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 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

- Drawing Legend**
- Planning Application Boundary
 - Landowners Boundary
 - Grid Connection in Co. Kerry
 - Derragh Wind Farm Turbines

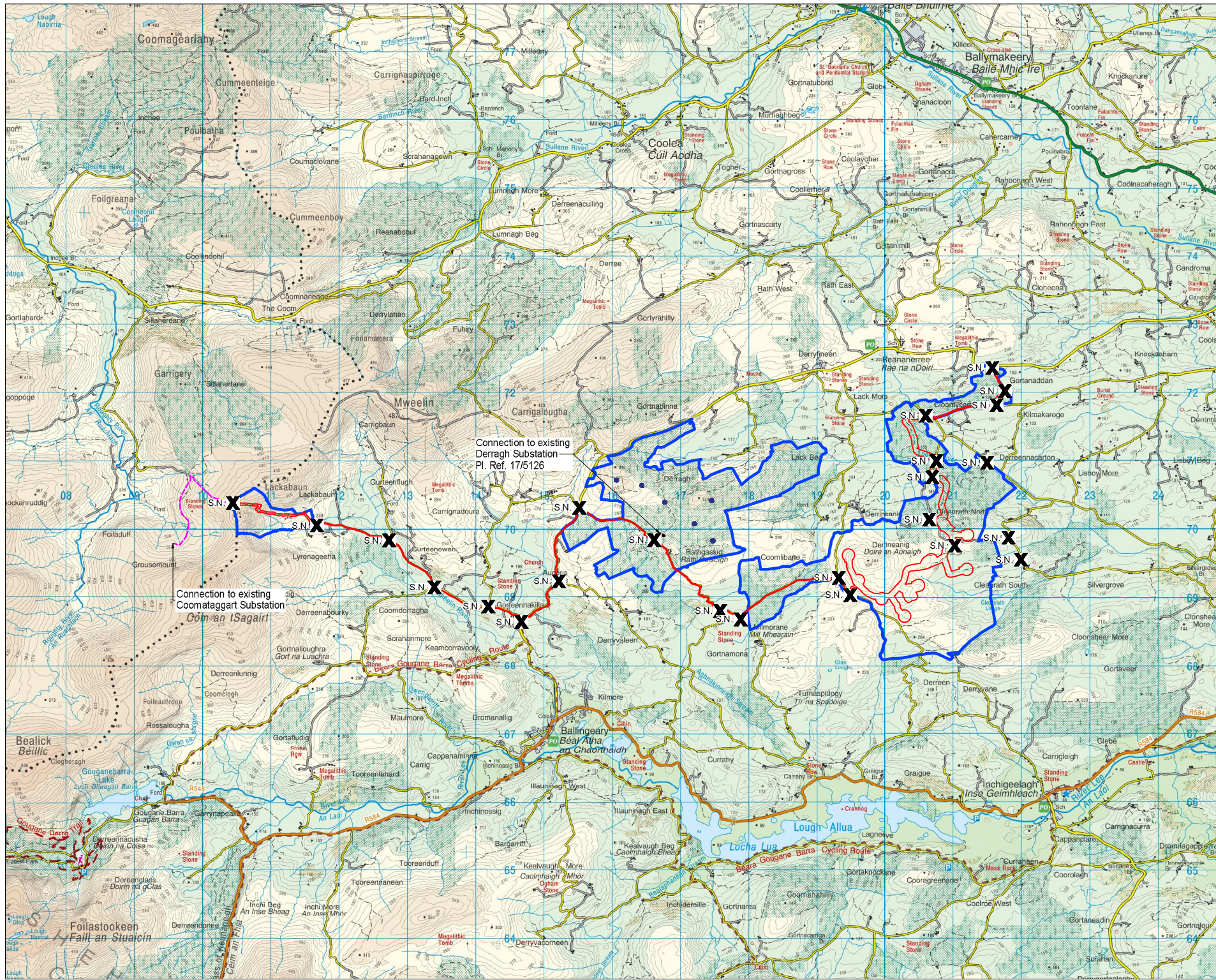


Location Map

PROJECT TITLE: Cleanrath Wind Farm, Co. Cork

DRAWN BY: Joseph O'Brien	CHECKED BY: Owen Cahill
PROJECT NO: 191223a	DRAWING NO: 191223a - 01
SCALE: 1:50,000 @ A3	DATE: 13.08.2020
OS SHEET NO: OS1006, OS1206	

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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Drainage Design Note

Drawing Legend

- Planning Application Boundary
- Landowners Boundary

S.N. X Site Notice

- Grid Connection in Co. Kerry
- Derragh Wind Farm Turbines

Site Notice Location Map

DRAWING TITLE: Cleanrath Wind Farm, Co. Cork

DRAWING BY: Joseph O'Brien	CHECKED BY: Owen Cahill
PROJECT NO: 191223a	DRAWING NO: 191223a - 02
SCALE: 1:50,000 @ A3	DATE: 13.08.2020
OS SHEET NO: OS1006, OS1206	

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Drainage Design Note
Drainage details are included in drawings prepared by Hydro Environmental Services

Drawing Legend

Planning Application Boundary

S.N. X Site Notice

Cable Trench to Grid Connection

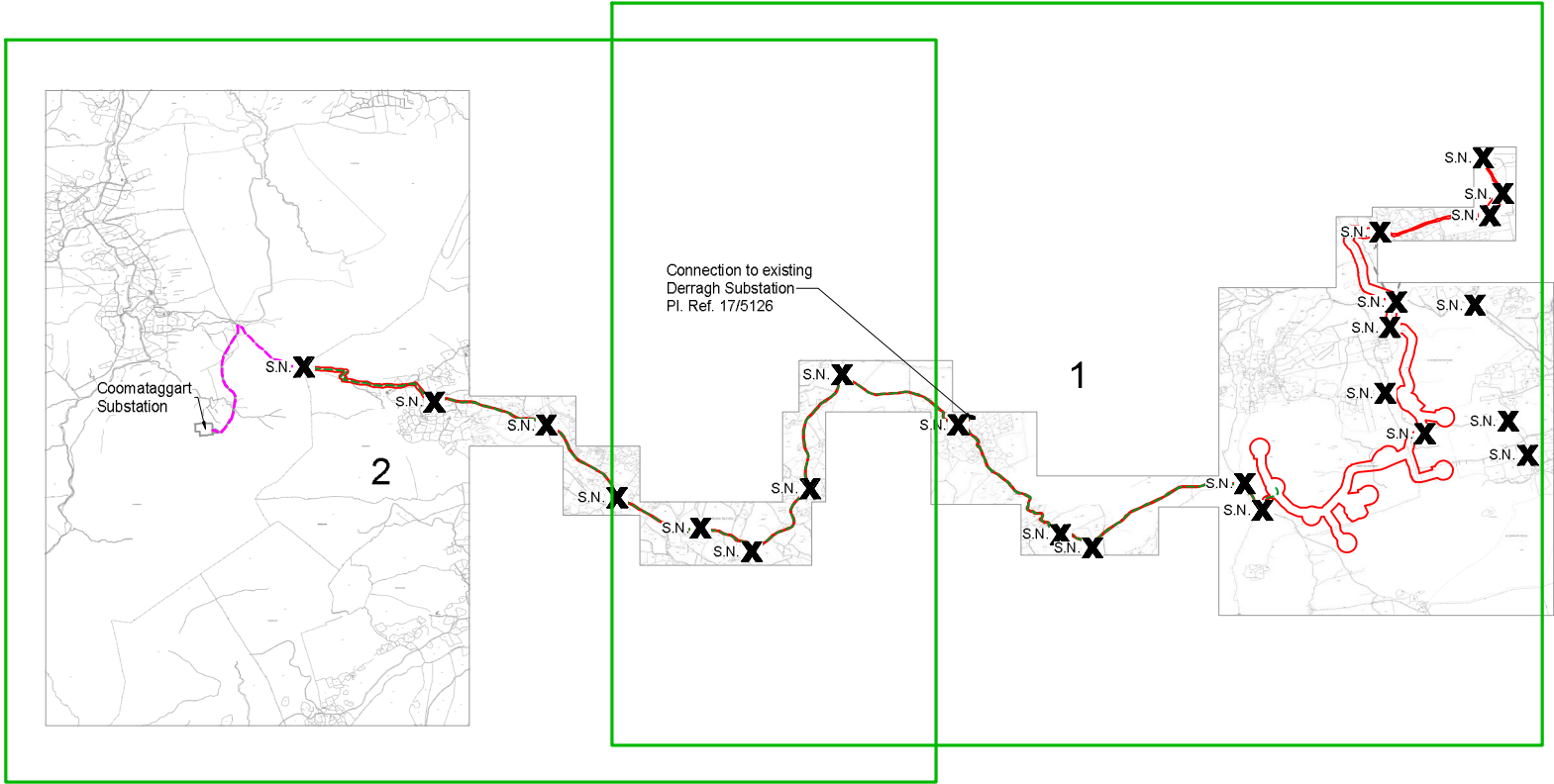
Grid Connection in Co. Kerry

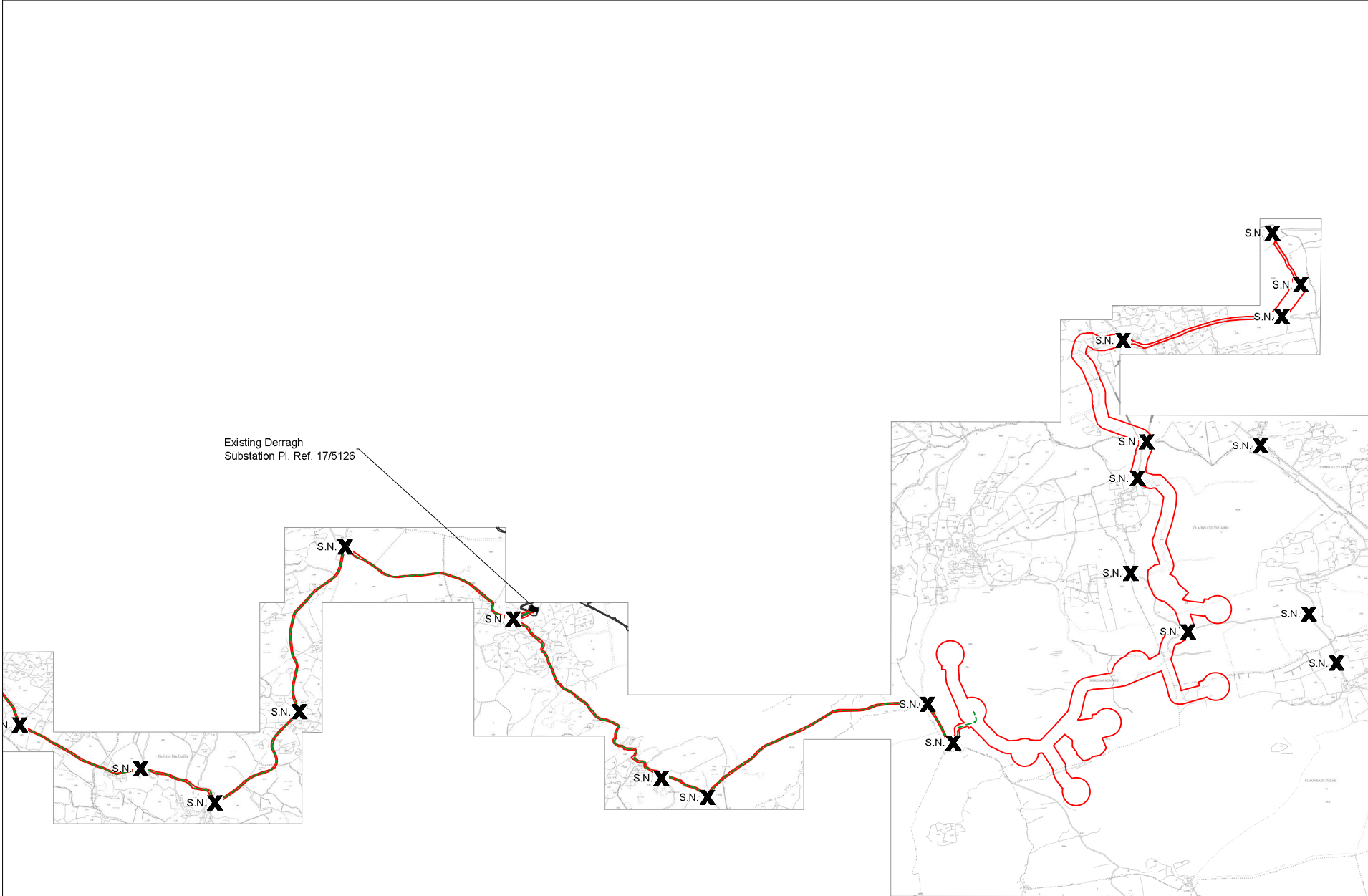
Site Location Key Plan

PROJECT TITLE:
Cleanrath Wind Farm, Co. Cork

DRAWING BY: Joseph o'Brien	CHECKED BY: Owen Cahill
PROJECT NO: 191223a	DRAWING NO: 191223a - 02A
SCALE: 1:50,000 @ A3	DATE: 13.08.2020
01 SHEET NO: 6367.6366.6370.6371.6412.6413.6414.6415.6416	

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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Drainage Design Note
Drainage details are included in drawings prepared by Hydro Environmental Services

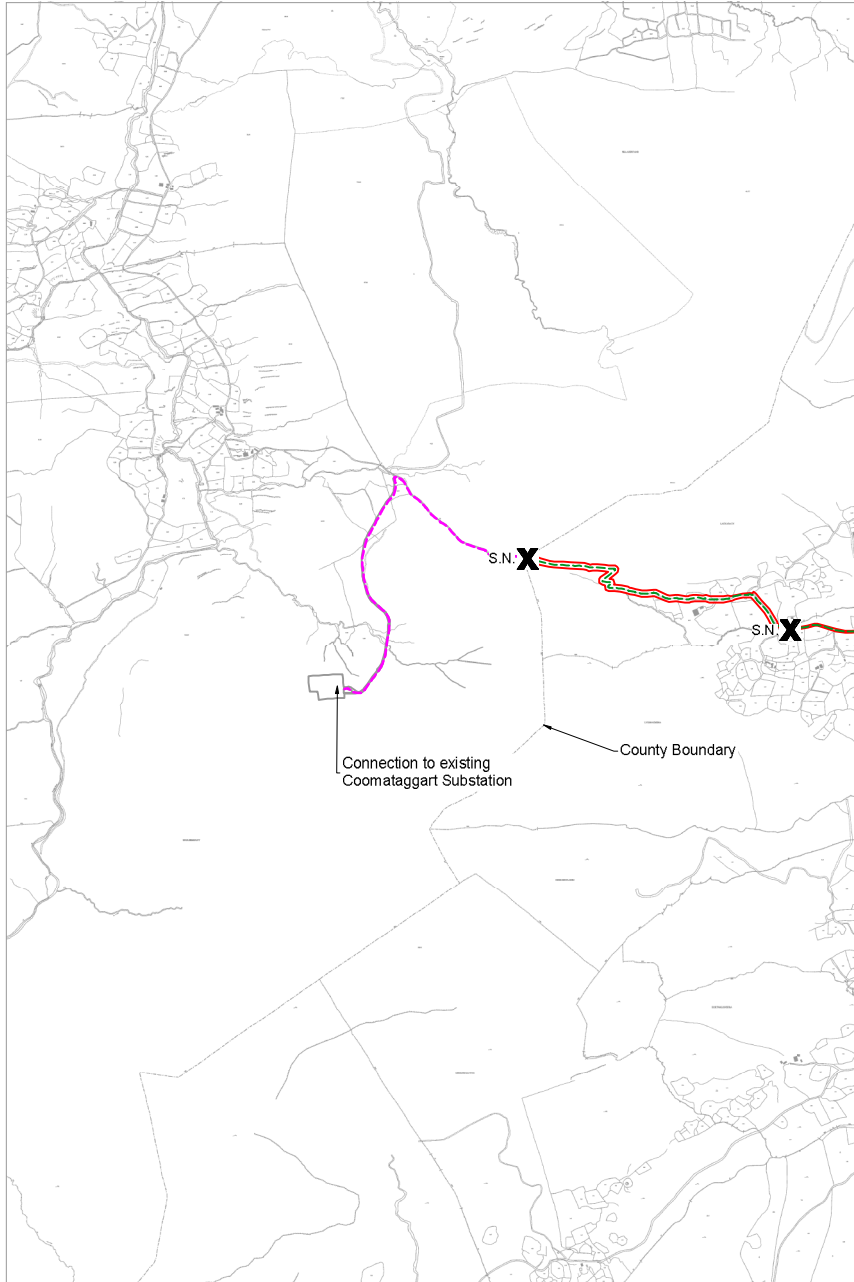
Drawing Legend

- Planning Application Boundary
- S.N. X Site Notice
- Grid Connection Cable Route

DRAWING TITLE	
Site Location	
Key Plan - Sheet 1 of 2	
PROJECT TITLE	
Cleanrath Wind Farm, Co. Cork	
DRAWING BY	CHECKED BY
Joseph o Brien	Owen Cahill
PROJECT NO.	DRAWING NO.
191223a	191223a - 02B
SCALE	DATE
1:25,000 @ A3	13.08.2020
01 SHEET NO.	
6367.6368.6369.6370.6371.6412.6413.6414.6415.6416	



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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Drainage Design Note
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Drawing Legend

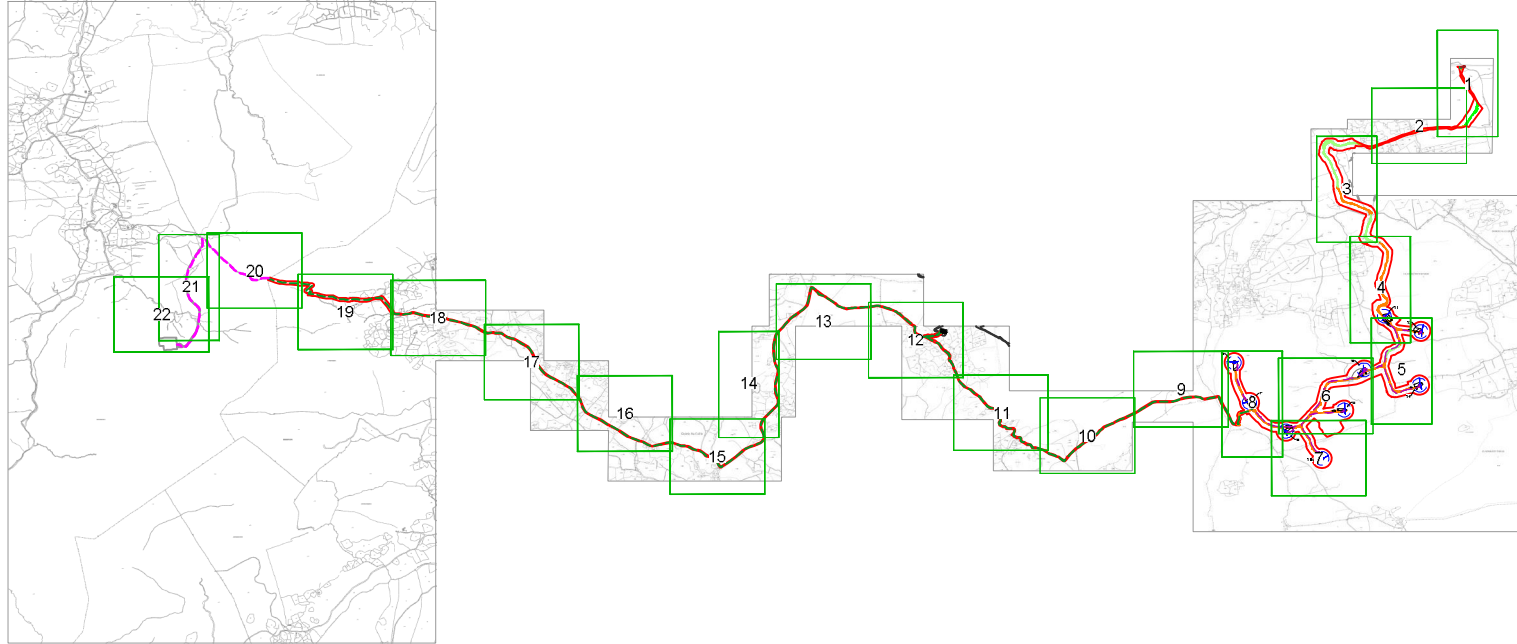
- Planning Application Boundary
- S.N. X Site Notice
- Grid Connection in Co. Kerry
- Grid Connection Cable Route

Drawing Title
Site Location
Key Plan - Sheet 2 of 2

PROJECT TITLE:
Cleanrath Wind Farm, Co. Cork

DRAWING BY: Joseph o'Brien	CHECKED BY: Owen Cahill
PROJECT NO.: 191223a	DRAWING NO.: 191223a - 02C
SCALE: 1:25,000 @ A3	DATE: 13.08.2020
01 SHEET NO.: 6367.6368.6369.6370.6371.6412.6413.6414.6415.6416	

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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Drainage Design Note
Drainage details are included in drawings prepared by Hydro Environmental Services

- Drawing Legend**
- Planning Application Boundary
 - Existing Road Upgraded
 - New Road
 - Temporary Road for Turbine Delivery
 - Junction/Road Widening
 - Crane Pad Hardstanding Area
 - Electrical Cable Trench
 - Turbine Foundation
 - Turbine Sweep Area
 - Grid Connection into Co. Kerry
 - Grid Connection Cable Route

DRAWING TITLE	
Site Layout Key Plan	
PROJECT TITLE	
Cleanrath Wind Farm, Co. Cork	
DRAWING BY	CHECKED BY
Joseph o'Brien	Owen Cahill
PROJECT NO.	DRAWING NO.
191223a	191223a - 03
SCALE	DATE
1:50,000 @ A3	13.08.2020
01 SHEET NO.	
6367, 6368, 6369, 6370, 6371, 6412, 6413, 6414, 6415, 6416	



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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Design Notes

Design Details are included in drawings prepared by Hydro Environmental Services

- Drawing Legend**
- Planning Application Boundary
 - New Road
 - Temporary Road for Turbine Delivery
 - Junction/Road Widening
 - Vegetation Area
 - Berm
 - Watercourse/Drain Crossings

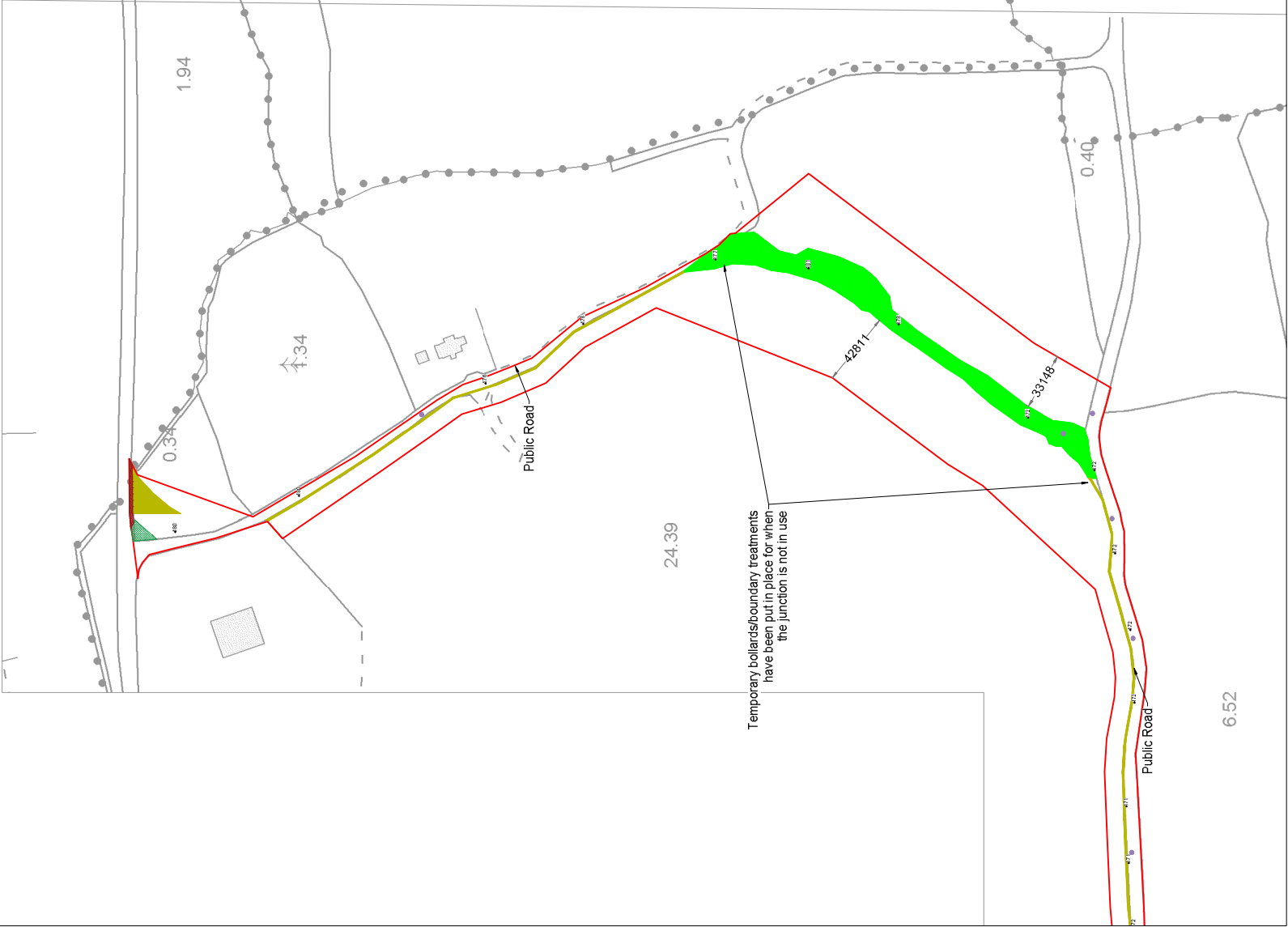


Site Layout Plan
Sheet 1 of 22

DRAWING TITLE		PROJECT TITLE	
		Clearrath Wind Farm, Co. Cork	
DRAWING BY	CHECKED BY	DRAWING NO.	
Joseph o'Brien	Owen Cahill	191223a - 04	
PROJECT	DATE	SCALE	
191223a	13.08.2020	1:2,500 @ A3	
DRAWING NO.			
6387.6386.6386.6387.6412.6413.6413.6413.6416			

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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Drainage Design Note
Drainage details are included in drawings prepared by Hydro Environmental Services

- Drawing Legend**
- Planning Application Boundary
 - Temporary Road for Turbine Delivery
 - Junction/Road Widening
 - Watercourse/Drain Crossings

DRAWING TITLE: Site Layout Plan Sheet 2 of 22	
PROJECT TITLE: Cleanrath Wind Farm, Co. Cork	
DRAWING BY: Joseph o Brien	CHECKED BY: Owen Cahill
PROJECT NO: 191223a	DRAWING NO: 191223a - 05
SCALE: 1:2,500 @ A3	DATE: 13.08.2020
05 SHEET NO: 6367.6368.6369.6370.6371.6412.6413.6414.6415.6416	



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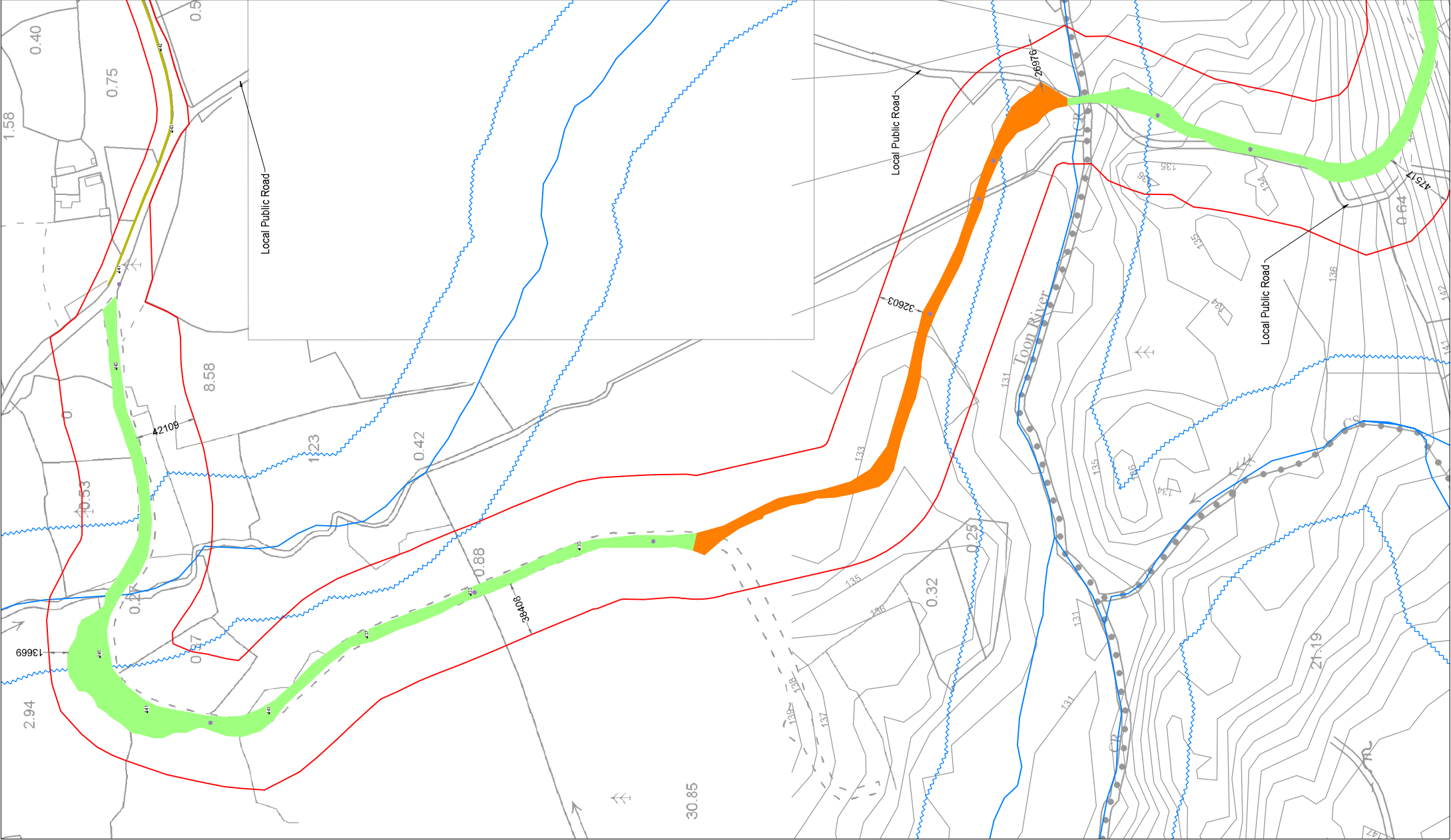
The map displays a topographic representation of a region with a proposed road alignment. The alignment is shown as a green line, with segments highlighted in orange. The map includes contour lines, a river labeled 'Toon River', and various elevation points. Labels such as 'Local Public Road' and 'Toon River' are present. Numerical values like 136, 135, 134, 133, 132, 131, 130, 129, 128, 127, 126, 125, 124, 123, 122, 121, 120, 119, 118, 117, 116, 115, 114, 113, 112, 111, 110, 109, 108, 107, 106, 105, 104, 103, 102, 101, 100, 99, 98, 97, 96, 95, 94, 93, 92, 91, 90, 89, 88, 87, 86, 85, 84, 83, 82, 81, 80, 79, 78, 77, 76, 75, 74, 73, 72, 71, 70, 69, 68, 67, 66, 65, 64, 63, 62, 61, 60, 59, 58, 57, 56, 55, 54, 53, 52, 51, 50, 49, 48, 47, 46, 45, 44, 43, 42, 41, 40, 39, 38, 37, 36, 35, 34, 33, 32, 31, 30, 29, 28, 27, 26, 25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0 are scattered across the map, indicating elevation points.

-
- The map displays a topographic representation of a region with a proposed road alignment. The alignment is shown as a green line, with segments highlighted in orange. The map includes contour lines, a river labeled 'Toon River', and various elevation points. Labels such as 'Local Public Road' and 'Toon River' are present. Numerical values like 136, 135, 134, 133, 132, 131, 130, 129, 128, 127, 126, 125, 124, 123, 122, 121, 120, 119, 118, 117, 116, 115, 114, 113, 112, 111, 110, 109, 108, 107, 106, 105, 104, 103, 102, 101, 100, 99, 98, 97, 96, 95, 94, 93, 92, 91, 90, 89, 88, 87, 86, 85, 84, 83, 82, 81, 80, 79, 78, 77, 76, 75, 74, 73, 72, 71, 70, 69, 68, 67, 66, 65, 64, 63, 62, 61, 60, 59, 58, 57, 56, 55, 54, 53, 52, 51, 50, 49, 48, 47, 46, 45, 44, 43, 42, 41, 40, 39, 38, 37, 36, 35, 34, 33, 32, 31, 30, 29, 28, 27, 26, 25, 24, 23, 22, 21, 20, 19, 18, 17, 16, 15, 14, 13, 12, 11, 10, 9, 8, 7, 6, 5, 4, 3, 2, 1, 0 are scattered across the map.

This topographic map illustrates a proposed road alignment in the Toon River area. The map features contour lines, a blue river, and a red dashed line indicating the proposed road. A green line highlights a specific section of the road, and an orange line highlights another section. Labels include 'Toon River', 'Local Public Road', and various elevation points.

This topographic map illustrates a proposed road alignment in the Toon River area. The map features contour lines, a blue river, and a red dashed line indicating the proposed road. A green line highlights a specific section of the road, and an orange line highlights another section. Labels include 'Toon River', 'Local Public Road', and various elevation points.

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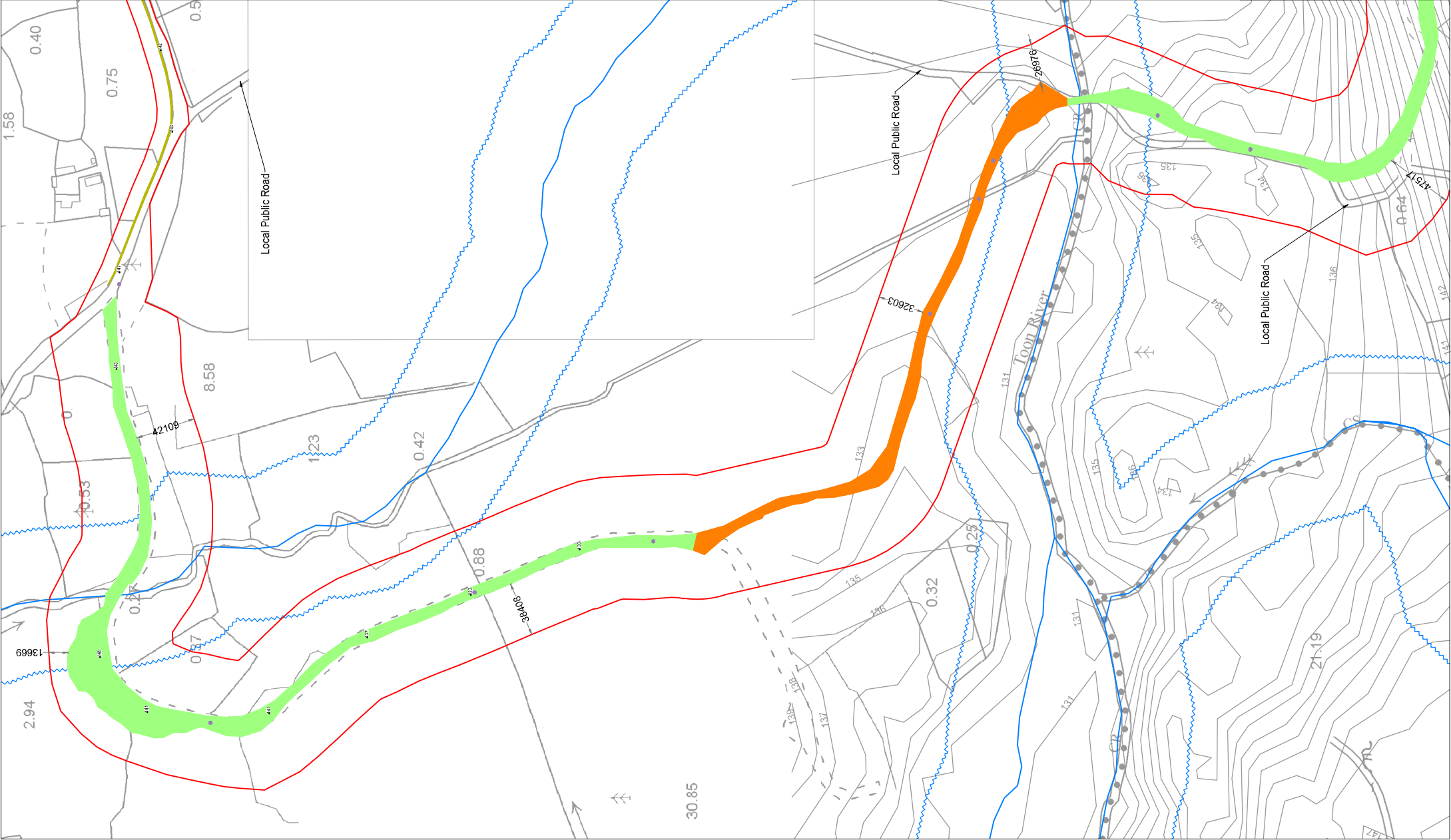


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The image is a topographic map of a construction site. It features contour lines indicating elevation, with labels such as 14005, 14006, 14007, 14008, 14009, 14010, 14011, 14012, 14013, 14014, 14015, 14016, 14017, 14018, 14019, 14020, 14021, 14022, 14023, 14024, 14025, 14026, 14027, 14028, 14029, 14030, 14031, 14032, 14033, 14034, 14035, 14036, 14037, 14038, 14039, 14040, 14041, 14042, 14043, 14044, 14045, 14046, 14047, 14048, 14049, 14050, 14051, 14052, 14053, 14054, 14055, 14056, 14057, 14058, 14059, 14060, 14061, 14062, 14063, 14064, 14065, 14066, 14067, 14068, 14069, 14070, 14071, 14072, 14073, 14074, 14075, 14076, 14077, 14078, 14079, 14080, 14081, 14082, 14083, 14084, 14085, 14086, 14087, 14088, 14089, 14090, 14091, 14092, 14093, 14094, 14095, 14096, 14097, 14098, 14099, 14100, 14101, 14102, 14103, 14104, 14105, 14106, 14107, 14108, 14109, 14110, 14111, 14112, 14113, 14114, 14115, 14116, 14117, 14118, 14119, 14120, 14121, 14122, 14123, 14124, 14125, 14126, 14127, 14128, 14129, 14130, 14131, 14132, 14133, 14134, 14135, 14136, 14137, 14138, 14139, 14140, 14141, 14142, 14143, 14144, 14145, 14146, 14147, 14148, 14149, 14150, 14151, 14152, 14153, 14154, 14155, 14156, 14157, 14158, 14159, 14160, 14161, 14162, 14163, 14164, 14165, 14166, 14167, 14168, 14169, 14170, 14171, 14172, 14173, 14174, 14175, 14176, 14177, 14178, 14179, 14180, 14181, 14182, 14183, 14184, 14185, 14186, 14187, 14188, 14189, 14190, 14191, 14192, 14193, 14194, 14195, 14196, 14197, 14198, 14199, 14200, 14201, 14202, 14203, 14204, 14205, 14206, 14207, 14208, 14209, 14210, 14211, 14212, 14213, 14214, 14215, 14216, 14217, 14218, 14219, 14220, 14221, 14222, 14223, 14224, 14225, 14226, 14227, 14228, 14229, 14230, 14231, 14232, 14233, 14234, 14235, 14236, 14237, 14238, 14239, 14240, 14241, 14242, 14243, 14244, 14245, 14246, 14247, 14248, 14249, 14250, 14251, 14252, 14253, 14254, 14255, 14256, 14257, 14258, 14259, 14260, 14261, 14262, 14263, 14264, 14265, 14266, 14267, 14268, 14269, 14270, 14271, 14272, 14273, 14274, 14275, 14276, 14277, 14278, 14279, 14280, 14281, 14282, 14283, 14284, 14285, 14286, 14287, 14288, 14289, 14290, 14291, 14292, 14293, 14294, 14295, 14296, 14297, 14298, 14299, 14300, 14301, 14302, 14303, 14304, 14305, 14306, 14307, 14308, 14309, 14310, 14311, 14312, 14313, 14314, 14315, 14316, 14317, 14318, 14319, 14320, 14321, 14322, 14323, 14324, 14325, 14326, 14327, 14328, 14329, 14330, 14331, 14332, 14333, 14334, 14335, 14336, 14337, 14338, 14339, 14340, 14341, 14342, 14343, 14344, 14345, 14346, 14347, 14348, 14349, 14350, 14351, 14352, 14353, 14354, 14355, 14356, 14357, 14358, 14359, 14360, 14361, 14362, 14363, 14364, 14365, 14366, 14367, 14368, 14369, 14370, 14371, 14372, 14373, 14374, 14375, 14376, 14377, 14378, 14379, 14380, 14381, 14382, 14383, 14384, 14385, 14386, 14387, 14388, 14389, 14390, 14391, 14392, 14393, 14394, 14395, 14396, 14397, 14398, 14399, 14400, 14401, 14402, 14403, 14404, 14405, 14406, 14407, 14408, 14409, 14410, 14411, 14412, 14413, 14414, 14415, 14416, 14417, 14418, 14419, 14420, 14421, 14422, 14423, 14424, 14425, 14426, 14427, 14428, 14429, 14430, 14431, 14432, 14433, 14434, 14435, 14436, 14437, 14438, 14439, 14440, 14441, 14442, 14443, 14444, 14445, 14446, 14447, 14448, 14449, 14450, 14451, 14452, 14453, 14454, 14455, 14456, 14457, 14458, 14459, 14460, 14461, 14462, 14463, 14464, 14465, 14466, 14467, 14468, 14469, 14470, 14471, 14472, 14473, 14474, 14475, 14476, 14477, 14478, 14479, 14480, 14481, 14482, 14483, 14484, 14485, 14486, 14487, 14488, 14489, 14490, 14491, 14492, 14493, 14494, 14495, 14496, 14497, 14498, 14499, 14500, 14501, 14502, 14503, 14504, 14505, 14506, 14507, 14508, 14509, 14510, 14511, 14512, 14513, 14514, 14515, 14516, 14517, 14518, 14519, 14520, 14521, 14522, 14523, 14524, 14525, 14526, 14527, 14528, 14529, 14530, 14531, 14532, 14533, 14534, 14535, 14536, 14537, 14538, 14539, 14540, 14541, 14542, 14543, 14544, 14545, 14546, 14547, 14548, 14549, 14550, 14551, 14552, 14553, 14554, 14555, 14556, 14557, 14558, 14559, 14560, 14561, 14562, 14563, 14564, 14565, 14566, 14567, 14568, 14569, 14570, 14571, 14572, 14573, 14

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| <p>Drainage Design Note</p> | <p>Drainage Design Note included in drawings prepared by Hydro Environmental Services</p> |







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7. Layout plans show typical turbine outer diameter as per turbine drawing.

