

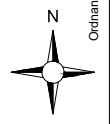
Proposed Drumnahough & Lenalea Wind Farm
Underground Grid Connection Cabling (On Appeal)
(Pl. Ref. 17/50543 ABP. Ref. PL05E. 248796)

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Drawing Legend

- Planning Application Site Boundary
- Existing Road to be Upgraded
- Existing Floating Road to be Upgraded
- Proposed Road
- Proposed Floating Road
- Internal Electrical Cable Trench
- Proposed Underground Grid Connection Cabling Route
- Directionally Drilled Cabling Route Section Under N15
- Works Area
- Soft Levelled Area
- Crane Pad Hardstanding Area
- Turbine Foundation
- Turbine Sweep Area
- Borrow Pit
- Proposed Amenity Track
- Passing Bay

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**Site Layout (1:5,000)
Key Plan**

PROJECT TITLE:
Meenbog Wind Farm, Co. Donegal

DRAWING BY: **Joseph O'Brien** CHECKED BY: **Michael Watson**

PROJECT No.: **160502** DRAWING No.: **0502 - 03**

SCALE: **1:20,000 @ A1** DATE: **14.12.2017**

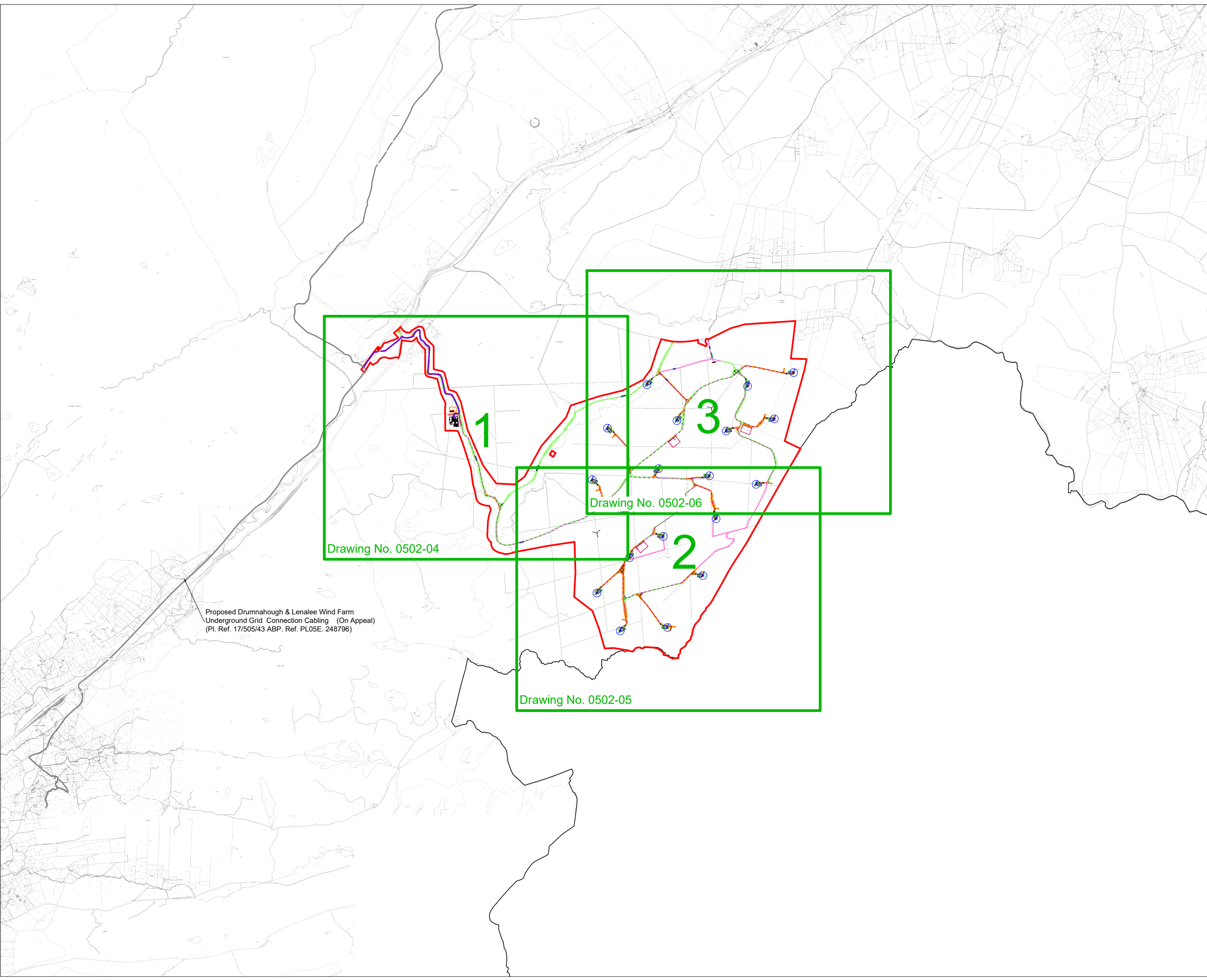
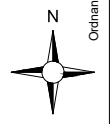
OS SHEET No.: 0267, 0268, 0269, 0400, 0401, 0423, 0424, 0425, 0426, 0427, 0450, 0451, 0452, 0453, 0454, 0478, 0479, 0480, 0481, 0482, 0506, 0507, 0508, 0509, 0535, 0536

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 - Passing Bay

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Drawing No. 0502-04

Drawing No. 0502-05

Drawing No. 0502-06

Proposed Drumnahough & Lenalee Wind Farm
Underground Grid Connection Cabling (On Appeal)
(Pl. Ref. 17/505/43 ABP. Ref. PL05E. 248796)

**Site Layout (1:5,000)
Key Plan**

PROJECT TITLE:
Meenbog Wind Farm, Co. Donegal

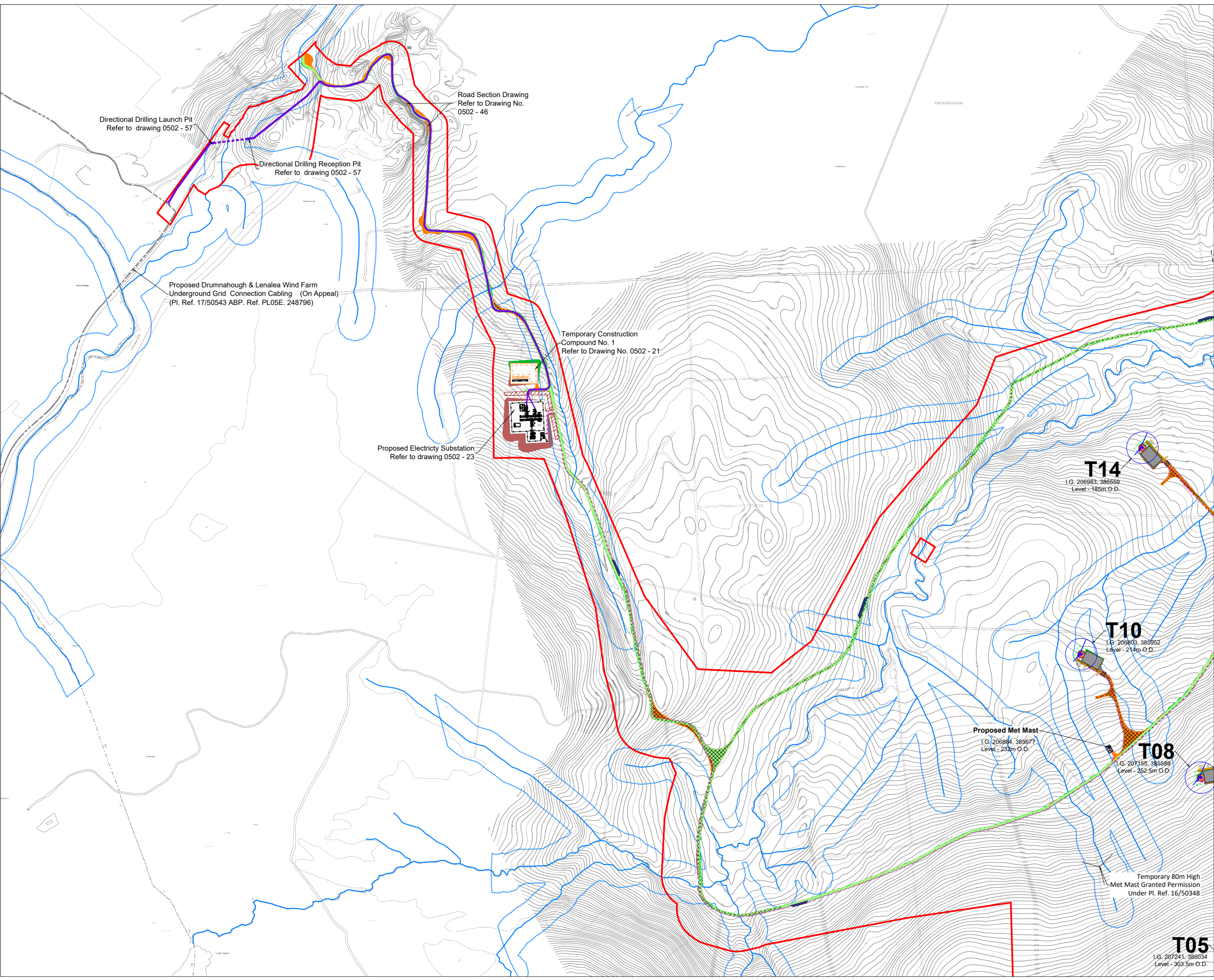
DRAWING BY: **Joseph O'Brien** CHECKED BY: **Michael Watson**

PROJECT No.: **160502** DRAWING No.: **0502 - 03**

SCALE: **1:20,000 @ A1** DATE: **13.12.2017**

OS SHEET No.:
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| | Existing Road to be Upgraded |
| | Existing Floating Road to be Upgraded |
| | Proposed Road |
| | Proposed Floating Road |
| | Internal Electrical Cable Trench |
| | Proposed Underground Grid Connection Cabling Route |
| | Directionally Drilled Cabling Route Section Under N15 |
| | River/Stream |
| | River/Stream 50m Buffer |
| | Lakes |
| | Lakes 50m Buffer |
| | Works Area |
| | Soft Levelled Area |
| | Crane Pad Hardstanding Area |
| | Turbine Foundation |
| | Turbine Sweep Area |
| | Borrow Pit |
| | Cut |
| | Fill |
| | Passing Bay |
| | Berm |

**Site Layout Plan
Sheet 1 of 3**

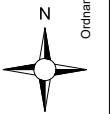
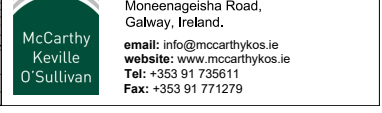
PROJECT TITLE:
Meenbog Wind Farm, Co. Donegal

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|--------------------------------------|--------------------------------------|
| DRAWING BY: Joseph O'Brien | CHECKED BY: Michael Watson |
| PROJECT No: 160502 | DRAWING No: 0502 - 04 |

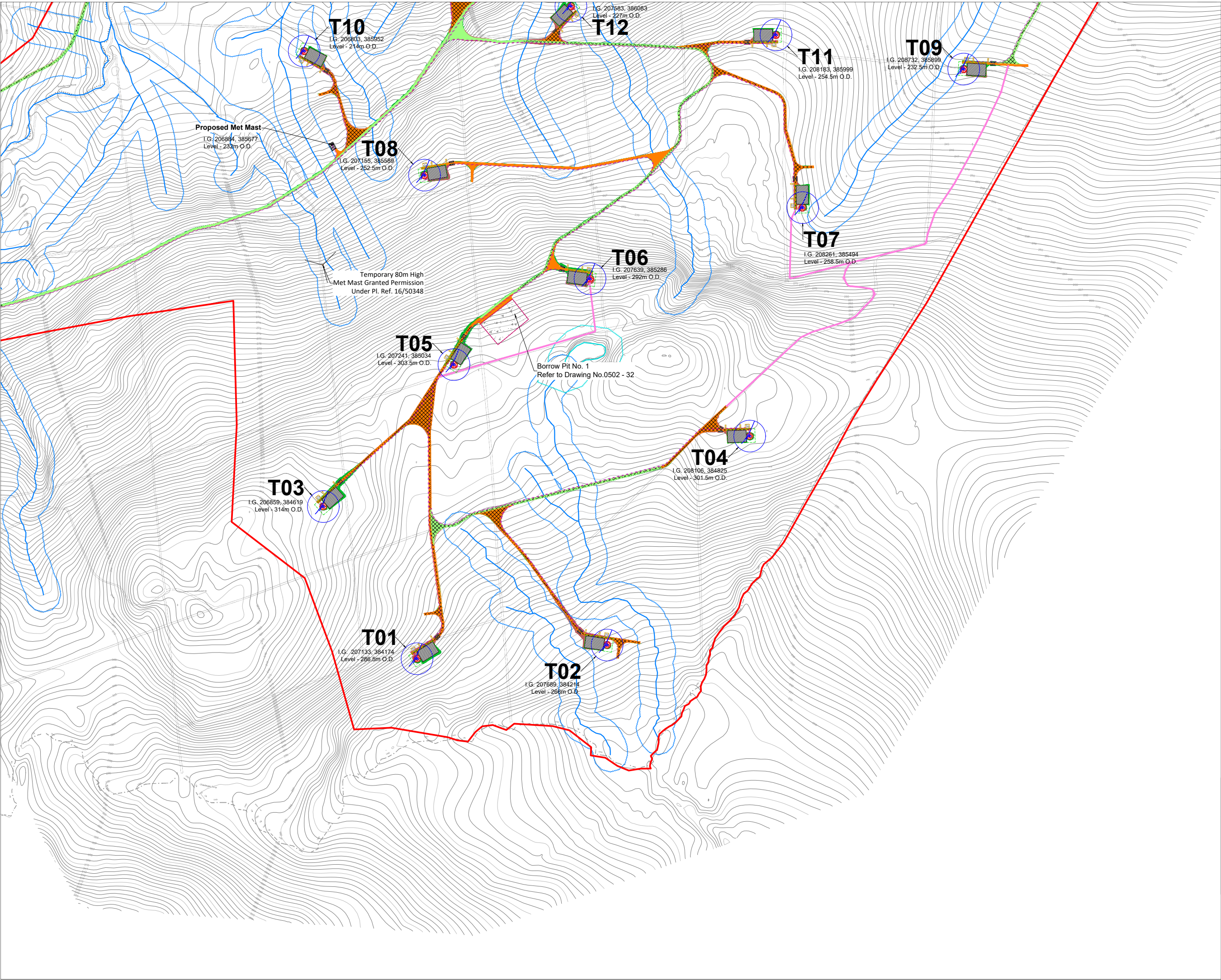
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OS SHEET No: 0367, 0368, 0369, 0400, 0401, 0423, 0424, 0425, 0426, 0427, 0450, 0451, 0452, 0453, 0454, 0478, 0479, 0480, 0481, 0482, 0506, 0507, 0508, 0509, 0535, 0536

