



APPENDIX 4-3

DRAINAGE DRAWINGS

POLLUTION PREVENTION NOTES:

- SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
- SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO OFF SITE RECEIVING WATERCOURSES.
 SUITX WATERCOURSES.
- 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 PUMPED DIRECTLY TO ANY NATURAL WATERCOURSE. ALL DISCHARGES TO BE MADE OVER OPEN GROUND OR INTO EXISTING FIELD DRAINS WITH SILT TRAP AT A MINIMUM OF 20M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
- 5. NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
- PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE.
- 7. PUMPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN DRAINS/DITCHES/STREAMS WILL BE COMPLETED IN A MANNER THAT DOES NOT CAUSE SCOUR OR EROSION AT THE POINT OF RELEASE/DISCHARGE. THIS WILL BE DONE BY REDUCING THE FLOW VELOCITIES OR BY USE OF SPLASH PLATES, AND OTHER SIMILAR DISCHARGE CONTROLS.
- VEGETATION WILL NOT BE STRIPPED FROM EXISTING DRAINS/DITCHES UNLESS ABSOLUTELY NECESSARY.

EXCAVATIONS

O. WHERE DEEP EXCAVATIONS ARE PROPOSED CUT-OFF DRAINS WILL BE USE 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 TEMPORARY STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED, AS FAR AS PRACTICABLE.

Site tracks

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

Refueling

- 13. REFUELLING OF MOBILE PLANT WILL BE COMPLETED IN DESIGNATED
- REFUELING AREAS ONLY, PREFERABLY 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 5. CARE WILL BE TAKEN WHEN COMPLETING CONCRETE WORKS ON SITE TO ENSURE NO DISCHARGES OCCUR.
- 16. CONCRETE WASH WATER, AND WASTE CONCRETE WILL BE MANAGED APPROPRIATELY ON SITE.

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

 \underline{STOP} - work in the immediate area should be stopped and the source of the pollution identified.

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

 \underline{NOTIFY} - The relevant authorities (Site Manager / Fisheries / NPWS / Local Authority etc.) should be notified immediately to ensure that measures can be implemented downstream to protect fisheries and other sensitive areas.

DRAINAGE NOTES:

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

2. SPARE STRAW BALES/SILT FENCING/ OR SIMILAR, TO BE STORED ON SITE. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE TEMPORARILY MANAGED BY PLACING SILT FENCES, STRAW BALES / OR SIMILAR OR ADDITIONAL CHECK DAMS AT THE PROBLEM AREAS. MOBILE

SILTBUSTER SYSTEM TO BE AVAILABLE ON-SITE FOR USE AS REQUIRED ALSO. 3. SUDS SYSTEM TO BE CONSTRUCTED PRIOR TO, OR AT THE SAME TIME AS THE ACCESS TRACKS. INTERIM MEASURES SUCH AS THE PLACEMENT OF STRAW BALES/SILT FENCING/OR SIMILAR APPROVED METHOD OR ADDITIONAL CHECK DAMS AND SILT FENCES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS TRACKS IS LIKELY TO CAUSE ADVERSE ENVIRONMENTAL EFFECTS THROUGH INCREASED SILT LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.

4. SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES
TO PREVENT THE CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO
RECEIVING WATERCOURSES. SEE NOTES ON POLLUTION PREVENTION.
5. INTERCEPTOR SWALES / DITCHES TO BE USED TO COLLECT UPSTREAM

SURFACE WATER FLOWS. REGULAR CROSS DRAINS / DISCHARGE TO FIELD DITCHES/DRAINS WILL BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER IN INTERCEPTOR DRAINS TO SUITABLE FIELD DRAIN OUTFALL POINTS. 6. DRAINAGE SWALES / DITCHES TO BE EXCAVATED ADJACENT TO THE ACCESS TRACKS. REGULAR CROSS DRAINS TO BE LOCATED ALONG ACCESS TRACKS TO PREVENT EXCESSIVE VOLUMES OF WATER COLLECTING IN THE SWALES / DITCHES. LOCATIONS OF CROSS DRAINS TO BE AGREED WITH THE ENGINEER ON SITE. SURFACE WATER WILL NOT BE ALLOWED TO DISCHARGE DIRECTLY INTO EXISTING WATERCOURSES.

7. WHERE POSSIBLE, A BUFFER ZONE OF >20M TO ANY EXISTING WATERCOURSE WILL BE REQUIRED WHERE OVER LAND DISCHARGES ARE

PROPOSED FROM ACCESS TRACK SWALES / DITCHES. 8. BATTERS OF ALL PROPOSED SWALES / DITCHES TO HAVE A SLOPE OF BETWEEN I : I.5 TO I : 2 DEPENDING UPON DEPTH OF SWALE/DITCH AND WILL BE LEFT AS CUT TO RE-VEGETATE WITH LOCAL SPECIES.

9. TRACK SIDE SWALES / DITCHES TO BE SHALLOW WITH MODERATE GRADIENTS TO PREVENT SCOURING. IN STEEP AREAS CHECK DAMS SHOULD BE INSTALLED TO REDUCE FLOW VELOCITIES AND PROVIDE SOURCE CONTROL OF SILT CONTAINMENT. WHERE NECESSARY THESE HAVE BEEN DESIGNATED IN CONJUNCTION WITH SETTLEMENT PONDS AND SILT TRAPS, PRIOR TO DISCHARGE.

10. SETTLEMENT PONDS TO BE CONSTRUCTED FOR SILT REMOVAL AT TURBINE BASES AND HARD STAND AREAS. POND SIZES DEPENDS ON CATCHMENT AREA SERVED. <u>SAMPLE POND SIZES SHOWN ON DRAWING D501</u>. II. STRAW BALES / OR SIMILAR AND SILT FENCES TO BE USED ALSO AROUND SPOIL STOCKPILES TO MITIGATE SILT RUNOFF. SILT FENCES MAY BE

REMOVED WHEN SUITABLE VEGETATION COVER IS ESTABLISHED. 12. SILT FENCES TO BE PROVIDE ALONG EDGE OF EXISTING WATERCOURSE WHERE WORKS COMES WITHIN <10M OF EDGE OF ANY DITCH / EPHEMERAL CHANNELS.

13. SLOPES OF THE SWALES / DITCHES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER FROM EXCAVATIONS TO BE STORED LOCALLY AND USED TO LINE SLOPES AND BASE OF SWALES / DITCHES OR LONGITUDINAL MOUNDS OF VEGETATION SWALES AT FIELD DRAIN DISCHARGE POINTS.

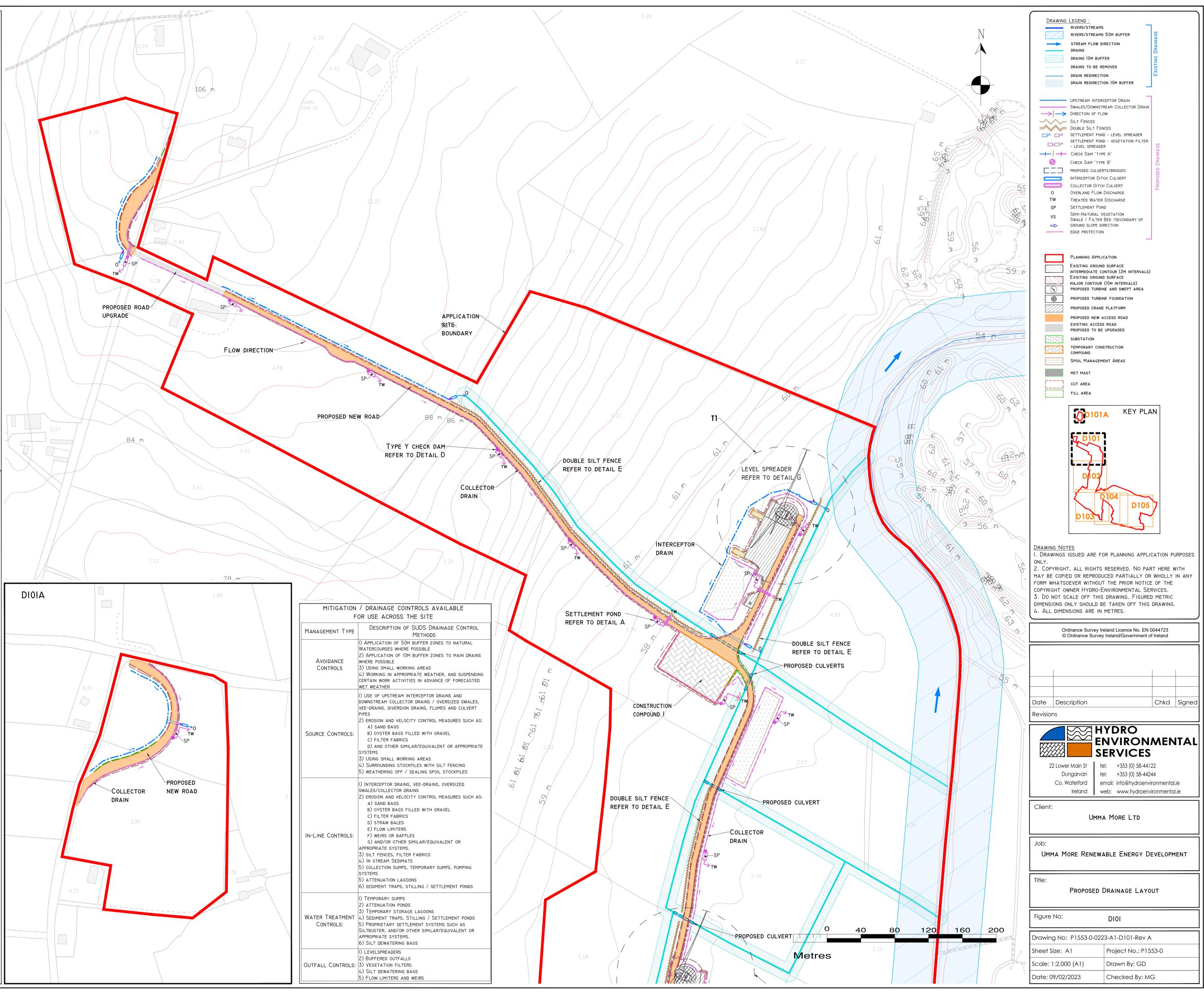
I4. AREAS STRIPPED OF VEGETATION SHOULD BE KEPT TO A MINIMUM.
I5. CLEAN STONE FLOW CONTROL CHECK DAMS TO BE MADE OF LOCALLY
WON / GEOLOGICALLY SIMILAR WELL GRADED STONE. AGGREGATE SIZE FOR
STONE CHECK DAMS TO BE TYPICALLY 20- 40MM CLEAN STONE. ON SLOPING
SECTIONS OF THE ACCESS TRACKS, 40MM CHECK DAMS TO BE PROTECTED
FROM WASHING AWAY THROUGH THE PLACEMENT OF 100M STONE ON THE
DOWNHILL FACE OF THE CHECK DAM AND BY WRAPPING IN GEOTEXTILE.
I6. BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND
DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY
INSPECTED AS PART OF AN ONGOING DRAINAGE MAINTENANCE PROGRAMME
DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED
WITH SILT OR VEGETATION, STONE CHECK DAM TO BE REMOVED AND