Drainage Design Note

Drainage details are included in drawings prepared by Hydro
Environmental Services

Drawing Legend

-  Planning Application Boundary
 Existing Road Upgraded
 New Road
 Crane Pad Hardstanding Area
 Electrical Cable Trench
 Turbine Foundation
 Turbine Sweep Area
 River/Stream/Drain
 River/Stream/Drain Buffer 50m
 Watercourse/Drain Crossings

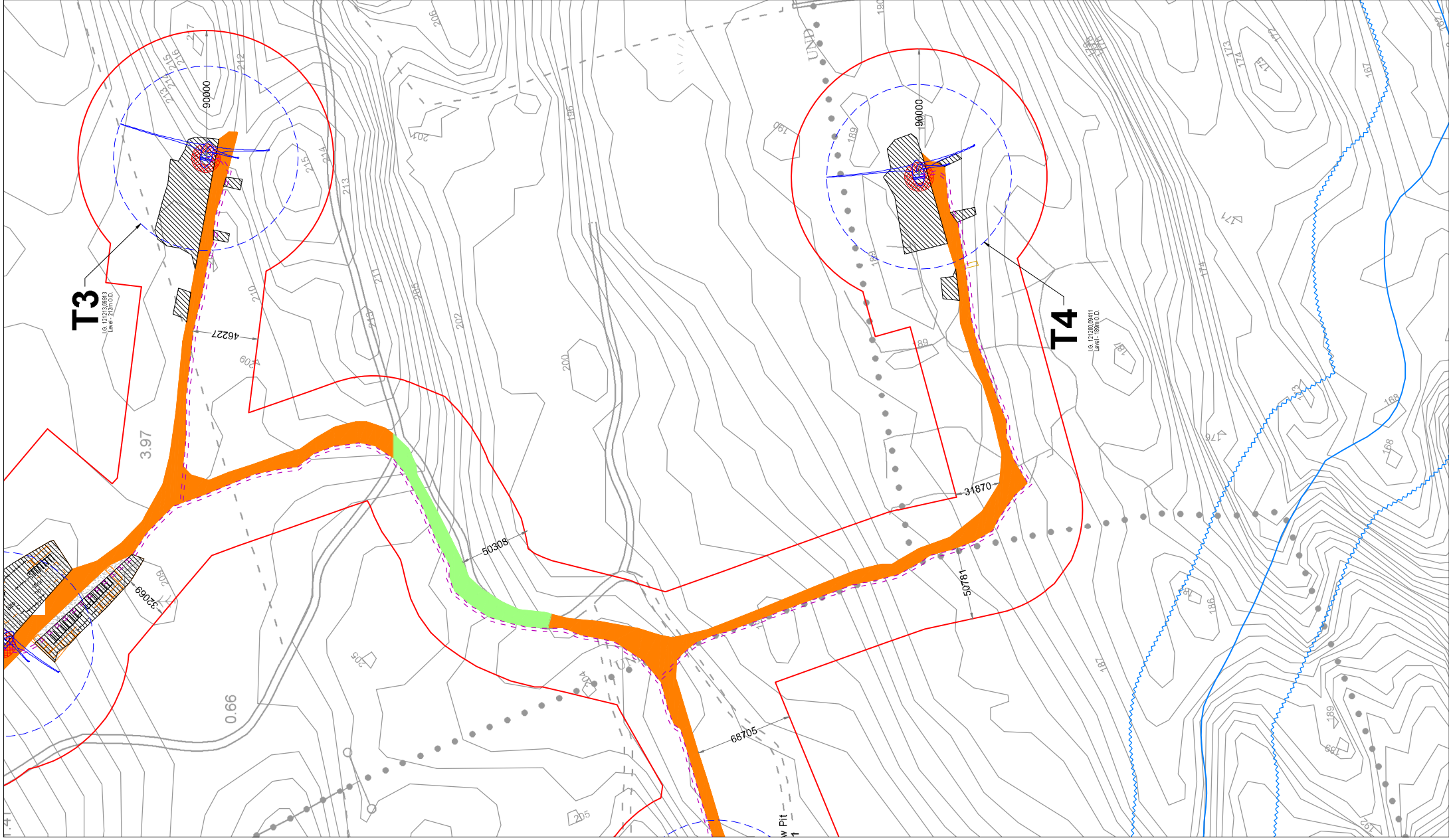


Site Layout Plan
Sheet 4 of 22

DRAWING BY:	Joseph o'Brien	CHECKED BY:	Owen Cahill
PROJECT No:	191223a	DRAWING No:	191223a - 07
SCALE:	1:2,500 @A3	DATE:	13.08.2020
DT SHEET No:		6367 9308 9369 8370 6371 6412 6413 6414 6415 6416	



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Website: www.mkoireland.ie

[illegible]

Drawing Legend

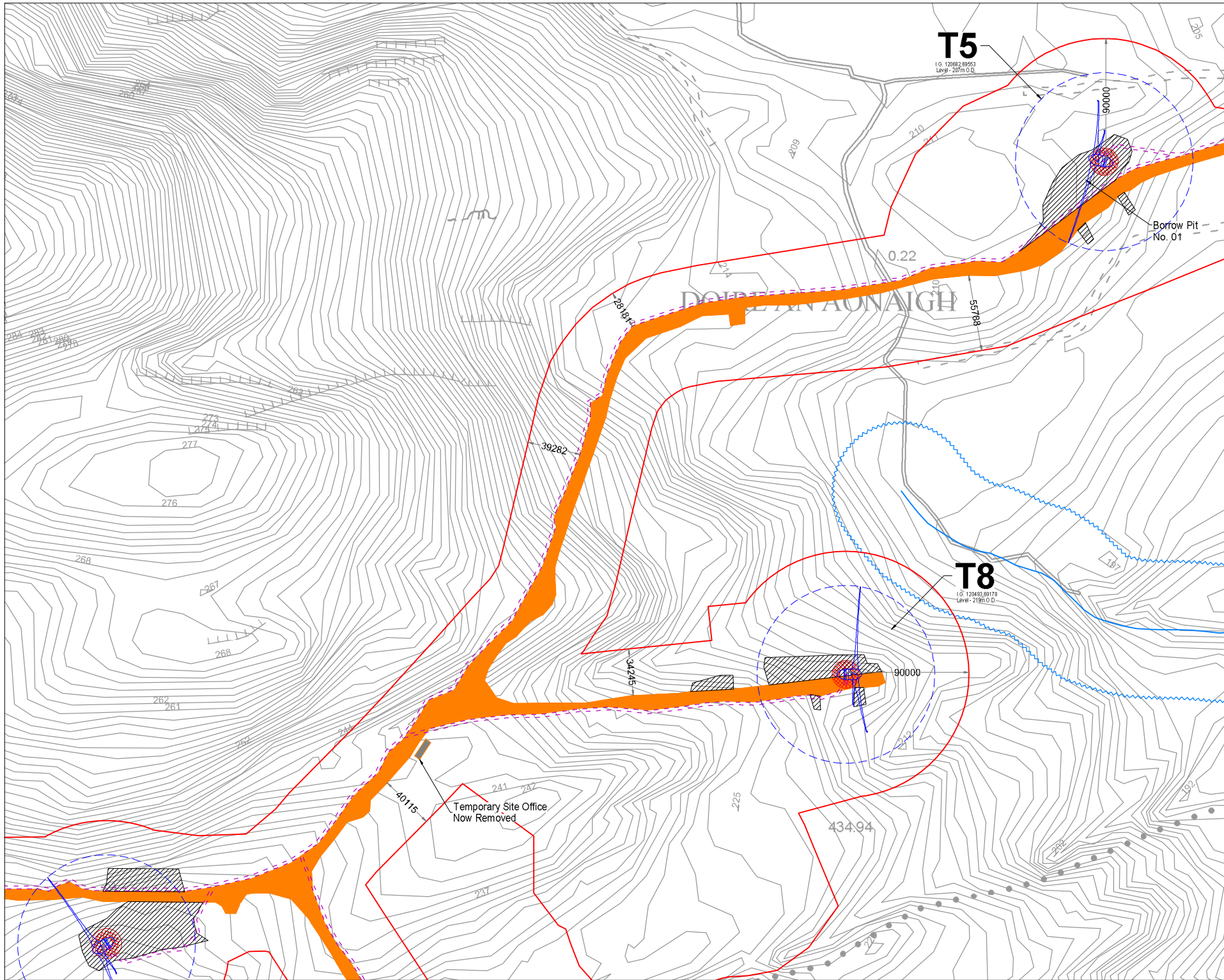
-  Planning Application Boundary
-  Existing Road Upgraded
-  New Road
-  Crane Pad/Handstanding Area
-  Electrical Cable Trench
-  Turbine Foundation
-  Turbine Sweep Area
-  River/Stream/Drain
-  River/Stream/Drain Buffer 50m



Site Layout Plan
Sheet 5 of 22

PROJECT TITLE	Cleanrath Wind Farm, Co. Cork			
DRAWING BY	Joseph o'Brien	CHECKED BY	Owen Cahill	
PROJECT No.	191223a	DRAWING No.	191223a - 08	
SCALE	1:2,500 @ A3	DATE	13.08.2020	
O/SHEET No.		6367 6368 6369 6370 6371 6412 6413 6414 6415 6416		





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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Drainage Design Note
Drainage details are included in drawings prepared by Hydro Environmental Services

Drawing Legend

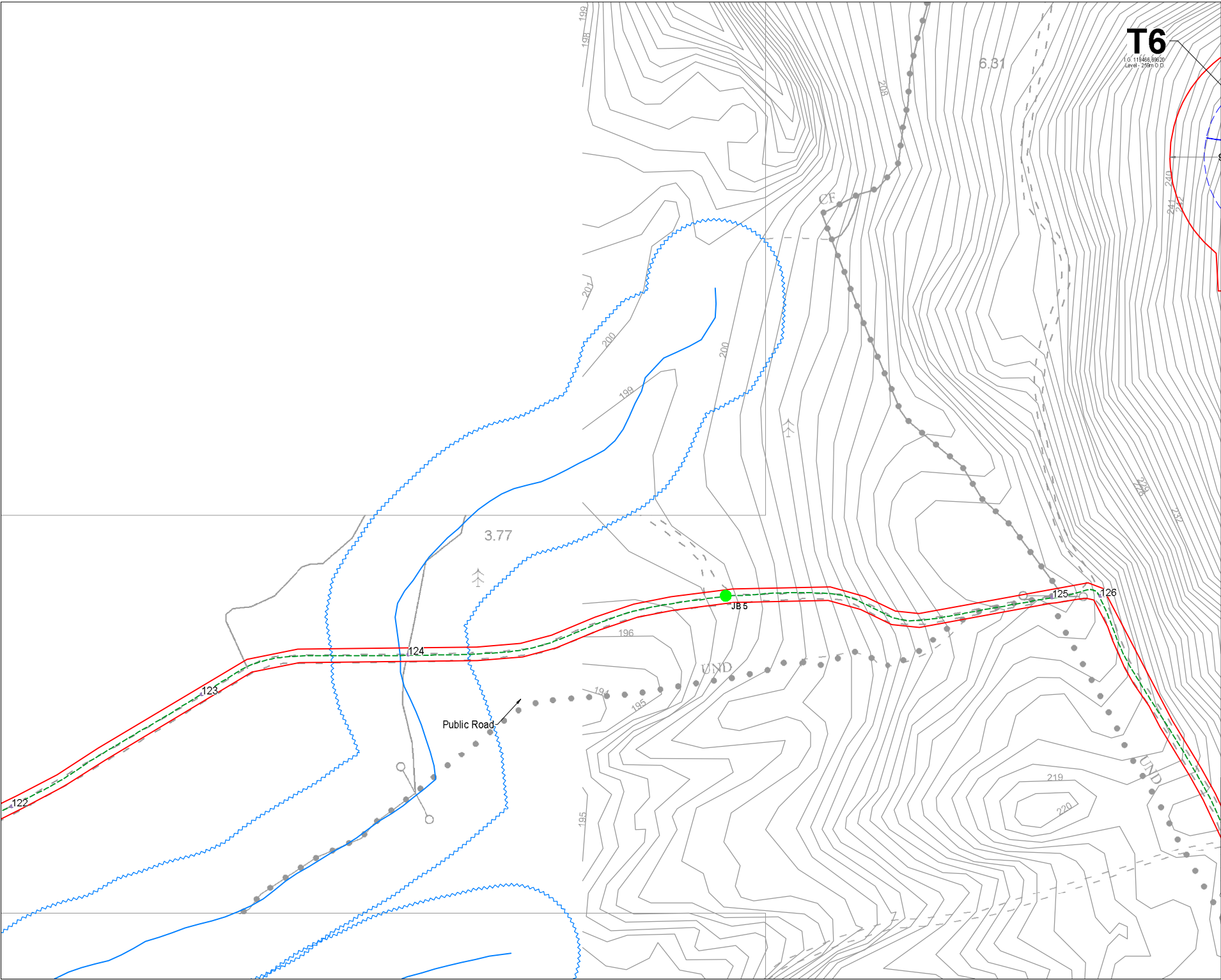
- Planning Application Boundary
- New Road
- Crane Pad Hardstanding Area
- Electrical Cable Trench
- Turbine Foundation
- Turbine Sweep Area
- River/Stream/Drain
- River/Stream/Drain Buffer 50m

Site Layout Plan
Sheet 6 of 22

PROJECT TITLE: Cleanrath Wind Farm, Co. Cork

DRAWING BY: Joseph O'Brien	CHECKED BY: Owen Cahill
PROJECT NO: 191223a	DRAWING NO: 191223a - 09
SCALE: 1:2,500 @A3	DATE: 13.08.2020
01 SHEET NO: 6367.6368.6369.6370.6371.6412.6413.6414.6415.6416	

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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Drawing Legend

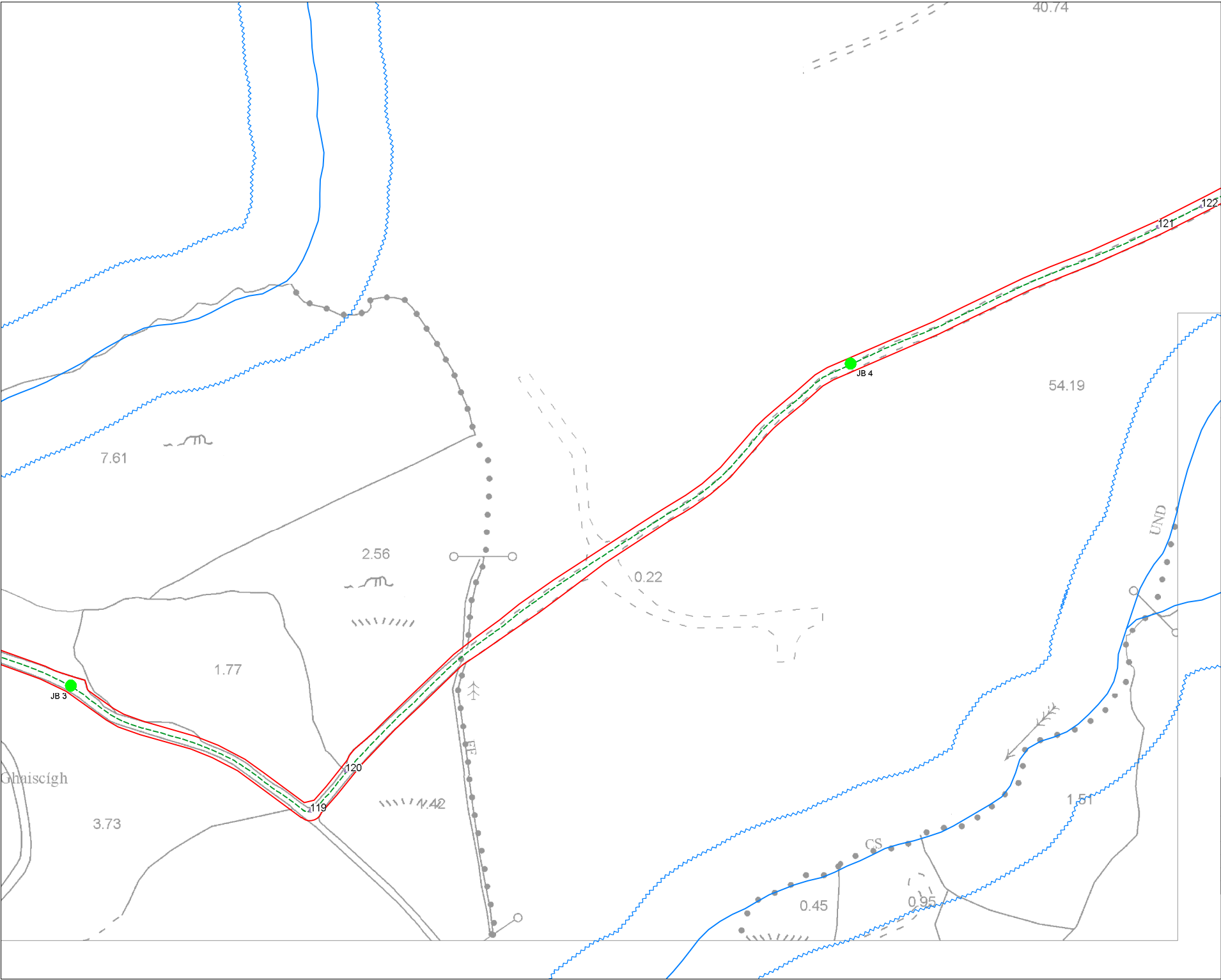
- Planning Application Boundary
- Turbine Sweep Area
- River/Stream/Drain
- River/Stream/Drain Buffer 50m
- Cable Route Grid Connection
- Joint Bay
- Watercourse/Drain Crossings

DRAWING TITLE:
Site Layout Plan
Sheet 9 of 22

PROJECT TITLE:
Cleanrath Wind Farm, Co. Cork

DRAWING BY: Joseph o'Brien	CHECKED BY: Owen Cahill
PROJECT NO.: 191223a	DRAWING NO.: 191223a - 12
SCALE: 1:2,500 @ A3	DATE: 13.08.2020
01 SHEET NO.: 6367.6368.6369.6370.6371.6412.6413.6414.6415.6416	

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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Grid Connection Drawing Notes

1. Grid connection cabling works along the public road corridor carried out under Road Opening Licence.
2. Location of grid connection cable is 'as constructed'.
3. All public/private services and utilities to be accommodated during grid connection cabling works.

Drawing Legend

- Planning Application Boundary
- River/Stream/Drain
- River/Stream/Drain Buffer 50m
- - - Cable Route Grid Connection
- Joint Bay
- Watercourse/Drain Crossings

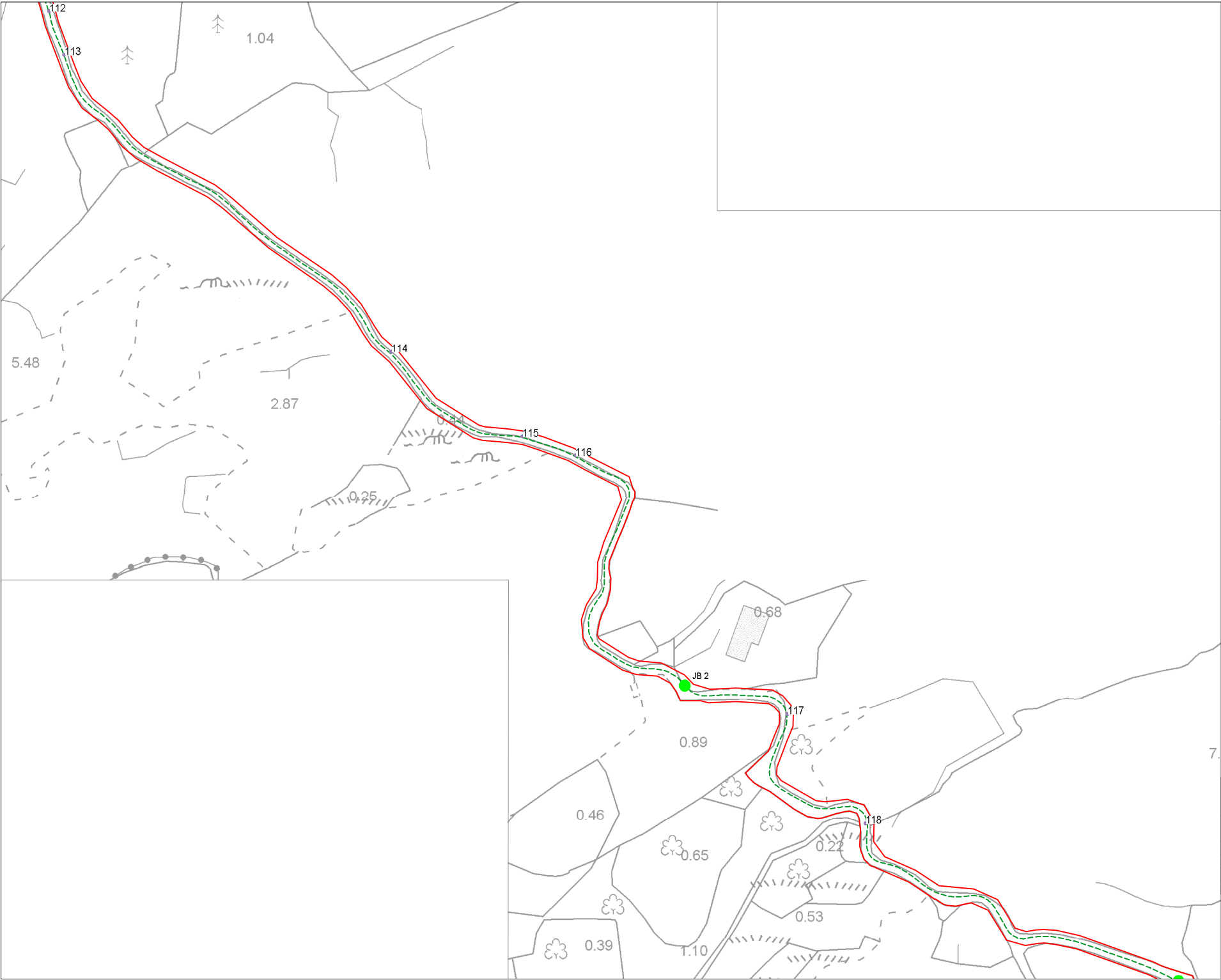
DRAWING TITLE:
**Site Layout Plan
Sheet 10 of 22**

PROJECT TITLE:
Cleanrath Wind Farm, Co. Cork

DRAWING BY: Joseph o Brien	CHECKED BY: Owen Cahill
PROJECT NO.: 191223a	DRAWING NO.: 191223a - 13
SCALE: 1:2,500 @ A3	DATE: 13.08.2020
01 SHEET NO.: 6367.6368.6369.6370.6371.6412.6413.6414.6415.6416	

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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Grid Connection Drawing Notes

1. Grid connection cabling works along the public road corridor carried out under Road Opening Licence
2. Location of grid connection cable is 'as constructed'
3. All public utility services and utilities to be accommodated during grid connection cabling works.


Drawing Legend

- Planning Application Boundary
- - - Cable Trench to Grid Connection
- Joint Bay
- Watercourse/Drain Crossings

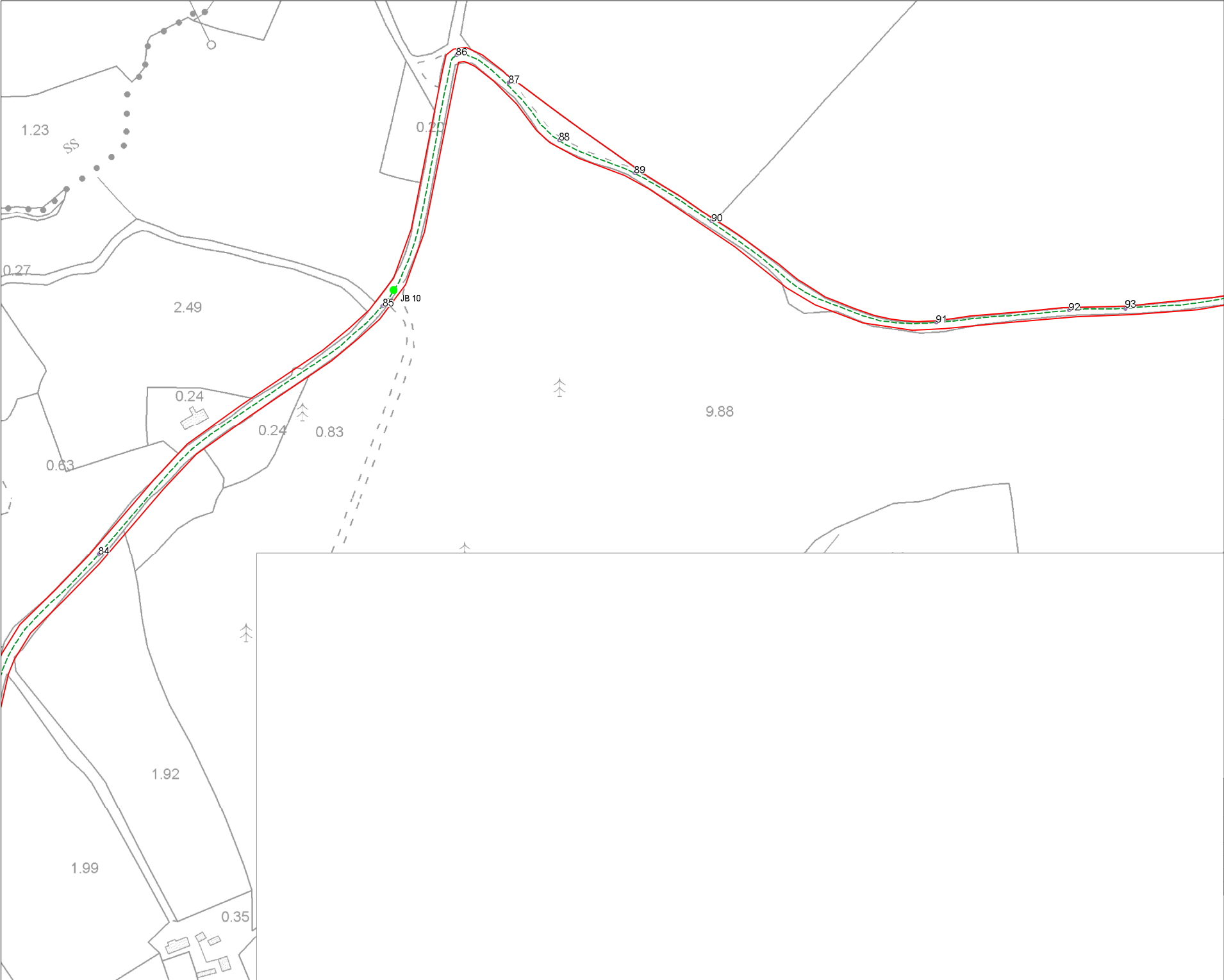
DRAWING TITLE:
Site Layout Plan
Sheet 11 of 22

PROJECT TITLE:
Cleanrath Wind Farm, Co. Cork

DRAWING BY: Joseph o'Brien	CHECKED BY: Owen Cahill
PROJECT NO.: 191223a	DRAWING NO.: 191223a - 14
SCALE: 1:2,500 @ A3	DATE: 13.08.2020
01 SHEET NO.: 6367.6368.6369.6370.6371.6412.6413.6414.6415.6416	



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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Grid Connection Drawing Notes

1. Grid connection cabling works along the public road corridor carried out under under Road Opening Licence
2. Location of grid connection cable is 'as constructed'
3. All public/private services and utilities to be accommodated during grid connection cabling works

Drawing Legend

- Planning Application Boundary
- - - Cable Trench to Grid Connection
- Joint Bay
- Watercourse/Drain Crossings

DRAWING TITLE:

**Site Layout Plan
Sheet 13 of 22**

PROJECT TITLE:

Cleanrath Wind Farm, Co. Cork

DRAWING BY:	CHECKED BY:
Joseph o Brien	Owen Cahill
PROJECT NO:	DRAWING NO:
191223a	191223a - 16
SCALE:	DATE:
1:2,500 @ A3	13.08.2020
01 SHEET NO:	
6367.6368.6369.6370.6371.6412.6413.6415.6416	

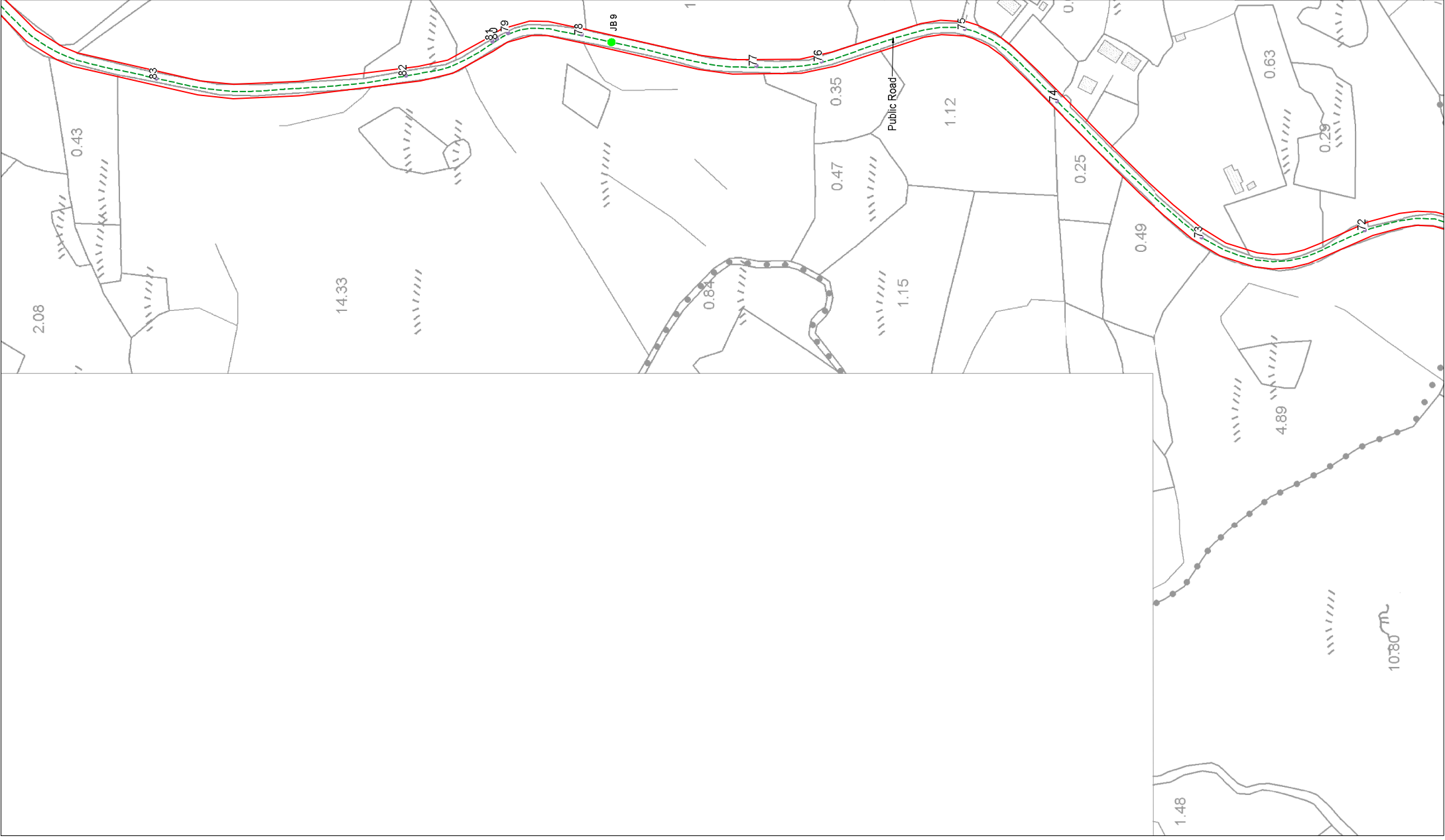
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6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing.
7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Grid Connection Drawing Notes

1. Grid connection cabling works along the public road corridor carried out under Road Opening Licence.
2. Location of grid connection cable is 'as constructed' during grid connection cabling works.

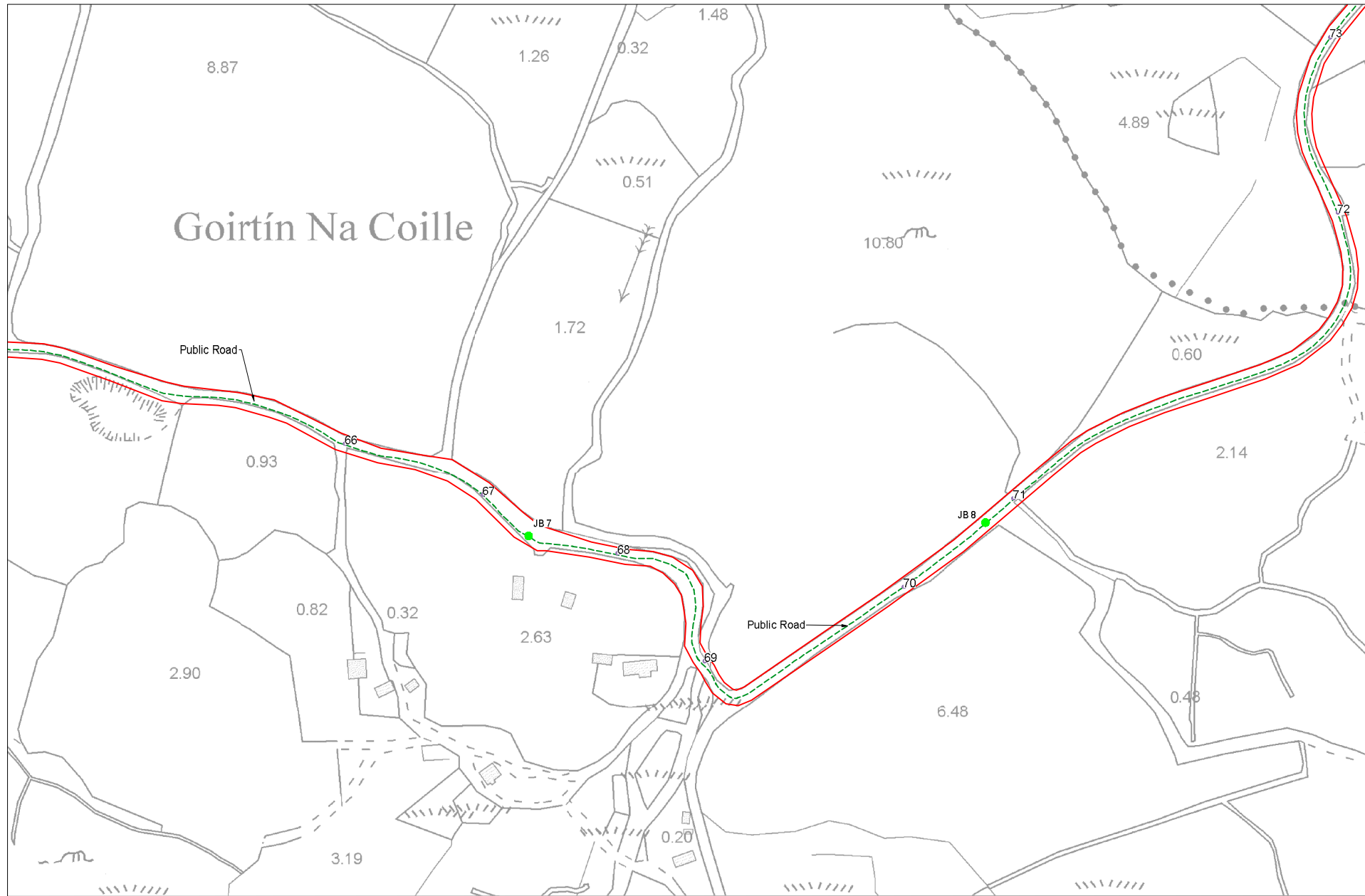


Drawing Legend

- Planning Application Boundary
- - - Cable Trench to Grid Connection
- Joint Bay
- Watercourse/Drain Crossings



DRAWING TITLE Site Layout Plan Sheet 14 of 22	
PROJECT TITLE Cleanrath Wind Farm, Co. Cork	
DRAWN BY Joseph o'Brien	CHECKED BY Owen Cahill
PROJECT 191223a	DRAWING 191223a - 17
SCALE 1:2,500 @ A3	DATE 13.08.2020
SHEET NO. 6387-6388-6389-6390-6391-6412-6413-6414-6415-6416	
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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Grid Connection Drawing Notes

1. Grid connection cabling works along the public road corridor carried out under Road Opening Licence
2. Location of grid connection cable is 'as constructed'
3. All public/private services and utilities to be accommodated during grid connection cabling works.

Drawing Legend

- Planning Application Boundary
- - - Cable Trench to Grid Connection
- Joint Bay
- Watercourse/Drain Crossings

DRAWING TITLE:
Site Layout Plan
Sheet 15 of 22

PROJECT TITLE:
Cleanrath Wind Farm, Co. Cork

DRAWING BY: Joseph o'Brien
CHECKED BY: Owen Cahill

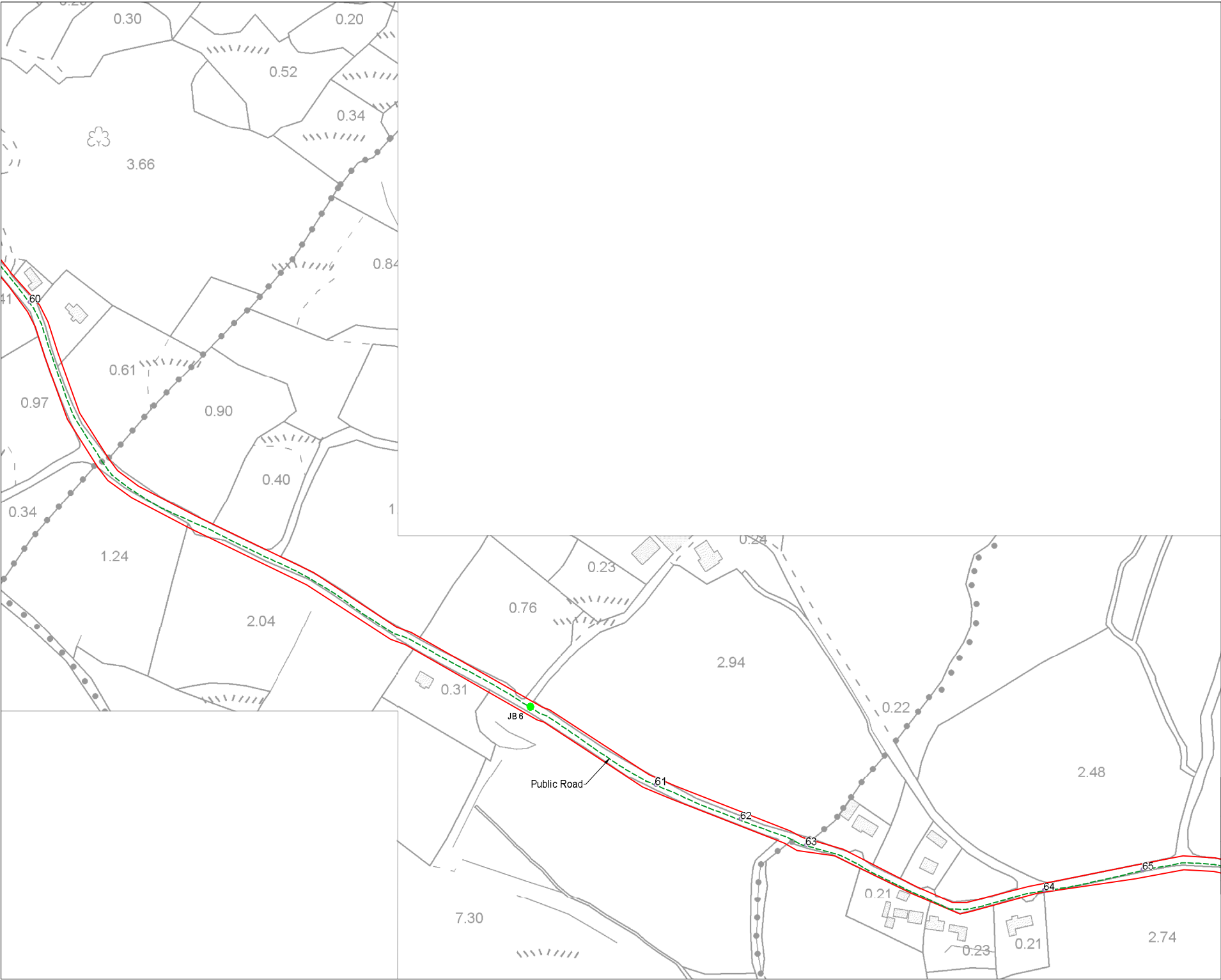
PROJECT NO: 191223a
DRAWING NO: 191223a - 18

SCALE: 1:2,500 @ A3
DATE: 13.08.2020

01 SHEET NO: 6367.6368.6369.6370.6371.6412.6413.6414.6415.6416



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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Grid Connection Drawing Notes

1. Grid connection cabling works along the public road corridor carried out under Road Opening Licence
2. Location of grid connection cable is 'as constructed'
3. All public/private services and utilities to be accommodated during grid connection cabling works.


Drawing Legend

- Planning Application Boundary
- - - Cable Trench to Grid Connection
- Joint Bay
- Watercourse/Drain Crossings

DRAWING TITLE:
Site Layout Plan
Sheet 16 of 22

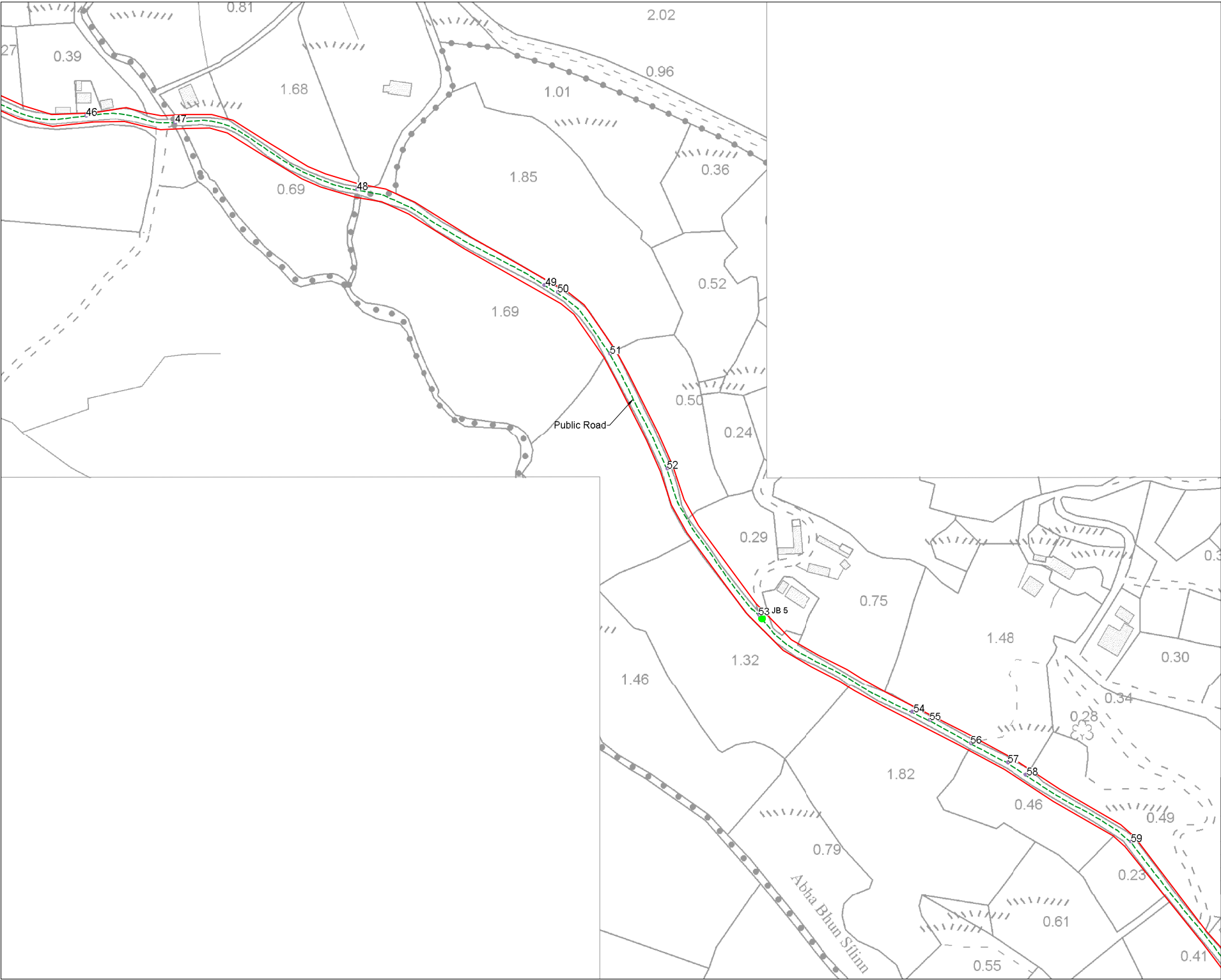
PROJECT TITLE:
Cleanrath Wind Farm, Co. Cork

DRAWING BY: Joseph o'Brien	CHECKED BY: Owen Cahill
PROJECT NO.: 191223a	DRAWING NO.: 191223a - 19
SCALE: 1:2,500 @ A3	DATE: 13.08.2020
01 SHEET NO.: 6367.6368.6369.6370.6371.6412.6413.6413.6415.6416	



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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Grid Connection Drawing Notes

1. Grid connection cabling works along the public road corridor carried out under Road Opening Licence
2. Location of grid connection cable is 'as constructed'
3. All public/private services and utilities to be accommodated during grid connection cabling works.

Drawing Legend

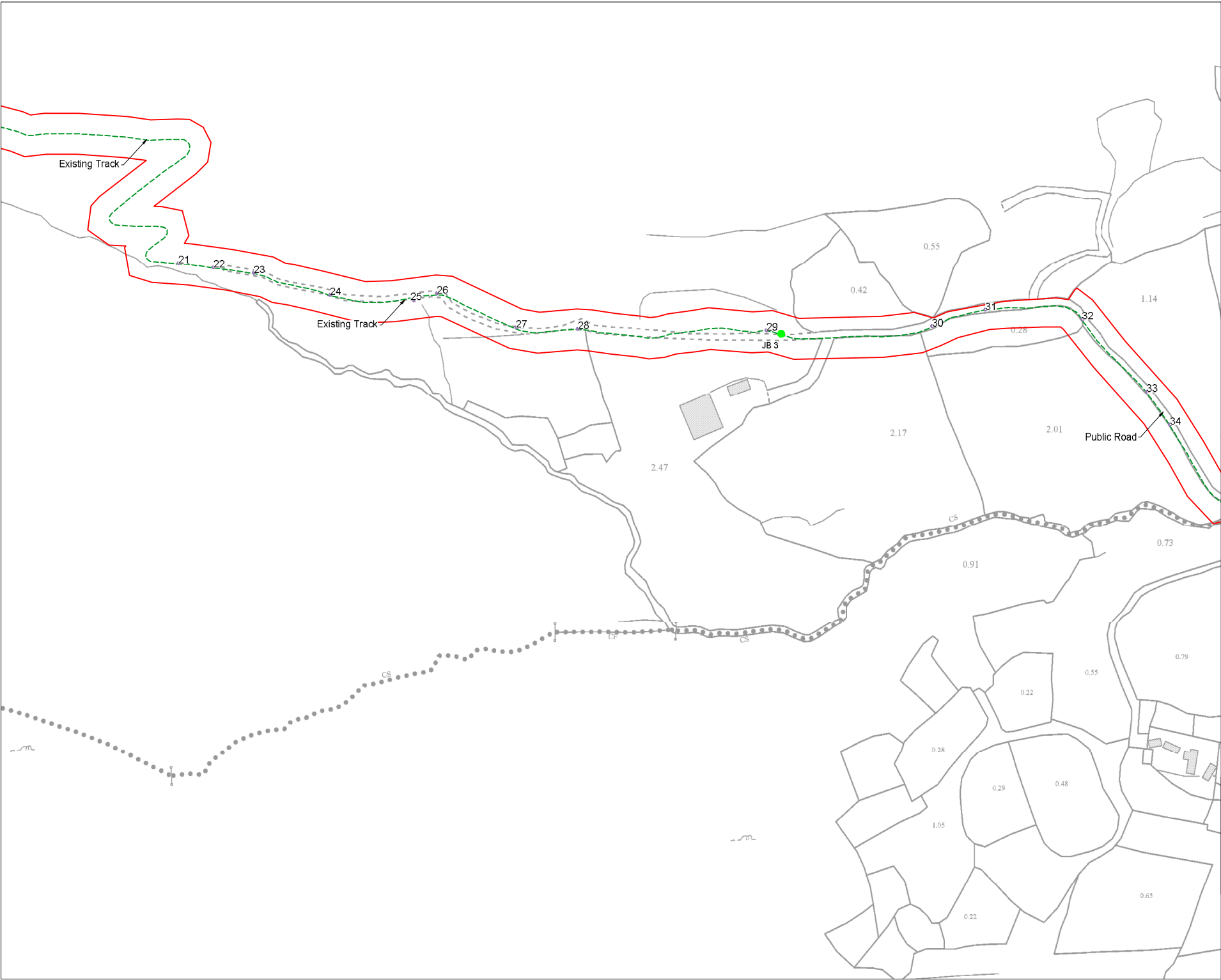
- Planning Application Boundary
- - - Cable Trench to Grid Connection
- Joint Bay
- Watercourse/Drain Crossings

DRAWING TITLE:
Site Layout Plan
Sheet 17 of 22

PROJECT TITLE:
Cleanrath Wind Farm, Co. Cork

DRAWING BY: Joseph o Brien	CHECKED BY: Owen Cahill
PROJECT NO.: 191223a	DRAWING NO.: 191223a - 20
SCALE: 1:2,500 @ A3	DATE: 13.08.2020
01 SHEET NO.: 6367.6368.6369.6370.6371.6412.6413.6414.6415.6416	

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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Grid Connection Drawing Notes

1. Grid connection cabling works along the public road corridor carried out under Road Opening Licence
2. Location of grid connection cable is 'to be constructed'
3. All public/private services and utilities to be accommodated during grid connection cabling works.

