIRS OR BAFFLES g) AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. 3) SILT FENCES, FILTER FABRICS 4) IN STREAM SEDIMENTS 5) COLLECTION SUMPS, TEMPORARY SUMPS, PUMPING SYSTEMS 6) ATTENUATION LAGOONS 7) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
WATER TREATMENT CONTROLS	<ol style="list-style-type: none"> 1) TEMPORARY SUMPS 2) ATTENUATION PONDS 3) TEMPORARY STORAGE LAGOONS 4) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS 5) PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTTRUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. 6) SALT DEMATERING BAGS
OUTFALL CONTROLS	<ol style="list-style-type: none"> 1) LEVELSPREADERS 2) BUFFERED OUTFALLS 3) VEGETATION FILTERS 4) SALT DEMATERING BAGS 5) FLOW LIMITERS AND WEIRS



DRAWING NOTES

1. DRAWINGS ISSUED ARE FOR PLANNING APPLICATION PURPOSES ONLY.
2. COPYRIGHT, ALL RIGHTS RESERVED. NO PART HERE WITH MAY BE COPIED OR REPRODUCED PARTIALLY OR WHOLLY IN ANY FORM WHATSOEVER WITHOUT THE PRIOR NOTICE OF THE COPYRIGHT OWNER HYDRO-ENVIRONMENTAL SERVICES.
3. DO NOT SCALE OFF THIS DRAWING. FIGURED METRIC DIMENSIONS ONLY SHOULD BE TAKEN OFF THIS DRAWING.
4. ALL DIMENSIONS ARE IN METRES.

Ordnance Survey Ireland Licence No. EN 0044720
© Ordnance Survey Ireland/Government of Ireland

Date	Description	Chkd	Signed
Revisions			

HYDRO ENVIRONMENTAL SERVICES

22 Lower Main St
Dungarvan
Co. Waterford
Ireland

tel: +353 (0) 58-44122
tel: +353 (0) 58-44244
email: info@hydroenvironmental.ie
web: www.hydroenvironmental.ie

Client: **BORD NA MONA POWERGEN LTD**

Job: **DERRINLOUGH WF, CO. OFFALY**

Title: **PROPOSED DRAINAGE LAYOUT**

Figure No: **171221 - 19**

Drawing No: P1463-0-0220-A0-171221-19-00A

Sheet Size: A0 Project No.: P1463-0

Scale: 1:2,000 (A0) Drawn By: MG / GD
Date: 14/02/2020 Checked By: MG

ROADWAY SURFACING DESIGN AND CONSTRUCTION TO ENGINEER'S SPECIFICATION (I.E. BY OTHERS).

- SPARE STRAW BALE/SILT FENCES OR SIMILAR, TO BE STORED ON SITE. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE TEMPORARILY MANAGED BY EXCESSIVE SILT LEVELS. STRAW BALES / OR SIMILAR OR ADDITIONAL CHECK DAMS AT THE PROBLEM AREAS. MOBILE SILT/STURBUT SYSTEM TO BE AVAILABLE ON SITE FOR USE AS REQUIRED ALSO.
- SLEES SYSTEM TO BE CONSTRUCTED PRIOR TO, OR AT THE SAME TIME AS ACCESS TRACKS. INTERIOR HEADINGS SUCH AS THE PLACEMENT OF STRAW BALES/SILT FENCES OR SIMILAR APPROVED METHOD OR ADDITIONAL CHECK DAMS AND SILT FENCES TO BE APPLIED IN ALL INSTANCES WHERE WORK CARRIES OUT TO CONSTRUCT THE ACCESS TRACKS IS LIKELY TO CAUSE ADVERSE ENVIRONMENTAL EFFECTS THROUGH INCREASED SILT LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.
- SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO RECEIVING WATER COURSES. SEE NOTES ON POLLUTION PREVENTION.
- INTERCEPTOR SWALES / DITCHES TO BE USED TO COLLECT UPSTREAM SURFACE WATER FLOWS. REGULAR CROSS DRAINS / DISCHARGE TO FIELD DITCHES WILL BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER IN INTERCEPTOR DRAINS TO SUITABLE FIELD DRAIN OUTFALL POINTS.
- DRAINAGE SWALES / DITCHES TO BE EXCAVATED ADJACENT TO THE ACCESS TRACKS. REGULAR CROSS DRAINS TO BE LOCATED ALONG ACCESS TRACKS TO PREVENT EXCESSIVE VOLUMES OF WATER COLLECTING IN THE SWALES / DITCHES. LOCATIONS OF CROSS DRAINS TO BE AGREED WITH THE ENGINEER ON SITE. SURFACE WATER WILL NOT BE ALLOWED TO DISCHARGE DIRECTLY INTO EXISTING WATERCOURSES.
- WHERE POSSIBLE, A BUFFER ZONE OF >50M TO ANY EXISTING WATERCOURSE WILL BE REQUIRED WHERE OVER LAND DISCHARGES ARE PROPOSED FROM ACCESS TRACK SWALES / DITCHES.
- BATTERS OF ALL PROPOSED SWALES / DITCHES TO HAVE A SLOPE OF BETWEEN 1:1.5 TO 1:2 DEPENDING UPON DEPTH OF SWALE/DITCH AND WILL BE LEFT AS OUT TO BE REVEGETATED WITH LOCAL SPECIES.
- TRACK SIDE SWALES / DITCHES TO BE SHALLOW WITH MODERATE GRADIENTS TO PREVENT SCOURING. IN STEEP AREAS CHECK DAMS SHOULD BE INSTALLED TO REDUCE FLOW VELOCITIES AND PROVIDE SOURCE CONTROL OF SILT CONTAMINANT. WHERE NECESSARY THESE HAVE BEEN DESIGNATED IN CONJUNCTION WITH SETTLEMENT PONDS AND SILT TRAPS, PRIOR TO DISCHARGE.
- SETTLEMENT PONDS TO BE CONSTRUCTED FOR SILT REMOVAL AT TURBINE BASES AND HAND STAND AREAS. POND SIZE DEPENDS ON CATCHMENT AREA SERVED. SAMPLE POND SIZES SHOWN ON DRAWING D001.
- STRAW BALES / OR SIMILAR AND SILT FENCES TO BE USED ALSO AROUND SPILL HEAPS TO MITIGATE SILT RUNOFF. SILT FENCES MAY BE REMOVED WHEN SUITABLE VEGETATION COVER IS ESTABLISHED.
- SILT FENCES TO BE PROVIDED ALONG EDGE OF EXISTING WATERCOURSE WHERE WORKS COMES WITHIN 15M OF EDGE OF ANY DITCH / EMBANKMENT CHANNELS.
- SLOPES OF THE SWALES / DITCHES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER (PEAT 'SOO' OR 'SCRAW') FROM EXCAVATIONS TO BE STORED LOCALLY AND USED TO LINE SLOPES AND BASE OF SWALES / DITCHES OR LONGITUDINAL MOUNDS OF VEGETATION SWALES AT FIELD DRAIN DISCHARGE POINTS.
- AREAS STRIPPED OF VEGETATION SHOULD BE KEPT TO A MINIMUM OF 1.5 TO 1:2 DEPENDING UPON DEPTH OF SWALE/DITCH AND WILL BE LEFT AS OUT TO BE REVEGETATED WITH LOCAL SPECIES.
- CLEAN STONE FLOW CONTROL CHECK DAMS TO BE MADE OF LOCALLY SOWN / GEOLOGICALLY SIMILAR WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 20-40MM CLEAN STONE. ON SLOPING SECTIONS OF THE ACCESS TRACKS, DOWN CHECK DAMS TO BE PROTECTED FROM WASHING AWAY THROUGH THE PLACEMENT OF 100M STONE ON THE DOWNHILL FACE OF THE CHECK DAM AND BY WRAPPING IN GEOTEXTILE.
- SHOULDER OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY MONITORED AS PART OF AN ONGOING DRAINAGE MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED WITH SILT OR VEGETATION, STONE CHECK DAM TO BE REMOVED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT.
- SPACING AND FREQUENCY OF CHECK DAMS WILL BE DEPENDENT UPON LONGITUDINAL GRADIENT OF SWALE.
- LOCATION OF FILTRATION CHECK DAMS (IF REQUIRED) TO BE AGREED ON SITE WITH ENGINEER. SETTLEMENT PONDS TO BE CONSTRUCTED IN A MANNER WHERE THEY MAY BE EASILY INFILLED AT A LATER DATE (POST COMPLETION OF THE TURBINE BASE AND HANDSTAND CONSTRUCTION). ONLY SUITABLE MATERIALS EXCAVATED FROM THE POND TO BE USED TO FORM PART OF THE EMBANKMENT AROUND THE POND.
- DIESEL FUEL SHOULD BE STORED WITHIN BUNDED CONTAINMENT STRUCTURES.
- SILT BAGS WILL BE USED ON SITE AT FIELD DRAIN DISCHARGE LOCATIONS, AS NECESSARY.

POLLUTION PREVENTION NOTES:

- SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE PROTECTION AGAINST SURFACE WATER AND EROSION/ POLLUTION, SILTATION AND EROSION.
- SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO OFF SITE RECEIVING WATERCOURSES.
- SILT WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/STRIPPED GROUND, TEMPORARY STOCKPILES, PLANT AND WHEEL WASH, SITE ROAD/TRACKS, AND DISTURBANCE OF EXISTING FIELD DRAINS AND DITCHES.
- WATERS CONTAINING SILT WILL NOT BE PUMPED DIRECTLY TO ANY NATURAL WATERCOURSE. ALL DISCHARGES TO BE MADE OVER OPEN GROUND OR INTO EXISTING FIELD DRAIN WITH SILT TRAP A MINIMUM 10M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
- NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
- PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE.
- PUMPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN FIELD DRAINS/DITCHES/STREAMS WILL BE COMPLETED IN A MANNER THAT DOES NOT CAUSE SCOUR OR EROSION AT THE POINT OF RELEASE/DISCHARGE. THIS WILL BE DONE BY REDUCING THE FLOW VELOCITIES OR BY USE OF SLOSH PLATES, AND OTHER SIMILAR DISCHARGE CONTROLS.
- VEGETATION WILL NOT BE STRIPPED FROM EXISTING FIELD DRAINS/DITCHES UNLESS ABSOLUTELY NECESSARY.

EXCAVATION:

- WHERE DEEP EXCAVATIONS ARE PROPOSED CUT-OFF DRAINS WILL BE USED TO REDUCE THE AMOUNT OF SURFACE WATER ENTERING THE EXCAVATION. THIS WILL BE CASE AROUND TURBINE BASE EXCAVATIONS.

EXPOSED GROUND & STOCKPILES

- THE AMOUNT OF EXPOSED GROUND AND TEMPORARY STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED, AS FAR AS PRACTICABLE.

SITE TRACKS

- USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR FILTRATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER AS REQUIRED.
- CHECK DAMS TO BE INSPECTED AND CLEANED REGULARLY.

REFUELLING

- REFUELLING OF MOBILE PLANT WILL BE COMPLETED IN DESIGNATED REFUELLING AREAS ONLY, PREFERABLY ON AN IMPERMEABLE SURFACE AND AWAY FROM FIELD DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.
- SPILL KITS AND DRIP TRAYS WILL BE AVAILABLE ON SITE FOR USE AS REQUIRED.

CONCRETE

- CARE WILL BE TAKEN WHEN COMPLETING CONCRETE WORKS ON SITE TO PREVENT NO DISCHARGE SCOUR.
- CONCRETE WASH WATER, AND WASTE CONCRETE WILL BE MANAGED APPROPRIATELY ON SITE.

IF WATER POLLUTION IS IDENTIFIED THE FOLLOWING STEPS WOULD BE ADHERED TO:

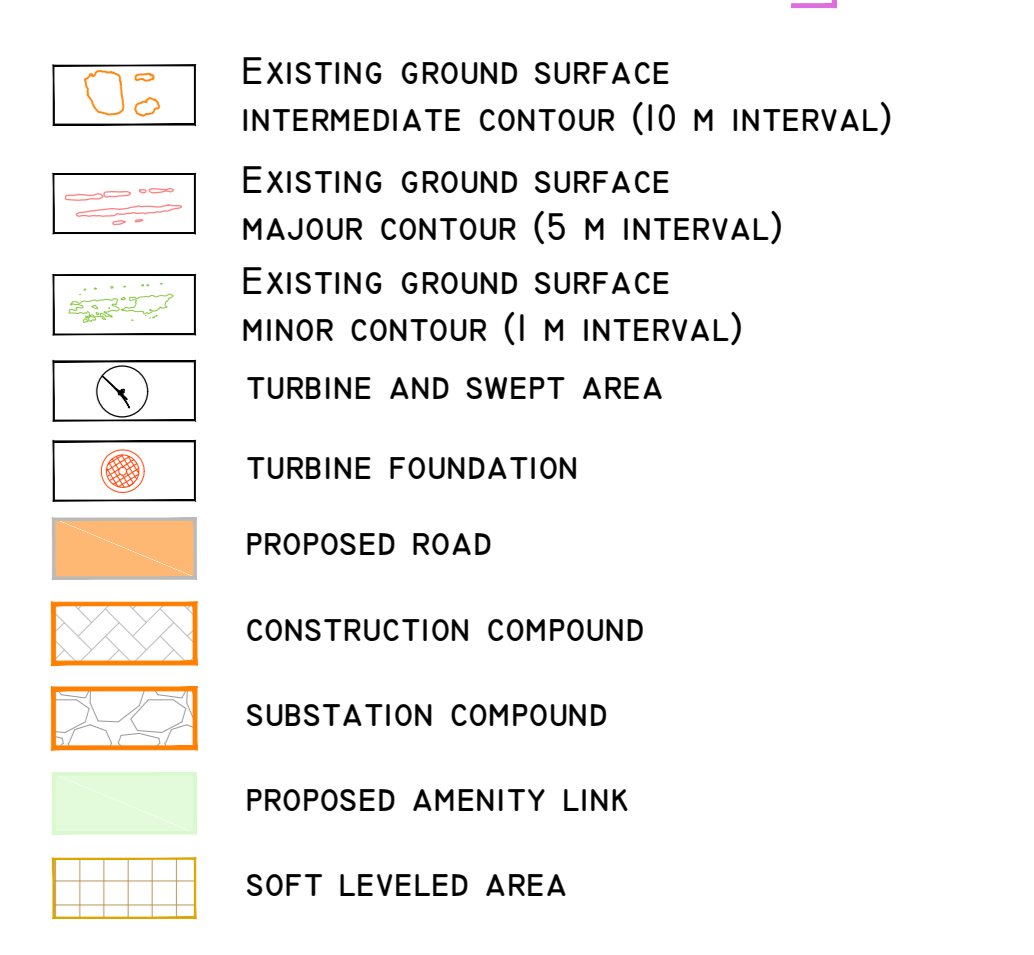
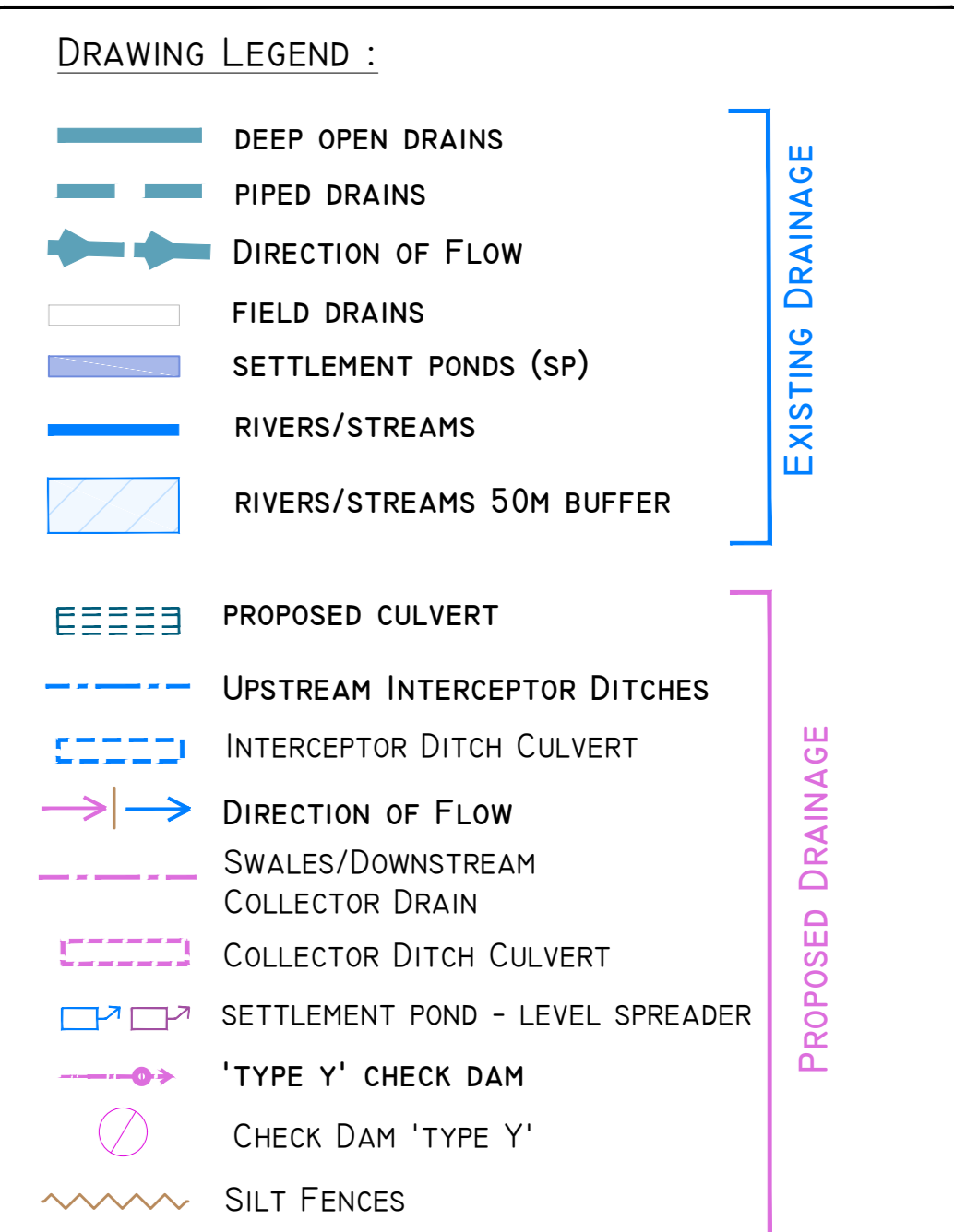
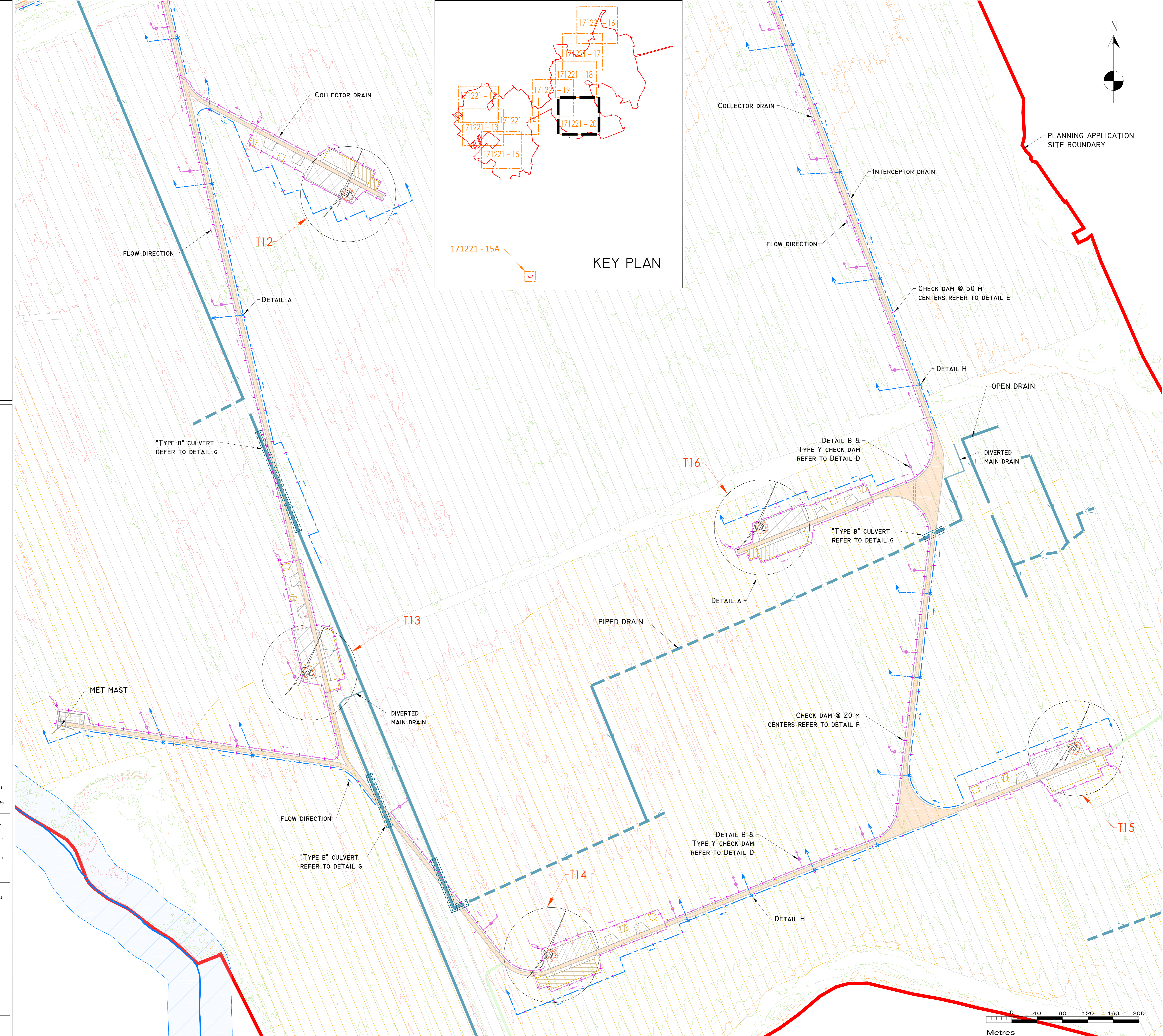
STOP - WORK IN THE IMMEDIATE AREA SHOULD BE STOPPED AND THE SOURCE OF THE POLLUTION IDENTIFIED.

CONTAIN - THE SOURCE OF THE POLLUTION SHOULD BE BUNDED USING A SUITABLE METHOD. NATURAL WATERCOURSES SHOULD BE TEMPORARILY DIVERTED AROUND THE SOURCE OF POLLUTION.

NOTIFY - THE RELEVANT AUTHORITIES (SITE MANAGER / FISHERIES / NPWS / LOCAL AUTHORITY ETC.) SHOULD BE NOTIFIED IMMEDIATELY TO ENSURE THAT MEASURES CAN BE IMPLEMENTED DOWNSTREAM TO PROTECT FISHERIES AND OTHER SENSITIVE AREAS.

MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE

MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS:	<ol style="list-style-type: none"> APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE USING SMALL WORKING AREAS WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED MET WEATHER
SOURCE CONTROLS:	<ol style="list-style-type: none"> USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEGETATION, OVERFLOW DRAINS, FLUMES AND SILVERT PIPES EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> SAND BAGS OSTER BAGS FILLED WITH GRAVEL FILTER FABRICS AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS USING SMALL WORKING AREAS COVERING STOCKPILES WEATHERING OFF / SEALING PEAT STOCKPILES
IN-LINE CONTROLS:	<ol style="list-style-type: none"> INTERCEPTOR DRAINS, VEGETATION, OVERSIZED SWALES/COLLECTOR DRAINS EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> SAND BAGS OSTER BAGS FILLED WITH GRAVEL FILTER FABRICS STRAW BALES FLOW LIMITERS WEIRS OR BATTERS AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS SILT FENCES, FILTER FABRICS IN STREAM SEDIMENTS COLLECTION PUMPS, TEMPORARY SUMPS, PUMPING SYSTEMS ATTENUATION LAGOONS SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
WATER TREATMENT CONTROLS:	<ol style="list-style-type: none"> TEMPORARY SUMPS ATTENUATION PONDS TEMPORARY STORAGE LAGOONS
OUTFALL CONTROLS:	<ol style="list-style-type: none"> SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTTRUBER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS SILT DENATURING BAGS LEVELSPREADERS BUFFERED OUTFALLS VEGETATION FILTERS SILT DENATURING BAGS FLOW LIMITERS AND WEIRS



DRAWING NOTES

- DRAWINGS ISSUED ARE FOR PLANNING APPLICATION PURPOSES ONLY.
- COPYRIGHT, ALL RIGHTS RESERVED. NO PART HERE WITH MAY BE COPIED OR REPRODUCED PARTIALLY OR WHOLLY IN ANY FORM WHATSOEVER WITHOUT THE PRIOR NOTICE OF THE COPYRIGHT OWNER HYDRO-ENVIRONMENTAL SERVICES.
- DO NOT SCALE OFF THIS DRAWING. FIGURED METRIC DIMENSIONS ONLY SHOULD BE TAKEN OFF THIS DRAWING.
- ALL DIMENSIONS ARE IN METRES.

Ordnance Survey Ireland Licence No. EN 0044720
© Ordnance Survey Ireland/Government of Ireland

Date	Description	Chkd	Signed

Revisions

HYDRO ENVIRONMENTAL SERVICES

22 Lower Main St
Dungarvan
Co. Waterford
Ireland

tel: +353 (0) 58-44122
tel: +353 (0) 58-44244
email: info@hydroenvironmental.ie
web: www.hydroenvironmental.ie

Client: **BORD NA MONA POWERGEN LTD**

Job: **DERRINLOUGH WF, CO. OFFALY**

Title: **PROPOSED DRAINAGE LAYOUT**

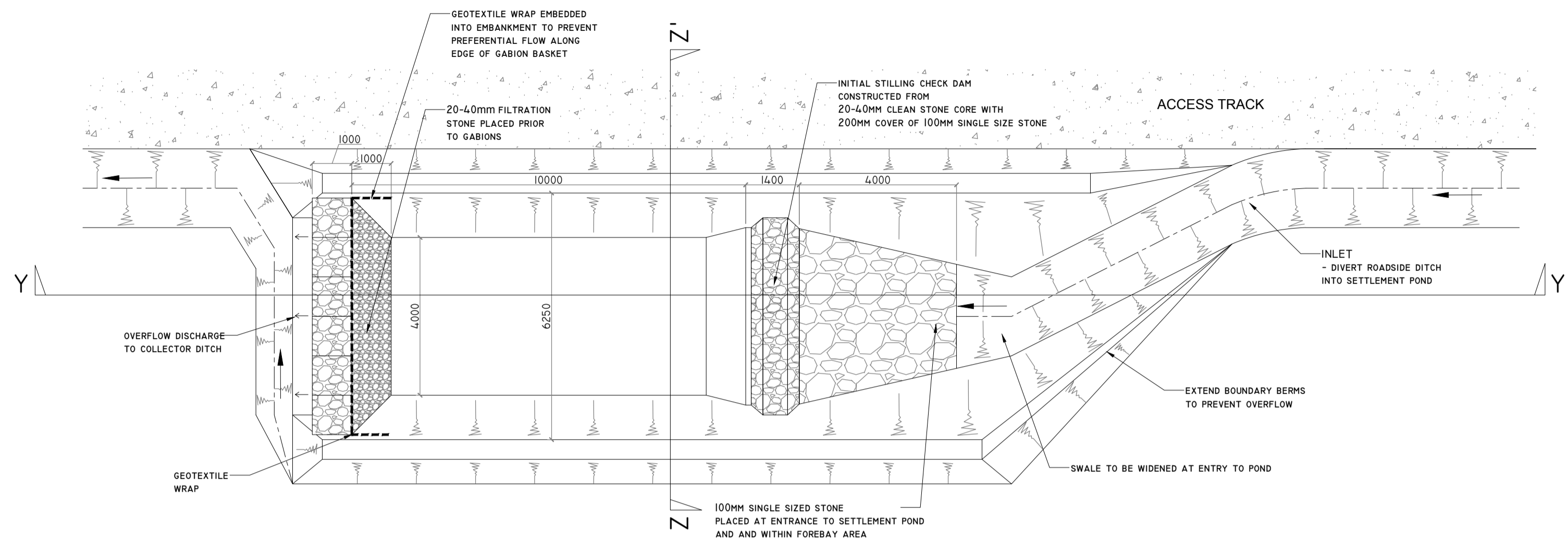
Figure No: **171221 - 20**

Drawing No: P1463-0-0220-A0-171221-20-00A

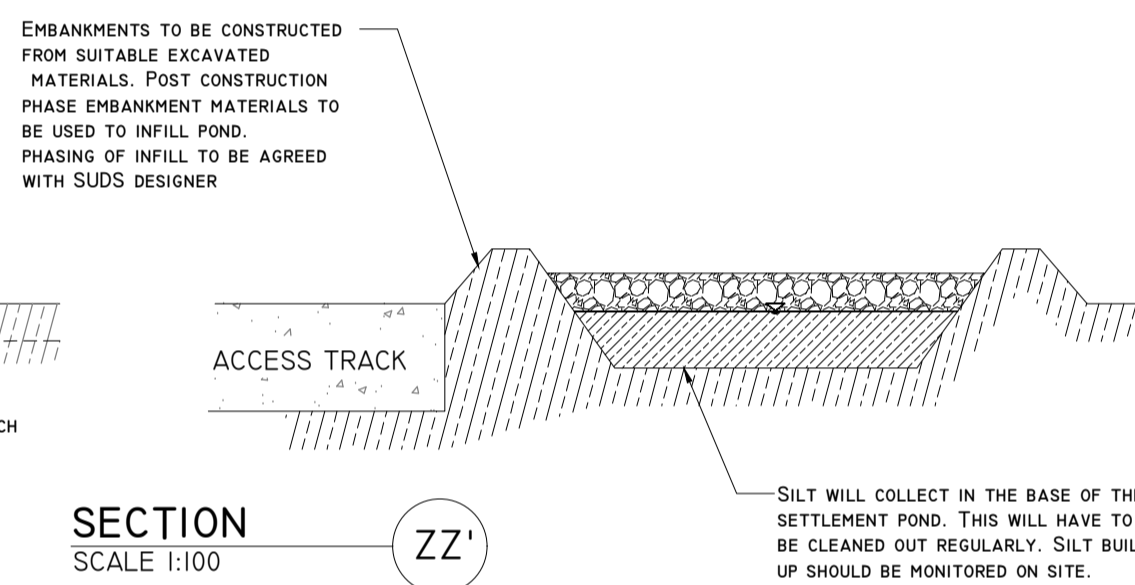
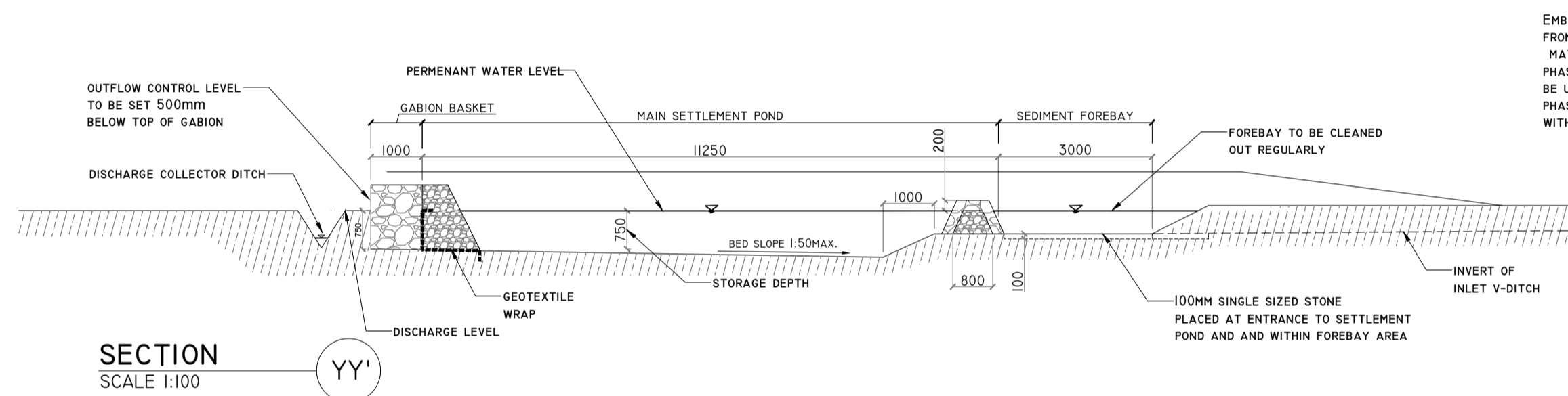
Sheet Size: A0 Project No.: P1463-0