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Drawing Legend

| | |
|--|---------------------------------------|
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| | Existing Road to be Upgraded |
| | Existing Floating Road to be Upgraded |
| | Proposed Road |
| | Proposed Floating Road |
| | Internal Electrical Cable Trench |
| | River/Stream |
| | River/Stream 50m Buffer |
| | Lakes |
| | Lakes 50m Buffer |
| | Works Area |
| | Soft Levelled Area |
| | Crane Pad Hardstanding Area |
| | Turbine Foundation |
| | Turbine Sweep Area |
| | Borrow Pit |
| | Cut |
| | Fill |
| | Proposed Amenity Track |

Site Layout Plan
Sheet 2 of 3

PROJECT TITLE:
Meenbog Wind Farm, Co. Donegal

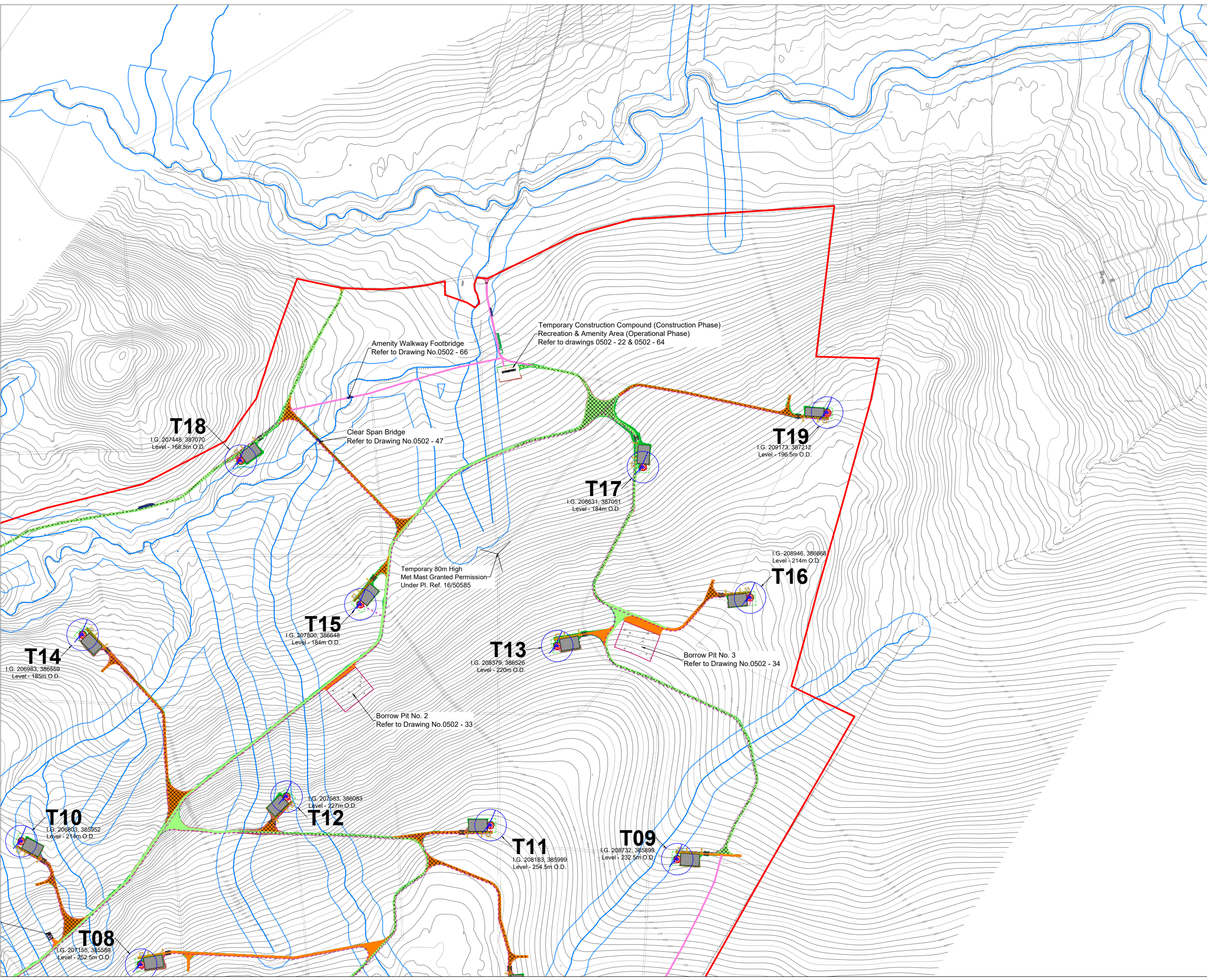
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| DRAWING BY: Joseph O'Brien | CHECKED BY: Michael Watson |
| PROJECT No.: 160502 | DRAWING No.: 0502 - 05 |
| SCALE: 1:5,000 @ A1 | DATE: 13.12.2017 |

OS SHEET No.:
0207, 0208, 0209, 0400, 0401, 0423, 0424, 0425, 0426, 0427, 0450, 0451, 0452, 0453, 0454, 0478, 0479, 0480, 0481, 0482, 0506, 0507, 0508, 0509, 0535, 0536

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- - - Existing Floating Road to be Upgraded
- Proposed Road
- - - Proposed Floating Road
- - - Internal Electrical Cable Trench
- River/Stream
- - - River/Stream 50m Buffer
- - - Works Area
- Soft Levelled Area
- Crane Pad Hardstanding Area
- ⊗ Turbine Foundation
- ⊗ Turbine Sweep Area
- Borrow Pit
- Cut
- Fill
- Proposed Amenity Track
- Passing Bay

**Site Layout Plan
Sheet 3 of 3**

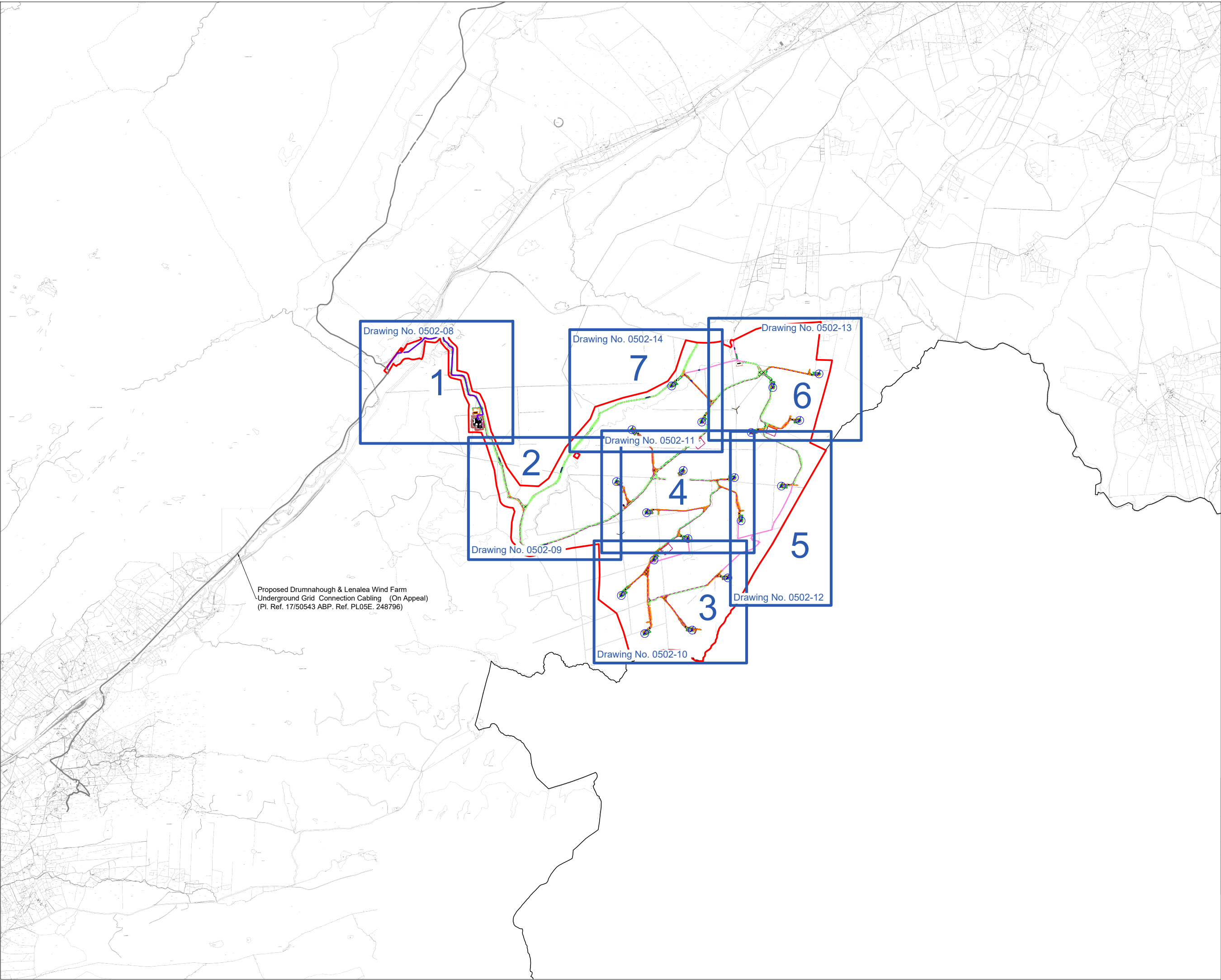
PROJECT TITLE:
Meenbog Wind Farm, Co. Donegal

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| DRAWING BY: Joseph O'Brien | CHECKED BY: Michael Watson |
| PROJECT No: 160502 | DRAWING No.: 0502 - 06 |
| SCALE: 1:5,000 @A1 | DATE: 13.12.2017 |

OS SHEET No.:
0207, 0208, 0209, 0400, 0401, 0423, 0424, 0425, 0426, 0427, 0450, 0451, 0452, 0453, 0454, 0478, 0479, 0480, 0481, 0482, 0506, 0507, 0508, 0509, 0535, 0536

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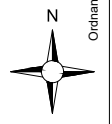
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Drawing Legend

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- Existing Floating Road to be Upgraded
- Proposed Road
- Proposed Floating Road
- Proposed Underground Grid Connection Cabling Route
- Directionally Drilled Cabling Route Section Under N15
- Internal Electrical Cable Trench
- Works Area
- Soft Levelled Area
- Crane Pad Hardstanding Area
- Turbine Foundation
- Turbine Sweep Area
- Borrow Pit
- Proposed Amenity Track
- Passing Bay

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**Site Layout (1:2,500)
Key Plan**

PROJECT TITLE:
Meenbog Wind Farm, Co. Donegal

DRAWING BY: **Joseph O'Brien** CHECKED BY: **Michael Watson**

PROJECT No.: **160502** DRAWING No.: **0502 - 07**

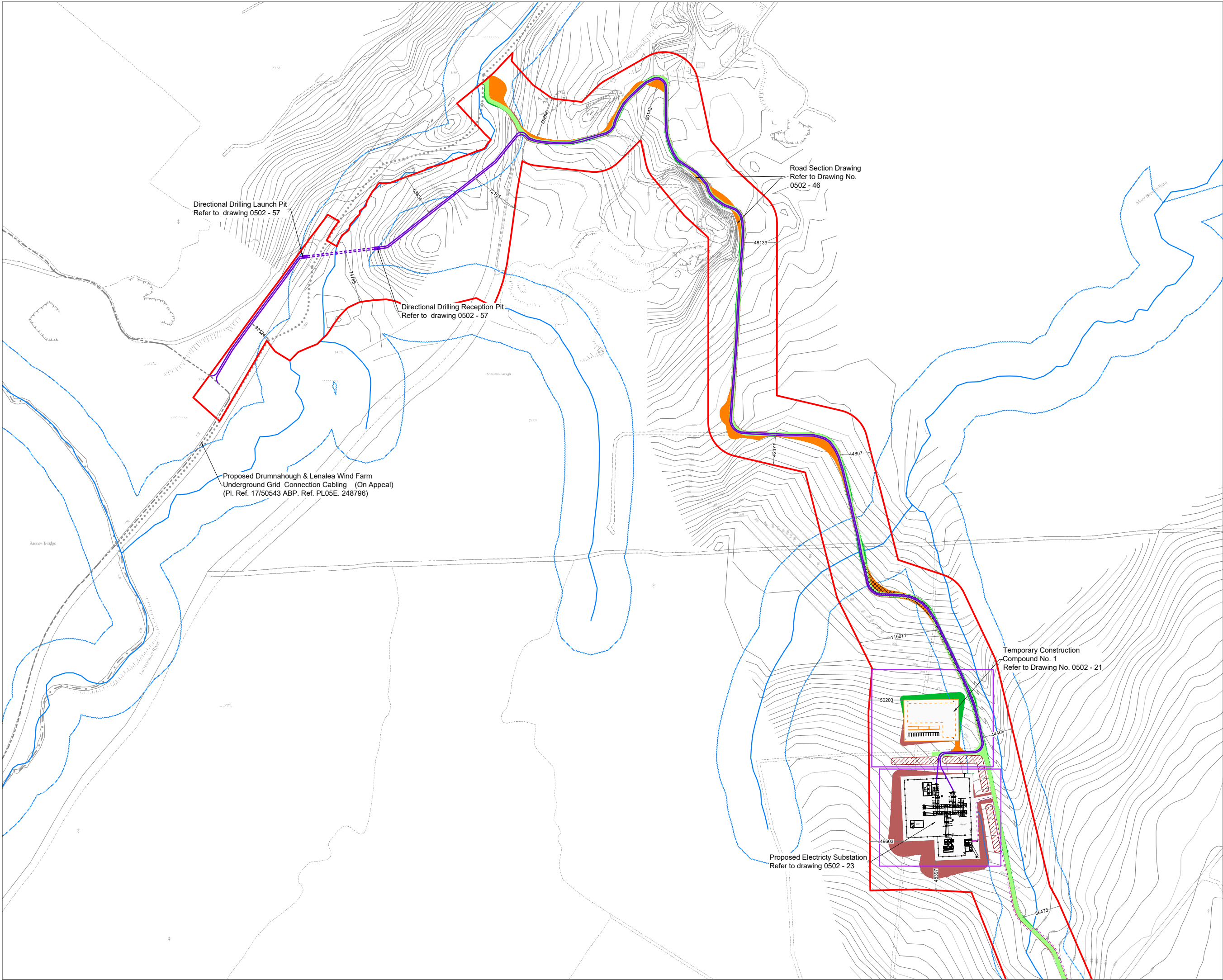
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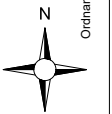
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 - ▧ Proposed Floating Road
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 - Proposed Underground Grid Connection Cabling Route
 - - - Directionally Drilled Cabling Route Section Under N15
 - River/Stream
 - ⬭ River/Stream 50m Buffer
 - Cut
 - Fill