Drawing Legend

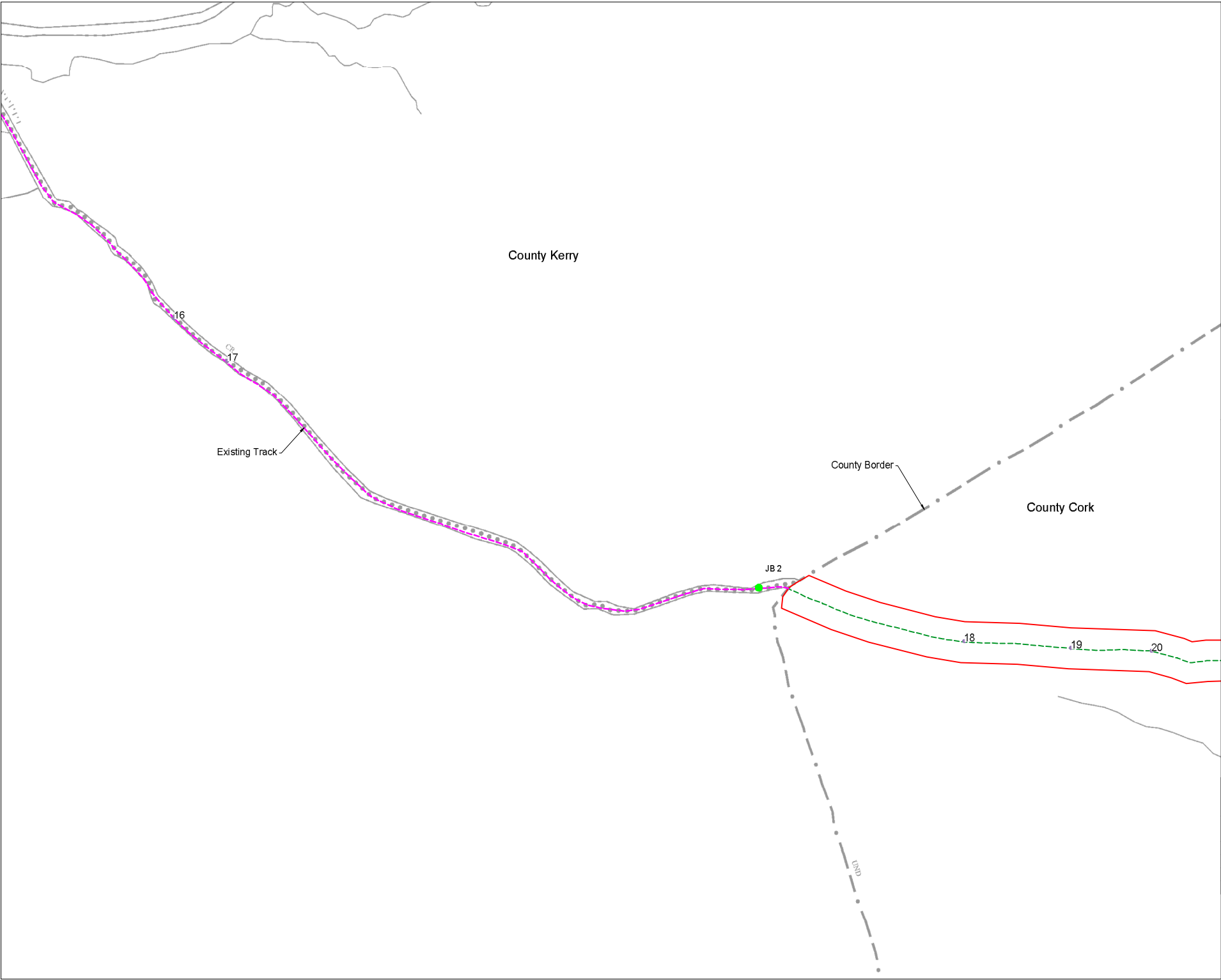
- Planning Application Boundary
- - - Cable Trench to Grid Connection
- Joint Bay
- Watercourse/Drain Crossings

DRAWING TITLE:
**Site Layout Plan
Sheet 19 of 22**

PROJECT TITLE:
Cleanrath Wind Farm, Co. Cork

DRAWING BY: Joseph o'Brien	CHECKED BY: Owen Cahill
PROJECT NO: 191223a	DRAWING NO: 191223a - 22
SCALE: 1:2,500 @ A3	DATE: 13.08.2020
01 SHEET NO: 6367.6368.6369.6370.6371.6412.6413.6414.6415.6416	

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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Grid Connection Drawing Notes

1. Grid connection cabling works along the public road corridor carried out under Road Opening Licence
2. Location of grid connection cable is 'as constructed'
3. All public/private services and utilities to be accommodated during grid connection cabling works.


Drawing Legend

- Planning Application Boundary
- - - Cable Trench to Grid Connection
- - - Cable Route within Co. Kerry
- Joint Bay
- Watercourse/Drain Crossings

DRAWING TITLE:
**Site Layout Plan
Sheet 20 of 22**

PROJECT TITLE:
Cleanrath Wind Farm, Co. Cork

DRAWING BY: Joseph o'Brien	CHECKED BY: Owen Cahill
PROJECT NO.: 191223a	DRAWING NO.: 191223a - 23
SCALE: 1:2,500 @ A3	DATE: 13.08.2020
01 SHEET NO.: 6367.6368.6369.6370.6371.6412.6413.6414.6415.6416	



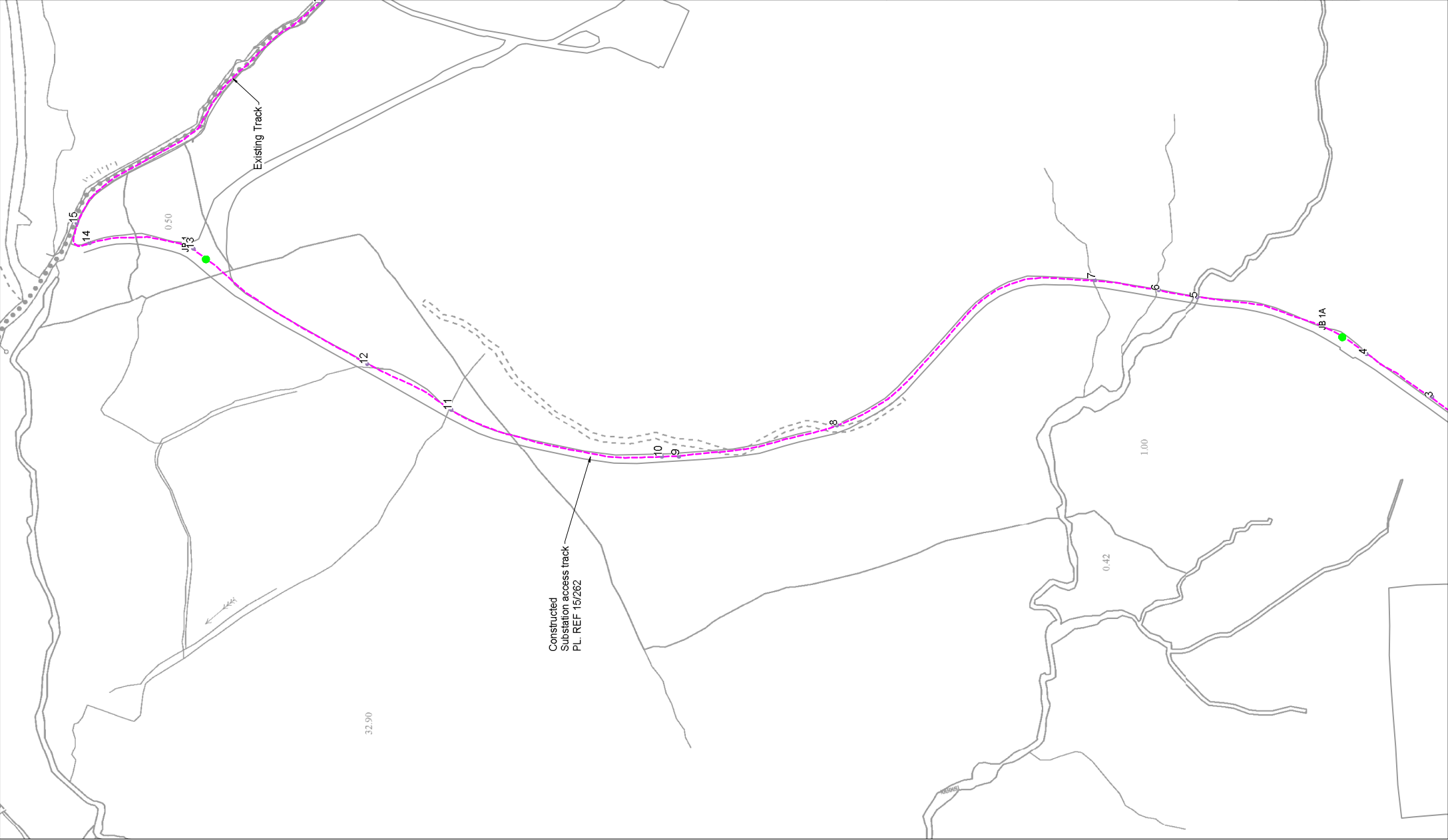
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6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing.
7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Grid Connection Drawing Notes

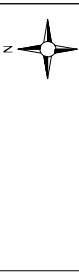
1. Grid connection cabling works along the public road corridor carried out under Road Opening Licence
2. Location of grid connection cable is 'as constructed'
3. All works shall be carried out in accordance with the relevant standards and specifications to be accommodated during grid connection cabling works.



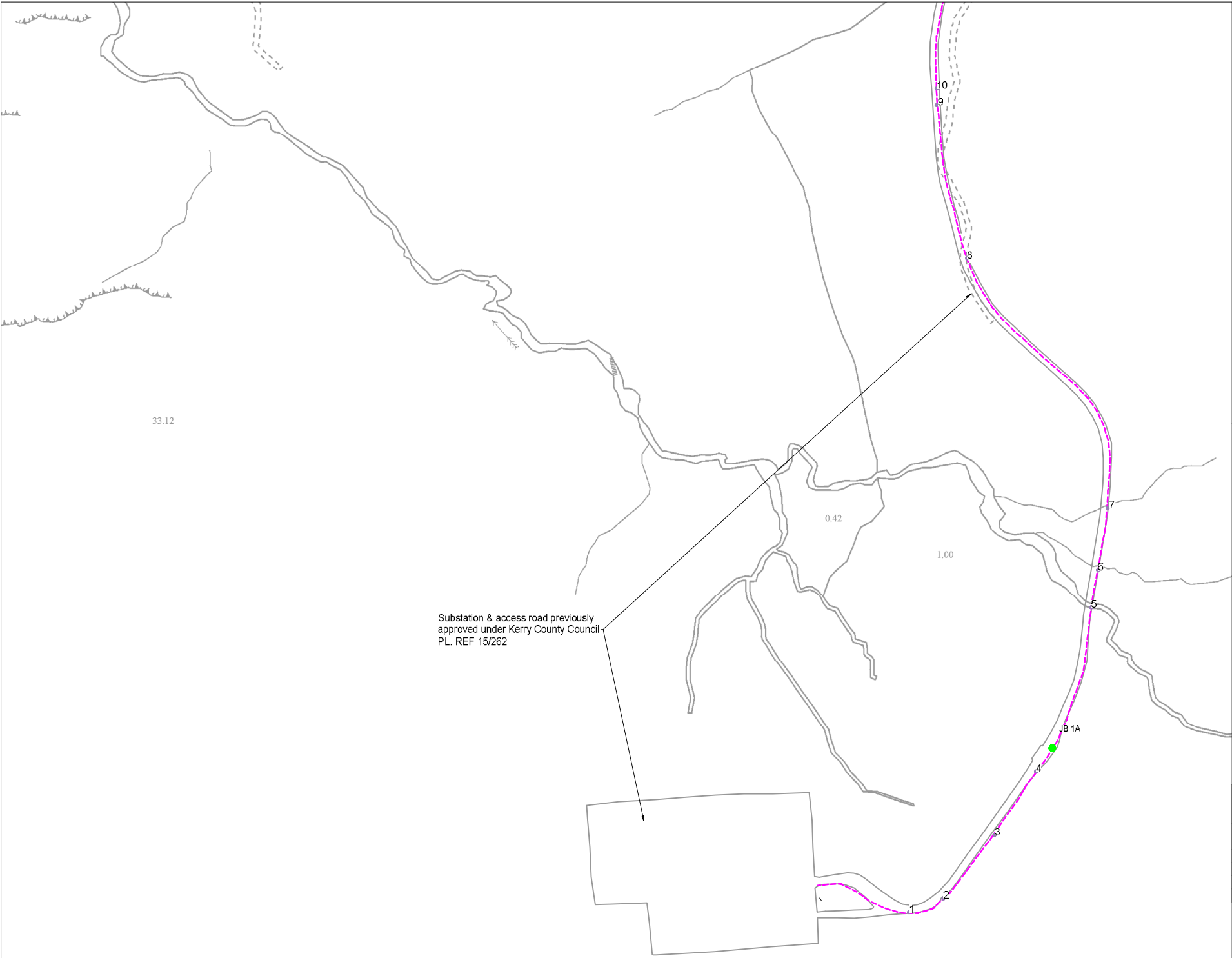
Drawing Legend

- Cable Route within Co. Kerry
- Joint Bay
- Watercourse/Drain Crossings

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DRAWING TITLE Site Layout Plan Sheet 21 of 22	
PROJECT TITLE Cleanrath Wind Farm, Co. Cork	
DRAWN BY Joseph o'Brien	CHECKED BY Owen Cahill
PROJECT 191223a	DATE 191223a - 24
SCALE 1:2,500 @ A3	DATE 13.08.2020
JOB SHEET N° 6387-6386-6385-6370-6371-6412-6413-6414-6415-6416	
MKO Planning and Environmental Team Road Survey Ireland, 1991, 1994 1995, 1996, 1997, 1998, 1999, 2000, 2001, 2002, 2003, 2004, 2005, 2006, 2007, 2008, 2009, 2010, 2011, 2012, 2013, 2014, 2015, 2016, 2017, 2018, 2019, 2020, 2021, 2022, 2023, 2024 Website: www.mkoland.ie	



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7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Grid Connection Drawing Notes

1. Grid connection cabling works along the public road corridor carried out under Road Opening Licence
2. Location of grid connection cable is 'as constructed'
3. All public/private services and utilities to be accommodated during grid connection cabling works.

Drawing Legend

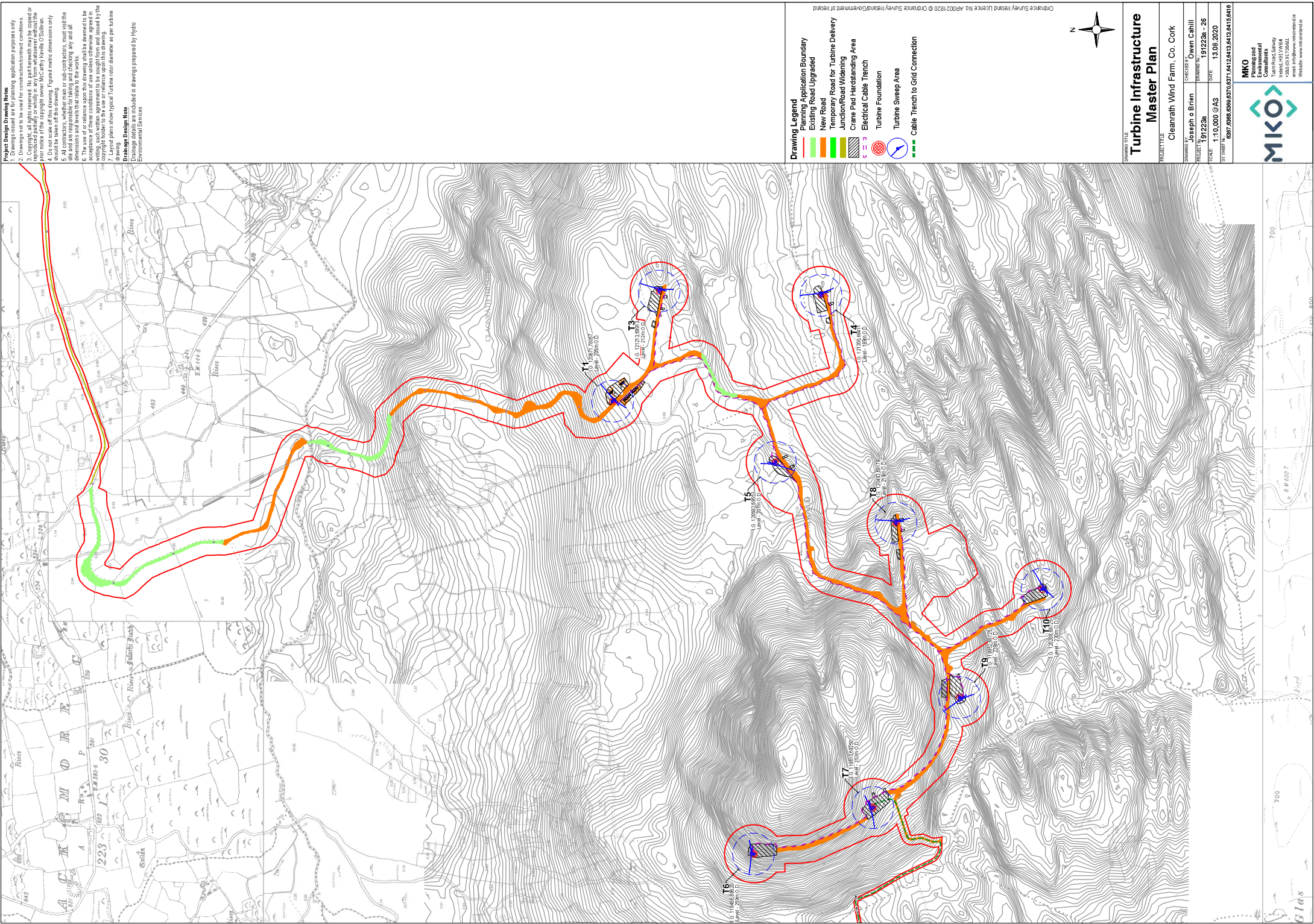
- Cable Route within Co. Kerry as permitted under KCC Pl. Ref. 15/1164
- Joint Bay
- Watercourse/Drain Crossings

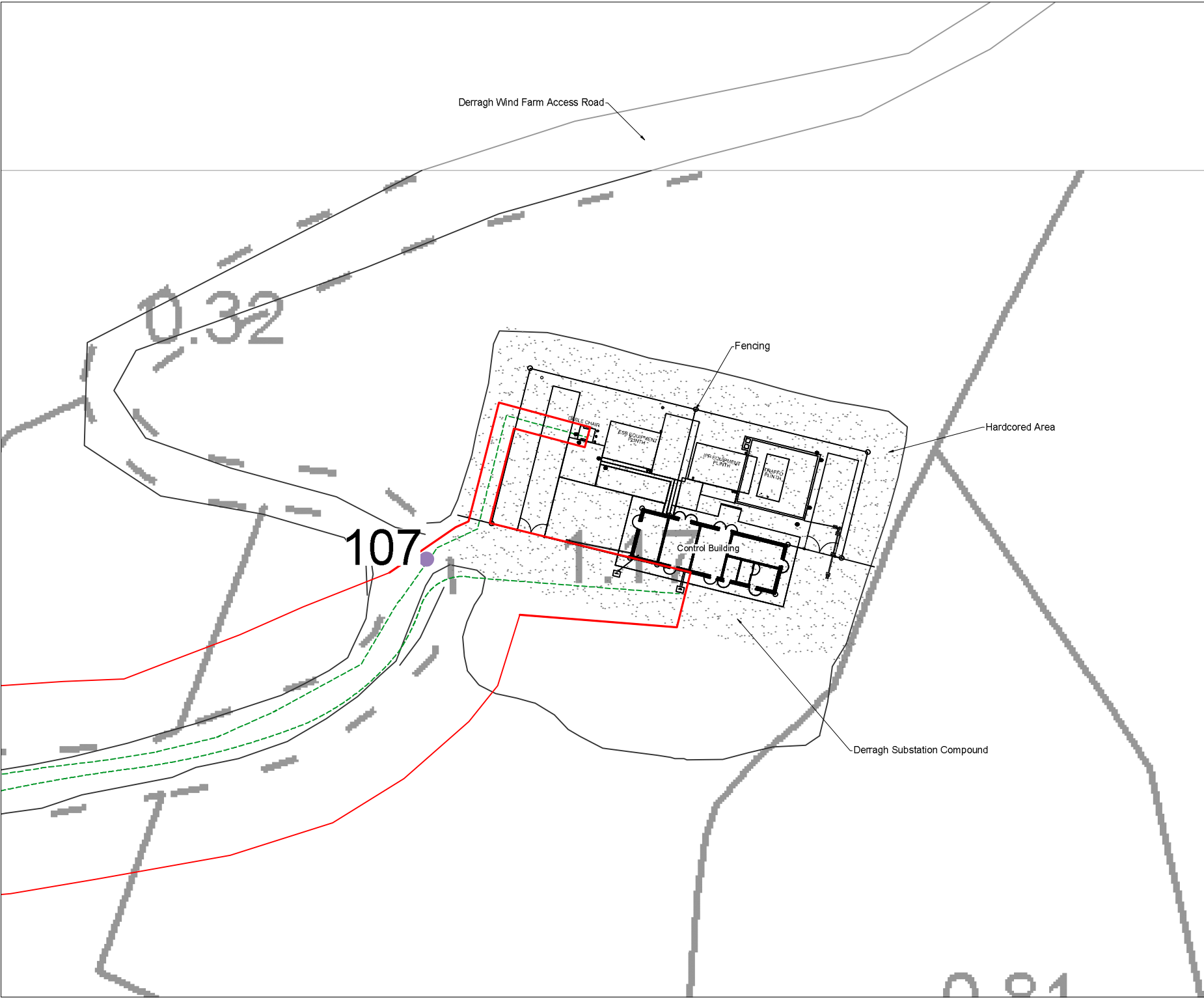
DRAWING TITLE:
**Site Layout Plan
Sheet 22 of 22**

PROJECT TITLE:
Cleanrath Wind Farm, Co. Cork

DRAWING BY: Joseph o Brien	CHECKED BY: Owen Cahill
PROJECT NO: 191223a	DRAWING NO: 191223a - 25
SCALE: 1:2,500 @ A3	DATE: 13.08.2020
01 SHEET NO: 6367.6366.6369.6370.6371.6412.6413.6413.6415.6416	

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Planning and
Environmental
Consultants
Tann Road, Galway
Ireland, H91 VW84
+353 (0) 91 7355611
email: info@www.mkofireland.ie
Website: www.mkofireland.ie





Project Design Drawing Notes

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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 user or reliance upon this drawing.
7. Layout plans show typical Turbine rotor diameter as per turbine drawing.

Grid Connection Drawing Notes

1. Grid connection cabling works along the public road corridor carried out under Road Opening Licence
2. Location of grid connection cable is 'as constructed'
3. All public/private services and utilities to be accommodated during grid connection cabling works.

Drawing Legend

- Planning Application Boundary
- - - Cable Trench to Grid Connection
- Watercourse/Drain Crossings

Drawing Title

Substation Layout Plan

Project Title

Cleanrath Wind Farm, Co. Cork

Drawing By	Checked By
Joseph o Brien	Owen Cahill
Project No.	Drawing No.
191223a	191223a - 28
Scale:	Date:
1:500 @ A3	13.08.2020
01 Sheet No.	
6367.6368.6369.6370.6371.6412.6413.6414.6415.6416	

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Planning and Environmental Consultants

Turn Road, Galway

Ireland, H91 VW84

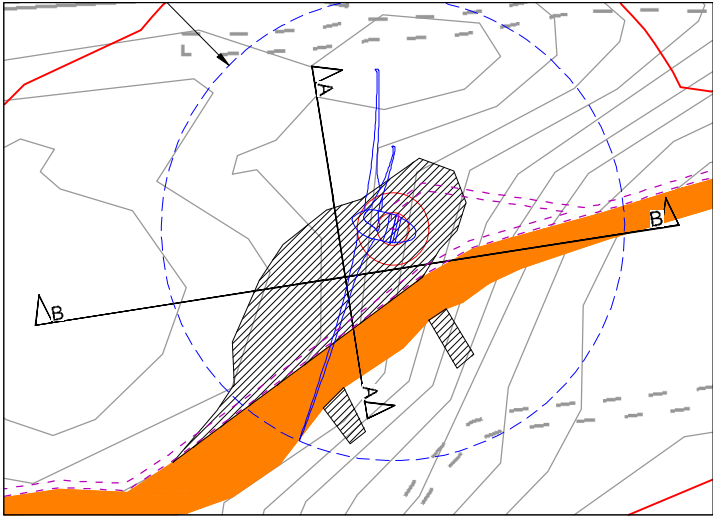
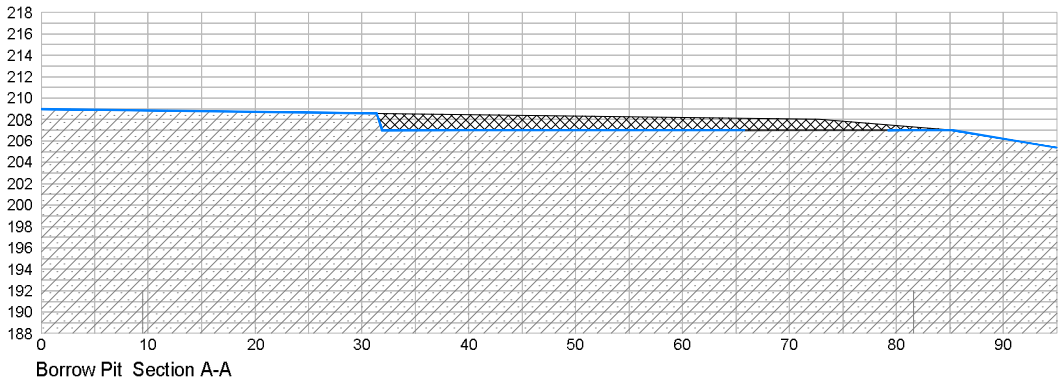
+353 (0) 91 735611

email: info@www.mkoireland.ie

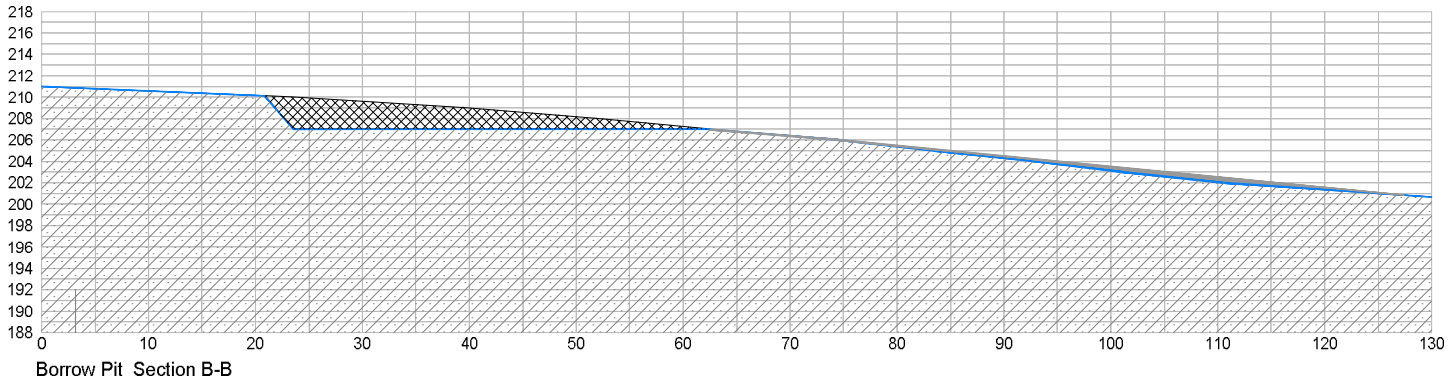
Website: www.mkoireland.ie

Drawing Legend

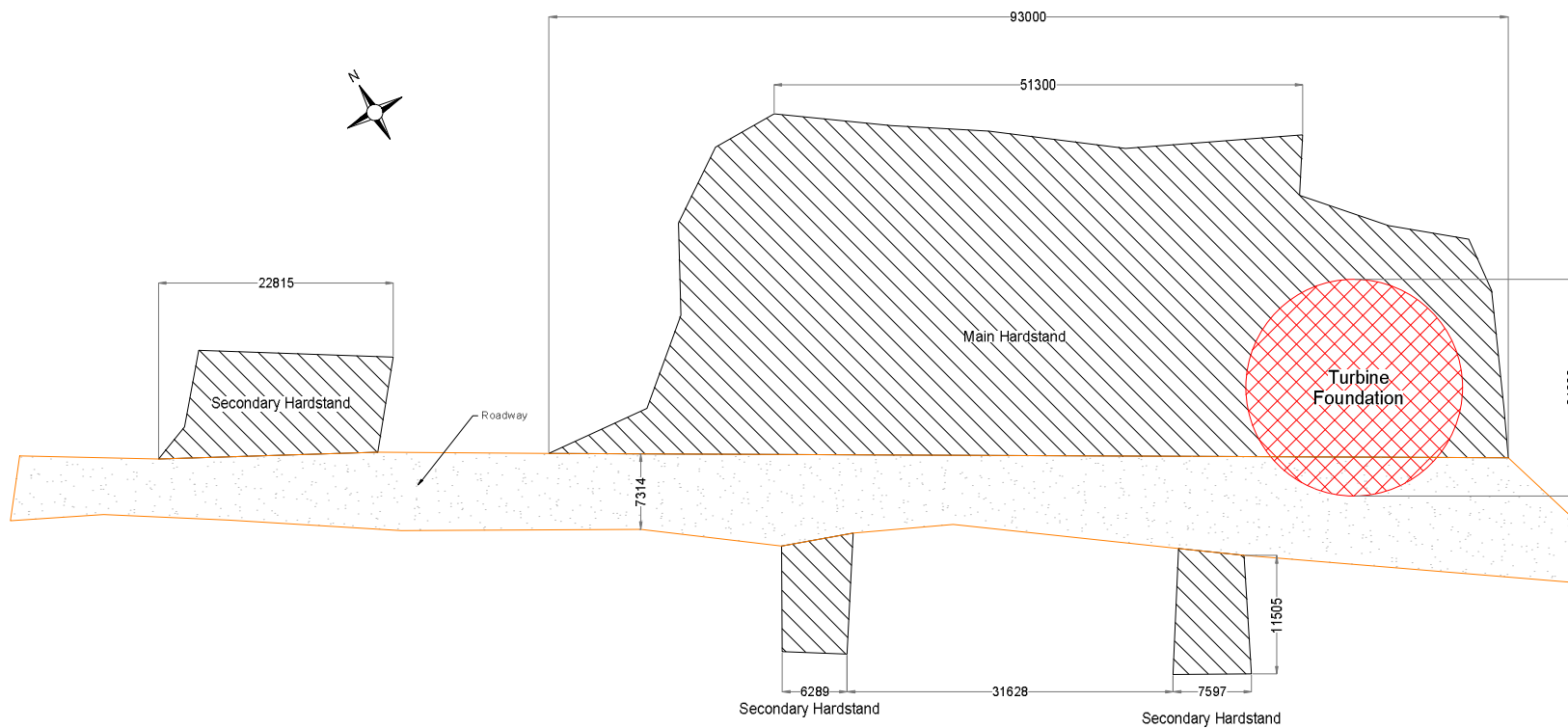
- Bedrock
- Excavated Area
- Roads
- Existing ground



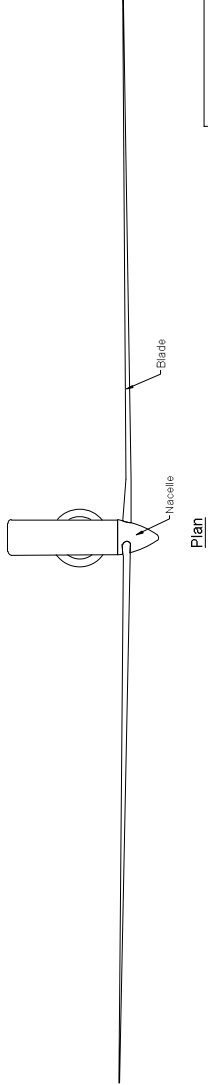
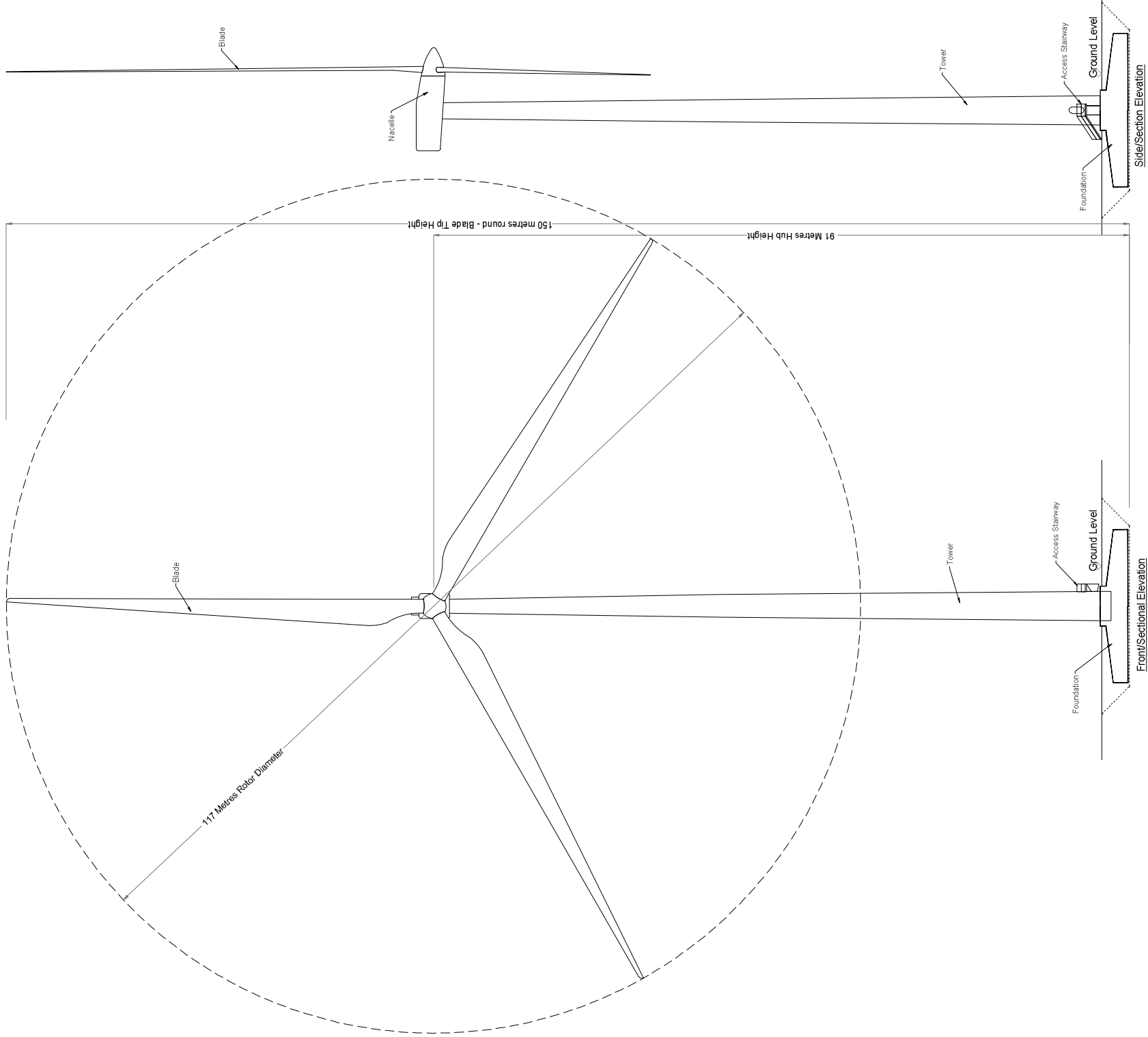
Borrow Pits No. 1 Scale 1:1,500



DRAWING TITLE: Borrow Pit Layouts & Sections	
PROJECT TITLE: Cleanrath Wind Farm, Co. Cork	
DRAWING BY: Joseph o Brien	CHECKED BY: Owen Cahill
PROJECT NO: 191223a	DRAWING NO: 191223a - 29
SCALE: 1:500 @ A3	DATE: 13.08.2020
01 SHEET NO: 6367.6368.6369.6370.6371.6412.6413.6415.6416	
 MKO Planning and Environmental Consultants Tann Road, Galway Ireland, H91 VV94 +353 (0) 91 735611 email: info@www.mkofireland.ie Website: www.mkofireland.ie	

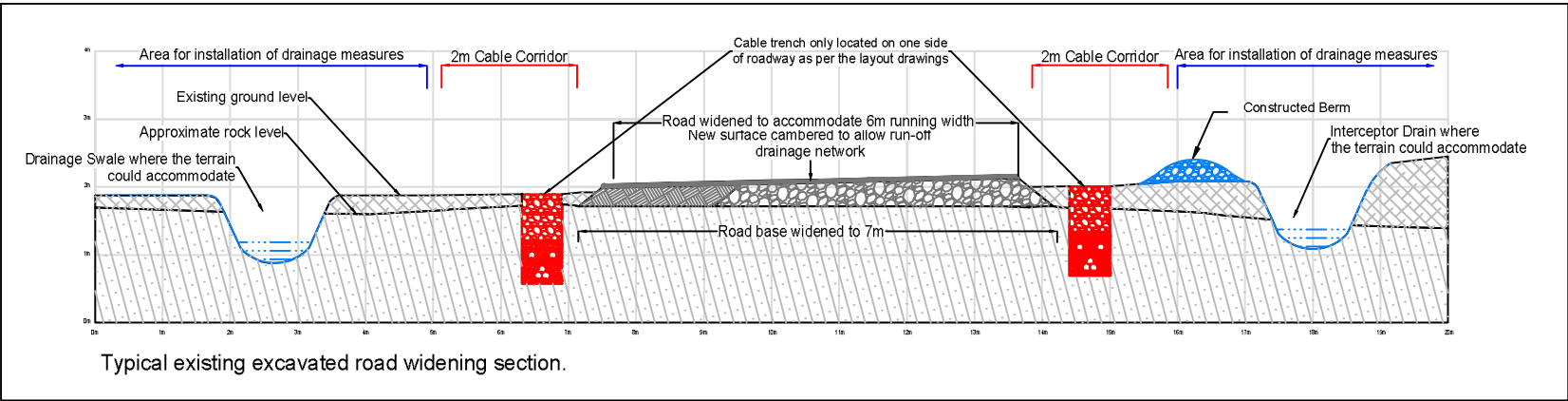
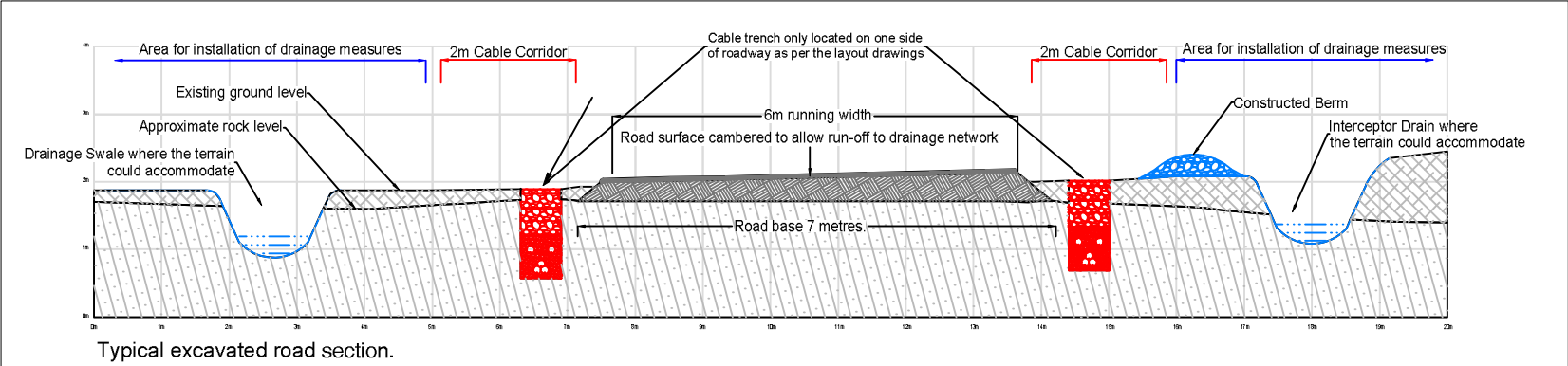



DRAWING TITLE	
Turbine Hardstand Layout Standard Detail Based on Turbine 3	
PROJECT TITLE	
Cleanrath Wind Farm, Co. Cork	
DRAWING BY	CHECKED BY
Joseph O'Brien	Eoin McCarthy
PROJECT No.	DRAWING No.
191223a	191223a - 30
SCALE	DATE
1:500 @ A3	13.08.2020



DRAWING TITLE		PROJECT FILE		CHECKED BY		DRAWING NO.	
Nordex N117		Cleanrath Wind Farm, Co. Cork		Joseph O'Brien		Eoin McCarthy	
Elevation & Plan				191223a		191223a - 31	
				SCALE		DATE	
				1:500 @A3		13.08.2020	

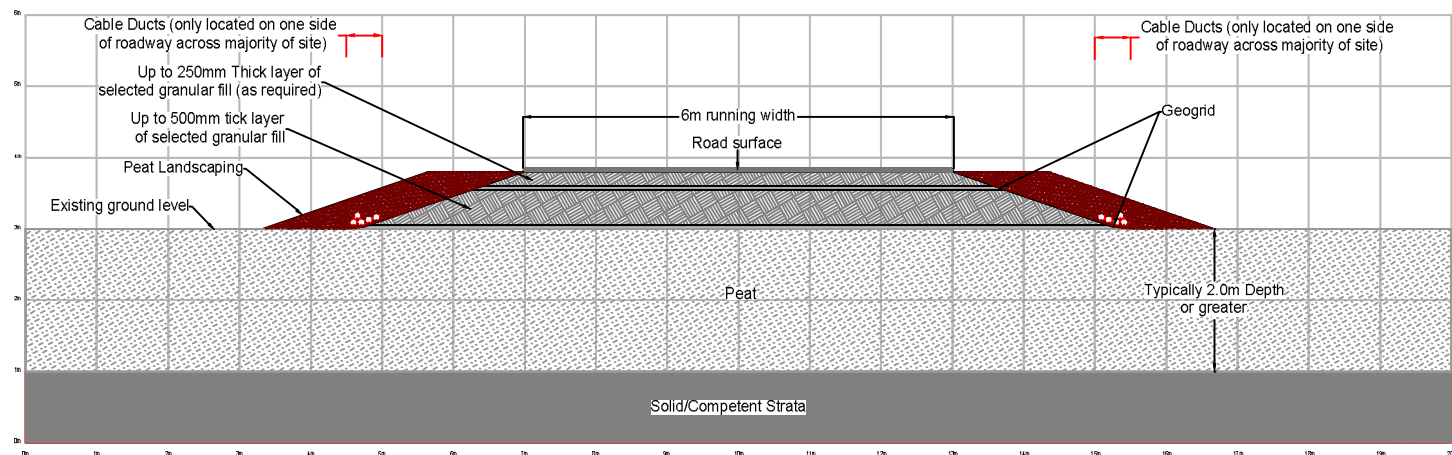
- Drawing Notes**
1. Widening occurred on either side of existing roads dependent on site conditions.
 2. Depths of road fill varied dependent on site conditions.



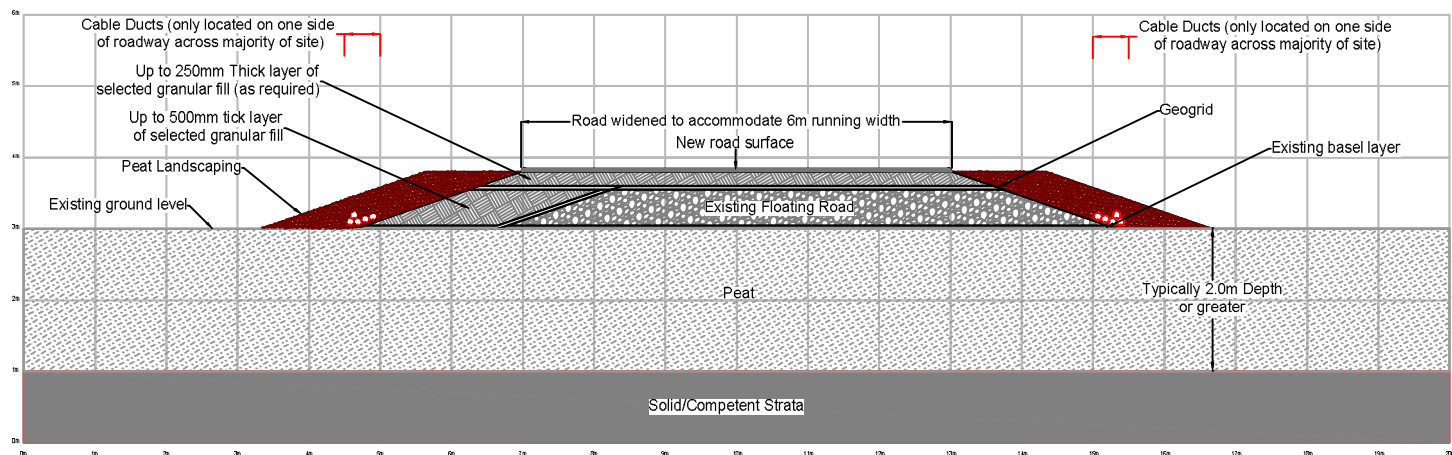
DRAWING TITLE	
Typical Excavated Road Sections	
PROJECT TITLE	
Cleanrath Wind Farm, Co. Cork	
DRAWING BY	CHECKED BY
Joseph O'Brien	Owen Cahill
PROJECT NO.	DRAWING NO.
191223a	191223a - 32
SCALE	DATE
1:75 @A3	13.08.2020
 MKO Planning and Environmental Consultants Tuam Road Galway Ireland, H91 VV84 +353 (0) 91 735611 email: info@www.mkofireland.ie Website: www.mkofireland.ie	

Drawing Notes

1. Widening occurred on either side of existing roads dependent on site conditions
2. Depths of road fill varied dependent on site conditions

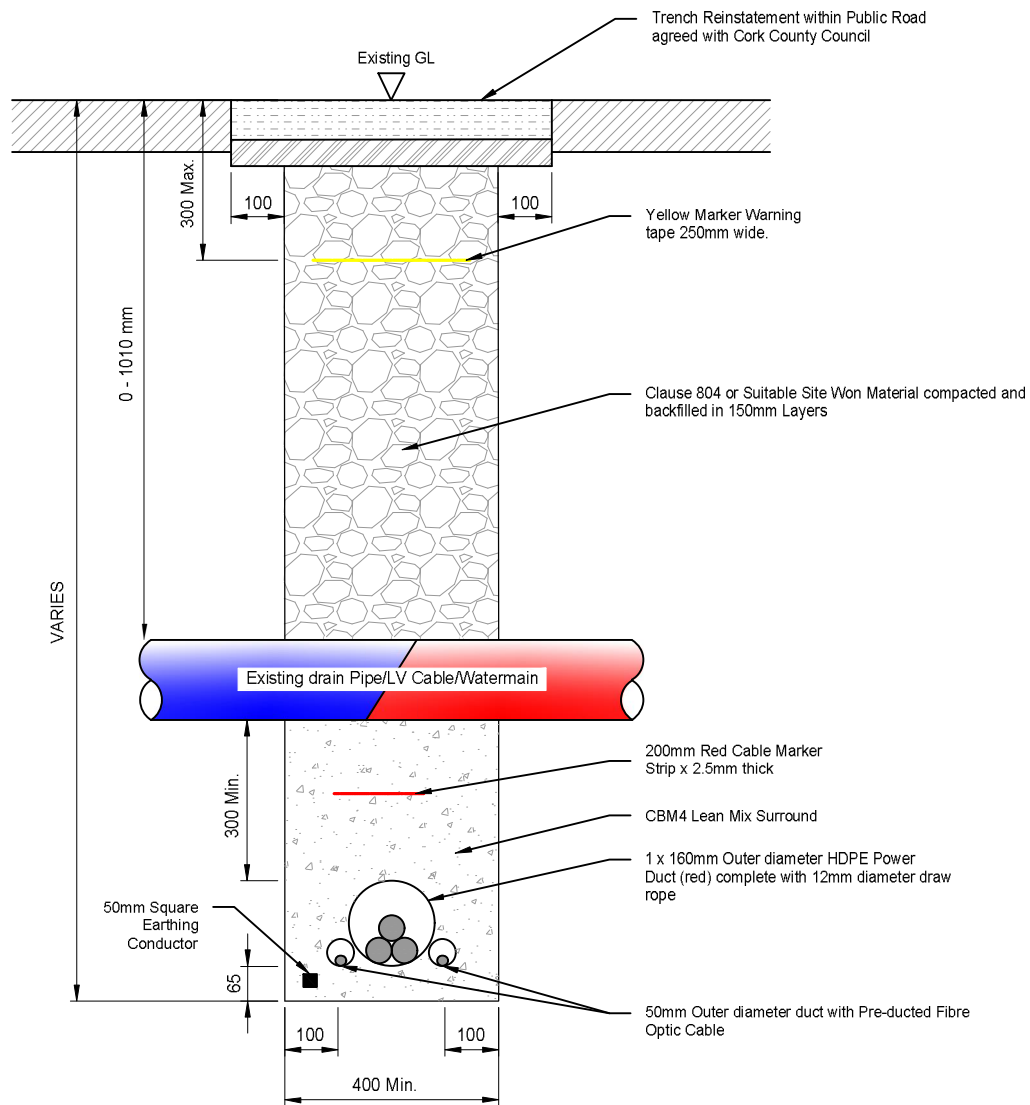


Typical floating road section.