Scale: 1:2,000 (A0) Drawn By: MG / GD
Date: 14/02/2020 Checked By: MG

DETAIL A

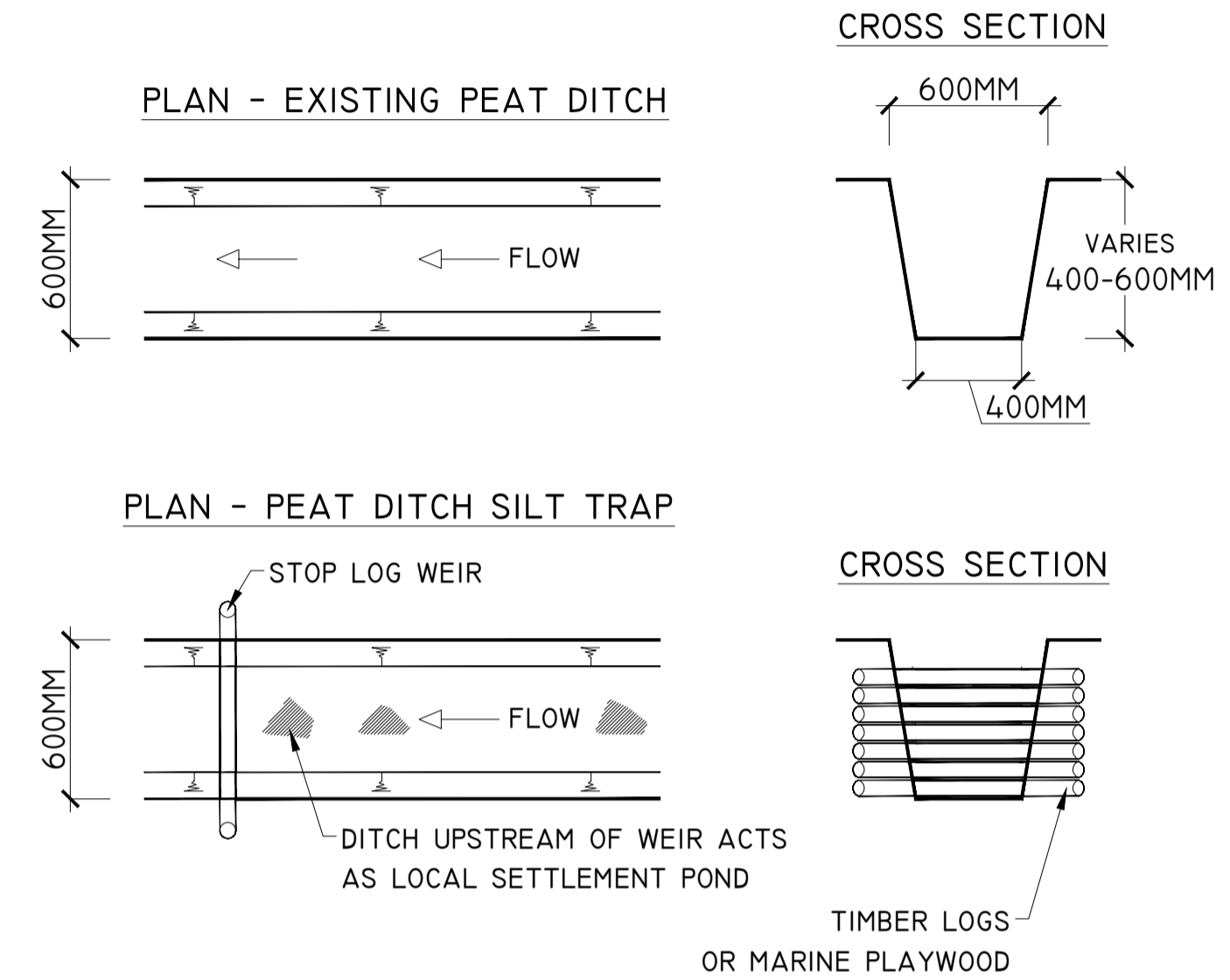


TYPICAL ROAD SIDE SETTLEMENT POND DETAIL
SCALE 1:200 (NOTE DIMENSIONS VARY DEPENDING ON CATCHMENT SIZE)



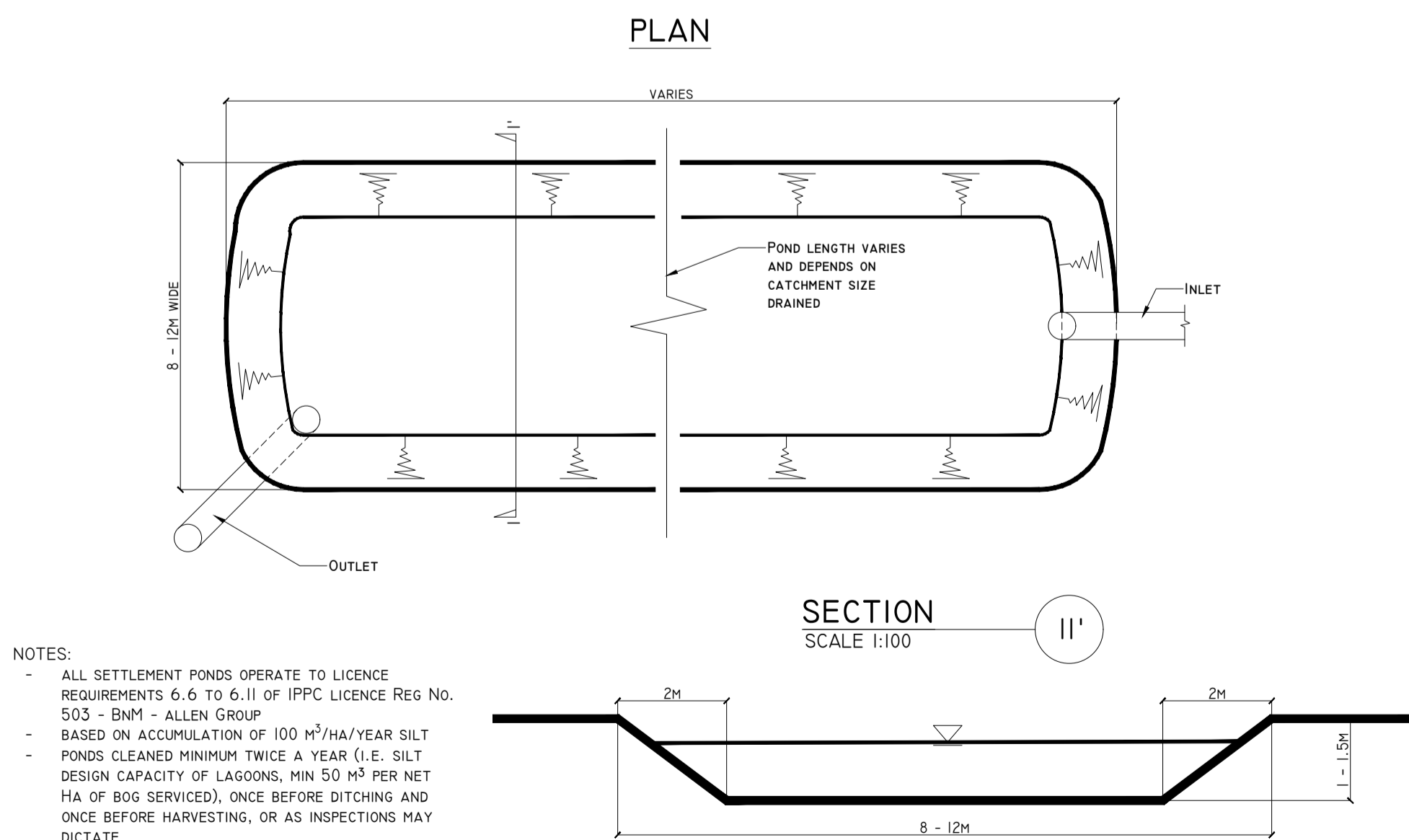
DETAIL B

PEAT DITCH SILT TRAP
SCALE 1:25



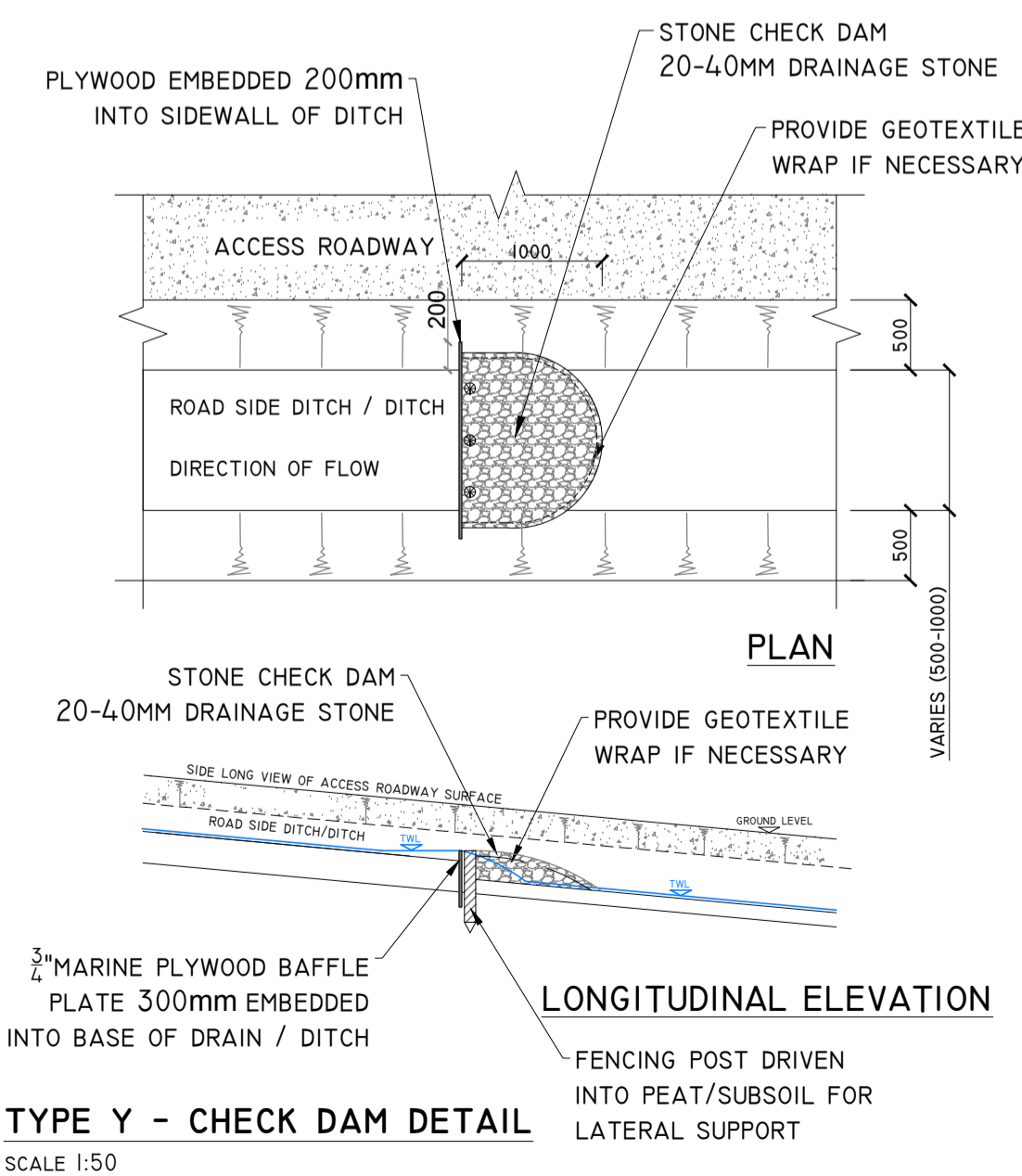
DETAIL C

TYPICAL BNM SETTLEMENT POND DETAIL
SCALE 1:200

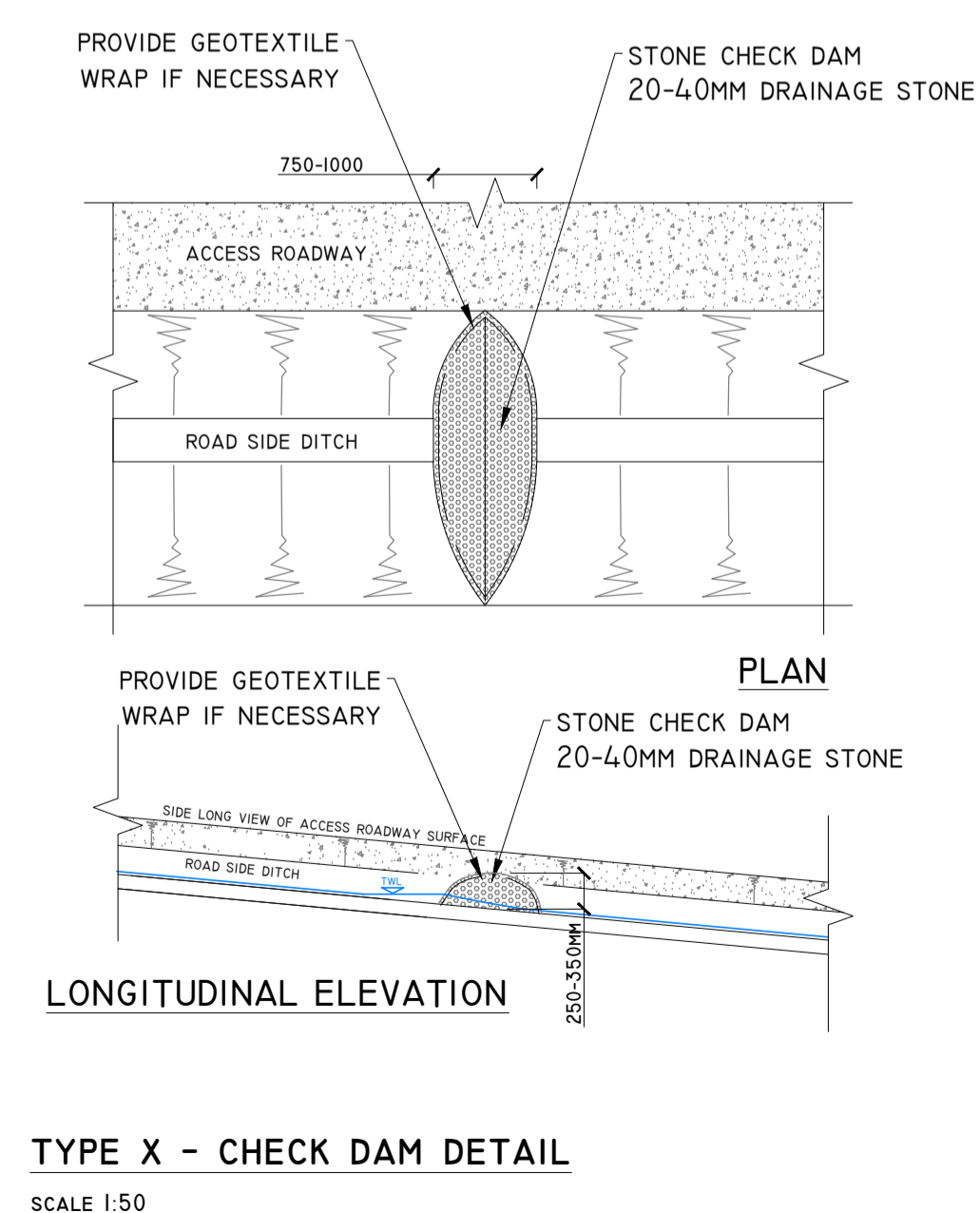


- NOTES:**
- ALL SETTLEMENT PONDS OPERATE TO LICENCE REQUIREMENTS 6.6 TO 6.11 OF IPPC LICENCE REG NO. 503 - BNM - ALLEN GROUP
 - BASED ON ACCUMULATION OF 100 M³/HA/YEAR SILT PONDS CLEANED MINIMUM TWICE A YEAR (I.E. SILT DESIGN CAPACITY OF LAGOONS, MIN 50 M³ PER NET HA OF BOG SERVICES), ONCE BEFORE DITCHING AND ONCE BEFORE HARVESTING, OR AS INSPECTIONS MAY DICTATE
 - GENERALLY - 8 - 12 M WIDE, AND 1 - 1.5 M DEEP
 - VELOCITY THRESHOLD OF 0.1 M/SEC

DETAIL D



DETAIL E



PROJECT DESIGN DRAWING NOTES:

- PLEASE NOTE THIS DRAWING IS FOR PLANNING PURPOSES ONLY, AND FURTHER DETAILED SPECIFICATION WILL BE REQUIRED FOR THE EXECUTION OF THE WORKS TO ENSURE THEY MEET RELEVANT DESIGN STANDARDS, AND POTENTIAL PLANNING CONDITIONS.
- DRAWINGS NOT TO BE USED FOR CONSTRUCTION / CONTRACT CONDITIONS.
- COPYRIGHT, ALL RIGHTS RESERVED. NO PART HERE WITH MAY BE COPIED OR REPRODUCED PARTIALLY OR WHOLLY IN ANY FORM WHATSOEVER WITHOUT THE PRIOR NOTICE OF THE COPYRIGHT OWNER HYDRO-ENVIRONMENTAL SERVICES.
- DO NOT SCALE OFF THIS DRAWING. FIGURED METRIC DIMENSIONS ONLY SHOULD BE TAKEN OFF THIS DRAWING.
- THE USE OF OR RELIANCE UPON THIS DRAWING SHALL BE DEEMED TO BE ACCEPTANCE OF THESE CONDITIONS OF USE UNLESS OTHERWISE AGREED IN WRITING. SUCH WRITTEN AGREEMENT TO BE SOUGHT FROM AND ISSUED BY THE COPYRIGHT HOLDER TO THE USER OR RELIANCE UPON THIS DRAWING.
- DRAINAGE SYSTEMS ARE OFFSET AT A DISTANCE APPROPRIATE TO THE SCALE OF THIS DRAWING. ALL DRAINAGE WILL BE LOCATED ADJACENT TO INFRASTRUCTURE, AS APPROPRIATE ACROSS THE SITE.

DRAINAGE DESIGN NOTES:

- ALL DRAINAGE SUBJECT TO MICRO-SITING AND OPTIMISATION ON SITE.
- THE LOCATIONS OF CONSTRUCTION PHASE INTERCEPTOR DRAINS, CHECK DAMS, CULVERTS, SWALES, SETTLEMENT PONDS AND LEVEL SPREADERS ARE SHOWN AS INDICATIVE, AND MAY BE CHANGED TO SUIT THE REQUIREMENTS OF THE LOCAL TOPOGRAPHY.
- SUPERVISING HYDROLOGIST OR ENVIRONMENTAL CLERK OF WORKS (ENVIRONMENTAL SCIENTIST) TO OVERSEE INSTALLATION OF DRAINAGE FEATURES FOLLOWING DETAILED DRAINAGE DESIGN.
- DRAINAGE MEASURES TO BE INSTALLED PRIOR TO, OR AT THE SAME TIME AS THE WORKS ARE INTENDED TO DRAIN.
- DESIGN ELEVATION OF THE WATER SURFACE ALONG THE ROUTE OF THE INTERCEPTOR DRAINS OR SWALES WILL NOT BE LOWER THAN THE DESIGN ELEVATION OF THE WATER SURFACE IN THE OUTLET AT THE LEVEL SPREADER OR SETTLEMENT POND.
- THE SPACING AND FREQUENCY OF THE CHECK DAMS WILL BE DEPENDANT ON THE GRADIENT OF THE INTERCEPTOR DRAIN OR SWALE IN WHICH THEY ARE BEING INSTALLED.
- CHECK DAM DESIGNS TO BE SELECTED BEST TO SUIT PARTICULAR TOPOGRAPHY AND HYDROLOGICAL ENVIRONMENT.
- DOWN GRADIENT SLOPE BELOW LEVEL SPREADER ONTO WHICH THE WATER WILL DISAPPEAR TO HAVE A GRADE 10%.
- NO DIRECT DISCHARGE OR PUMPING TO WATERCOURSES WILL BE PERMITTED. ALL DISCHARGES FROM LEVEL SPREADERS OR STILLING PONDS TO BE VIA VEGETATED FILTERS. SELECTION OF SUITABLE AREAS TO USE AS VEGETATION FILTERS WILL BE DETERMINED BY THE SIZE OF THE CONTRIBUTING CATCHMENT, SLOPE AND GROUND CONDITIONS.
- NEW TEMPORARY CONSTRUCTION PHASE SETTLEMENT PONDS TO BE SIZED ACCORDING TO THE CATCHMENT AREA THEY WILL BE RECEIVING WATER FROM.
- DIVERSION OF DRAINAGE DITCHES WILL ONLY TAKE PLACE WHEN ALTERNATIVE DRAINAGE DITCH HAS BEEN INSTALLED TO HANDLE THE SAME WATER.
- ALL DRAINAGE SYSTEM FEATURES TO BE SUBJECT OF INSPECTION AND MAINTENANCE PLAN.
- THE LAYOUT SHOWN IS SLIGHTLY OFFSET FOR SCALE PURPOSES, AND ALL DRAINAGE WILL BE INSTALLED AS CLOSE TO ACCESS TRACKS/ROADS AS POSSIBLE.

05.10.16	Planning - Rev A	M.G.	M.Gill
Date	Description	Chkd	Signed
Revisions			

HYDRO ENVIRONMENTAL SERVICES
 22 Lower Main St
 Dungarvan
 Co. Waterford
 Ireland

tel: +353 (0) 58-44122
 tel: +353 (0) 58-44244
 email: info@hydroenvironmental.ie
 web: www.hydroenvironmental.ie

Client: **BORD NA MONA POWERGEN LTD**

Job: **DERRINLOUGH WIND FARM, CO. OFFALY**

Title: **DRAINAGE DETAILS I**

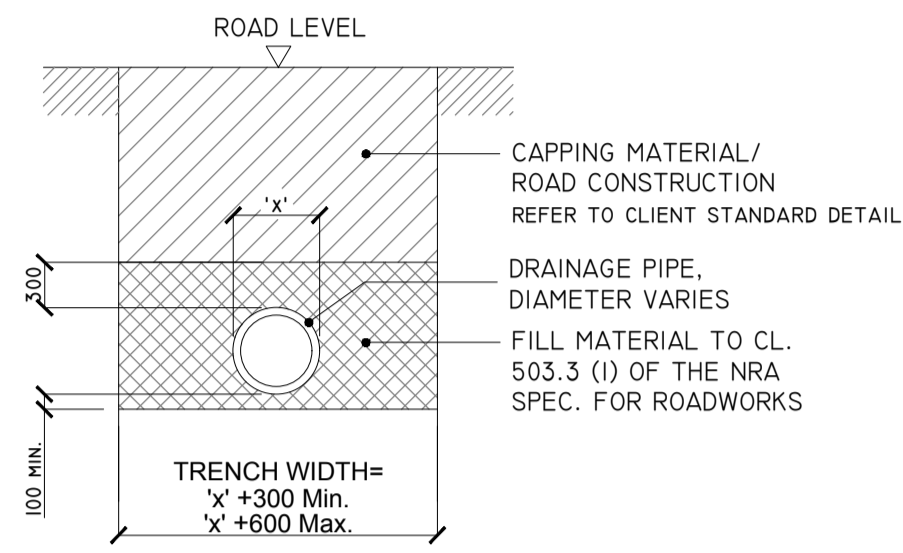
Figure No: **171221 - 21**

Drawing No: **P1463-0220-A1-171221-21-00A**

Sheet Size: **A1** Project No.: **P1463**
 Scale: **as shown (A1)** Drawn By: **G.D./M.Gill**
 Date: **14/02/2020** Checked By: **M.G.**

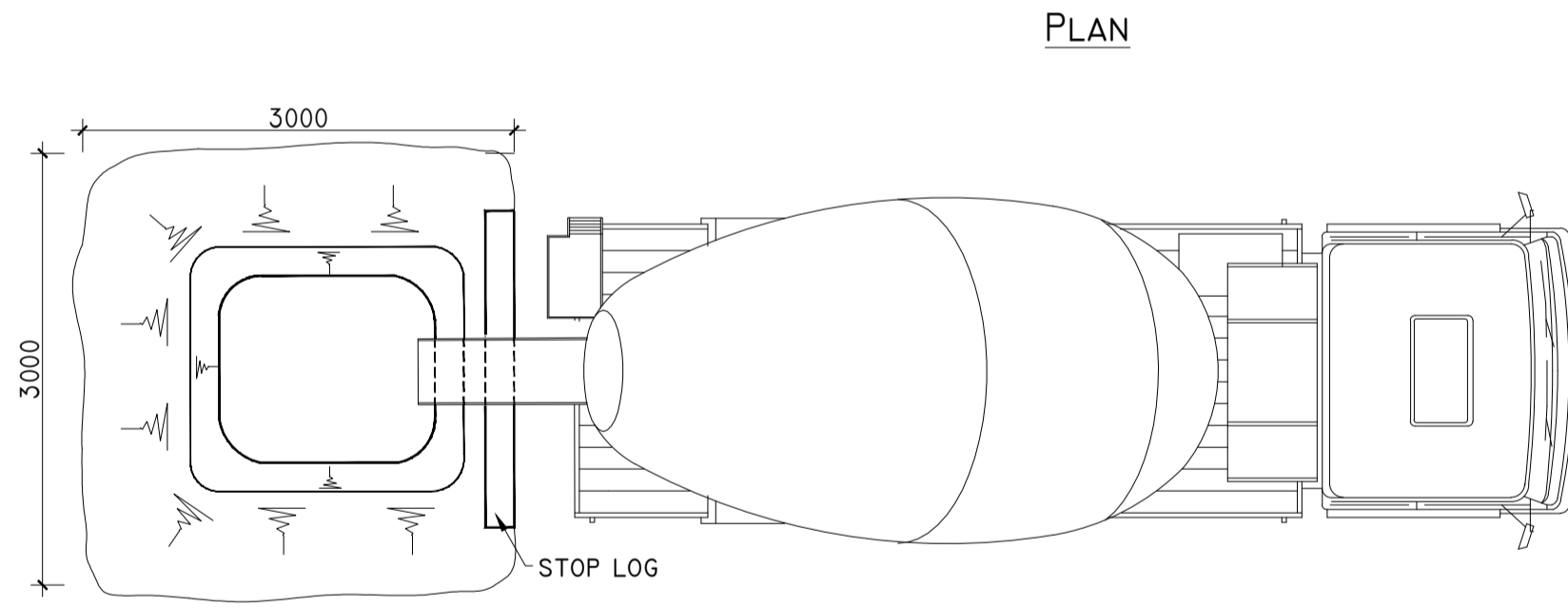
DETAIL F

'TYPE B' CULVERT - DRAINAGE CROSSING BENEATH EXCAVATED ROAD
SCALE 1:50

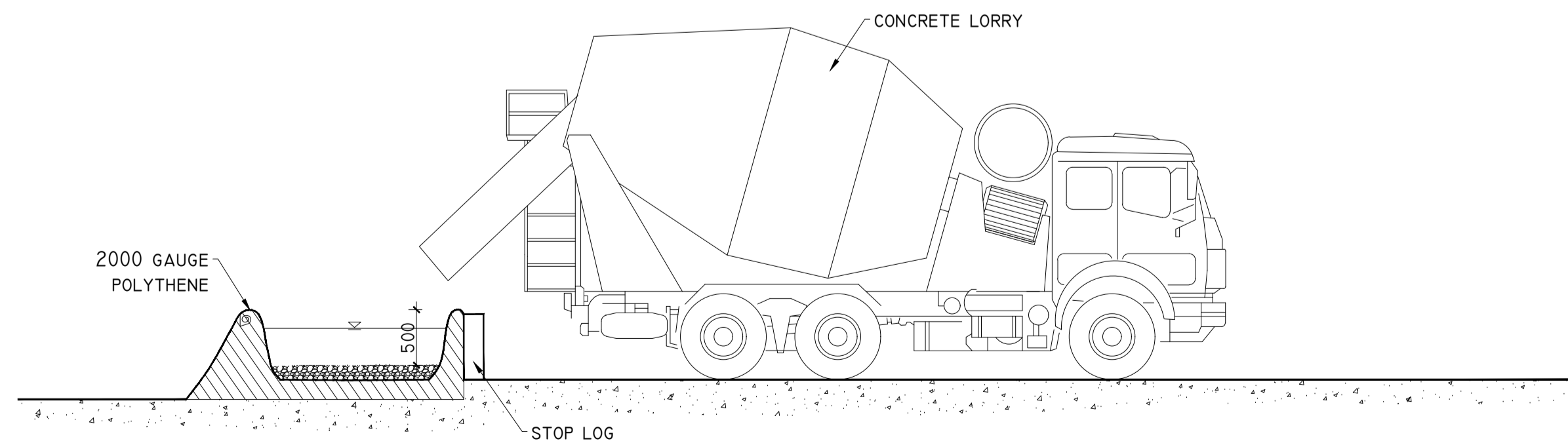


DETAIL I

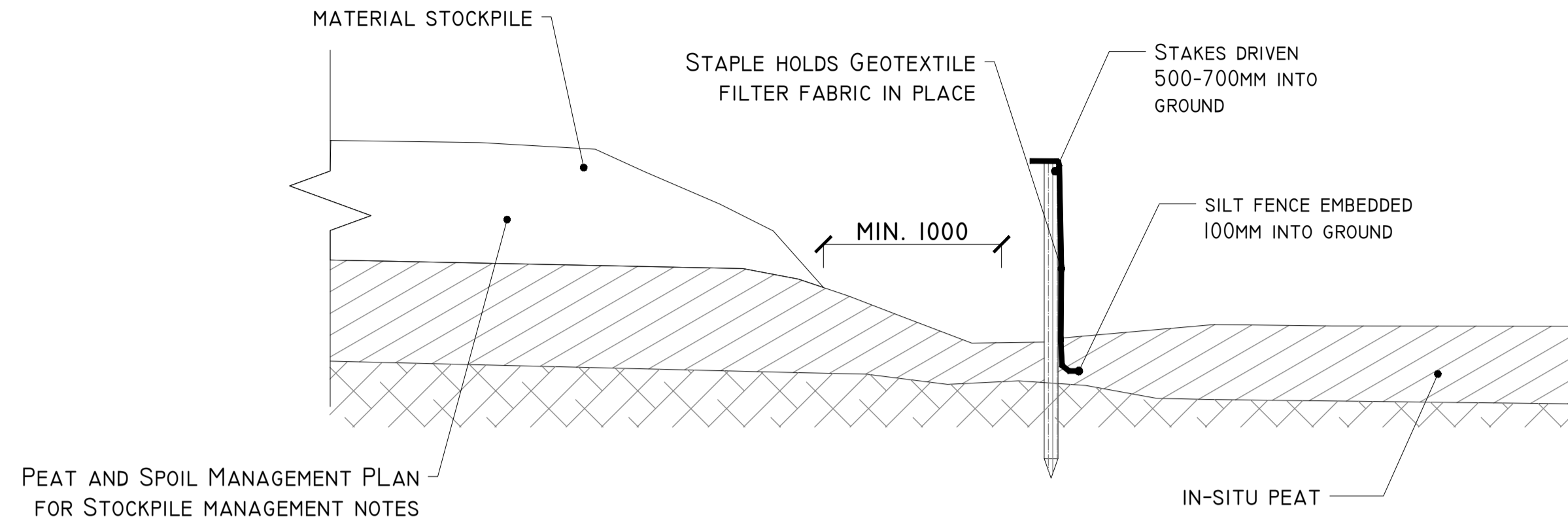
TEMPORARY CONCRETE WASH OUT PIT
SCALE 1:25



