



APPENDIX 4-4

DRAINAGE DESIGN

PROSPECTIVE DRAINAGE NOTES:

1. EXISTING DRAINAGE LAYOUT IS BASED ON MAPPING COMPLETED BY CHENCO, HES, AND PRO, BY BOTH VISUAL INSPECTION AND BY DRONE SURVEYS.
2. EXISTING DRAINAGE REFLECTS ALL RESIDUAL DRAINS, CULVERTS, SETTLEMENT PONDS, SILT TRAPS AND SILT FENCING INSTALLED AS PART OF PREVIOUS CONSTRUCTION WORKS.
3. ONLY THE DOWNSTREAM CONNECTIONS TO WATERCOURSES VIA THE FORESTRY DRAINAGE NETWORK ARE SHOWN FOR EACH WIND FARM OUTFALL. THE ENTIRE DOWNSTREAM FORESTRY DRAINAGE NETWORK IS NOT SHOWN.
4. FROM THOSE WIND FARM OUTFALL LOCATIONS TREATED DRAINAGE WATER MAKES ITS WAY DOWNHILL AS SHOWN.
5. ADDITIONAL DRAINAGE ASSOCIATED WITH PROSPECTIVE DEVELOPMENT ARE PROPORTIONATE TO THE WORKS THAT ARE INTENDED IN EACH AREA. THIS IS BECAUSE MUCH OF THE EXISTING WIND FARM DRAINAGE NETWORK IS IN PLACE AND ALREADY STABLE AND FUNCTIONING CORRECTLY.
6. PREVIOUS WATER QUALITY MONITORING DEMONSTRATES THAT THE EXISTING WIND FARM DRAINAGE NETWORK IS SUFFICIENT TO PROTECT DOWNSTREAM WATER QUALITY.
7. MORE SIGNIFICANT ADDITIONAL DRAINAGE INFRASTRUCTURE IS PROPOSED IN AREAS WHERE THE MAIN ADDITIONAL WORKS ARE PROPOSED (I.E. AT BORROW PITS 2 AND 3, ACCESS TRACK TO T15, T16 AREA, ACCESS TRACK TO T2, T2 AREA, T11 AREA).
8. THE PROPOSED DRAINAGE REPLICATES WHAT WORKED WELL FROM THE EXISTING DRAINAGE LAYOUT, I.E. USE OF INTERCEPTOR/COLLECTOR DRAINS, SILT FENCING, SILT TRAPS, SETTLEMENT PONDS, AND ROUTING TREATED DRAINAGE DOWNSTREAM VIA EXISTING FORESTRY DRAINAGE NETWORK.

GENERAL POLLUTION PREVENTION NOTES:

1. SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
2. SUITABLE DRAINAGE CONTROL MEASURES WILL BE IN PLACE AT ALL TIMES TO PREVENT CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO OFF SITE RECEIVING WATERCOURSES.
3. SILTY WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/DISTURBED GROUND, TEMPORARY STOCKPILES, PLANT AND WHEEL WASH, SITE ROAD/TRAFFIC, AND DISTURBANCE OF EXISTING FIELD DRAINS AND DITCHES.
4. WATER CONTAINING SILT WILL NOT BE DISCHARGED OR PUMPED DIRECTLY TO ANY NATURAL WATERCOURSE. ALL DISCHARGES WILL BE MADE OVER OPEN GROUND OR INTO EXISTING FIELD DRAIN WITH SILT TRAP AT A MINIMUM OF 20M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
5. NO EXCAVATED MATERIAL WILL 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 DRAINS/DITCHES/STREAMS WILL BE COMPLETED IN A MANNER THAT WILL NOT CAUSE SCOUR OR EROSION AT THE POINT OF RELEASE/DISCHARGE. THIS WILL BE DONE BY REDUCING THE FLOW VELOCITIES OR BY USE OF SUITABLE SPLASH PLATES, AND/OR OTHER SIMILAR DISCHARGE CONTROLS.
8. VEGETATION WILL NOT BE STRIPPED FROM EXISTING DRAINS/DITCHES UNLESS ABSOLUTELY NECESSARY.