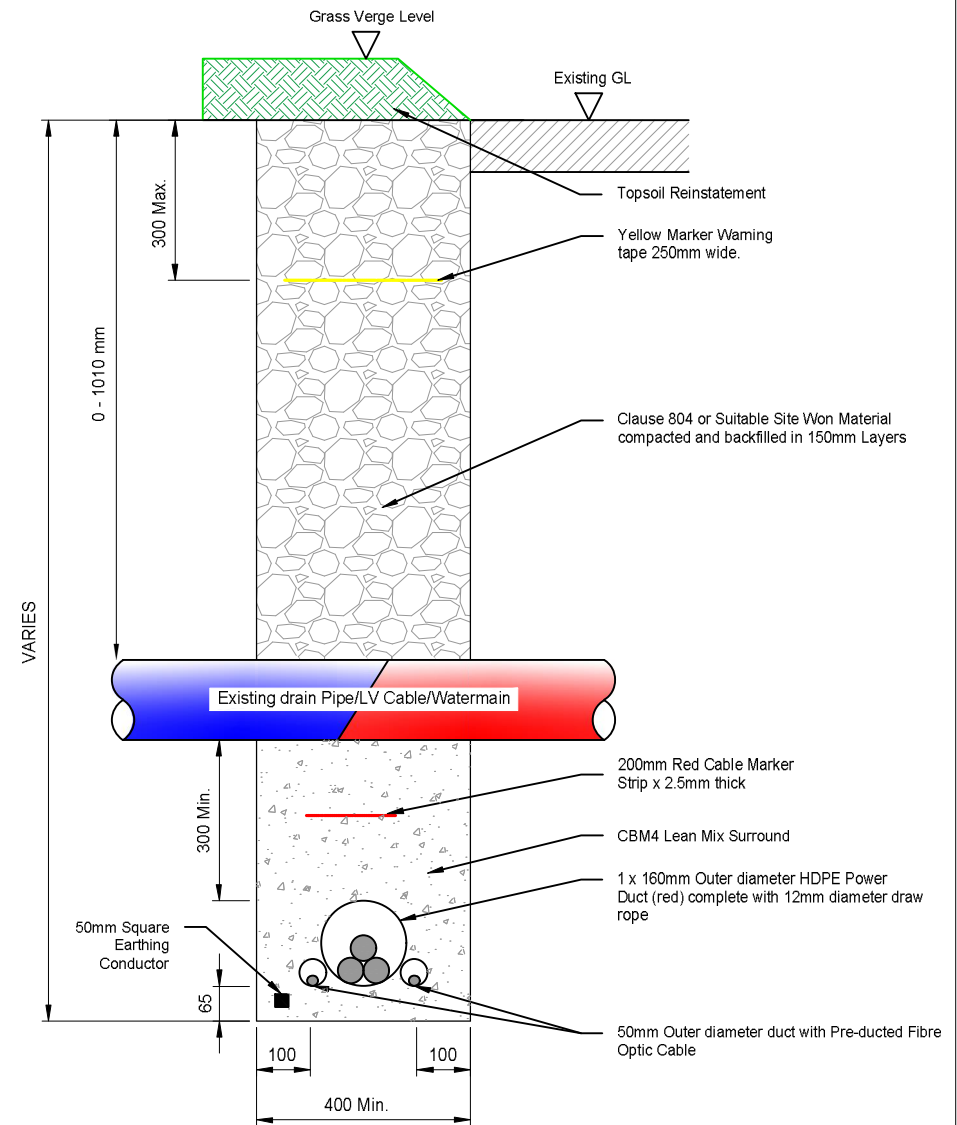


Typical floating road widening section.

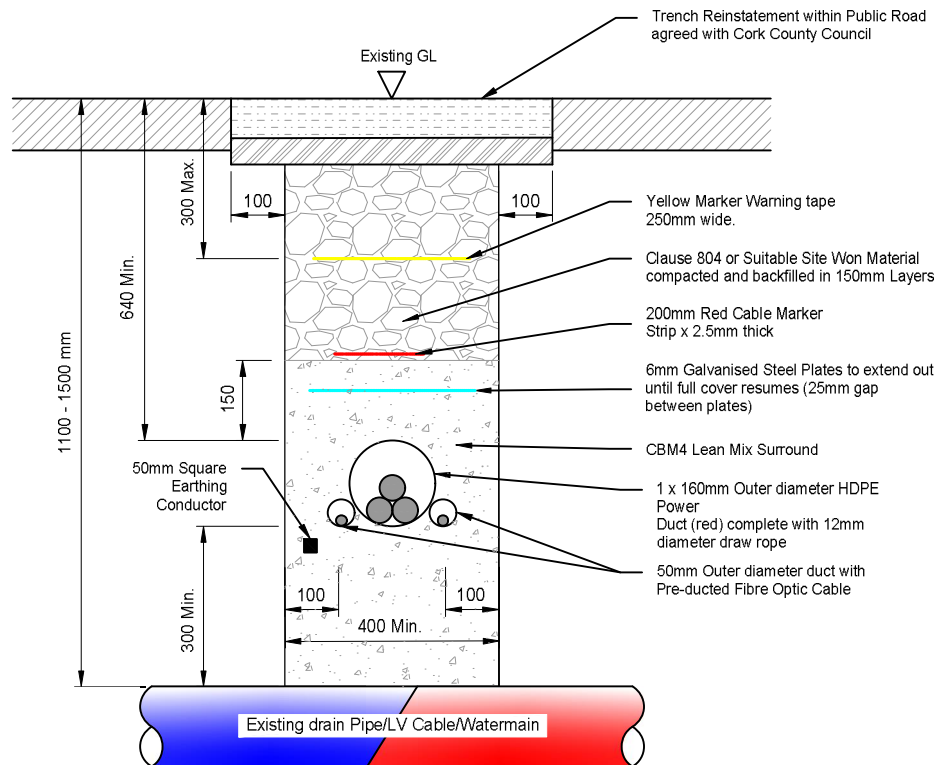
DRAWING TITLE			
Typical Floating Road Sections			
PROJECT TITLE			
Cleanrath Wind Farm, Co. Cork			
DRAWN BY		CHECKED BY	
Joseph O'Brien		Owen Cahill	
PROJECT NO.		DRAWING NO.	
191223a		191223a - 33	
SCALE		DATE	
1:75 @A3		13.08.2020	
		MKO	
		Planning and Environmental Consultants	
		Tulla Road, Galway	
		Ireland, H91 VV84	
		+353 (0) 91 735611	
		email: info@www.mkofireland.ie	
		Website: www.mkofireland.ie	



Typical 33kV Cable Trench Crossing Under Existing Services In Public Road Detail Scale 1:10

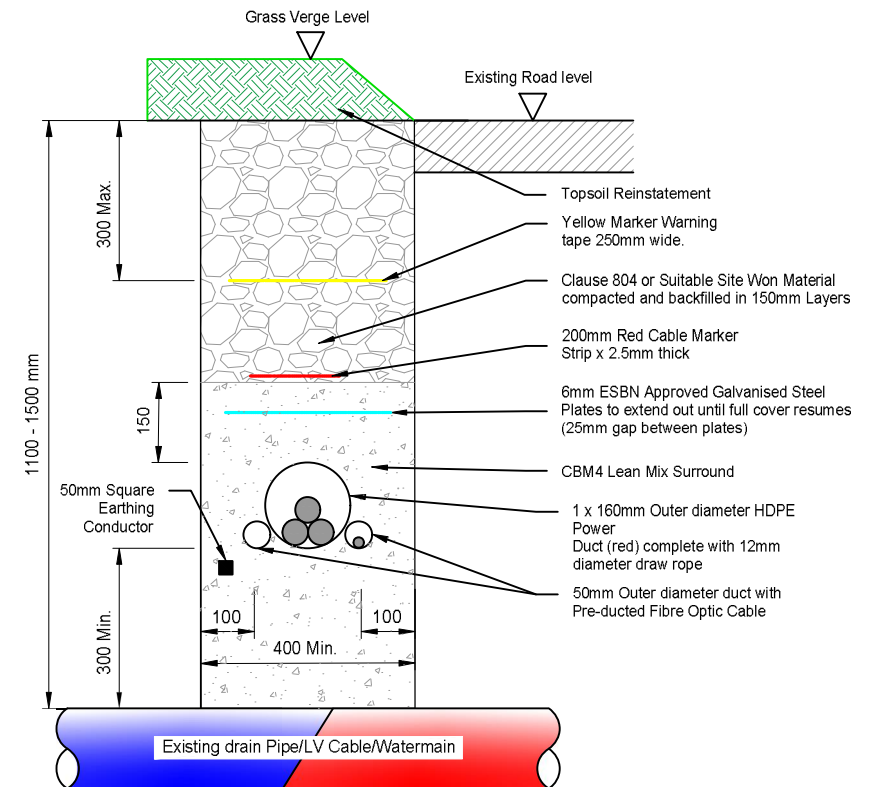


Typical 33kV Cable Trench Crossing Under Existing Services In Public Road Verge Detail Scale 1:10



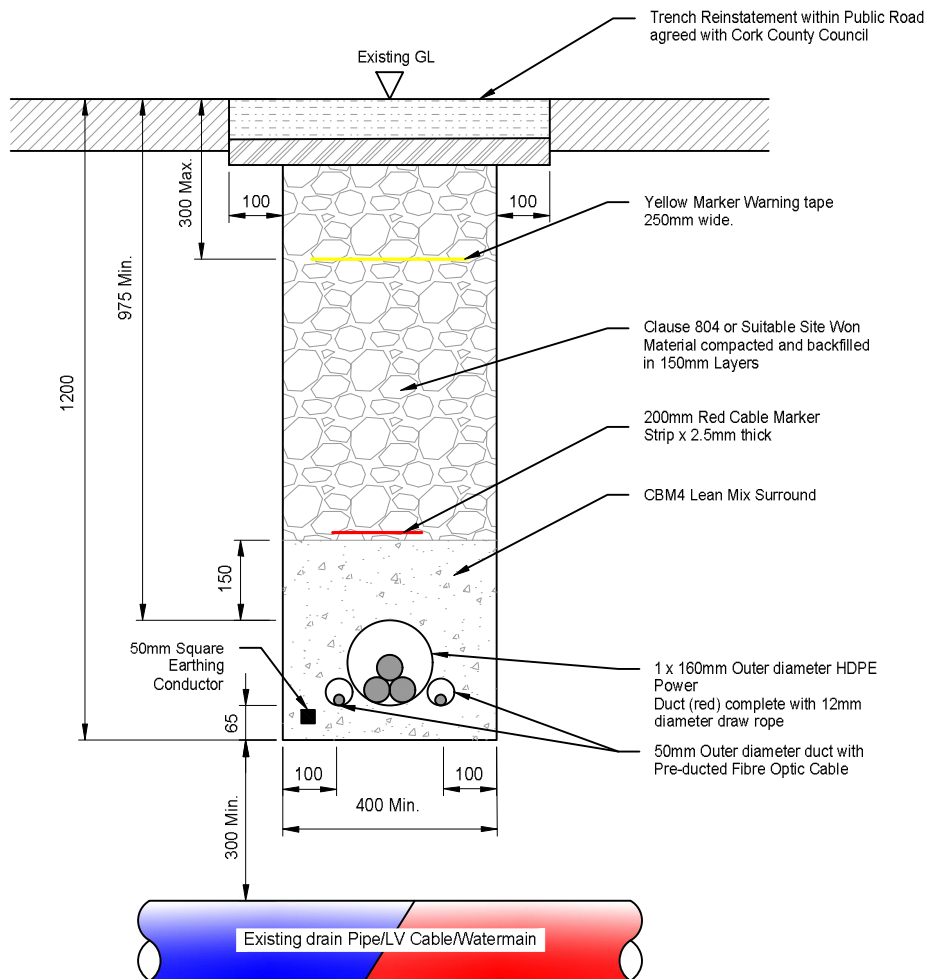
Typical 33kV Cable Trench Crossing Over Existing Services In Public Road Detail Scale 1:10

Scale 1:10



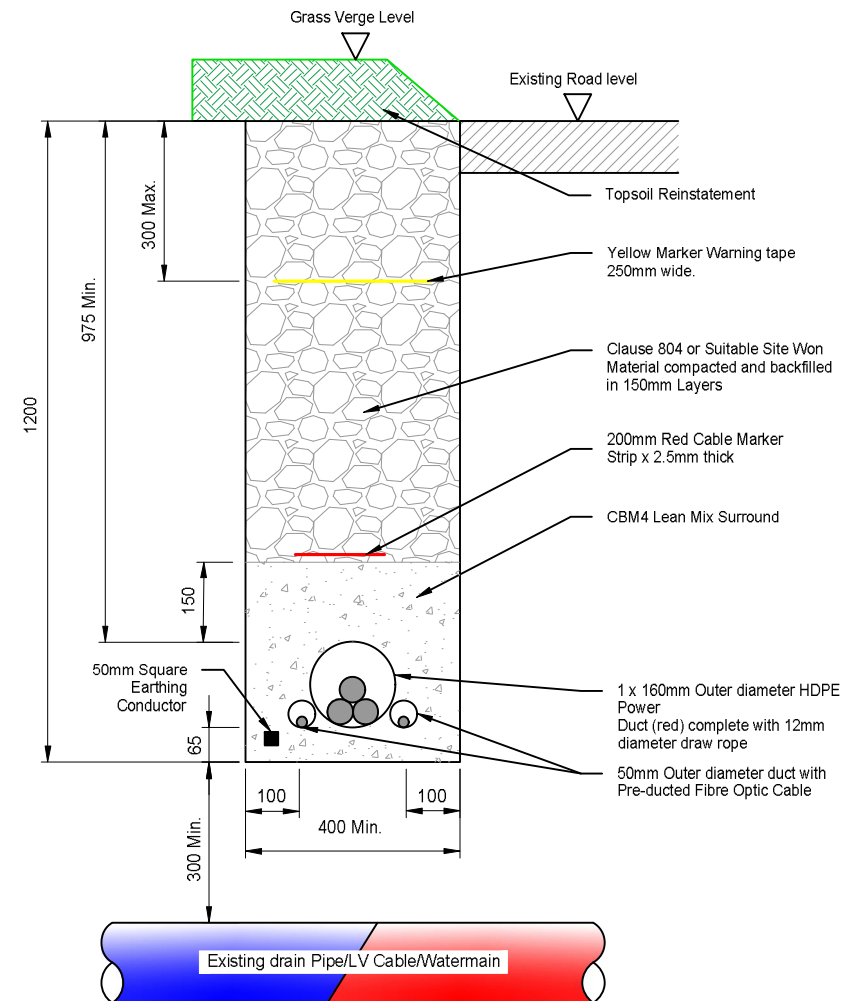
Typical 33kV Cable Trench Crossing Over Existing Services In
Public Road Verge Detail Scale 1:10

Scale 1:10



Typical 33kV Cable Trench Crossing Over Existing Services In Public Road Detail

Scale 1:10

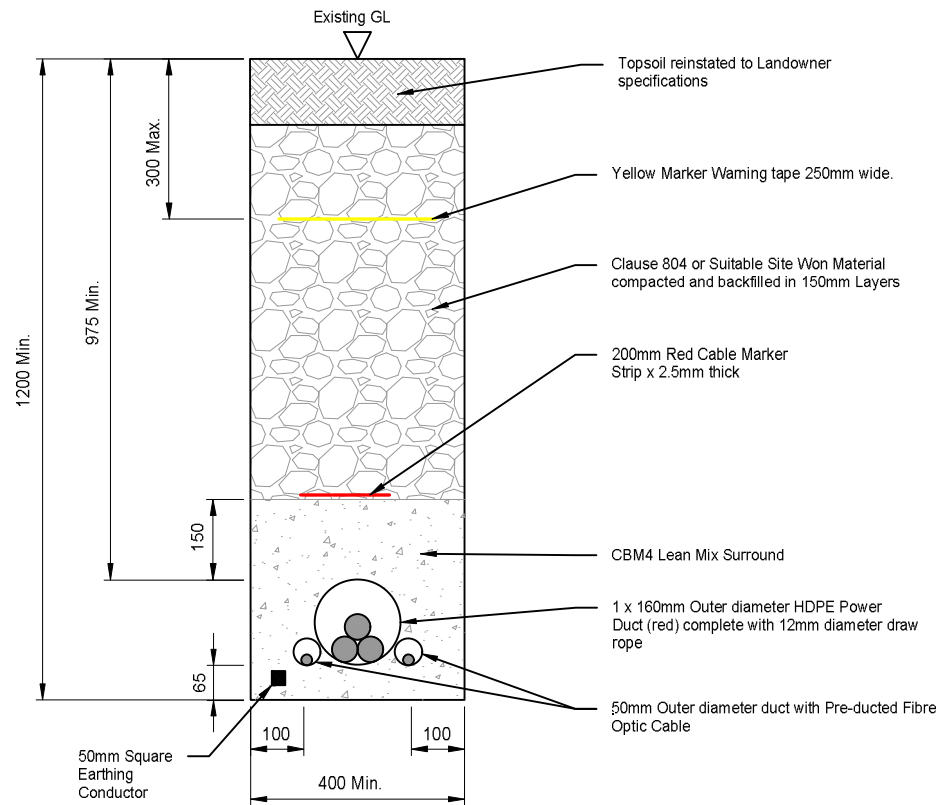


Typical 33kV Cable Trench Crossing Over Existing Services In Public Road Verge Detail

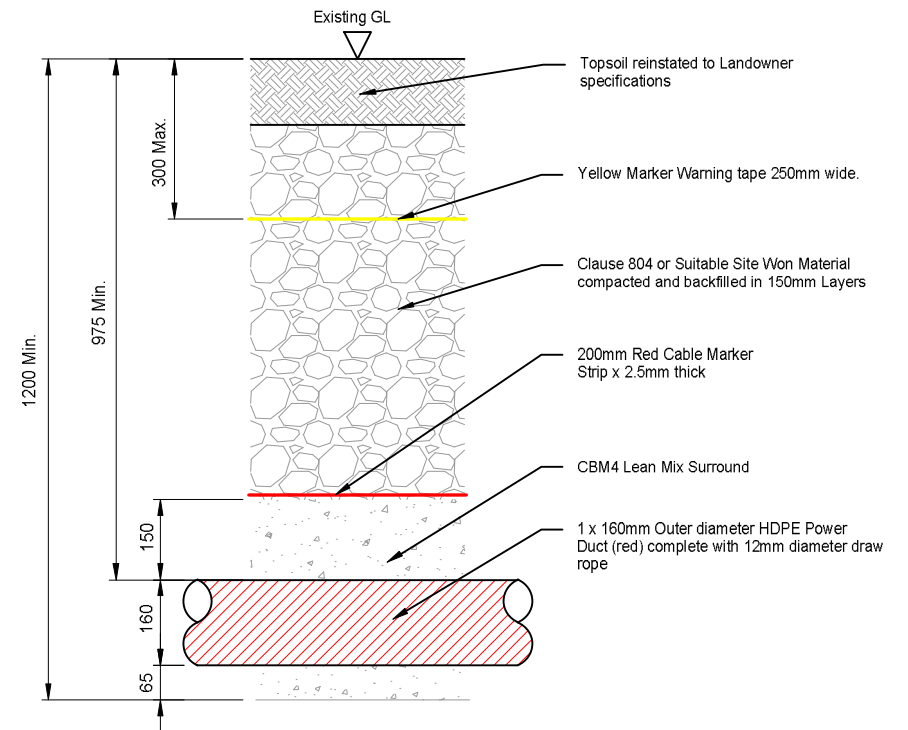
Scale 1:10



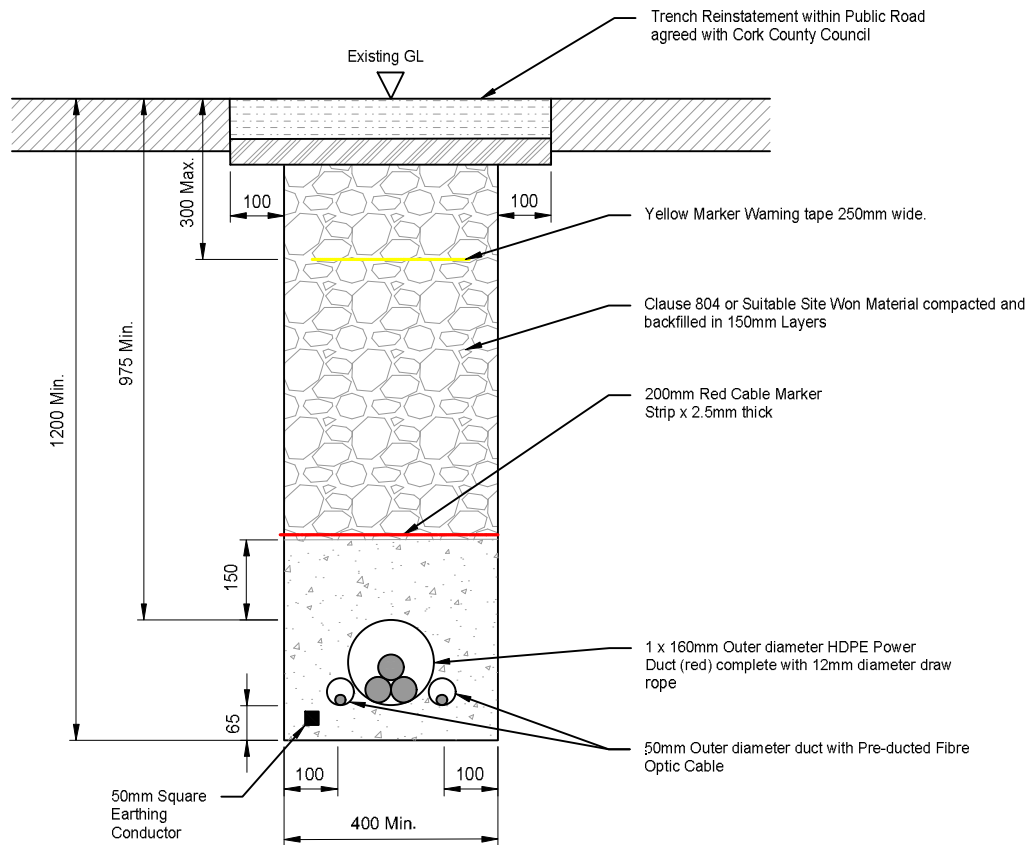
DRAWING TITLE: Typical 33kV Cable Trench Crossing Over Where Standard Separation Depth/Cover is Available		DRAWING No: 191223a - 36	
PROJECT TITLE: Cleanrath Wind Farm, Co. Cork		PROJECT No: 191223a	
DRAWING/MODIFIED BY: Joseph O'Brien	CHECKED BY: Owen Cahill	SCALE: 1:10@A3	DATE: 13.08.2020
MKO Planning & Environmental Consultants Tuum Road, Galway, Ireland, H91 VM64 email: info@mkofireland.ie Tel: +353 91 735611			



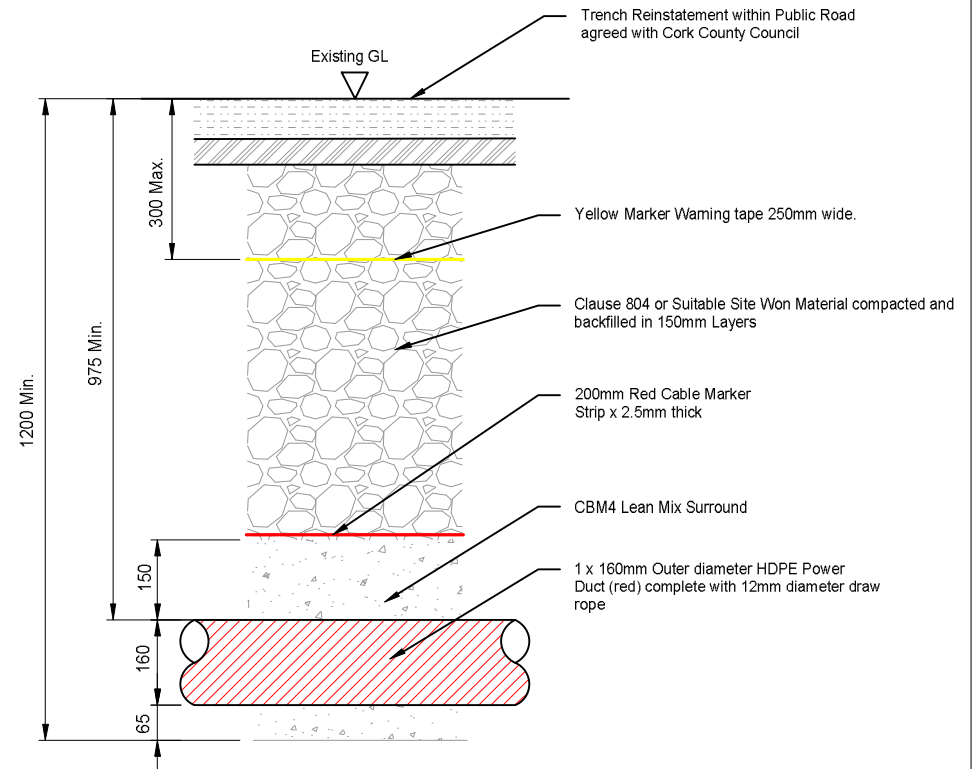
**33kV Cable Trench In Open
Ground End View** Scale 1:10



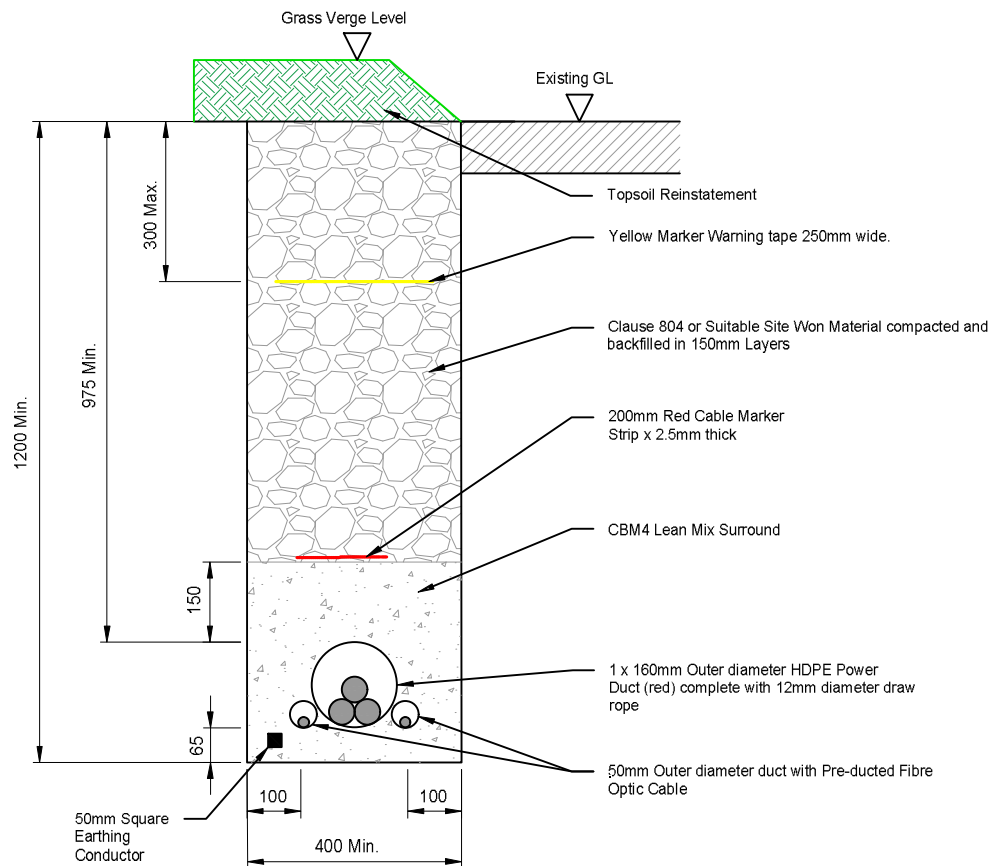
**33kV Cable Trench In Open
Ground Elevation** Scale 1:10



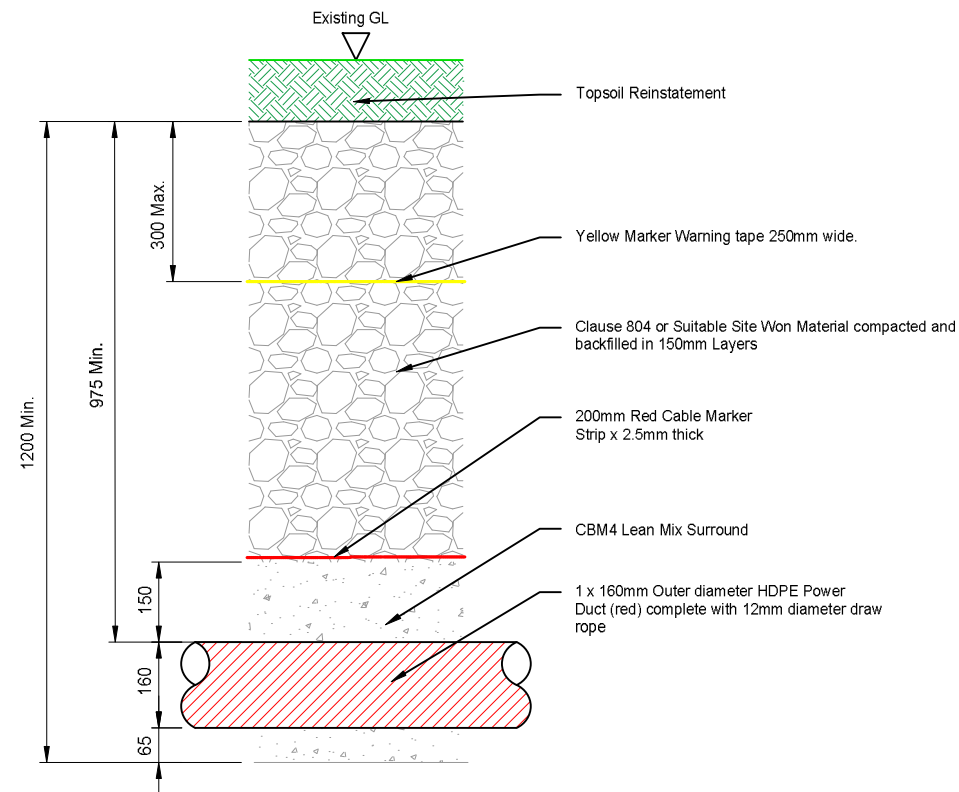
33kV Cable Trench In Public Roadway End View Scale 1:10



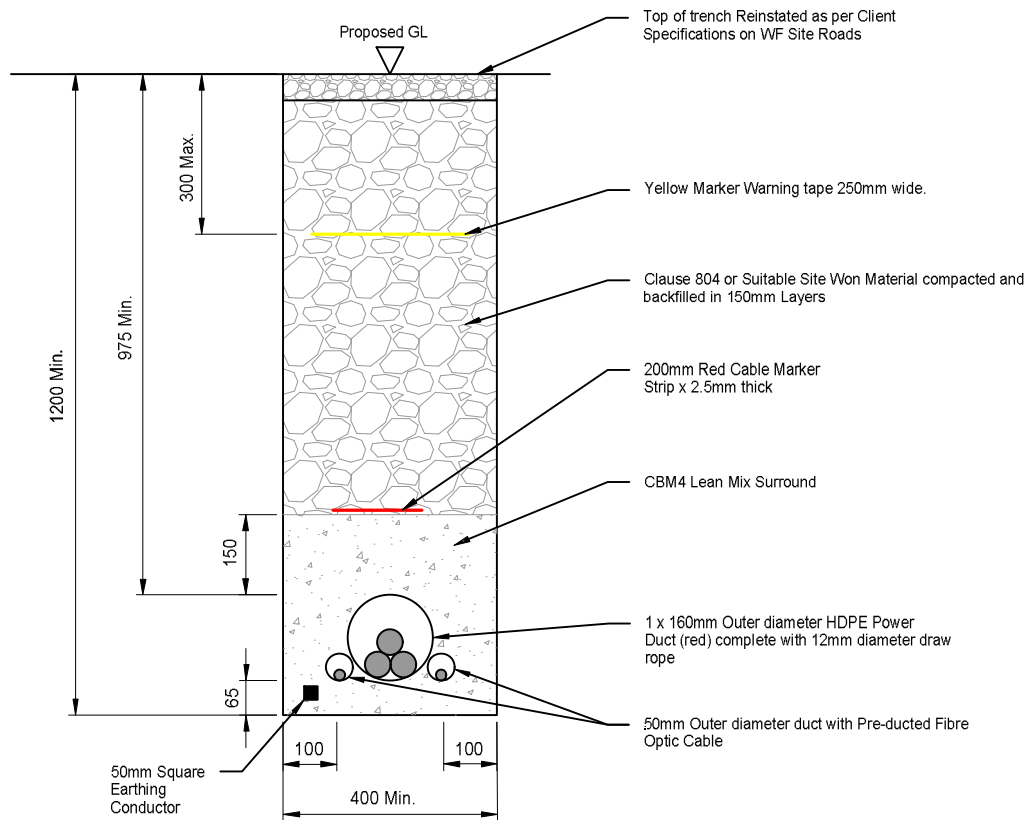
33kV Cable Trench In Public Roadway Elevation Scale 1:10



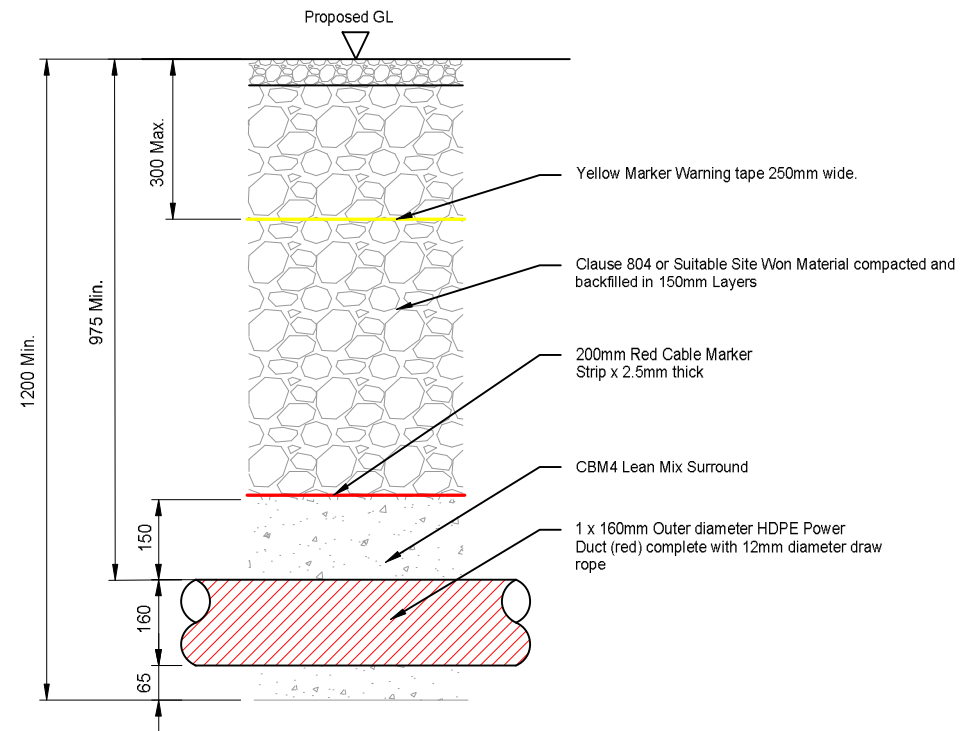
33kV Cable Trench In Road Verge End View Scale 1:10



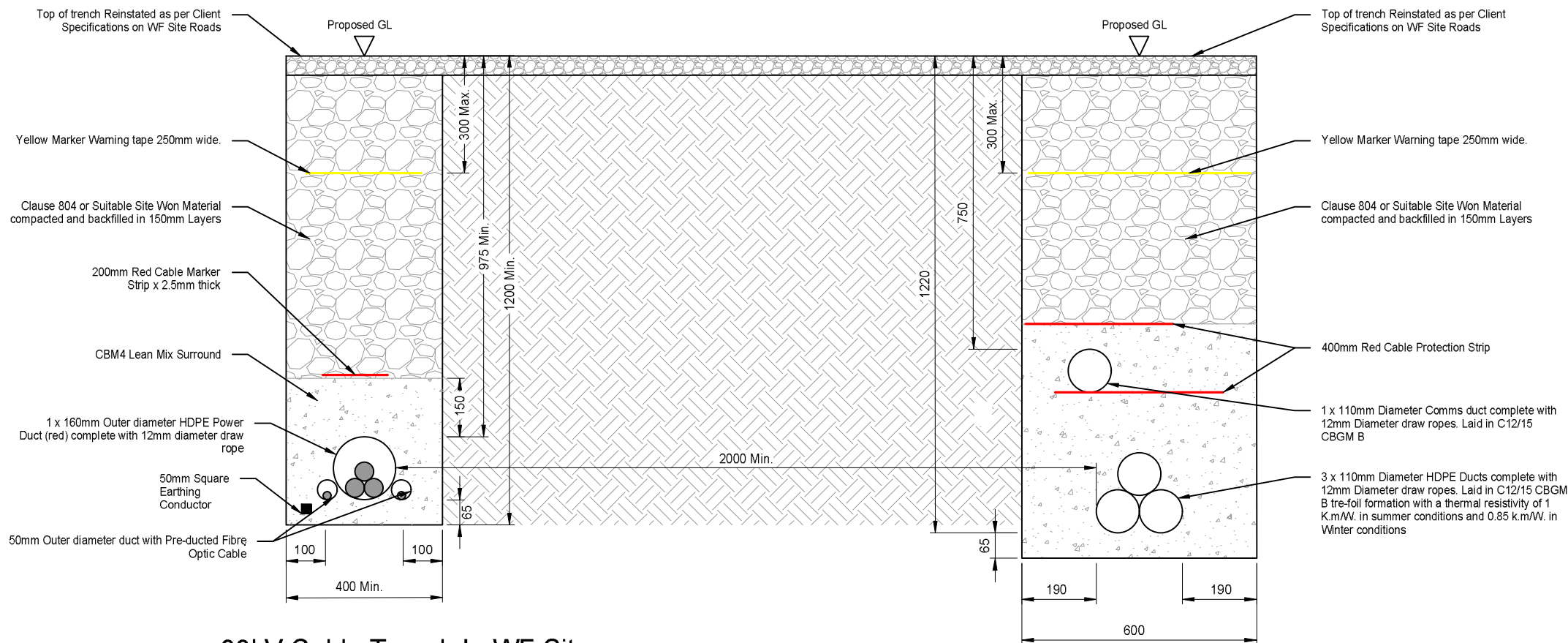
33kV Cable Trench In Road Verge Elevation Scale 1:10



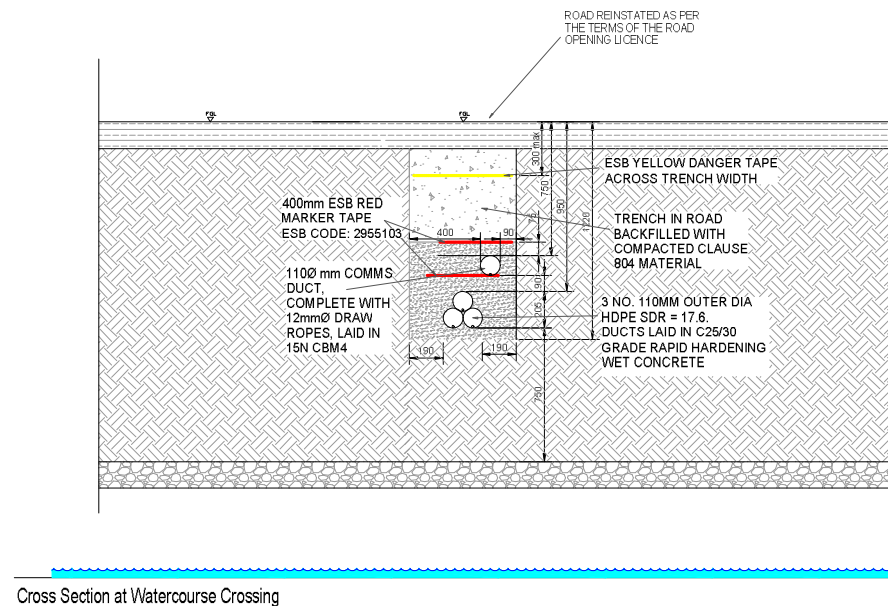
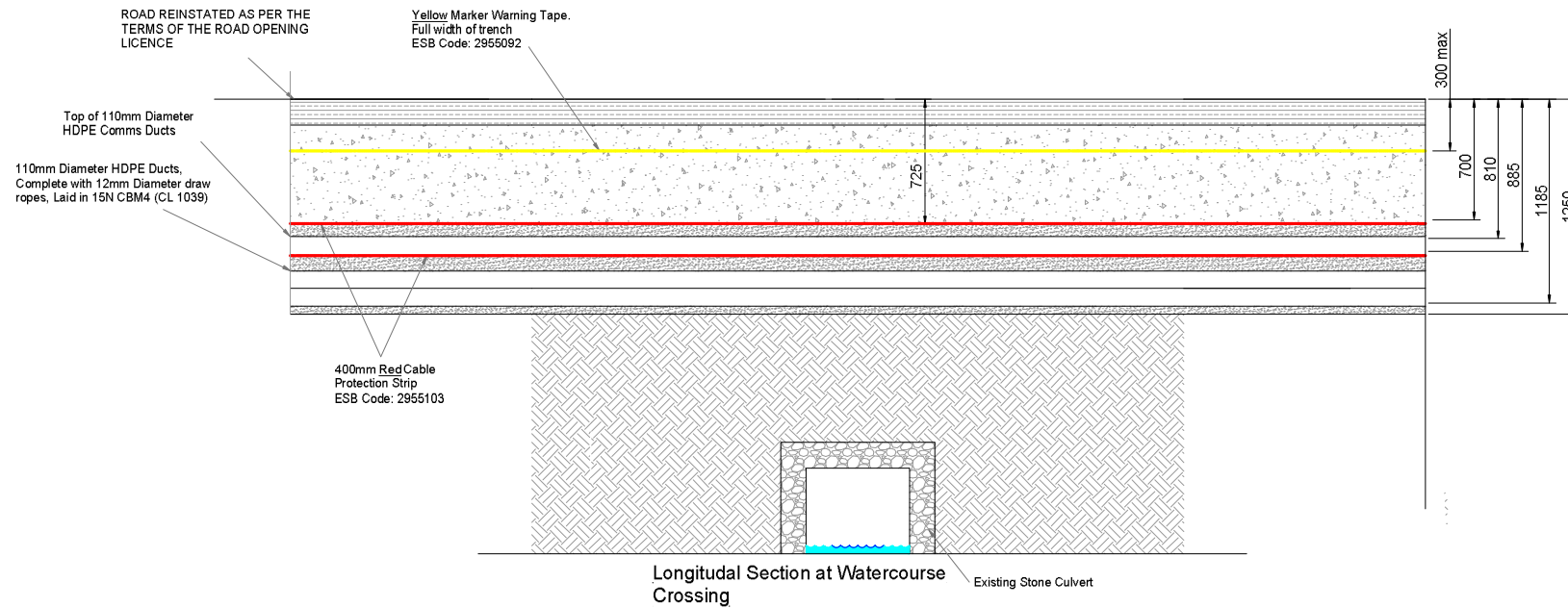
33kV Cable Trench In WF Site Road Detail End View Scale 1:10



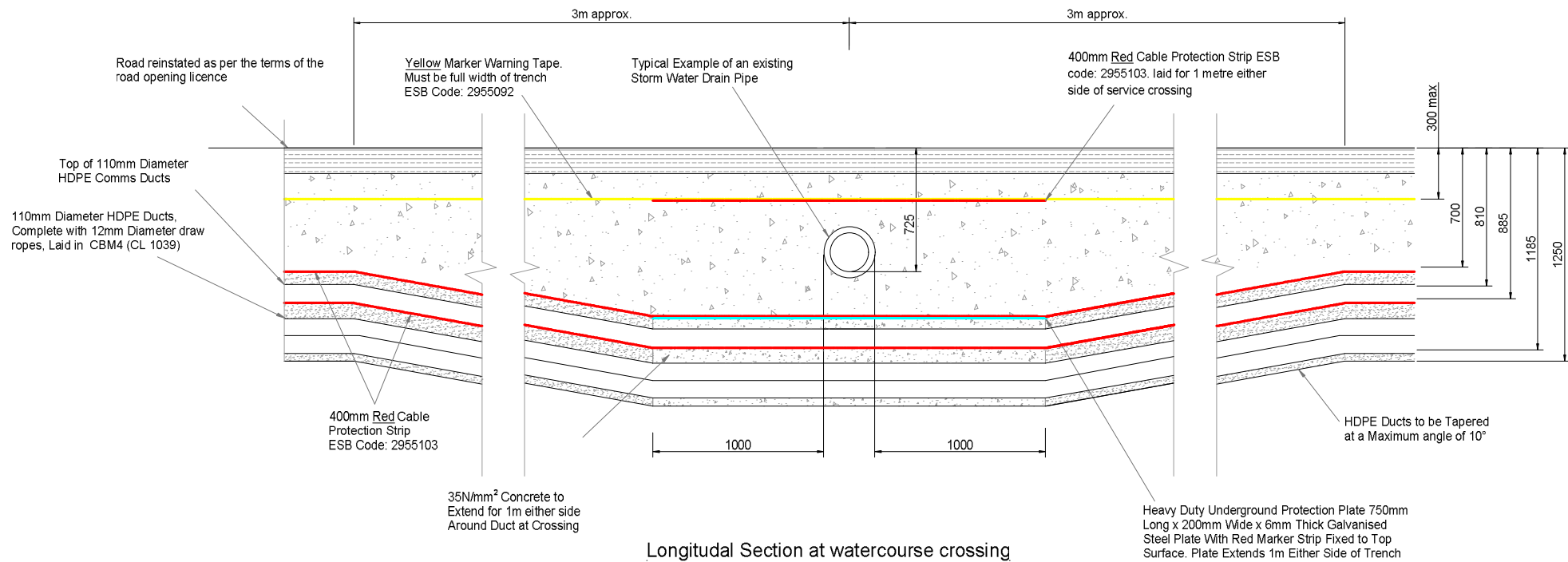
33kV Cable Trench In WF Site Road Detail Elevation Scale 1:10