ELEVATION



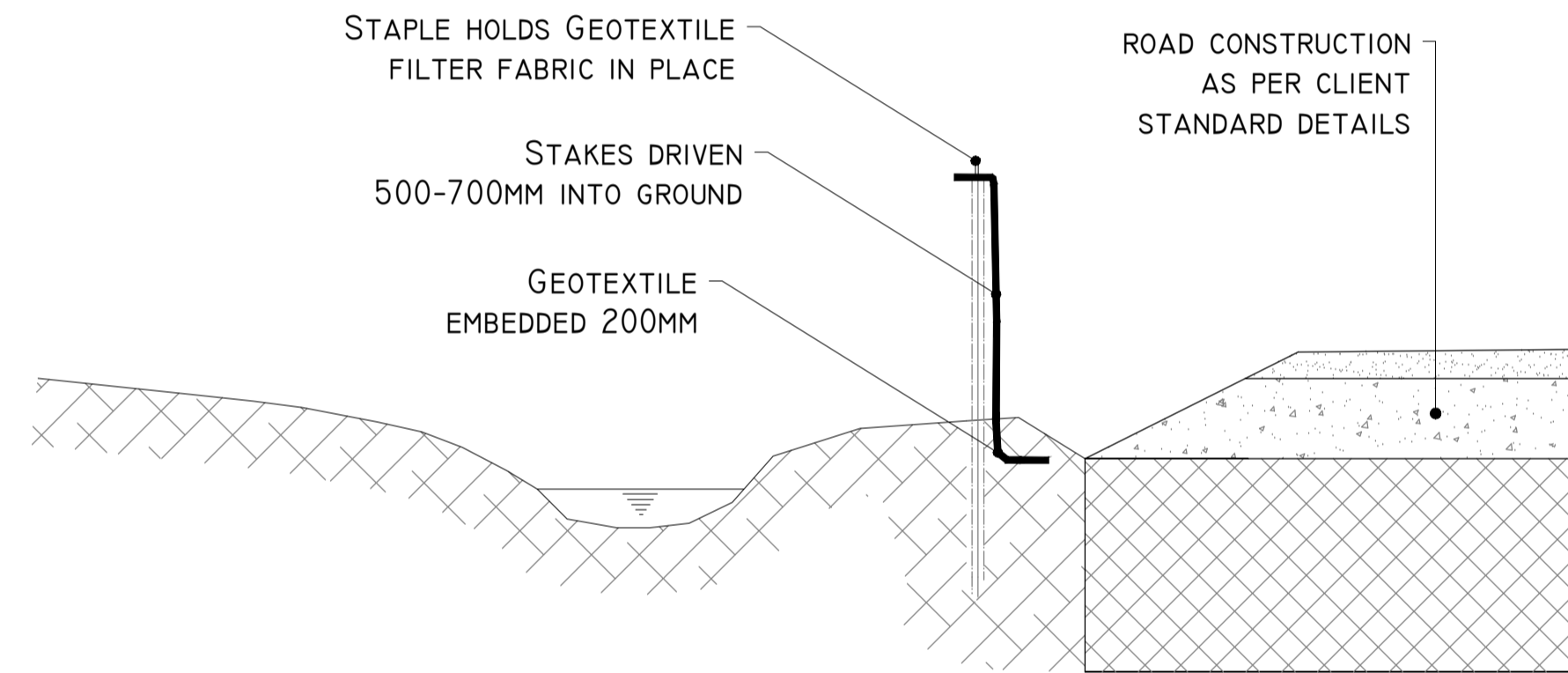
DETAIL G-I



PEAT AND SPOIL MANAGEMENT PLAN
FOR STOCKPILE MANAGEMENT NOTES

SILT FENCE
SCALE 1:25

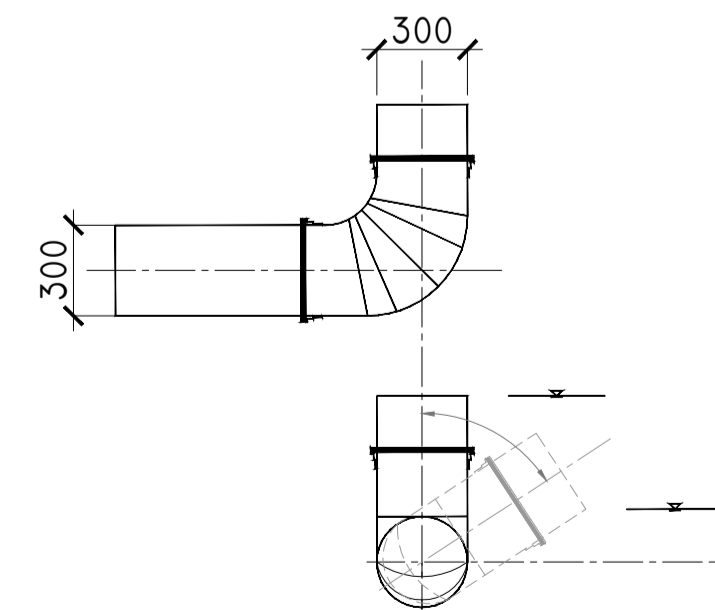
DETAIL G-II



SILT FENCE FOR WATERCOURSE PROTECTION
SCALE 1:25

DETAIL H

90° U BEND AND WATER LEVEL CONTROL MECHANISM
SCALE 1:25



PROJECT DESIGN DRAWING NOTES:
1. PLEASE NOTE THIS DRAWING IS FOR PLANNING PURPOSES ONLY, AND FURTHER DETAILED SPECIFICATION WILL BE REQUIRED FOR THE EXECUTION OF THE WORKS TO ENSURE THEY MEET REQUIRED DESIGN STANDARDS, AND POTENTIAL PLANNING CONDITIONS.
2. DRAWINGS NOT TO BE USED FOR CONSTRUCTION /CONTRACT CONDITIONS.
3. COPYRIGHT, ALL RIGHTS RESERVED. NO PART HERE WITH MAY BE COPIED OR REPRODUCED PARTIALLY OR WHOLLY IN ANY FORM WHATSOEVER WITHOUT THE PRIOR NOTICE OF THE COPYRIGHT OWNER HYDRO-ENVIRONMENTAL SERVICES.
4. DO NOT SCALE OFF THIS DRAWING. FIGURED METRIC DIMENSIONS ONLY SHOULD BE TAKEN OFF THIS DRAWING.
5. THE USE OF OR RELIANCE UPON THIS DRAWING SHALL BE DEEMED TO BE ACCEPTANCE OF THESE CONDITIONS UNLESS OTHERWISE AGREED IN WRITING. SUCH WRITTEN AGREEMENT TO BE SOUGHT FROM AND ISSUED BY THE COPYRIGHT HOLDER TO THE USER OR RELIANCE UPON THIS DRAWING.
6. DRAINAGE SYSTEMS ARE OFFSET AT A DISTANCE APPROPRIATE TO THE SCALE OF THIS DRAWING. ALL DRAINAGE WILL BE LOCATED ADJACENT TO INFRASTRUCTURE, AS APPROPRIATE ACROSS THE SITE.

DRAINAGE DESIGN NOTES:
1. ALL DRAINAGE SUBJECT TO MICRO-SITING AND OPTIMISATION ON SITE.
2. THE LOCATIONS OF CONSTRUCTION PHASE INTERCEPTOR DRAINS, CHECK DAMS, CULVERTS, SWALES, SETTLEMENT PONDS AND LEVEL SPREADERS ARE SHOWN AS INDICATIVE, AND MAY BE CHANGED TO SUIT THE REQUIREMENTS OF THE LOCAL TOPOGRAPHY.
3. SUPERVISING HYDROLOGIST OR ENVIRONMENTAL CLERK OF WORKS (ENVIRONMENTAL SCIENTIST) TO OVERSEE INSTALLATION OF DRAINAGE FEATURES FOLLOWING DETAILED DRAINAGE DESIGN.
4. DRAINAGE MEASURES TO BE INSTALLED PRIOR TO, OR AT THE SAME TIME AS THE WORKS AREAS THEY ARE INTENDED TO DRAIN.
5. DESIGN ELEVATION OF THE WATER SURFACE ALONG THE ROUTE OF THE INTERCEPTOR DRAINS OR SWALES WILL NOT BE LOWER THAN THE DESIGN ELEVATION OF THE WATER SURFACE IN THE OUTLET AT THE LEVEL SPREADER OR SETTLEMENT POND.
6. THE SPACING AND FREQUENCY OF THE CHECK DAMS WILL BE DEPENDANT ON THE GRADIENT OF THE INTERCEPTOR DRAIN OR SWALE IN WHICH THEY ARE BEING INSTALLED.
7. CHECK DAM DESIGNS TO BE SELECTED BEST TO SUIT PARTICULAR TOPOGRAPHY AND HYDROLOGICAL ENVIRONMENT.
8. DOWN GRADIENT SLOPE BELOW LEVEL SPREADER ONTO WHICH THE WATER WILL DISSIPATE TO HAVE A GRADE 0.5%.
9. NO DIRECT DISCHARGE OR PUMPING TO WATERCOURSES WILL BE PERMITTED. ALL DISCHARGES FROM LEVEL SPREADERS OR STILLING PONDS TO BE VIA VEGETATED FILTERS. SELECTION OR SUITABLE AREAS TO USE AS VEGETATION FILTERS WILL BE DETERMINED BY THE SIZE OF THE CONTRIBUTING CATCHMENT, SLOPE AND GROUND CONDITIONS.
10. NEW TEMPORARY CONSTRUCTION PHASE SETTLEMENT PONDS TO BE SIZED ACCORDING TO THE CATCHMENT AREA THEY WILL BE RECEIVING WATER FROM.
11. DIVERSION OF DRAINAGE DITCHES WILL ONLY TAKE PLACE WHEN ALTERNATIVE DRAINAGE DITCH HAS BEEN INSTALLED TO HANDLE THE SAME WATER.
12. ALL DRAINAGE SYSTEM FEATURES TO BE SUBJECT OF INSPECTION AND MAINTENANCE PLAN.
13. THE LAYOUT SHOWN IS SLIGHTLY OFFSET FOR SCALE PURPOSES, AND ALL DRAINAGE WILL BE INSTALLED AS CLOSE TO ACCESS TRACKS/ROADS AS POSSIBLE.

05.10.16	Planning - Rev A	M.G.	M.Gill
Date	Description	Chkd	Signed
Revisions			

HYDRO ENVIRONMENTAL SERVICES
22 Lower Main St
Dungannon
Co. Waterford
Ireland

tel: +353 (0) 58-44122
tel: +353 (0) 58-44244
email: info@hydroenvironmental.ie
web: www.hydroenvironmental.ie

Client:
BORD NA MONA POWERGEN LTD

Job:
DERRINLOUGH WIND FARM, CO. OFFALY

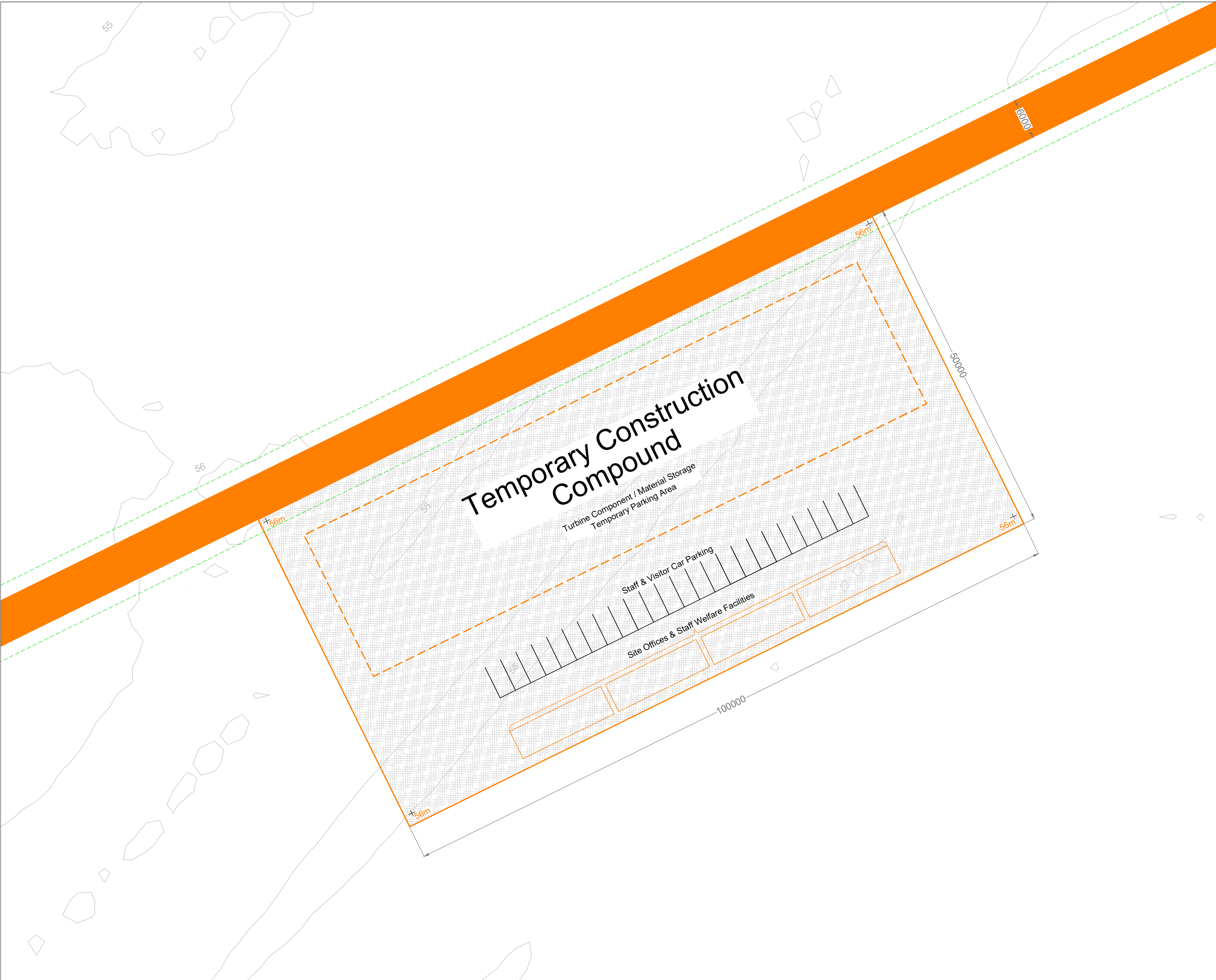
Title:
DRAINAGE DETAILS 2

Figure No:
171221 - 22

Drawing No: P1463-0220-A1-171221-22-00A

Sheet Size: A1
Scale: as shown (A1)
Date: 14/02/2020

Project No.: P1463
Drawn By: G.D./M.Gill
Checked By: M.G.



- Project Design Drawing Notes**
1. Drawings issued are for planning application purposes only.
 2. Drawings not to be used for construction/contract conditions.
 3. Copyright, all rights reserved. No part hereof may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
 4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
 5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
 6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
 8. Final levels may vary depending on local ground conditions.
 9. Construction Compound layout is indicative. Final Arrangement will be on per contractor's requirements.

- Drawing Legend**
- Proposed Road
 - Works Area for Internal Cabling

Temporary Construction Compound 1

PROJECT TITLE:
Derrinlough Wind Farm, Co. Offaly

DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
PROJECT No: 171221	DRAWING No: 171221 - 23

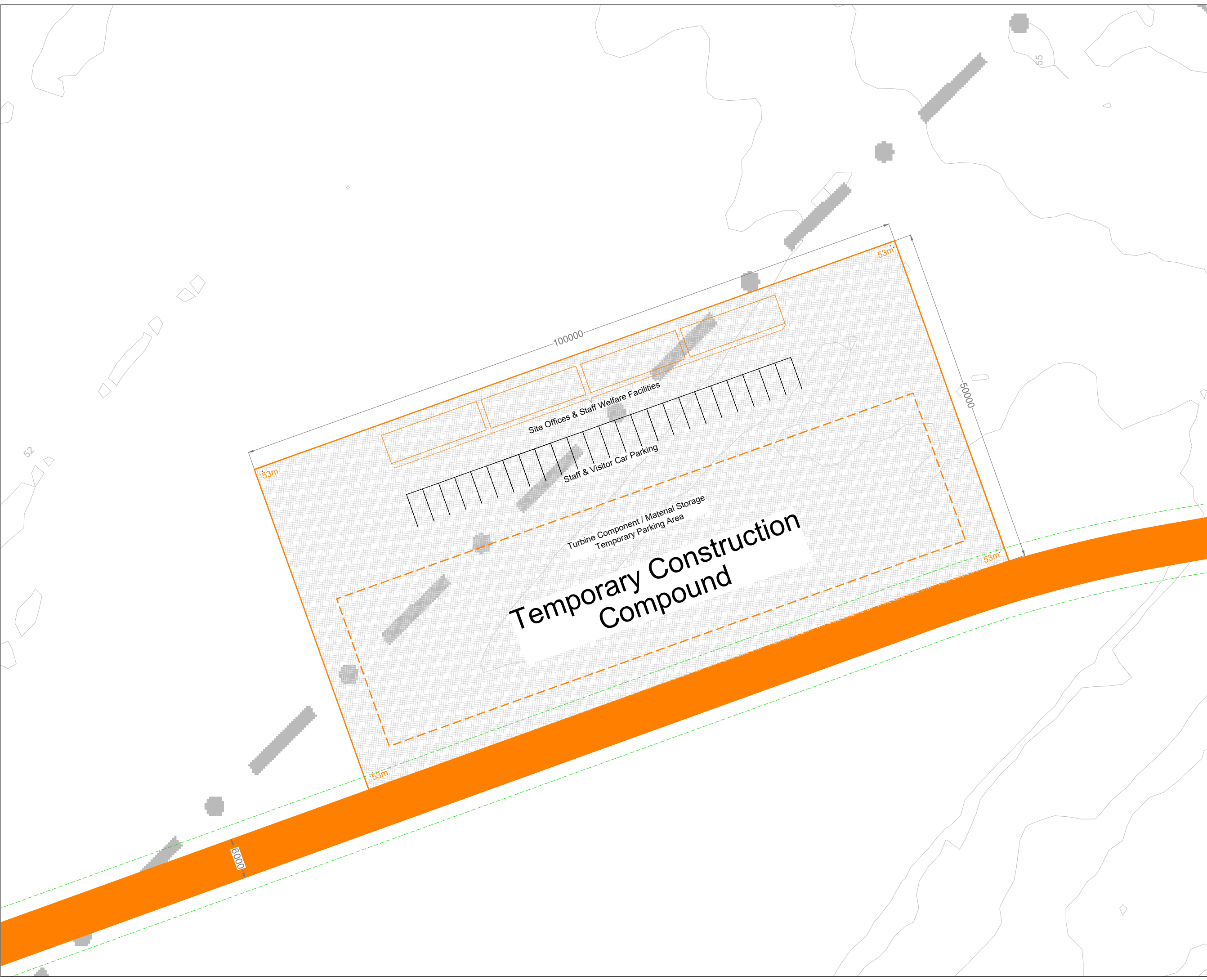
SCALE: 1:500 @ A3	DATE: 19.02.2020
-----------------------------	----------------------------

OS GRID REF: 3489, 3490, 3491, 3537, 3538, 3539, 3540, 3541, 3586, 3587, 3588, 3589, 3590, 3643, 3644, 3645, 3646, 3700, 3701, 3702, 3703, 3704



MKO
Planning and Environmental Consultants
Tuam Road, Galway
Ireland, H91 VW94
+353 (0) 91 735611
email: info@www.mkofireland.ie
Website: www.mkofireland.ie

Ordnance Survey Ireland Licence No. AR0021820 © Ordnance Survey Ireland / Government of Ireland



- Project Design Drawing Notes**
1. Drawings issued are for planning application purposes only.
 2. Drawings not to be used for construction/contract conditions.
 3. Copyright, all rights reserved. No part hereof may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
 4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
 5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
 6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
 8. Final levels may vary depending on local ground conditions.
 9. Construction Compound layout is indicative. Final Arrangement will be on per contractor's requirements.

Drawing Legend

- Proposed Road
- Works Area for Internal Cabling



Ordnance Survey Ireland Licence No. AR0021820 © Ordnance Survey Ireland / Government of Ireland

DRAWING TITLE:
Temporary Construction Compound 2

PROJECT TITLE:
Derrinlough Wind Farm, Co. Offaly

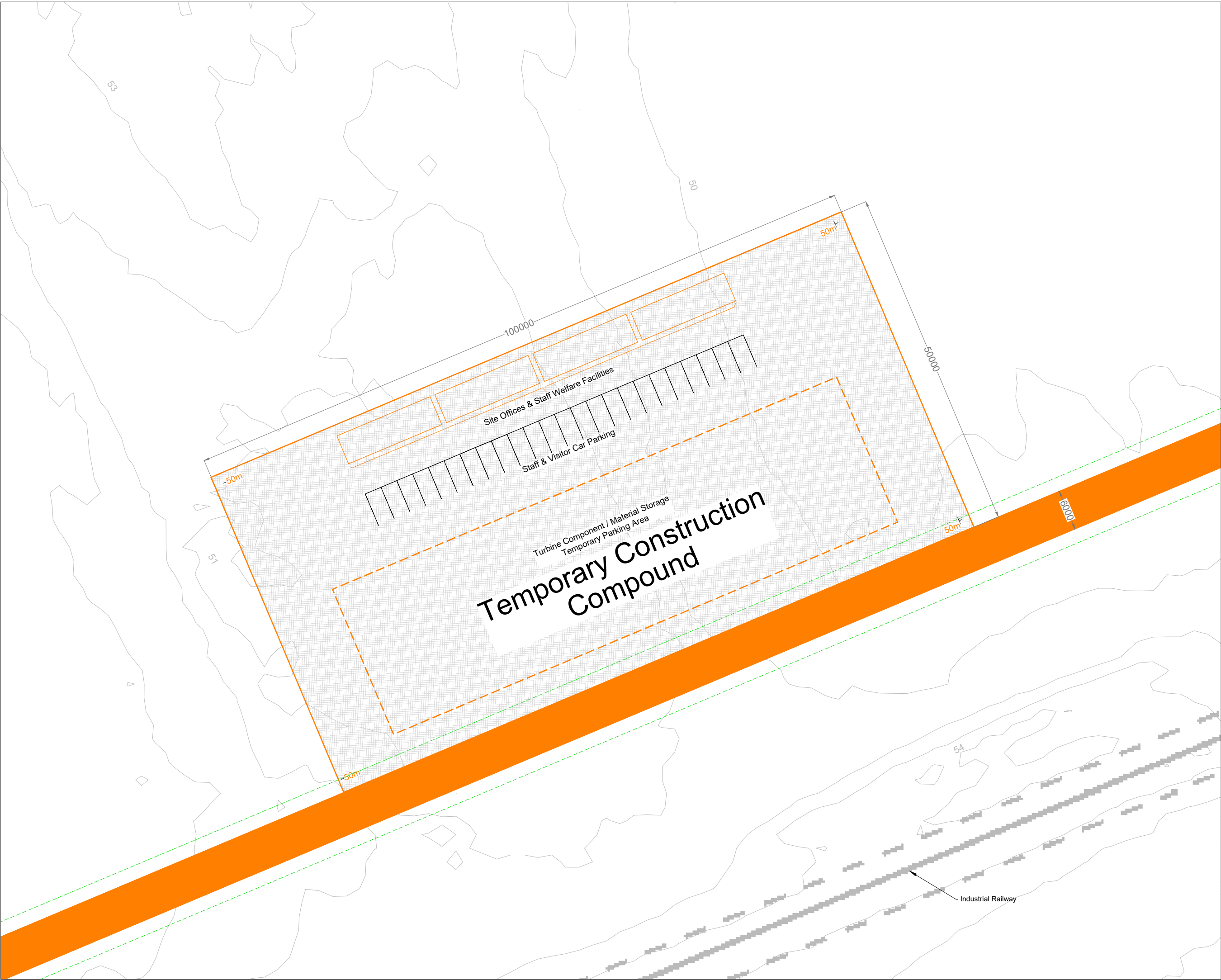
DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
PROJECT No.: 171221	DRAWING No.: 171221 - 24

SCALE: 1:500 @ A3	DATE: 19.02.2020
-----------------------------	----------------------------

OS GRID REF: 3489, 3490, 3491, 3537, 3538, 3539, 3540, 3541, 3586, 3587, 3588, 3589, 3590, 3643, 3644, 3645, 3646, 3700, 3701, 3702, 3703, 3704



MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW94
 +353 (0) 91 735611
 email: info@www.mkofireland.ie
 Website: www.mkofireland.ie



- Project Design Drawing Notes**
1. Drawings issued are for planning application purposes only.
 2. Drawings not to be used for construction/contract conditions.
 3. Copyright, all rights reserved. No part hereof may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
 4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
 5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
 6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
 8. Final levels may vary depending on local ground conditions.
 9. Construction Compound layout is indicative. Final Arrangement will be on per contractor's requirements.

- Drawing Legend**
- Proposed Road
 - - - Works Area for Internal Cabling



Temporary Construction Compound 3

Derrinlough Wind Farm, Co. Offaly

DRAWING BY: **Joseph O'Brien** CHECKED BY: **Eoin McCarthy**

PROJECT No: **171221** DRAWING No: **171221 - 25**

SCALE: **1:500 @ A3** DATE: **19.02.2020**

OS Grid Ref: 3489, 3490, 3491, 3537, 3538, 3539, 3540, 3541, 3586, 3587, 3588, 3589, 3590, 3643, 3644, 3645, 3646, 3700, 3701, 3702, 3703, 3704



MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW94
 +353 (0) 91 735611
 email: info@www.mkofireland.ie
 Website: www.mkofireland.ie

Ordnance Survey Ireland Licence No. AR0021820 © Ordnance Survey Ireland / Government of Ireland



- Project Design Drawing Notes**
1. Drawings issued are for planning application purposes only.
 2. Drawings not to be used for construction/contract conditions.
 3. Copyright, all rights reserved. No part herewith may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
 4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
 5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
 6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
 8. Final levels may vary depending on local ground conditions.
 9. Construction Compound layout is indicative. Final Arrangement will be on per contractor's requirements.

- Drawing Legend**
- Proposed Road
 - Works Area for Internal Cabling



Ordnance Survey Ireland Licence No. AR0021820© Ordnance Survey Ireland/Government of Ireland

DRAWING TITLE:
Temporary Construction Compound 4

PROJECT TITLE:
Derrinlough Wind Farm, Co. Offaly

DRAWING BY: Joseph O'Brien **CHECKED BY:** Eoin McCarthy

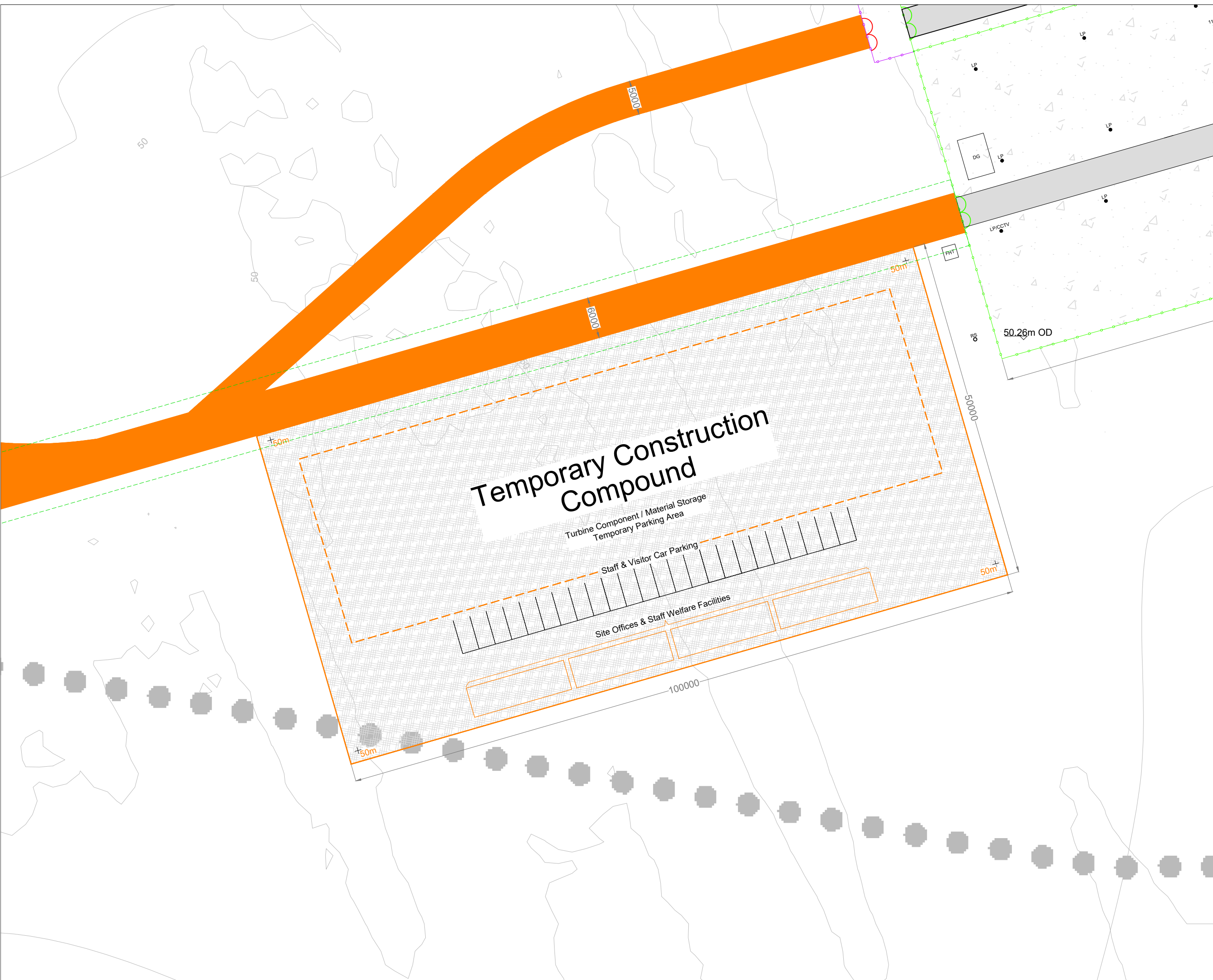
PROJECT No.: 171221 **DRAWING No.:** 171221 - 26

SCALE: 1:500 @ A3 **DATE:** 19.02.2020



MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW94
 +353 (0) 91 735611
 email: info@www.mkofireland.ie
 Website: www.mkofireland.ie

OS Grid Ref: 3488, 3489, 3490, 3491, 3537, 3538, 3539, 3540, 3541, 3586, 3587, 3588, 3589, 3590, 3643, 3644, 3645, 3646, 3700, 3701, 3702, 3703, 3704



- Project Design Drawing Notes**
1. Drawings issued are for planning application purposes only.
 2. Drawings not to be used for construction/contract conditions.
 3. Copyright, all rights reserved. No part herewith may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
 4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
 5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
 6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
 8. Final levels may vary depending on local ground conditions.
 9. Construction Compound layout is indicative. Final Arrangement will be on per contractor's requirements.