EXCAVATIONS

9. WHERE (TEMPORARY) 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 TEMPORARY EXPOSED GROUND AND TEMPORARY STOCKPILES OPEN/EXPOSED AT ANY TIME WILL BE MINIMISED.

SILT TRAPS

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

REFUELLING

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

CONCRETE

15. CONCRETE POURS WILL BE MANAGED AND SUPERVISED TO ENSURE THERE WILL BE NO LEAKAGE/SEEPAGE/DISCHARGE OF CONCRETE OR CONCRETE WATER DURING THE CONSTRUCTION PHASE.
16. CONCRETE WASH WATER, AND WASTE CONCRETE WILL BE MANAGED APPROPRIATELY ON SITE AT A LINED CONCRETE WASH OUT PIT.

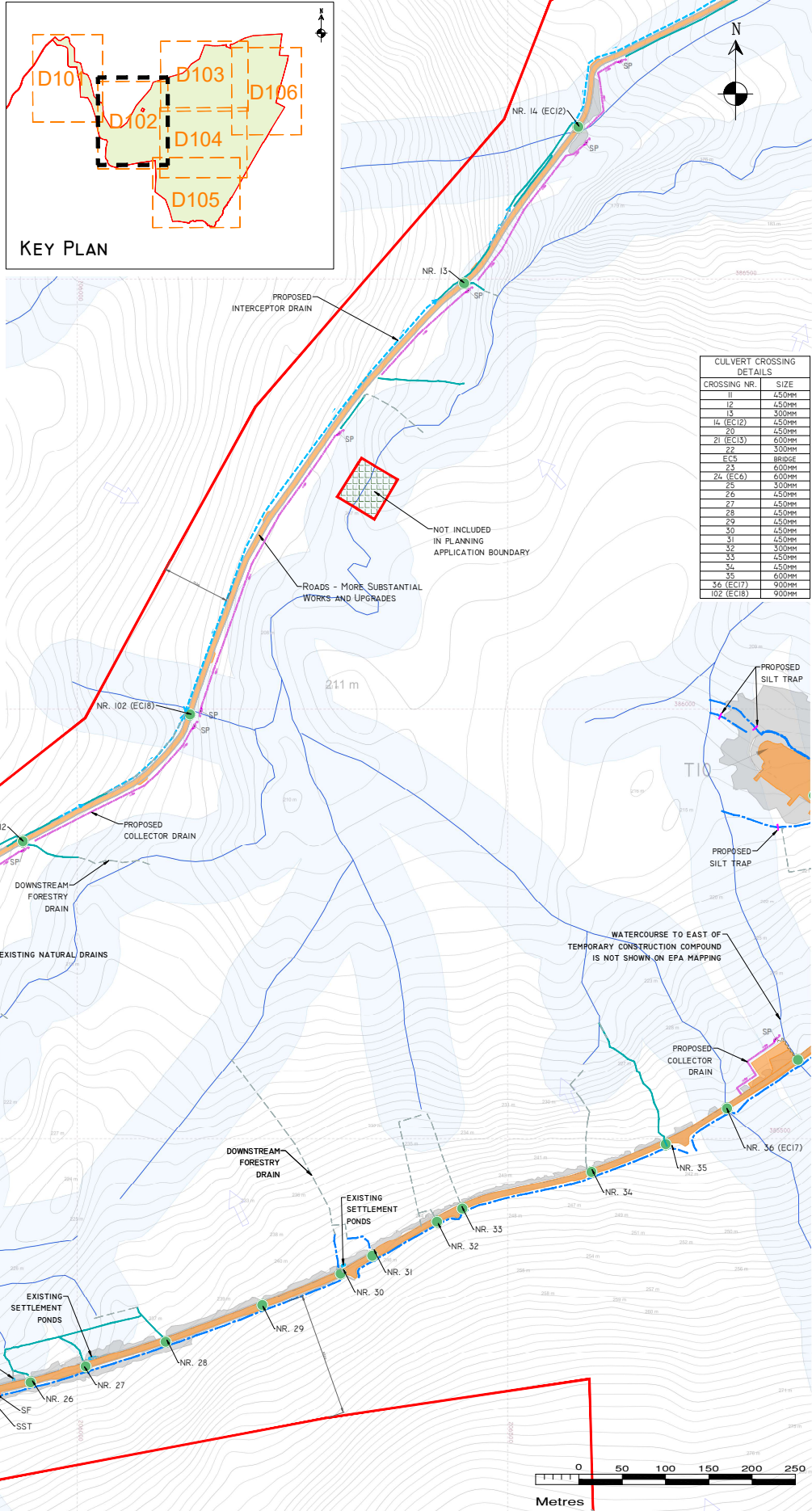
IF WATER POLLUTION IS IDENTIFIED THE FOLLOWING STEPS WOULD BE ADHERED TO:

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

CONTAIN – THE SOURCE OF THE POLLUTION SHOULD BE BUNDLED USING A SUITABLE METHOD. NATURAL WATERCOURSES SHOULD BE TEMPORARILY DIVERTED AROUND ANY SOURCE OF POLLUTION.

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

KEY PLAN



DRAWING LEGEND :

- PLANNING APPLICATION BOUNDARY
- EXISTING DEVELOPMENT FOOTPRINT
- SITE LAYOUT IS UNDERLAIN BY 1M INTERVAL CONTOURS TO 100M MAIN HEAD
- SLOPE / DRAINAGE DIRECTION
- WATERCOURSES
- WATERCOURSE BUFFER 50M
- LAKES
- LAKES 50M BUFFER
- EXISTING NATURAL DRAINS
- DOWNSTREAM FORESTRY DRAIN
- EXISTING DRAIN
- EXISTING SETTLEMENT PONDS
- EXISTING CULVERT LOCATIONS

- EXISTING SILT FENCES (SF*)
- SF* - SINGLE SILT FENCE
- SF - DOUBLE SILT FENCE
- SF - MULTIPLE SILT FENCES
- EXISTING SILT TRAPS (SST*)
- SST* - SINGLE SILT TRAP
- SST - DOUBLE SILT TRAP
- SST - MULTIPLE SILT TRAPS
- UPSTREAM INTERCEPTOR DRAIN
- SWALES / DOWNSTREAM COLLECTOR DRAIN
- SETTLEMENT POND - VEGETATION FILTER
- LEVEL SPREADER
- CHECK DAM "TYPE B"
- DIRECTION OF FLOW
- PROPOSED SILT FENCE
- PROPOSED SILT TRAPS (PST)
- SETTLEMENT POND
- PROSPECTIVE DEVELOPMENT FOOTPRINT

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4. ALL DIMENSIONS ARE IN METRES.