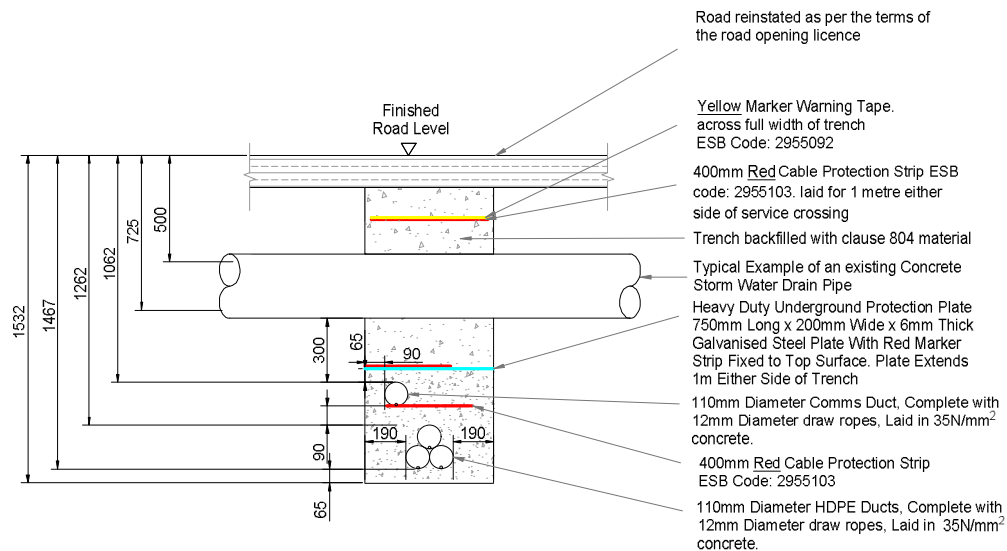
DRAWING TITLE: Typical 33kV and 38 kV Cable Trench In Wind Farm Site Road Details		DRAWING No: 191223a - 41	
PROJECT TITLE: Cleanrath Wind Farm, Co. Cork		PROJECT No. 191223a	
DRAWING/MODIFIED BY: Joseph O'Brien		CHECKED BY: Owen Cahill	SCALE: 1:10@A3
		DATE: 13.08.2020	
MKO Planning & Environmental Consultants Tuam Road, Galway, Ireland, H91 VM64 email: info@mkofireland.ie Tel: +353 91 735611			



DRAWING TITLE: Typical Cable Trench Over Culvert in Trefoil Arrangement - Option 1		DRAWING No: 191223a - 42	
PROJECT TITLE: Cleanrath Wind Farm, Co. Cork		PROJECT No.: 191223a	
DRAWING/MODIFIED BY: Joseph O'Brien	CHECKED BY: Owen Cahill	SCALE: 1:30@A3	DATE: 13.08.2020
MKO Planning & Environmental Consultants Tuum Road, Galway, Ireland, H91 VM64 email: info@mkofireland.ie Tel: +353 91 735611			



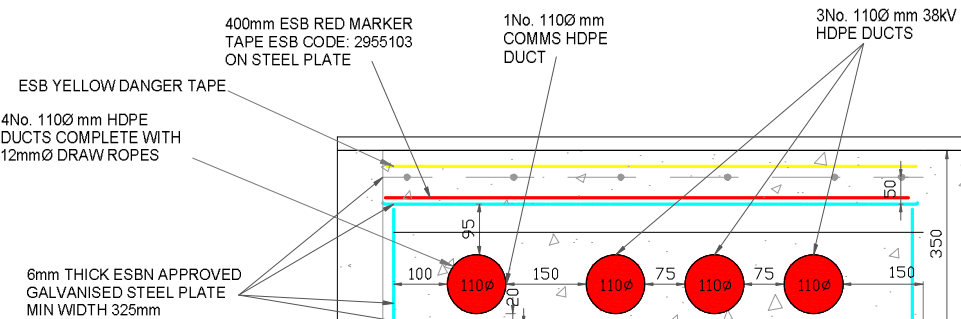
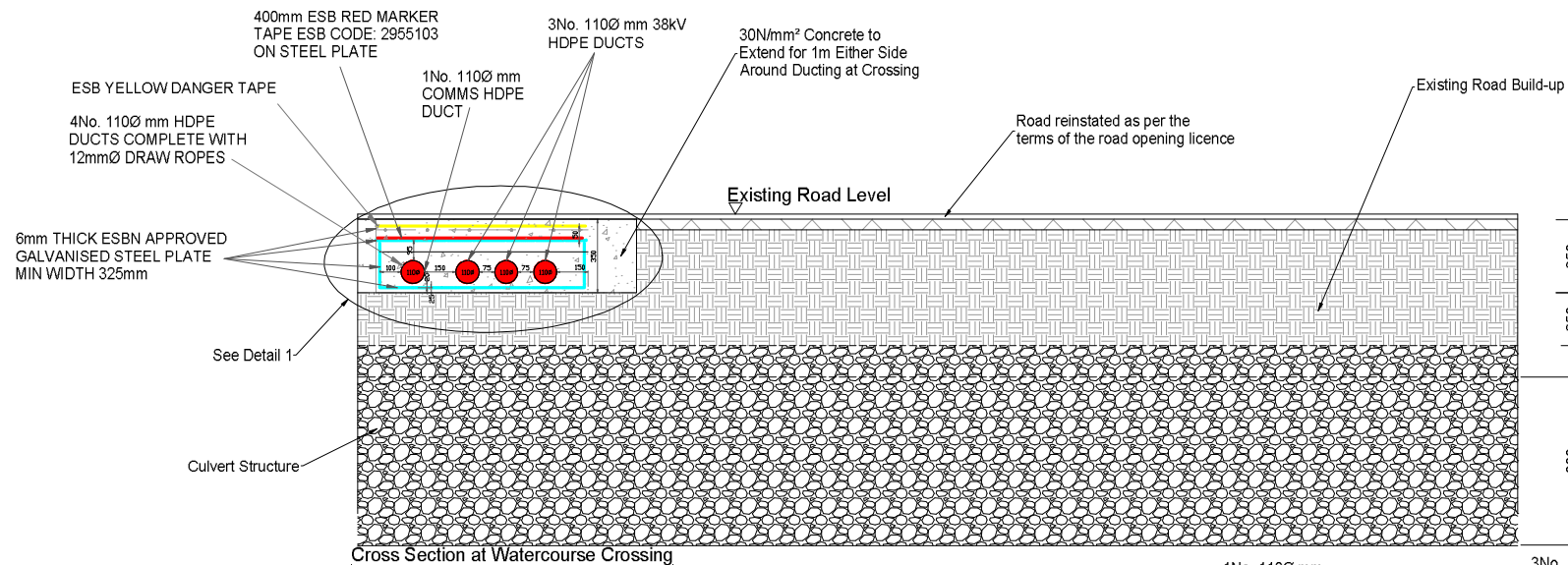
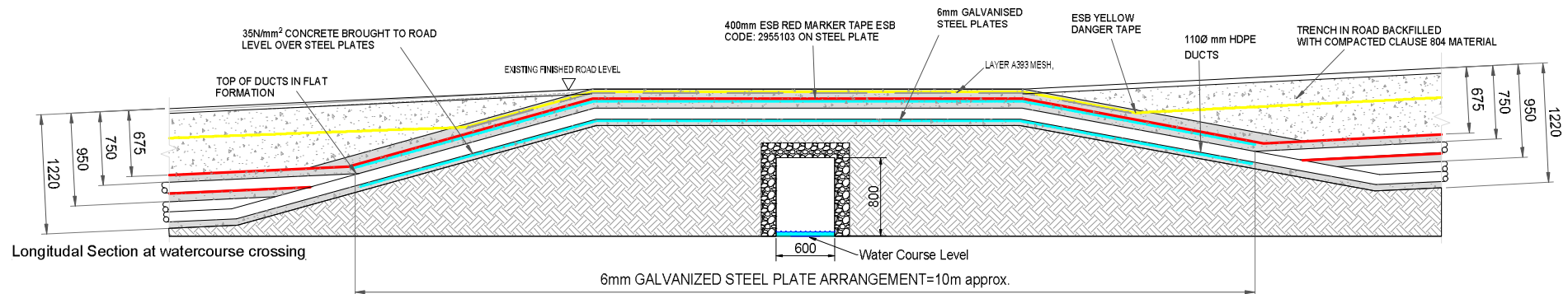
Longitudinal Section at watercourse crossing

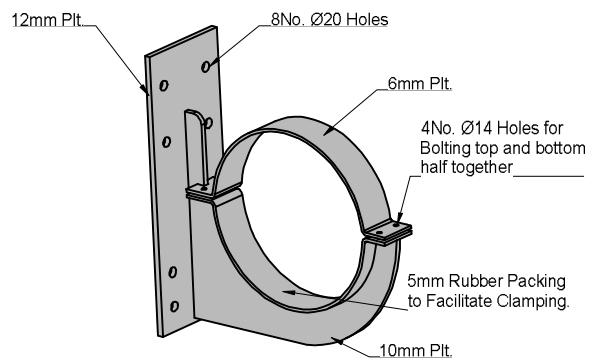
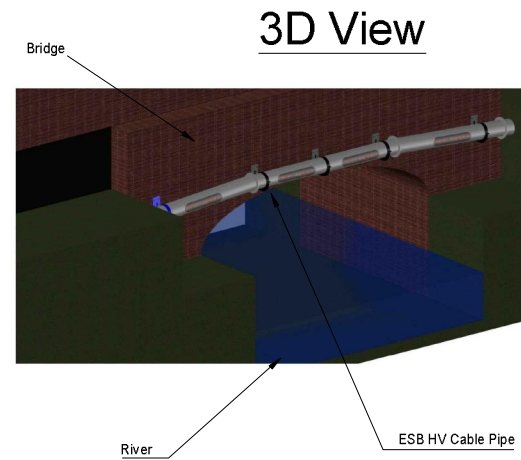
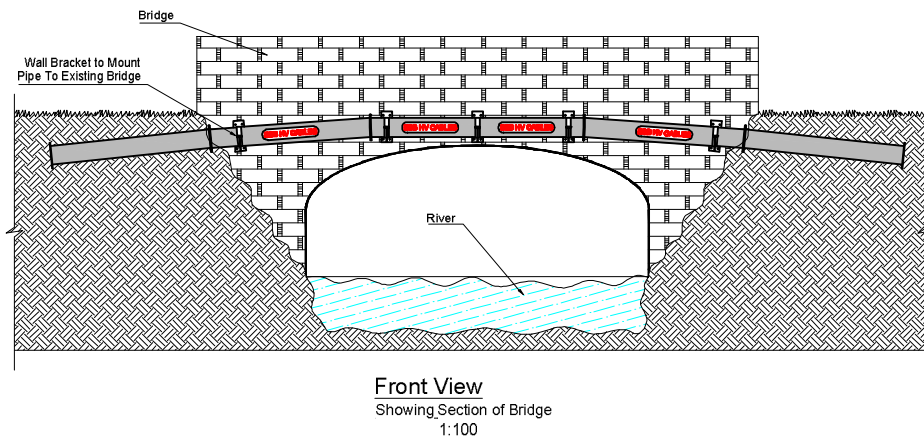


Cross Section at Watercourse Crossing

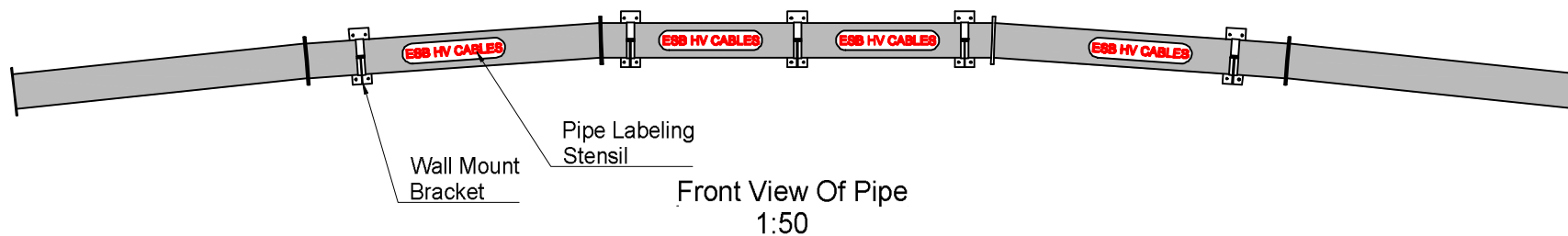



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PROJECT TITLE: Cleanrath Wind Farm, Co. Cork		PROJECT No.: 191223a	
DRAWING/MODIFIED BY: Joseph O'Brien	CHECKED BY: Owen Cahill	SCALE: 1:25@A3	DATE: 13.08.2020
MKO Planning & Environmental Consultants Tuzem Road, Galway, Ireland, H91 VM64 email: info@mkofireland.ie Tel: +353 91 735611			

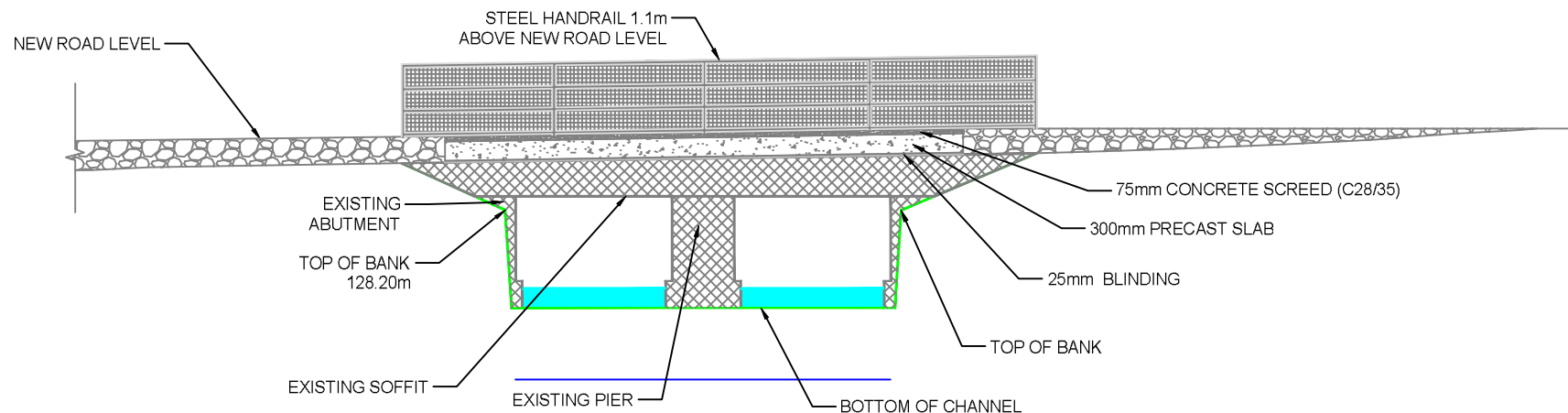




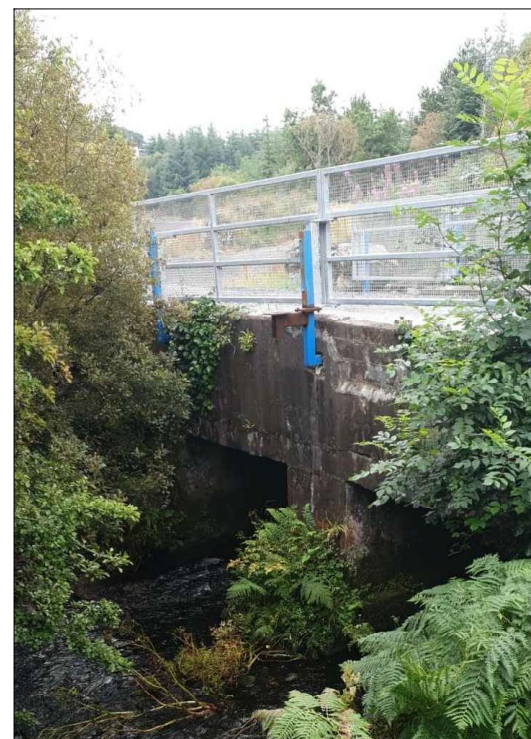
3D View Of Wall Bracket



DRAWING TITLE:	
Typical Piped Crossing Attached or Adjacent to Concrete Bridge Option 4	
PROJECT TITLE:	
Cleanrath Wind Farm, Co. Cork	
DRAWN BY:	CHECKED BY:
Joseph O'Brien	Owen Cahill
PROJECT NO:	DRAWING NO:
191223a	191223a - 45
SCALE:	DATE:
As Shown @ A3	13.08.2020
 MKO Planning and Environmental Consultants Tully Road, Galway Ireland, H91 VV94 +353 (0) 91 7355611 email: info@www.mkofireland.ie Website: www.mkofireland.ie	



View of Bridge Facing South

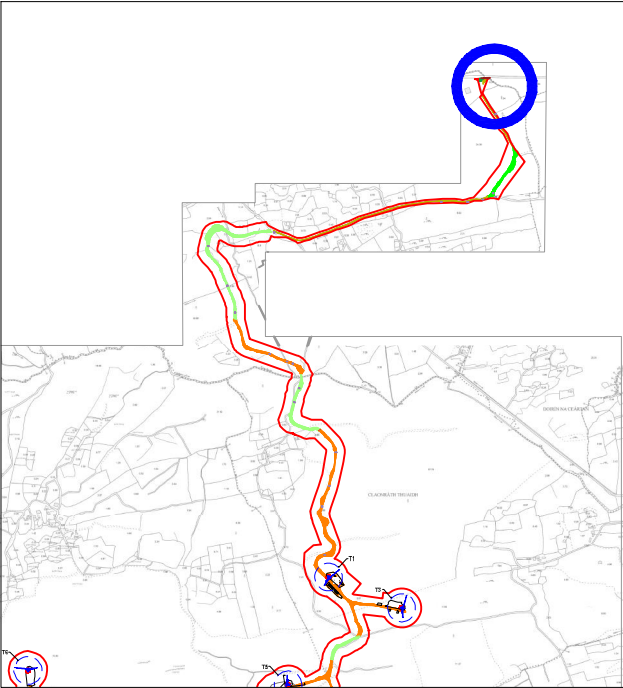


End View of Bridge Upgrade

DRAWING TITLE: Upgrade Works to Bridge at Northern Access	
PROJECT TITLE: Cleanrath Wind Farm, Co. Cork	
DRAWING BY: Joseph O'Brien	CHECKED BY: Owen Cahill
PROJECT NO: 191223a	DRAWING NO: 191223a - 46
SCALE: 1:75 @ A3	DATE: 13.08.2020
 MKO Planning and Environmental Consultants Tarran Road, Galway Ireland, H91 VW94 +353 (0) 91 7355611 email: info@www.mkofireland.ie Website: www.mkofireland.ie	


Drawing Legend

- Existing Road Edge
- Junction/Road Widening
- Existing Dwelling Access Area
- Embankment
- Vegetation Area
- Berm



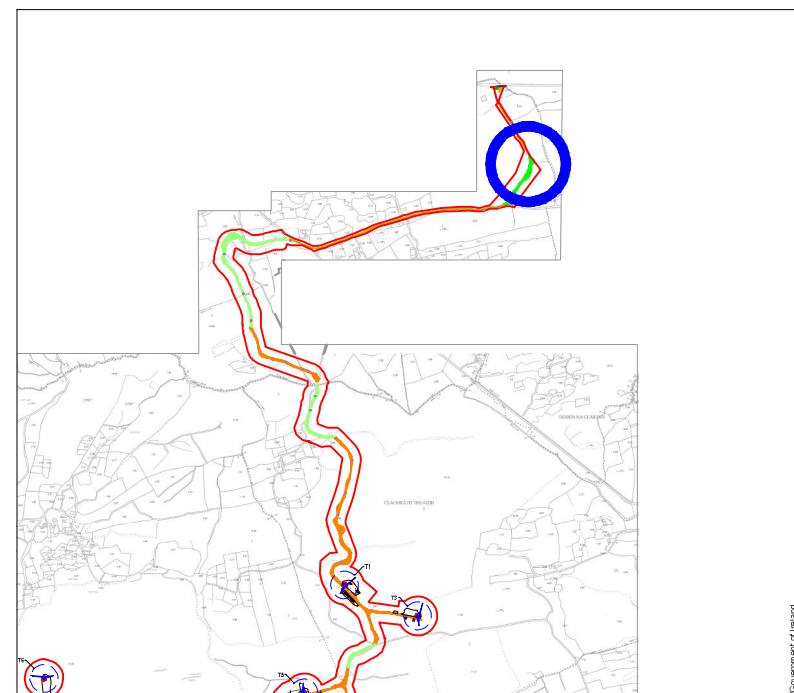
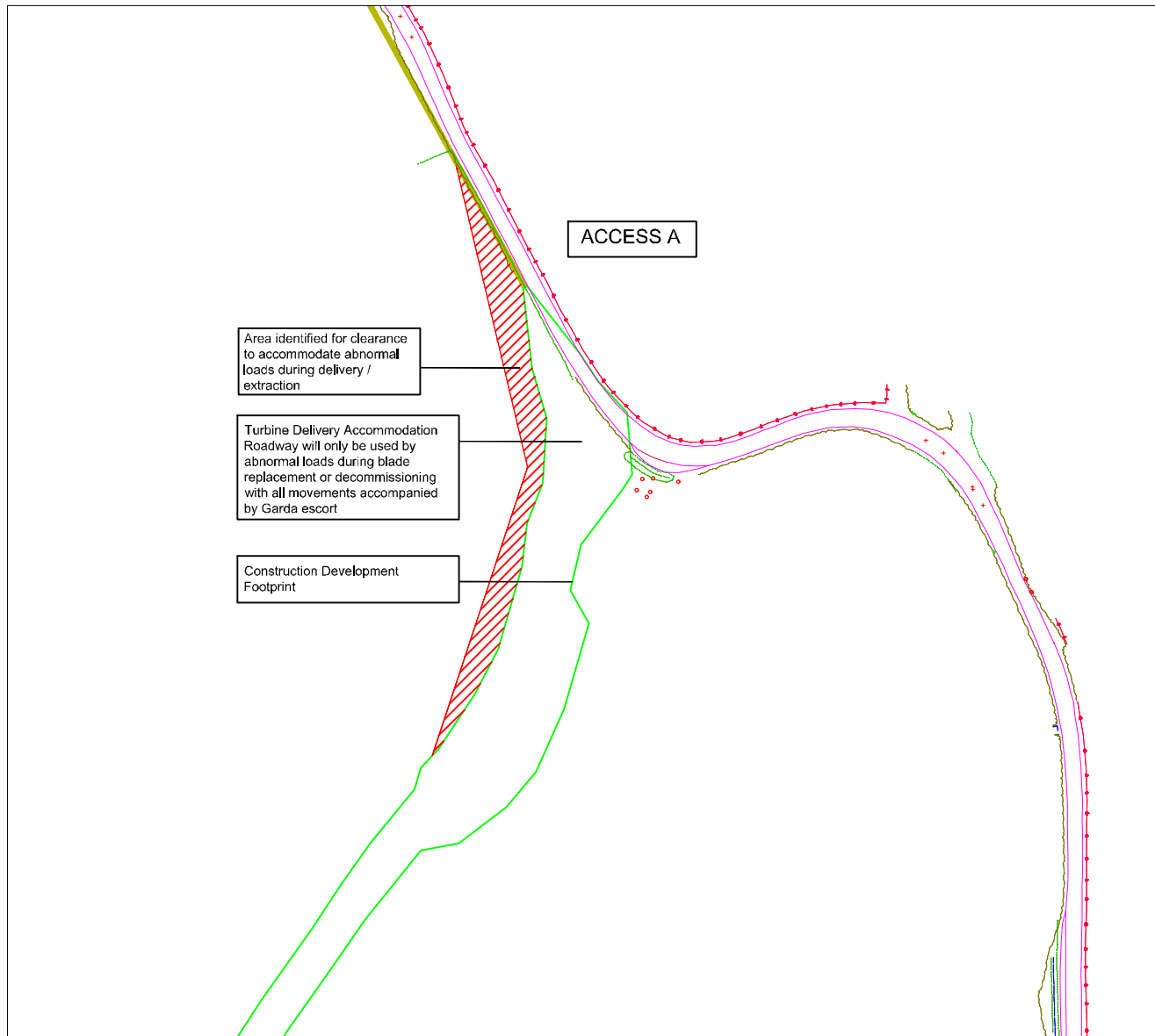
1:25,000 Location on Context Map



DRAWING TITLE: Junction at Sawmill at Cloontycarthy	
PROJECT TITLE: Cleanrath Wind Farm, Co. Cork	
DRAWING BY: Joseph o Brien	CHECKED BY: Owen Cahill
PROJECT NO: 191223a	DRAWING NO: 191223a - 47
SCALE: 1:1,000 @ A3	DATE: 13.08.2020
01 SHEET NO: 6367.6368.6369.6370.6371.6412.6413.6414.6415.6416	
 MKO Planning and Environmental Consultants Tarran Road, Galway Inland, HSE VVW04 +353 (0) 91 735611 email: info@www.mkofireland.ie Website: www.mkofireland.ie	

Drawing Legend

- Existing Road Edge
- As Constructed Accomodation Roadway
- Transport Runover Area
- Junction/Road Widening



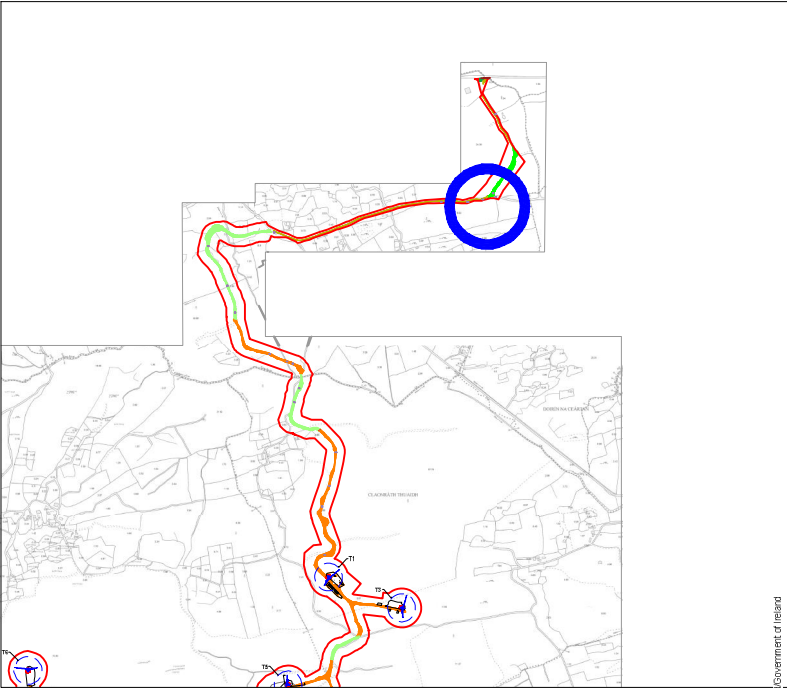
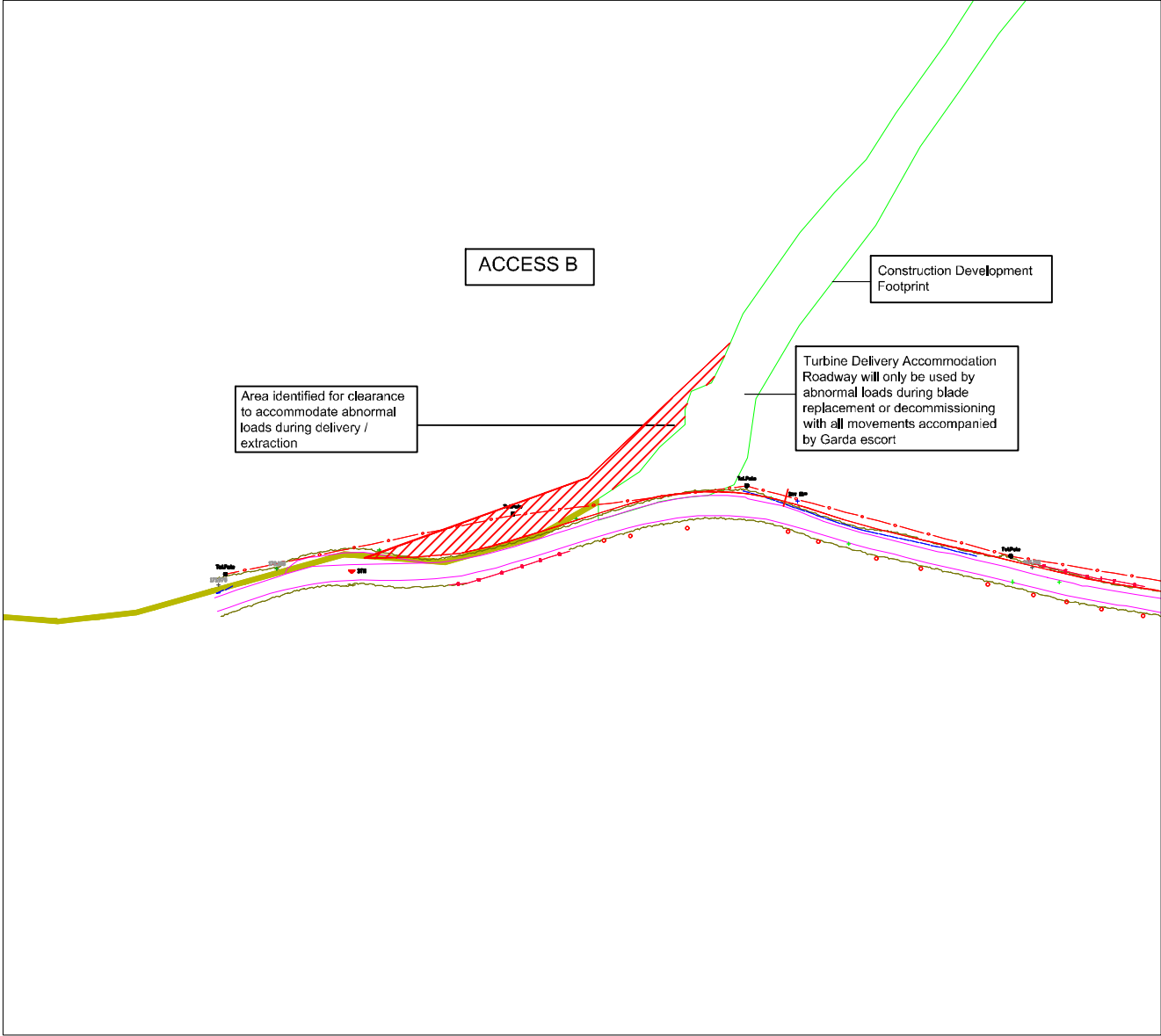
1:25,000 Location on Context Map



DRAWING TITLE	
Access Junction A	
PROJECT TITLE	
Cleanrath Wind Farm, Co. Cork	
DRAWING BY	CHECKED BY:
Joseph o Brien	Owen Cahill
PROJECT NO.	DRAWING NO.
191223a	191223a - 48
SCALE	DATE
1:1,000 @ A3	13.08.2020
01 SHEET NO.	
6367.6368.6369.6370.6371.6412.6413.6414.6415.6416	
MKO Planning and Environmental Consultants Tarr Road, Galway Ireland, H91 VV94 +353 (0) 91 735611 email: info@www.mkofireland.ie Website: www.mkofireland.ie	

Drawing Legend

- Existing Road Edge
- As Constructed Accomodation Roadway
- Transport Runover Area
- Junction/Road Widening



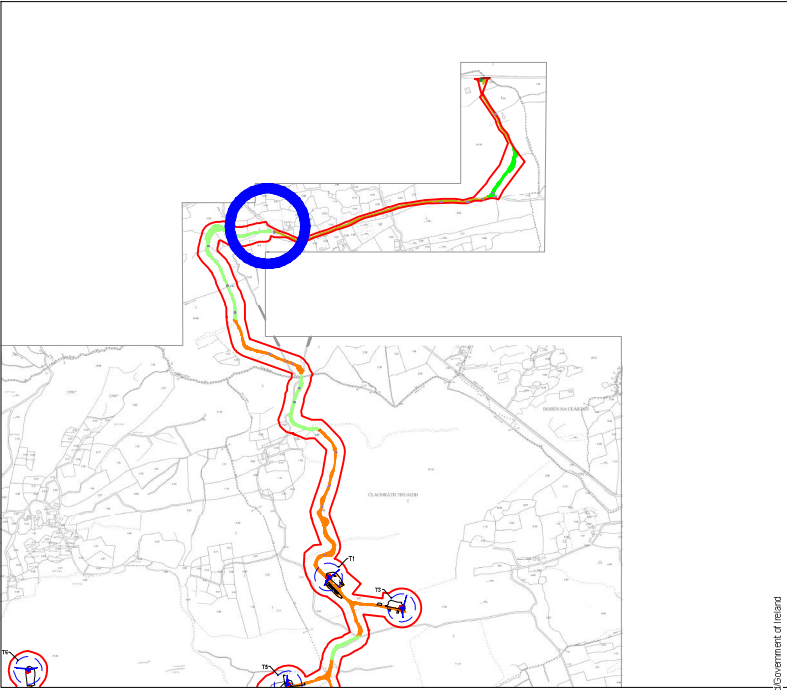
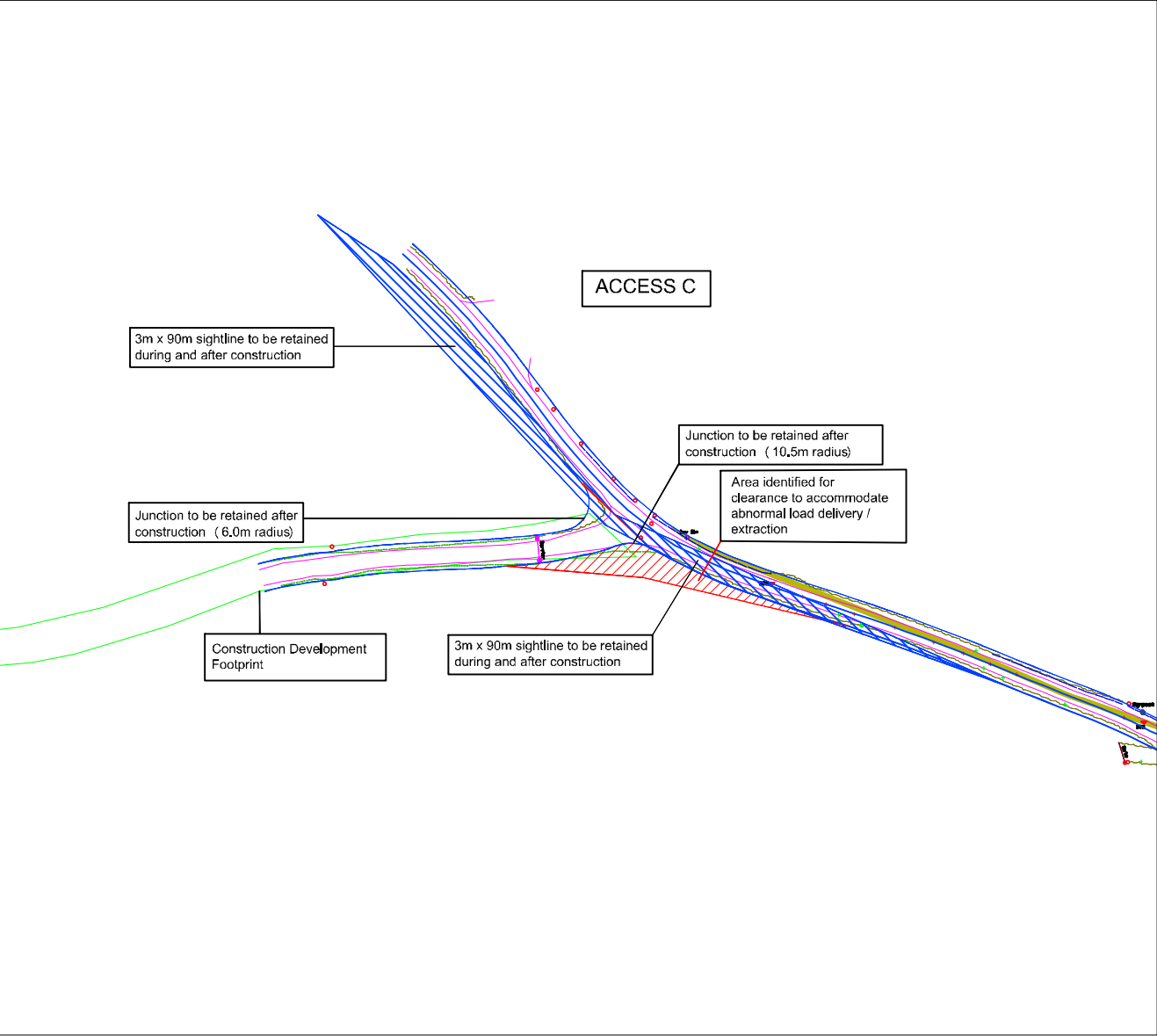
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DRAWING TITLE	
Access Junction B	
PROJECT TITLE	
Cleanrath Wind Farm, Co. Cork	
DRAWING BY	CHECKED BY:
Joseph o Brien	Owen Cahill
PROJECT NO:	DRAWING NO:
191223a	191223a - 49
SCALE:	DATE:
1:1,000 @ A3	13.08.2020
01 SHEET NO:	
6367.6368.6369.6370.6371.6412.6413.6414.6415.6416	
MKO	
Planning and Environmental Consultants	
Tarr Road, Galway	
Ireland, H91 VV94	
+353 (0) 91 735611	
email: info@www.mkofireland.ie	
Website: www.mkofireland.ie	


Drawing Legend

- Existing Road Edge
- As Constructed Wind Farm Access Track
- Transport Runover Area
- Sight line
- Junction/Road Widening



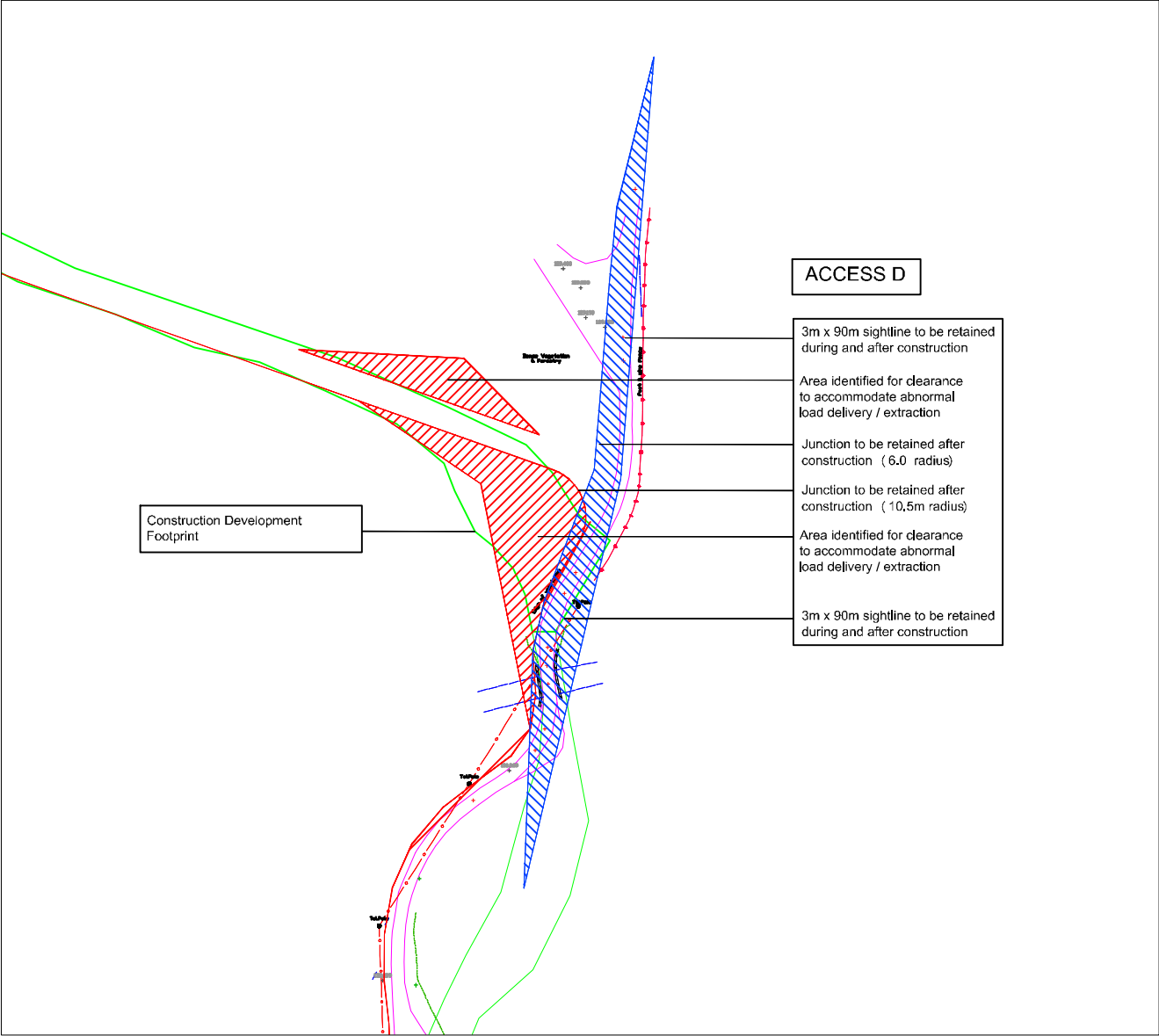
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DRAWING TITLE	
Access Junction C	
PROJECT TITLE	
Cleanrath Wind Farm, Co. Cork	
DRAWING BY	CHECKED BY:
Joseph o Brien	Owen Cahill
PROJECT NO:	DRAWING NO:
191223a	191223a - 50
SCALE:	DATE:
1:1,000 @ A3	13.08.2020
01 SHEET NO: 6367.6368.6369.6370.6371.6412.6413.6414.6415.6416	
	
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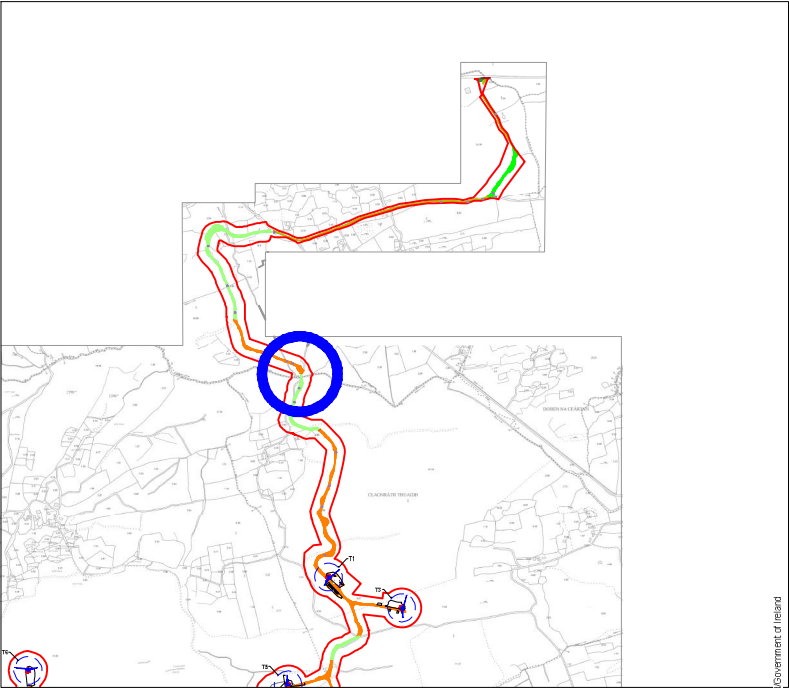
Drawing Legend

- Existing Road Edge
- As Constructed Wind Farm Access Track
- Transport Runover Area
- Sight line



ACCESS D

- 3m x 90m sightline to be retained during and after construction
- Area identified for clearance to accommodate abnormal load delivery / extraction
- Junction to be retained after construction (6.0 radius)
- Junction to be retained after construction (10.5m radius)
- Area identified for clearance to accommodate abnormal load delivery / extraction
- 3m x 90m sightline to be retained during and after construction



1:25,000 Location on Context Map



DRAWING TITLE
Access Junction D

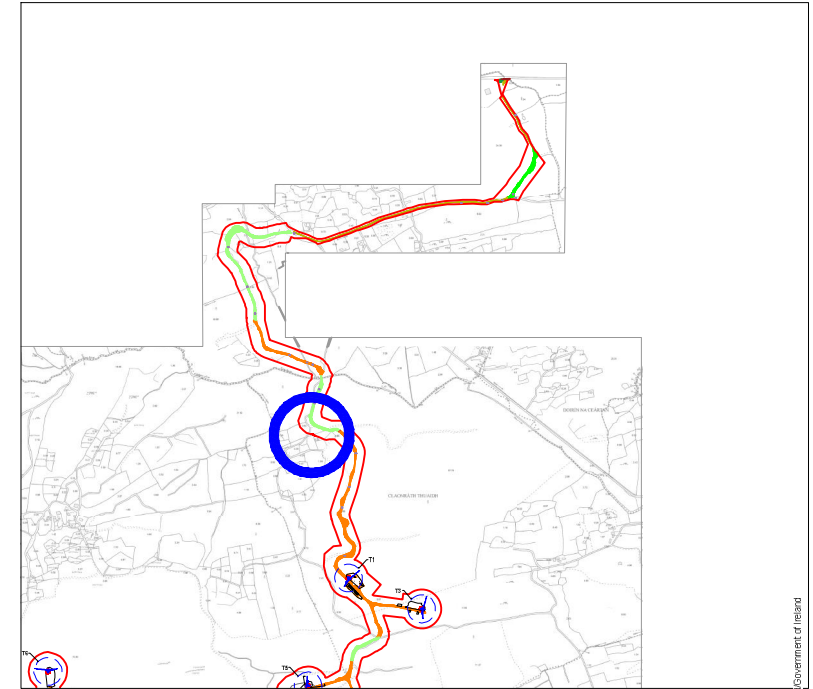
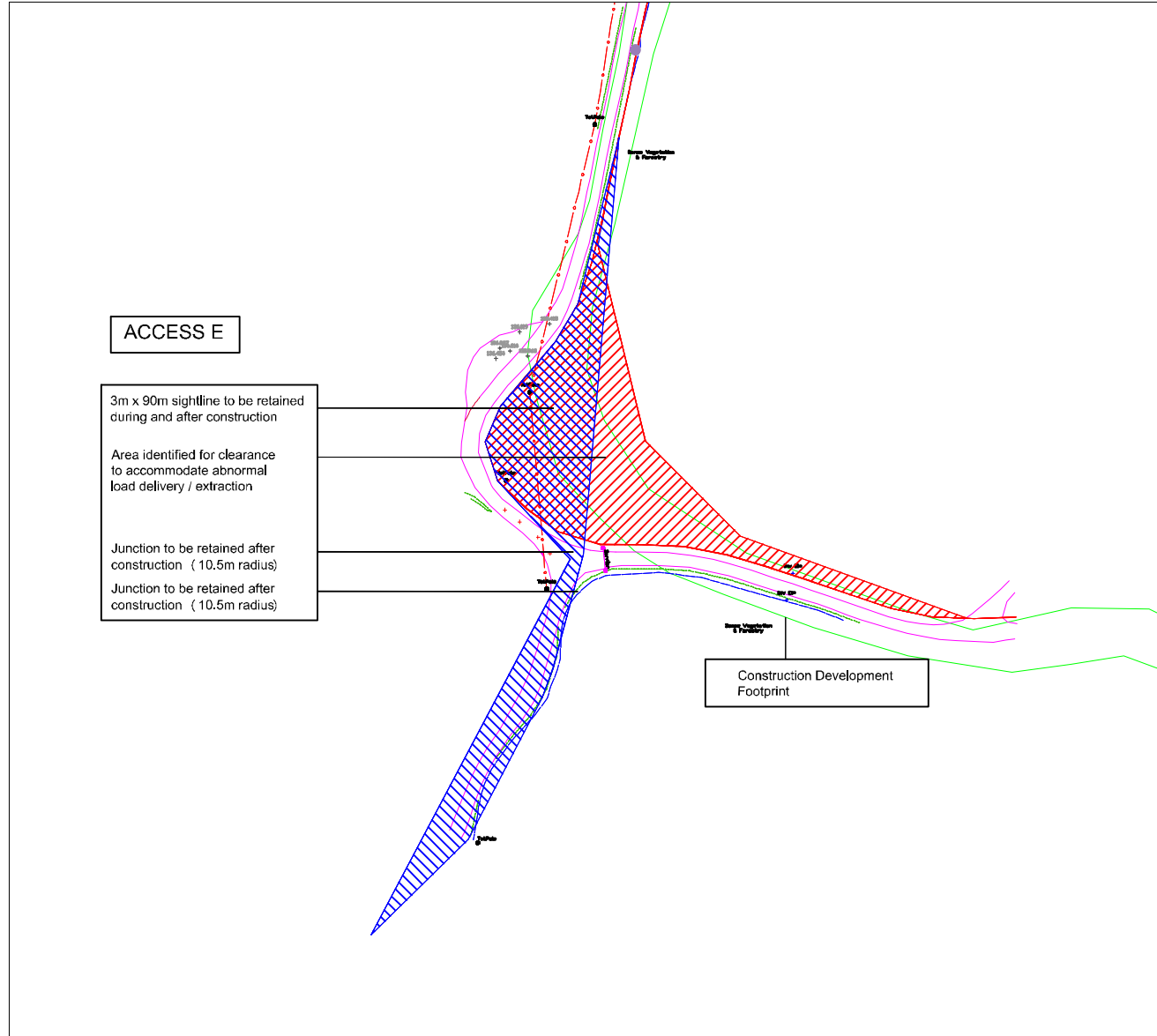
PROJECT TITLE
Cleanrath Wind Farm, Co. Cork

DRAWING BY Joseph o Brien	CHECKED BY Owen Cahill
PROJECT NO. 191223a	DRAWING NO. 191223a - 51
SCALE 1:1,000 @ A3	DATE 13.08.2020
01 SHEET NO. 6367.6368.6369.6370.6371.6412.6413.6414.6415.6416	

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Ireland, H91 VV94
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email: info@www.mkofireland.ie
Website: www.mkofireland.ie

Drawing Legend

- Existing Road Edge
- As Constructed Wind Farm Access Track
- Transport Runover Area
- Sight line



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DRAWING TITLE: Access Junction E	
PROJECT TITLE: Cleanrath Wind Farm, Co. Cork	
DRAWING BY: Joseph o'Brien	CHECKED BY: Owen Cahill
PROJECT NO: 191223a	DRAWING NO: 191223a - 62
SCALE: 1:1,000 @ A3	DATE: 13.08.2020
OS SHEET NO.: 6367,6368,6369,6370,6371,6412,6413,6415,6416	
 MKO Planning and Environmental Consultants Tarran Road, Galway Ireland, H91 VW94 +353 (0) 91 735611 email: info@www.mkofireland.ie Website: www.mkofireland.ie	

DRAINAGE DESIGN NOTES:

1. ALL DRAINAGE SUBJECT TO MICRO-SITING AND OPTIMISATION ON SITE.
2. THE LOCATIONS OF THE INTERCEPTOR DRAINS, CHECK DAMS, CULVERTS, SWALES, STILLING 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 STILLING 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 LESS THE 6%.
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, SIZE AND GROUND CONDITIONS.
10. STILLING PONDS TO BE SIZED ACCORDING TO THE 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. EXISTING DRAINS/DITCHES TO BE INCORPORATED OR REMOVED DURING WIND FARM CONSTRUCTION.
13. ALL DRAINAGE SYSTEM FEATURES TO BE SUBJECT OF INSPECTION AND MAINTENANCE PLAN.
14. THE LAYOUT SHOWN IS SLIGHTLY OFFSET FOR SCALE PURPOSES, AND ALL DRAINAGE WOULD BE INSTALLED AS CLOSE TO THE ROAD AS POSSIBLE, AND WITHIN THE PLANNING BOUNDARY FOR THE DEVELOPMENT.