Drawing Legend

- Proposed Road
- Works Area for Internal Cabling



Ordnance Survey Ireland Licence No. AR0021820© Ordnance Survey Ireland/Government of Ireland

Temporary Construction Compound 5

Derrinlough Wind Farm, Co. Offaly

DRAWING BY: **Joseph O'Brien** CHECKED BY: **Eoin McCarthy**

PROJECT No: **171221** DRAWING No: **171221 - 27**

SCALE: **1:500 @ A3** DATE: **19.02.2020**



MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW94
 +353 (0) 91 735611
 email: info@www.mkofireland.ie
 Website: www.mkofireland.ie

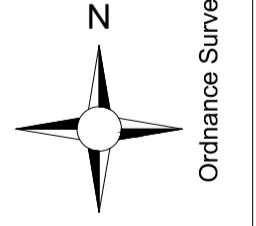


- Project Design Drawing Notes**
1. Drawings issued are for planning application purposes only.
 2. Drawings not to be used for construction/contract conditions.
 3. Copyright, all rights reserved. No part herewith may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
 4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
 5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
 6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
 8. Final levels may vary depending on local ground conditions.

SUBSTATION COMPONENT LEGEND:

ID	DESCRIPTION
BBPI	BUSBAR POST INSULATOR
BW	BORED WELL
CB	CIRCUIT BREAKER
CC	CABLE CHAIR
CCTV	CLOSED CIRCUIT TELEVISION
CT	CURRENT TRANSFORMER
CT/VT	COMBINED CURRENT & VOLTAGE TRANSFORMER
DA	BUSBAR DISCONNECTOR
DB	BUSBAR DISCONNECTOR
DE	EARTH SWITCH
DEM	TRANSFORMER EARTH SWITCH
DG	DIESEL GENERATOR
DL	LINE DISCONNECTOR
DT	TRANSFORMER DISCONNECTOR
FHT	FUOIL HOLDING TANK
HOT	HOUSE TRANSFORMER
IFK	INTERFACE KIOSK
LM	LIGHTNING MAST
LP	LAMP POST
LT	LAMP TRAP
NER	NETURAL EARTHING RESISTOR
NER CSE	NER CABLE SEALING END
OLG	OVERHEAD LINE GANTRY
PI	POST INSULATOR
RS	RURAL SUPPLY
SA	SURGE ARRESTER
TP	TELECOMMUNICATIONS POLE
VT	VOLTAGE TRANSFORMER

- Drawing Legend**
- Planning Application Boundary
 - Proposed Road
 - - - Works Area for Internal Cabling
 - Amenity Pathway



DRAWING TITLE:
Substation Layout

PROJECT TITLE:
Derrinlough Wind Farm, Co. Offaly

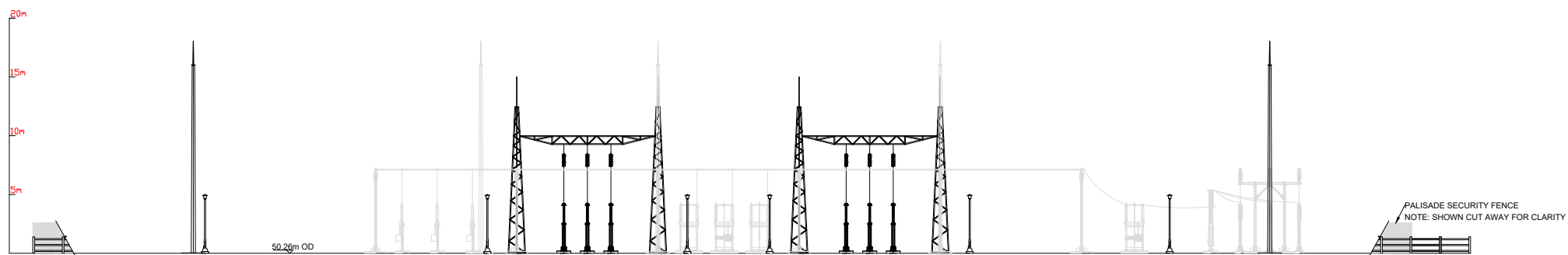
DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
PROJECT No.: 171221	DRAWING No.: 171221 - 28
SCALE: 1:500 @ A1	DATE: 19.02.2020

OS SHEET NO: 3488, 3489, 3490, 3491, 3537, 3538, 3539, 3540, 3541, 3586, 3587, 3588, 3589, 3590, 3643, 3644, 3645, 3646, 3700, 3701, 3702, 3703, 3704, 3756, 3759, 3760, 3761, 3762



Drawing Notes

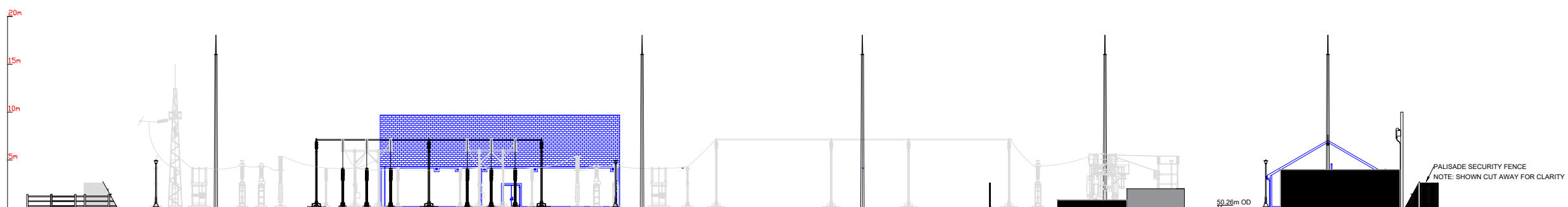
1. Layout and arrangements of substation buildings and electrical equipment is shown indicatively and for illustration purposes only as final specifications of buildings and electrical equipment is to be dictated by Eirgrid/ESB networks requirements.



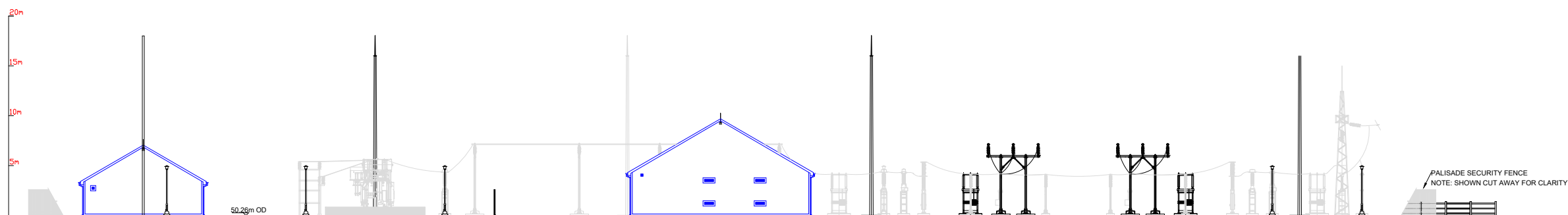
SECTION VIEW A - A



SECTION VIEW B - B



SECTION VIEW C - C

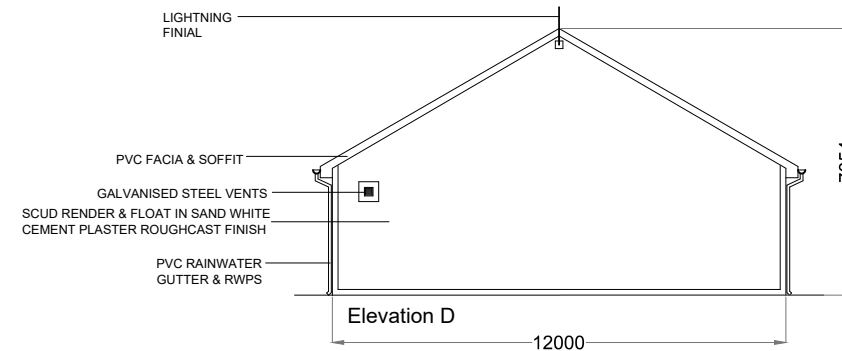
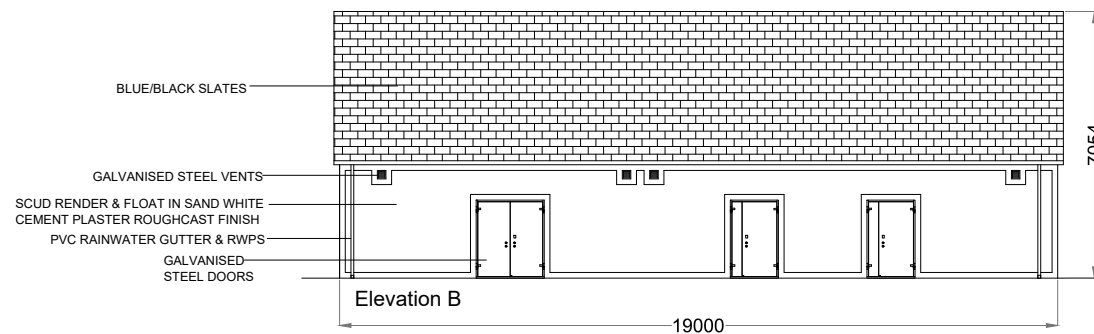
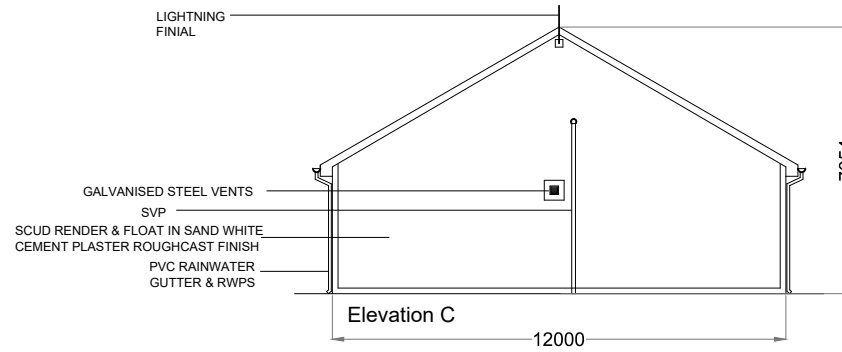
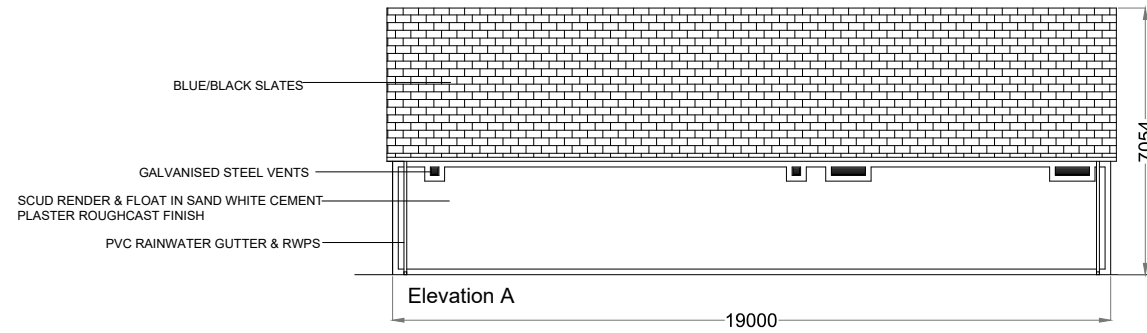
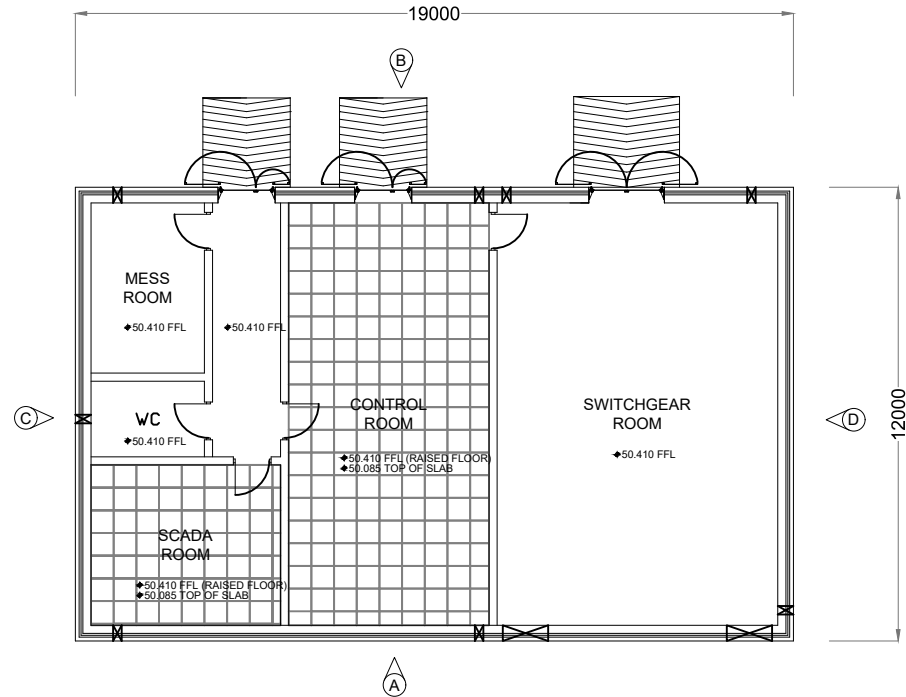


SECTION VIEW D - D

DRAWING TITLE: Substation Sections	
PROJECT TITLE: Derrinlough Wind Farm, Co. Offaly	
DRAWING BY: JMcD	CHECKED BY: NM
PROJECT No.: 1712221	DRAWING No.: 171221 - 29
SCALE: 1:500 @ A3	DATE: 19.02.2020

Drawing Notes

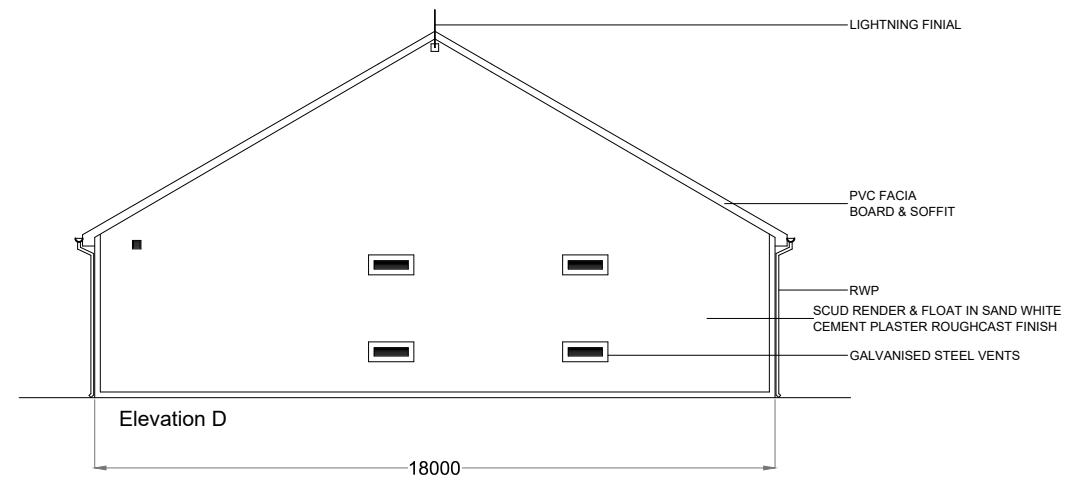
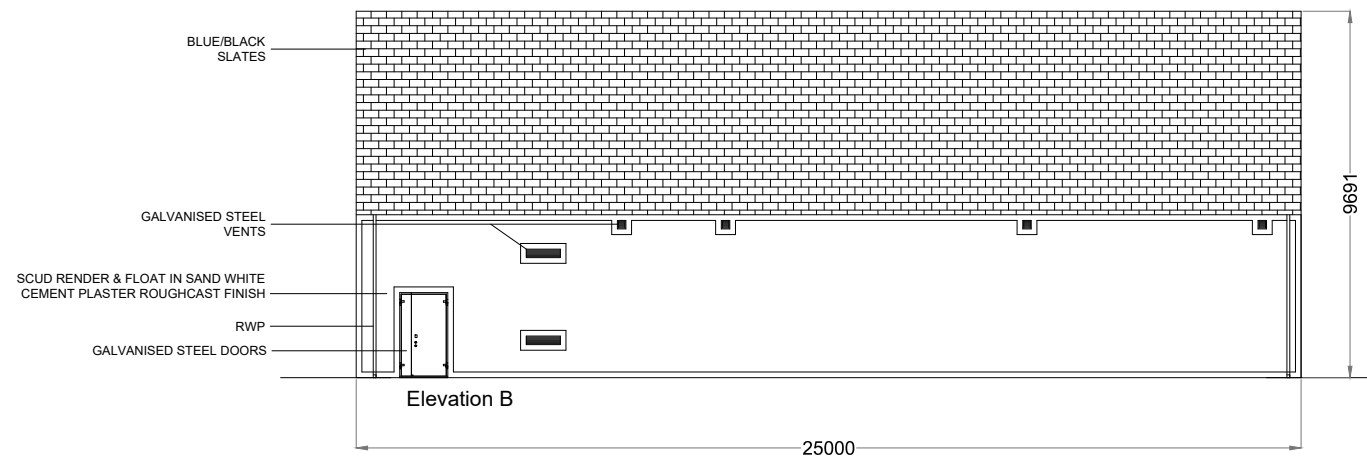
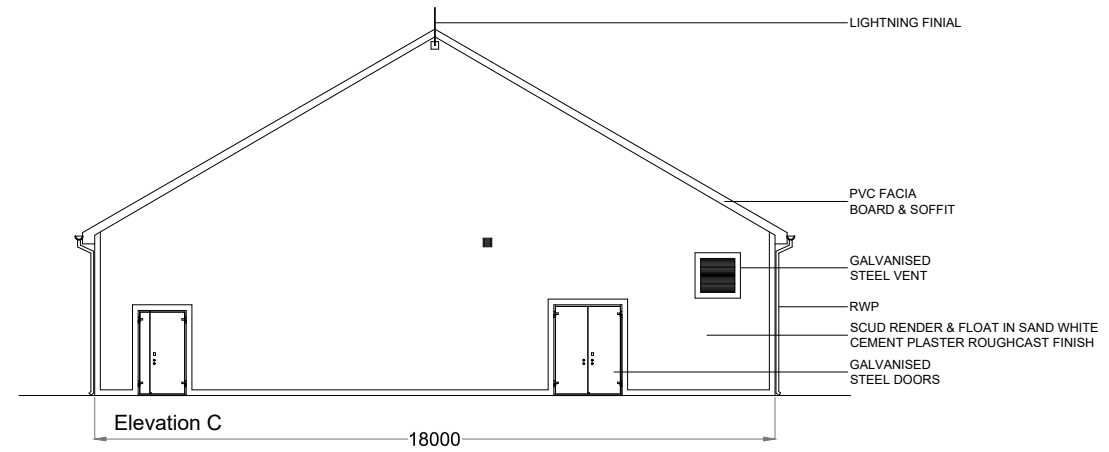
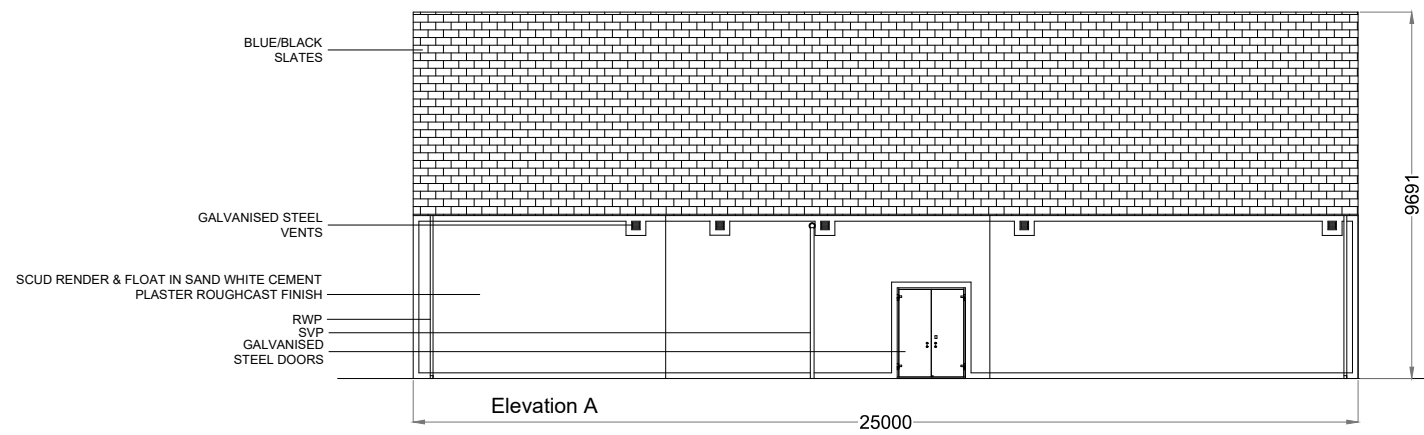
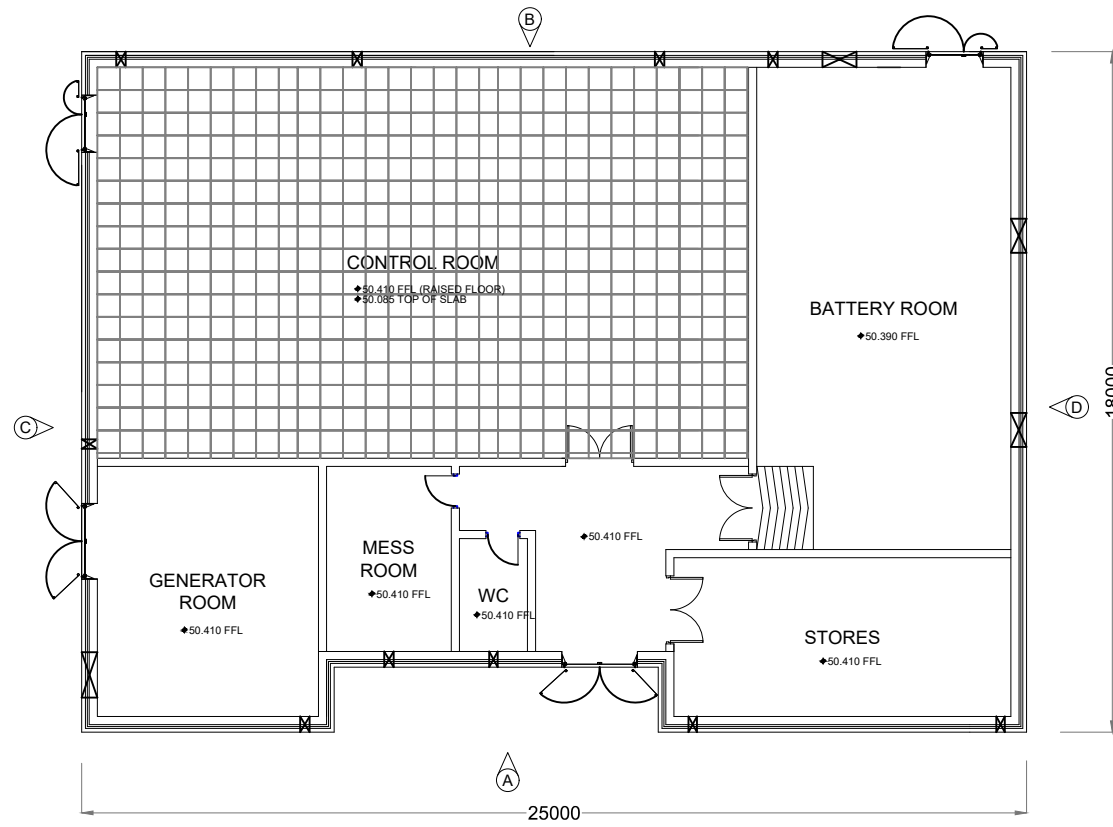
1. Layout and arrangements of substation buildings and electrical equipment is shown indicatively and for illustration purposes only as final specifications of buildings and electrical equipment is to be dictated by Eirgrid/ESB networks requirements.



DRAWING TITLE: IPP Control Building	
PROJECT TITLE: Derrinlough Wind Farm, Co. Offaly	
DRAWING BY: JMcD	CHECKED BY: NM
PROJECT No.: 1712221	DRAWING No.: 171221 - 30
SCALE: 1:200 @ A3	DATE: 19.02.2020

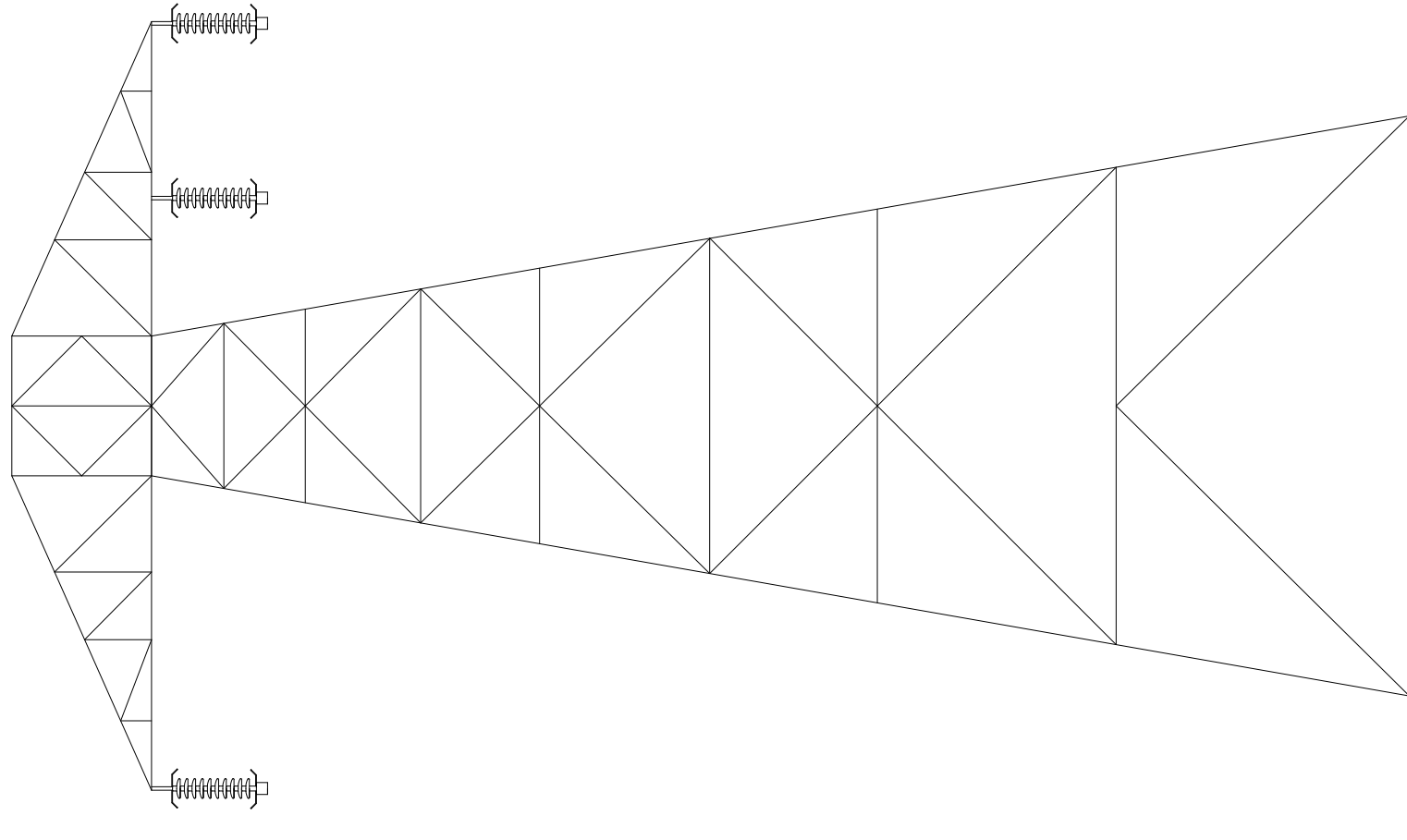
Drawing Notes

1. Layout and arrangements of substation buildings and electrical equipment is shown indicatively and for illustration purposes only as final specifications of buildings and electrical equipment is to be dictated by Eirgrid/ESB networks requirements.