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Client: **PLANREE LTD**

Job: **MEENBOG WIND FARM, Co. DONEGAL**

Title: **PROSPECTIVE DEVELOPMENT DRAINAGE LAYOUT SHEET 2 OF 6**

Figure No: **D102**

Drawing No: **P1249-9-0626-A1-D102-00A**

Sheet Size: **A1**

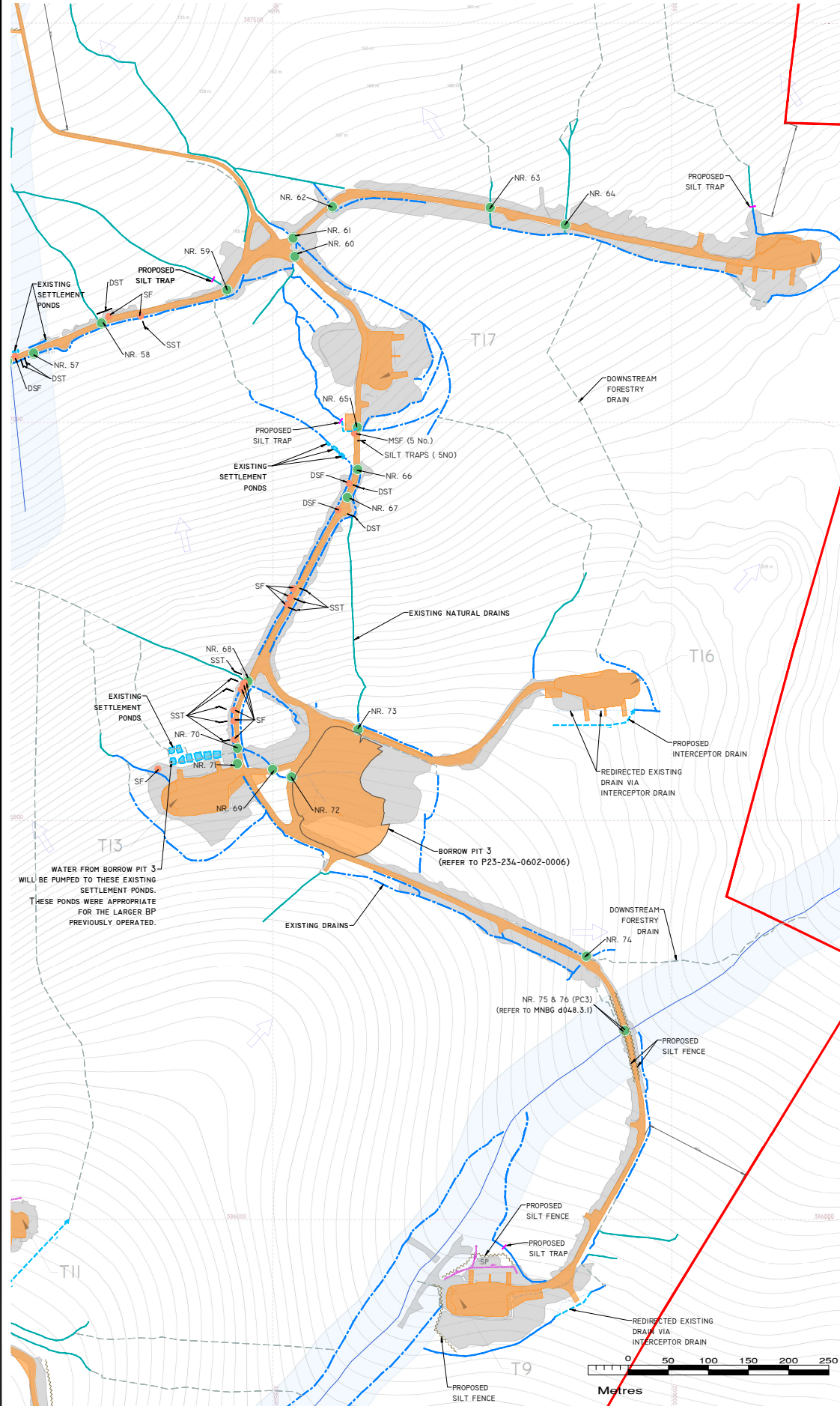
Scale: **1:2,500 (A1)**

Date: **25/04/2026**

Project No: **P1249-9**

Drawn By: **MG/GA**

Checked By: **MG**



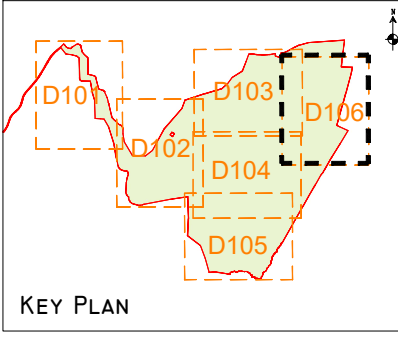
- PROSPECTIVE DRAINAGE NOTES:**
1. EXISTING DRAINAGE LAYOUT IS BASED ON MAPPING COMPLETED BY ENERO, HES, AND MPO, BY BOTH VISUAL INSPECTION AND BY DRONE SURVEYS.
 2. EXISTING DRAINAGE REFLECTS ALL RESIDUAL DRAINS, CULVERTS, SETTLEMENT PONDS, SILT TRAPS AND SILT FENCING INSTALLED AS PART OF PREVIOUS CONSTRUCTION WORKS.
 3. ONLY THE DOWNSTREAM CONNECTIONS TO WATERCOURSES VIA THE FORESTRY DRAINAGE NETWORK ARE SHOWN FOR EACH WIND FARM OUTFALL. THE ENTIRE DOWNSTREAM FORESTRY DRAINAGE NETWORK IS NOT SHOWN.
 4. FROM THOSE WIND FARM OUTFALL LOCATIONS TREATED DRAINAGE WATER MAKES ITS WAY DOWNHILL AS SHOWN.
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 8. THE PROPOSED DRAINAGE REPLICATES WHAT WORKED WELL FROM THE EXISTING DRAINAGE LAYOUT, I.E. USE OF INTERCEPTOR/COLLECTOR DRAINS, SILT FENCING, SILT TRAPS, SETTLEMENT PONDS, AND ROUTING TREATED DRAINAGE DOWNSTREAM VIA EXISTING FORESTRY DRAINAGE NETWORK.