POLLUTION PREVENTION NOTES:

1. SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE COMPLETE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
2. SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
3. SILTY WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/DISTURBED GROUND, STOCKPILES, PLANT AND WHEEL WASH, SITE ROADS/TRACKS, AND DISTURBANCE OF STREAM/RIVER BEDS.

DISCHARGES

4. WATER CONTAINING SILT WILL NOT BE PUMPED DIRECTLY TO ANY WATERCOURSE / DRAIN / OR DITCH. ALL DISCHARGES TO BE MADE OVER OPEN VEGETATED GROUND AT A MINIMUM 20M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
5. A 15M BUFFER ZONE (OR GREATER) IS TO BE MAINTAINED AROUND ALL SENSITIVE WATERCOURSES AND WATERBODIES.
6. PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE.
7. PUMPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN 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 USE OF SPLASH PLATES, AND DISCHARGE CONTROLS.
8. VEGETATION WILL NOT BE STRIPPED FROM EXISTING DITCHES UNLESS ABSOLUTELY NECESSARY.

EXCAVATIONS

9. 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

10. THE AMOUNT OF EXPOSED GROUND AND STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED AS FAR AS PRACTICABLE.
11. TEMPORARY STOCKPILES WILL BE COVERED OR SEALED AS SOON AS POSSIBLE.
12. SILT FENCES WILL BE USED TO REDUCE SILTY RUNOFF FROM TEMPORARY PEAT STORAGE AREAS, AND/OR BARE PEAT AREAS AS REQUIRED.

SITE TRACKS

13. USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR FILTRATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER.
14. CHECK DAMS TO BE INSPECTED AND CLEANED REGULARLY.
15. DISCHARGES FROM SITE TRACKS WILL BE VIA OUTFALL SPILLWAYS, SETTLEMENT PONDS AND VEGETATION SWALES.

REFUELLING

16. REFUEL MOBILE PLANT IN DESIGNATED REFUELLING AREA ONLY, PREFERABLY ON AN IMPERMEABLE SURFACE AND AWAY FROM DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.
17. SPILL KITS AND DRIP TRAYS SHOULD BE AVAILABLE ON SITE.

CONCRETE

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

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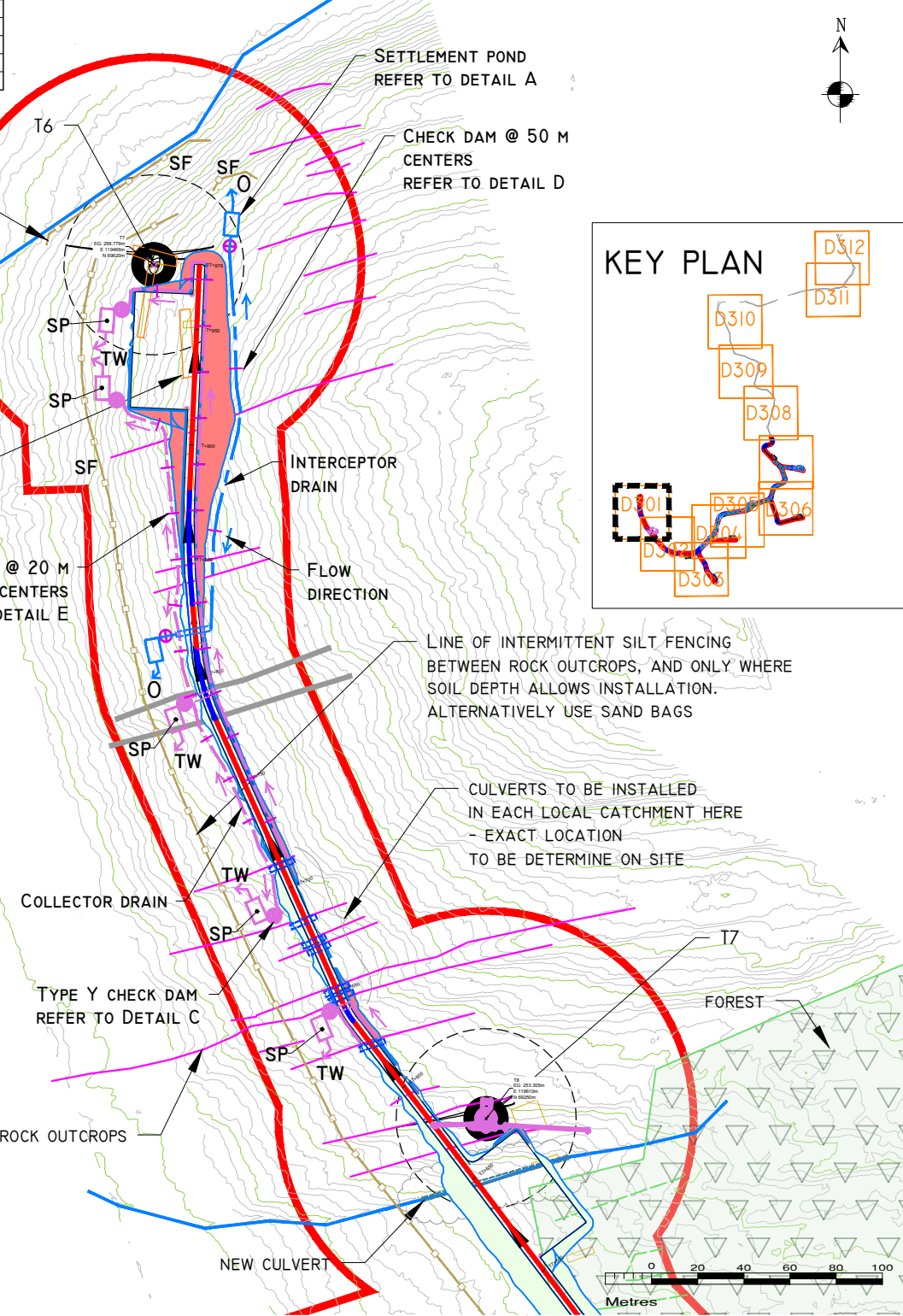
CONTAIN - THE SOURCE OF THE POLLUTION SHOULD BE BUNDED USING A SUITABLE METHOD. NATURAL WATERCOURSES SHOULD BE TEMPORARILY DIVERTED AROUND THE SOURCE OF POLLUTION.

POND SIZE W [m] x L [m] x D [m]				CATCHMENT SIZE (H ²)		
RETURN PERIOD	50 YRS	STORM DURATION		500	1000	2000
0HR RETENTION FOR COARSE SILT	6 HRS			2.8 x 9 x 1 m	4 x 15 x 1 m	5.7 x 18 x 1 m
1HR RETENTION FOR MEDIUM SILT	12 HRS			3.2 x 10 x 1 m	4.5 x 14 x 1 m	6.4 x 20 x 1 m
24HR RETENTION FOR FINE SILT	24 HRS			3.5 x 11 x 1 m	5 x 16 x 1 m	7 x 22 x 1 m

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2. THESE DRAWINGS HAVE BEEN PREPARED USING AVAILABLE LIDAR TOPOGRAPHY DATA, NO DETAILED SITE SURVEY IS AVAILABLE.
3. WHERE POSSIBLE WE HAVE ATTEMPTED TO ACCOUNT FOR CHANGES IN GROUND LEVEL BASED ON SITE OBSERVATIONS, AND AVAILABLE AERIAL PHOTO INFORMATION.
4. SETTLEMENT PONDS AND NEW DRAIN LOCATIONS SHOWN ON THESE DRAWINGS ARE INDICATIVE, AND NEED TO BE SCALED ACCORDING TO THE CATCHMENT DRAINING INTO EACH PROPOSED POND. THIS NEEDS TO BE DETERMINED ON THE GROUND. POND SIZES PER CATCHMENT AREA ARE OUTLINED IN THE TABLE PROVIDED WITHIN THIS DRAWING.

MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE	
MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS	1) APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE
	2) APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE
SOURCE CONTROLS	3) USING SMALL WORKING AREAS
	4) WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHER
IN-LINE CONTROLS	1) USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE-DRAINS, DIVERSION DRAINS, FLUMES AND CULVERT PIPES
	2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: A) SAND BAGS B) OYSTER BAGS FILLED WITH GRAVEL C) FILTER FABRICS D) AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS
WATER TREATMENT CONTROLS	3) USING SMALL WORKING AREAS
	4) COVERING STOCKPILES
OUTFALL CONTROLS	5) WEATHERING OFF / SEALING PEAT STOCKPILES
	1) INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED SWALES/COLLECTOR DRAINS
OUTFALL CONTROLS	2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: 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
OUTFALL CONTROLS	4) IN STREAM SEDIMENTS
	5) COLLECTION SUMPS, TEMPORARY SUMPS, PUMPING SYSTEMS
OUTFALL CONTROLS	6) ATTENUATION LAGOONS
	7) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
OUTFALL CONTROLS	1) TEMPORARY SUMPS
	2) ATTENUATION PONDS
OUTFALL CONTROLS	3) TEMPORARY STORAGE LAGOONS
	4) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
OUTFALL CONTROLS	5) PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTBUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS.
	6) SILT DEWATERING BAGS
OUTFALL CONTROLS	1) LEVEL SPREADERS
	2) BUFFERED OUTFALLS
OUTFALL CONTROLS	3) VEGETATION FILTERS
	4) SILT DEWATERING BAGS
OUTFALL CONTROLS	5) FLOW LIMITERS AND WEIRS



LEGEND

- RIVERS/STREAMS
- RIVERS/STREAMS 50M BUFFER
- EXISTING DRAIN
- EXISTING CULVERT
- FOREST DRAIN
- LAND STREAMS/DRAINS
- UPSTREAM INTERCEPTOR DRAIN
- SWALES/DOWNSTREAM
- COLLECTOR DRAIN
- DIRECTION OF FLOW
- SETTLEMENT POND
- CROSS DRAIN
- CHECK DAM 'TYPE A'
- CHECK DAM 'TYPE B'
- PROPOSED CULVERT
- SILT FENCE
- INTERCEPTOR DITCHES
- DIRECTION OF FLOW
- DRAINAGE SWALE - COLLECTOR DRAIN
- STILLING POND (STP)
- LEVEL SPREADER (LP)
- PLANNING BOUNDARY
- CUT AREA
- FILL AREA
- ROCK OUTCROPS (APPROX.)
- FARM ACCESS ROAD
- TRENCHES
- FOREST
- EXISTING GROUND SURFACE
- INTERMEDIATE CONTOUR (5 M INTERVAL)
- EXISTING GROUND SURFACE
- MINOR CONTOUR (1 M INTERVAL)
- TURBINE AND SWEEP AREA

DRAWING NOTES

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14.01.19	Construction	MG	MG
Date	Description	Chkd	Signed
Revisions			

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web: www.hydroenvironmental.ie

Client: **CLEANRATH WINDFARM LTD.**

Job: **CLEANRATH WIND FARM**

Title: **DRAINAGE PLAN**

Figure No: **D301**

Drawing No: P1272-4-0619-A3-D301-00A

Sheet Size: A3 Project No.: P1272-4

Scale: 1:2,000 (A3) Drawn By: MG/GD

Date: 25/06/2019 Checked By: MG

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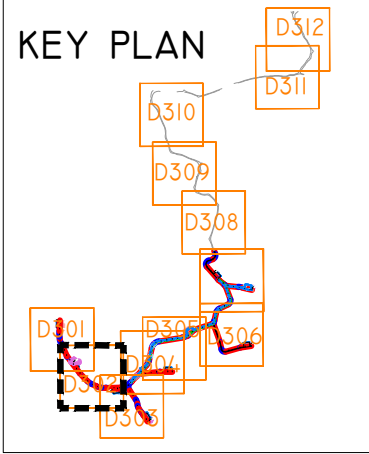
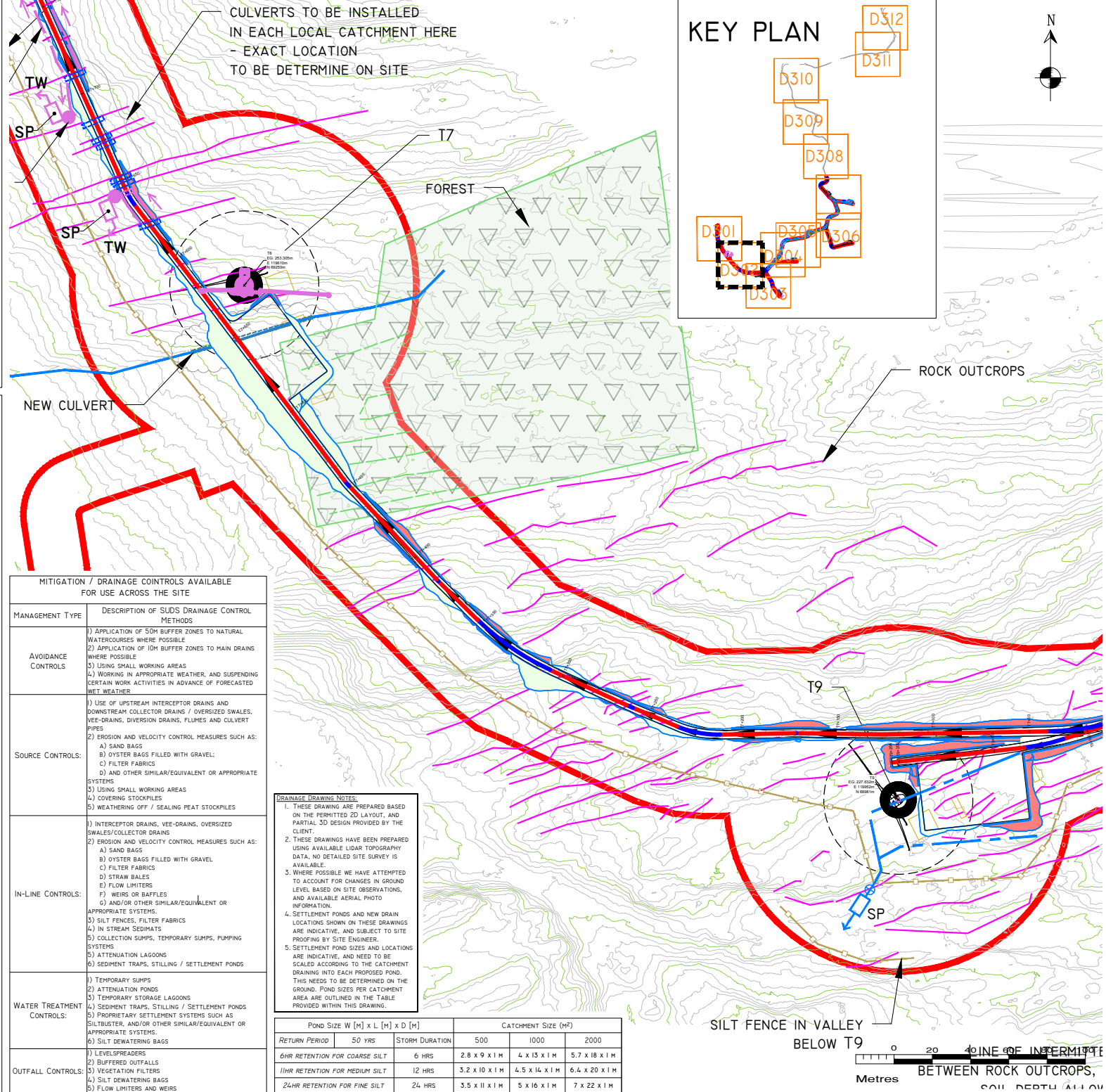
CONCRETE

18. CARE WILL BE TAKEN WHEN COMPLETING CONCRETE WORKS ON SITE TO ENSURE NO DISCHARGES OCCUR.
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IF WATER POLLUTION IS IDENTIFIED THE FOLLOWING STEPS WOULD BE ADHERED TO:

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



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- RIVERS/STREAMS
- RIVERS/STREAMS 50M BUFFER
- EXISTING DRAIN
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- FOREST DRAIN
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ORDNANCE SURVEY IRELAND LICENCE NO. EN 0044719
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14.01.19 Construction MG MG
Date Description Chkd Signed

Revisions

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Client: **CLEANRATH WINDFARM LTD.**

Job: **CLEANRATH WIND FARM**

Title: **DRAINAGE PLAN**

Figure No: **D302**

Drawing No: P1272-4-0619-A3-D302-00A
Sheet Size: A3 Project No.: P1272-4
Scale: 1:2,000 (A3) Drawn By: MG/GD
Date: 25/06/2019 Checked By: MG

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2. THE LOCATIONS OF THE INTERCEPTOR DRAINS, CHECK DAMS, CULVERTS, SWALES, STILLING 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 STILLING 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 LESS THE 6%.
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. STILLING PONDS TO BE SIZED ACCORDING TO THE 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. EXISTING DRAINS/DITCHES TO BE INCORPORATED OR REMOVED DURING WIND FARM CONSTRUCTION.
13. ALL DRAINAGE SYSTEM FEATURES TO BE SUBJECT OF INSPECTION AND MAINTENANCE PLAN.
14. THE LAYOUT SHOWN IS SLIGHTLY OFFSET FOR SCALE PURPOSES, AND ALL DRAINAGE WOULD BE INSTALLED AS CLOSE TO THE ROAD AS POSSIBLE, AND WITHIN THE PLANNING BOUNDARY FOR THE DEVELOPMENT.

POLLUTION PREVENTION NOTES:

1. SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE COMPLETE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
2. SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
3. SILTY WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/DISTURBED GROUND, STOCKPILES, PLANT AND WHEEL WASH, SITE ROADS/TRACKS, AND DISTURBANCE OF STREAM/RIVER BEDS.

DISCHARGES

4. WATER CONTAINING SILT WILL NOT BE PUMPED DIRECTLY TO ANY WATERCOURSE / DRAIN / OR DITCH. ALL DISCHARGES TO BE MADE OVER OPEN VEGETATED GROUND AT A MINIMUM 20M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
5. A 15M BUFFER ZONE (OR GREATER) TO BE MAINTAINED AROUND ALL SENSITIVE WATERCOURSES AND WATERBODIES. NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
6. PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE.
7. PUMPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN 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 USE OF SPLASH PLATES, AND DISCHARGE CONTROLS.
8. VEGETATION WILL NOT BE STRIPPED FROM EXISTING DITCHES UNLESS ABSOLUTELY NECESSARY.

EXCAVATIONS

9. 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

10. THE AMOUNT OF EXPOSED GROUND AND STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED AS FAR AS PRACTICABLE.
11. TEMPORARY STOCKPILES WILL BE COVERED OR SEALED AS SOON AS POSSIBLE.
12. SILT FENCES WILL BE USED TO REDUCE SILTY RUNOFF FROM TEMPORARY PEAT STORAGE AREAS, AND/OR BARE PEAT AREAS AS REQUIRED.

SITE TRACKS

13. USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR FILTRATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER.
14. CHECK DAMS TO BE INSPECTED AND CLEANED REGULARLY.
15. DISCHARGES FROM SITE TRACKS WILL BE VIA OUTFALL SPILLWAYS, SETTLEMENT PONDS AND VEGETATION SWALES.

REFUELING

16. REFUEL MOBILE PLANT IN DESIGNATED REFUELING AREA ONLY, PREFERABLY ON AN IMPERMEABLE SURFACE AND AWAY FROM DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.
17. SPILL KITS AND DRIP TRAYS SHOULD BE AVAILABLE ON SITE.

CONCRETE

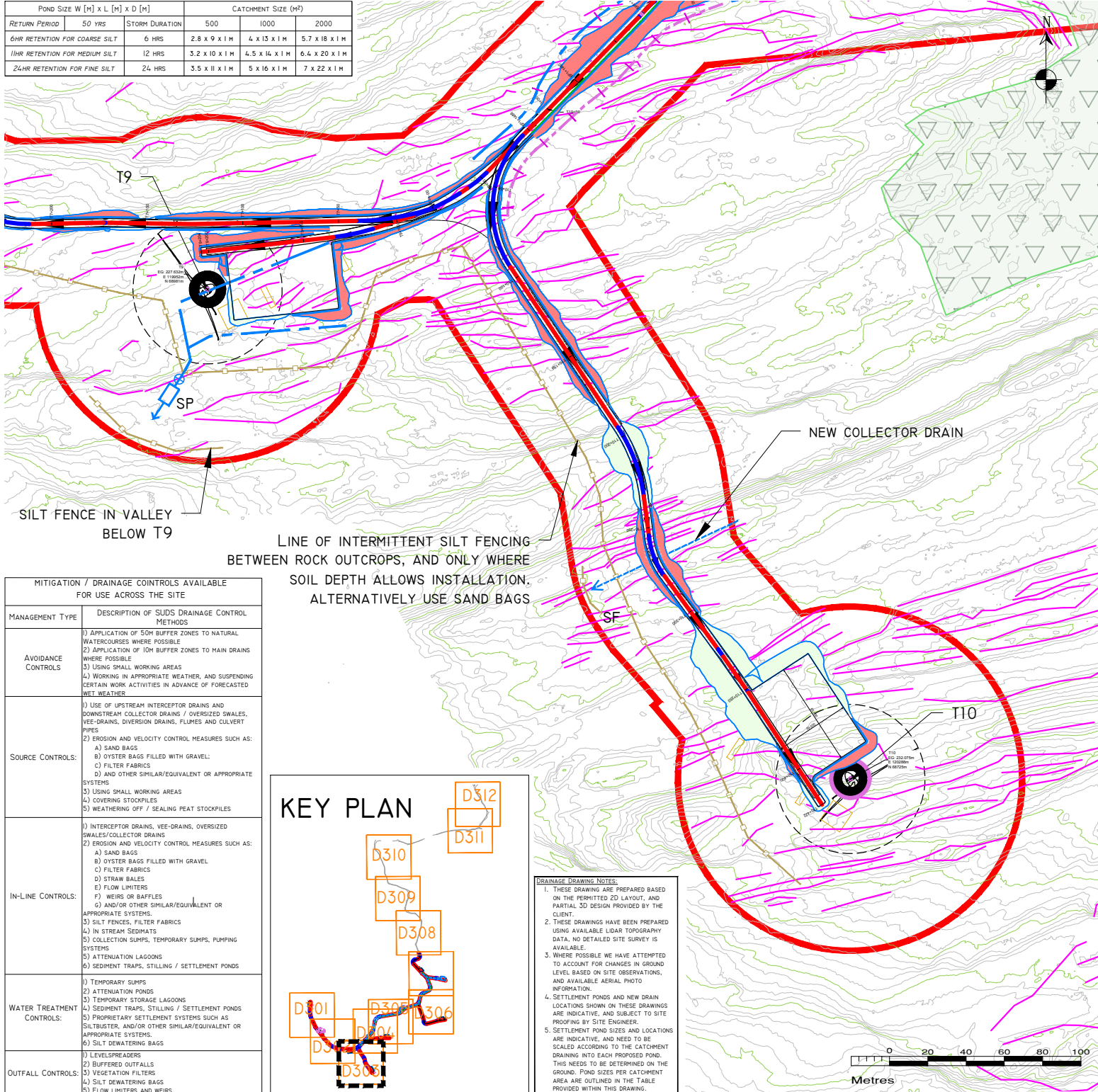
18. CARE WILL BE TAKEN WHEN COMPLETING CONCRETE WORKS ON SITE TO ENSURE NO DISCHARGES OCCUR.
19. CONCRETE WASH WATER, AND WASTE CONCRETE WILL BE MANAGED APPROPRIATELY ON SITE.

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.

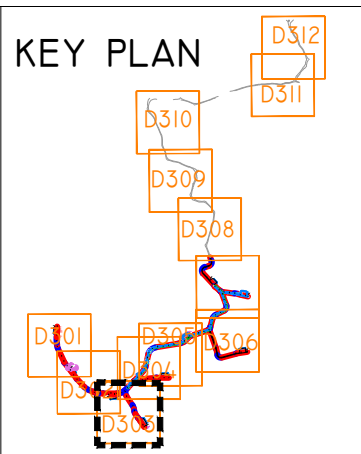
CONTAIN - THE SOURCE OF THE POLLUTION SHOULD BE BUNDED USING A SUITABLE METHOD. NATURAL WATERCOURSES SHOULD BE TEMPORARILY DIVERTED AROUND THE SOURCE OF POLLUTION.

POND SIZE W [m] x L [m] x D [m]				CATCHMENT SIZE (H ²)		
RETURN PERIOD	50 YRS	STORM DURATION		500	1000	2000
6HR RETENTION FOR COARSE SILT	6 HRS			2.8 x 9 x 1 m	4 x 13 x 1 m	5.7 x 18 x 1 m
12HR RETENTION FOR MEDIUM SILT	12 HRS			3.2 x 10 x 1 m	4.5 x 14 x 1 m	6.4 x 20 x 1 m
24HR RETENTION FOR FINE SILT	24 HRS			3.5 x 11 x 1 m	5 x 16 x 1 m	7 x 22 x 1 m



LINE OF INTERMITTENT SILT FENCING BETWEEN ROCK OUTCROPS, AND ONLY WHERE SOIL DEPTH ALLOWS INSTALLATION, ALTERNATIVELY USE SAND BAGS

MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE	
MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS	1) APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE
	2) APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE
	3) USING SMALL WORKING AREAS
	4) WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHER
	5) USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE-DRAINS, DIVERSION DRAINS, FLUMES AND CULVERT PIPES
SOURCE CONTROLS	2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS:
	A) SAND BAGS
	B) OYSTER BAGS FILLED WITH GRAVEL
	C) FILTER FABRICS
	D) AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS
IN-LINE CONTROLS	1) INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED SWALES/COLLECTOR DRAINS
	2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS:
	A) SAND BAGS
	B) OYSTER BAGS FILLED WITH GRAVEL
	C) FILTER FABRICS
WATER TREATMENT CONTROLS	1) TEMPORARY SLUMPS
	2) TEMPORARY STORAGE LAGOONS
	3) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
	4) PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTBUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS.
	5) SILT DEWATERING BAGS
OUTFALL CONTROLS	1) LEVEL SPREADERS
	2) BUFFERED OUTFALLS
	3) VEGETATION FILTERS
	4) SILT DEWATERING BAGS
	5) FLOW LIMITERS AND WEIRS



DRAINAGE DRAWING NOTES:

1. THESE DRAWING ARE PREPARED BASED ON THE PERMITTED 2D LAYOUT, AND PARTIAL 3D DESIGN PROVIDED BY THE CLIENT.
2. THESE DRAWINGS HAVE BEEN PREPARED USING AVAILABLE LIDAR TOPOGRAPHY DATA, NO DETAILED SITE SURVEY IS AVAILABLE.
3. WHERE POSSIBLE WE HAVE ATTEMPTED TO ACCOUNT FOR CHANGES IN GROUND LEVEL BASED ON SITE OBSERVATIONS, AND AVAILABLE AERIAL PHOTO INFORMATION.
4. SETTLEMENT PONDS AND NEW DRAIN LOCATIONS SHOWN ON THESE DRAWINGS ARE INDICATIVE, AND SUBJECT TO SITE PROFILING BY SITE ENGINEER.
5. SETTLEMENT POND SIZES AND LOCATIONS ARE INDICATIVE, AND NEED TO BE SCALED ACCORDING TO THE CATCHMENT DRAINING INTO EACH PROPOSED POND. THIS NEEDS TO BE DETERMINED ON THE GROUND. POND SIZES PER CATCHMENT AREA ARE OUTLINED IN THE TABLE PROVIDED WITHIN THIS DRAWING.

LEGEND

- RIVERS/STREAMS
- RIVERS/STREAMS 50M BUFFER
- EXISTING DRAIN
- EXISTING CULVERT
- FOREST DRAIN
- LAND STREAMS/DRAINS
- UPSTREAM INTERCEPTOR DRAIN
- SWALES/DOWNSTREAM COLLECTOR DRAIN
- DIRECTION OF FLOW
- SETTLEMENT POND
- CROSS DRAIN
- CHECK DAM 'TYPE A'
- CHECK DAM 'TYPE B'
- PROPOSED CULVERT
- SILT FENCE
- INTERCEPTOR DITCHES
- DIRECTION OF FLOW DRAINAGE SWALE - COLLECTOR DRAIN
- STILLING POND (STP)
- LEVEL SPREADER (LP)
- PLANNING BOUNDARY
- CUT AREA
- FILL AREA
- ROCK OUTCROPS (APPROX.)
- FARM ACCESS ROAD
- TRENCHES
- FOREST
- EXISTING GROUND SURFACE INTERMEDIATE CONTOUR (5 M INTERVAL)
- EXISTING GROUND SURFACE MINOR CONTOUR (1 M INTERVAL)
- TURBINE AND SWEEP AREA

DRAWING NOTES

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2. DO NOT SCALE OFF THIS DRAWING. FIGURED METRIC DIMENSIONS ONLY SHOULD BE TAKEN OFF THIS DRAWING.

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14.01.19	Construction	MG	MG
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Revisions			

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Client: **CLEANRATH WINDFARM LTD.**

Job: **CLEANRATH WIND FARM**

Title: **DRAINAGE PLAN**

Figure No: **D303**

Drawing No: P1272-4-0619-A3-D303-00A

Sheet Size: A3	Project No.: P1272-4
Scale: 1:2,000 (A3)	Drawn By: MG/GD
Date: 25/06/2019	Checked By: MG

DRAINAGE DESIGN NOTES:

1. ALL DRAINAGE SUBJECT TO MICRO-SITING AND OPTIMISATION ON SITE.
2. THE LOCATIONS OF THE INTERCEPTOR DRAINS, CHECK DAMS, CULVERTS, SWALES, STILLING 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 STILLING 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 LESS THE 6%.
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 TO BE VIA VEGETATED FILTERS. SELECTION OR SUITABLE AREAS TO USE TO BE VIA VEGETATED FILTERS.

AS VEGETATION FILTERS WILL BE DETERMINED BY THE SIZE OF THE CONTRIBUTING CATCHMENT, SLOPE AND GROUND CONDITIONS.

10. STILLING PONDS TO BE SIZED ACCORDING TO THE 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. EXISTING DRAINS/DITCHES TO BE INCORPORATED OR REMOVED DURING WIND FARM CONSTRUCTION.
13. ALL DRAINAGE SYSTEM FEATURES TO BE SUBJECT OF INSPECTION AND MAINTENANCE PLAN.
14. THE LAYOUT SHOWN IS SLIGHTLY OFFSET FOR SCALE PURPOSES, AND ALL DRAINAGE WOULD BE INSTALLED AS CLOSE TO THE ROAD AS POSSIBLE, AND WITHIN THE PLANNING BOUNDARY FOR THE DEVELOPMENT.

POLLUTION PREVENTION NOTES:

1. SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE COMPLETE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
2. SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
3. SILTY WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/DISTURBED GROUND, STOCKPILES, PLANT AND WHEEL WASH, SITE ROADS/TRACKS, AND DISTURBANCE OF STREAM/RIVER BEDS.

DISCHARGES

4. WATER CONTAINING SILT WILL NOT BE PUMPED DIRECTLY TO ANY WATERCOURSE / DRAIN / OR DITCH. ALL DISCHARGES TO BE MADE OVER OPEN VEGETATED GROUND AT A MINIMUM 20M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
5. A 15M BUFFER ZONE (OR GREATER) TO BE MAINTAINED AROUND ALL SENSITIVE WATERCOURSES AND WATERBODIES. NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
6. PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE.
7. PUMPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN 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 USE OF SPLASH PLATES, AND DISCHARGE CONTROLS.
8. VEGETATION WILL NOT BE STRIPPED FROM EXISTING DITCHES UNLESS ABSOLUTELY NECESSARY.

EXCAVATIONS

9. 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

10. THE AMOUNT OF EXPOSED GROUND AND STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED AS FAR AS PRACTICABLE.
11. TEMPORARY STOCKPILES WILL BE COVERED OR SEALED AS SOON AS POSSIBLE.
12. SILT FENCES WILL BE USED TO REDUCE SILTY RUNOFF FROM TEMPORARY PEAT STORAGE AREAS, AND/OR BARE PEAT AREAS AS REQUIRED.

SITE TRACKS

13. USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR FILTRATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER.
14. CHECK DAMS TO BE INSPECTED AND CLEANED REGULARLY.
15. DISCHARGES FROM SITE TRACKS WILL BE VIA OUTFALL SPILLWAYS, SETTLEMENT PONDS AND VEGETATION SWALES.

REFUELLING

16. REFUEL MOBILE PLANT IN DESIGNATED REFUELLING AREA ONLY, PREFERABLY ON AN IMPERMEABLE SURFACE AND AWAY FROM DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.
17. SPILL KITS AND DRIP TRAYS SHOULD BE AVAILABLE ON SITE.

CONCRETE

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

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

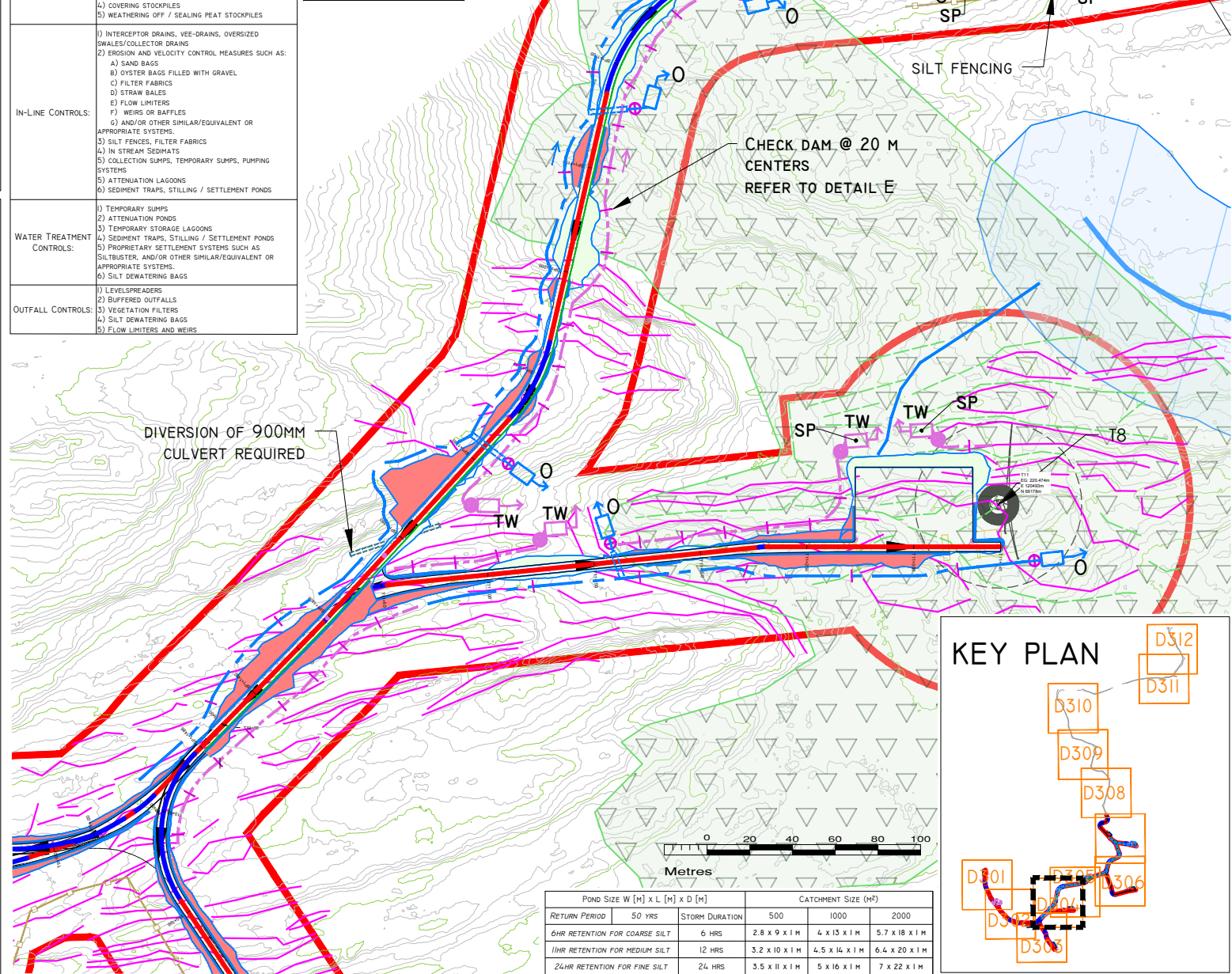
STOP - WORK IN THE IMMEDIATE AREA SHOULD BE STOPPED AND THE SOURCE OF THE POLLUTION IDENTIFIED.

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

MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE	
MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS	1) APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE 2) APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE 3) USING SMALL WORKING AREAS 4) WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHER
	1) USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE-DRAINS, DIVERSION DRAINS, FLUMES AND CULVERT PIPES 2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: A) SAND BAGS B) OYSTER BAGS FILLED WITH GRAVEL C) FILTER FABRICS D) AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS 3) USING SMALL WORKING AREAS 4) COVERING STOCKPILES 5) WEATHERING OFF / SEALING PEAT STOCKPILES
SOURCE CONTROLS	1) INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED SWALES/COLLECTOR DRAINS 2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: 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 6) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
	1) TEMPORARY SUMPS 2) ATTENUATION LAGOONS 3) TEMPORARY STORAGE LAGOONS 4) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS 5) PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTBUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. 6) SILT DEWATERING BAGS
IN-LINE CONTROLS	1) LEVEL SPREADERS 2) BUFFERED OUTFALLS 3) VEGETATION FILTERS 4) SILT DEWATERING BAGS 5) FLOW LIMITERS AND WEIRS
	1) TEMPORARY SUMPS 2) ATTENUATION LAGOONS 3) TEMPORARY STORAGE LAGOONS 4) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS 5) PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTBUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. 6) SILT DEWATERING BAGS
WATER TREATMENT CONTROLS	1) LEVEL SPREADERS 2) BUFFERED OUTFALLS 3) VEGETATION FILTERS 4) SILT DEWATERING BAGS 5) FLOW LIMITERS AND WEIRS
	1) TEMPORARY SUMPS 2) ATTENUATION LAGOONS 3) TEMPORARY STORAGE LAGOONS 4) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS 5) PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTBUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. 6) SILT DEWATERING BAGS
OUTFALL CONTROLS	1) LEVEL SPREADERS 2) BUFFERED OUTFALLS 3) VEGETATION FILTERS 4) SILT DEWATERING BAGS 5) FLOW LIMITERS AND WEIRS
	1) TEMPORARY SUMPS 2) ATTENUATION LAGOONS 3) TEMPORARY STORAGE LAGOONS 4) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS 5) PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTBUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. 6) SILT DEWATERING BAGS

DRAINAGE DRAWING NOTES:

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2. THESE DRAWINGS HAVE BEEN PREPARED USING AVAILABLE LIDAR TOPOGRAPHY DATA. NO DETAILED SITE SURVEY IS AVAILABLE.
3. WHERE POSSIBLE WE HAVE ATTEMPTED TO ACCOUNT FOR CHANGES IN GROUND LEVEL BASED ON SITE OBSERVATIONS, AND AVAILABLE AERIAL PHOTO INFORMATION.
4. SETTLEMENT PONDS AND NEW DRAIN LOCATIONS SHOWN ON THESE DRAWINGS ARE INDICATIVE, AND SUBJECT TO SITE PROOFING BY SITE ENGINEER.
5. SETTLEMENT POND SIZES AND LOCATIONS ARE INDICATIVE, AND NEED TO BE SCALED ACCORDING TO THE CATCHMENT DRAINING INTO EACH PROPOSED POND. THIS NEEDS TO BE DETERMINED ON THE GROUND. POND SIZES PER CATCHMENT AREA ARE OUTLINED IN THE TABLE PROVIDED WITHIN THIS DRAWING.



LEGEND

- RIVERS/STREAMS
- RIVERS/STREAMS 50M BUFFER
- EXISTING DRAIN
- EXISTING CULVERT
- FOREST DRAIN
- LAND STREAMS/DRAINS
- UPSTREAM INTERCEPTOR DRAIN
- SWALES/DOWNSTREAM COLLECTOR DRAIN
- DIRECTION OF FLOW
- SETTLEMENT POND
- CROSS DRAIN
- CHECK DAM 'TYPE A'
- CHECK DAM 'TYPE B'
- PROPOSED CULVERT
- SILT FENCE
- INTERCEPTOR DITCHES
- DIRECTION OF FLOW DRAINAGE SWALE - COLLECTOR DRAIN
- STILLING POND (STP)
- LEVEL SPREADER (LP)
- PLANNING BOUNDARY
- CUT AREA
- FILL AREA
- ROCK OUTCROPS (APPROX.)
- FARM ACCESS ROAD
- TRENCHES
- FOREST
- EXISTING GROUND SURFACE
- INTERMEDIATE CONTOUR (5 M INTERVAL)
- EXISTING GROUND SURFACE
- MINOR CONTOUR (1 M INTERVAL)
- TURBINE AND SWEEP AREA

DRAINAGE DRAWING NOTES:

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Date	Description	MG	MG
14.01.19	Construction		

Revisions

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Client: **CLEANRATH WINDFARM LTD.**

Job: **CLEANRATH WIND FARM**

Title: **DRAINAGE PLAN**

Figure No: **D304**

Drawing No: P1272-4-0619-A3-D304-00A

Sheet Size: A3 Project No.: P1272-4

Scale: 1:2,000 (A3) Drawn By: MG/GD

Date: 25/06/2019 Checked By: MG

DRAINAGE DESIGN NOTES:

1. ALL DRAINAGE SUBJECT TO MICRO-SITING AND OPTIMISATION ON SITE.
2. THE LOCATIONS OF THE INTERCEPTOR DRAINS, CHECK DAMS, CULVERTS, SWALES, STILLING 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 THEN THE DESIGN ELEVATION OF THE WATER SURFACE IN THE OUTLET AT THE LEVEL SPREADER OR STILLING 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 LESS THE 6%.
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 OF SUITABLE AREAS TO USE AS VEGETATION FILTERS WILL BE DETERMINED BY THE SIZE OF THE CONTRIBUTING CATCHMENT, SLOPE AND GROUND CONDITIONS.
10. STILLING PONDS TO BE SIZED ACCORDING TO THE 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. EXISTING DRAINS/DITCHES TO BE INCORPORATED OR REMOVED DURING WIND FARM CONSTRUCTION.
13. ALL DRAINAGE SYSTEM FEATURES TO BE SUBJECT OF INSPECTION AND MAINTENANCE PLAN.
14. THE LAYOUT SHOWN IS SLIGHTLY OFFSET FOR SCALE PURPOSES, AND ALL DRAINAGE WOULD BE INSTALLED AS CLOSE TO THE ROAD AS POSSIBLE, AND WITHIN THE PLANNING BOUNDARY FOR THE DEVELOPMENT.