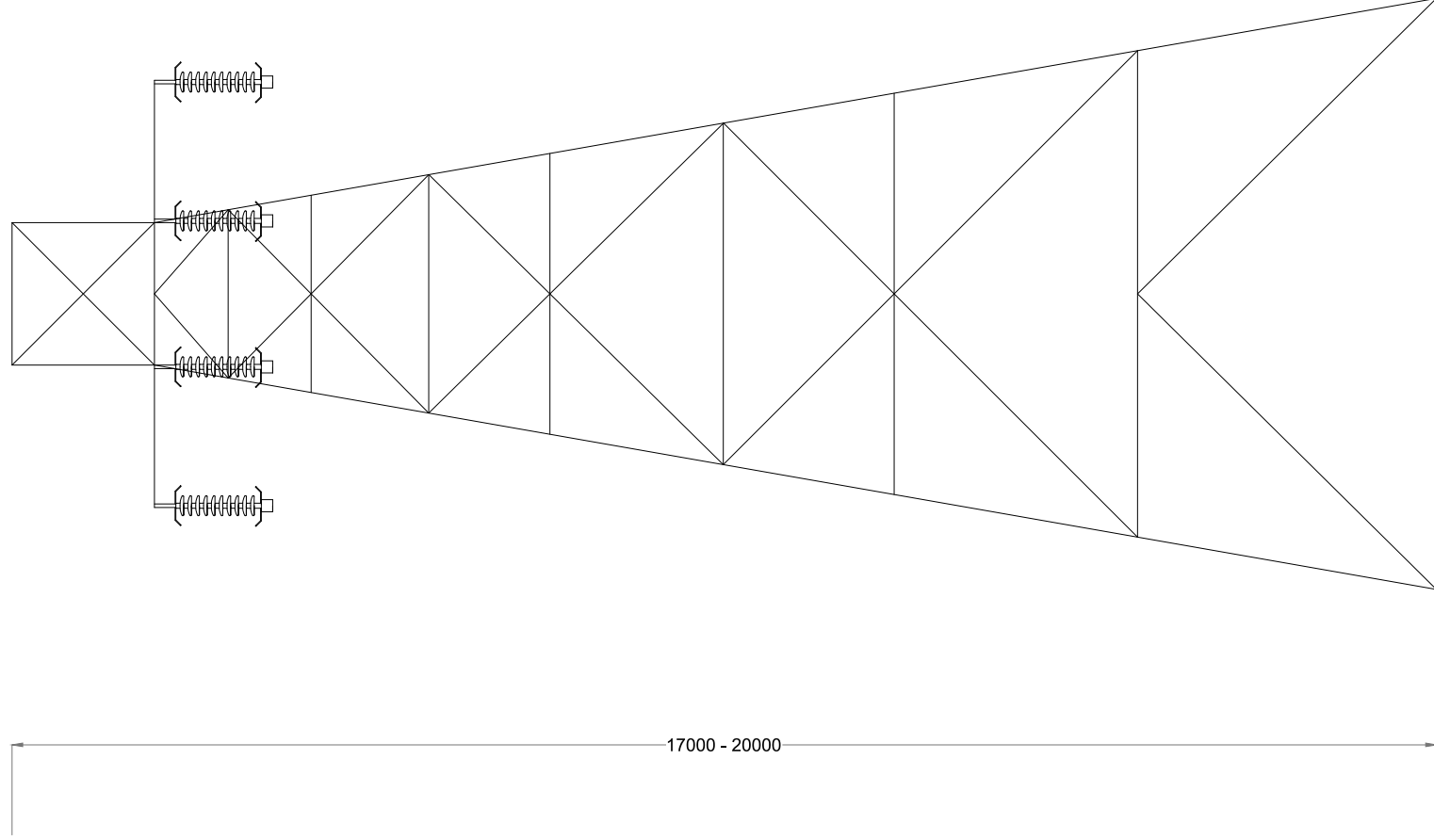


DRAWING TITLE: TSO Control Building	
PROJECT TITLE: Derrinlough Wind Farm, Co. Offaly	
DRAWING BY: JMcD	CHECKED BY: NM
PROJECT No.: 1712221	DRAWING No.: 171221 - 31
SCALE: 1:200 @ A3	DATE: 19.02.2020

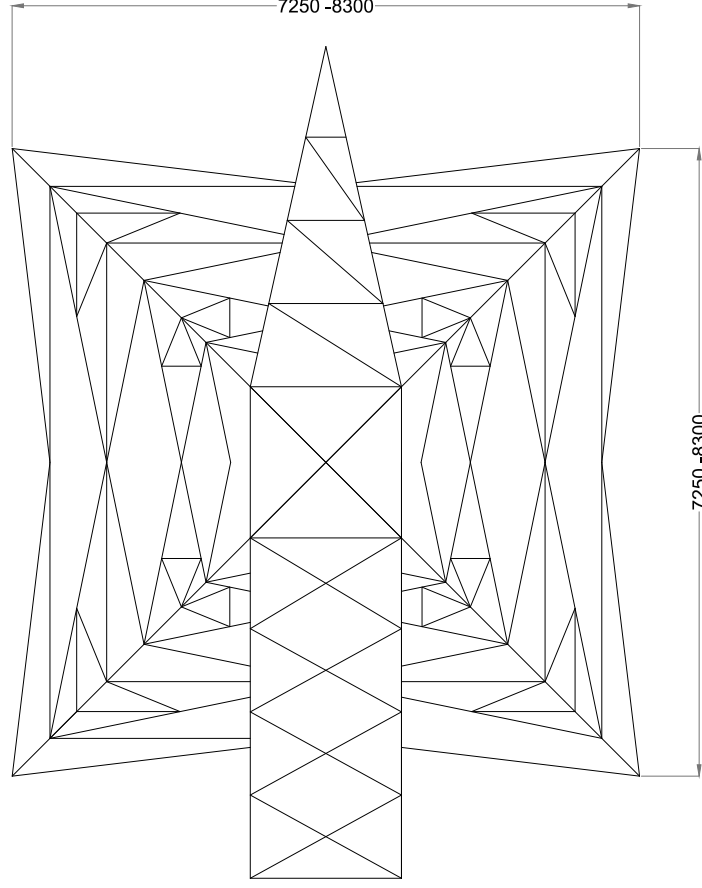
BORD NA MÓNA
Naturally Driven



FRONT ELEVATION

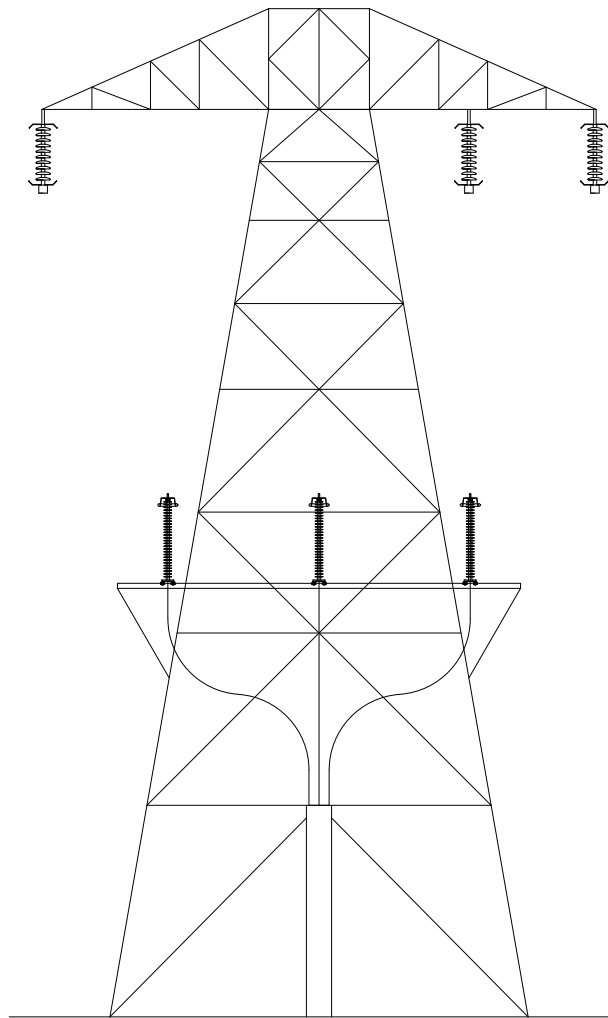


SIDE ELEVATION

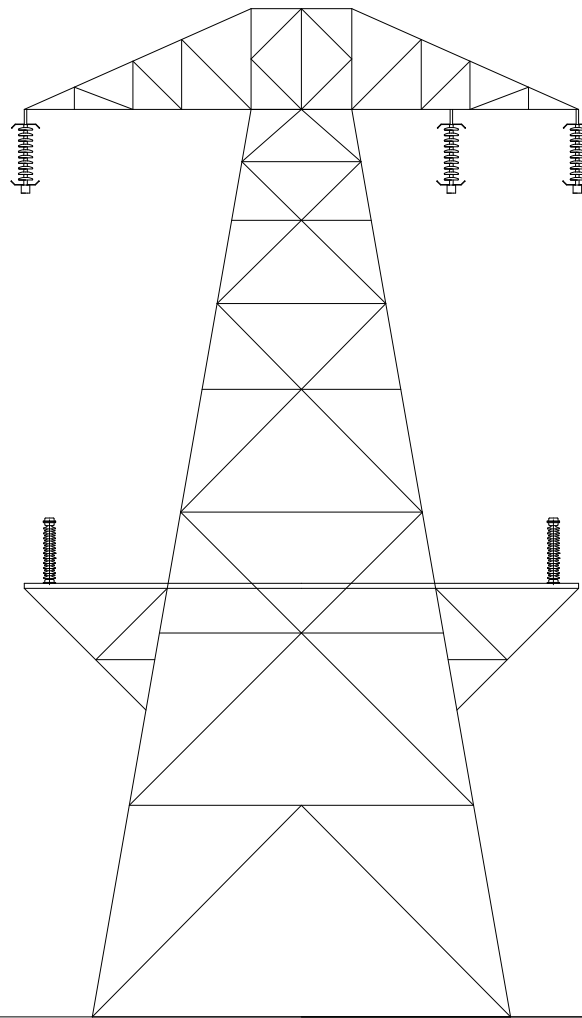


PLAN VIEW

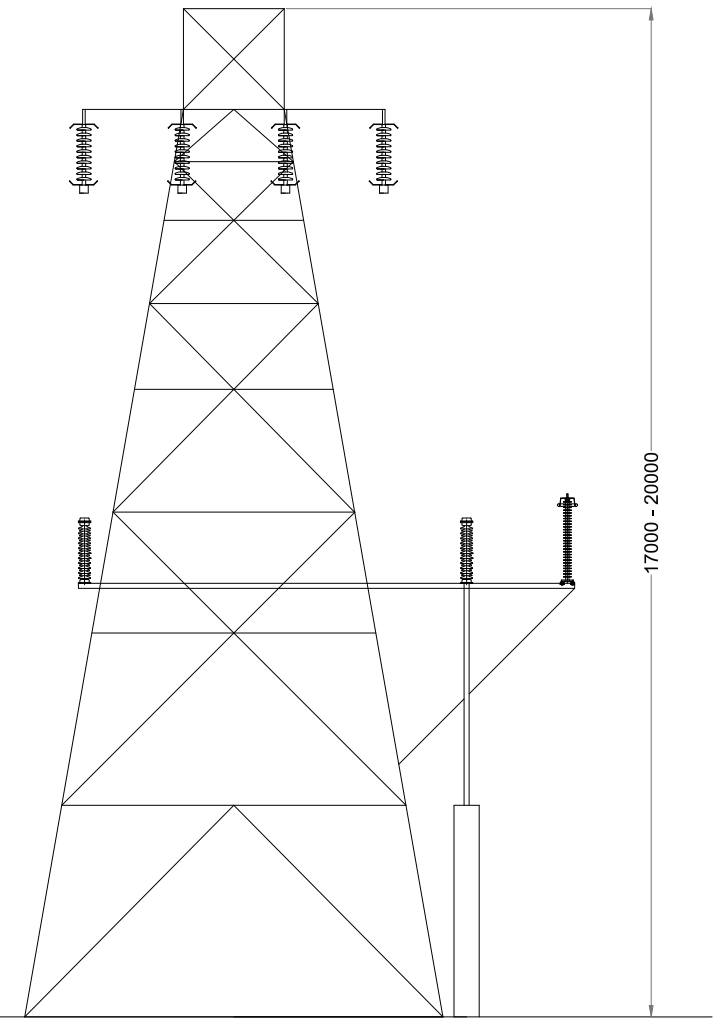
DRAWING TITLE	
110 kV Overhead Line Tower Unshielded Arrangement	
PROJECT TITLE	
Derrinlough Wind Farm, Co. Offaly	
CHECKED BY:	NM
DRAWING BY:	JMcD
PROJECT No:	171221
DRAWING No:	171221 - 32
SCALE:	1:100 @ A3
DATE:	19.02.2020



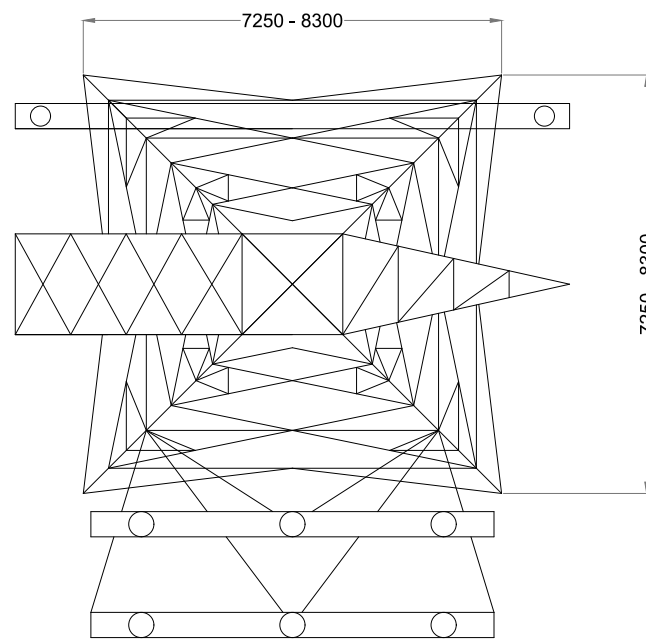
FRONT ELEVATION



REAR ELEVATION



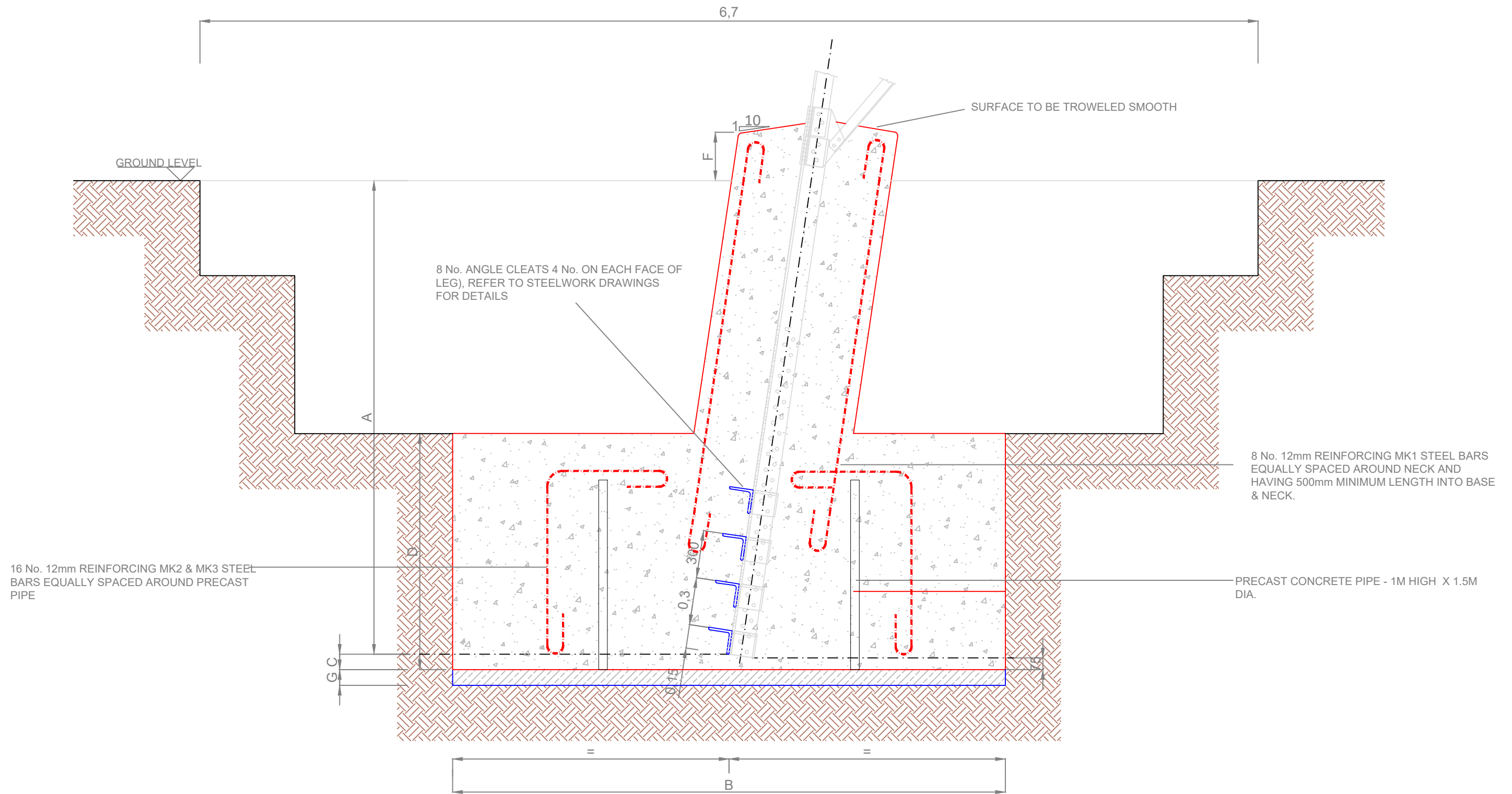
SIDE ELEVATION



PLAN VIEW

DRAWING TITLE:	
110 kV Overhead Line - Line Cable Interface Tower	
PROJECT TITLE:	
Derrinlough Wind Farm, Co. Offaly	
DRAWING BY:	CHECKED BY:
JMcD	NM
PROJECT No.:	DRAWING No.:
1712221	171221 - 33
SCALE:	DATE:
1:150 @ A3	19.02.2020

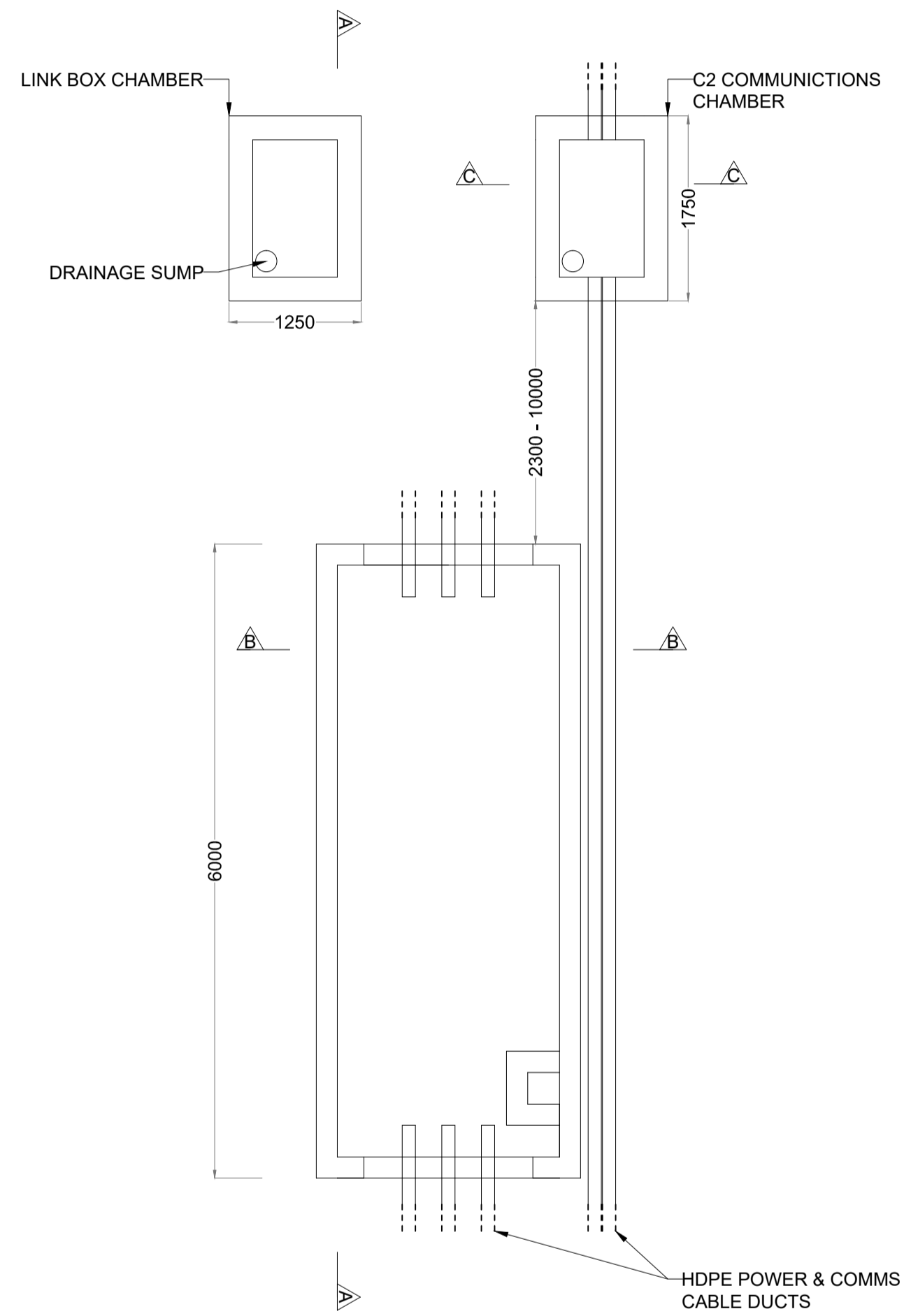
BORD NA MÓNA
Naturally Driven



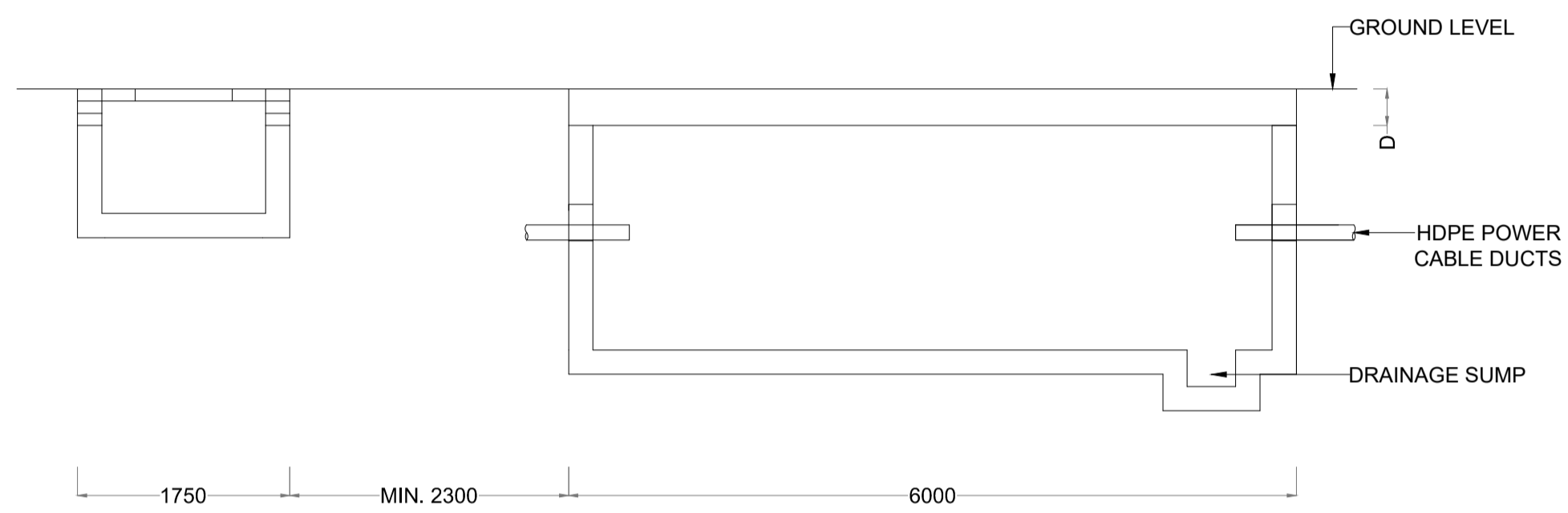
DRAWING TITLE:		Tower Foundation	
PROJECT TITLE:		Derrinlough Wind Farm, Co. Offaly	
DRAWING BY:	CHECKED BY:	JMcD	NM
PROJECT No.:	DRAWING No.:	1712221	171221 - 34
SCALE:	DATE:	1:25 @ A3	19.02.2020

DIMENSIONS	A	B	C	D	E	F	G
mm	3000	3600	105	1600	1000	300	100

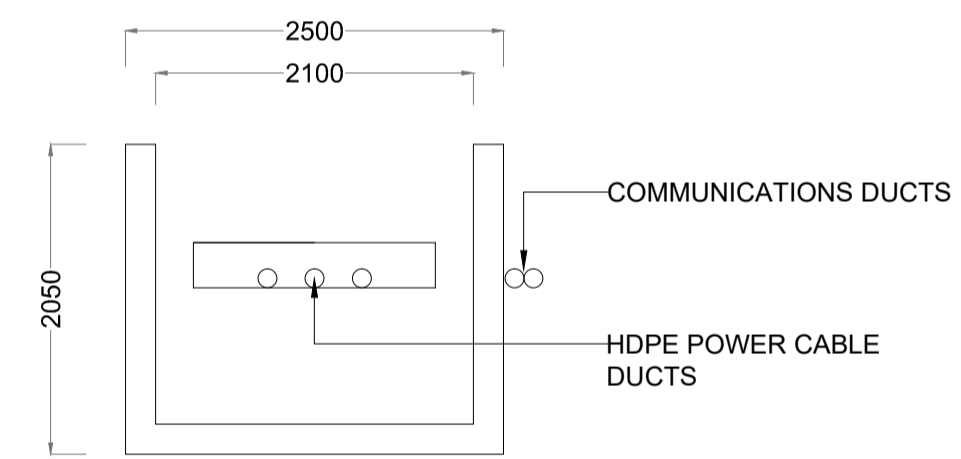




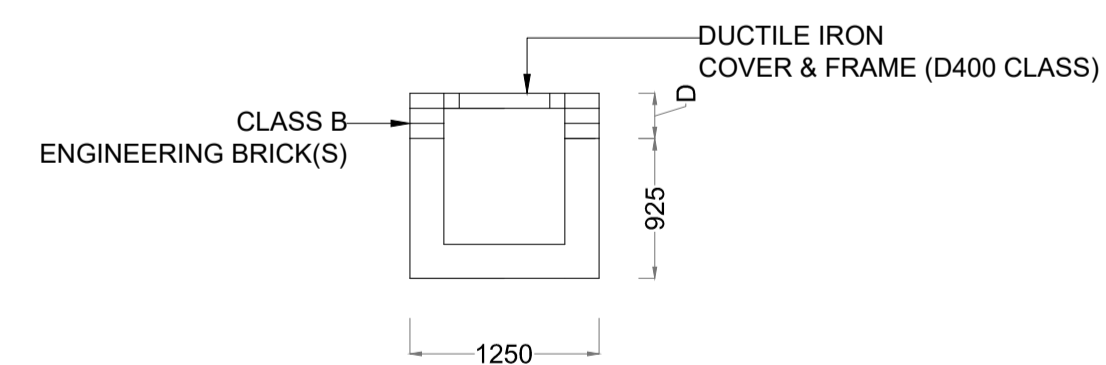
PLAN VIEW



SECTION VIEW A - A

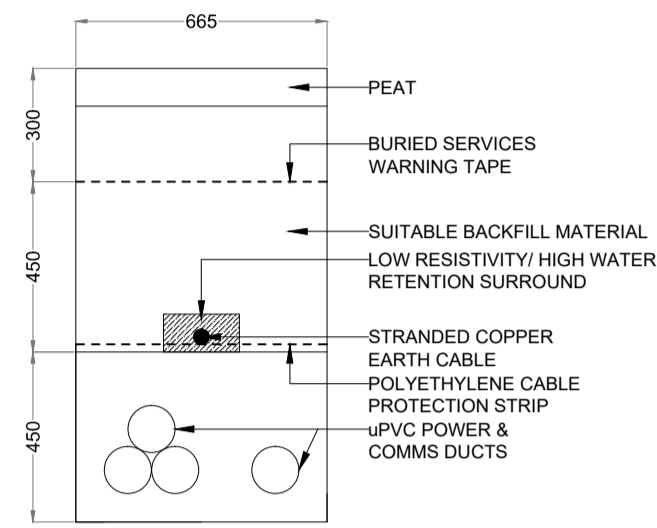


SECTION VIEW B - B

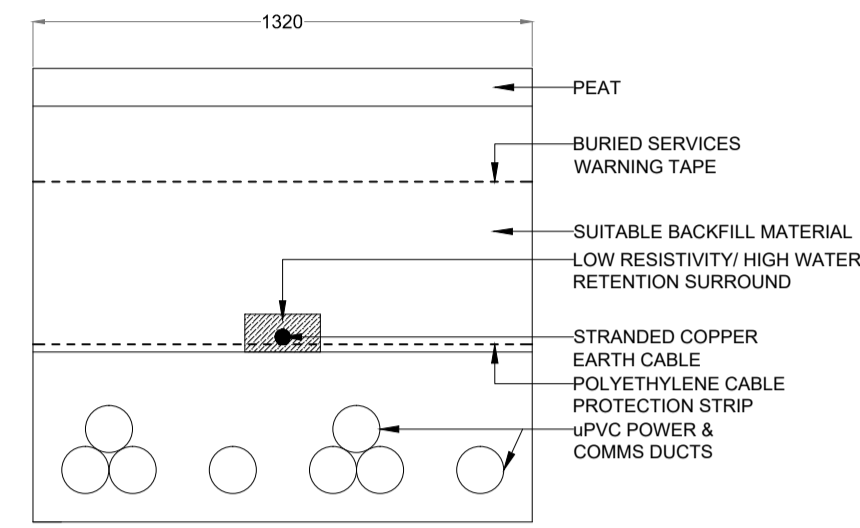


SECTION VIEW C - C

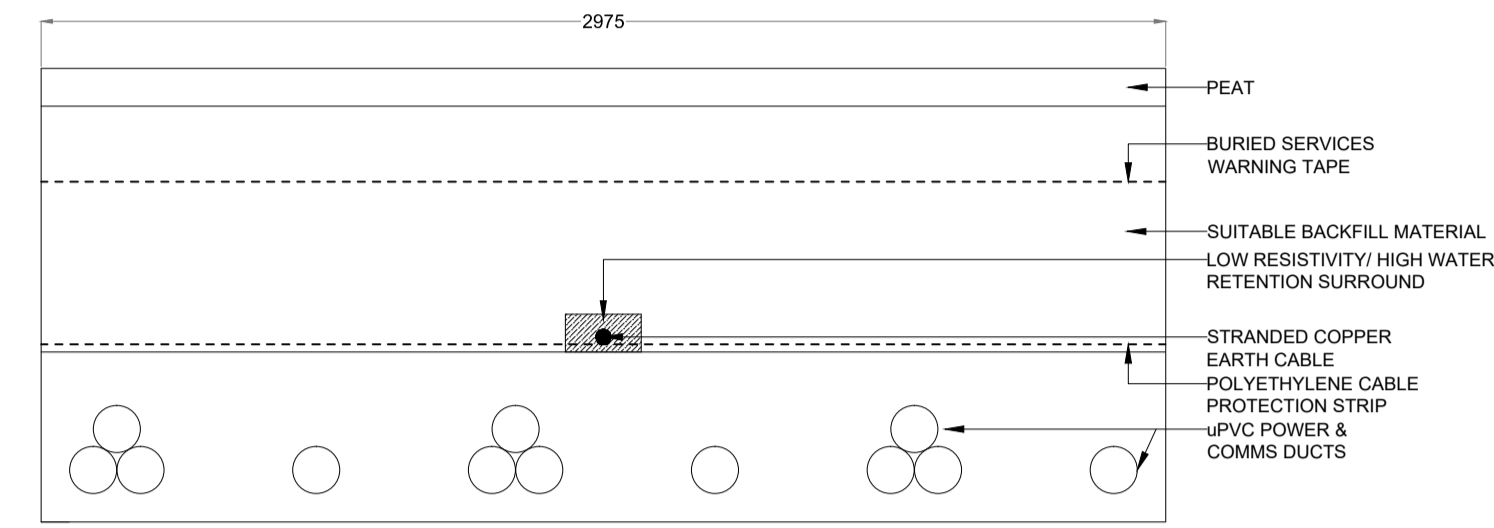
DRAWING TITLE:	
110 kV Joint Bay, C2 Chamber & Link Box Arrangement Details	
PROJECT TITLE:	
Derrinlough Wind Farm, Co. Offaly	
DRAWING BY:	CHECKED BY:
JMcD	NM
PROJECT No.:	DRAWING No.:
1712221	171221 - 35
SCALE:	DATE:
1:50 @ A1	19.02.2020