DRAWING TITLE:
**Site Layout Plan
 Sheet 1 of 7**

PROJECT TITLE:
Meenbog Wind Farm, Co. Donegal

DRAWING BY: **Joseph O'Brien** CHECKED BY: **Michael Watson**

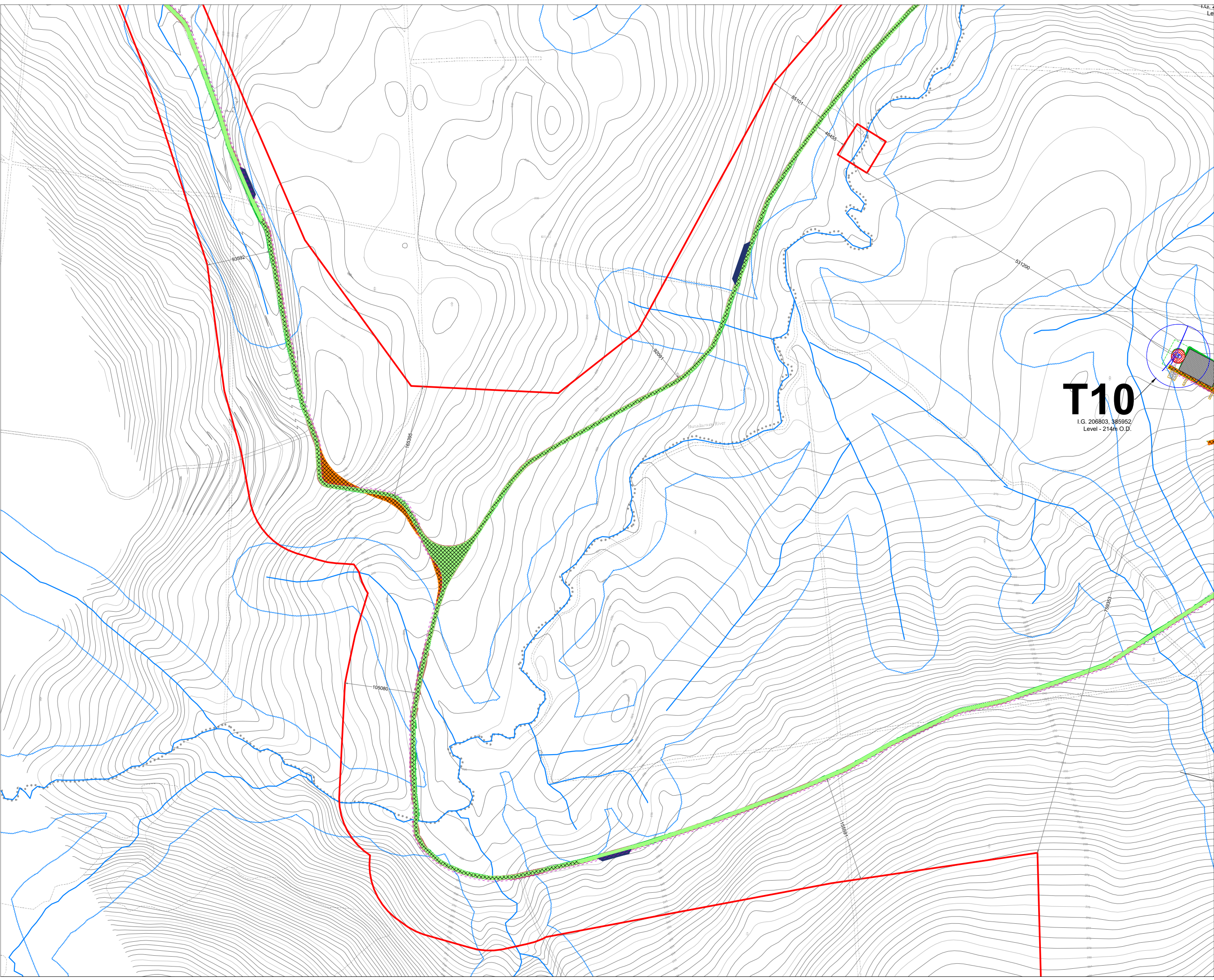
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SCALE: **1:2,500 @A1** DATE: **14.12.2017**

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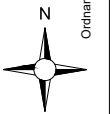
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T10
 I.G. 206803, 385952
 Level - 214m O.D.

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 - Soft Levelled Area
 - Crane Pad Hardstanding Area
 - ⊗ Turbine Foundation
 - ⊙ Turbine Sweep Area
 - Cut
 - Fill
 - Passing Bay



Site Layout Plan
Sheet 2 of 7

PROJECT TITLE:
 Meenbog Wind Farm, Co. Donegal

DRAWING BY: **Joseph O'Brien** CHECKED BY: **Michael Watson**

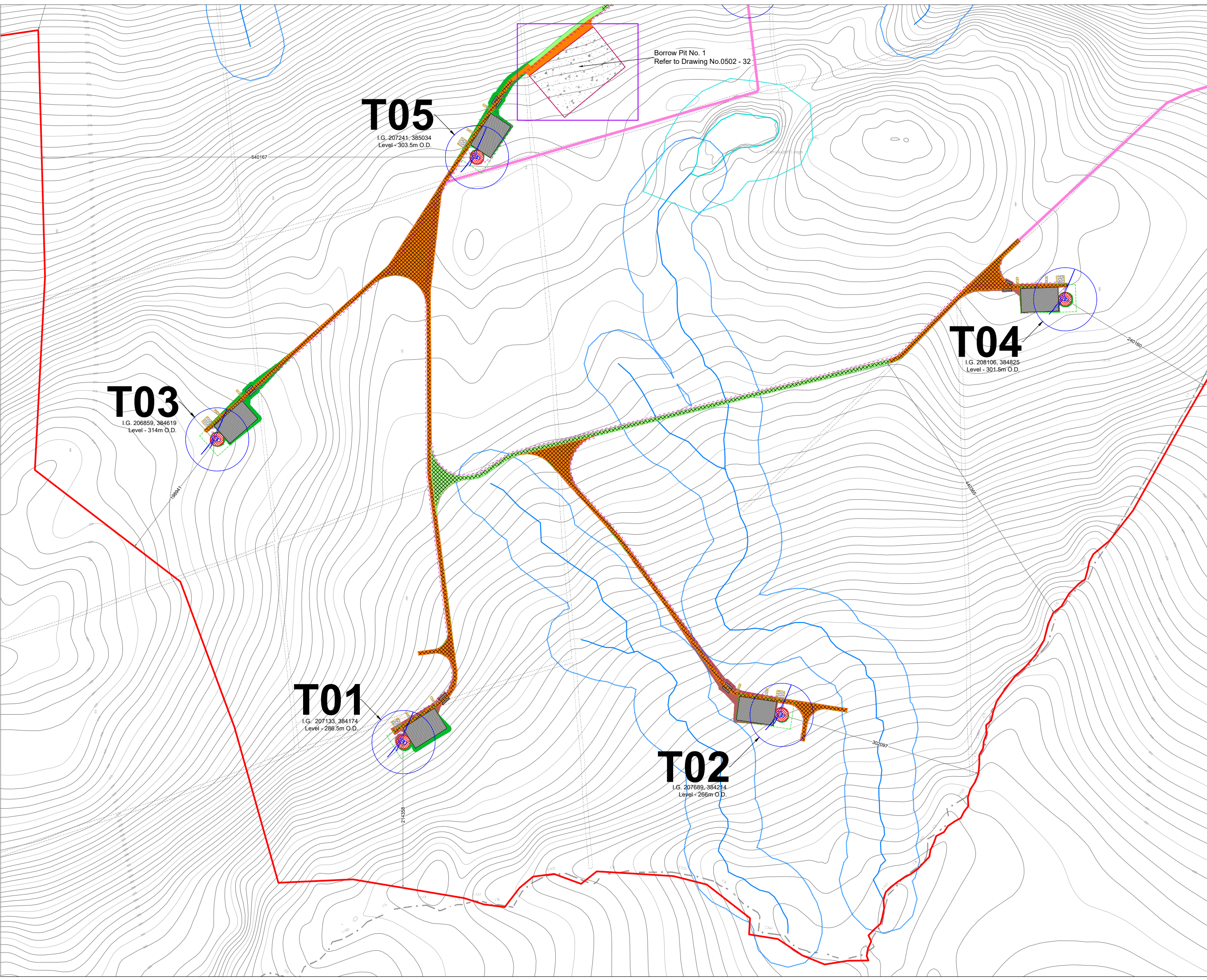
PROJECT No.: **160502** DRAWING No.: **0502 - 09**

SCALE: **1:2,500 @ A1** DATE: **13.12.2017**

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Borrow Pit No. 1
Refer to Drawing No.0502 - 32

T05
I.G. 207241, 385034
Level - 303.5m O.D.

T04
I.G. 208106, 384825
Level - 301.5m O.D.

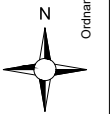
T03
I.G. 206859, 384619
Level - 314m O.D.

T01
I.G. 207133, 384174
Level - 286.5m O.D.

T02
I.G. 207689, 384214
Level - 266m O.D.

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 - River/Stream 50m Buffer
 - Lakes
 - Lakes 50m Buffer
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 - Turbine Sweep Area
 - Borrow Pit
 - Cut
 - Fill
 - Proposed Amenity Track



DRAWING TITLE:
**Site Layout Plan
Sheet 3 of 7**

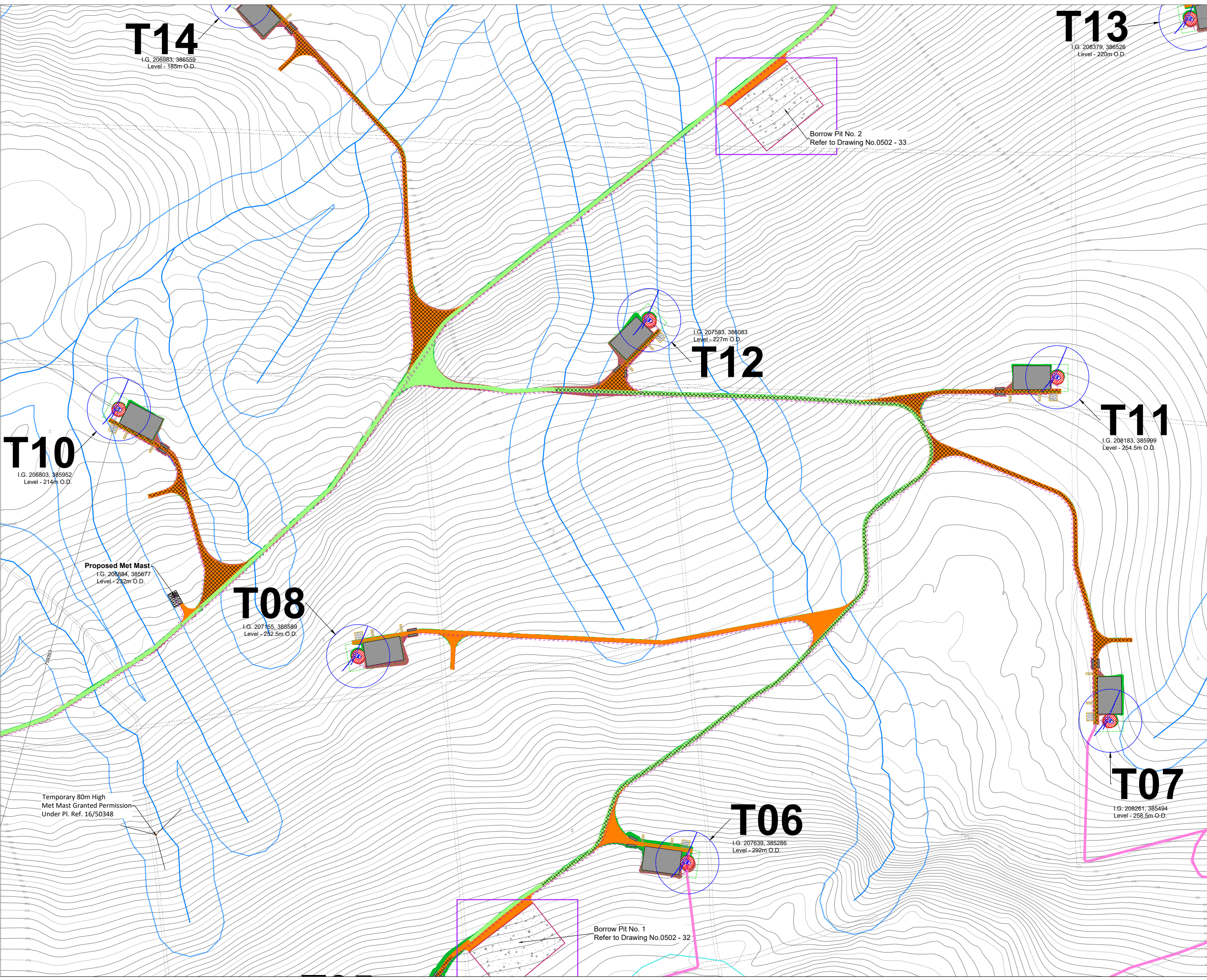
PROJECT TITLE:
Meenbog Wind Farm, Co. Donegal

| | |
|--------------------------------------|--------------------------------------|
| DRAWING BY: Joseph O'Brien | CHECKED BY: Michael Watson |
| PROJECT No: 160502 | DRAWING No.: 0502 - 10 |
| SCALE: 1:2,500 @A1 | DATE: 13.12.2017 |

OS SHEET No.:
0207, 0208, 0209, 0400, 0401, 0423, 0424, 0425, 0426, 0427, 0428, 0451, 0452, 0453, 0454, 0478, 0479, 0480, 0481, 0482, 0506, 0507, 0508, 0509, 0535, 0536

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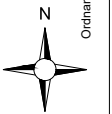


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6. The use of or reliance upon this drawing shall be deemed to be acceptance of these conditions of use unless otherwise agreed in writing, such written agreement to be sought from and issued by the copyright holder to the use or reliance upon this drawing.
7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
8. Final levels may vary depending on local ground conditions
9. Internal electrical cable trench may be installed on either side of site roads.