GENERAL POLLUTION PREVENTION NOTES:

1. SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
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 3. SILTY WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/DISTURBED GROUND, TEMPORARY STOCKPILES, PLANT AND WHEEL WASH SITE, ROADS/TRACKS, AND DISTURBANCE OF EXISTING FIELD DRAINS AND DITCHES.
- DISCHARGES**
4. WATER CONTAINING SILT WILL NOT BE DISCHARGED OR PUMPED DIRECTLY TO ANY NATURAL WATERCOURSE. ALL DISCHARGES WILL BE MADE OVER OPEN GROUND OR INTO EXISTING FIELD DRAIN WITH SILT TRAP AT A MINIMUM OF 20M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
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- EXPOSED GROUND & STOCKPILES**
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- SITE TRACKS**
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 14. SPILL KITS AND DRP TRAYS WILL BE AVAILABLE ON SITE FOR USE AS REQUIRED.

CULVERT CROSSING DETAILS		
CROSSING NR.	SIZE	
57	450mm	
58	450mm	
59	450mm	
60	450mm	
61	600mm	
62	300mm	
63	600mm	
64	600mm	
65	450mm	
66	450mm	
67	450mm	
68	450mm	
69	300mm	
70	300mm	
71	450mm	
72	300mm	
73	225mm	
74	450mm	
75 (PC3)	900mm	
76 (PC3)	900mm	

- CONCRETE**
15. CONCRETE POURS WILL BE MANAGED AND SUPERVISED TO ENSURE THERE WILL BE NO LEAKAGE/SEEPAGE/DISCHARGE OF CONCRETE OR CONCRETE WATER DURING THE CONSTRUCTION PHASE.
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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 BUNDING USING A SUITABLE METHOD. NATURAL WATERCOURSES SHOULD BE TEMPORARILY DIVERTED AROUND ANY SOURCE OF POLLUTION.
- NOTIFY** - THE RELEVANT AUTHORITIES (SITE MANAGER / FISHERIES / NPWS / LOCAL AUTHORITY ETC.) SHOULD BE NOTIFIED IMMEDIATELY TO ENSURE THAT MEASURES CAN BE IMPLEMENTED DOWNSTREAM TO PROTECT FISHERIES AND OTHER SENSITIVE RECEPTORS.



DRAWING LEGEND :

- PLANNING APPLICATION BOUNDARY
- EXISTING DEVELOPMENT FOOTPRINT
- SITE LAYOUT IS UNDERLAIN BY 1M INTERVAL CONTOURS TO MOD MAIN HEAD
- SLOPE / DRAINAGE DIRECTION
- WATERCOURSES
- WATERCOURSE BUFFER 50M
- LAKES
- LAKES 50M BUFFER
- EXISTING NATURAL DRAINS
- DOWNSTREAM FORESTRY DRAIN
- EXISTING DRAINS
- EXISTING SETTLEMENT PONDS
- EXISTING CULVERT LOCATIONS
- EXISTING NATURAL DRAINAGE
- EXISTING BUILT DRAINAGE
- PROPOSED DRAINAGE
- PROSPECTIVE DEVELOPMENT FOOTPRINT

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Date	Description	Chkd	Signed
Revisions			