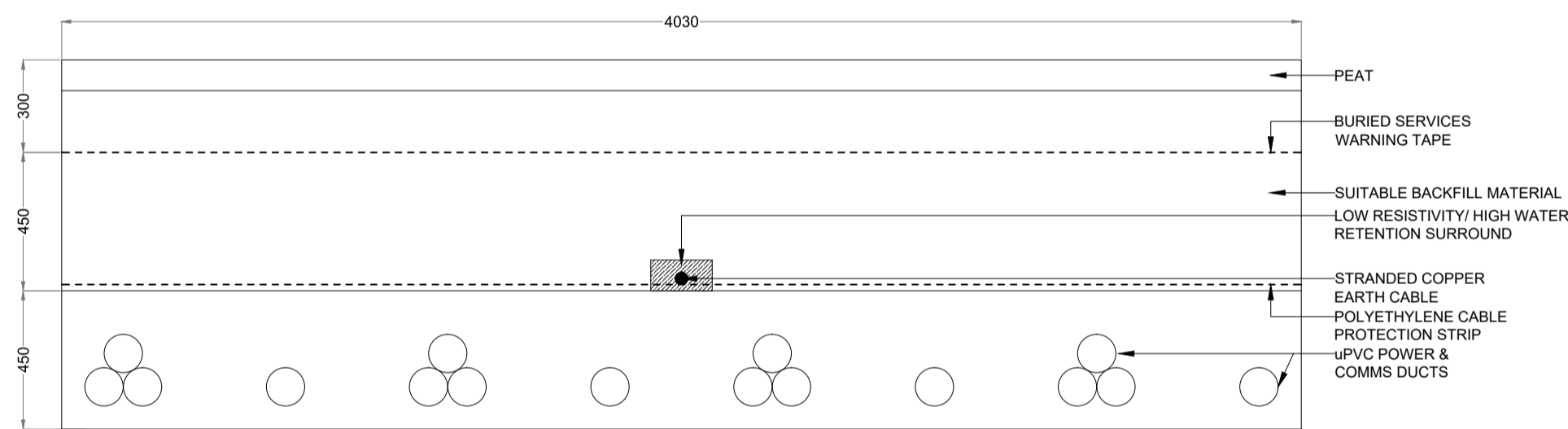
CABLE TRENCH TYPE 1



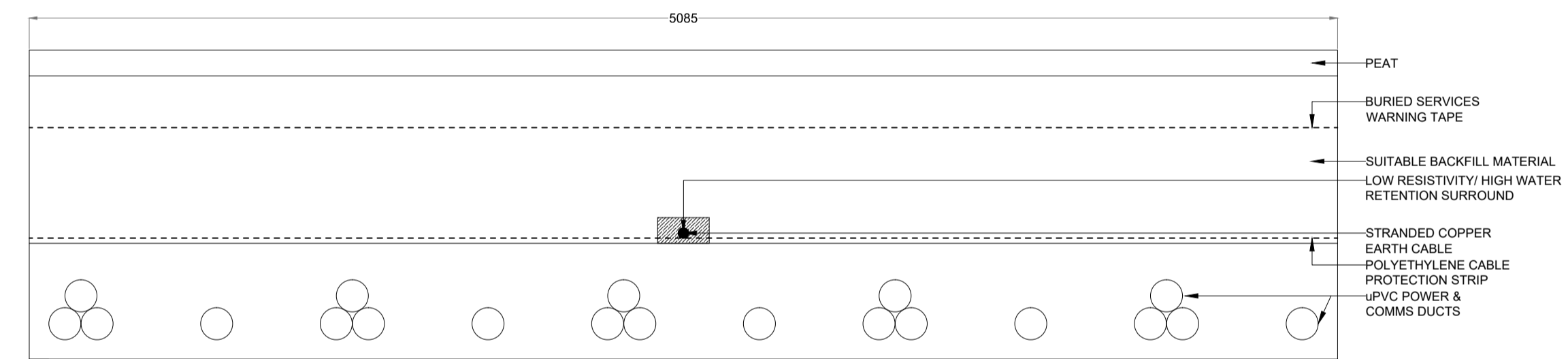
CABLE TRENCH TYPE 2



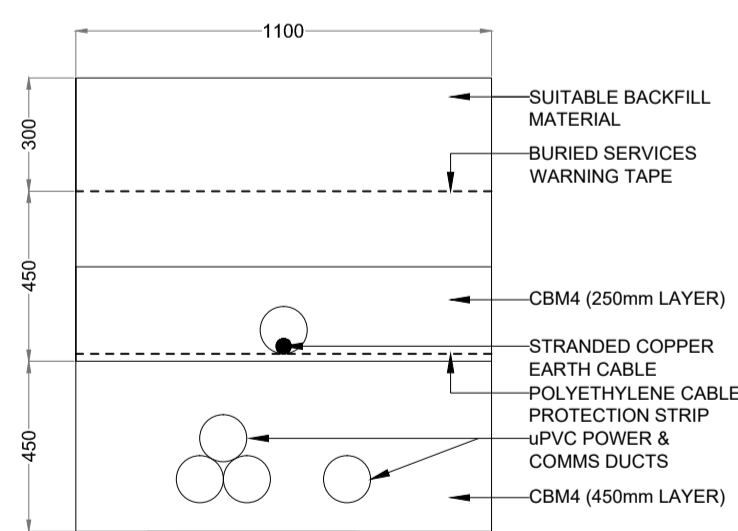
CABLE TRENCH TYPE 3



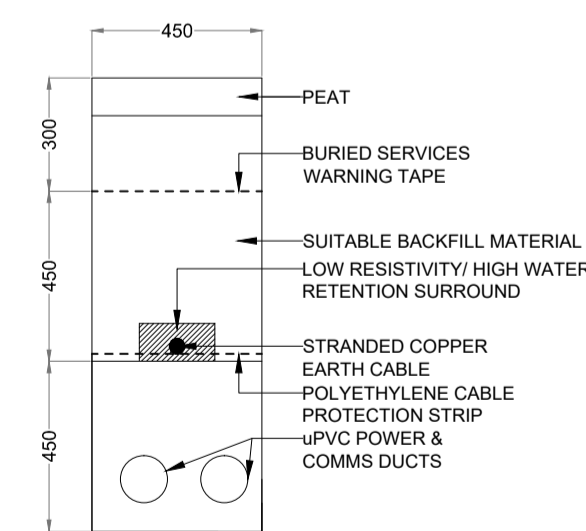
CABLE TRENCH TYPE 4



CABLE TRENCH TYPE 5

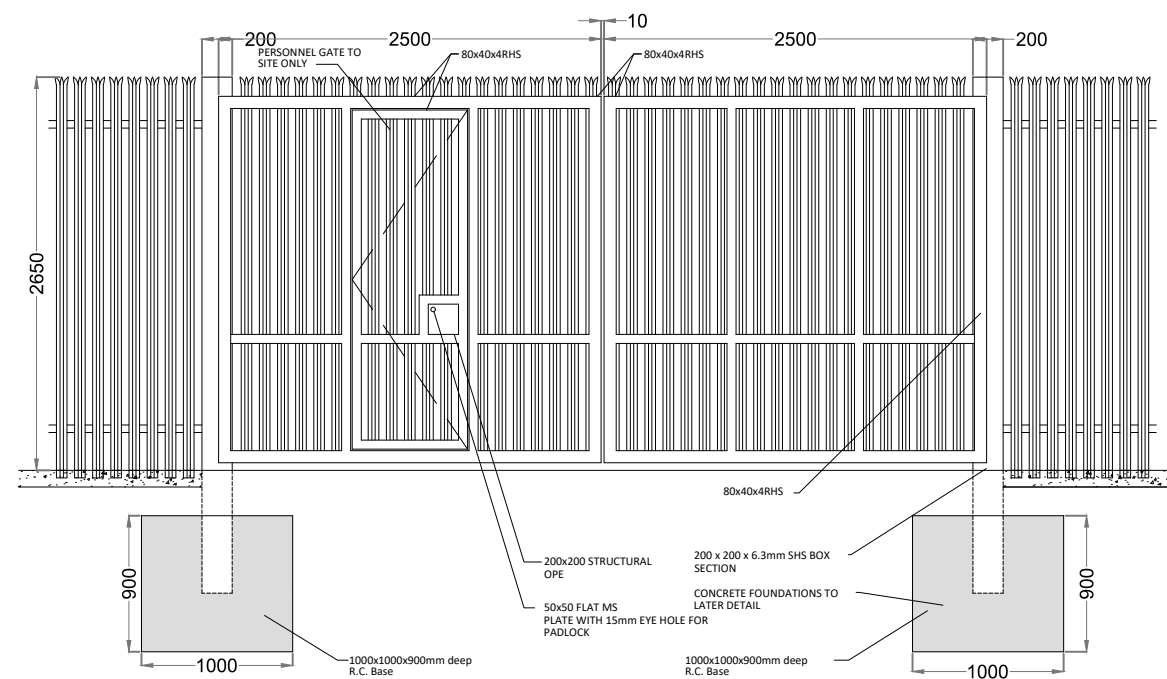
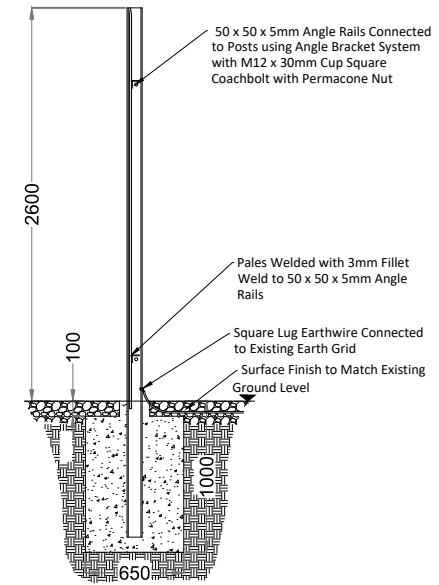
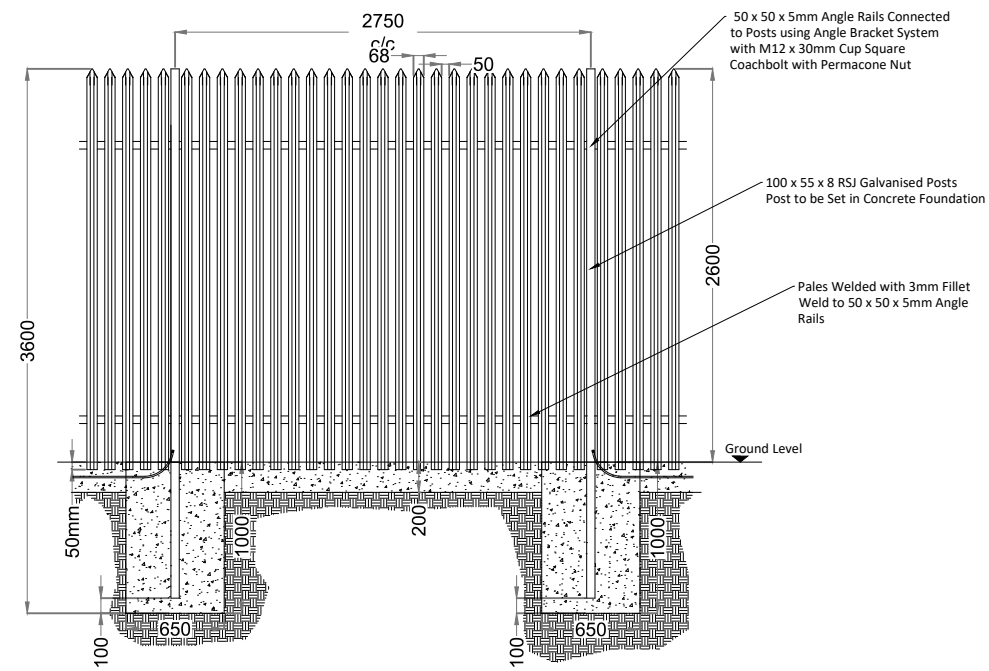


ROAD CROSSING TRENCH DETAIL (TYPICAL)



MET MAST TRENCH DETAIL (TYPICAL)

DRAWING TITLE:	
Internal Collector Network Typical Trench Arrangement Detail	
PROJECT TITLE:	
Derrinlough Wind Farm, Co. Offaly	
DRAWING BY:	CHECKED BY:
JMcD	NM
PROJECT No.:	DRAWING No.:
1712221	171221 - 36
SCALE:	DATE:
1:20 @ A1	19.02.2020

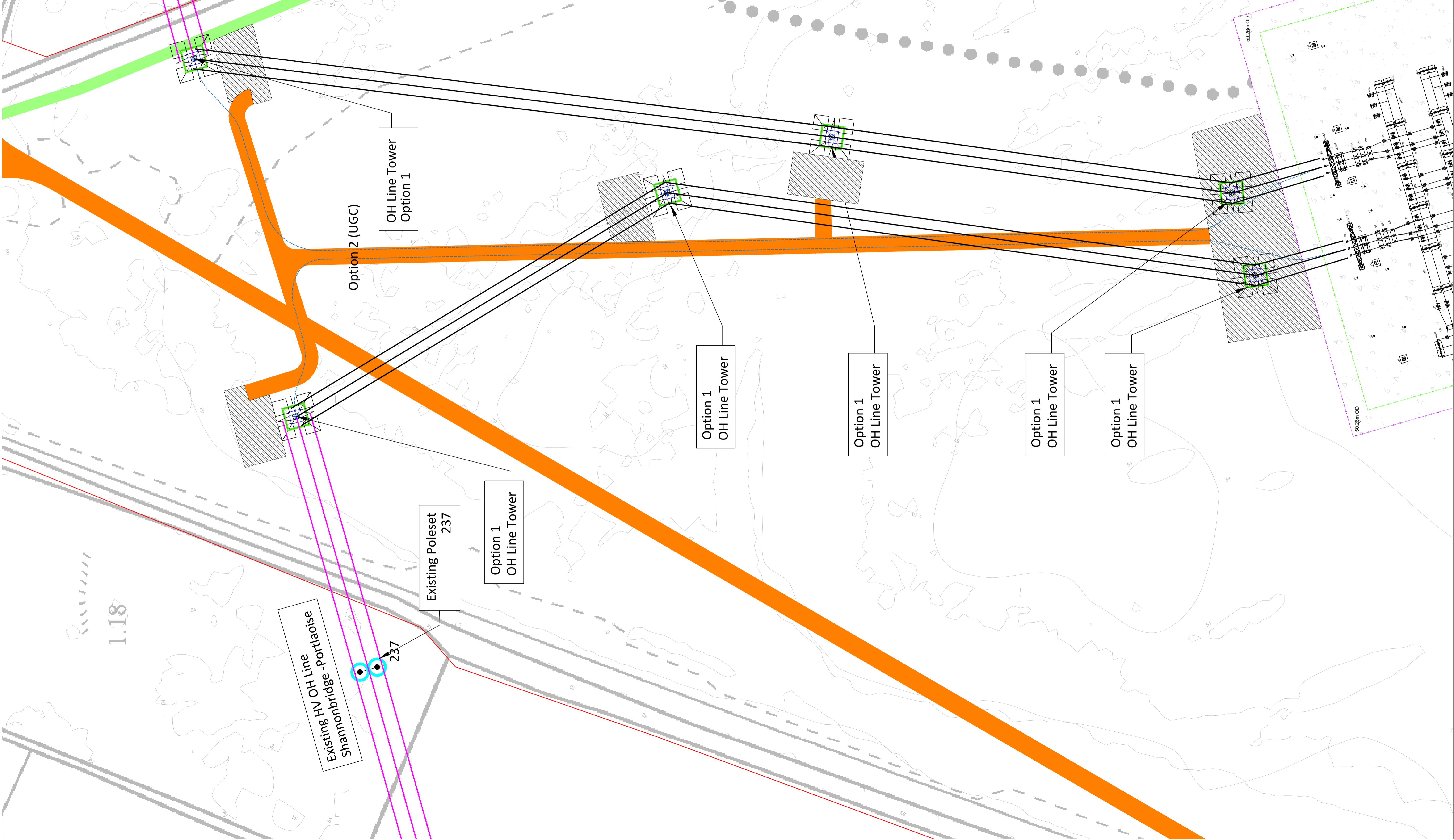


DRAWING TITLE: Palisade Fence And Gate Details	
PROJECT TITLE: Derrinlough Wind Farm, Co. Offaly	
DRAWING BY: JMcD	CHECKED BY: NM
PROJECT No.: 1712221	DRAWING No.: 171221 - 37
SCALE: 1:50 @ A3	DATE: 19.02.2020



Project Design Drawing Notes

1. Drawings issued are for planning application purposes only.
2. Drawings not to be used for construction/contract conditions.
3. Copyright, all rights reserved. No part hereof may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
8. Final levels may vary depending on local ground conditions.



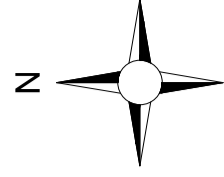
SUBSTATION COMPONENT LEGEND:

ID	DESCRIPTION
BBPI	BUSBAR POST INSULATOR
BW	BORED WELL
CB	CIRCUIT BREAKER
CC	CLOSED CIRCUIT BREAKER
CCIV	CLOSED CIRCUIT TELEVISION
CT	CURRENT TRANSFORMER
CTVT	COMBINED CURRENT & VOLTAGE TRANSFORMER
DA	BUSBAR DISCONNECTOR
DB	BUSBAR DISCONNECTOR
DEM	TRANSFORMER EARTH SWITCH
DG	DIESEL GENERATOR
DL	LINE DISCONNECTOR
DT	TRANSFORMER DISCONNECTOR
HT	HIGH TEMPERATURE
HTL	COOL TOWER FAN
HTP	HEAT TREATING PLANT
IFK	INTERFACE KIOSK
LM	LIGHTNING MAST
LP	LAMP POST
LT	LAMP TRAP
MT	METAL MOUNTING RESISTOR
NC	NEUTRAL CABLE SEALING RING
OLG	OVERHEAD LINE GANTY
PI	POST INSULATOR
RS	RURAL SUPPLY
SA	SURGE ARRESTER
TP	TELEPHONE TRANSFORMER POLE
VT	VOLTAGE TRANSFORMER

Drawing Legend

- Planning Application Boundary
- Proposed Road
- Amenity Pathway
- Crane Pad Handstanding Area

Ordnance Survey Ireland Licence No. AR0021820© Ordnance Survey Ireland/Government of Ireland



Grid Connection Infrastructure Options

PROJECT TITLE:
Derrinlough Wind Farm, Co. Offaly

DRAWING BY: Joseph O'Brien

CHECKED BY: Eoin McCarthy

PROJECT No.: 171221

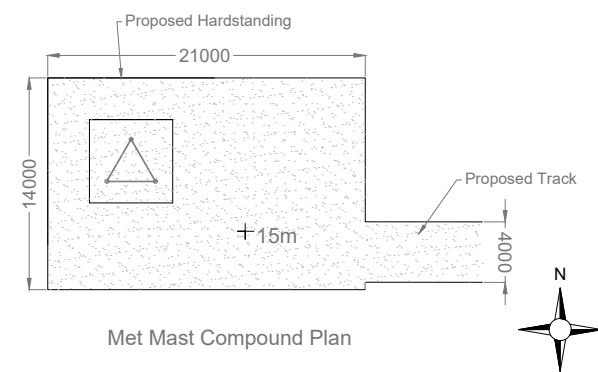
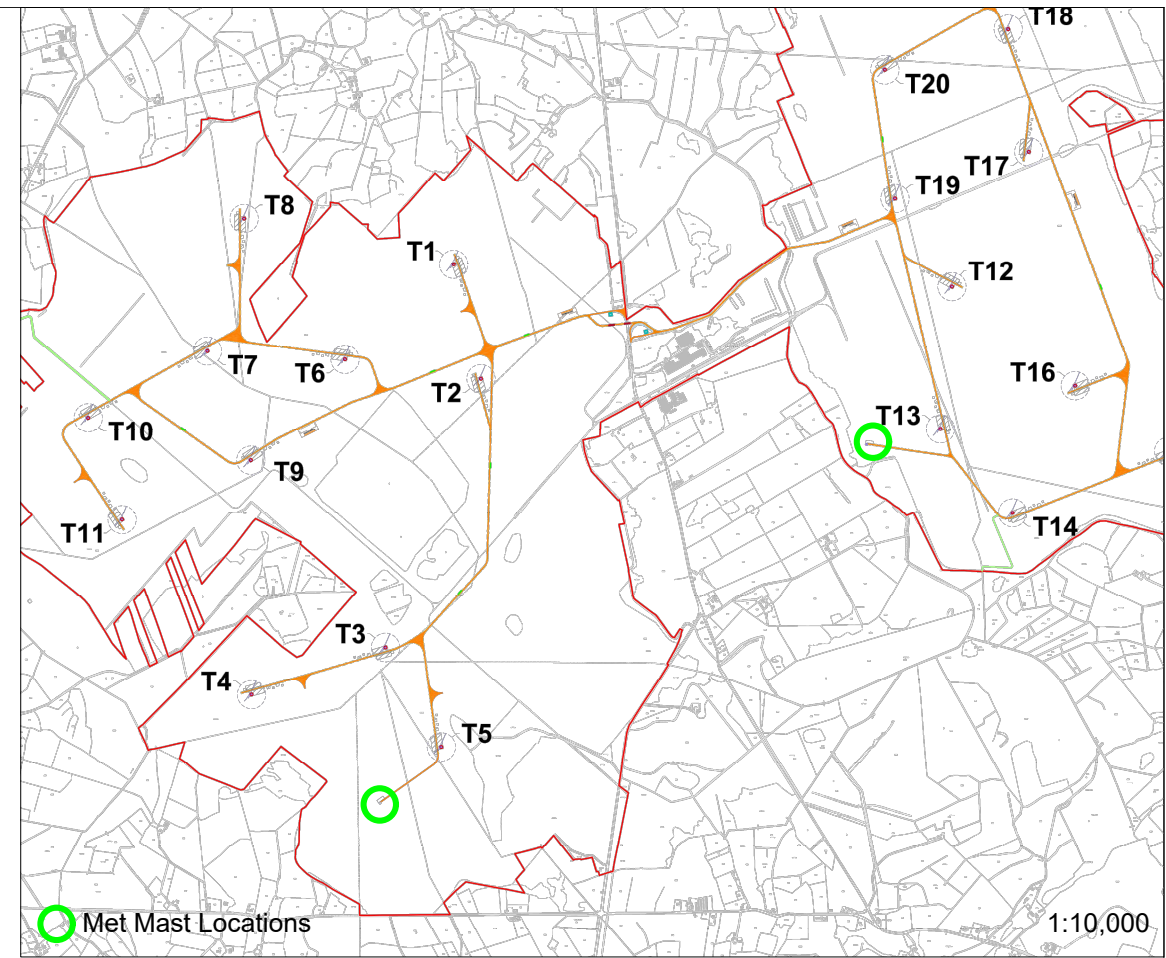
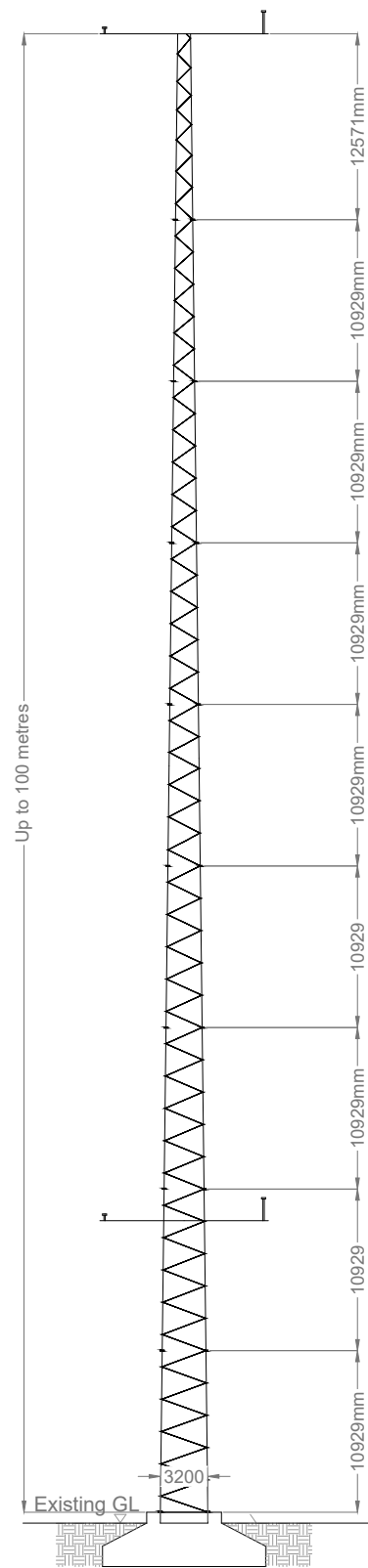
DRAWING No.: 171221 - 38

SCALE: 1:500 @ A1

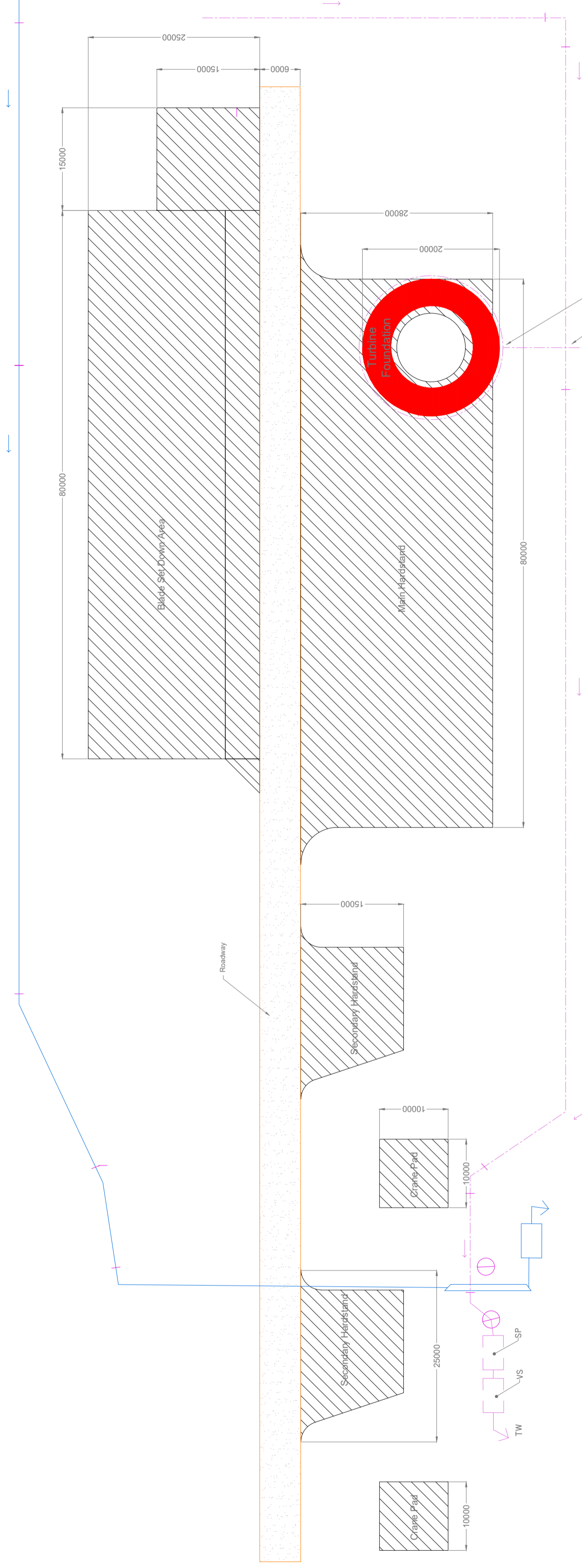
DATE: 19.02.2020

OS SHEET No.: 300 3443, 3444, 3445, 3446, 3447, 3448, 3449, 3450, 3451, 3452, 3453, 3454, 3455, 3456, 3457, 3458, 3459, 3460, 3461, 3462, 3463, 3464, 3465, 3466, 3467, 3468, 3469, 3470, 3471, 3472, 3473, 3474, 3475, 3476, 3477, 3478, 3479, 3480, 3481, 3482





DRAWING TITLE: Typical Free Standing Anemometry Mast	
PROJECT TITLE: Derrinlough Wind Farm, Co. Offaly	
DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
PROJECT No.: 171221	DRAWING No.: 171221 - 39
SCALE: 1:500 @ A3	DATE: 19.02.2020



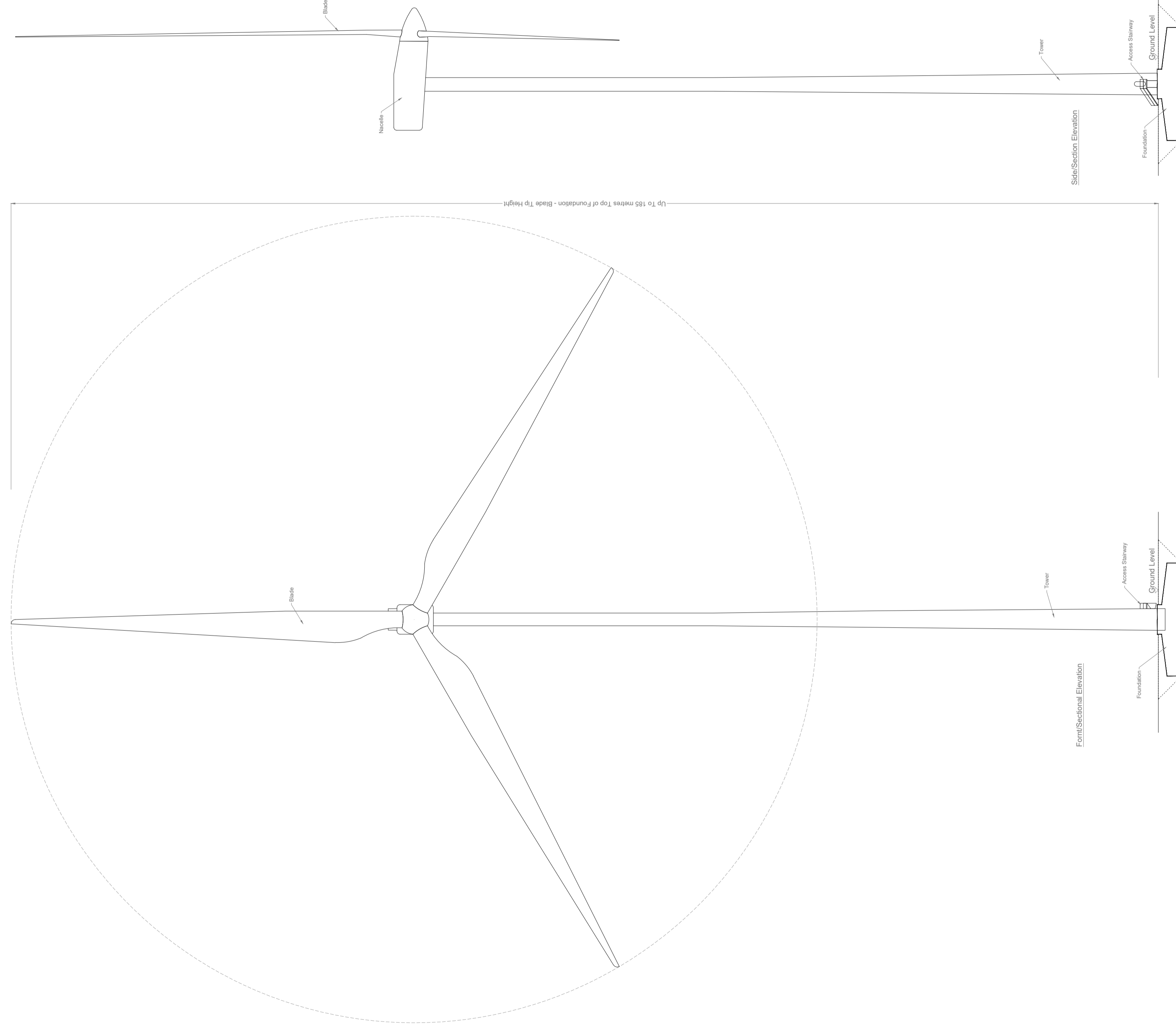
DRAWING LEGEND

	UPSTREAM INTERTIE DRAIN
	SWALES/DOWNSTREAM COLLECTOR DRAIN
	DIRECTION OF FLOW
	SETTLEMENT POND - VEGETATION FILTER - LEVEL SPREADER
	CHECK DAM 'TYPE A'
	CHECK DAM 'TYPE B'
	INTERTIE DITCH CULVERT
	COLLECTOR DITCH CULVERT
	OVERLAND FLOW DISCHARGE
	TREATED WATER DISCHARGE
	SETTLEMENT POND
	SEMI-NATURAL VEGETATION SWALE / FILTER BED / SECONDARY SP

PROPOSED DRAINAGE

Positive drainage to turbine base
Outfalls to proposed drainage or overoutfall to lower ground depending on topography

Treatment at outfall, if turbine drainage not possible



- Drawing Notes**
- Proposed wind turbines to have a maximum ground to blade tip height of up to 185m.
 - Exact make and model of the turbine to be dictated by a competitive tender process.
 - Installed wind turbine not to exceed maximum size envelope set out above in any blade length and hub-height configuration.
 - Turbine foundation diameter may vary.
 - Ground level represents the top of turbine foundation.