Drawing Legend

| | |
|--|---------------------------------------|
| | Planning Application Site Boundary |
| | Existing Road to be Upgraded |
| | Existing Floating Road to be Upgraded |
| | Proposed Road |
| | Proposed Floating Road |
| | Internal Electrical Cable Trench |
| | River/Stream |
| | River/Stream 50m Buffer |
| | Works Area |
| | Soft Levelled Area |
| | Crane Pad Hardstanding Area |
| | Turbine Foundation |
| | Turbine Sweep Area |
| | Borrow Pit |
| | Cut |
| | Fill |
| | Proposed Amenity Track |



DRAWING TITLE:
Site Layout Plan
Sheet 4 of 7

PROJECT TITLE:
 Meenbog Wind Farm, Co. Donegal

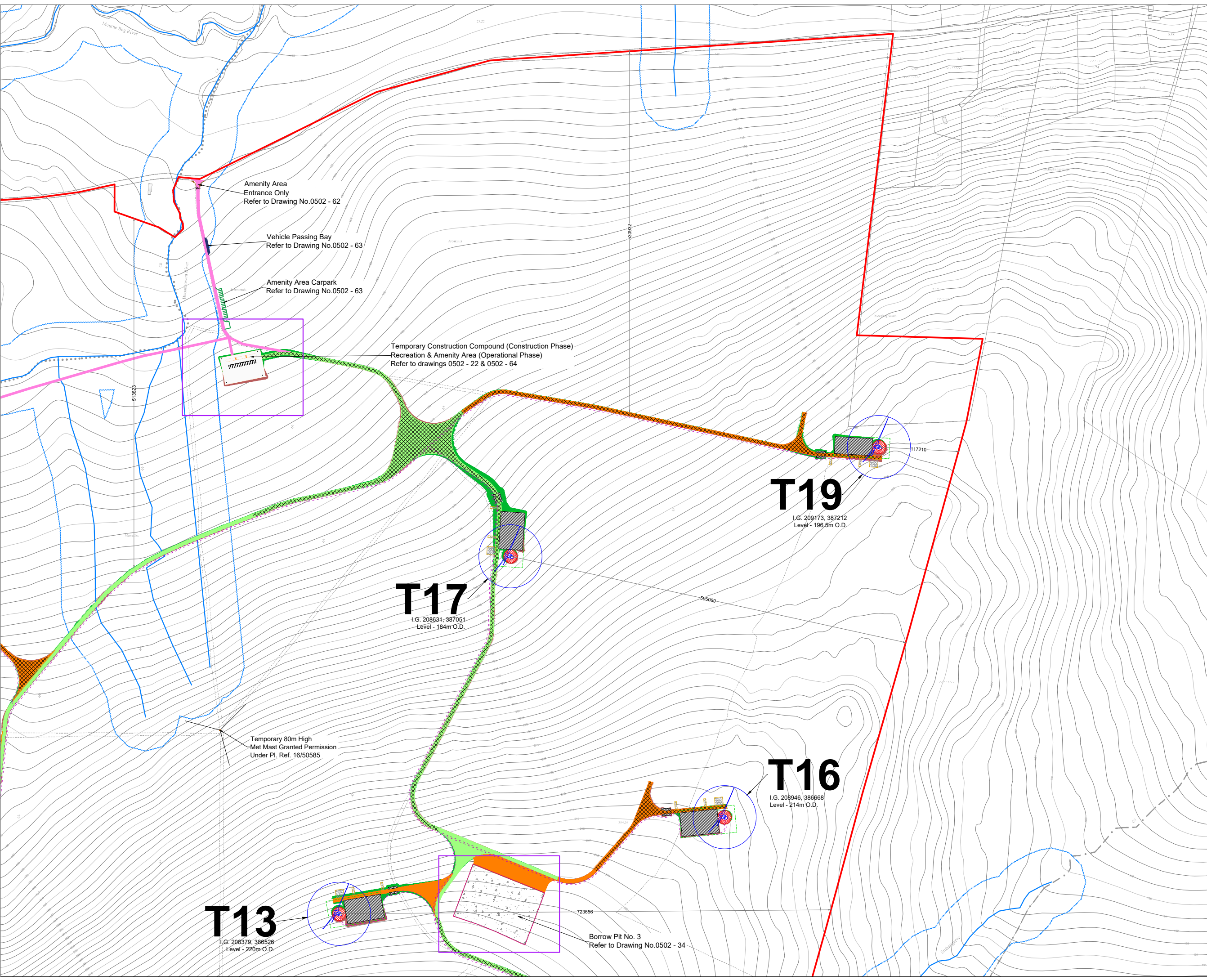
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|--------------------------------------|--------------------------------------|
| DRAWING BY: Joseph O'Brien | CHECKED BY: Michael Watson |
| PROJECT No.: 160502 | DRAWING No.: 0502 - 11 |
| SCALE: 1:2,500 @ A1 | DATE: 13.12.2017 |

OS SHEET No.: 0207, 0208, 0209, 0400, 0401, 0423, 0424, 0425, 0426, 0427, 0450, 0451, 0452, 0453, 0454, 0478, 0479, 0480, 0481, 0482, 0506, 0507, 0508, 0509, 0535, 0536

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Amenity Area
Entrance Only
Refer to Drawing No.0502 - 62

Vehicle Passing Bay
Refer to Drawing No.0502 - 63

Amenity Area Carpark
Refer to Drawing No.0502 - 63

Temporary Construction Compound (Construction Phase)
Recreation & Amenity Area (Operational Phase)
Refer to drawings 0502 - 22 & 0502 - 64

Temporary 80m High
Met Mast Granted Permission
Under Pl. Ref. 16/50585

Borrow Pit No. 3
Refer to Drawing No.0502 - 34

T13
I.G. 208379, 386526
Level - 220m O.D.

T17
I.G. 208631, 387051
Level - 184m O.D.

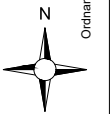
T16
I.G. 208946, 386668
Level - 214m O.D.

T19
I.G. 209173, 387212
Level - 196.5m O.D.

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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 use or reliance upon this drawing.
 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
 8. Final levels may vary depending on local ground conditions
 9. Internal electrical cable trench may be installed on either side of site roads.

Drawing Legend

| | |
|--|---------------------------------------|
| | Planning Application Site Boundary |
| | Existing Road to be Upgraded |
| | Existing Floating Road to be Upgraded |
| | Proposed Road |
| | Proposed Floating Road |
| | Internal Electrical Cable Trench |
| | River/Stream |
| | River/Stream 50m Buffer |
| | Works Area |
| | Soft Levelled Area |
| | Crane Pad Hardstanding Area |
| | Turbine Foundation |
| | Turbine Sweep Area |
| | Borrow Pit |
| | Cut |
| | Fill |
| | Proposed Amenity Track |
| | Passing Bay |



**Site Layout Plan
Sheet 6 of 7**

PROJECT TITLE:
Meenbog Wind Farm, Co. Donegal

| | |
|--------------------------------------|--------------------------------------|
| DRAWING BY: Joseph O'Brien | CHECKED BY: Michael Watson |
| PROJECT No: 160502 | DRAWING No.: 0502 - 13 |
| SCALE: 1:2,500 @ A1 | DATE: 13.12.2017 |

OS SHEET No.:
0207, 0208, 0209, 0400, 0401, 0423, 0424, 0425, 0426, 0427, 0450, 0451, 0452, 0453, 0454, 0478, 0479, 0480, 0481, 0482, 0506, 0507, 0508, 0509, 0535, 0536

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 7. Layout plans show typical Turbine rotor diameter as per turbine drawing.
 8. Final levels may vary depending on local ground conditions
 9. Internal electrical cable trench may be installed on either side of site roads.

T18
 I.G. 207448, 387070
 Level - 196.5m O.D.

Amenity Walkway Footbridge
 Refer to Drawing No.0502 - 66

Clear Span Bridge
 Refer to Drawing No.0502 - 47


















I.G. 207800, 356648
 Level - 184m O.D.

T15

T14
 I.G. 206983, 386559
 Level - 185m O.D.

Borrow Pit No. 2
 Refer to Drawing No.0502 - 33

Drawing Legend

-  Planning Application Site Boundary
-  Existing Road to be Upgraded
-  Existing Floating Road to be Upgraded
-  Proposed Road
-  Proposed Floating Road
-  Internal Electrical Cable Trench
-  River/Stream
-  River/Stream 50m Buffer
-  Works Area
-  Soft Levelled Area
-  Crane Pad Hardstanding Area
-  Turbine Foundation
-  Turbine Sweep Area
-  Borrow Pit
-  Cut
-  Fill
-  Passing Bay



DRAWING TITLE:
**Site Layout Plan
 Sheet 7 of 7**

PROJECT TITLE:
 Meenbog Wind Farm, Co. Donegal

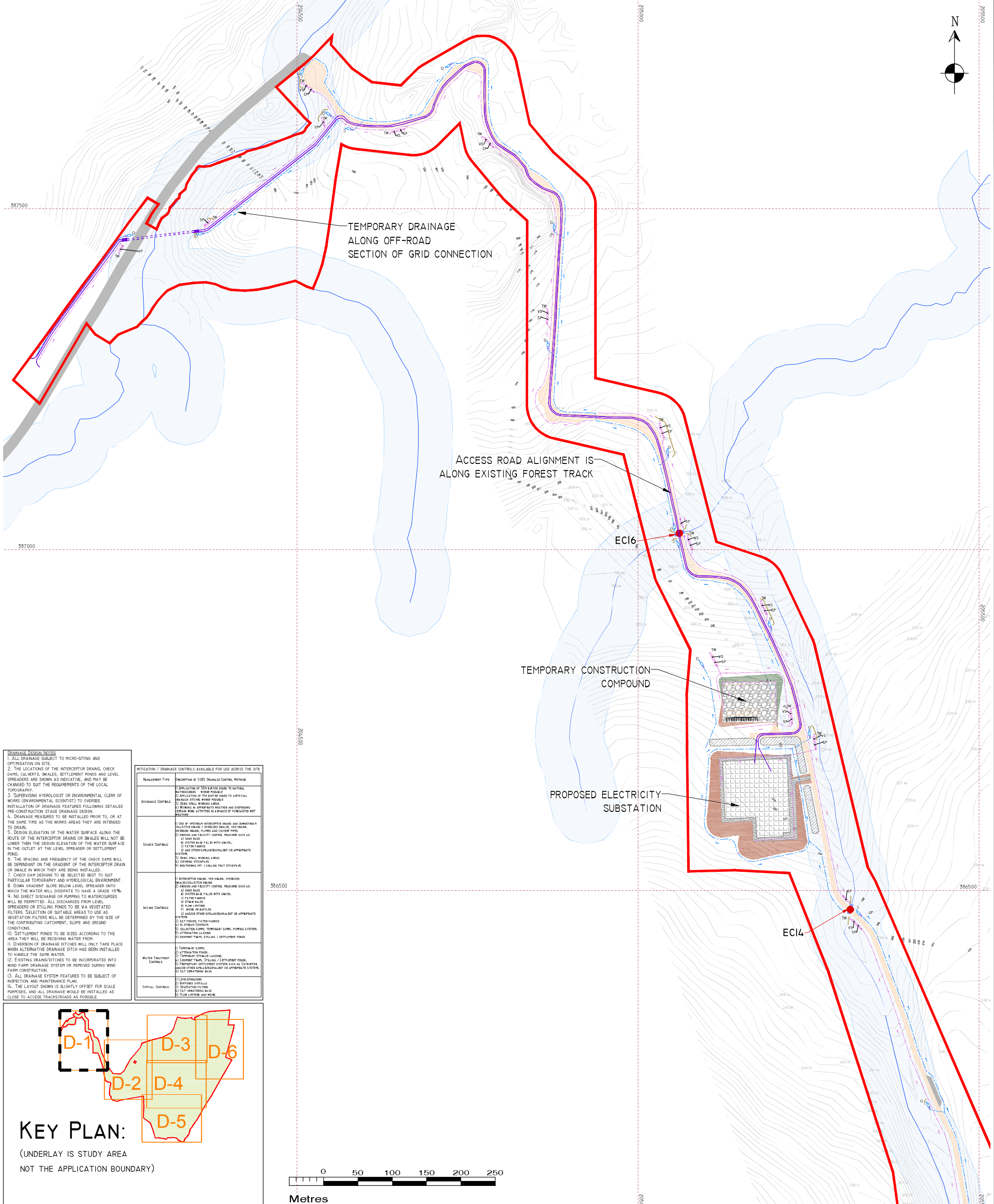
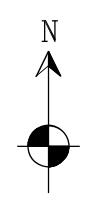
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| DRAWING BY: Joseph O'Brien | CHECKED BY: Michael Watson |
| PROJECT No: 160502 | DRAWING No.: 0502 - 14 |
| SCALE: 1:2,500 @A1 | DATE: 13.12.2017 |

OS SHEET No.: 0267, 0268, 0269, 0400, 0401, 0423, 0424, 0425, 0426, 0427, 0450, 0451, 0452, 0453, 0454, 0478, 0479, 0480, 0481, 0482, 0506, 0507, 0508, 0509, 0535, 0536



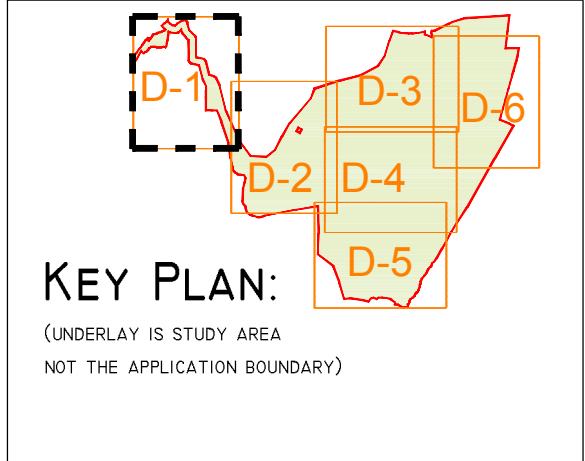
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 Fax: +353 91 771279

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- DRAINAGE DESIGN NOTES**
1. ALL DRAINAGE SUBJECT TO MICRO-SITING AND OPTIMIZATION ON SITE.
 2. THE LOCATIONS OF THE INTERCEPT DRAINS, CHECK DAMS, CULVERTS, SWALES, SETTLEMENT PONDS AND LEVEL SPREADERS ARE SHOWN AS INDICATIVE, AND MAY BE CHANGED TO SUIT THE REQUIREMENTS OF THE LOCAL TOPOGRAPHY.
 3. SUPERVISING HYDROLOGIST OR ENVIRONMENTAL CLERK OF WORKS (ENVIRONMENTAL SCIENTIST) TO OVERSEE INSTALLATION OF DRAINAGE FEATURES FOLLOWING DETAILED PRE-CONSTRUCTION STAGE 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 INTERCEPT DRAINS OR SWALES WILL NOT BE LOWER THAN THE DESIGN ELEVATION OF THE WATER SURFACE IN THE OUTLET AT THE LEVEL SPREADER OR SETTLEMENT POND.
 6. THE SPACING AND FREQUENCY OF THE CHECK DAMS WILL BE DEPENDANT ON THE GRADIENT OF THE INTERCEPT 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 $\leq 0.5\%$.
 9. NO DIRECT DISCHARGE OR PUMPING TO WATERCOURSES WILL BE PERMITTED. ALL DISCHARGES FROM LEVEL SPREADERS OR STILLING PONDS TO BE VIA VEGETATED FILTERS. SELECTION OF SUITABLE AREAS TO USE AS VEGETATION FILTERS WILL BE DETERMINED BY THE SIZE OF THE CONTRIBUTING CATCHMENT, SLOPE AND GROUND CONDITIONS.
 10. SETTLEMENT 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 INTO WIND FARM DRAINAGE SYSTEM 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 ACCESS TRACKS/ROADS AS POSSIBLE.