REPLACED SUBSEQUENT TO THE REMOVAL OF SILT. 17. SPACING AND FREQUENCY OF CHECK DAMS WILL BE DEPENDENT UPON LONGITUDINAL GRADIENT OF SWALE.

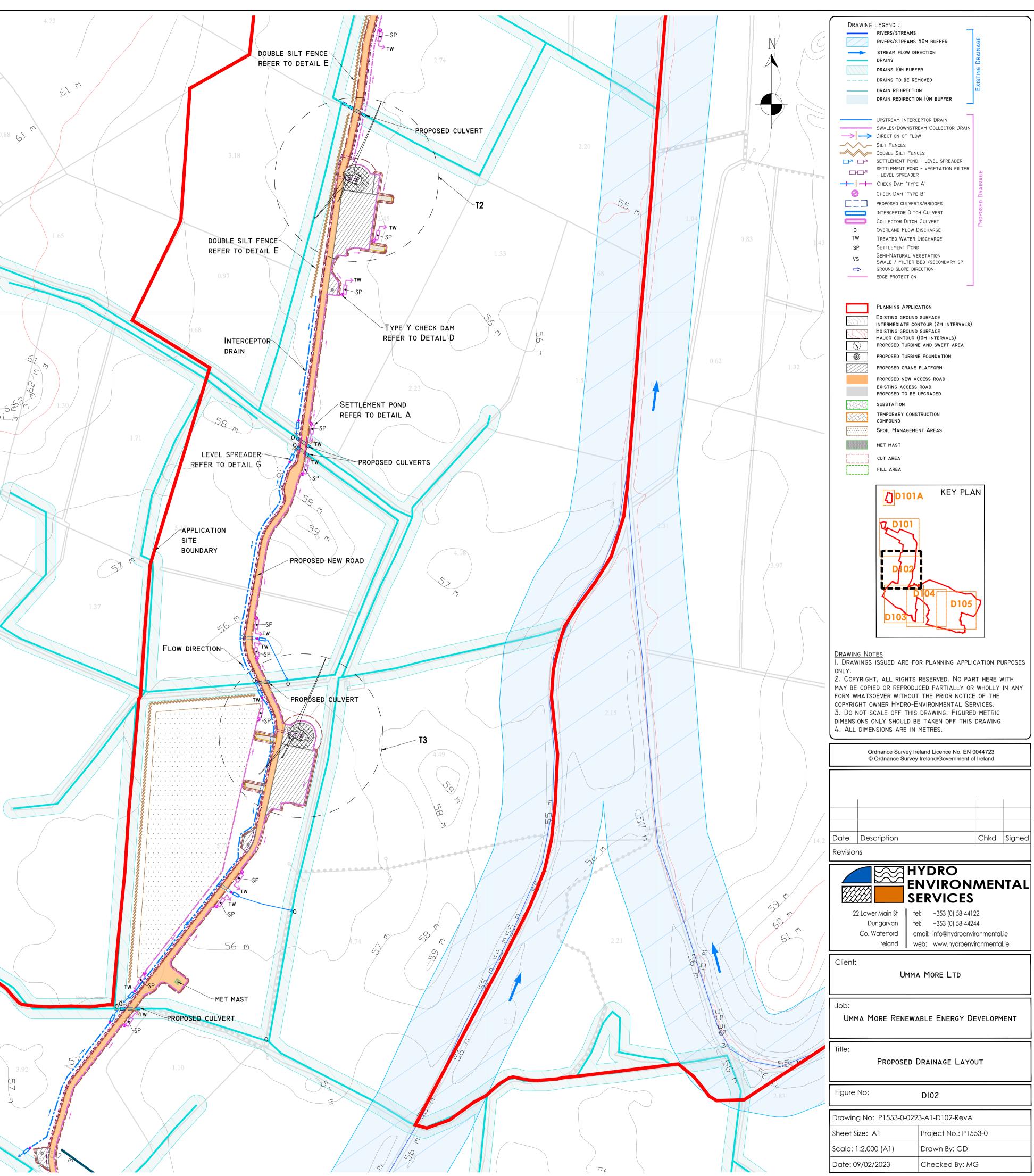
18. LOCATION OF FILTRATION CHECK DAMS (IF REQUIRED) TO BE AGREED ON SITE WITH ENGINEER. SETTLEMENT PONDS TO BE CONSTRUCTED IN A MANNER WHERE THEY MAY BE EASILY INFILLED AT A LATER DATE (POST COMPLETION OF THE TURBINE BASE AND HARDSTAND CONSTRUCTION). ONLY SUITABLE MATERIALS EXCAVATED FROM THE POND TO BE USED TO FORM PART OF THE EMBANKMENT AROUND THE POND.

19. OIL/FUEL SHOULD BE STORED WITHIN BUNDED CONTAINMENT STRUCTURES.

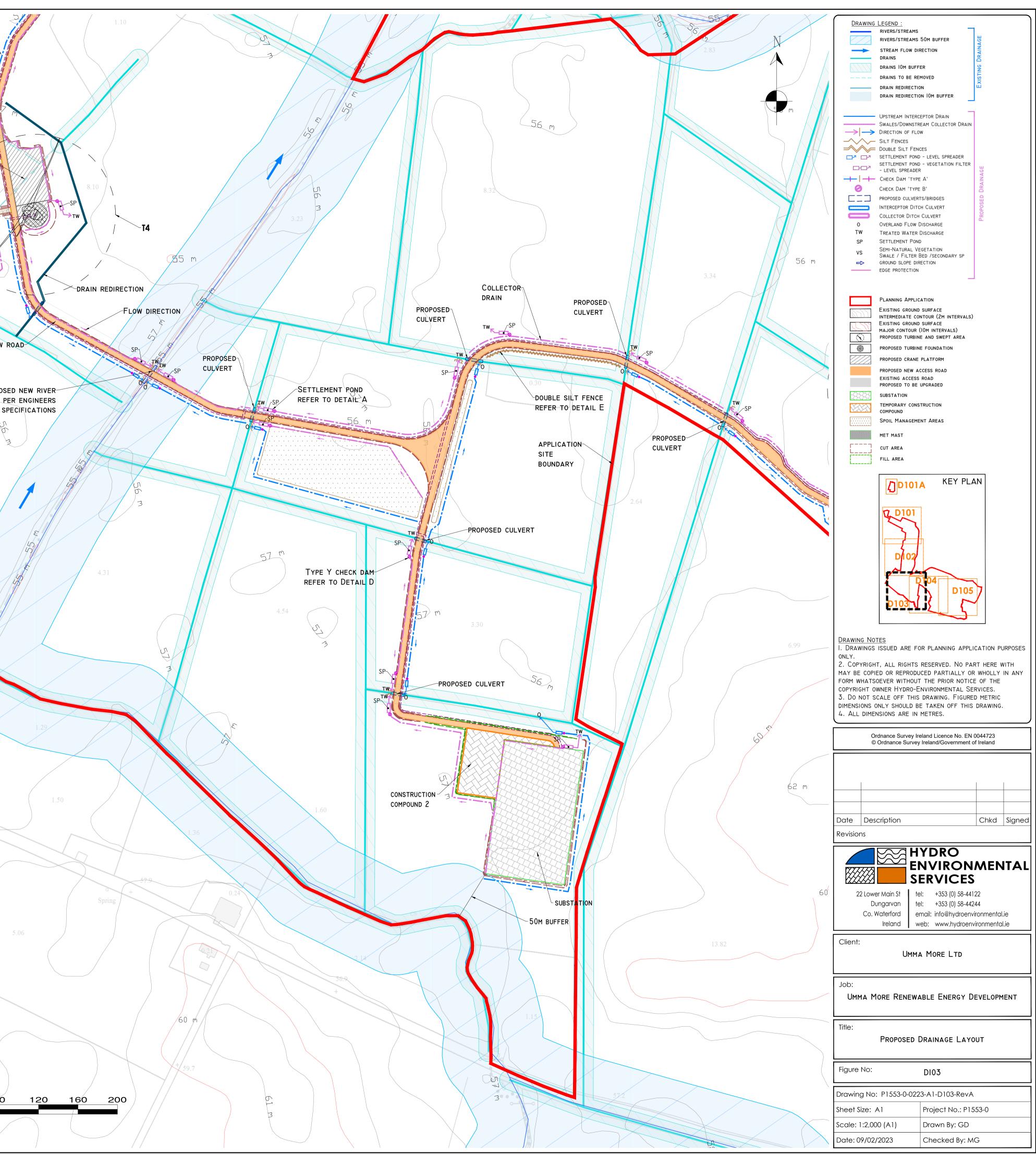
20. SILT BAGS WILL BE USED ON SITE AT FIELD DRAIN DISCHARGE LOCATIONS, AS NECESSARY.