Client: **PLANREE LTD**

Job: **MEENBOG WIND FARM, Co. DONEGAL**

Title: **PROSPECTIVE DEVELOPMENT DRAINAGE LAYOUT SHEET 6 OF 6**

Figure No: **D106**

Drawing No: **P1249-9-0626-A1-D106-00A**

Sheet Size: **A1** Project No: **P1249-9**

Scale: **1:2,500 (A1)** Drawn By: **MG/JA**

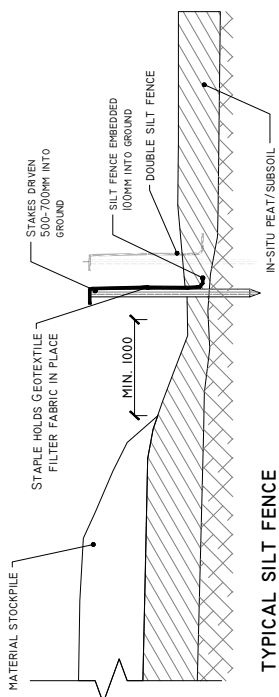
Date: **25/04/2026** Checked By: **MG**

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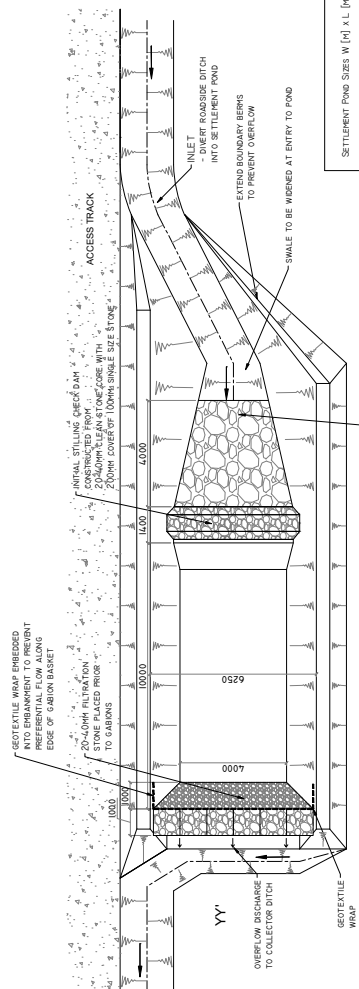
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web: www.hydroenvironmental.ie

DETAIL B

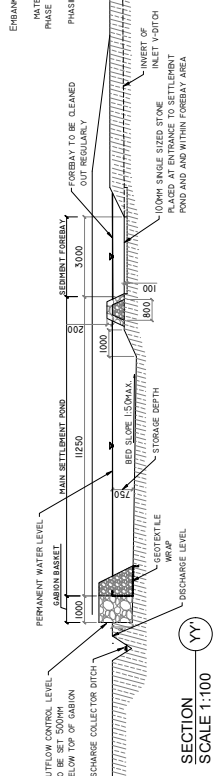


TYPICAL SILT FENCE
SCALE 1:25

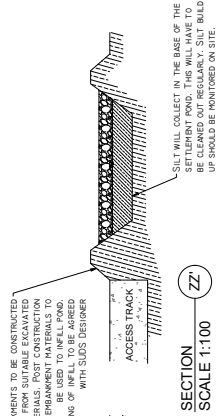
SETTLEMENT POND SIZES W [m] x L [m] x D [m]		MEMBERS WHO FARM TRACKS/HARVESTERS CATCHMENT AREAS (HA)			
RETENTION PERIOD	10 HRS	500	1000	2000	
6HR RETENTION FOR COARSE SILT	6 HRS	2.4 x 8.0 x 1.1	4.6 x 14.2 x 1.1	8.0 x 22.5 x 1.1	
12HR RETENTION FOR MEDIUM SILT	12 HRS	4.0 x 8.5 x 1.1	6.0 x 22.0 x 1.1	10.0 x 36.0 x 1.1	
24HR RETENTION FOR FINE SILT	24 HRS	6.0 x 17.0 x 1.1	8.0 x 29.0 x 1.1	16.0 x 44.5 x 1.1	



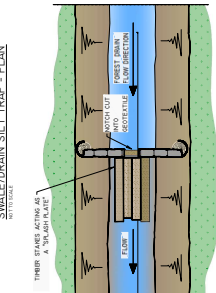
TYPE A - ROAD SIDE SETTLEMENT POND DETAIL
SCALE 1:100 (NOTE DIMENSIONS VARY DEPENDING ON CATCHMENT SIZE - SEE ATTACHED TABLE)