| Management Type | DESCRIPTION OF SILES DRAINAGE CONTROL METHOD |
|--------------------------|--|
| AVOIDANCE CONTROLS | <ol style="list-style-type: none"> 1) APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE 2) APPLICATION OF 50M BUFFER ZONES TO ARTIFICIAL DRAINAGE SYSTEMS WHERE POSSIBLE 3) WORKING IN APPROPRIATE WEATHER AND SUSPENDING CERTAIN WORKS ACTIVITIES IN ADVANCE OF FORECAST WET WEATHER |
| SOURCE CONTROLS | <ol style="list-style-type: none"> 1) USE OF UPSTREAM INTERCEPT DRAINS AND DOWNSTREAM COLLECTOR DRAINS / FILTER BEDS, VEGETATED SWALES, SWALES, SWALES AND CULVERT PIPES 2) PRECISION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> a) SAND BAGS b) FILTER FABRICS c) OTHER OTHERS (SILT/SAND/GRIT) OR APPROPRIATE SYSTEMS 3) MAKE SURE WORKING AREAS 4) COVERING STOCKPILES 5) WEATHERING OFF / EROSION PAINT STOCKPILES |
| IN-AREA CONTROLS | <ol style="list-style-type: none"> 1) INTERCEPT DRAINS, VEGETATED SWALES, OVERHEAD SWALES/COLLECTOR DRAINS 2) PRECISION AND VELOCITY CONTROL MEASURES SUCH AS: <ol style="list-style-type: none"> a) SAND BAGS b) FILTER FABRICS c) OTHER OTHERS (SILT/SAND/GRIT) OR APPROPRIATE SYSTEMS 3) SILT FENCES, FILTER FABRICS 4) IN OTHER SITUATIONS 5) COLLECTION TRAPS, TEMPORARY CULPS, PUMPING SYSTEMS 6) SETTLEMENT PONDS 7) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS |
| WATER TREATMENT CONTROLS | <ol style="list-style-type: none"> 1) TEMPORARY CULPS 2) SETTLEMENT PONDS 3) TEMPORARY STILLING BASINS 4) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS 5) PERMANENT SETTLEMENT SYSTEMS SUCH AS FILTER BEDS AND OTHER OTHERS (SILT/SAND/GRIT) OR APPROPRIATE SYSTEMS 6) SILT SPREADING BASIN |
| OFF-AREA CONTROLS | <ol style="list-style-type: none"> 1) LEVEL SPREADERS 2) BUFFERED OFFSPILLS 3) VEGETATED SWALES 4) SILT SPREADING BASIN 5) FLOW DIVERTERS AND WEIRS |



DRAWING LEGEND :

| | | |
|--|--|--|
| <ul style="list-style-type: none"> APPLICATION BOUNDARY EXISTING ROADS EXISTING TRACKS/FOREST ROADS WORKS AREA CRANE PAD HARDSTANDING AREA BORROW PIT TURBINE FOUNDATION TURBINE AND SWEEP AREA SITE LAYOUT IS UNDERLAIN BY 1M INTERVAL CONTOURS TO MOD MALIN HEAD SLOPE / DRAINAGE DIRECTION | <ul style="list-style-type: none"> EXISTING RIVER \ STREAM \ LAKE RIVER \ STREAM BUFFER 50M LAKES LAKES 50M BUFFER EXISTING CULVERTS / BRIDGES UPSTREAM INTERCEPT DRAIN SWALES / DOWNSTREAM COLLECTOR DRAIN DIRECTION OF FLOW SILT FENCES DOUBLE / TRIPLE SILT FENCES SETTLEMENT POND - VEGETATION FILTER LEVEL SPREADER SETTLEMENT POND - LEVEL SPREADER | <ul style="list-style-type: none"> CHECK DAM 'TYPE B' PROPOSED CULVERTS / BRIDGES INTERCEPT DITCH CULVERT COLLECTOR DITCH CULVERT OVERLAND FLOW DISCHARGE TREATED WATER DISCHARGE TW SP VS PUMPING SUMP BERM ON SITE GRID CONNECTION |
|--|--|--|

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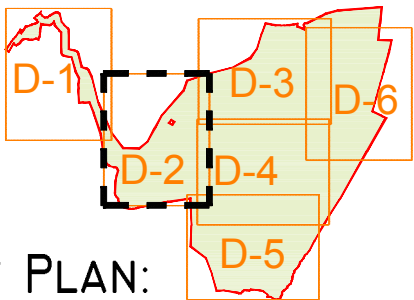
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web: www.hydroenvironmental.ie

| | | |
|-------------|------------------------------------|----------------------|
| Client: | MCCARTHY KEVILLE AND O'SULLIVAN | |
| Job: | MEENBOG WIND FARM, Co. DONEGAL | |
| Title: | DRAINAGE LAYOUT SHEET 1 OF 6 | |
| Figure No: | D101 (0502-15) | |
| Drawing No: | P1249-2-1217-A1-D101 (0502-15)-00A | Project No.: P1249-2 |
| Sheet Size: | A1 | Drawn By: MG/GD |
| Scale: | 1:2,500 (A1) | Date: 13/12/2017 |
| Checked By: | MG | |

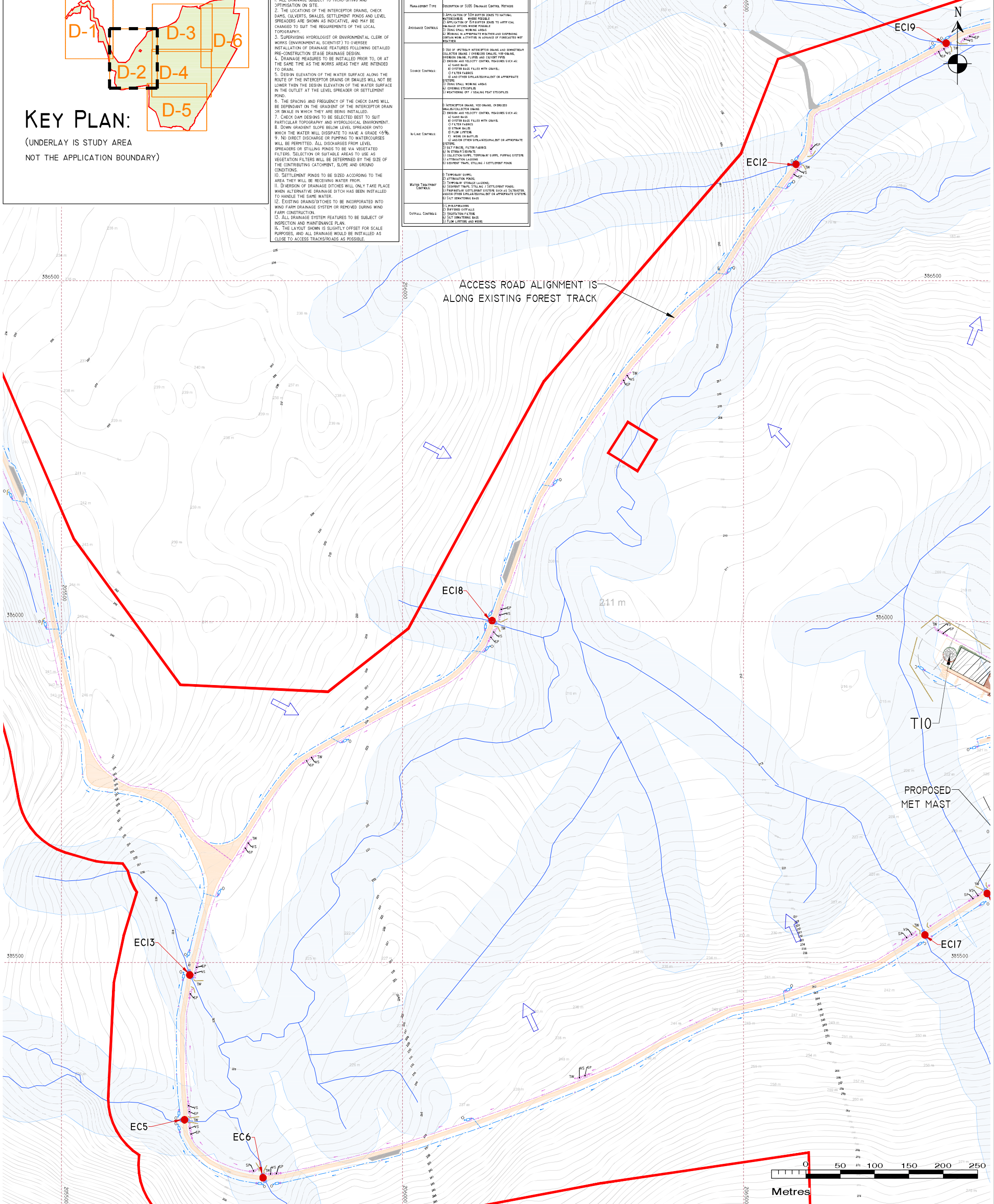
KEY PLAN:

(UNDERLAY IS STUDY AREA NOT THE APPLICATION BOUNDARY)



1. DRAINAGE DESIGN SUBJECT TO MICRO-SITING AND OPTIMISATION ON SITE.
2. THE LOCATIONS OF THE INTERCEPTOR DRAINS, CHECK DAMS, CULVERTS, SWALES, SETTLEMENT PONDS AND LEVEL SPREADERS ARE SHOWN AS INDICATIVE, AND MAY BE CHANGED TO SUIT THE REQUIREMENTS OF THE LOCAL TOPOGRAPHY.
3. SUPERVISING HYDROLOGIST OR ENVIRONMENTAL CLERK OF WORKS (ENVIRONMENTAL SCIENTIST) TO OVERSEE INSTALLATION OF DRAINAGE FEATURES FOLLOWING DETAILED PRE-CONSTRUCTION STAGE DRAINAGE DESIGN.
4. DRAINAGE MEASURES TO BE INSTALLED PRIOR TO, OR AT THE SAME TIME AS THE WORKS AREAS THEY ARE INTENDED TO DRAIN.
5. DESIGN ELEVATION OF THE WATER SURFACE ALONG THE ROUTE OF THE INTERCEPTOR DRAINS OR SWALES WILL NOT BE LOWER THAN THE DESIGN ELEVATION OF THE WATER SURFACE IN THE OUTLET AT THE LEVEL SPREADER OR SETTLEMENT POND.
6. THE SPACING AND FREQUENCY OF THE CHECK DAMS WILL BE DEPENDANT ON THE GRADIENT OF THE INTERCEPTOR DRAIN OR SWALE IN WHICH THEY ARE BEING INSTALLED.
7. CHECK DAM DESIGN TO BE SELECTED BEST TO SUIT PARTICULAR TOPOGRAPHY AND HYDROLOGICAL ENVIRONMENT.
8. DOWN GRADIENT SLOPE BELOW LEVEL SPREADER ONTO WHICH THE WATER WILL DISPERSE TO HAVE A GRADE 0.5%.
9. NO DIRECT DISCHARGE OR PUMPING TO WATERCOURSES WILL BE PERMITTED. ALL DISCHARGES FROM LEVEL SPREADERS OR STILLING PONDS TO BE VIA VEGETATED FILTERS. SELECTION OF SUITABLE AREAS TO USE AS VEGETATION FILTERS WILL BE DETERMINED BY THE SIZE OF THE CONTRIBUTING CATCHMENT, SLOPE AND GROUND CONDITIONS.
10. SETTLEMENT 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.
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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 ACCESS TRACKS/ROADS AS POSSIBLE.

| Management Type | Description of SUDS Drainage Control Method |
|--------------------------|--|
| Avoidance Controls | 1. Application of 50m buffer zones to natural watercourses where possible. 2. Application of 50m buffer zones to artificial watercourses where possible. 3. Design of all works to avoid or minimise potential impacts on watercourses and riparian habitats. 4. Installation of appropriate watercourse crossing structures in advance of finalised works. |
| Source Controls | 1. Use of artificial interceptors (drains and swales) to collect surface runoff from roofs, paved areas, parking areas, etc. 2. Use of permeable paving materials. 3. Use of permeable paving materials. 4. Use of permeable paving materials. 5. Use of permeable paving materials. 6. Use of permeable paving materials. 7. Use of permeable paving materials. 8. Use of permeable paving materials. 9. Use of permeable paving materials. 10. Use of permeable paving materials. |
| In-Land Controls | 1. Interceptor drains, swales, or berms. 2. Interceptor drains, swales, or berms. 3. Interceptor drains, swales, or berms. 4. Interceptor drains, swales, or berms. 5. Interceptor drains, swales, or berms. 6. Interceptor drains, swales, or berms. 7. Interceptor drains, swales, or berms. 8. Interceptor drains, swales, or berms. 9. Interceptor drains, swales, or berms. 10. Interceptor drains, swales, or berms. |
| Water Treatment Controls | 1. Temporary sumps. 2. Temporary storage lagoons. 3. Temporary storage lagoons. 4. Temporary storage lagoons. 5. Temporary storage lagoons. 6. Temporary storage lagoons. 7. Temporary storage lagoons. 8. Temporary storage lagoons. 9. Temporary storage lagoons. 10. Temporary storage lagoons. |
| Outfall Controls | 1. Filter strips. 2. Filter strips. 3. Filter strips. 4. Filter strips. 5. Filter strips. 6. Filter strips. 7. Filter strips. 8. Filter strips. 9. Filter strips. 10. Filter strips. |



DRAWING LEGEND:

| | | | | | |
|--|------------------------------|--|--------------------------------|--|---|
| | APPLICATION BOUNDARY | | EXISTING RIVER / STREAM / LAKE | | CHECK DAM 'TYPE B' |
| | EXISTING ROADS | | RIVER / STREAM BUFFER 50M | | PROPOSED CULVERTS / BRIDGES |
| | EXISTING TRACKS/FOREST ROADS | | LAKES | | INTERCEPTOR DITCH CULVERT |
| | WORKS AREA | | LAKES 50M BUFFER | | COLLECTOR DITCH CULVERT |
| | CRANE PAD HARDSTANDING AREA | | | | OVERLAND FLOW DISCHARGE |
| | BORROW PIT | | | | TREATED WATER DISCHARGE |
| | TURBINE FOUNDATION | | | | SETTLEMENT POND |
| | TURBINE AND SWEEP AREA | | | | SEMI-NATURAL VEGETATION SWALE / FILTER BED / SECONDARY SP |
| | SLOPE / DRAINAGE DIRECTION | | | | PUMPING SUMP |
| | | | | | BERM |
| | | | | | ON SITE GRID CONNECTION |

EXISTING DRAINAGE

| | |
|--|--|
| | UPSTREAM INTERCEPTOR DRAIN |
| | SWALES / DOWNSTREAM COLLECTOR DRAIN |
| | DIRECTION OF FLOW |
| | SILT FENCES |
| | DOUBLE / TRIPLE SILT FENCES |
| | SETTLEMENT POND - VEGETATION FILTER - LEVEL SPREADER |
| | SETTLEMENT POND - LEVEL SPREADER |

PROPOSED DRAINAGE

| | |
|--|--|
| | UPSTREAM INTERCEPTOR DRAIN |
| | SWALES / DOWNSTREAM COLLECTOR DRAIN |
| | DIRECTION OF FLOW |
| | SILT FENCES |
| | DOUBLE / TRIPLE SILT FENCES |
| | SETTLEMENT POND - VEGETATION FILTER - LEVEL SPREADER |
| | SETTLEMENT POND - LEVEL SPREADER |

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| | | | |
|----------|-------------|------|--------|
| 13.12.17 | Planning | MG | MG |
| Date | Description | Chkd | Signed |

Revisions

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 email: info@hydroenvironmental.ie
 web: www.hydroenvironmental.ie

Client: MCCARTHY KEVILLE AND O'SULLIVAN

Job: MEENBOG WIND FARM, Co. DONEGAL

Title: DRAINAGE LAYOUT SHEET 2 OF 6

Figure No: D102 (0502-16)