POLLUTION PREVENTION NOTES: I. SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE PROTECTION		I / DRAINAGE COINTROLS AVAILABLE	
AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION. 2. SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES	Management Type	DESCRIPTION OF SUDS DRAINAGE CONTROL METHODS	
TO PREVENT CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO OFF SITE RECEIVING WATERCOURSES. 3. SILTY WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF		 APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS 	1.92
EXPOSED/DISTURBED GROUND, TEMPORARY STOCKPILES, PLANT AND WHEEL WASH, SITE ROADS/TRACKS, AND DISTURBANCE OF EXISTING FIELD DRAINS AND DITCHES.	CONTROLS	WHERE POSSIBLE 3) USING SMALL WORKING AREAS 4) WORKING IN APPROPRIATE WEATHER, AND SUSPENDING CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED	
 <u>Discharges</u> Water containing silt will not be pumped directly to any natural watercourse. All discharges to be made over open ground or into 		WET WEATHER I) USE OF UPSTREAM INTERCEPTOR DRAINS AND DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES,	0.88
EXISTING FIELD DRAINS WITH SILT TRAP AT A MINIMUM OF 20M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED. 5. NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.		VEE-DRAINS, DIVERSION DRAINS, FLUMES AND CULVERT PIPES 2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS:	0,66
 PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE. 	SOURCE CONTROLS:	A) SAND BAGS B) OYSTER BAGS FILLED WITH GRAVEL C) FILTER FABRICS	1.34
7. PUMPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN DRAINS/DITCHES/STREAMS WILL BE COMPLETED IN A MANNER THAT DOES NOT CAUSE SCOUR OR EROSION AT THE POINT OF RELEASE/DISCHARGE. THIS		 D) AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS 3) USING SMALL WORKING AREAS 4) SURROUNDING STOCKPILES WITH SILT FENCING 	
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EXPOSED GROUND & STOCKPILES 10. The amount of exposed ground and temporary stockpiles open at any one time will be minimised, as far as practicable.	IN-LINE CONTROLS:	F) WEIRS OR BAFFLES G) AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS.	
SITE TRACKS II. USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR FILTRATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER AS REQUIRED.		 3) SILT FENCES, FILTER FABRICS 4) IN STREAM SEDIMATS 5) COLLECTION SUMPS, TEMPORARY SUMPS, PUMPING 	
12. CHECK DAMS TO BE INSPECTED AND CLEANED REGULARLY. <u>Refueling</u> 13. Refuelling of mobile plant will be completed in designated		SYSTEMS 5) ATTENUATION LAGOONS 6) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS	
13. REPUELING OF MOBILE PLANT WILL BE COMPLETED IN DESIGNATED REFUELING AREAS ONLY, PREFERABLY 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		 TEMPORARY SUMPS ATTENUATION PONDS TEMPORARY STORAGE LAGOONS 	2.99
REQUIRED.	WATER TREATMENT Controls:	4) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS 5) PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTBUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR	
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IF WATER POLLUTION IS IDENTIFIED THE FOLLOWING STEPS WOULD BE ADHERED TO:	OUTFALL CONTROLS:	 2) BUFFERED OUTFALLS 3) VEGETATION FILTERS 4) SILT DEWATERING BAGS 5) FLOW LIMITERS AND WEIRS 	
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<u>CONTAIN</u> - THE SOURCE OF THE POLLUTION SHOULD BE BUNDED USING A SUITABLE METHOD. NATURAL WATERCOURSES SHOULD BE TEMPORARILY DIVERTED			0.94
AROUND THE SOURCE OF POLLUTION. NOTIFY - The relevant authorities (Site Manager / Fisheries / NPWS	0.95		-61 m 0.94
/ LOCAL AUTHORITY ETC.) SHOULD BE NOTIFIED IMMEDIATELY TO ENSURE THAT MEASURES CAN BE IMPLEMENTED DOWNSTREAM TO PROTECT FISHERIES AND OTHER SENSITIVE AREAS.		59 m	60 m 59 m ^{-1,19}
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STRUCTURES. 20. SILT BAGS WILL BE USED ON SITE AT FIELD DRAIN DISCHARGE LOCATIONS, AS NECESSARY.	2.38 Metre		
			3.62