POLLUTION PREVENTION NOTES:

1. SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE COMPLETE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
2. SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
3. SILTY WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/DISTURBED GROUND, STOCKPILES, PLANT AND WHEEL WASH, SITE ROADS/TRACKS, AND DISTURBANCE OF STREAM/RIVER BEDS.

DISCHARGES

4. WATER CONTAINING SILT WILL NOT BE PUMPED DIRECTLY TO ANY WATERCOURSE / DRAIN / OR DITCH. ALL DISCHARGES TO BE MADE OVER OPEN VEGETATED GROUND AT A MINIMUM 20M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
5. A 15M BUFFER ZONE (OR GREATER) TO BE MAINTAINED AROUND ALL SENSITIVE WATERCOURSES AND WATERBODIES. NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
6. PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE.
7. PUMPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN STREAMS WILL BE CONVEYED 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 USE OF SPLASH PLATES, AND DISCHARGE CONTROLS.
8. VEGETATION WILL NOT BE STRIPPED FROM EXISTING DITCHES UNLESS ABSOLUTELY NECESSARY.

EXCAVATIONS

9. 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

10. THE AMOUNT OF EXPOSED GROUND AND STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED AS FAR AS PRACTICABLE.
11. TEMPORARY STOCKPILES WILL BE COVERED OR SEALED AS SOON AS POSSIBLE.
12. SILT FENCES WILL BE USED TO REDUCE SILTY RUNOFF FROM TEMPORARY PEAT STORAGE AREAS, AND/OR BARE PEAT AREAS AS REQUIRED.

SITE TRACKS

13. USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR FILTRATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER.
14. CHECK DAMS TO BE INSPECTED AND CLEANED REGULARLY.
15. DISCHARGES FROM SITE TRACKS WILL BE VIA OUTFALL SPILLWAYS, SETTLEMENT PONDS AND VEGETATION SWALES.

REFUELLING

16. REFUEL MOBILE PLANT IN DESIGNATED REFUELLING AREA ONLY, PREFERABLY ON AN IMPERMEABLE SURFACE AND AWAY FROM DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.
17. SPILL KITS AND DRIP TRAYS SHOULD BE AVAILABLE ON SITE.

CONCRETE

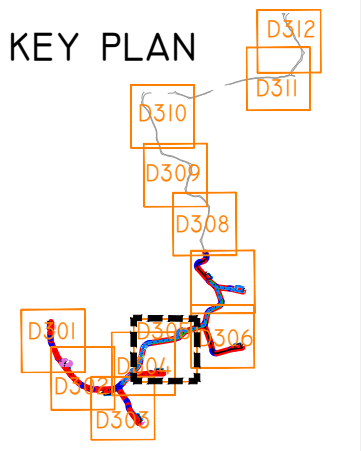
18. CARE WILL BE TAKEN WHEN COMPLETING CONCRETE WORKS ON SITE TO ENSURE NO DISCHARGES OCCUR.
19. CONCRETE WASH WATER, AND WASTE CONCRETE WILL BE MANAGED APPROPRIATELY ON SITE.

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

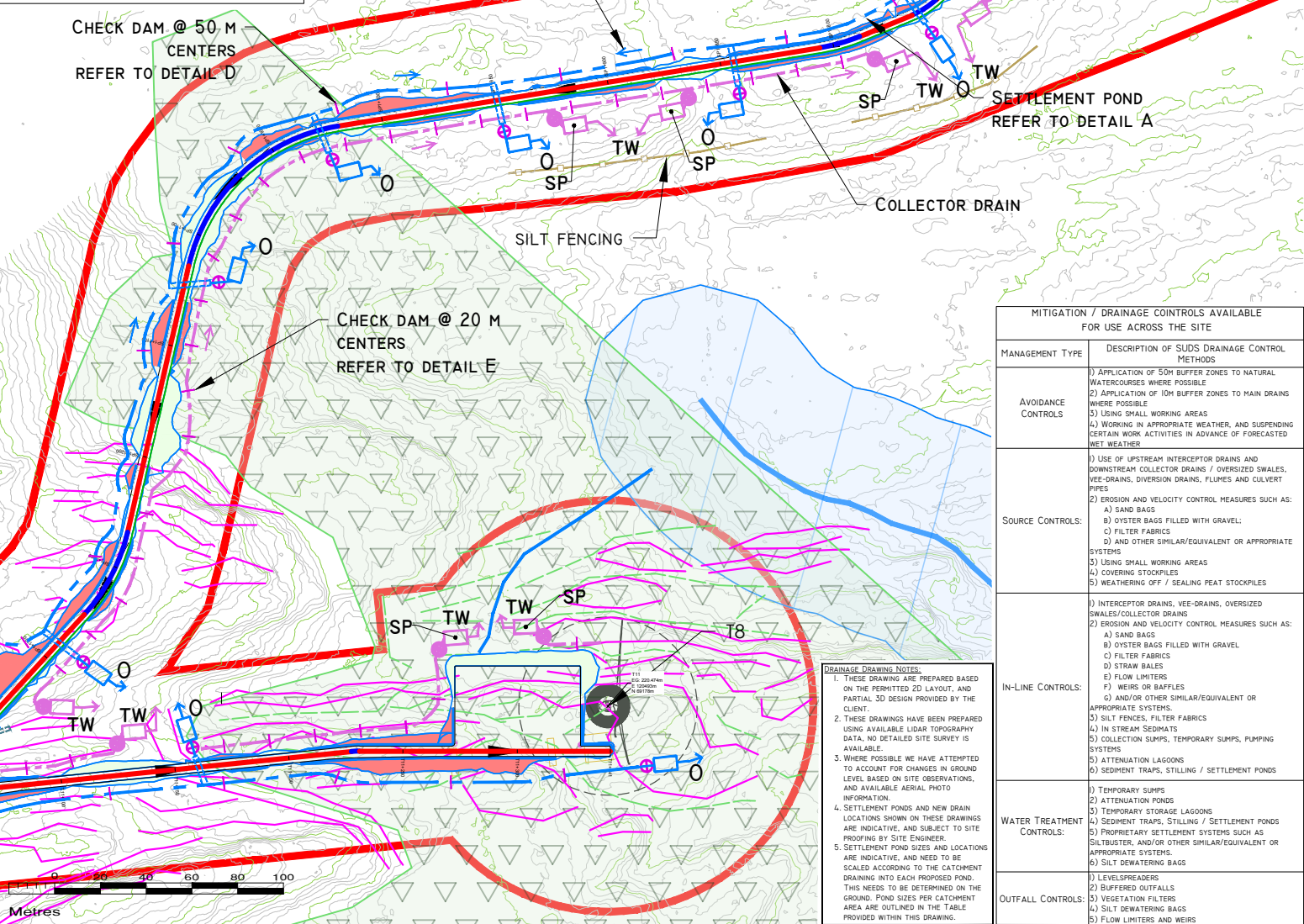
STOP - WORK IN THE IMMEDIATE AREA SHOULD BE STOPPED AND THE SOURCE OF THE POLLUTION IDENTIFIED.

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

KEY PLAN



POND SIZE W [m] x L [m] x D [m]	CATCHMENT SIZE (M²)		
	50 YRS	1000	2000
6HR RETENTION FOR COARSE SILT	6 HRS	2.8 x 9 x 1 M	4 x 13 x 1 M
12HR RETENTION FOR MEDIUM SILT	12 HRS	3.2 x 10 x 1 M	4.5 x 14 x 1 M
24HR RETENTION FOR FINE SILT	24 HRS	3.5 x 11 x 1 M	5 x 16 x 1 M
		5 x 16 x 1 M	7 x 22 x 1 M



DRAINAGE DRAWING NOTES:

1. THESE DRAWINGS ARE PREPARED BASED ON THE PERMITTED 2D LAYOUT, AND PARTIAL 3D DESIGN PROVIDED BY THE CLIENT.
2. THESE DRAWINGS HAVE BEEN PREPARED USING AVAILABLE LIDAR TOPOGRAPHY DATA, NO DETAILED SITE SURVEY IS AVAILABLE.
3. WHERE POSSIBLE WE HAVE ATTEMPTED TO ACCOUNT FOR CHANGES IN GROUND LEVEL BASED ON SITE OBSERVATIONS, AND AVAILABLE AERIAL PHOTO INFORMATION.
4. SETTLEMENT PONDS AND NEW DRAIN LOCATIONS SHOWN ON THESE DRAWINGS ARE INDICATIVE, AND SUBJECT TO SITE PROOFING BY SITE ENGINEER.
5. SETTLEMENT POND SIZES AND LOCATIONS ARE INDICATIVE, AND NEED TO BE SCALED ACCORDING TO THE CATCHMENT DRAINING INTO EACH PROPOSED POND. THIS NEEDS TO BE DETERMINED ON THE GROUND. POND SIZES PER CATCHMENT AREA ARE OUTLINED IN THE TABLE PROVIDED WITHIN THIS DRAWING.

MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE	
MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS	1) APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE 2) APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE 3) USING SMALL WORKING AREAS 4) WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHER.
	1) USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE-DRAINS, DIVERSION DRAINS, FLUMES AND CULVERT PIPES 2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: A) SAND BAGS B) OYSTER BAGS FILLED WITH GRAVEL C) FILTER FABRICS D) AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS 3) USING SMALL WORKING AREAS 4) COVERING STOCKPILES 5) WEATHERING OFF / SEALING PEAT STOCKPILES
SOURCE CONTROLS:	1) INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED SWALES/COLLECTOR DRAINS 2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: A) SAND BAGS B) OYSTER BAGS FILLED WITH GRAVEL C) FILTER FABRICS D) AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS 3) USING SMALL WORKING AREAS 4) COVERING STOCKPILES 5) WEATHERING OFF / SEALING PEAT STOCKPILES
IN-LINE CONTROLS:	1) SAND BAGS 2) OYSTER BAGS FILLED WITH GRAVEL 3) FILTER FABRICS 4) FLOW LIMITERS 5) WEIRS OR BAFFLES 6) AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. 7) SILT FENCES, FILTER FABRICS 8) IN STREAM SEDIMENTS 9) COLLECTION Sumps, TEMPORARY Sumps, PUMPING SYSTEMS 10) ATTENUATION LAGOONS 11) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
WATER TREATMENT CONTROLS:	1) TEMPORARY Sumps 2) ATTENUATION PONDS 3) TEMPORARY STORAGE LAGOONS 4) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS 5) PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTBUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. 6) SILT DEWATERING BAGS
OUTFALL CONTROLS:	1) LEVEL SPREADERS 2) BUFFERED OUTFALLS 3) VEGETATION FILTERS 4) SILT DEWATERING BAGS 5) FLOW LIMITERS AND WEIRS

LEGEND

- RIVERS/STREAMS
- RIVERS/STREAMS 50M BUFFER
- EXISTING DRAIN
- EXISTING CULVERT
- FOREST DRAIN
- LAND STREAMS/DRAINS
- UPSTREAM INTERCEPTOR DRAIN
- SWALES/DOWNSTREAM COLLECTOR DRAIN
- DIRECTION OF FLOW
- SETTLEMENT POND
- CROSS DRAIN
- CHECK DAM 'TYPE A'
- CHECK DAM 'TYPE B'
- PROPOSED CULVERT
- SILT FENCE
- INTERCEPTOR DITCHES
- DIRECTION OF FLOW DRAINAGE SWALE - COLLECTOR DRAIN
- STILLING POND (STP)
- LEVEL SPREADER (LP)
- PLANNING BOUNDARY
- CUT AREA
- FILL AREA
- ROCK OUTCROPS (APPROX.)
- FARM ACCESS ROAD
- TRENCHES
- FOREST
- EXISTING GROUND SURFACE INTERMEDIATE CONTOUR (5 M INTERVAL)
- EXISTING GROUND SURFACE MINOR CONTOUR (1 M INTERVAL)
- TURBINE AND SWEEP AREA

DRAWING NOTES

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2. DO NOT SCALE OFF THIS DRAWING. FIGURED METRIC DIMENSIONS ONLY SHOULD BE TAKEN OFF THIS DRAWING.

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Client: **CLEANRATH WINDFARM LTD.**

Job: **CLEANRATH WIND FARM**

Title: **DRAINAGE PLAN**

Figure No:	D305
Drawing No:	P1272-4-0619-A3-D305-00A
Sheet Size:	A3
Scale:	1:2,000 (A3)
Date:	25/06/2019
Drawn By:	MG/GD
Checked By:	MG

DRAINAGE DESIGN NOTES:

1. ALL DRAINAGE SUBJECT TO MICRO-SITING AND OPTIMISATION ON SITE.
2. THE LOCATIONS OF THE INTERCEPTOR DRAINS, CHECK DAMS, CULVERTS, SWALES, STILLING 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 STILLING 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 LESS THE 6%.
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. STILLING PONDS TO BE SIZED ACCORDING TO THE 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. EXISTING DRAINS/DITCHES TO BE INCORPORATED OR REMOVED DURING WIND FARM CONSTRUCTION.
13. ALL DRAINAGE SYSTEM FEATURES TO BE SUBJECT OF INSPECTION AND MAINTENANCE PLAN.
14. THE LAYOUT SHOWN IS SLIGHTLY OFFSET FOR SCALE PURPOSES, AND ALL DRAINAGE WOULD BE INSTALLED AS CLOSE TO THE ROAD AS POSSIBLE, AND WITHIN THE PLANNING BOUNDARY FOR THE DEVELOPMENT.

POLLUTION PREVENTION NOTES:

1. SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE COMPLETE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
2. SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
3. SILTY WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/DISTURBED GROUND, STOCKPILES, PLANT AND WHEEL WASH, SITE ROADS/TRACKS, AND DISTURBANCE OF STREAM/RIVER BEDS.
4. WATER CONTAINING SILT WILL NOT BE PUMPED DIRECTLY TO ANY WATERCOURSE / DRAIN / OR DITCH. ALL DISCHARGES TO BE MADE OVER OPEN VEGETATED GROUND AT A MINIMUM 20M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
5. A 15M BUFFER ZONE (OR GREATER) TO BE MAINTAINED AROUND ALL SENSITIVE WATERCOURSES AND WATERBODIES. NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
6. PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE.
7. PUMPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN STREAMS WILL BE CONSIDERED 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 USE OF SPLASH PLATES, AND DISCHARGE CONTROLS.
8. VEGETATION WILL NOT BE STRIPPED FROM EXISTING DITCHES UNLESS ABSOLUTELY NECESSARY.
9. 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.
10. THE AMOUNT OF EXPOSED GROUND AND STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED AS FAR AS PRACTICABLE.
11. TEMPORARY STOCKPILES WILL BE COVERED OR SEALED AS SOON AS POSSIBLE.
12. SILT FENCES WILL BE USED TO REDUCE SILTY RUNOFF FROM TEMPORARY PEAT STORAGE AREAS, AND/OR BARE PEAT AREAS AS REQUIRED.

EXCAVATIONS

EXPOSED GROUND & STOCKPILES

1. THE AMOUNT OF EXPOSED GROUND AND STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED AS FAR AS PRACTICABLE.
1. TEMPORARY STOCKPILES WILL BE COVERED OR SEALED AS SOON AS POSSIBLE.
2. SILT FENCES WILL BE USED TO REDUCE SILTY RUNOFF FROM TEMPORARY PEAT STORAGE AREAS, AND/OR BARE PEAT AREAS AS REQUIRED.

SITE TRACKS

1. USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR FILTRATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER.
2. CHECK DAMS TO BE INSPECTED AND CLEANED REGULARLY.
3. DISCHARGES FROM SITE TRACKS WILL BE VIA OUTFALL SPILLWAYS, SETTLEMENT PONDS AND VEGETATION SWALES.

REFUELLING

1. REFUEL MOBILE PLANT IN DESIGNATED REFUELLING AREA ONLY, PREFERABLY ON AN IMPERMEABLE SURFACE AND AWAY FROM DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.
2. SPILL KITS AND DRIP TRAYS SHOULD BE AVAILABLE ON SITE.

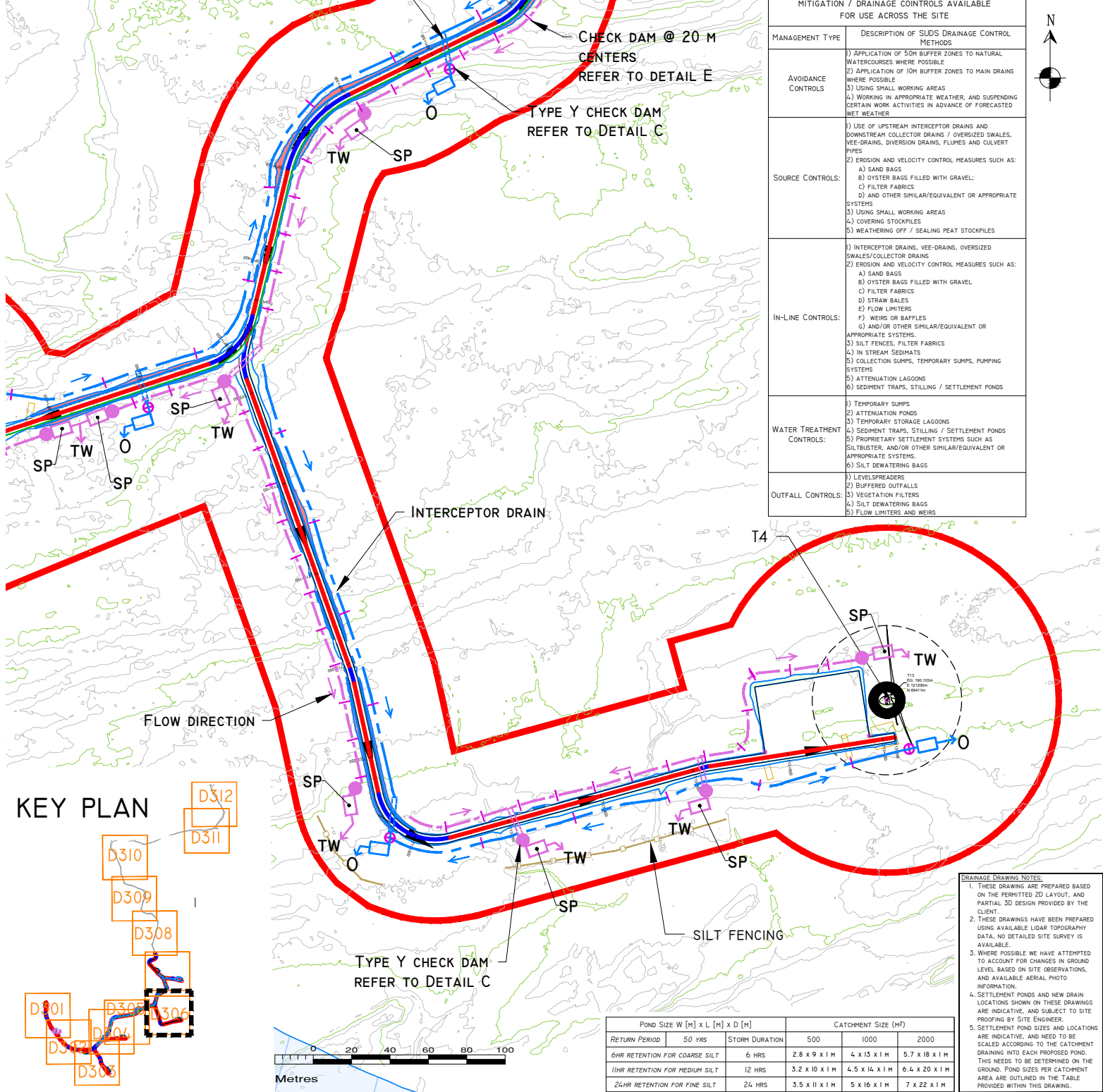
CONCRETE

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



MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE	
MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS	1) APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE
	2) APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE
SOURCE CONTROLS	1) USING SMALL WORKING AREAS
	2) WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHER
IN-LINE CONTROLS	1) USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE-DRAINS, DIVERSION DRAINS, FLUMES AND CULVERT PIPES
	2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: 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
WATER TREATMENT CONTROLS	1) INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED SWALES/COLLECTOR DRAINS
	2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: 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
OUTFALL CONTROLS	1) TEMPORARY SUMPS
	2) ATTENUATION PONDS
OUTFALL CONTROLS	3) TEMPORARY STORAGE LAAGOONS
	4) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
OUTFALL CONTROLS	5) PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTBUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS
	6) SILT DEWATERING BAGS
OUTFALL CONTROLS	1) LEVELSPREADERS
	2) BUFFERED OUTFALLS
OUTFALL CONTROLS	3) VEGETATION FILTERS
	4) SILT DEWATERING BAGS
OUTFALL CONTROLS	5) FLOW LIMITERS AND WEIRS

LEGEND

- RIVERS/STREAMS
- RIVERS/STREAMS 50M BUFFER
- EXISTING DRAIN
- EXISTING CULVERT
- FOREST DRAIN
- LAND STREAMS/DRAINS
- UPSTREAM INTERCEPTOR DRAIN
- SWALES/DOWNSTREAM COLLECTOR DRAIN
- DIRECTION OF FLOW
- SETTLEMENT POND
- CROSS DRAIN
- CHECK DAM 'TYPE A'
- CHECK DAM 'TYPE B'
- PROPOSED CULVERT
- SILT FENCE
- INTERCEPTOR DITCHES
- DIRECTION OF FLOW DRAINAGE SWALE - COLLECTOR DRAIN
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- LEVEL SPREADER (LP)
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- CUT AREA
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- EXISTING GROUND SURFACE MINOR CONTOUR (1 M INTERVAL)
- TURBINE AND SWEEP AREA

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Date	Description	Chkd	Signed

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Client: **CLEANRATH WINDFARM LTD.**

Job: **CLEANRATH WIND FARM**

Title: **DRAINAGE PLAN**

Figure No: **D306**

Drawing No: **P1272-4-0619-A3-D306-00A**

Sheet Size: **A3** Project No: **P1272-4**

Scale: **1:2,000 (A3)** Drawn By: **MG/GD**

Date: **25/06/2019** Checked By: **MG**

POND SIZE W [M] x L [M] x D [M]	CATCHMENT SIZE (H ²)		
	500	1000	2000
6HR RETENTION FOR COARSE SILT	2.8 x 9 x 1 m	4 x 15 x 1 m	5.7 x 18 x 1 m
12HR RETENTION FOR MEDIUM SILT	3.2 x 10 x 1 m	4.5 x 14 x 1 m	6.4 x 20 x 1 m
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3. WHERE POSSIBLE WE HAVE ATTEMPTED TO ACCOUNT FOR CHANGES IN GROUND LEVEL BASED ON SITE OBSERVATIONS, AND AVAILABLE AERIAL PHOTO INFORMATION.
4. SETTLEMENT PONDS AND NEW DRAIN LOCATIONS SHOWN ON THESE DRAWINGS ARE INDICATIVE, AND SUBJECT TO SITE PROOFING BY SITE ENGINEER.
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DRAINAGE DESIGN NOTES:

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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 STILLING 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 LESS THE 6%.
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.
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13. ALL DRAINAGE SYSTEM FEATURES TO BE SUBJECT OF INSPECTION AND MAINTENANCE PLAN.
14. THE LAYOUT SHOWN IS SLIGHTLY OFFSET FOR SCALE PURPOSES, AND ALL DRAINAGE WOULD BE INSTALLED AS CLOSE TO THE ROAD AS POSSIBLE, AND WITHIN THE PLANNING BOUNDARY FOR THE DEVELOPMENT.

POLLUTION PREVENTION NOTES:

1. SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE COMPLETE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
2. SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
3. SILTY WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/DISTURBED GROUND, STOCKPILES, PLANT AND WHEEL WASH, SITE ROADS/TRACKS, AND DISTURBANCE OF STREAM/RIVER BEDS.

DISCHARGES

4. WATER CONTAINING SILT WILL NOT BE PUMPED DIRECTLY TO ANY WATERCOURSE / DRAIN / OR DITCH. ALL DISCHARGES TO BE MADE OVER OPEN VEGETATED GROUND AT A MINIMUM 20M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
5. A 15M BUFFER ZONE (OR GREATER) TO BE MAINTAINED AROUND ALL SENSITIVE WATERCOURSES AND WATERBODIES. NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
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7. PUMPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN 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 USE OF SPLASH PLATES, AND DISCHARGE CONTROLS.
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EXCAVATIONS

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10. THE AMOUNT OF EXPOSED GROUND AND STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED AS FAR AS PRACTICABLE.
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REFUELLING

16. REFUEL MOBILE PLANT IN DESIGNATED REFUELLING AREA ONLY, PREFERABLY ON AN IMPERMEABLE SURFACE AND AWAY FROM DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.
17. SPILL KITS AND DRIP TRAYS SHOULD BE AVAILABLE ON SITE.

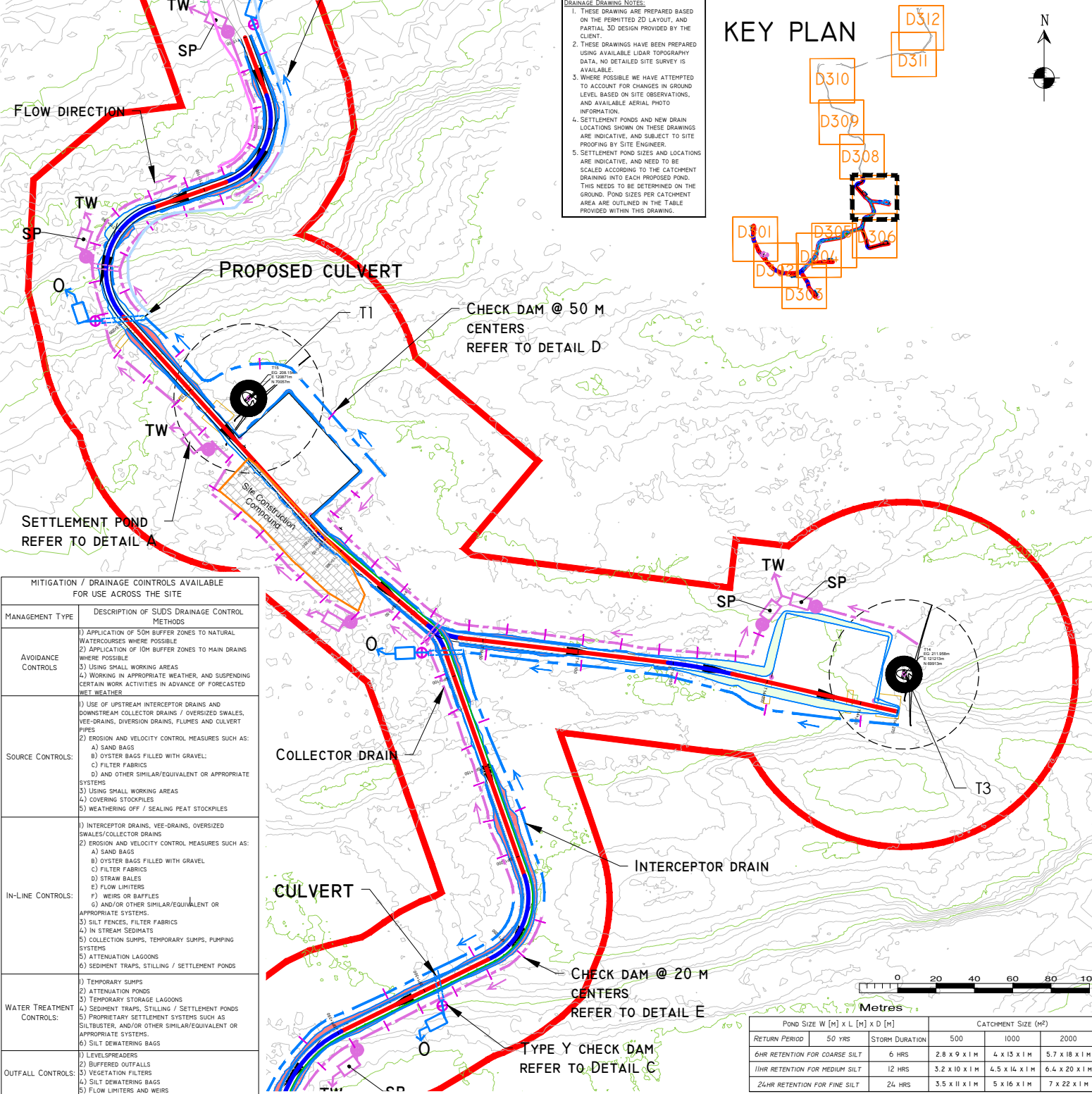
CONCRETE

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

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

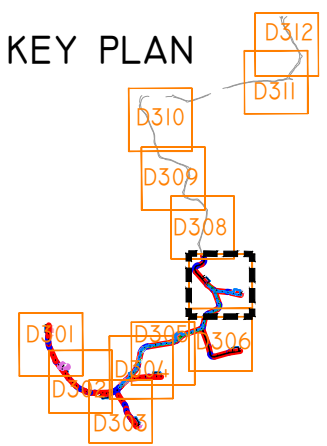
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3. WHERE POSSIBLE WE HAVE ATTEMPTED TO ACCOUNT FOR CHANGES IN GROUND LEVEL BASED ON SITE OBSERVATIONS, AND AVAILABLE AERIAL PHOTO INFORMATION.
4. SETTLEMENT PONDS AND NEW DRAIN LOCATIONS SHOWN ON THESE DRAWINGS ARE INDICATIVE, AND SUBJECT TO SITE PROOFING BY SITE ENGINEER.
5. SETTLEMENT POND SIZES AND LOCATIONS ARE INDICATIVE, AND NEED TO BE SCALED ACCORDING TO THE CATCHMENT DRAINING INTO EACH PROPOSED POND. THIS NEEDS TO BE DETERMINED ON THE GROUND. POND SIZES PER CATCHMENT AREA ARE OUTLINED IN THE TABLE PROVIDED WITHIN THIS DRAWING.

KEY PLAN



LEGEND

- RIVERS/STREAMS
- RIVERS/STREAMS 50M BUFFER
- EXISTING DRAIN
- EXISTING CULVERT
- FOREST DRAIN
- LAND STREAMS/DRAINS
- UPSTREAM INTERCEPTOR DRAIN
- SWALES/DOWNSTREAM COLLECTOR DRAIN
- DIRECTION OF FLOW
- SETTLEMENT POND
- CROSS DRAIN
- CHECK DAM 'TYPE A'
- CHECK DAM 'TYPE B'
- PROPOSED CULVERT
- SILT FENCE
- INTERCEPTOR DITCHES
- DIRECTION OF FLOW
- DRAINAGE SWALE - COLLECTOR DRAIN
- STILLING POND (STP)
- LEVEL SPREADER (LP)
- PLANNING BOUNDARY
- CUT AREA
- FILL AREA
- ROCK OUTCROPS (APPROX.)
- FARM ACCESS ROAD
- TRENCHES
- FOREST
- EXISTING GROUND SURFACE
- INTERMEDIATE CONTOUR (5 M INTERVAL)
- EXISTING GROUND SURFACE
- MINOR CONTOUR (1 M INTERVAL)
- TURBINE AND SWEEP AREA

DRAINAGE

DRAINAGE

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14.01.19	Construction	MG	MG
Date	Description	Chkd	Signed

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web: www.hydroenvironmental.ie

Client: **CLEANRATH WINDFARM LTD.**

Job: **CLEANRATH WIND FARM**

Title: **DRAINAGE PLAN**

Figure No: **D307**

Drawing No: P1272-4-0619-A3-D307-00A	Project No.: P1272-4
Sheet Size: A3	Drawn By: MG/GD
Scale: 1:2,000 (A3)	Checked By: MG
Date: 25/06/2019	

POND SIZE W [m] x L [m] x D [m]			CATCHMENT SIZE (Hr)		
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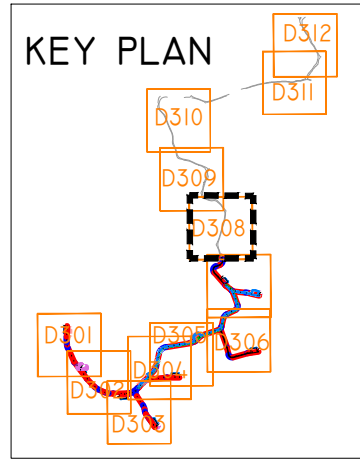
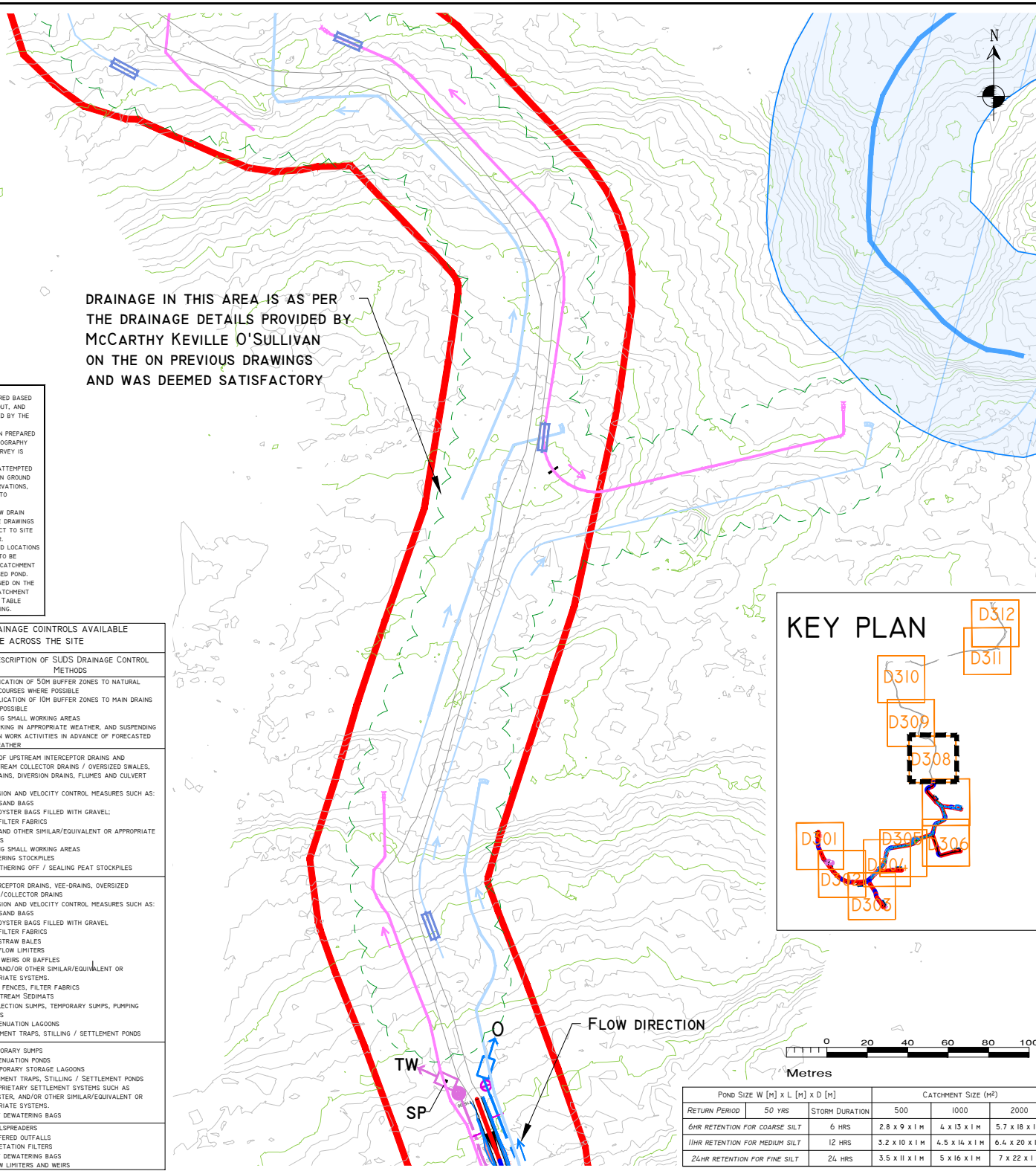
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MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE	
MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS	1) APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE
	2) APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE
SOURCE CONTROLS:	3) USING SMALL WORKING AREAS
	4) WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHER
SOURCE CONTROLS:	1) USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE-DRAINS, DIVERSION DRAINS, FLUMES AND CULVERT PIPES
	2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: A) SAND BAGS B) OYSTER BAGS FILLED WITH GRAVEL C) FILTER FABRICS D) AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS
IN-LINE CONTROLS:	3) USING SMALL WORKING AREAS
	4) COVERING STOCKPILES
IN-LINE CONTROLS:	5) WEATHERING OFF / SEALING PEAT STOCKPILES
	1) INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED SWALES/COLLECTOR DRAINS
IN-LINE CONTROLS:	2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: 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
WATER TREATMENT CONTROLS:	4) IN STREAM SEDIMENTS
	5) COLLECTION SUMPS, TEMPORARY SUMPS, PUMPING SYSTEMS
WATER TREATMENT CONTROLS:	6) ATTENUATION LAGOONS
	6) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
WATER TREATMENT CONTROLS:	1) TEMPORARY SUMPS
	2) TEMPORARY PONDS
WATER TREATMENT CONTROLS:	3) TEMPORARY STORAGE LAGOONS
	4) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
WATER TREATMENT CONTROLS:	5) PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTBUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS.
	6) SILT DEWATERING BAGS
OUTFALL CONTROLS:	1) LEVEL SPREADERS
	2) BUFFERED OUTFALLS
OUTFALL CONTROLS:	3) VEGETATION FILTERS
	4) SILT DEWATERING BAGS
OUTFALL CONTROLS:	5) FLOW LIMITERS AND WEIRS

DRAINAGE IN THIS AREA IS AS PER THE DRAINAGE DETAILS PROVIDED BY MCCARTHY KEVILLE O'SULLIVAN ON THE ON PREVIOUS DRAWINGS AND WAS DEEMED SATISFACTORY



POND SIZE W [m] x L [m] x D [m]			CATCHMENT SIZE (m²)		
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- LEGEND**
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 - EXISTING DRAIN
 - EXISTING CULVERT
 - FOREST DRAIN
 - LAND STREAMS/DRAINS
 - UPSTREAM INTERCEPTOR DRAIN
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 - SETTLEMENT POND
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 - INTERCEPTOR DITCHES
 - DIRECTION OF FLOW DRAINAGE SWALE - COLLECTOR DRAIN
 - STILLING POND (STP)
 - LEVEL SPREADER (LP)
 - PLANNING BOUNDARY
 - CUT AREA
 - FILL AREA
 - ROCK OUTCROPS (APPROX.)
 - FARM ACCESS ROAD
 - TRENCHES
 - FOREST
 - EXISTING GROUND SURFACE INTERMEDIATE CONTOUR (5 M INTERVAL)
 - EXISTING GROUND SURFACE MINOR CONTOUR (1 M INTERVAL)
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Date	Description	Chkd	Signed

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web: www.hydroenvironmental.ie

Client: **CLEANRATH WINDFARM LTD.**

Job: **CLEANRATH WIND FARM**

Title: **DRAINAGE PLAN**

Figure No: **D308**

Drawing No: P1272-4-0619-A3-D308-00A
Sheet Size: A3 Project No.: P1272-4
Scale: 1:2,000 (A3) Drawn By: MG/GD
Date: 25/06/2019 Checked By: MG

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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.

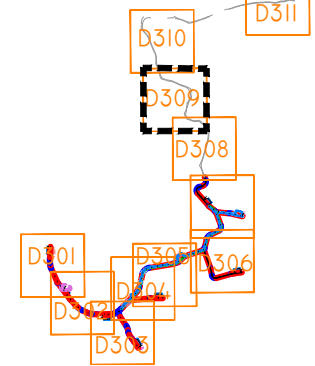
DRAINAGE DRAWING NOTES:

1. THESE DRAWING ARE PREPARED BASED ON THE PERMITTED 2D LAYOUT, AND PARTIAL 3D DESIGN PROVIDED BY THE CLIENT.
2. THESE DRAWINGS HAVE BEEN PREPARED USING AVAILABLE LIDAR TOPOGRAPHY DATA, NO DETAILED SITE SURVEY IS AVAILABLE.
3. WHERE POSSIBLE WE HAVE ATTEMPTED TO ACCOUNT FOR CHANGES IN GROUND LEVEL BASED ON SITE OBSERVATIONS, AND AVAILABLE AERIAL PHOTO INFORMATION.
4. SETTLEMENT PONDS AND NEW DRAIN LOCATIONS SHOWN ON THESE DRAWINGS ARE INDICATIVE, AND SUBJECT TO SITE PROOFING BY SITE ENGINEER.
5. SETTLEMENT POND SIZES AND LOCATIONS ARE INDICATIVE, AND NEED TO BE SCALED ACCORDING TO THE CATCHMENT DRAINING INTO EACH PROPOSED POND. THIS NEEDS TO BE DETERMINED ON THE GROUND. POND SIZES PER CATCHMENT AREA ARE OUTLINED IN THE TABLE PROVIDED WITHIN THIS DRAWING.

MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE	
MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS	1) APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE
	2) APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE
SOURCE CONTROLS:	3) USING SMALL WORKING AREAS
	4) WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHER
IN-LINE CONTROLS:	1) USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE-DRAINS, DIVERSION DRAINS, FLUMES AND CULVERT PIPES
	2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: A) SAND BAGS B) OYSTER BAGS FILLED WITH GRAVEL C) FILTER FABRICS D) AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS
WATER TREATMENT CONTROLS:	3) SILT FENCES, FILTER FABRICS
	4) IN STREAM SEDIMENTS
OUTFALL CONTROLS:	5) COLLECTION SUMPS, TEMPORARY SUMPS, PUMPING SYSTEMS
	6) ATTENUATION LAGOONS
OUTFALL CONTROLS:	1) TEMPORARY SUMPS
	2) ATTENUATION PONDS
OUTFALL CONTROLS:	3) TEMPORARY STORAGE LAGOONS
	4) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
OUTFALL CONTROLS:	5) PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTBLUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS.
	6) SILT DEWATERING BAGS
OUTFALL CONTROLS:	1) LEVEL SPREADERS
	2) BUFFERED OUTFALLS
OUTFALL CONTROLS:	3) VEGETATION FILTERS
	4) SILT DEWATERING BAGS
OUTFALL CONTROLS:	5) FLOW LIMITERS AND WEIRS

DRAINAGE IN THIS AREA IS AS PER THE DRAINAGE DETAILS PROVIDED BY MCCARTHY KEVILLE O'SULLIVAN ON THE ON PREVIOUS DRAWINGS AND WAS DEEMED SATISFACTORY

KEY PLAN



POND SIZE W [m] x L [m] x D [m]			CATCHMENT SIZE (M²)		
RETURN PERIOD	50 YRS	STORM DURATION	500	1000	2000
6HR RETENTION FOR COARSE SILT	6 HRS		2.8 x 9 x 1 M	4 x 13 x 1 M	5.7 x 18 x 1 M
11HR RETENTION FOR MEDIUM SILT	12 HRS		3.2 x 10 x 1 M	4.5 x 14 x 1 M	6.4 x 20 x 1 M
24HR RETENTION FOR FINE SILT	24 HRS		3.5 x 11 x 1 M	5 x 16 x 1 M	7 x 22 x 1 M

- LEGEND**
- RIVERS/STREAMS
 - RIVERS/STREAMS 50M BUFFER
 - EXISTING DRAIN
 - EXISTING CULVERT
 - FOREST DRAIN
 - LAND STREAMS/DRAINS
 - UPSTREAM INTERCEPTOR DRAIN
 - SWALES/DOWNSTREAM COLLECTOR DRAIN
 - DIRECTION OF FLOW
 - SETTLEMENT POND
 - CROSS DRAIN
 - CHECK DAM 'TYPE A'
 - CHECK DAM 'TYPE B'
 - PROPOSED CULVERT
 - SILT FENCE
 - INTERCEPTOR DITCHES
 - DIRECTION OF FLOW DRAINAGE SWALE - COLLECTOR DRAIN
 - STILLING POND (STP)
 - LEVEL SPREADER (LP)
 - PLANNING BOUNDARY
 - CUT AREA
 - FILL AREA
 - ROCK OUTCROPS (APPROX.)
 - FARM ACCESS ROAD
 - TRENCHES
 - FOREST
 - EXISTING GROUND SURFACE INTERMEDIATE CONTOUR (5 M INTERVAL)
 - EXISTING GROUND SURFACE MINOR CONTOUR (1 M INTERVAL)
 - TURBINE AND SWEEP AREA

DRAWING NOTES

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2. DO NOT SCALE OFF THIS DRAWING. FIGURED METRIC DIMENSIONS ONLY SHOULD BE TAKEN OFF THIS DRAWING.

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14.01.19	Construction	MG	MG
Date	Description	Chkd	Signed
Revisions			

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web: www.hydroenvironmental.ie

Client: **CLEANRATH WINDFARM LTD.**

Job: **CLEANRATH WIND FARM**

Title: **DRAINAGE PLAN**

Figure No: **D309**

Drawing No: P1272-4-0619-A3-D309-00A
Sheet Size: A3 Project No.: P1272-4
Scale: 1:2,000 (A3) Drawn By: MG/GD
Date: 25/06/2019 Checked By: MG

- DRAINAGE DESIGN NOTES:**
1. ALL DRAINAGE SUBJECT TO MICRO-SITING AND OPTIMISATION ON SITE.
 2. THE LOCATIONS OF THE INTERCEPTOR DRAINS, CHECK DAMS, CULVERTS, SWALES, STILLING 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 THEN THE DESIGN ELEVATION OF THE WATER SURFACE IN THE OUTLET AT THE LEVEL SPREADER OR STILLING 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 LESS THE 6%.
 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. STILLING PONDS TO BE SIZED ACCORDING TO THE 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. EXISTING DRAINS/DITCHES TO BE INCORPORATED OR REMOVED DURING WIND FARM CONSTRUCTION.
 13. ALL DRAINAGE SYSTEM FEATURES TO BE SUBJECT OF INSPECTION AND MAINTENANCE PLAN.
 14. THE LAYOUT SHOWN IS SLIGHTLY OFFSET FOR SCALE PURPOSES, AND ALL DRAINAGE WOULD BE INSTALLED AS CLOSE TO THE ROAD AS POSSIBLE, AND WITHIN THE PLANNING BOUNDARY FOR THE DEVELOPMENT.

POLLUTION PREVENTION NOTES:

1. SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE COMPLETE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
2. SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
3. SILTY WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/DISTURBED GROUND, STOCKPILES, PLANT AND WHEEL WASH, SITE ROADS/TRACKS, AND DISTURBANCE OF STREAM/RIVER BEDS.