Drawing No: P1249-2-1217-A1-D102(0502-16)-00A

Sheet Size: A1
 Scale: 1:2,500 (A1)
 Date: 13/12/2017

Project No.: P1249-2
 Drawn By: MG/GD
 Checked By: MG

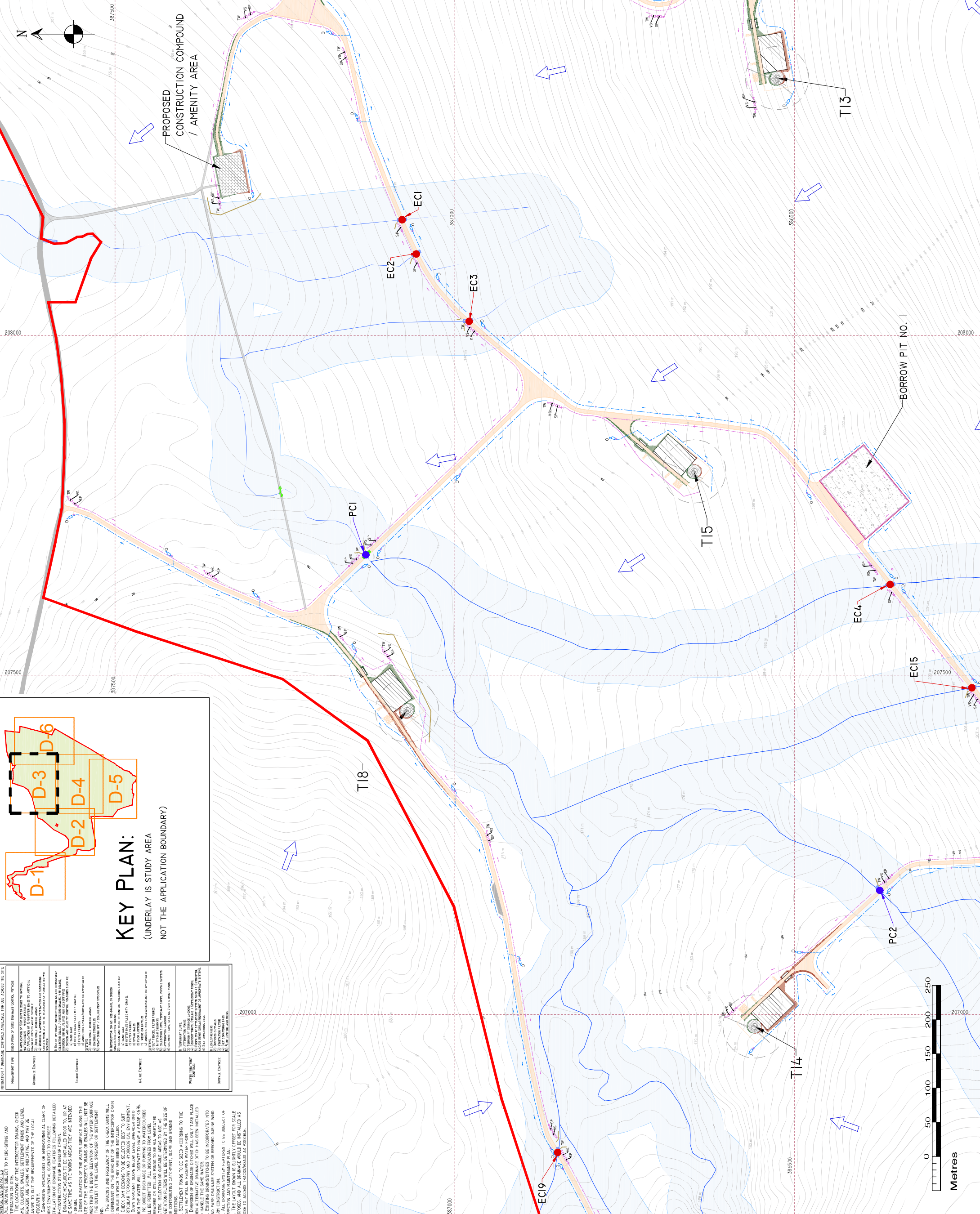
| DRAWING LEGEND: | |
|-----------------|--|
| [Symbol] | APPLICATION BOUNDARY |
| [Symbol] | EXISTING ROADS |
| [Symbol] | EXISTING TRACKS/FOREST ROADS |
| [Symbol] | WORKS AREA |
| [Symbol] | CRANE PAD |
| [Symbol] | HARVESTING AREA |
| [Symbol] | BORROW PIT |
| [Symbol] | TURBINE FOUNDATION |
| [Symbol] | TURBINE AND SHEFT AREA |
| [Symbol] | SITE LAYOUT IS UNDERLAIN BY 1M INTERVAL CONTOURS TO 100M MAIN HEAD |
| [Symbol] | SLOPE / DRAINAGE DIRECTION |
| [Symbol] | EXISTING RIVER / STREAM / LAKE |
| [Symbol] | RIVER / STREAM BUFFER 50M |
| [Symbol] | LAKES |
| [Symbol] | EXISTING OLIVERTS / BRIDGES |
| [Symbol] | UPSTREAM INTERCEPTOR DRAIN |
| [Symbol] | SWALES / DOWNSTREAM COLLECTOR DRAIN |
| [Symbol] | DIRECTION OF FLOW |
| [Symbol] | SILT FENCES |
| [Symbol] | DOUBLE / TRIPLE SILT FENCES |
| [Symbol] | SETTLEMENT FOND - VEGETATION FILTER |
| [Symbol] | LEVEL SPREADER |
| [Symbol] | SETTLEMENT FOND - LEVEL SPREADER |
| [Symbol] | CHECK DAM 'TYPE A' |
| [Symbol] | CHECK DAM 'TYPE B' |
| [Symbol] | PROPOSED OLIVERTS / BRIDGES |
| [Symbol] | INTERCEPTOR DITCH OLIVERT |
| [Symbol] | COLLECTOR DITCH OLIVERT |
| [Symbol] | OVERLAND FLOW DISCHARGE |
| [Symbol] | TREATED WATER DISCHARGE |
| [Symbol] | SETTLEMENT FOND |
| [Symbol] | SEM-NATURAL VEGETATION |
| [Symbol] | SWALE / FILTER BED / SECONDARY SP |
| [Symbol] | PUMPING SUMP |
| [Symbol] | BERM |
| [Symbol] | ON SITE GRID CONNECTION |

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| 3/12/17 Planning | MG/MG |
| Date | Description |
| Revisions | |
| | Chkd |
| | Signed |

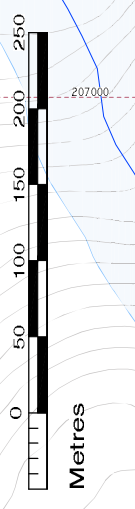
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| | |
|--------------|-----------------------------------|
| Client: | MCCARTHY KEVILLE AND O'SULLIVAN |
| Job: | MEENBOG WIND FARM, CO. DONEGAL |
| Title: | DRAINAGE LAYOUT SHEET 3 OF 6 |
| Figure No.: | D103 (0502-17) |
| Drawing No.: | P1249-2-1217-A1-D103(0502-17)-00A |
| Sheet Size: | A1 |
| Scale: | 1:2,500 (A1) |
| Date: | 13/12/2017 |
| Drawn By: | MG/GSD |
| Checked By: | MG |



KEY PLAN:
 (UNDERLAY IS STUDY AREA NOT THE APPLICATION BOUNDARY)

| DESCRIPTION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE |
|---|
| Maximum Time Description of 500m Diameter Control Network |
| Advanced Controls Application of 500m Diameter Control Network Application of 500m Diameter Control Network to Area A Application of 500m Diameter Control Network to Area B Application of 500m Diameter Control Network to Area C Application of 500m Diameter Control Network to Area D Application of 500m Diameter Control Network to Area E Application of 500m Diameter Control Network to Area F Application of 500m Diameter Control Network to Area G Application of 500m Diameter Control Network to Area H Application of 500m Diameter Control Network to Area I Application of 500m Diameter Control Network to Area J Application of 500m Diameter Control Network to Area K Application of 500m Diameter Control Network to Area L Application of 500m Diameter Control Network to Area M Application of 500m Diameter Control Network to Area N Application of 500m Diameter Control Network to Area O Application of 500m Diameter Control Network to Area P Application of 500m Diameter Control Network to Area Q Application of 500m Diameter Control Network to Area R Application of 500m Diameter Control Network to Area S Application of 500m Diameter Control Network to Area T Application of 500m Diameter Control Network to Area U Application of 500m Diameter Control Network to Area V Application of 500m Diameter Control Network to Area W Application of 500m Diameter Control Network to Area X Application of 500m Diameter Control Network to Area Y Application of 500m Diameter Control Network to Area Z |
| Source Controls Application of 500m Diameter Control Network Application of 500m Diameter Control Network to Area A Application of 500m Diameter Control Network to Area B Application of 500m Diameter Control Network to Area C Application of 500m Diameter Control Network to Area D Application of 500m Diameter Control Network to Area E Application of 500m Diameter Control Network to Area F Application of 500m Diameter Control Network to Area G Application of 500m Diameter Control Network to Area H Application of 500m Diameter Control Network to Area I Application of 500m Diameter Control Network to Area J Application of 500m Diameter Control Network to Area K Application of 500m Diameter Control Network to Area L Application of 500m Diameter Control Network to Area M Application of 500m Diameter Control Network to Area N Application of 500m Diameter Control Network to Area O Application of 500m Diameter Control Network to Area P Application of 500m Diameter Control Network to Area Q Application of 500m Diameter Control Network to Area R Application of 500m Diameter Control Network to Area S Application of 500m Diameter Control Network to Area T Application of 500m Diameter Control Network to Area U Application of 500m Diameter Control Network to Area V Application of 500m Diameter Control Network to Area W Application of 500m Diameter Control Network to Area X Application of 500m Diameter Control Network to Area Y Application of 500m Diameter Control Network to Area Z |
| Main Controls Application of 500m Diameter Control Network Application of 500m Diameter Control Network to Area A Application of 500m Diameter Control Network to Area B Application of 500m Diameter Control Network to Area C Application of 500m Diameter Control Network to Area D Application of 500m Diameter Control Network to Area E Application of 500m Diameter Control Network to Area F Application of 500m Diameter Control Network to Area G Application of 500m Diameter Control Network to Area H Application of 500m Diameter Control Network to Area I Application of 500m Diameter Control Network to Area J Application of 500m Diameter Control Network to Area K Application of 500m Diameter Control Network to Area L Application of 500m Diameter Control Network to Area M Application of 500m Diameter Control Network to Area N Application of 500m Diameter Control Network to Area O Application of 500m Diameter Control Network to Area P Application of 500m Diameter Control Network to Area Q Application of 500m Diameter Control Network to Area R Application of 500m Diameter Control Network to Area S Application of 500m Diameter Control Network to Area T Application of 500m Diameter Control Network to Area U Application of 500m Diameter Control Network to Area V Application of 500m Diameter Control Network to Area W Application of 500m Diameter Control Network to Area X Application of 500m Diameter Control Network to Area Y Application of 500m Diameter Control Network to Area Z |
| Water Treatment Controls Application of 500m Diameter Control Network Application of 500m Diameter Control Network to Area A Application of 500m Diameter Control Network to Area B Application of 500m Diameter Control Network to Area C Application of 500m Diameter Control Network to Area D Application of 500m Diameter Control Network to Area E Application of 500m Diameter Control Network to Area F Application of 500m Diameter Control Network to Area G Application of 500m Diameter Control Network to Area H Application of 500m Diameter Control Network to Area I Application of 500m Diameter Control Network to Area J Application of 500m Diameter Control Network to Area K Application of 500m Diameter Control Network to Area L Application of 500m Diameter Control Network to Area M Application of 500m Diameter Control Network to Area N Application of 500m Diameter Control Network to Area O Application of 500m Diameter Control Network to Area P Application of 500m Diameter Control Network to Area Q Application of 500m Diameter Control Network to Area R Application of 500m Diameter Control Network to Area S Application of 500m Diameter Control Network to Area T Application of 500m Diameter Control Network to Area U Application of 500m Diameter Control Network to Area V Application of 500m Diameter Control Network to Area W Application of 500m Diameter Control Network to Area X Application of 500m Diameter Control Network to Area Y Application of 500m Diameter Control Network to Area Z |
| Optimal Controls Application of 500m Diameter Control Network Application of 500m Diameter Control Network to Area A Application of 500m Diameter Control Network to Area B Application of 500m Diameter Control Network to Area C Application of 500m Diameter Control Network to Area D Application of 500m Diameter Control Network to Area E Application of 500m Diameter Control Network to Area F Application of 500m Diameter Control Network to Area G Application of 500m Diameter Control Network to Area H Application of 500m Diameter Control Network to Area I Application of 500m Diameter Control Network to Area J Application of 500m Diameter Control Network to Area K Application of 500m Diameter Control Network to Area L Application of 500m Diameter Control Network to Area M Application of 500m Diameter Control Network to Area N Application of 500m Diameter Control Network to Area O Application of 500m Diameter Control Network to Area P Application of 500m Diameter Control Network to Area Q Application of 500m Diameter Control Network to Area R Application of 500m Diameter Control Network to Area S Application of 500m Diameter Control Network to Area T Application of 500m Diameter Control Network to Area U Application of 500m Diameter Control Network to Area V Application of 500m Diameter Control Network to Area W Application of 500m Diameter Control Network to Area X Application of 500m Diameter Control Network to Area Y Application of 500m Diameter Control Network to Area Z |



DRAWING LEGEND:

- APPLICATION BOUNDARY
- EXISTING ROADS
- EXISTING TRACKS/FOREST ROADS
- WORKS AREA
- CRANE PAD
- HAUL/LOADING AREA
- BORROW PIT
- TURBINE FOUNDATION
- TURBINE AND SHEFT AREA
- SITE LAYOUT IS UNDERLAY BY 1M INTERVAL CONTOURS TO 100M MAIN HEAD
- SLOPE / DRAINAGE DIRECTION
- EXISTING RIVER / STREAM / LAKE
- RIVER / STREAM BUFFER 50M
- LAKES
- EXISTING OLIVERTS / BRIDGES
- UPSTREAM INTERCEPTOR DRAIN
- SWALES / DOWNSTREAM COLLECTOR DRAIN
- DIRECTION OF FLOW
- SILT FENCES
- DOUBLE / TRIPLE SILT FENCES
- SETTLEMENT FOND - VEGETATION FILTER
- LEVEL SPREADER
- CHECK DAM 'TYPE A'
- CHECK DAM 'TYPE B'
- PROPOSED OLIVERTS / BRIDGES
- INTERCEPTOR DITCH OLIVERT
- COLLECTOR DITCH OLIVERT
- OVERLAND FLOW DISCHARGE
- TREATED WATER DISCHARGE
- SETTLEMENT FOND
- SEM-NATURAL VEGETATION
- SWALE / FILTER BED / SECONDARY SP
- PUMPING SUMP
- BERM
- ON SITE GRID CONNECTION

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| 3/12/17 | Planning | MG | MG | MG |
| Date | Description | Chkd | Signed | Revisions |

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Client: MCCARTHY KEVILLE AND O'SULLIVAN