POLLUTION PREVENTION NOTES: 57 m SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE PROTECTION INTERCEPTOR DRAIN AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO OFF SITE RECEIVING WATERCOURSES SILTY WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/DISTURBED GROUND, TEMPORARY STOCKPILES, PLANT AND WHEEL 57 m WASH, SITE ROADS/TRACKS, AND DISTURBANCE OF EXISTING FIELD DRAINS AND DITCHES. SCHARGES WATER CONTAINING SILT WILL NOT BE PUMPED DIRECTLY TO ANY NATURAL WATERCOURSE. ALL DISCHARGES TO BE MADE OVER OPEN GROUND OR INTO DRAIN TO BE REMOVED EXISTING FIELD DRAINS WITH SILT TRAP AT A MINIMUM OF 20M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED. 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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. PROPOSED NEW ROAD REFUELING 3. REFUELLING OF MOBILE PLANT WILL BE COMPLETED IN DESIGNATED REFUELING AREAS ONLY, PREFERABLY ON AN IMPERMEABLE SURFACE AND AWAY FROM FIELD DRAINS / DITCHES AND WATERCOURSES / WATERBODIES. SPILL KITS AND DRIP TRAYS WILL BE AVAILABLE ON SITE FOR USE AS REQUIRED. PROPOSED NEW RIVER-CROSSING AS PER ENGINEERS 5. CARE WILL BE TAKEN WHEN COMPLETING CONCRETE WORKS ON SITE TO ENSURE NO DISCHARGES OCCUR. 6. 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. 61 m CONTAIN - THE SOURCE OF THE POLLUTION SHOULD BE BUNDED USING A SUITABLE METHOD. NATURAL WATERCOURSES SHOULD BE TEMPORARILY DIVERTED AROUND THE SOURCE OF POLLUTION. NOTIFY - THE RELEVANT AUTHORITIES (SITE MANAGER / FISHERIES / NPWS 60 m / LOCAL AUTHORITY ETC.) SHOULD BE NOTIFIED IMMEDIATELY TO ENSURE THAT MEASURES CAN BE IMPLEMENTED DOWNSTREAM TO PROTECT FISHERIES AND OTHER SENSITIVE AREAS. DRAINAGE NOTES: ROADWAY SURFACING DESIGN AND CONSTRUCTION TO ENGINEER'S SPECIFICATION (I.E. BY OTHERS). 2. SPARE STRAW BALES/SILT FENCING/ OR SIMILAR, TO BE STORED ON SITE. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE TEMPORARILY MANAGED BY PLACING SILT FENCES, STRAW BALES / OR SIMILAR OR ADDITIONAL CHECK DAMS AT THE PROBLEM AREAS. MOBILE SILTBUSTER SYSTEM TO BE AVAILABLE ON-SITE FOR USE AS REQUIRED ALSO. SUDS SYSTEM TO BE CONSTRUCTED PRIOR TO, OR AT THE SAME TIME AS THE ACCESS TRACKS. INTERIM MEASURES SUCH AS THE PLACEMENT OF STRAW BALES/SILT FENCING/OR SIMILAR APPROVED METHOD OR ADDITIONAL CHECK DAMS AND SILT FENCES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS TRACKS IS LIKELY TO CAUSE ADVERSE ENVIRONMENTAL EFFECTS THROUGH INCREASED SILT LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE. 4. SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO 58 m RECEIVING WATERCOURSES. SEE NOTES ON POLLUTION PREVENTION. 5. INTERCEPTOR SWALES / DITCHES TO BE USED TO COLLECT UPSTREAM SURFACE WATER FLOWS. REGULAR CROSS DRAINS / DISCHARGE TO FIELD MITIGATION / DRAINAGE COINTROLS AVAILABLE DITCHES/DRAINS WILL BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER IN INTERCEPTOR DRAINS TO SUITABLE FIELD DRAIN OUTFALL POINTS. FOR USE ACROSS THE SITE 6. DRAINAGE SWALES / DITCHES TO BE EXCAVATED ADJACENT TO THE ACCESS TRACKS. REGULAR CROSS DRAINS TO BE LOCATED ALONG ACCESS DESCRIPTION OF SUDS DRAINAGE CONTROL MANAGEMENT TYPE TRACKS TO PREVENT EXCESSIVE VOLUMES OF WATER COLLECTING IN THE METHODS SWALES / DITCHES. LOCATIONS OF CROSS DRAINS TO BE AGREED WITH THE APPLICATION OF 50M BUFFER ZONES TO NATURAL ENGINEER ON SITE. SURFACE WATER WILL NOT BE ALLOWED TO DISCHARGE WATERCOURSES WHERE POSSIBLE DIRECTLY INTO EXISTING WATERCOURSES. 2) APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS 7. Where possible, a buffer zone of >20m to any existing Avoidance WHERE POSSIBLE WATERCOURSE WILL BE REQUIRED WHERE OVER LAND DISCHARGES ARE CONTROLS 3) USING SMALL WORKING AREAS PROPOSED FROM ACCESS TRACK SWALES / DITCHES. 4) WORKING IN APPROPRIATE WEATHER, AND SUSPENDING 8. BATTERS OF ALL PROPOSED SWALES / DITCHES TO HAVE A SLOPE OF CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED BETWEEN I : 1.5 TO I : 2 DEPENDING UPON DEPTH OF SWALE/DITCH AND WILL WET WEATHER BE LEFT AS CUT TO RE-VEGETATE WITH LOCAL SPECIES. 9. TRACK SIDE SWALES / DITCHES TO BE SHALLOW WITH MODERATE I) USE OF UPSTREAM INTERCEPTOR DRAINS AND GRADIENTS TO PREVENT SCOURING. IN STEEP AREAS CHECK DAMS SHOULD BE DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE-DRAINS, DIVERSION DRAINS, FLUMES AND CULVERT INSTALLED TO REDUCE FLOW VELOCITIES AND PROVIDE SOURCE CONTROL OF SILT CONTAINMENT. WHERE NECESSARY THESE HAVE BEEN DESIGNATED IN 2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: CONJUNCTION WITH SETTLEMENT PONDS AND SILT TRAPS, PRIOR TO DISCHARGE. A) SAND BAGS 10. SETTLEMENT PONDS TO BE CONSTRUCTED FOR SILT REMOVAL AT SOURCE CONTROLS: B) OYSTER BAGS FILLED WITH GRAVEL 19 TURBINE BASES AND HARD STAND AREAS. POND SIZES DEPENDS ON C) FILTER FABRICS CATCHMENT AREA SERVED. SAMPLE POND SIZES SHOWN ON DRAWING D501. D) AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE 11. STRAW BALES / OR SIMILAR AND SILT FENCES TO BE USED ALSO SYSTEMS AROUND SPOIL STOCKPILES TO MITIGATE SILT RUNOFF. SILT FENCES MAY BE 3) USING SMALL WORKING AREAS REMOVED WHEN SUITABLE VEGETATION COVER IS ESTABLISHED. 4) SURROUNDING STOCKPILES WITH SILT FENCING 12. SILT FENCES TO BE PROVIDE ALONG EDGE OF EXISTING WATERCOURSE 5) WEATHERING OFF / SEALING SPOIL STOCKPILES where works comes within <10m of edge of any ditch / ephemeral CHANNELS.) INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED 13. SLOPES OF THE SWALES / DITCHES TO BE VEGETATED OR PROTECTED SWALES/COLLECTOR DRAINS FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED 2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS: VEGETATIVE LAYER FROM EXCAVATIONS TO BE STORED LOCALLY AND USED A) SAND BAGS TO LINE SLOPES AND BASE OF SWALES / DITCHES OR LONGITUDINAL MOUNDS B) OYSTER BAGS FILLED WITH GRAVEL OF VEGETATION SWALES AT FIELD DRAIN DISCHARGE POINTS. C) FILTER FABRICS 14. AREAS STRIPPED OF VEGETATION SHOULD BE KEPT TO A MINIMUM. D) STRAW BALES 15. CLEAN STONE FLOW CONTROL CHECK DAMS TO BE MADE OF LOCALLY E) FLOW LIMITERS WON / GEOLOGICALLY SIMILAR WELL GRADED STONE. AGGREGATE SIZE FOR IN-LINE CONTROLS: F) WEIRS OR BAFFLES STONE CHECK DAMS TO BE TYPICALLY 20- 40MM CLEAN STONE. ON SLOPING G) AND/OR OTHER SIMILAR/EQUIVALENT OR SECTIONS OF THE ACCESS TRACKS, 40MM CHECK DAMS TO BE PROTECTED APPROPRIATE SYSTEMS. FROM WASHING AWAY THROUGH THE PLACEMENT OF 100M STONE ON THE 3) SILT FENCES, FILTER FABRICS DOWNHILL FACE OF THE CHECK DAM AND BY WRAPPING IN GEOTEXTILE. 4) IN STREAM SEDIMATS 16. BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND 5) COLLECTION SUMPS, TEMPORARY SUMPS, PUMPING DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY SYSTEMS INSPECTED AS PART OF AN ONGOING DRAINAGE MAINTENANCE PROGRAMME 5) ATTENUATION LAGOONS DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED 6) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS WITH SILT OR VEGETATION, STONE CHECK DAM TO BE REMOVED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT. I) TEMPORARY SUMPS 17. SPACING AND FREQUENCY OF CHECK DAMS WILL BE DEPENDENT UPON 2) ATTENUATION PONDS LONGITUDINAL GRADIENT OF SWALE. 3) TEMPORARY STORAGE LAGOONS 18. LOCATION OF FILTRATION CHECK DAMS (IF REQUIRED) TO BE AGREED WATER TREATMENT 4) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS ON SITE WITH ENGINEER. SETTLEMENT PONDS TO BE CONSTRUCTED IN A CONTROLS: 5) PROPRIETARY SETTLEMENT SYSTEMS SUCH AS MANNER WHERE THEY MAY BE EASILY INFILLED AT A LATER DATE (POST SILTBUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR COMPLETION OF THE TURBINE BASE AND HARDSTAND CONSTRUCTION). ONLY APPROPRIATE SYSTEMS. SUITABLE MATERIALS EXCAVATED FROM THE POND TO BE USED TO FORM (40 80 6) SILT DEWATERING BAGS PART OF THE EMBANKMENT AROUND THE POND. I) LEVELSPREADERS 19. OIL/FUEL SHOULD BE STORED WITHIN BUNDED CONTAINMENT 2) BUFFERED OUTFALLS STRUCTURES. OUTFALL CONTROLS: 3) VEGETATION FILTERS 20. SILT BAGS WILL BE USED ON SITE AT FIELD DRAIN DISCHARGE Metres 4) SILT DEWATERING BAGS LOCATIONS, AS NECESSARY. 5) FLOW LIMITERS AND WEIRS



POLLUTION PREVENTION NOTES:

- SITE MANAGEMENT PROPOSALS ARE INTENDED TO ENSURE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
 SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES
- TO PREVENT CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO OFF SITE RECEIVING WATERCOURSES. 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

Discharges

AND DITCHES.

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

EXCAVATIONS

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

EXPOSED GROUND & STOCKPILES

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

SITE TRACKS

 Use of track side swales with check dams, and/or filtration check dams will reduce silt in runoff water as required.
 Check dams to be inspected and cleaned regularly.

Refueling

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

CONCRETE

- CONCRETE 5. CARE WILL BE TAKEN WHEN COMPLETING CONCRETE WORKS ON SITE TO ENSURE NO DISCHARGES OCCUR.
- 16. CONCRETE WASH WATER, AND WASTE CONCRETE WILL BE MANAGED APPROPRIATELY ON SITE.

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

 \underline{STOP} - work in the immediate area should be stopped and the source of the pollution identified.

 $\frac{CONTAIN}{CONTAIN}$ - the source of the pollution should be bunded using a suitable method. Natural watercourses should be temporarily diverted around the source of pollution.

 \underline{NOTIFY} - The relevant authorities (Site Manager / Fisheries / NPWS / Local Authority etc.) should be notified immediately to ensure that measures can be implemented downstream to protect fisheries and other sensitive areas.

DRAINAGE NOTES:

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

2. SPARE STRAW BALES/SILT FENCING/ OR SIMILAR, TO BE STORED ON SITE. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE TEMPORARILY MANAGED BY PLACING SILT FENCES, STRAW BALES / OR SIMILAR OR ADDITIONAL CHECK DAMS AT THE PROBLEM AREAS. MOBILE

SILTBUSTER SYSTEM TO BE AVAILABLE ON-SITE FOR USE AS REQUIRED ALSO. 3. SUDS SYSTEM TO BE CONSTRUCTED PRIOR TO, OR AT THE SAME TIME AS THE ACCESS TRACKS. INTERIM MEASURES SUCH AS THE PLACEMENT OF STRAW BALES/SILT FENCING/OR SIMILAR APPROVED METHOD OR ADDITIONAL CHECK DAMS AND SILT FENCES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS TRACKS IS LIKELY TO CAUSE ADVERSE ENVIRONMENTAL EFFECTS THROUGH INCREASED SILT LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.

4. SUITABLE PREVENTION MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT THE CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO RECEIVING WATERCOURSES. SEE NOTES ON POLLUTION PREVENTION.

5. INTERCEPTOR SWALES / DITCHES TO BE USED TO COLLECT UPSTREAM SURFACE WATER FLOWS. REGULAR CROSS DRAINS / DISCHARGE TO FIELD DITCHES/DRAINS WILL BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER IN INTERCEPTOR DRAINS TO SUITABLE FIELD DRAIN OUTFALL POINTS. 6. DRAINAGE SWALES / DITCHES TO BE EXCAVATED ADJACENT TO THE ACCESS TRACKS. REGULAR CROSS DRAINS TO BE LOCATED ALONG ACCESS TRACKS TO PREVENT EXCESSIVE VOLUMES OF WATER COLLECTING IN THE SWALES / DITCHES. LOCATIONS OF CROSS DRAINS TO BE AGREED WITH THE ENGINEER ON SITE. SURFACE WATER WILL NOT BE ALLOWED TO DISCHARGE DIRECTLY INTO EXISTING WATERCOURSES.

7. Where possible, a buffer zone of >20m to any existing watercourse will be required where over land discharges are

PROPOSED FROM ACCESS TRACK SWALES / DITCHES. 8. BATTERS OF ALL PROPOSED SWALES / DITCHES TO HAVE A SLOPE OF BETWEEN I : I.5 TO I : 2 DEPENDING UPON DEPTH OF SWALE/DITCH AND WILL BE LEFT AS CUT TO RE-VEGETATE WITH LOCAL SPECIES.