DRAWING TITLE:
Typical Wind Turbine Hardstanding & Elevations

PROJECT TITLE:
Derrinlough Wind Farm, Co. Offaly

CHECKED BY:
Joseph O'Brien

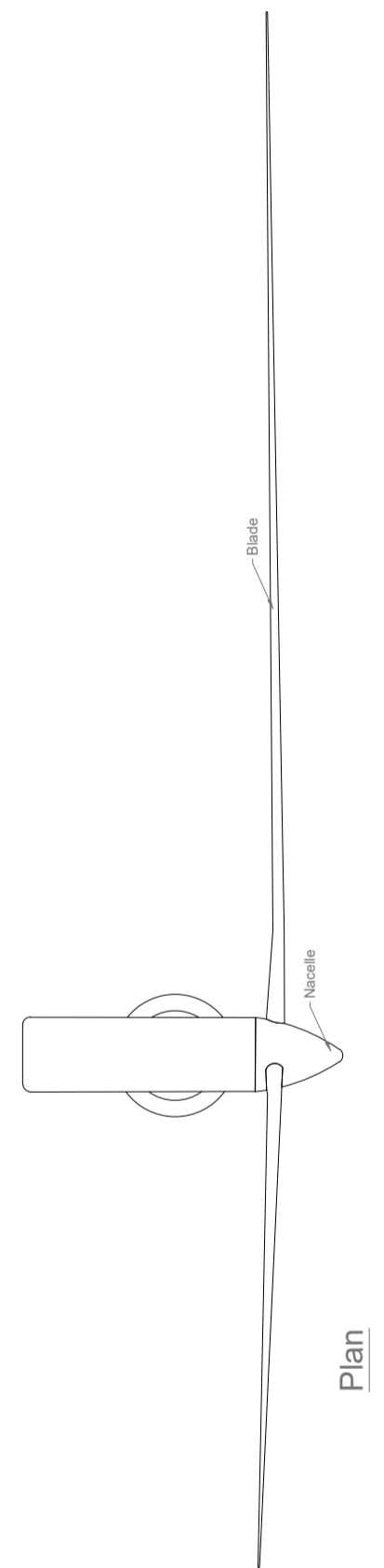
DRAWING NO.:
171221 - 40

PROJECT NO.:
171221

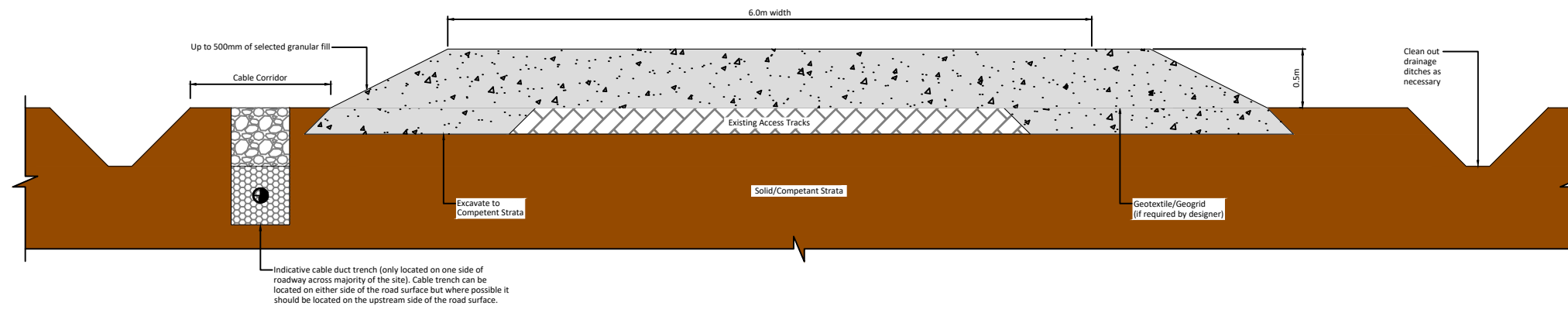
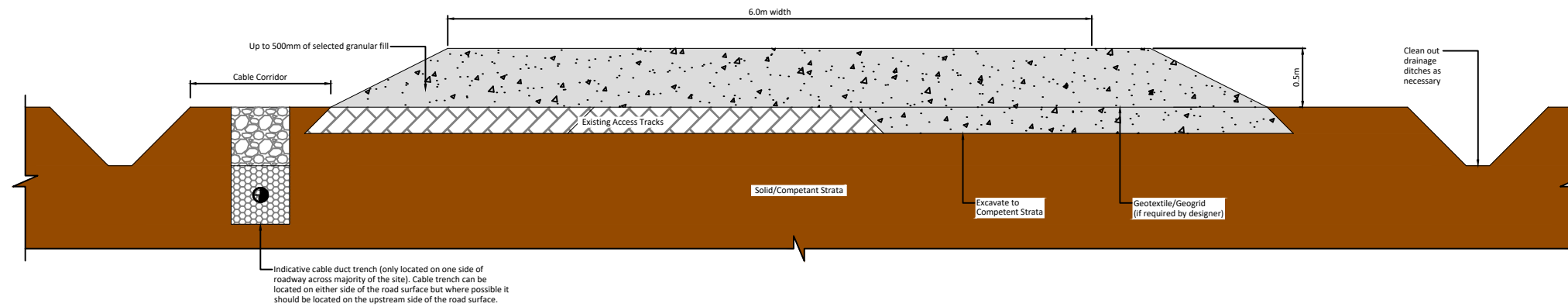
DATE:
19.02.2020

SCALE:
1:500 @ A1

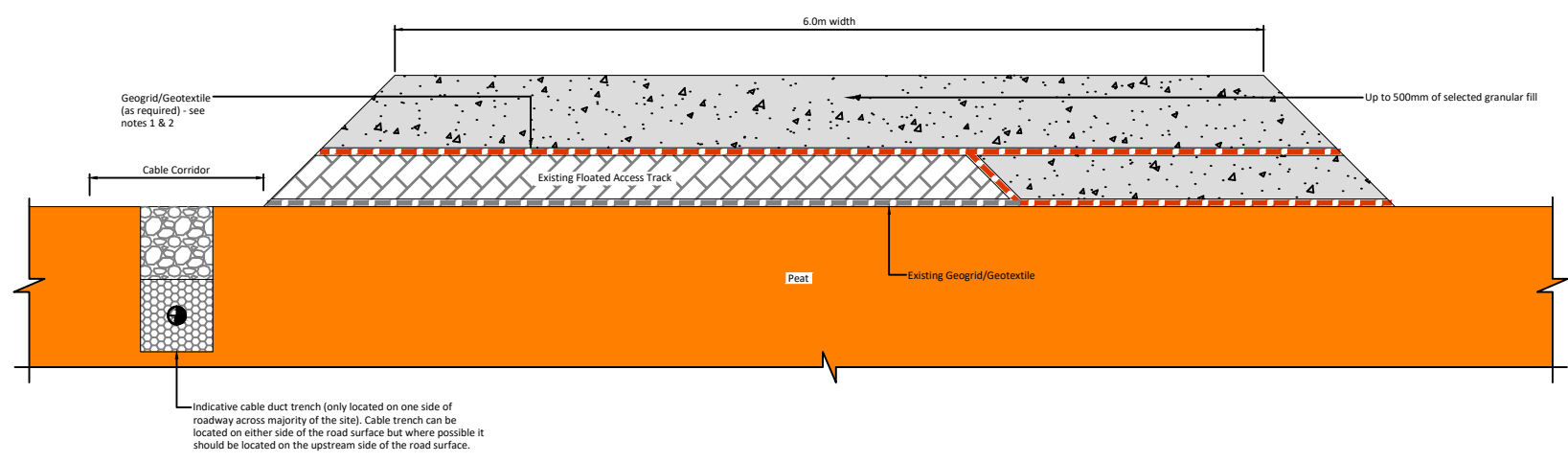
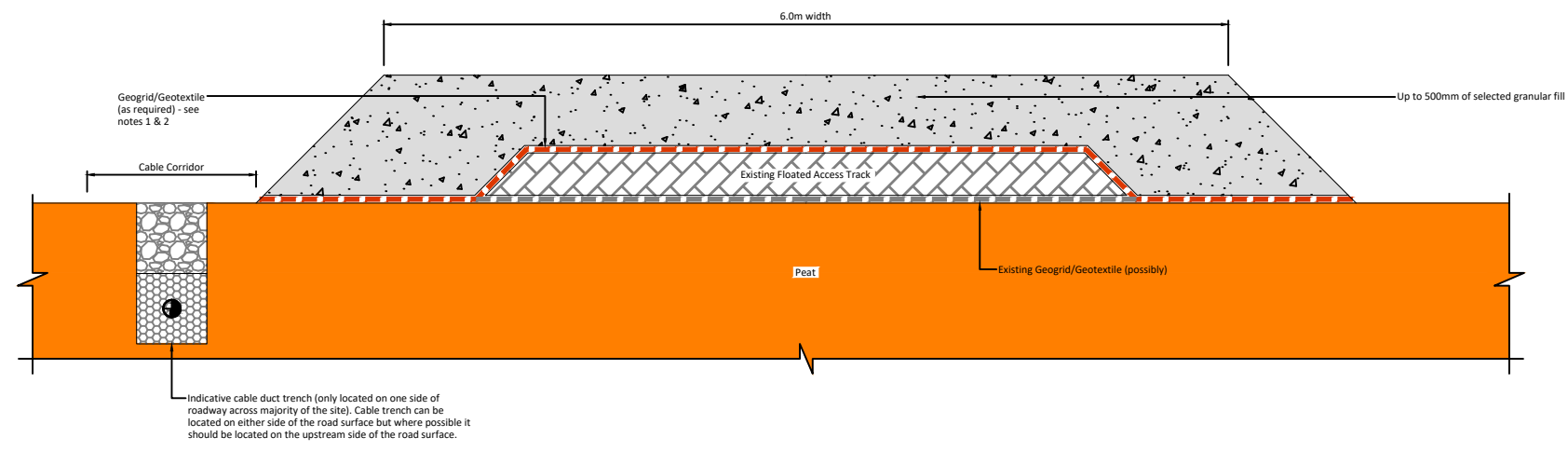
MKO
Tuum Road, Galway
Ireland, H91 VV64
+353 (0) 91 735611
email: info@www.mkofireland.ie
Website: www.mkofireland.ie



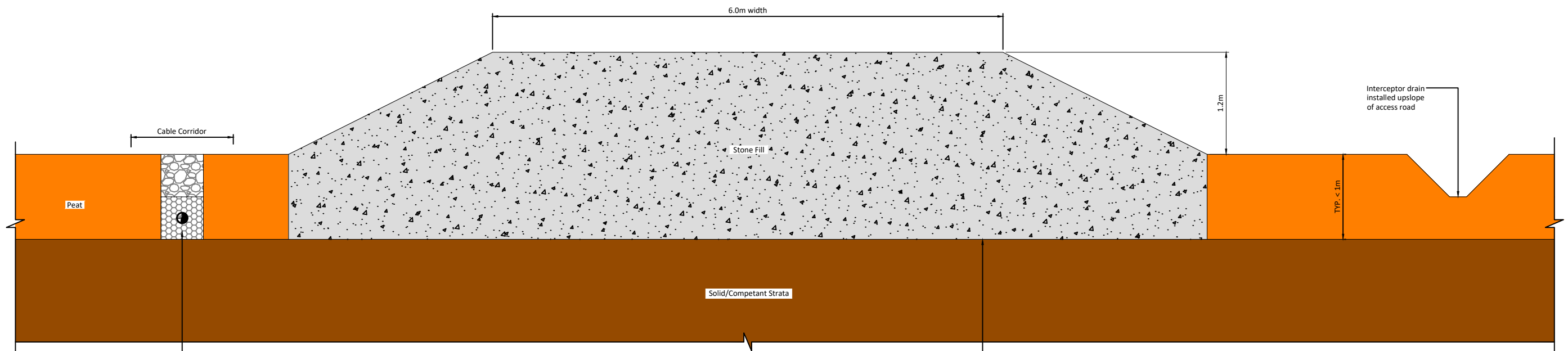
Plan



DRAWING TITLE:	
Type A Upgrade of Existing Excavated Access Tracks	
PROJECT TITLE:	
Derrinlough Wind Farm, Co. Offaly	
DRAWING BY:	CHECKED BY:
POR	IH
PROJECT No.:	DRAWING No.:
171221	171221 - 41
SCALE:	DATE:
1:50 @ A3	19.02.2020



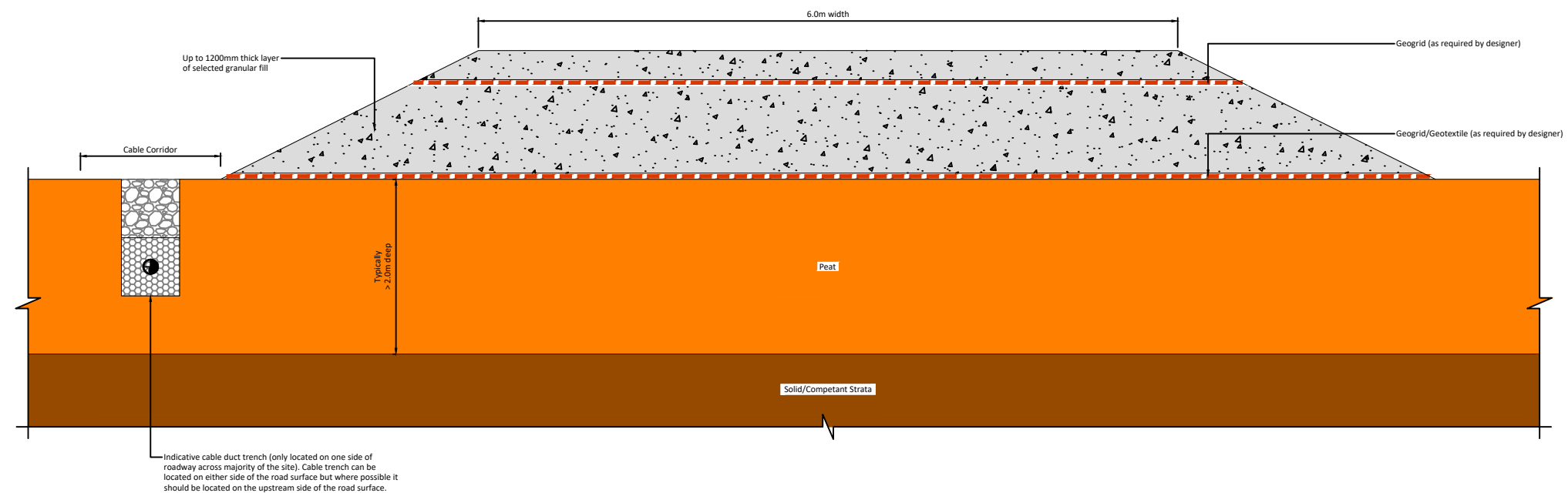
DRAWING TITLE:	
Type B Upgrade of Existing Floated Access Tracks	
PROJECT TITLE:	
Derrinlough Wind Farm, Co. Offaly	
DRAWING BY:	CHECKED BY:
POR	IH
PROJECT No.:	DRAWING No.:
171221	171221 - 42
SCALE:	DATE:
1:50 @ A3	19.02.2020



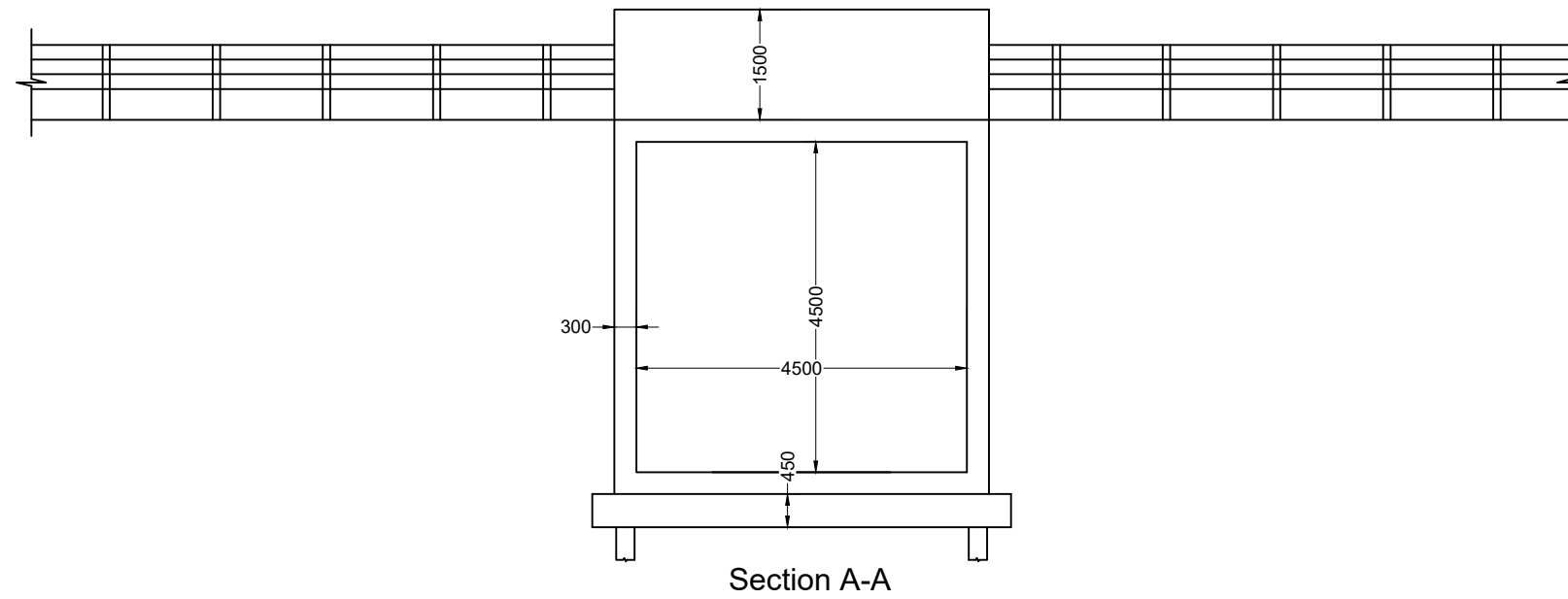
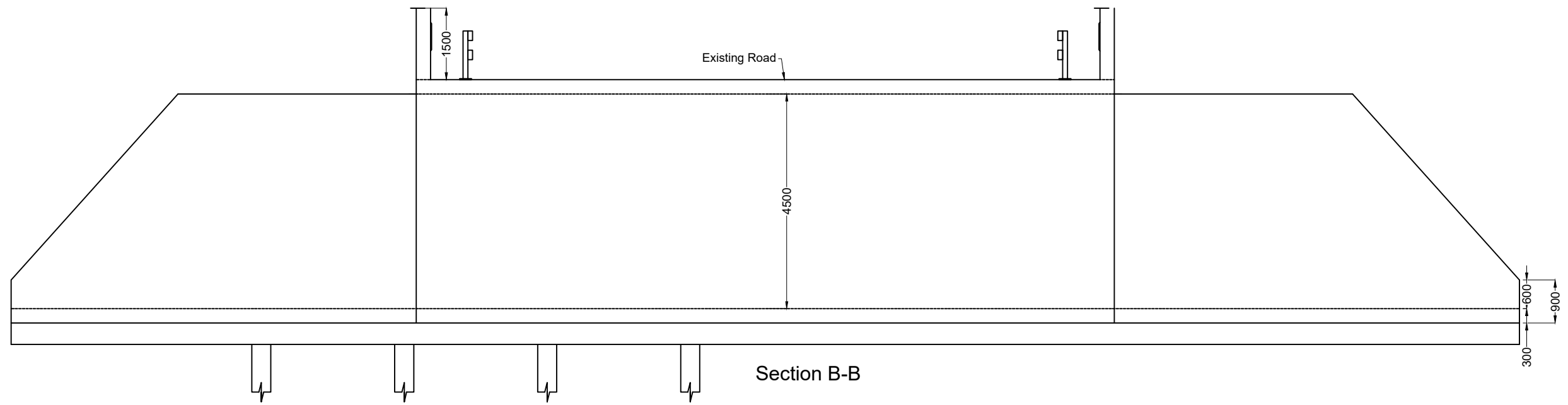
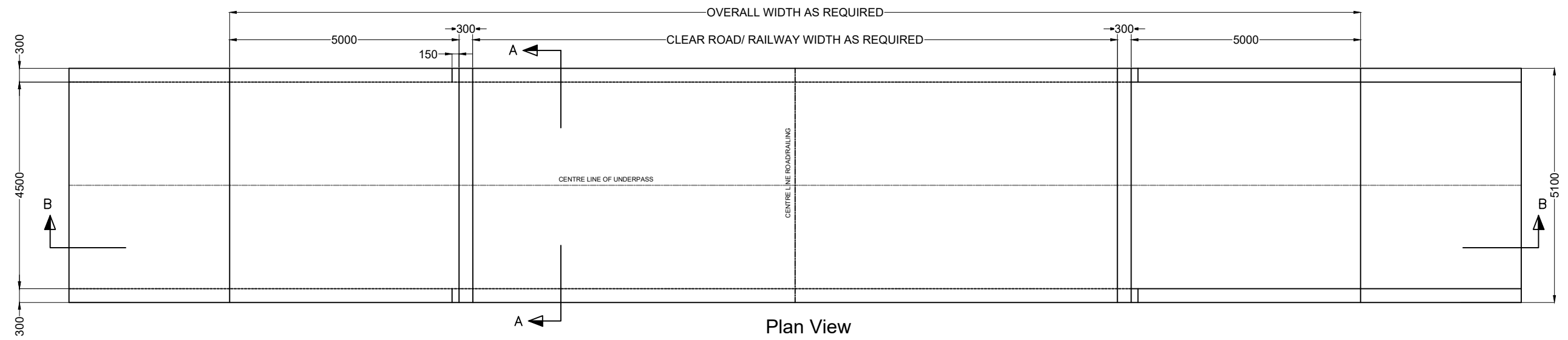
Indicative cable duct trench (only located on one side of roadway across majority of the site). Cable trench can be located on either side of the road surface but where possible it should be located on the upstream side of the road surface.

Geogrid/Geotextile (if required by designer)

DRAWING TITLE: Type C New Excavate and Replace Access Road	
PROJECT TITLE: Derrinlough Wind Farm, Co. Offaly	
DRAWING BY: POR	CHECKED BY: IH
PROJECT No.: 171221	DRAWING No.: 171221 - 43
SCALE: 1:50 @ A3	DATE: 19.02.2020



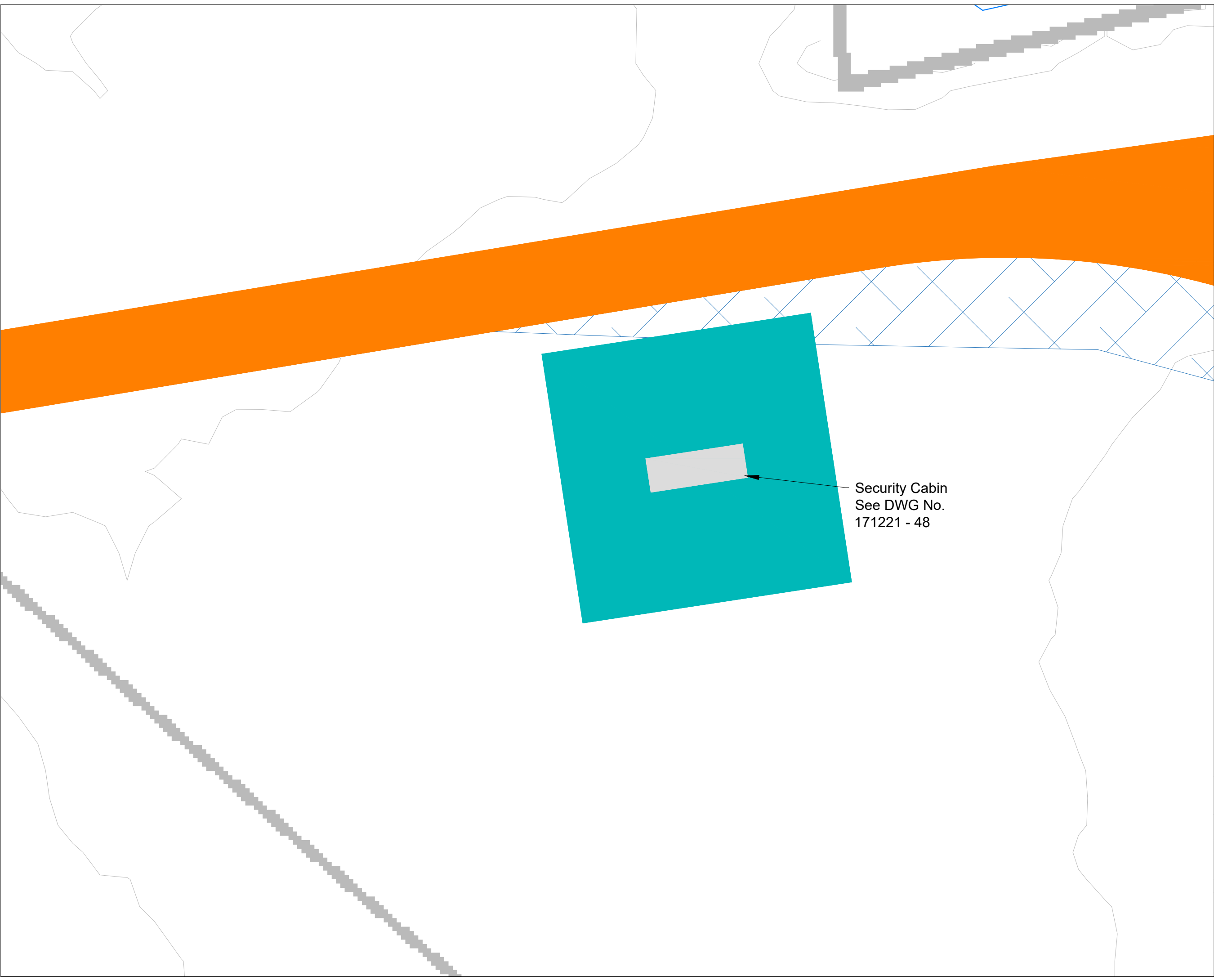
DRAWING TITLE:	
Type D New Floated Access Road	
PROJECT TITLE:	
Derrinlough Wind Farm, Co. Offaly	
DRAWING BY:	CHECKED BY:
POR	IH
PROJECT No.:	DRAWING No.:
171221	171221 - 44
SCALE:	DATE:
1:50 @ A3	19.02.2020






DRAWING TITLE: Typical Underpass Detail	
PROJECT TITLE: Derrinlough Wind Farm, Co. Offaly	
DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
PROJECT No.: 171221	DRAWING No.: 171221 - 45
SCALE: 1:100 @ A3	DATE: 19.02.2020

	MKO
	Planning and Environmental Consultants
	Tuam Road, Galway
	Ireland, H91 VW94
	+353 (0) 91 735611 email: info@www.mkofireland.ie Website: www.mkofireland.ie

- Project Design Drawing Notes**
1. Drawings issued are for planning application purposes only.
 2. Drawings not to be used for construction/contract conditions.
 3. Copyright, all rights reserved. No part hereof may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
 4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
 5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
 6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
 8. Final levels may vary depending on local ground conditions.