Job: MEENBOG WIND FARM, CO. DONEGAL

Title: DRAINAGE LAYOUT SHEET 4 OF 6

Figure No: D104 (0502-18)

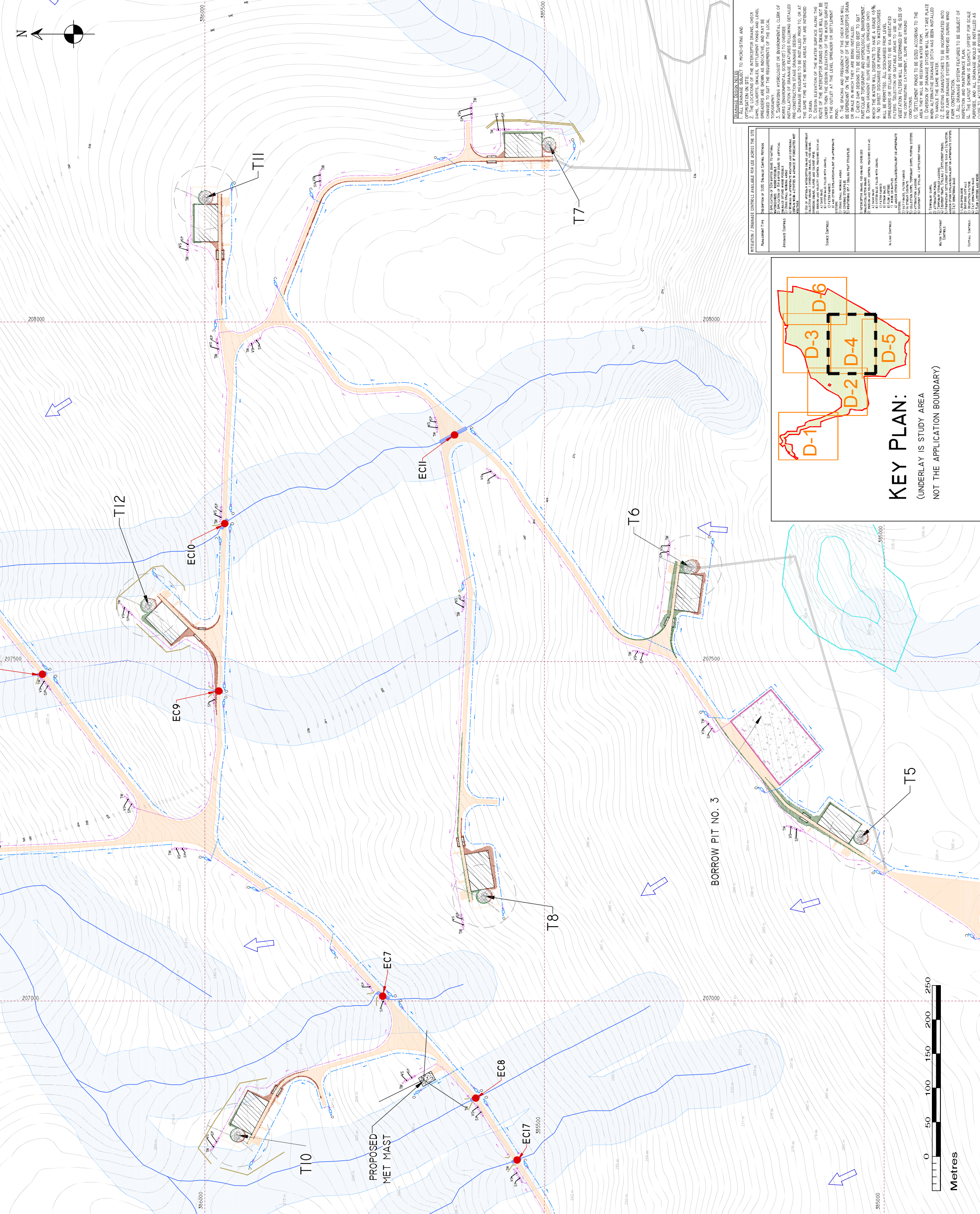
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Scale: 1:2,500 (A1)

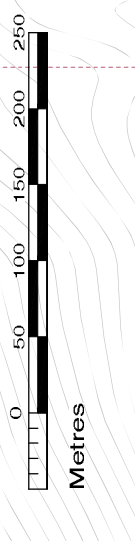
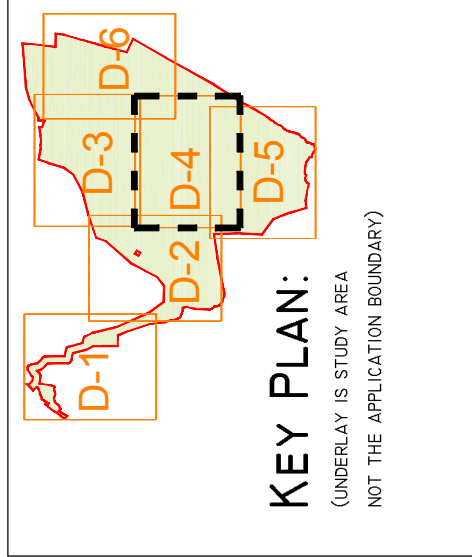
Date: 13/12/2017

Drawn By: MG/GSD
 Checked By: MG



DESIGNER'S NOTES
 1. ALL DRAINAGE SYSTEMS TO BE INSTALLED AND OPTIMIZED ON SITE. INTERCEPTOR BASINS, CHECK DAMS, SWALES, SWALES, SETTLEMENT PANS AND LEVEL SPREADERS ARE SHOWN AS INDICATIVE, AND MAY BE CHANGED TO SUIT THE REQUIREMENTS OF THE LOCAL AUTHORITIES.
 2. SUPERVISOR HYDROLOGIST OR ENVIRONMENTAL CLERK OF WORK (ENVIRONMENTAL SCIENTIST) TO OVERSEE PRE-CONSTRUCTION STAGE DRAINAGE DESIGN.
 3. DRAINAGE HEADGAGES TO BE INSTALLED PRIOR TO, OR AT THE SAME TIME AS, THE WORKS ARE BEING INSTALLED TO DRAIN. THE AS THE WORKS ARE BEING INSTALLED TO DRAIN. THE AS THE WORKS ARE BEING INSTALLED TO DRAIN.
 4. DESIGN ELEVATION OF THE WATER SURFACE ALONG THE LENGTH OF THE DRAINAGE SYSTEM OR SWALE SHALL BE DETERMINED BY THE GRAZING OF THE INTERCEPTOR DRAIN OR SWALE IN WHICH THEY ARE BEING INSTALLED.
 5. DOWN GRADIENT SLOPE BELOW LEVEL SPREADER ONTO VEGETATION FILTER BED SHALL BE MAINTAINED TO PREVENT OVERFLOW OF WATER INTO THE VEGETATION FILTER BED.
 6. NO DIRECT DISCHARGE OR PUMPING TO WATERCOURSES SHALL BE PERMITTED.
 7. VEGETATION FILTER BEDS SHALL BE INSTALLED TO PREVENT OVERFLOW OF WATER INTO THE VEGETATION FILTER BED.
 8. SETTLEMENT PANS TO BE SIZED ACCORDING TO THE AREA THEY WILL BE RECEIVING WATER FROM.
 9. ALL ALTERNATIVE DRAINAGE DITCH HAS BEEN INSTALLED TO HANDLE THE SAME WATER TO BE DISCHARGED INTO THE VEGETATION FILTER BED.
 10. WIND FARM DRAINAGE SYSTEM OR IMPROVED DRAINAGE SYSTEM TO BE SUBJECT OF INSPECTION AND MAINTENANCE PLAN.
 11. THE LAYOUT SHOWN IS SLIGHTLY OFFSET FOR SCALE PURPOSES, AND ALL DIMENSIONS WOULD BE INSTALLED AS SHOWN TO MATCH THE DIMENSIONS OF THE DRAINAGE SYSTEM.

| Management Type | Retention / Drainage Controls Available for Use Across the Site |
|-------------------------|--|
| Advanced Controls | Retention of 500m ³ in each control structure Application of 500m ³ buffer zone to natural drainage Retention of 500m ³ in each control structure Retention of 500m ³ in each control structure Retention of 500m ³ in each control structure |
| Basic Controls | Retention of 500m ³ in each control structure Retention of 500m ³ in each control structure Retention of 500m ³ in each control structure Retention of 500m ³ in each control structure Retention of 500m ³ in each control structure |
| No-Side Controls | Retention of 500m ³ in each control structure Retention of 500m ³ in each control structure Retention of 500m ³ in each control structure Retention of 500m ³ in each control structure Retention of 500m ³ in each control structure |
| Water Treatment Control | Retention of 500m ³ in each control structure Retention of 500m ³ in each control structure Retention of 500m ³ in each control structure Retention of 500m ³ in each control structure Retention of 500m ³ in each control structure |
| Control Controls | Retention of 500m ³ in each control structure Retention of 500m ³ in each control structure Retention of 500m ³ in each control structure Retention of 500m ³ in each control structure Retention of 500m ³ in each control structure |



DRAWING LEGEND:

- APPLICATION BOUNDARY
- EXISTING ROADS
- EXISTING TRACKS/FOREST ROADS
- WORKS AREA
- CRANE PAD
- HAUL/LOADING AREA
- BORROW PIT
- TURBINE FOUNDATION
- TURBINE AND SWEPT AREA
- SITE LAYOUT IS UNDERLAIN BY 1M INTERVAL CONTOURS TO 100m MAIN HEAD
- SLOPE / DRAINAGE DIRECTION
- EXISTING RIVER / STREAM / LAKE
- RIVER / STREAM BUFFER 50M
- LAKES
- LAKES 50M BUFFER
- EXISTING CULVERTS / BRIDGES
- UPSTREAM INTERCEPTOR DRAIN
- SWALES / DOWNSTREAM COLLECTOR DRAIN
- DIRECTION OF FLOW
- SILT FENCES
- DOUBLE / TRIPLE SILT FENCES
- SETTLEMENT FOND - VEGETATION FILTER - LEVEL SPREADER
- SETTLEMENT FOND - LEVEL SPREADER
- CHECK DAM 'TYPE A'
- CHECK DAM 'TYPE B'
- PROPOSED CULVERTS / BRIDGES
- INTERCEPTOR DITCH CULVERT
- COLLECTOR DITCH CULVERT
- OVERLAND FLOW DISCHARGE
- TREATED WATER DISCHARGE
- SETTLEMENT FOND
- SEMI-NATURAL VEGETATION
- SWALE / FILTER BED / SECONDARY SP
- PUMPING SUMP
- BERM
- ON SITE GRID CONNECTION

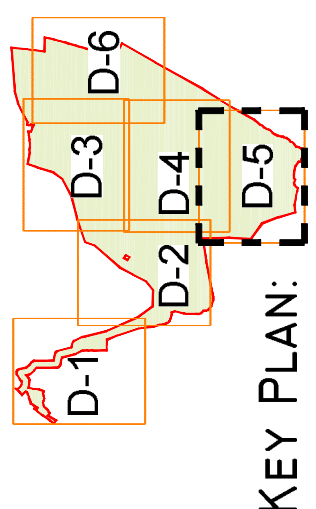
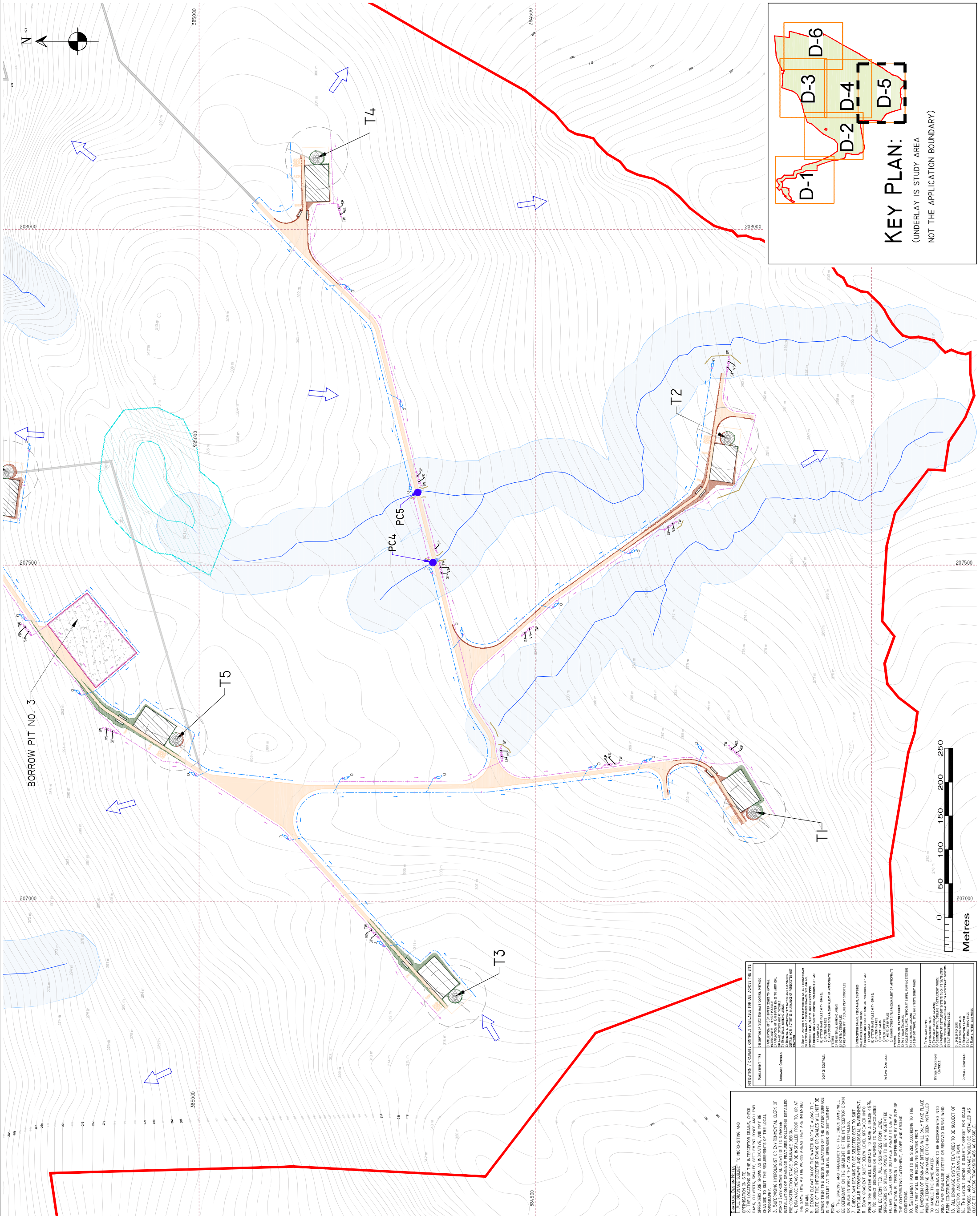
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| 3/12/17 | Planning | MG | MG |
| Date | Description | Chkd | Signed |