9. TRACK SIDE SWALES / DITCHES TO BE SHALLOW WITH MODERATE GRADIENTS TO PREVENT SCOURING. IN STEEP AREAS CHECK DAMS SHOULD BE INSTALLED TO REDUCE FLOW VELOCITIES AND PROVIDE SOURCE CONTROL OF SILT CONTAINMENT. WHERE NECESSARY THESE HAVE BEEN DESIGNATED IN CONJUNCTION WITH SETTLEMENT PONDS AND SILT TRAPS, PRIOR TO DISCHARGE.

 IO. SETTLEMENT PONDS TO BE CONSTRUCTED FOR SILT REMOVAL AT TURBINE BASES AND HARD STAND AREAS. POND SIZES DEPENDS ON CATCHMENT AREA SERVED. <u>SAMPLE POND SIZES SHOWN ON DRAWING D501</u>.
 II. STRAW BALES / OR SIMILAR AND SILT FENCES TO BE USED ALSO

AROUND SPOIL STOCKPILES TO MITIGATE SILT RUNOFF. SILT FENCES MAY BE REMOVED WHEN SUITABLE VEGETATION COVER IS ESTABLISHED. 12. SILT FENCES TO BE PROVIDE ALONG EDGE OF EXISTING WATERCOURSE WHERE WORKS COMES WITHIN <10M OF EDGE OF ANY DITCH / EPHEMERAL CHANNELS.

13. SLOPES OF THE SWALES / DITCHES TO BE VEGETATED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STRIPPED VEGETATIVE LAYER FROM EXCAVATIONS TO BE STORED LOCALLY AND USED TO LINE SLOPES AND BASE OF SWALES / DITCHES OR LONGITUDINAL MOUNDS OF VEGETATION SWALES AT FIELD DRAIN DISCHARGE POINTS.

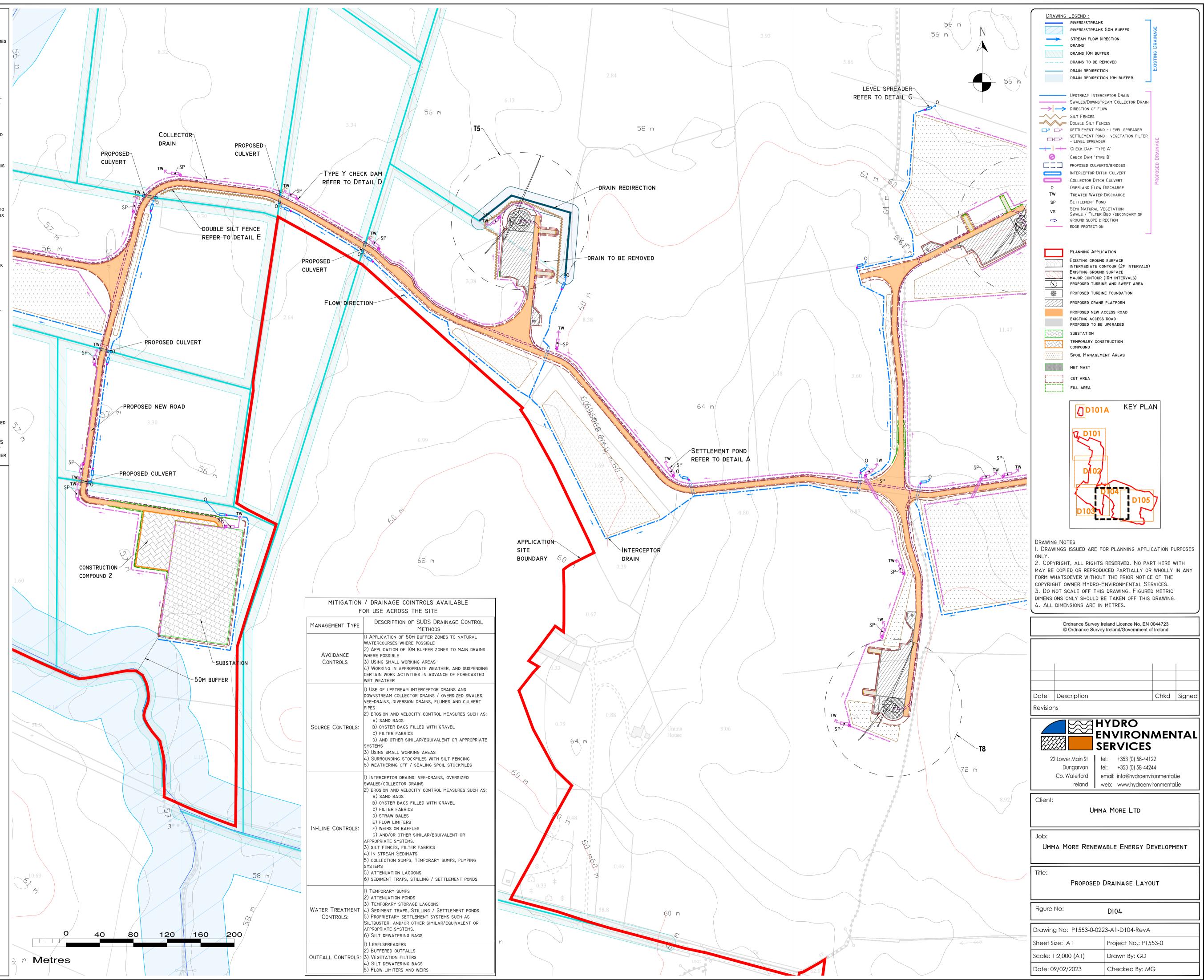
14. AREAS STRIPPED OF VEGETATION SHOULD BE KEPT TO A MINIMUM.
15. CLEAN STONE FLOW CONTROL CHECK DAMS TO BE MADE OF LOCALLY
WON / GEOLOGICALLY SIMILAR WELL GRADED STONE. AGGREGATE SIZE FOR
STONE CHECK DAMS TO BE TYPICALLY 20- 40MM CLEAN STONE. ON SLOPING
SECTIONS OF THE ACCESS TRACKS, 40MM CHECK DAMS TO BE PROTECTED
FROM WASHING AWAY THROUGH THE PLACEMENT OF 100M STONE ON THE
DOWNHILL FACE OF THE CHECK DAM AND BY WRAPPING IN GEOTEXTILE.
16. BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REMOVED AND
DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY
INSPECTED AS PART OF AN ONGOING DRAINAGE MAINTENANCE PROGRAMME
DURING THE CONSTRUCTION PHASE. WHERE CHECK DAMS BECOME CLOGGED

WITH SILT OR VEGETATION, STONE CHECK DAM TO BE REMOVED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT. 17. SPACING AND FREQUENCY OF CHECK DAMS WILL BE DEPENDENT UPON LONGITUDINAL GRADIENT OF SWALE.

18. LOCATION OF FILTRATION CHECK DAMS (IF REQUIRED) TO BE AGREED ON SITE WITH ENGINEER. SETTLEMENT PONDS TO BE CONSTRUCTED IN A MANNER WHERE THEY MAY BE EASILY INFILLED AT A LATER DATE (POST COMPLETION OF THE TURBINE BASE AND HARDSTAND CONSTRUCTION). ONLY SUITABLE MATERIALS EXCAVATED FROM THE POND TO BE USED TO FORM PART OF THE EMBANKMENT AROUND THE POND.

19. OIL/FUEL SHOULD BE STORED WITHIN BUNDED CONTAINMENT STRUCTURES.

20. SILT BAGS WILL BE USED ON SITE AT FIELD DRAIN DISCHARGE LOCATIONS, AS NECESSARY.



POLLUTION PREVENTION NOTES:

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

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AND DITCHES.

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

EXCAVATIONS

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

EXPOSED GROUND & STOCKPILES

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

<u>Site tracks</u>

. 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.

Refueling

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

- CONCRETE 15. CARE WILL BE TAKEN WHEN COMPLETING CONCRETE WORKS ON SITE TO ENSURE NO DISCHARGES OCCUR.
- 6. 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 CONTAIN - THE SOURCE OF THE POLLUTION SHOULD BE BUNDED USING A SUITABLE METHOD. NATURAL WATERCOURSES SHOULD BE TEMPORARILY DIVERTED AROUND THE SOURCE OF POLLUTION.

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

DRAINAGE NOTES:

- ROADWAY SURFACING DESIGN AND CONSTRUCTION TO ENGINEER'S SPECIFICATION (I.E. BY OTHERS).
- 2. SPARE STRAW BALES/SILT FENCING/ OR SIMILAR, TO BE STORED ON SITE. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXCESSIVE SILT LEVELS IN ANY AREA TO BE TEMPORARILY MANAGED BY PLACING SILT FENCES, STRAW BALES / OR SIMILAR OR ADDITIONAL CHECK DAMS AT THE PROBLEM AREAS. MOBILE
- SILTBUSTER SYSTEM TO BE AVAILABLE ON-SITE FOR USE AS REQUIRED ALSO. SUDS SYSTEM TO BE CONSTRUCTED PRIOR TO, OR AT THE SAME TIME AS THE ACCESS TRACKS. INTERIM MEASURES SUCH AS THE PLACEMENT OF STRAW BALES/SILT FENCING/OR SIMILAR APPROVED METHOD OR ADDITIONAL CHECK DAMS AND SILT FENCES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS TRACKS IS LIKELY TO CAUSE ADVERSE ENVIRONMENTAL EFFECTS THROUGH INCREASED SILT LOADINGS BEING GENERATED DURING THE CONSTRUCTION PHASE.

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7. WHERE POSSIBLE, A BUFFER ZONE OF >20M TO ANY EXISTING WATERCOURSE WILL BE REQUIRED WHERE OVER LAND DISCHARGES ARE

PROPOSED FROM ACCESS TRACK SWALES / DITCHES. 8. BATTERS OF ALL PROPOSED SWALES / DITCHES TO HAVE A SLOPE OF BETWEEN I : 1.5 TO I : 2 DEPENDING UPON DEPTH OF SWALE/DITCH AND WILL BE LEFT AS CUT TO RE-VEGETATE WITH LOCAL SPECIES.