DISCHARGES

4. WATER CONTAINING SILT WILL NOT BE PUMPED DIRECTLY TO ANY WATERCOURSE / DRAIN / OR DITCH. ALL DISCHARGES TO BE MADE OVER OPEN VEGETATED GROUND AT A MINIMUM 20M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
5. A 15M BUFFER ZONE (OR GREATER) TO BE MAINTAINED AROUND ALL SENSITIVE WATERCOURSES AND WATERBODIES.
6. NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
7. PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE.
8. PUMPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN 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 USE OF SPLASH PLATES, AND DISCHARGE CONTROLS.
9. VEGETATION WILL NOT BE STRIPPED FROM EXISTING DITCHES UNLESS ABSOLUTELY NECESSARY.

EXCAVATIONS

9. 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

10. THE AMOUNT OF EXPOSED GROUND AND STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED AS FAR AS PRACTICABLE.
11. TEMPORARY STOCKPILES WILL BE COVERED OR SEALED AS SOON AS POSSIBLE.
12. SILT FENCES WILL BE USED TO REDUCE SILTY RUNOFF FROM TEMPORARY PEAT STORAGE AREAS, AND/OR BARE PEAT AREAS AS REQUIRED.

SITE TRACKS

13. USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR FILTRATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER.
14. CHECK DAMS TO BE INSPECTED AND CLEANED REGULARLY.
15. DISCHARGES FROM SITE TRACKS WILL BE VIA OUTFALL SPILLWAYS, SETTLEMENT PONDS AND VEGETATION SWALES.

REFUELING

16. REFUEL MOBILE PLANT IN DESIGNATED REFUELING AREA ONLY, PREFERABLY ON AN IMPERMEABLE SURFACE AND AWAY FROM DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.
17. SPILL KITS AND DRIP TRAYS SHOULD BE AVAILABLE ON SITE.

CONCRETE

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

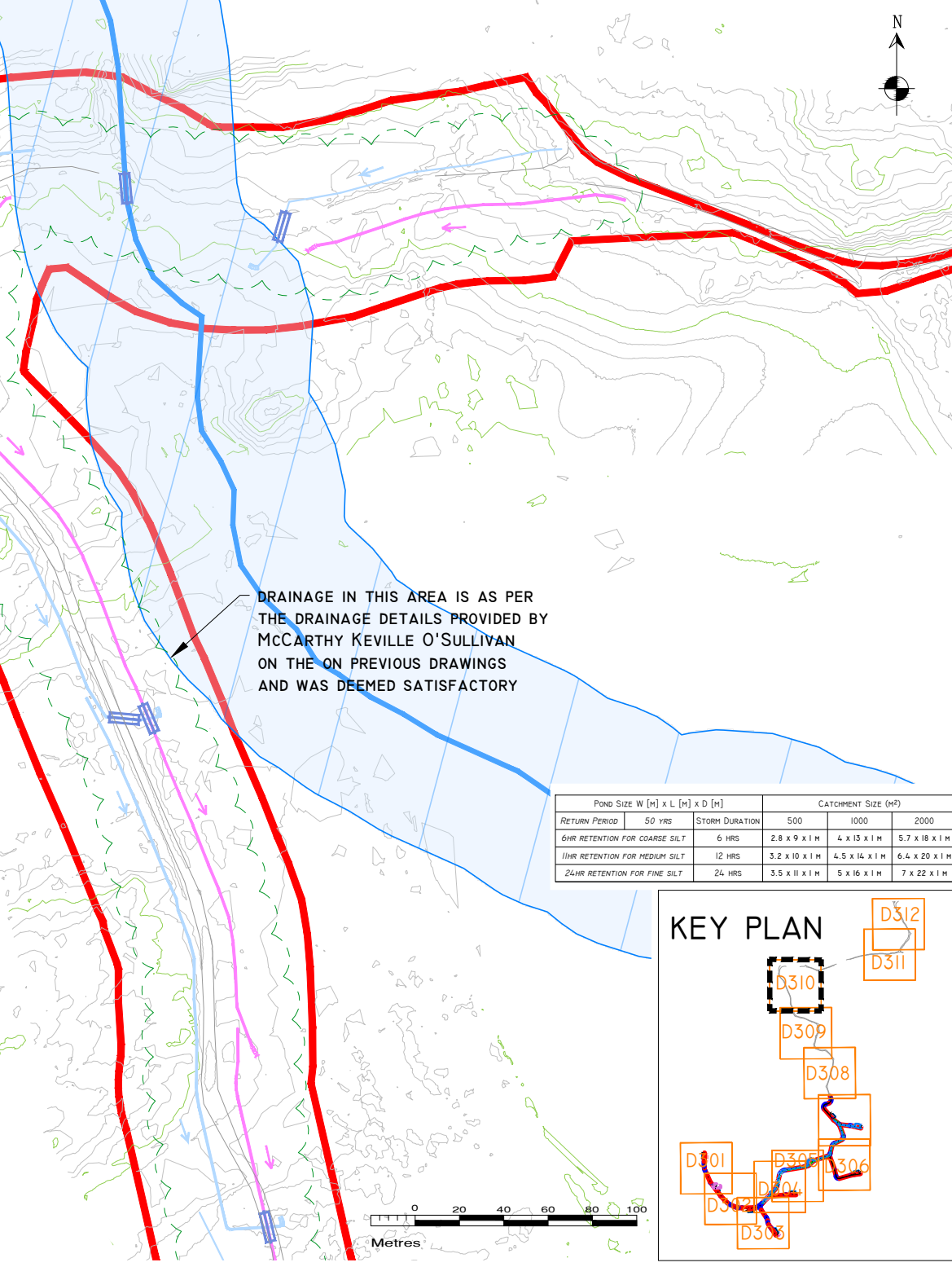
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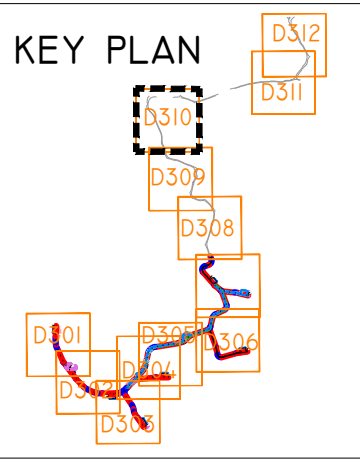
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 3. WHERE POSSIBLE WE HAVE ATTEMPTED TO ACCOUNT FOR CHANGES IN GROUND LEVEL BASED ON SITE OBSERVATIONS, AND AVAILABLE AERIAL PHOTO INFORMATION.
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MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE	
MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS	1) APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE
	2) APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE
SOURCE CONTROLS:	3) USING SMALL WORKING AREAS
	4) WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHER
IN-LINE CONTROLS:	1) USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE-GRAINS, DIVERSION DRAINS, FLUMES AND CULVERT PIPES
	2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: A) SAND BAGS B) OYSTER BAGS FILLED WITH GRAVEL C) FILTER FABRICS D) AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS
WATER TREATMENT CONTROLS:	3) SILT FENCES, FILTER FABRICS
	4) IN STREAM SEDIMENTS
OUTFALL CONTROLS:	5) COLLECTION SUMPS, TEMPORARY SUMPS, PUMPING SYSTEMS
	6) SEDIMENTATION LAGOONS
OUTFALL CONTROLS:	1) TEMPORARY SUMPS
	2) ATTENUATION PONDS
OUTFALL CONTROLS:	3) TEMPORARY STORAGE LAGOONS
	4) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
OUTFALL CONTROLS:	5) PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTBUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS.
	6) SILT DEWATERING BAGS
OUTFALL CONTROLS:	1) LEVEL SPREADERS
	2) BUFFERED OUTFALLS
OUTFALL CONTROLS:	3) VEGETATION FILTERS
	4) SILT DEWATERING BAGS
OUTFALL CONTROLS:	5) FLOW LIMITERS AND WEIRS



DRAINAGE IN THIS AREA IS AS PER THE DRAINAGE DETAILS PROVIDED BY MCCARTHY KEVILLE O'SULLIVAN ON THE ON PREVIOUS DRAWINGS AND WAS DEEMED SATISFACTORY

POND SIZE W [M] x L [M] x D [M]			CATCHMENT SIZE (M²)		
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24HR RETENTION FOR FINE SILT	24 HRS		3.5 x 11 x 1 M	5 x 16 x 1 M	7 x 22 x 1 M



- LEGEND**
- RIVERS/STREAMS
 - RIVERS/STREAMS 50M BUFFER
 - EXISTING DRAIN
 - EXISTING CULVERT
 - FOREST DRAIN
 - LAND STREAMS/DRAINS
 - UPSTREAM INTERCEPTOR DRAIN
 - SWALES/DOWNSTREAM COLLECTOR DRAIN
 - DIRECTION OF FLOW
 - SETTLEMENT POND
 - CROSS DRAIN
 - CHECK DAM 'TYPE A'
 - CHECK DAM 'TYPE B'
 - PROPOSED CULVERT
 - SILT FENCE
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 - STILLING POND (STP)
 - LEVEL SPREADER (LP)
 - PLANNING BOUNDARY
 - CUT AREA
 - FILL AREA
 - ROCK OUTCROPS (APPROX.)
 - FARM ACCESS ROAD
 - TRENCHES
 - FOREST
 - EXISTING GROUND SURFACE
 - INTERMEDIATE CONTOUR (5 M INTERVAL)
 - EXISTING GROUND SURFACE
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 - TURBINE AND SWEEP AREA

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14.01.19	Construction	MG	MG
Date	Description	Chkd	Signed
Revisions			

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Client:		CLEANRATH WINDFARM LTD.	
Job:		CLEANRATH WIND FARM	
Title:		DRAINAGE PLAN	
Figure No:		D310	
Drawing No:		P1272-4-0619-A3-D310-00A	
Sheet Size:		A3	Project No.: P1272-4
Scale:		1:2,000 (A3)	Drawn By: MG/GD
Date:		25/06/2019	Checked By: MG

DRAINAGE DESIGN NOTES

1. ALL DRAINAGE SUBJECT TO MICRO-SITING AND OPTIMISATION ON SITE.

2. THE LOCATIONS OF THE INTERCEPTOR DRAINS, CHECK DAMS, CULVERTS, SWALES, STILLING PONDS AND LEVEL SPREADERS ARE SHOWN AS INDICATIVE, AND MAY BE CHANGED TO SUIT THE REQUIREMENTS OF THE LOCAL TOPOGRAPHY.

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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 THEN THE DESIGN ELEVATION OF THE WATER SURFACE IN THE OUTLET AT THE LEVEL SPREADER OR STILLING POND.

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SITE TRACKS

14. USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR FILTRATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER.

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REFUELLING

17. REFUEL MOBILE PLANT IN DESIGNATED REFUELLING AREA ONLY, PREFERABLY ON AN IMPERMEABLE SURFACE AND AWAY FROM DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.

18. SPILL KITS AND DRIP TRAYS SHOULD BE AVAILABLE ON SITE.

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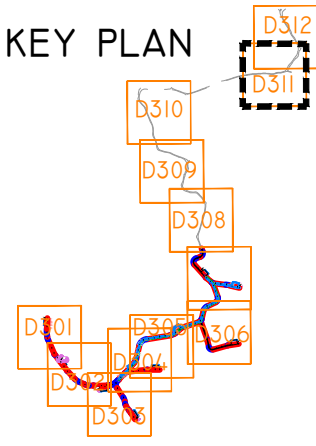
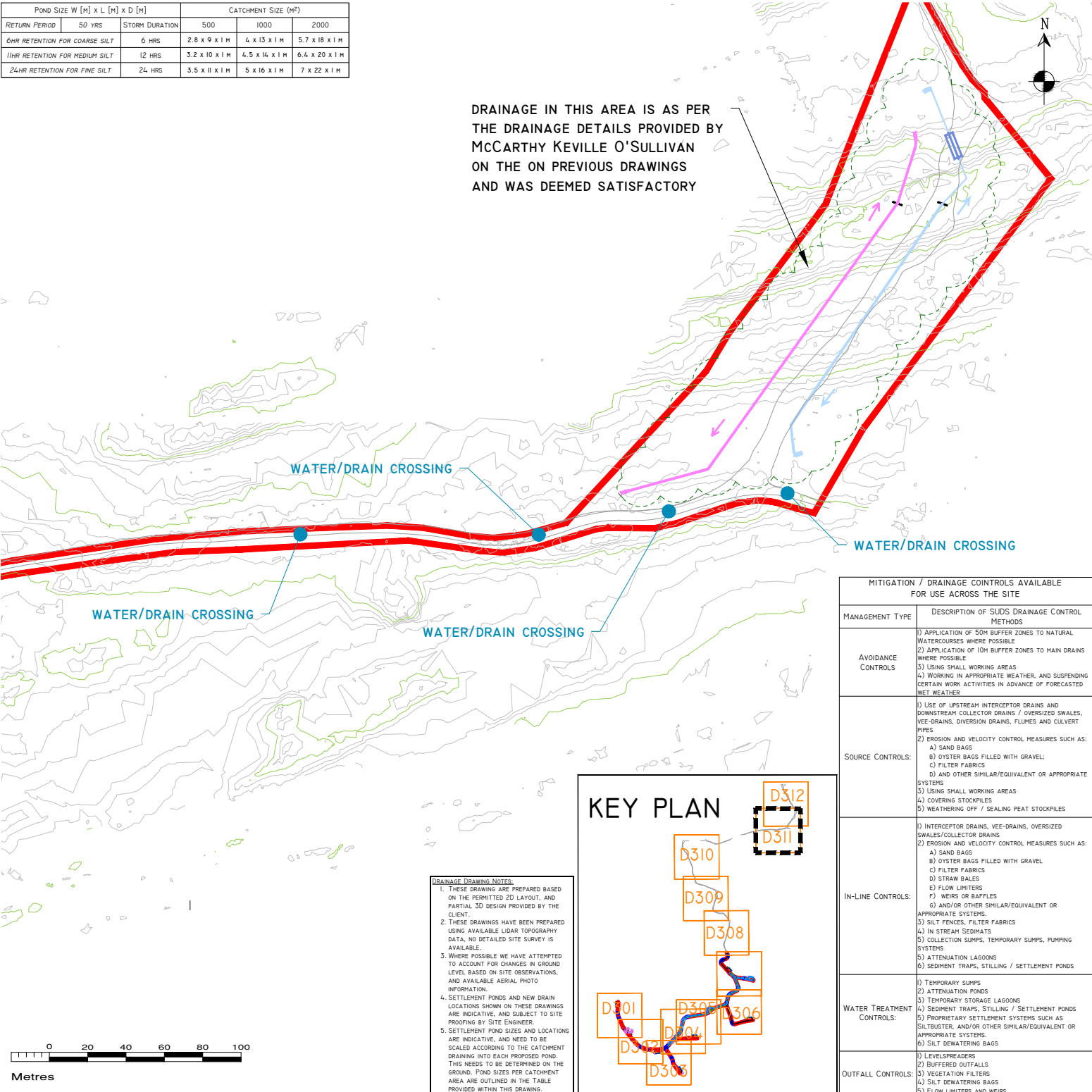
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DRAINAGE IN THIS AREA IS AS PER THE DRAINAGE DETAILS PROVIDED BY MCCARTHY KEVILLE O'SULLIVAN ON THE ON PREVIOUS DRAWINGS AND WAS DEEMED SATISFACTORY



DRAINAGE DRAWING NOTES:

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2. THESE DRAWINGS HAVE BEEN PREPARED USING AVAILABLE LIDAR TOPOGRAPHY DATA, NO DETAILED SITE SURVEY IS AVAILABLE.

3. WHERE POSSIBLE WE HAVE ATTEMPTED TO ACCOUNT FOR CHANGES IN GROUND LEVEL BASED ON SITE OBSERVATIONS, AND AVAILABLE AERIAL PHOTO INFORMATION.

4. SETTLEMENT PONDS AND NEW DRAIN LOCATIONS SHOWN ON THESE DRAWINGS ARE INDICATIVE, AND SUBJECT TO SITE PROFILING BY SITE ENGINEER.

5. SETTLEMENT POND SIZES AND LOCATIONS ARE INDICATIVE, AND NEED TO BE SCALED ACCORDING TO THE CATCHMENT DRAINING INTO EACH PROPOSED POND. THIS NEEDS TO BE DETERMINED ON THE GROUND. POND SIZES PER CATCHMENT AREA ARE OUTLINED IN THE TABLE PROVIDED WITHIN THIS DRAWING.

MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE	
MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS	1) APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE
	2) APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE
SOURCE CONTROLS	3) USING SMALL WORKING AREAS
	4) WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHER
IN-LINE CONTROLS	1) USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE-DRAINS, DIVERSION DRAINS, FLUMES AND CULVERT PIPES
	2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: A) SAND BAGS B) OYSTER BAGS FILLED WITH GRAVEL C) FILTER FABRICS D) AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS
WATER TREATMENT CONTROLS	3) USING SMALL WORKING AREAS
	4) COVERING STOCKPILES
OUTFALL CONTROLS	5) WEATHERING OFF / SEALING PEAT STOCKPILES
	1) INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED SWALES/COLLECTOR DRAINS
	2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: 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
	1) TEMPORARY SUMPS
	2) ATTENUATION PONDS
	3) TEMPORARY STORAGE LAGOONS
	4) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
	5) PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTBUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS
	6) SILT DEWATERING BAGS
	1) LEVELSPREADERS
	2) BUFFERED OUTFALLS
	3) VEGETATION FILTERS
	4) SILT DEWATERING BAGS
	5) FLOW LIMITERS AND WEIRS

LEGEND

- RIVERS/STREAMS
- RIVERS/STREAMS 50M BUFFER
- EXISTING DRAIN
- EXISTING CULVERT
- FOREST DRAIN
- LAND STREAMS/DRAINS
- UPSTREAM INTERCEPTOR DRAIN
- SWALES/DOWNSTREAM COLLECTOR DRAIN
- DIRECTION OF FLOW
- SETTLEMENT POND
- CROSS DRAIN
- CHECK DAM 'TYPE A'
- CHECK DAM 'TYPE B'
- PROPOSED CULVERT
- SILT FENCE
- INTERCEPTOR DITCHES
- DIRECTION OF FLOW DRAINAGE SWALE - COLLECTOR DRAIN
- STILLING POND (STP)
- LEVEL SPREADER (LP)
- PLANNING BOUNDARY
- CUT AREA
- FILL AREA
- ROCK OUTCROPS (APPROX.)
- FARM ACCESS ROAD
- TRENCHES
- FOREST
- EXISTING GROUND SURFACE INTERMEDIATE CONTOUR (5 M INTERVAL)
- EXISTING GROUND SURFACE MINOR CONTOUR (1 M INTERVAL)
- TURBINE AND SWEEP AREA

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14.01.19	Construction	MG	MG
Date	Description	Chkd	Signed

Revisions

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Client: **CLEANRATH WINDFARM LTD.**

Job: **CLEANRATH WIND FARM**

Title: **DRAINAGE PLAN**

Figure No: **D311**

Drawing No: P1272-4-0619-A3-D311-00A

Sheet Size: A3 Project No.: P1272-4

Scale: 1:2,000 (A3) Drawn By: MG/GD

Date: 25/06/2019 Checked By: MG

DRAINAGE DESIGN NOTES

1. ALL DRAINAGE SUBJECT TO MICRO-SITING AND OPTIMISATION ON SITE.
2. THE LOCATIONS OF THE INTERCEPTOR DRAINS, CHECK DAMS, CULVERTS, SWALES, STILLING 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 THEN THE DESIGN ELEVATION OF THE WATER SURFACE IN THE OUTLET AT THE LEVEL SPREADER OR STILLING 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 LESS THE 6%.
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. STILLING PONDS TO BE SIZED ACCORDING TO THE 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. EXISTING DRAINS/DITCHES TO BE INCORPORATED OR REMOVED DURING WIND FARM CONSTRUCTION.
13. ALL DRAINAGE SYSTEM FEATURES TO BE SUBJECT OF INSPECTION AND MAINTENANCE PLAN.
14. THE LAYOUT SHOWN IS SLIGHTLY OFFSET FOR SCALE PURPOSES, AND ALL DRAINAGE WOULD BE INSTALLED AS CLOSE TO THE ROAD AS POSSIBLE, AND WITHIN THE PLANNING BOUNDARY FOR THE DEVELOPMENT.

POLLUTION PREVENTION NOTES:

1. SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE COMPLETE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
2. SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SILTS TO RECEIVING WATERCOURSES.
3. SILTY WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/DISTURBED GROUND, STOCKPILES, PLANT AND WHEEL WASH, SITE ROADS/TRACKS, AND DISTURBANCE OF STREAM/RIVER BEDS.

DISCHARGES

4. WATER CONTAINING SILT WILL NOT BE PUMPED DIRECTLY TO ANY WATERCOURSE / DRAIN / OR DITCH. ALL DISCHARGES TO BE MADE OVER OPEN VEGETATED GROUND AT A MINIMUM 20M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
5. A 15M BUFFER ZONE (OR GREATER) TO BE MAINTAINED AROUND ALL SENSITIVE WATERCOURSES AND WATERBODIES. NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
6. PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE.
7. PUMPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN 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 USE OF SPLASH PLATES, AND DISCHARGE CONTROLS.
8. VEGETATION WILL NOT BE STRIPPED FROM EXISTING DITCHES UNLESS ABSOLUTELY NECESSARY.

EXCAVATIONS

9. 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

10. THE AMOUNT OF EXPOSED GROUND AND STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED AS FAR AS PRACTICABLE.
11. TEMPORARY STOCKPILES WILL BE COVERED OR SEALED AS SOON AS POSSIBLE.
12. SILT FENCES WILL BE USED TO REDUCE SILTY RUNOFF FROM TEMPORARY PEAT STORAGE AREAS, AND/OR BARE PEAT AREAS AS REQUIRED.

SITE TRACKS

13. USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR FILTRATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER.
14. CHECK DAMS TO BE INSPECTED AND CLEANED REGULARLY.
15. DISCHARGES FROM SITE TRACKS WILL BE VIA OUTFALL SPILLWAYS, SETTLEMENT PONDS AND VEGETATION SWALES.

REFUELLING

16. REFUEL MOBILE PLANT IN DESIGNATED REFUELLING AREA ONLY, PREFERABLY ON AN IMPERMEABLE SURFACE AND AWAY FROM DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.
17. SPILL KITS AND DRIP TRAYS SHOULD BE AVAILABLE ON SITE.

CONCRETE

18. CARE WILL BE TAKEN WHEN COMPLETING CONCRETE WORKS ON SITE TO ENSURE NO DISCHARGES OCCUR.
19. 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.

POND SIZE W [m] x L [m] x D [m]			CATCHMENT SIZE (H ²)		
RETURN PERIOD	50 YRS	STORM DURATION	500	1000	2000
6HR RETENTION FOR COARSE SILT	6 HRS		2.8 x 9 x 1 m	4 x 15 x 1 m	5.7 x 18 x 1 m
11HR RETENTION FOR MEDIUM SILT	12 HRS		3.2 x 10 x 1 m	4.5 x 14 x 1 m	6.4 x 20 x 1 m
24HR RETENTION FOR FINE SILT	24 HRS		3.5 x 11 x 1 m	5 x 16 x 1 m	7 x 22 x 1 m

DRAINAGE DRAWING NOTES

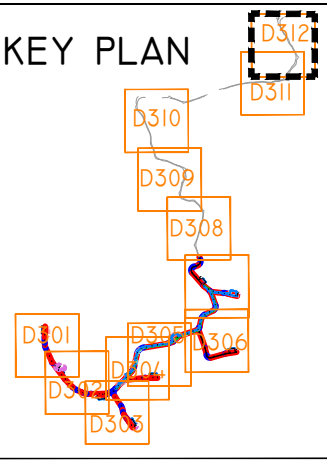
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MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE	
MANAGEMENT TYPE	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS
AVOIDANCE CONTROLS	1) APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE 2) APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE 3) USING SMALL WORKING AREAS 4) WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHER
	1) USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE-DRAINS, DIVERSION DRAINS, FLUMES AND CULVERT PIPES 2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: A) SAND BAGS B) OYSTER BAGS FILLED WITH GRAVEL C) FILTER FABRICS D) AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS 3) USING SMALL WORKING AREAS 4) COVERING STOCKPILES 5) WEATHERING OFF / SEALING PEAT STOCKPILES
SOURCE CONTROLS:	1) INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED SWALES/COLLECTOR DRAINS 2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: A) SAND BAGS B) OYSTER BAGS FILLED WITH GRAVEL C) FILTER FABRICS D) AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS 3) SILT FENCES, FILTER FABRICS 4) IN STREAM SEDIMENTS 5) COLLECTION SUMPS, TEMPORARY SUMPS, PUMPING SYSTEMS 6) SEDIMENT LAGOONS 7) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
IN-LINE CONTROLS:	1) TEMPORARY SUMPS 2) ATTENUATION PONDS 3) TEMPORARY STORAGE LAGOONS 4) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS 5) PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTBUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. 6) SILT DEWATERING BAGS
WATER TREATMENT CONTROLS:	1) LEVEL SPREADERS 2) BUFFERED OUTFALLS 3) VEGETATION FILTERS 4) SILT DEWATERING BAGS 5) FLOW LIMITERS AND WEIRS
OUTFALL CONTROLS:	

DRAINAGE IN THIS AREA IS AS PER THE DRAINAGE DETAILS PROVIDED BY MCCARTHY KEVILLE O'SULLIVAN ON THE ON PREVIOUS DRAWINGS AND WAS DEEMED SATISFACTORY

WATER/DRAIN CROSSING

KEY PLAN



LEGEND

- RIVERS/STREAMS
- RIVERS/STREAMS 50M BUFFER
- EXISTING DRAIN
- EXISTING CULVERT
- FOREST DRAIN
- LAND STREAMS/DRAINS
- UPSTREAM INTERCEPTOR DRAIN
- SWALES/DOWNSTREAM COLLECTOR DRAIN
- DIRECTION OF FLOW
- SETTLEMENT POND
- CROSS DRAIN
- CHECK DAM 'TYPE A'
- CHECK DAM 'TYPE B'
- PROPOSED CULVERT
- SILT FENCE
- INTERCEPTOR DITCHES
- DIRECTION OF FLOW DRAINAGE SWALE - COLLECTOR DRAIN
- STILLING POND (STP)
- LEVEL SPREADER (LP)
- PLANNING BOUNDARY
- CUT AREA
- FILL AREA
- ROCK OUTCROPS (APPROX.)
- FARM ACCESS ROAD
- TRENCHES
- FOREST
- EXISTING GROUND SURFACE
- INTERMEDIATE CONTOUR (5 M INTERVAL)
- EXISTING GROUND SURFACE
- MINOR CONTOUR (1 M INTERVAL)
- TURBINE AND SWEEP AREA

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Revisions			

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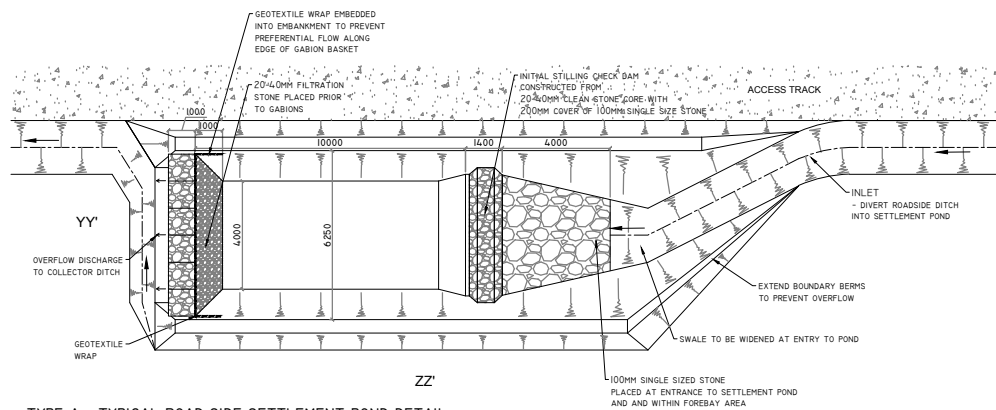
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CLEANRATH WINDFARM LTD.

Job:
CLEANRATH WIND FARM

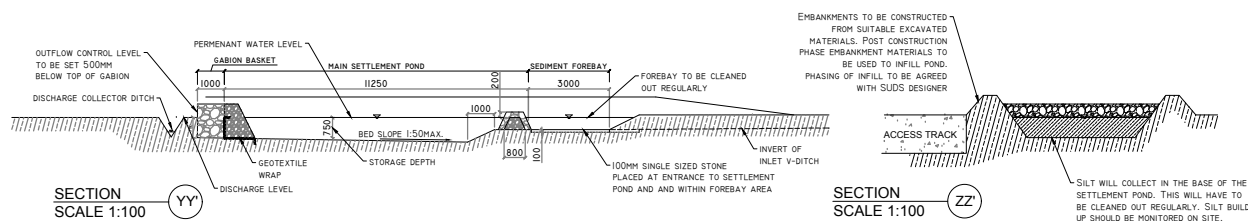
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Date: 25/06/2019	Checked By: MG

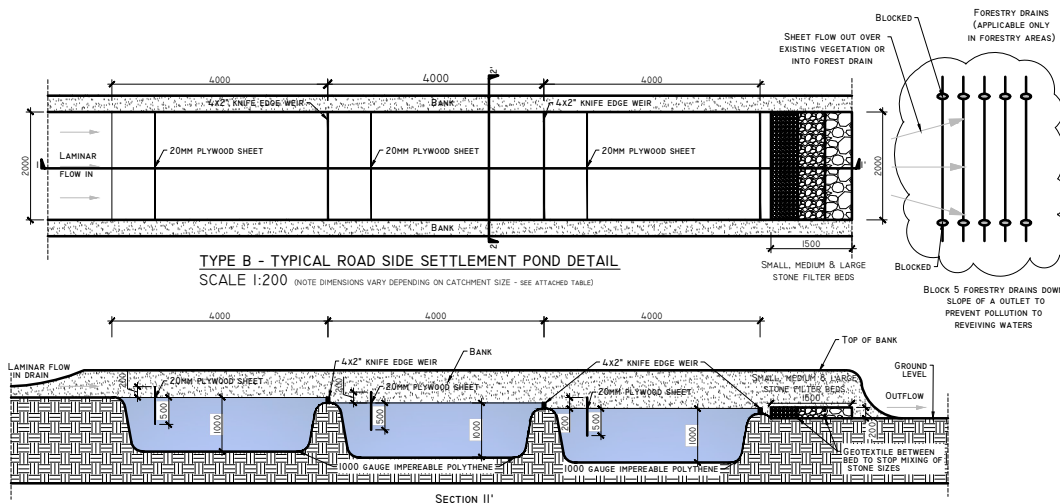


TYPE A - TYPICAL ROAD SIDE SETTLEMENT POND DETAIL
SCALE 1:200 (NOTE DIMENSIONS VARY DEPENDING ON CATCHMENT SIZE - SEE ATTACHED TABLE)

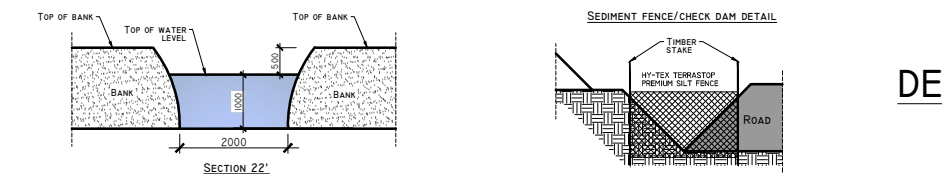


SECTION YY'
SCALE 1:100

SECTION ZZ'
SCALE 1:100

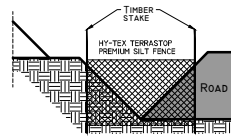


TYPE B - TYPICAL ROAD SIDE SETTLEMENT POND DETAIL
SCALE 1:200 (NOTE DIMENSIONS VARY DEPENDING ON CATCHMENT SIZE - SEE ATTACHED TABLE)



SECTION 22'

SEDIMENT FENCE/CHECK DAM DETAIL



DETAIL A2

DETAIL A1

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Revisions

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Job: CLEANRATH WF, Co. CORK

Title: DRAINAGE DETAILS 1

Figure No: D501

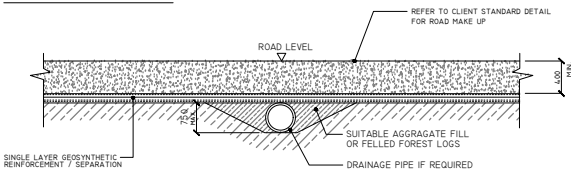
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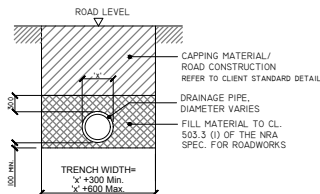
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DETAIL B



'TYPE A' CULVERT - DRAINAGE CROSSING BENEATH FLOATING ROAD

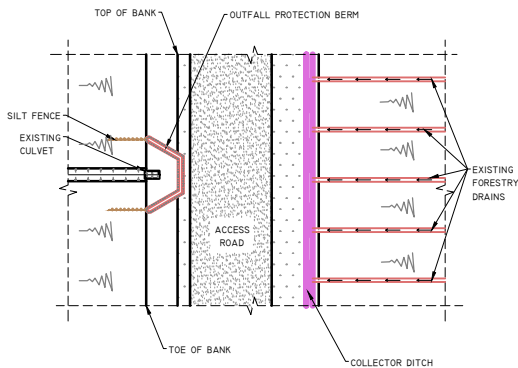
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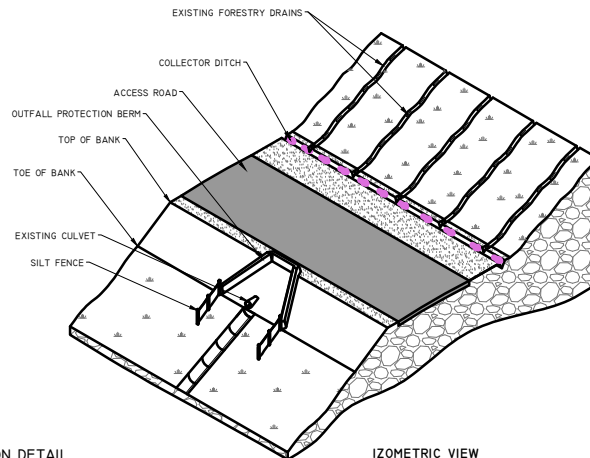
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DETAIL BI

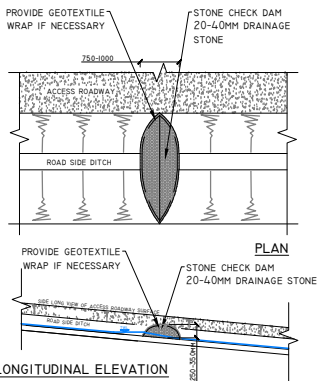


CULVERT - OUTFALL PROTECTION DETAIL

SCHEMATIC - NOT TO SCALE



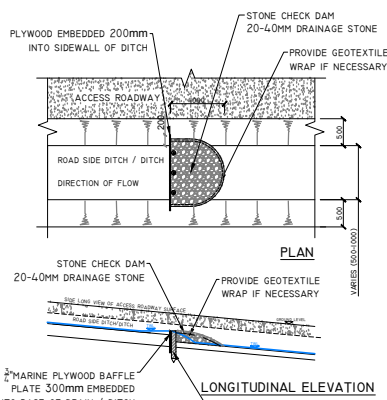
DETAIL C



TYPE X - CHECK DAM DETAIL

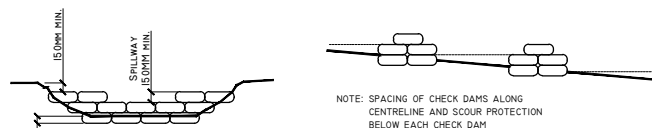
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DETAIL D

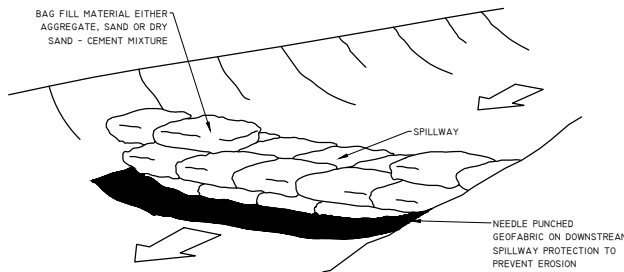


TYPE Y - CHECK DAM DETAIL

SCALE 1:100



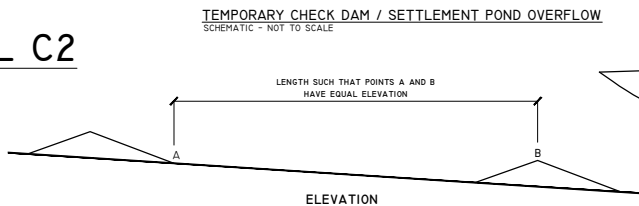
DETAIL CI



TEMPORARY CHECK DAM / SETTLEMENT POND OVERFLOW SAND FILLED BAG CONSTRUCTION

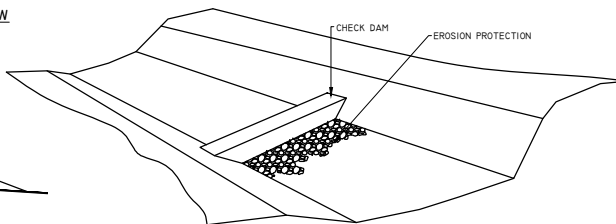
SCHEMATIC - NOT TO SCALE

DETAIL C2



TEMPORARY CHECK DAM / SETTLEMENT POND OVERFLOW

SCHEMATIC - NOT TO SCALE



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Revisions

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Job: CLEANRATH WF, Co. CORK

Title: DRAINAGE DETAILS 2

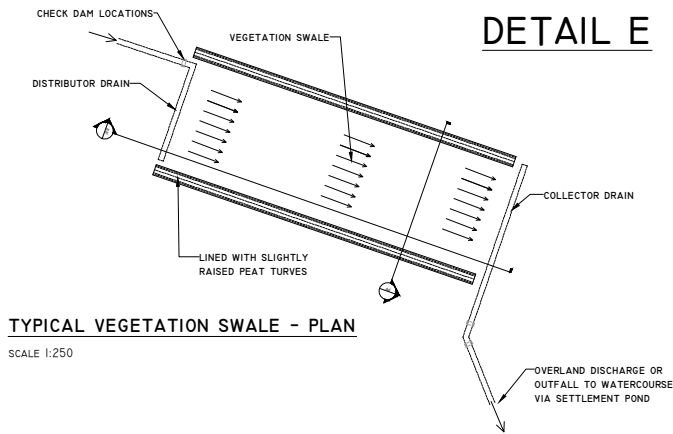
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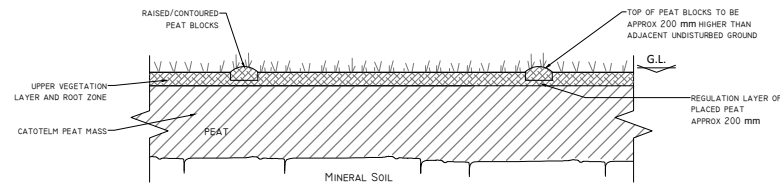
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Date: 21/06/2019 Checked By: M.G.

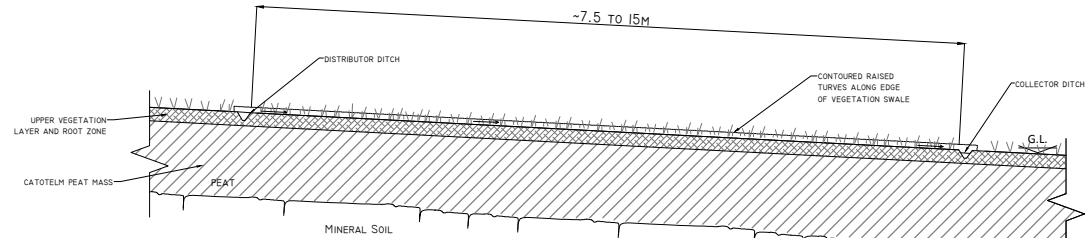


TYPICAL VEGETATION SWALE - PLAN

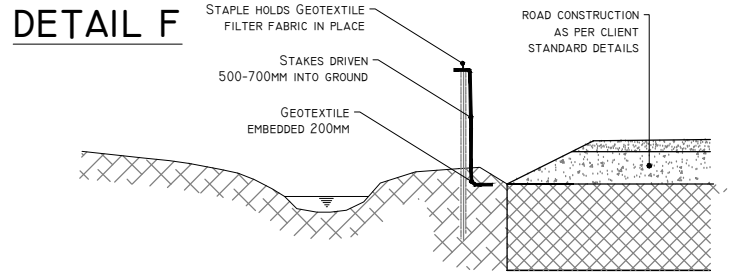
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SECTION AA'
SCALE 1:200



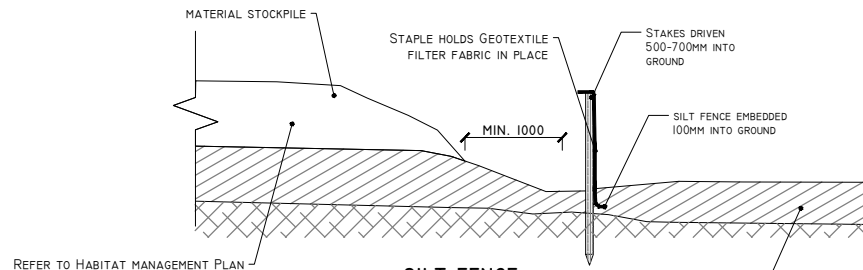
SECTION BB'
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SILT FENCE FOR WATERCOURSE PROTECTION

SCALE 1:25

DETAIL G-I

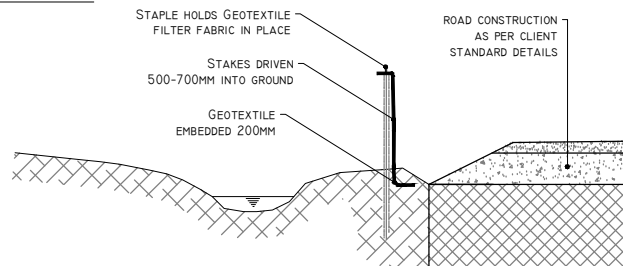


SILT FENCE

SCALE 1:25

REFER TO HABITAT MANAGEMENT PLAN AND PEAT MANAGEMENT PLAN FOR STOCKPILE MANAGEMENT NOTES

DETAIL G-II



SILT FENCE FOR WATERCOURSE PROTECTION

SCALE 1:25

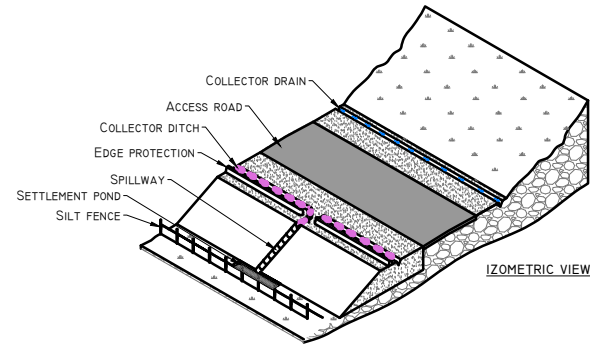
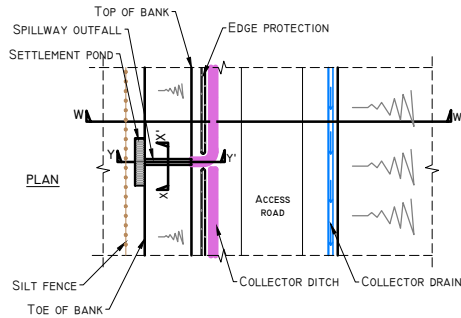
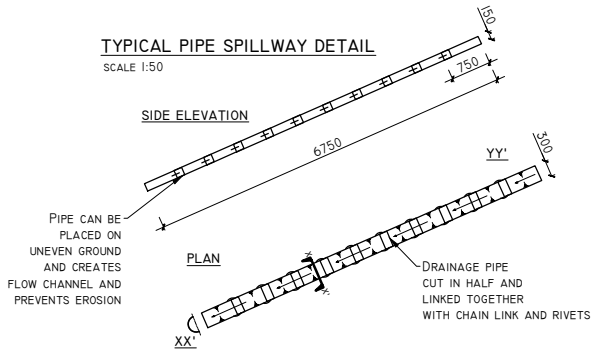
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Date	Description	Chkd	Signed
Revisions			



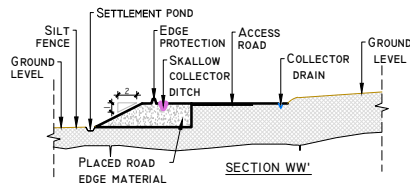
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Job:	CLEANRATH WF, Co. CORK
Title:	DRAINAGE DETAILS 3
Figure No:	D503
Drawing No:	P1272-4-0619-A1-D503-00A
Sheet Size:	A1
Project No.:	P1272-4
Scale:	as shown (A1)
Drawn By:	MG/GD
Date:	21/06/2019
Checked By:	M.G.

DETAIL H

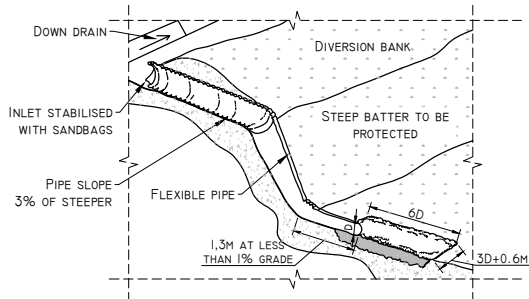


SPILLWAY OUTFALL PLAN
SCHEMATIC - NOT TO SCALE

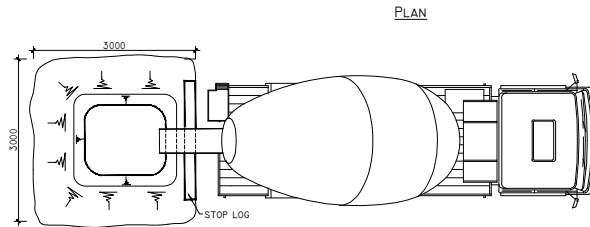
DETAIL I



TYPICAL PIPE SPILLWAY DETAIL
SCHEMATIC - NOT TO SCALE

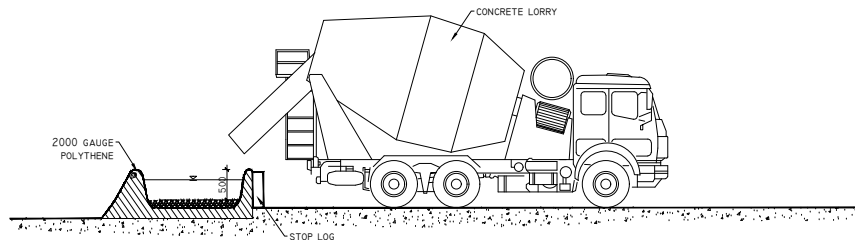


TEMPORARY CONCRETE WASH OUT PIT
SCALE 1:50



ELEVATION

DETAIL J



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21/06/19	Construction	MG	MG
Date	Description	Chkd	Signed
Revisions			
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Client: INCHEE ENERGY SUPPLY LTD			
Job: BOOLYNAGHLERAGH WF, Co. CLARE			
Title: DRAINAGE DETAILS 4			
Figure No: D504			
Drawing No: P1272-4-0619-A1-D504-00A			
Sheet Size: A1		Project No.: P1272-4	
Scale: as shown (A1)		Drawn By: MG/GD	
Date: 21/06/2019		Checked By: M.G.	