Drawing Legend

	Proposed Road
	Security Cabin Compound
	Temporary Abnormal Load Delivery Vehicle Overrun



Ordnance Survey Ireland Licence No. AR0021820 © Ordnance Survey Ireland / Government of Ireland

DRAWING TITLE:
Security Compound 1

PROJECT TITLE:
Derrinlough Wind Farm, Co. Offaly

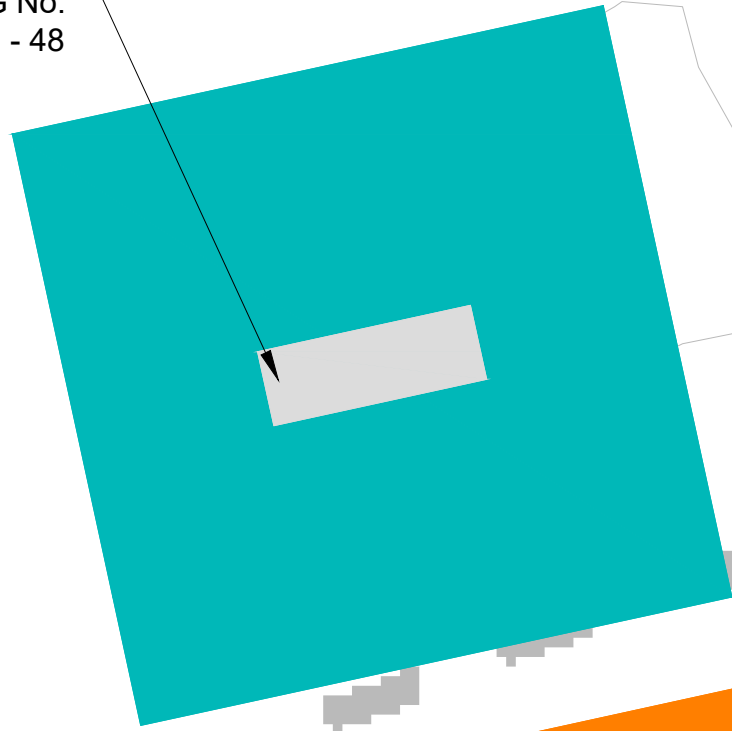
DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
PROJECT No.: 171221	DRAWING No.: 171221 - 46
SCALE: 1:250 @ A3	DATE: 19.02.2020

OS Licence No. 10001820 © Ordnance Survey Ireland Licence No. AR0021820 © Ordnance Survey Ireland / Government of Ireland





	MKO
	Planning and Environmental Consultants
	Tuam Road, Galway
	Ireland, H91 VW94 +353 (0) 91 735611 email: info@www.mkofireland.ie Website: www.mkofireland.ie

- Project Design Drawing Notes**
1. Drawings issued are for planning application purposes only.
 2. Drawings not to be used for construction/contract conditions.
 3. Copyright, all rights reserved. No part hereof may be copied or reproduced partially or wholly in any form whatsoever without the prior notice of the copyright owner McCarthy Keville O'Sullivan.
 4. Do not scale off this drawing. Figured metric dimensions only should be taken off this drawing.
 5. All contractors, whether main or sub-contractors, must visit the site and are responsible for taking and checking any and all dimensions and levels that relate to the works.
 6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
 8. Final levels may vary depending on local ground conditions.

Security Cabin
See DWG No.
171221 - 48



Drawing Legend

-  Proposed Road
-  Works Area for Internal Cabling
-  Security Cabin Compound
-  Temporary Abnormal Load Delivery Vehicle Overrun



Ordnance Survey Ireland Licence No. AR0021820 © Ordnance Survey Ireland / Government of Ireland

DRAWING TITLE:
Security Compound 2

PROJECT TITLE:
Derrinlough Wind Farm, Co. Offaly

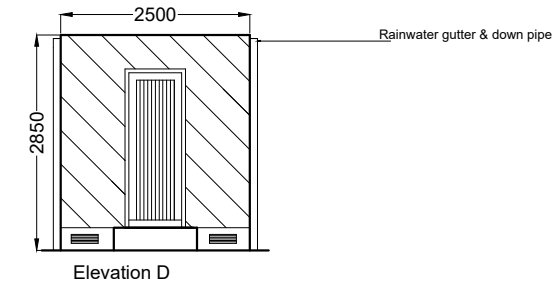
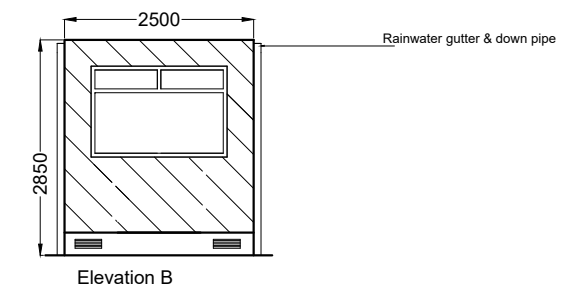
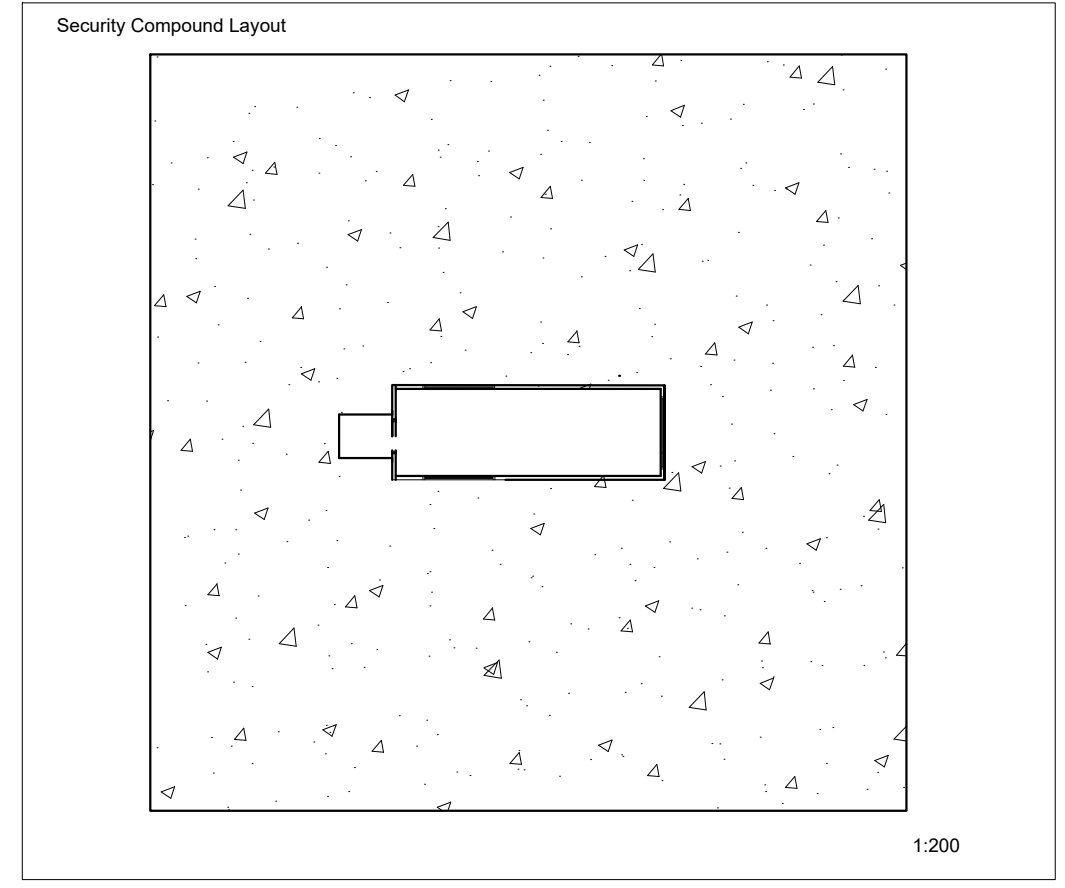
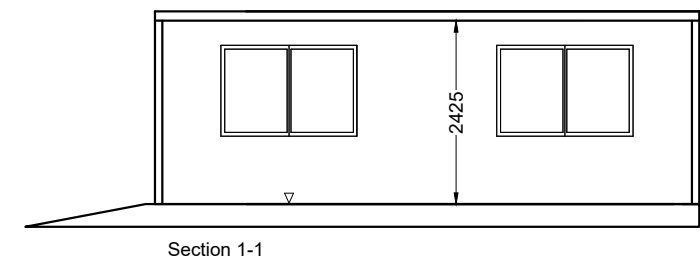
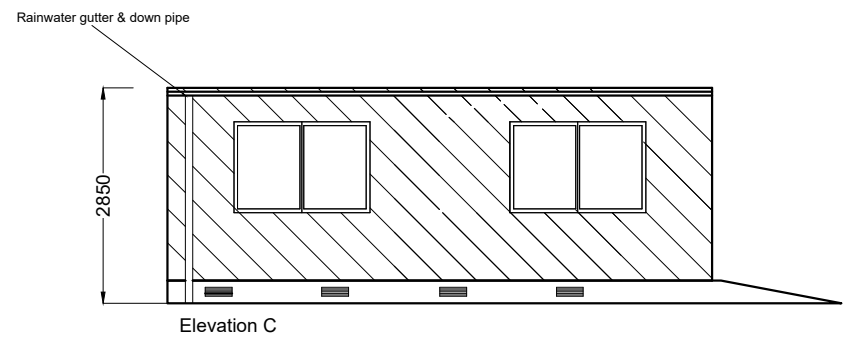
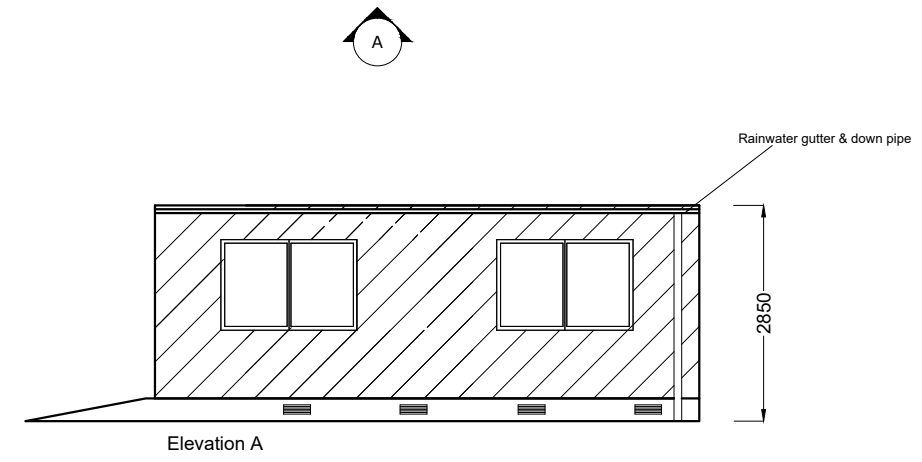
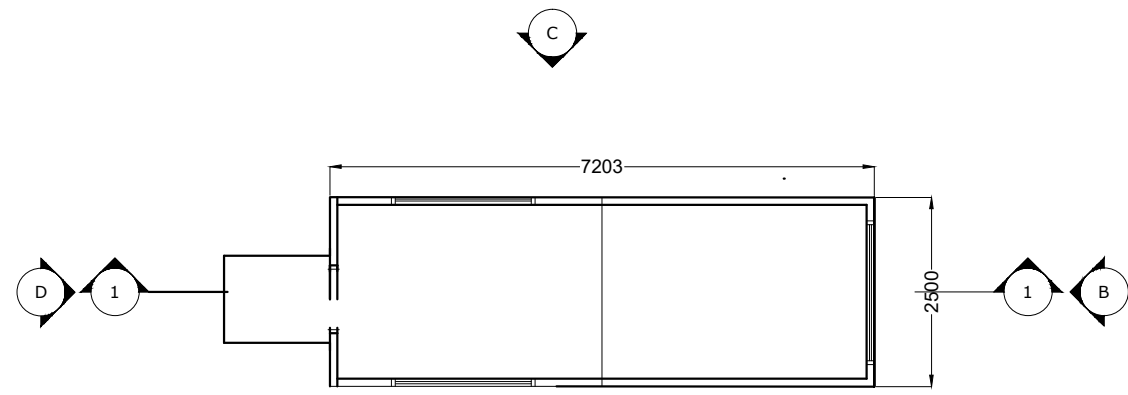
DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
PROJECT No.: 171221	DRAWING No.: 171221 - 47

SCALE: 1:250 @ A3	DATE: 19.02.2020
-----------------------------	----------------------------

OS Grid Reference: 3489, 3490, 3491, 3537, 3538, 3539, 3540, 3541, 3586, 3587, 3588, 3589, 3590, 3643, 3644, 3645, 3646, 3700, 3701, 3702, 3703, 3704



MKO
Planning and
Environmental
Consultants
Tuam Road, Galway
Ireland, H91 VW94
+353 (0) 91 735611
email: info@www.mkofireland.ie
Website: www.mkofireland.ie

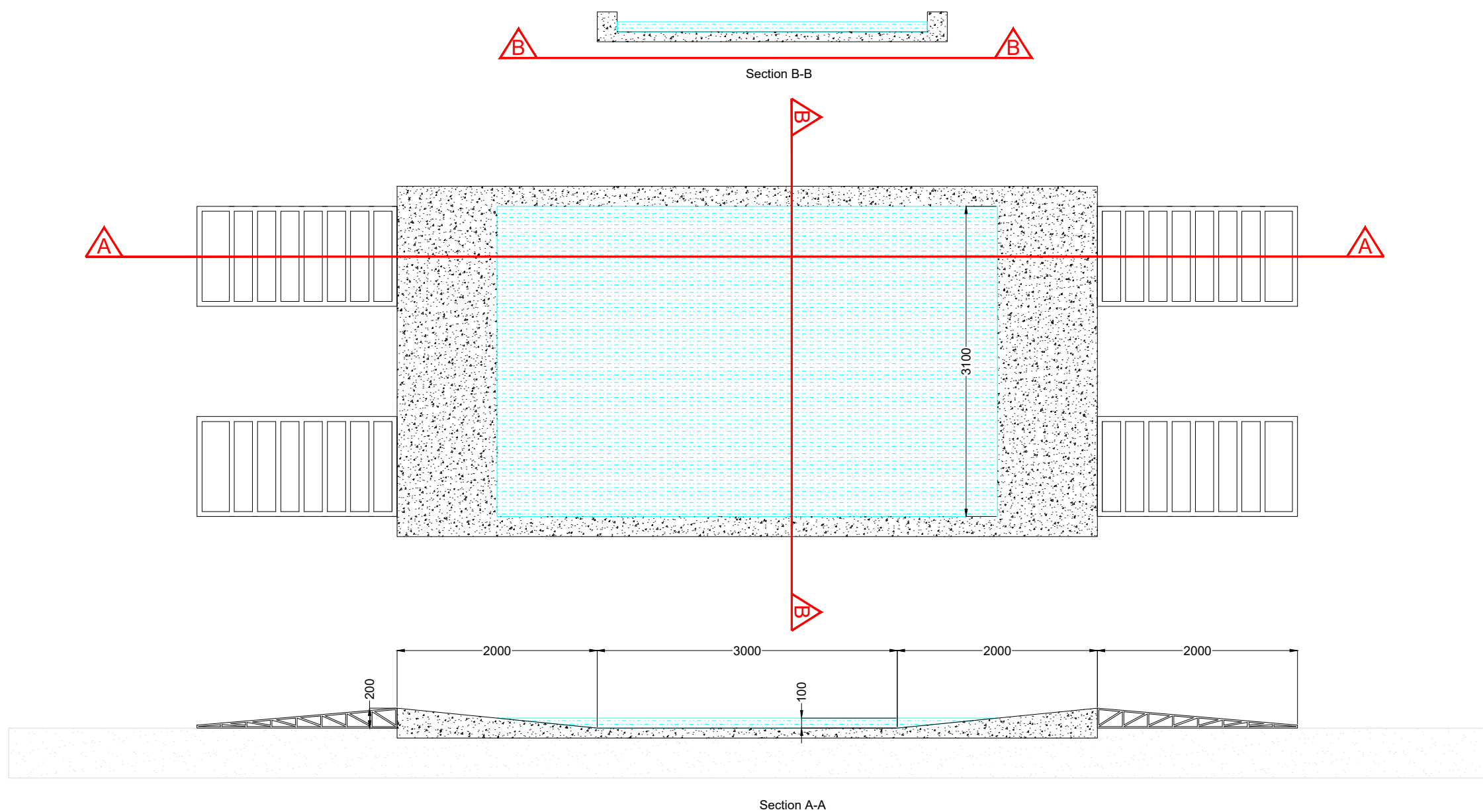


DRAWING TITLE: Typical Security Cabin Detail	
PROJECT TITLE: Derrinlough Wind Farm, Co. Offaly	
DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
PROJECT No.: 171221	DRAWING No.: 171221 - 48
SCALE: 1:100 @ A3	DATE: 19.02.2020



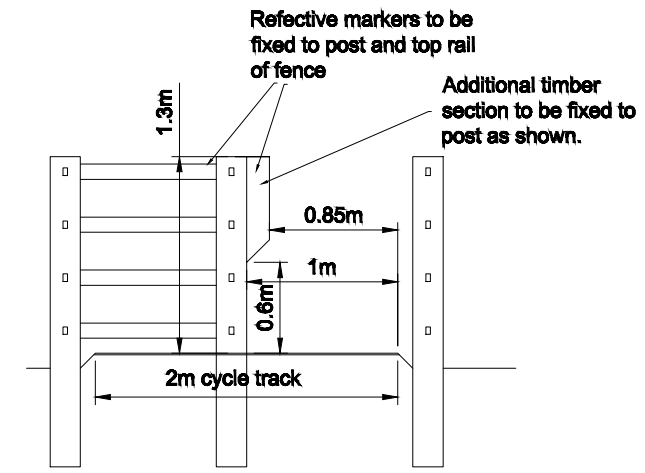
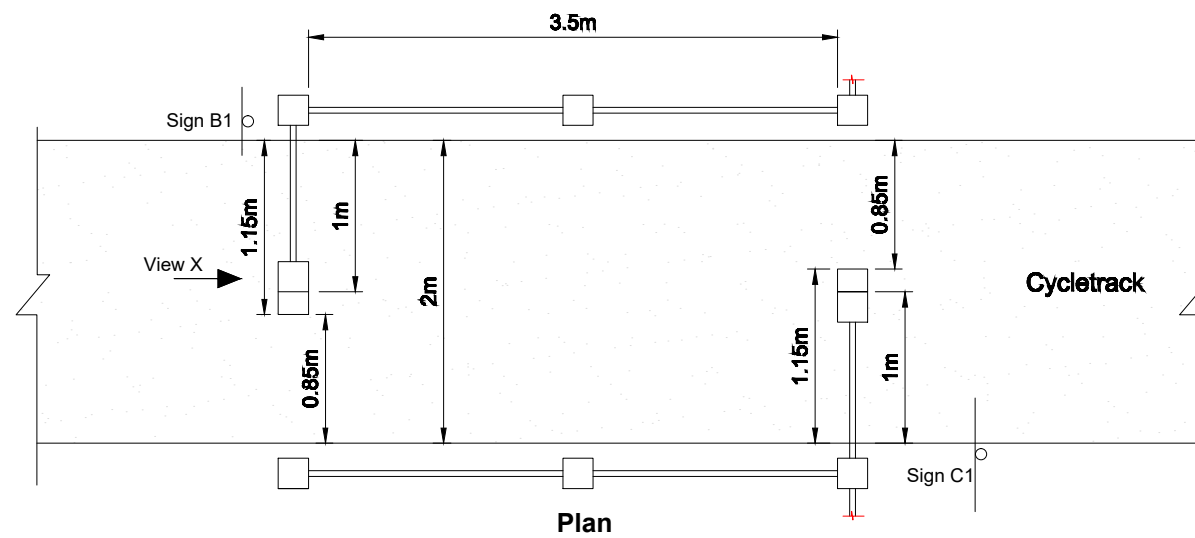
MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW94
 +353 (0) 91 735611
 email: info@www.mkofireland.ie
 Website: www.mkofireland.ie

Note
 Wheel washes will be appropriately
 located at all entrances used during
 construction of the wind farm



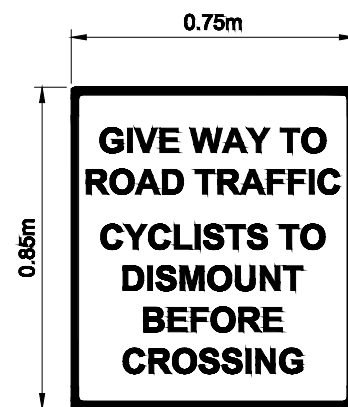
DRAWING TITLE: Typical Wheel Wash Detail	
PROJECT TITLE: Derrinlough Wind Farm, Co. Offaly	
DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
PROJECT No: 171221	DRAWING No: 171221 - 49
SCALE: 1:50 @ A3	DATE: 19.02.2020

MKO
 Planning and Environmental Consultants
 Tuam Road, Galway
 Ireland, H91 VW94
 +353 (0) 91 735611
 email: info@www.mkofireland.ie
 Website: www.mkofireland.ie

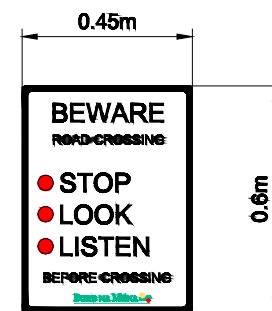


DETAIL A - CHICANE FENCING AT ROAD

Scale 1:50



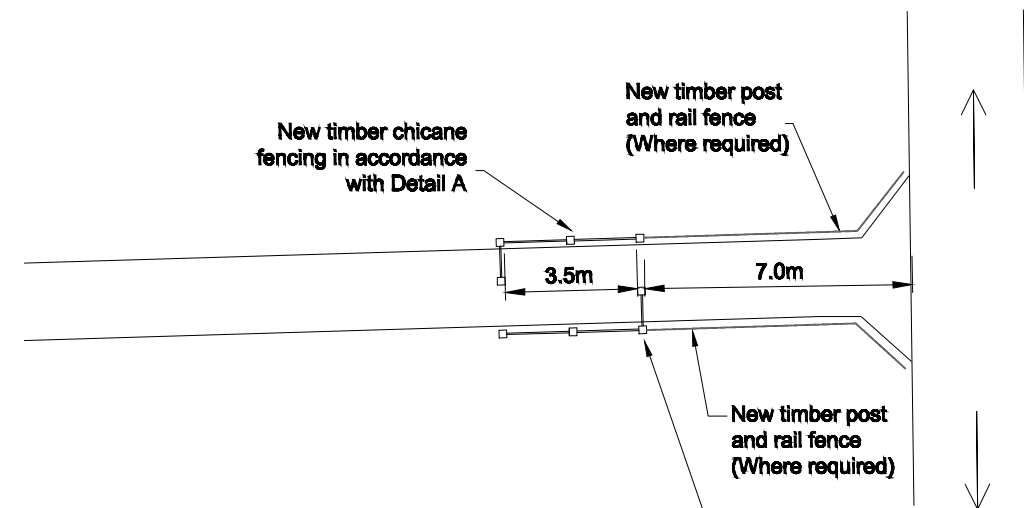
SIGN C1
 APPROACH WARNING SIGN
 SITED AT CHICANE AS SHOWN
 ALUMINIUM (11SWG) OR SIMILAR
 APPROVED
 CLASS 1 REFLECTIVE MATERIAL
 SIGN TO BE MOUNTED ON GALVANISED
 CIRCULAR HOLLOW STEEL POST 76MM IN
 DIAMETER.



SIGN B1
 APPROACH WARNING SIGN
 SITED AT ENTRANCE TO CHICANE
 ALUMINIUM (11SWG) OR SIMILAR
 APPROVED CLASS 1 REFLECTIVE
 MATERIAL
 SIGN TO BE MOUNTED ON GALVANISED
 CIRCULAR HOLLOW STEEL POST 76MM
 IN DIAMETER

Typical Sign Details

Scale 1:20



END OF AMENITY
 ACCESS TRACK-
 TYPICAL DETAIL
 Scale 1:200

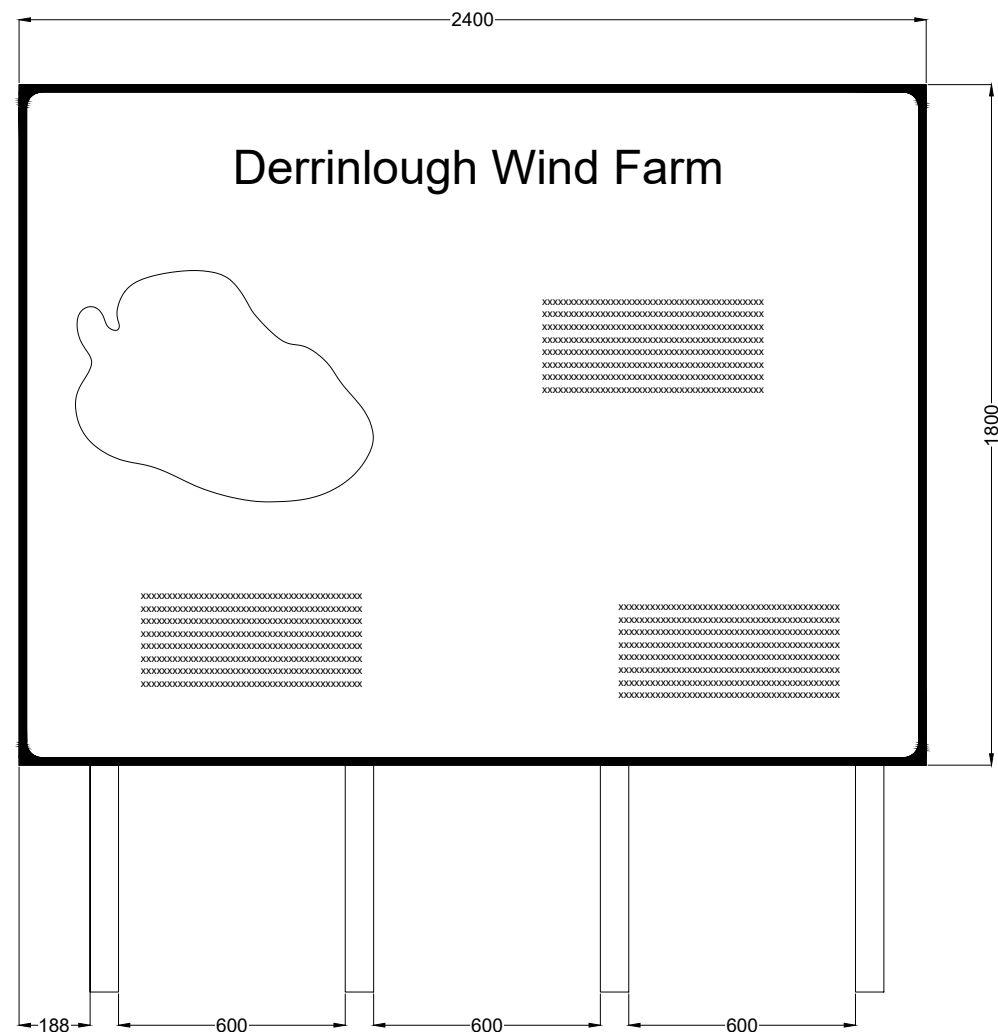
- Notes**
1. Timber gates to be in accordance with NRA detail RCD/300/11.
 2. Timber fencing to be in accordance with RC 25 and erected in accordance with Clause 2.5 of RC 25 except where otherwise shown. All lengths of fencing (including branches and spurs) shall start with a post and end with a post.
 3. Post holes falling in rock shall be excavated to the depths shown or as agreed with the Engineer. Holes shall be backfilled with Mix S12 concrete.
 4. Signs on cycletrack to be located so as to ensure 2.5m clearance for vehicular traffic.

Pedestrian/Cyclist Amenity Entrance Typical Detail

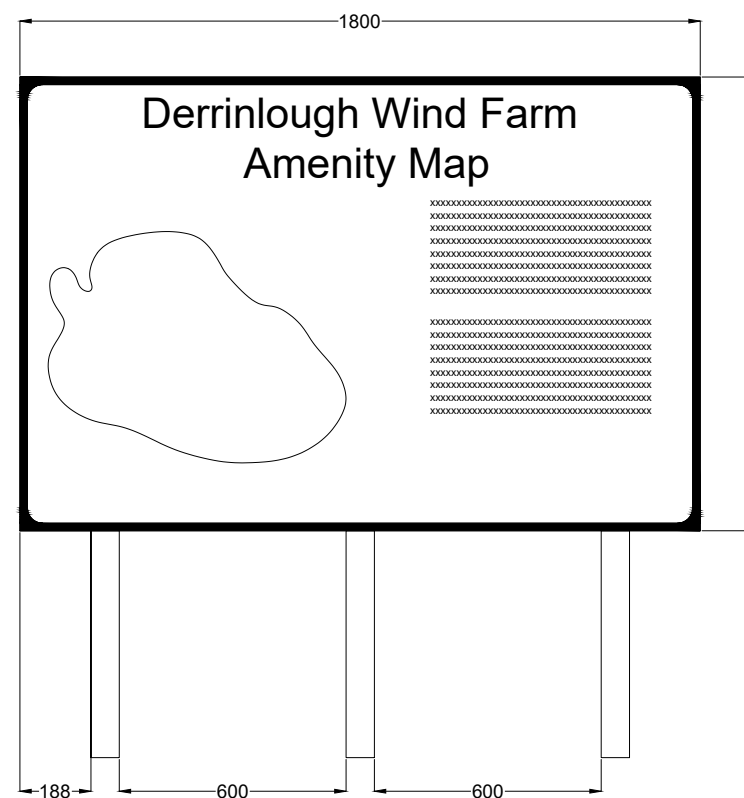
PROJECT TITLE: Derrinlough Wind Farm, Co. Offaly	
DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
PROJECT No.: 171221	DRAWING No.: 171221 - 50
SCALE: As Shown @ A3	DATE: 19.02.2020

MKO
 Planning and
 Environmental
 Consultants
 Tuam Road, Galway
 Ireland, H91 VW94
 +353 (0) 91 735611
 email: info@www.mkofireland.ie
 Website: www.mkofireland.ie

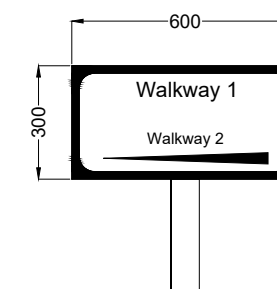
Note
For illustrative purposes only
exact details to be confirmed



Signage Type A - Entry Point Signage



Signage Type B - Waypoint Map Signage



Signage Type C - Way Point Direction Signage

DRAWING TITLE: Typical Signage Detail	
PROJECT TITLE: Derrinlough Wind Farm, Co. Offaly	
DRAWING BY: Joseph O'Brien	CHECKED BY: Eoin McCarthy
PROJECT No.: 171221	DRAWING No.: 171221 - 51
SCALE: 1:20 @ A3	DATE: 19.02.2020