9. TRACK SIDE SWALES / DITCHES TO BE SHALLOW WITH MODERATE GRADIENTS TO PREVENT SCOURING. IN STEEP AREAS CHECK DAMS SHOULD BE INSTALLED TO REDUCE FLOW VELOCITIES AND PROVIDE SOURCE CONTROL OF SILT CONTAINMENT. WHERE NECESSARY THESE HAVE BEEN DESIGNATED IN CONJUNCTION WITH SETTLEMENT PONDS AND SILT TRAPS, PRIOR TO DISCHARGE.

10. SETTLEMENT PONDS TO BE CONSTRUCTED FOR SILT REMOVAL AT TURBINE BASES AND HARD STAND AREAS. POND SIZES DEPENDS ON CATCHMENT AREA SERVED. SAMPLE POND SIZES SHOWN ON DRAWING D501. 11. STRAW BALES / OR SIMILAR AND SILT FENCES TO BE USED ALSO

AROUND SPOIL STOCKPILES TO MITIGATE SILT RUNOFF. SILT FENCES MAY BE REMOVED WHEN SUITABLE VEGETATION COVER IS ESTABLISHED. 12. SILT FENCES TO BE PROVIDE ALONG EDGE OF EXISTING WATERCOURSE where works comes within <10m of edge of any ditch / ephemeral CHANNELS.

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14. AREAS STRIPPED OF VEGETATION SHOULD BE KEPT TO A MINIMUM. 15. CLEAN STONE FLOW CONTROL CHECK DAMS TO BE MADE OF LOCALLY WON / GEOLOGICALLY SIMILAR WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE TYPICALLY 20- 40MM CLEAN STONE. ON SLOPING SECTIONS OF THE ACCESS TRACKS, 40MM CHECK DAMS TO BE PROTECTED FROM WASHING AWAY THROUGH THE PLACEMENT OF 100M STONE ON THE DOWNHILL FACE OF THE CHECK DAM AND BY WRAPPING IN GEOTEXTILE. 16. Build up of silt levels at check dams to be removed and DISPOSED OF APPROPRIATELY. SILT LEVELS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING DRAINAGE MAINTENANCE PROGRAMME

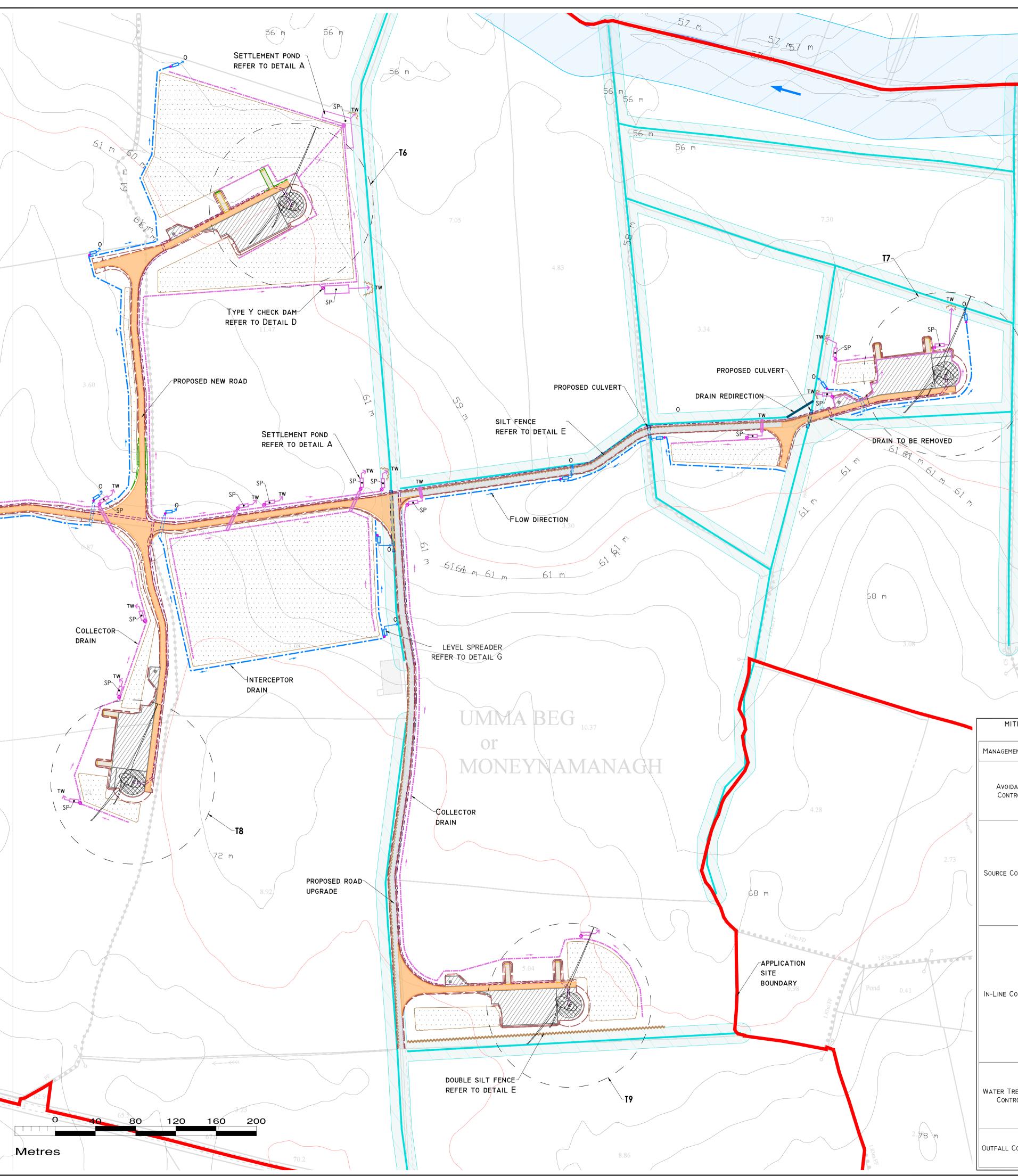
during the construction phase. Where check dams become clogged WITH SILT OR VEGETATION, STONE CHECK DAM TO BE REMOVED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT. 17. SPACING AND FREQUENCY OF CHECK DAMS WILL BE DEPENDENT UPON

LONGITUDINAL GRADIENT OF SWALE. 18. LOCATION OF FILTRATION CHECK DAMS (IF REQUIRED) TO BE AGREED ON SITE WITH ENGINEER. SETTLEMENT PONDS TO BE CONSTRUCTED IN A

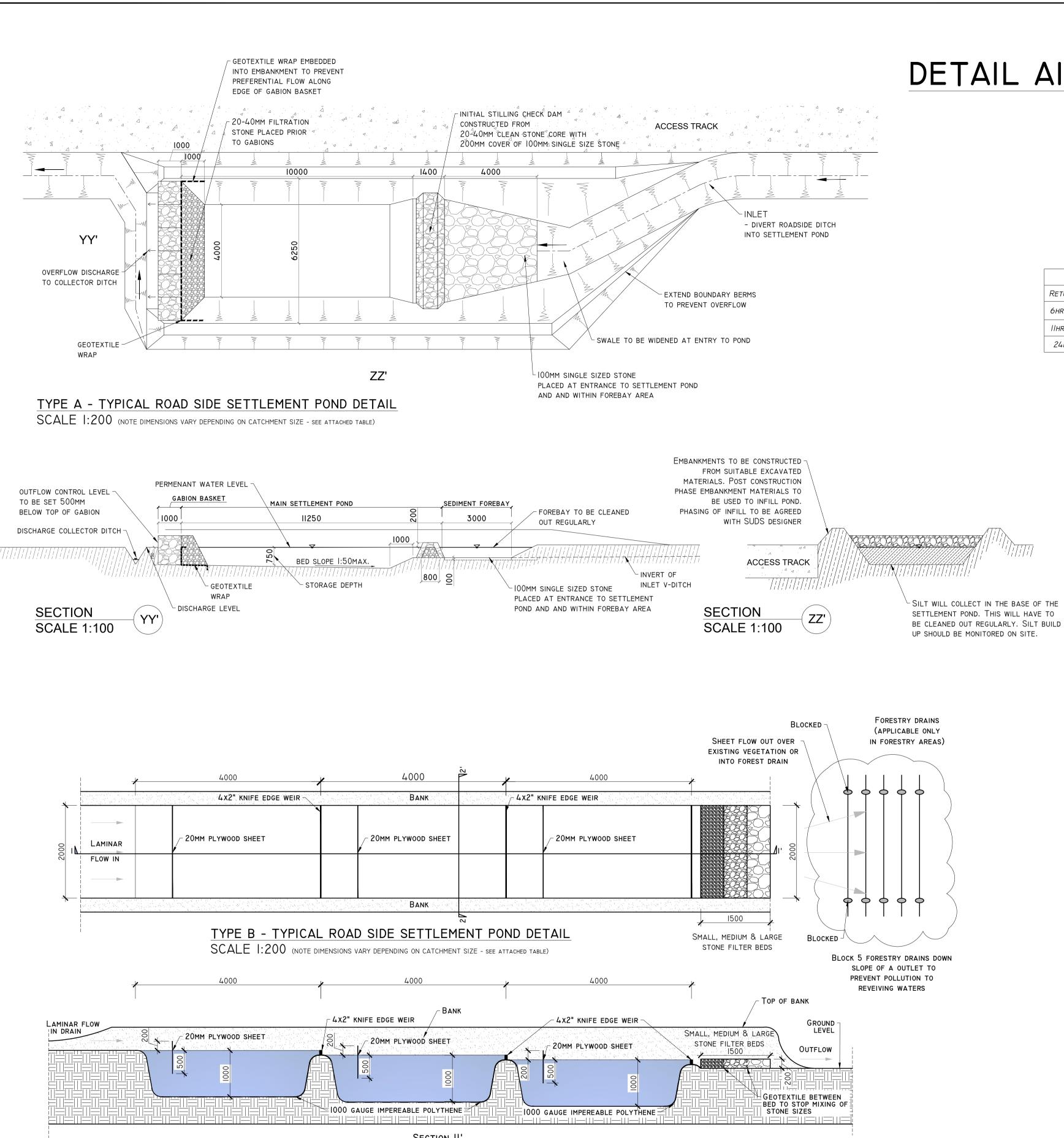
MANNER WHERE THEY MAY BE EASILY INFILLED AT A LATER DATE (POST COMPLETION OF THE TURBINE BASE AND HARDSTAND CONSTRUCTION). ONLY SUITABLE MATERIALS EXCAVATED FROM THE POND TO BE USED TO FORM PART OF THE EMBANKMENT AROUND THE POND. 19. OIL/FUEL SHOULD BE STORED WITHIN BUNDED CONTAINMENT