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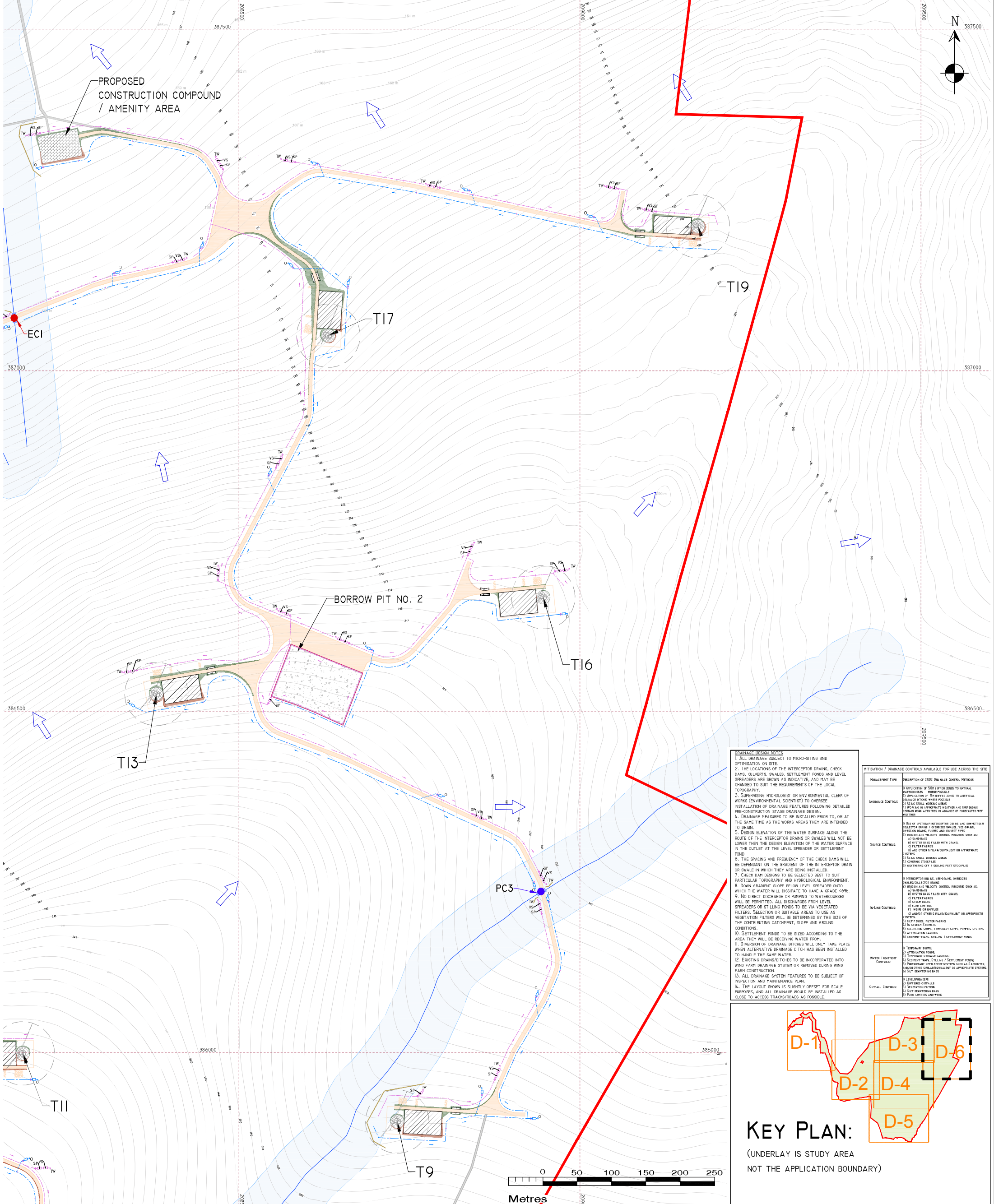
| | |
|--------------|-----------------------------------|
| Client: | MCCARTHY KEVILLE AND O'SULLIVAN |
| Job: | MEENBOG WIND FARM, CO. DONEGAL |
| Title: | DRAINAGE LAYOUT SHEET 5 OF 6 |
| Figure No.: | D105 (0502-19) |
| Drawing No.: | P1249-2-1217-A1-D105(0502-19)-00A |
| Sheet Size: | A1 |
| Scale: | 1:2,500 (A1) |
| Date: | 13/12/2017 |
| Drawn By: | MG/GSD |
| Checked By: | MG |



DESIGN REQUIREMENTS TO MID-DRAINING AND OPTIMIZATION ON SITE:

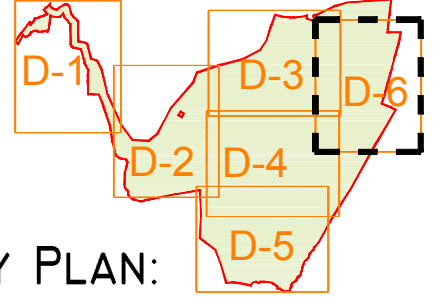
1. ALL DRAINAGE SUBJECT TO MID-DRAINING AND OPTIMIZATION ON SITE.
2. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES.
3. SUPERVISING HYDROLOGIST OR ENVIRONMENTAL CLERK OF WORKS (ENVIRONMENTAL SCIENTIST) TO OVERSEE PRE-CONSTRUCTION STAGE DRAINAGE DESIGN.
4. DRAINAGE REQUIREMENTS TO BE INSTALLED PRIOR TO OR AT THE SAME TIME AS THE WORKS ARE BEING INTRODUCED TO BRAN.
5. DESIGN ELEVATION OF THE WATER SURFACE ALONG THE ROUTE FROM THE INTERCEPTOR DRAIN TO THE SETTLERS MUST BE GREATER THAN THE DESIGN ELEVATION OF THE WATER SURFACE IN THE OUTLET AT THE LEVEL SPREADER OR SETTLEMENT FOND.
6. DRAINAGE REQUIREMENTS TO BE INSTALLED PRIOR TO OR AT THE SAME TIME AS THE WORKS ARE BEING INTRODUCED TO BRAN.
7. DESIGN ELEVATION OF THE WATER SURFACE ALONG THE ROUTE FROM THE INTERCEPTOR DRAIN TO THE SETTLERS MUST BE GREATER THAN THE DESIGN ELEVATION OF THE WATER SURFACE IN THE OUTLET AT THE LEVEL SPREADER OR SETTLEMENT FOND.
8. DOWN GRADIENT SLOPE BELOW LEVEL SPREADER ONTO THE SETTLERS MUST BE MAINTAINED.
9. NO DIRECT DISCHARGE OF PONDING TO WATER COURSES.
10. SETTLEMENT POND TO BE SIZED ACCORDING TO THE CONTRIBUTING CATCHMENT, SOPE AND GROUND AREA. IT WILL BE RECEIVING WATER FROM THE AREA IT WILL BE RECEIVING WATER FROM.
11. SETTLEMENT POND TO BE SIZED ACCORDING TO THE CONTRIBUTING CATCHMENT, SOPE AND GROUND AREA. IT WILL BE RECEIVING WATER FROM THE AREA IT WILL BE RECEIVING WATER FROM.
12. SETTLEMENT POND TO BE SIZED ACCORDING TO THE CONTRIBUTING CATCHMENT, SOPE AND GROUND AREA. IT WILL BE RECEIVING WATER FROM THE AREA IT WILL BE RECEIVING WATER FROM.
13. SETTLEMENT POND TO BE SIZED ACCORDING TO THE CONTRIBUTING CATCHMENT, SOPE AND GROUND AREA. IT WILL BE RECEIVING WATER FROM THE AREA IT WILL BE RECEIVING WATER FROM.
14. SETTLEMENT POND TO BE SIZED ACCORDING TO THE CONTRIBUTING CATCHMENT, SOPE AND GROUND AREA. IT WILL BE RECEIVING WATER FROM THE AREA IT WILL BE RECEIVING WATER FROM.

| MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE | Maximum Type |
|--|---|
| ANIMALS CONTROLS | 1. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 2. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 3. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 4. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 5. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 6. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 7. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 8. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 9. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 10. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. |
| SOURCE CONTROLS | 1. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 2. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 3. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 4. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 5. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 6. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 7. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 8. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 9. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 10. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. |
| WATER TREATMENT CONTROLS | 1. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 2. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 3. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 4. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 5. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 6. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 7. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 8. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 9. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 10. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. |
| GENERAL CONTROLS | 1. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 2. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 3. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 4. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 5. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 6. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 7. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 8. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 9. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. 10. APPLICATION OF 50% BUFFER ZONE TO ALL DRAINAGE STRUCTURES. |

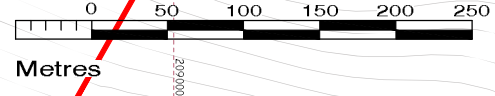


- DRAINAGE DESIGN NOTES**
1. ALL DRAINAGE SUBJECT TO MICRO-SITING AND OPTIMISATION ON SITE.
 2. THE LOCATIONS OF THE INTERCEPTOR DRAINS, CHECK DAMS, CULVERTS, SWALES, SETTLEMENT PONDS AND LEVEL SPREADERS ARE SHOWN AS INDICATIVE, AND MAY BE CHANGED TO SUIT THE REQUIREMENTS OF THE LOCAL TOPOGRAPHY.
 3. SUPERVISING HYDROLOGIST OR ENVIRONMENTAL CLERK OF WORKS (ENVIRONMENTAL SCIENTIST) TO OVERSEE INSTALLATION OF DRAINAGE FEATURES FOLLOWING DETAILED PRE-CONSTRUCTION STAGE DRAINAGE DESIGN.
 4. DRAINAGE HEADERS TO BE INSTALLED PRIOR TO, OR AT THE SAME TIME AS THE WORKS ARE THEY ARE INTENDED TO DRAIN.
 5. DESIGN ELEVATION OF THE WATER SURFACE ALONG THE ROUTE OF THE INTERCEPTOR DRAINS OR SWALES WILL NOT BE LOWER THAN THE DESIGN ELEVATION OF THE WATER SURFACE IN THE OUTLET AT THE LEVEL SPREADER OR SETTLEMENT POND.
 6. THE SPACING AND FREQUENCY OF THE CHECK DAMS WILL BE DEPENDANT ON THE GRADIENT OF THE INTERCEPTOR DRAIN OR SWALE IN WHICH THEY ARE BEING INSTALLED.
 7. CHECK DAM DESIGNS TO BE SELECTED BEST TO SUIT PARTICULAR TOPOGRAPHY AND HYDROLOGICAL ENVIRONMENT.
 8. DOWN GRADIENT SLOPE BELOW LEVEL SPREADER ONTO WHICH THE WATER WILL DISAPATE TO HAVE A GRADE <math>< 0.06\%</math>.
 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. SETTLEMENT 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 INTO WIND FARM DRAINAGE SYSTEM 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 ACCESS TRACKS/ROADS AS POSSIBLE.

| Management Type | Description of SUDS Drainage Control Method |
|--------------------------|--|
| Avoidance Controls | 1. APPLICATION OF SUDS OFFERED DUE TO NATURAL WATERCOURSES WHERE POSSIBLE. 2. APPLICATION OF SUDS OFFERED DUE TO ARTIFICIAL DRAINAGE SYSTEMS WHERE POSSIBLE. 3. LEAK DRAINAGE CONTROL. 4. WORKING IN APPROPRIATE WEATHER AND SUPERVISING SPECIAL WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHER. |
| Source Controls | 1. USE OF INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OPENED SWALES. VEGETATION, PERFORATED DRAIN, FLUTES AND CULVERT PIPES. 2. BREAK AND VELOCITY CONTROL MEASURES SUCH AS: a) SAND BARS b) FILTER FABRICS c) FLOW LITTER d) OTHER FILTERS e) OTHER OTHER COLLAPSE/SIGNALBIT OR APPROPRIATE SYSTEMS. 3. MAKE SURE MINIMUM A HEAD 4. CONTROL STORES 5. WEATHERING OFF / SEALING PEAT FOOTPLATES |
| In-Line Controls | 1. INTERCEPTOR DAMS, VEGETATED, OPENED SWALES/COLLECTOR DRAINS 2. BREAK AND VELOCITY CONTROL MEASURES SUCH AS: a) SAND BARS b) FILTER FABRICS c) FLOW LITTER d) OTHER FILTERS e) OTHER OTHER COLLAPSE/SIGNALBIT OR APPROPRIATE SYSTEMS. 3. SALT FENCES, FILTER FABRICS 4. IN-TERRAIN CONTROL 5. COLLECTION SUMP, TEMPORARY SUMP, PUMPING SYSTEMS 6. ATTENTION LADING 7. SEDIMENT TRAP, STILLING / SETTLEMENT POND |
| Water Treatment Controls | 1. TEMPORARY SUMP 2. ATTENTION LADING 3. SEDIMENT TRAP, STILLING / SETTLEMENT POND 4. PERMANENT SETTLEMENT SYSTEM SUCH AS CULTURE AND/OR OTHER EQUIVALENT OR APPROPRIATE SYSTEMS 5. SUDS TREATING BASIN |
| Overall Controls | 1. VEGETATION 2. SALT FENCES 3. SALT SPREADING BASIN 4. SALT SPREADING BASIN 5. FLOW LITTER AND WIRE |



KEY PLAN:
(UNDERLAY IS STUDY AREA NOT THE APPLICATION BOUNDARY)



DRAWING LEGEND :

- | | | |
|--|--|---|
| <ul style="list-style-type: none"> APPLICATION BOUNDARY EXISTING ROADS EXISTING TRACKS/FOREST ROADS WORKS AREA CRANE PAD HARDSTANDING AREA BORROW PIT TURBINE FOUNDATION TURBINE AND SWEEP AREA SITE LAYOUT IS UNDERLAIN BY 1M INTERVAL CONTOURS TO MOD MALIN HEAD SLOPE / DRAINAGE DIRECTION | <ul style="list-style-type: none"> EXISTING RIVER \ STREAM \ LAKE RIVER \ STREAM BUFFER 50M LAKES LAKES 50M BUFFER EXISTING CULTURTS / BRIDGES UPSTREAM INTERCEPTOR DRAIN SWALES / DOWNSTREAM COLLECTOR DRAIN DIRECTION OF FLOW SILT FENCES DOUBLE / TRIPLE SILT FENCES SETTLEMENT POND - VEGETATION FILTER LEVEL SPREADER SETTLEMENT POND - LEVEL SPREADER | <ul style="list-style-type: none"> CHECK DAM 'TYPE B' PROPOSED CULTURTS / BRIDGES INTERCEPTOR DITCH CULTURT COLLECTOR DITCH CULTURT OVERLAND FLOW DISCHARGE TREATED WATER DISCHARGE TW SP VS SETTLEMENT POND - VEGETATION FILTER LEVEL SPREADER ON SITE GRID CONNECTION |
|--|--|---|

- EXISTING DRAINAGE**
- PROPOSED DRAINAGE**

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| 13.12.17 | Planning | MG | MG |
| Date | Description | Chkd | Signed |

Revisions

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|--------------|-----------------------------------|
| Client: | MCCARTHY KEVILLE AND O'SULLIVAN |
| Job: | MEENBOG WIND FARM, Co. DONEGAL |
| Title: | DRAINAGE LAYOUT SHEET 6 OF 6 |
| Figure No: | D106 (0502-20) |
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