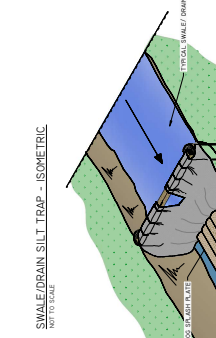
SECTION
SCALE 1:100



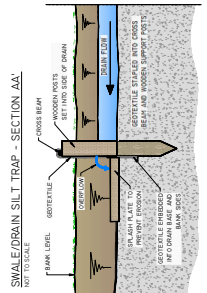
SECTION
SCALE 1:100



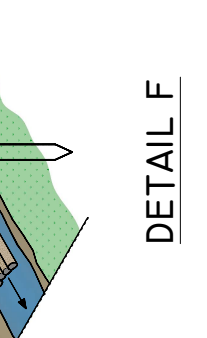
SECTION
SCALE 1:100



SWALE/RAIN SILT TRAP - ISOMETRIC
NOT TO SCALE



SWALE/RAIN SILT TRAP - SECTION AA
NOT TO SCALE



SWALE/RAIN SILT TRAP - SECTION BB
NOT TO SCALE

DETAIL C

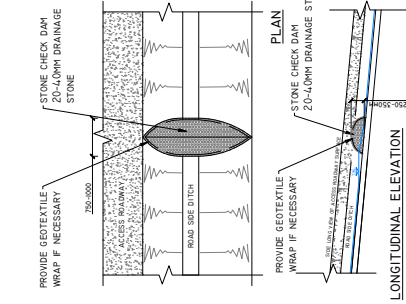
DETAIL D

DETAIL E

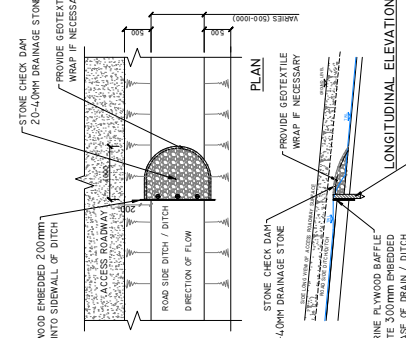
DETAIL F

DETAIL G

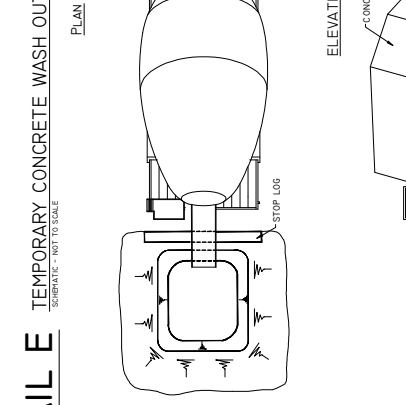
DETAIL H



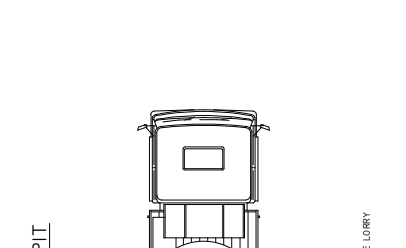
TYPE X - CHECK DAM DETAIL
SCALE 1:50



TYPE Y - CHECK DAM DETAIL
SCALE 1:50



PLAN



SECTION AA
NOT TO SCALE

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Client:

PLANEE LTD

Date:

Description:

Revisions:

Checked:

Signed:

MEMBERS WHO FARM, CO. DONEGAL

Figure No: D501

Drawing No: P1249-002-A1-0501-00A

Sheet No: A1

Project No: P1249-9

Scale: as shown (A1)

Date: 25/06/2024

Checked By: MG

Hydro Environmental Services
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Tel: 031 818 4422
Email: info@hydroenvironmental.com.au
Web: www.hydroenvironmental.com.au

Client: PLANEE LTD

Date: Description: Revisions:

Checked: Signed:

MEMBERS WHO FARM, CO. DONEGAL

Figure No: D501

Drawing No: P1249-002-A1-0501-00A

Sheet No: A1

Project No: P1249-9

Scale: as shown (A1)

Date: 25/06/2024

Checked By: MG