STRUCTURES. 20. SILT BAGS WILL BE USED ON SITE AT FIELD DRAIN DISCHARGE

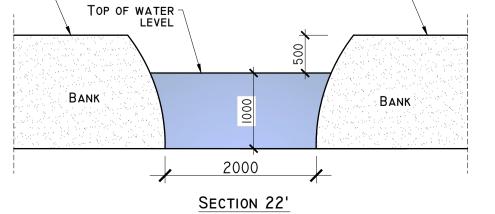
LOCATIONS, AS NECESSARY.



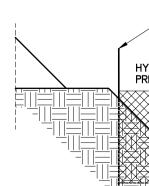
		DRAWING LEGEND : RIVERS/STREAMS
	N	
		RIVERS/STREAMS 50M BUFFER STREAM FLOW DIRECTION DRAINS DRAINS IOM BUFFER DRAINS TO BE REMOVED DRAIN BEDIRECTION
		DRAINS TO BE REMOVED
		DRAIN REDIRECTION 10M BUFFER
		UPSTREAM INTERCEPTOR DRAIN Swales/Downstream Collector Drain
	1.10	Direction of flow
		DOUBLE SILT FENCES SETTLEMENT POND - LEVEL SPREADER SETTLEMENT POND - VEGETATION FILTER
	1.64	- LEVEL SPREADER
		PROPOSED CULVERTS/BRIDGES INTERCEPTOR DITCH CULVERT COLLECTOR DITCH CULVERT O OVERLAND FLOW DISCHARGE
		TW Treated Water Discharge SP Settlement Pond
		VS SEMI-NATURAL VEGETATION SWALE / FILTER BED /SECONDARY SP GROUND SLOPE DIRECTION
		EDGE PROTECTION
	2.71	PLANNING APPLICATION
		EXISTING GROUND SURFACE INTERMEDIATE CONTOUR (2M INTERVALS) EXISTING GROUND SURFACE
		MAJOR CONTOUR (10M INTERVALS) PROPOSED TURBINE AND SWEPT AREA PROPOSED TURBINE FOUNDATION
		PROPOSED CRANE PLATFORM
		PROPOSED NEW ACCESS ROAD EXISTING ACCESS ROAD PROPOSED TO BE UPGRADED
		SUBSTATION TEMPORARY CONSTRUCTION
		COMPOUND SPOIL MANAGEMENT AREAS
	4/44	MET MAST
		FILL AREA
		D101A KEY PLAN
	1.17	
		7 D101
		D102
	0,2	D104
2	2.76	Drawing Notes I. Drawings issued are for planning application purposes
The second		ONLY. 2. COPYRIGHT, ALL RIGHTS RESERVED. NO PART HERE WITH
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	FOR USE ACROSS THE SITE	4. ALL DIMENSIONS ARE IN METRES.
MENT T	METHODS I) APPLICATION OF 50M BUFFER ZONES TO NATURAL	Ordnance Survey Ireland Licence No. EN 0044723 © Ordnance Survey Ireland/Government of Ireland
DANCE	WATERCOURSES WHERE POSSIBLE 2) APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE	
TROLS	3) USING SMALL WORKING AREAS4) WORKING IN APPROPRIATE WEATHER, AND SUSPENDING	
	CERTAIN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHER I) USE OF UPSTREAM INTERCEPTOR DRAINS AND	
	DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES, VEE-DRAINS, DIVERSION DRAINS, FLUMES AND CULVERT PIPES	DateDescriptionChkdSignedRevisions
CONTR	2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS:A) SAND BAGS	
Contr	C) FILTER FABRICS D) AND OTHER SIMILAR/EQUIVALENT OR APPROPRIATE	
	SYSTEMS 3) Using small working areas 4) Surrounding stockpiles with silt fencing	22 Lower Main St tel: +353 (0) 58-44122
	5) WEATHERING OFF / SEALING SPOIL STOCKPILES	Dungarvan tel: +353 (0) 58-44244 Co. Waterford email: info@hydroenvironmental.ie
	SWALES/COLLECTOR DRAINS 2) EROSION AND VELOCITY CONTROL MEASURES SUCH AS:	Ireland web: www.hydroenvironmental.ie
A) SAND BAGS B) OYSTER BAGS FILLED WITH GRAVEL C) FILTER FABRICS D) STRAW BALES E) FLOW LIMITERS CONTROLS: F) WEIRS OR BAFFLES G) AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. 3) SILT FENCES, FILTER FABRICS		Client: UMMA MORE LTD
		Job: Umma More Renewable Energy Development
	 4) IN STREAM SEDIMATS 5) COLLECTION SUMPS, TEMPORARY SUMPS, PUMPING 	
	SYSTEMS 5) ATTENUATION LAGOONS 6) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS	Title:
	I) TEMPORARY SUMPS 2) ATTENUATION PONDS	PROPOSED DRAINAGE LAYOUT
	3) TEMPORARY STORAGE LAGOONS 1ENT 4) SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS	Figure No: DI05
TROLS:	SILTBUSTER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS.	Drawing No: P1553-0-0223-A1-D105-RevA
	 6) SILT DEWATERING BAGS 1) LEVELSPREADERS 2) RUEFERED OUTFALLS 	Sheet Size: A1 Project No.: P1553-0
Contr	2) BUFFERED OUTFALLS ROLS: 3) VEGETATION FILTERS 4) SILT DEWATERING BAGS	Scale: 1:2,000 (A1) Drawn By: GD
	5) FLOW LIMITERS AND WEIRS	Date: 09/02/2023 Checked By: MG



Section II' TOP OF BANK



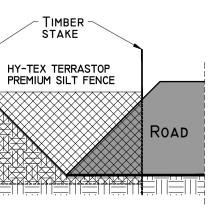
TOP OF BANK -



DETAIL AI

POND SIZE W [M] X L [M] X D [M] CATCHMENT S 500 RETURN PERIOD 10 YRS STORM DURATION 1000 I.0 x 3.5 х I м I.25x 3.75 : 6HR RETENTION FOR COARSE SILT 6 HRS Ilhr retention for medium silt I.5 x 4.5 x I M 2.0 x 6.0 x II HRS 24HR RETENTION FOR FINE SILT 24 HRS 2.25х 6.75х Ім 3.0 х 9.0 х

SEDIMENT FENCE/CHECK DAM DETAIL



DETAIL A2

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09/02/23 Planning Date Description	MG MG Chkd Signed		
Revisions HYDRO ENVIRONMENTAL SERVICES 22 Lower Main St Dungarvan Co. Waterford Ireland UWW.hydroenvironmental.ie Web: WWW.hydroenvironmental.ie			
Client: Umma More Ltd			
Job: Umma More Renewable Energy Development			
Title: Drainage Details I			
Figure No: D501			
Drawing No: P1553-0-0223-A1-D501-RevA Sheet Size: A1 Project No.: P1553-0			

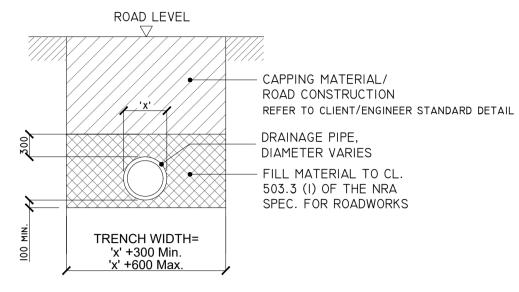
Scale: as shown (A1) Drawn By: MG/GD

Checked By: M.G.

Date: 09/02/2023

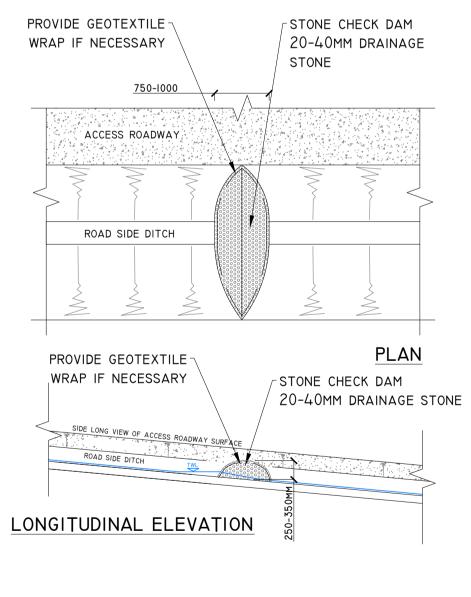
SIZE (M ²)				
	2000			
хІм	2.0 х 6.25 х I м			
хІм	2.75x 8.25x I M			
хІм	4.0 x 13.0 x 1 m			

DETAIL B



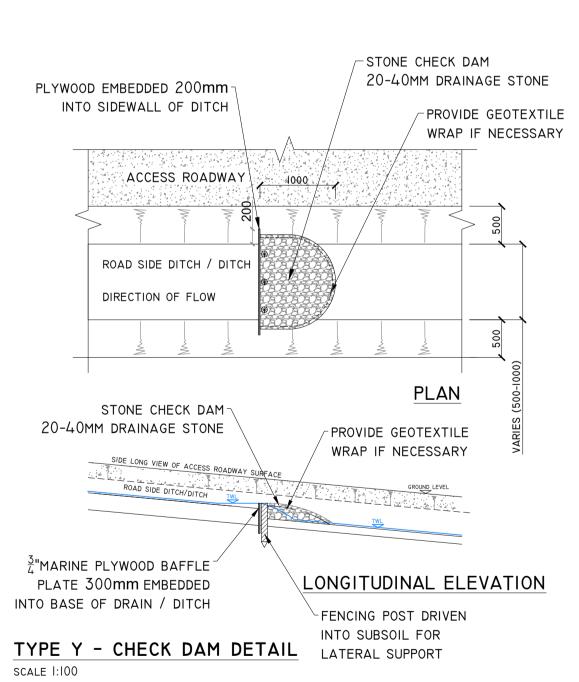
'TYPE B' CULVERT - DRAINAGE CROSSING BENEATH EXCAVATED ROAD SCALE I:50

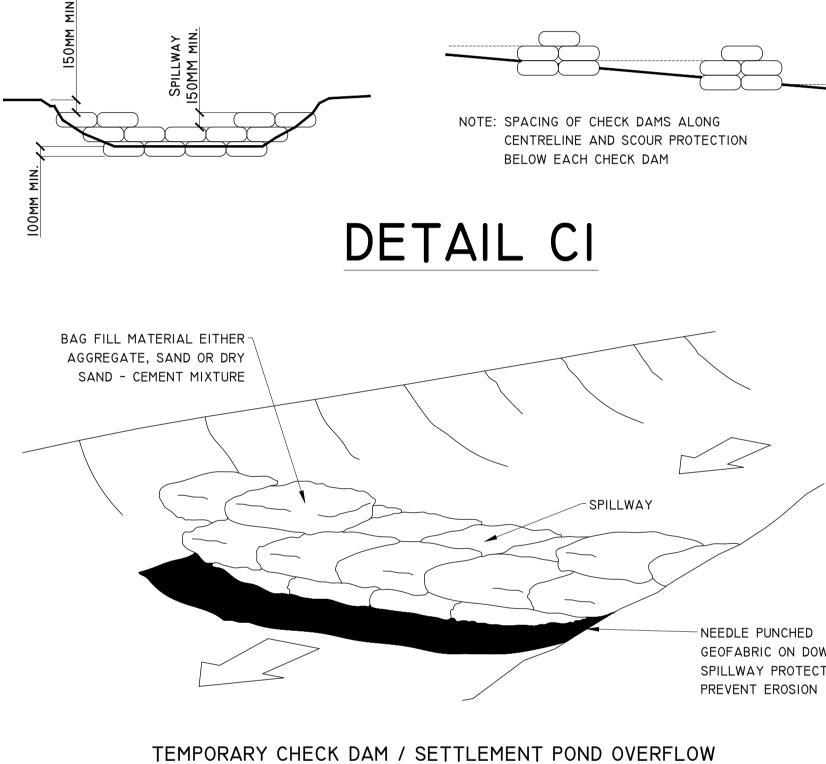




TYPE X - CHECK DAM DETAIL scale 1:50



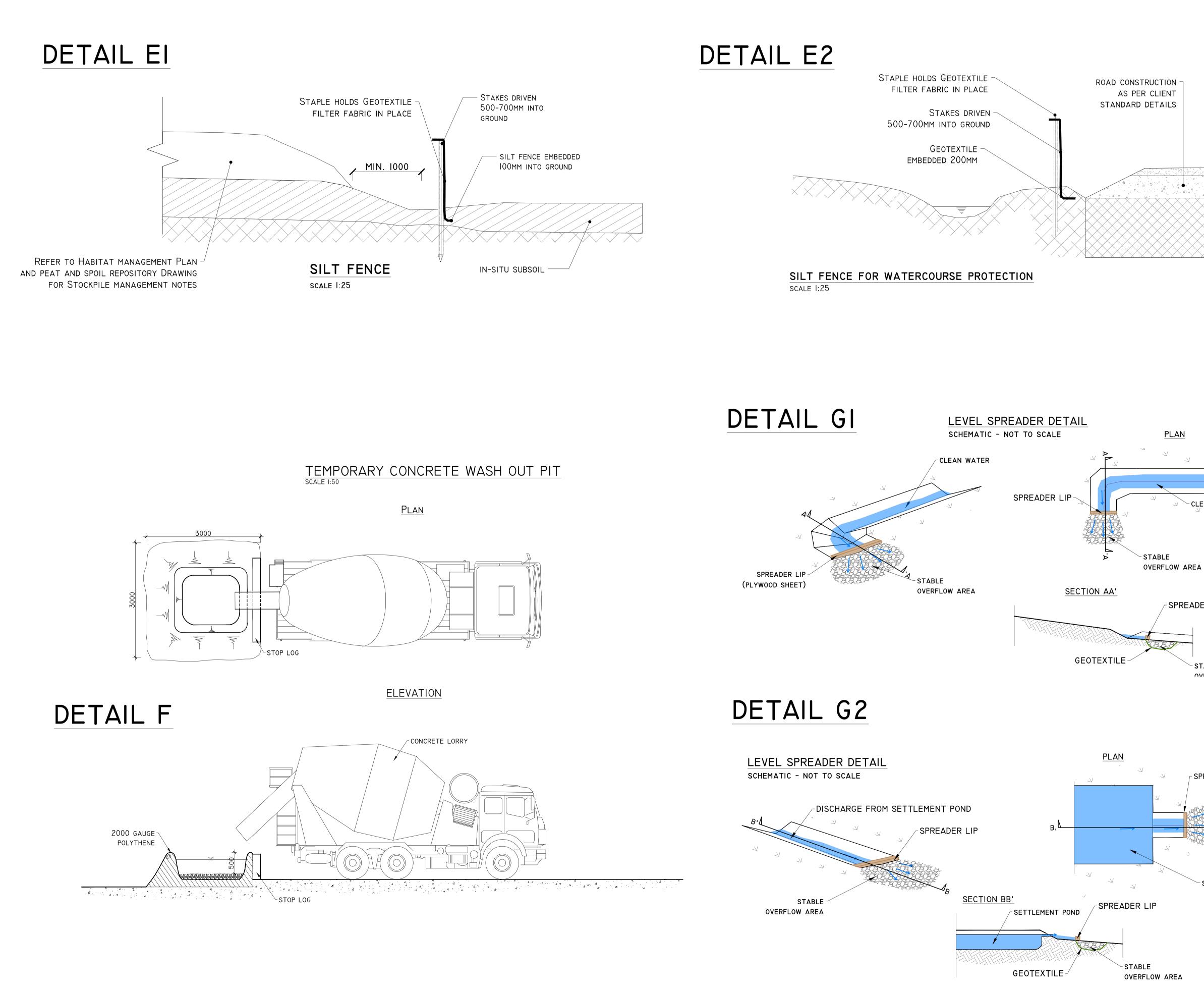




SAND FILLED BAG CONSTRUCTION SCHEMATIC - NOT TO SCALE

9/02/23 Plonning MG MG 9/02/23 Plonning MG MG 09/02/23 Plonning MG MG Date Description Child Signed Revisions Exclusions Exclusions Exclusions Zitzer and Contextic Exclusions Exclusions Exclusions Contextic Exclusions Exclusions Exclusions Contextic Exclusions Exclusions Exclusions Contextic Exclusions Exclusions Exclusions Cleart: UMMA More Renewable Energy Development Exclusions Cleart: Data Display=0.00000000000000000000000000000000000
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Date Description Chkd Signed Revisions HYDRO Signed Project No.: P1553-0-0223-A1-D502-RevA Signed Revisions HYDRO Signed Project No.: P1553-0 Project No.: P1553-0 Project No.: P1553-0
Date Description Chkd Signed Revisions Revisions Image: Properties of the state
Date Description Chkd Signed Revisions HYDRO ENVIRONMENTAL 22 Lower Main St Dungarvan Dungarvan Co. Waterford Itel: +353 (0) 58-44122 1el: +353 (0) 58-44244 email: info@hydroenvironmental.ie Web: www.hydroenvironmental.ie Vieterit UMMA Job: UMMA More LTD Job: UMMA More Renewable Energy Development Title: Drawing No: P1553-0-0223-A1-D502-RevA Sheet Size: A1 Project No.: P1553-0
Date Description Chkd Signed Revisions HYDRO ENVIRONMENTAL 22 Lower Main St Dungarvan Dungarvan Co. Waterford Itel: +353 (0) 58-44122 1el: +353 (0) 58-44124 email: info@Hydraenvironmental.ie Web: www.hydroenvironmental.ie Viet: UMMA More LTD Job: UMMA More Job: UMMA More Job: UMMA More Job: UMMA More Job: Drawing Nore Pigure No: D502 Drawing No: P1553-0-0223-A1-D502-RevA Sheet Size: A1 Project No.: P1553-0
Date Description Chkd Signed Revisions HYDRO ENVIRONMENTAL 22 Lower Main St Dungarvan Dungarvan Co. Waterford Itel: +353 (0) 58-44122 Tel: 1tel: +353 (0) 58-44244 email: info@hydroenvironmental.ie Client: UMMA MORE LTD Job: UMMA MORE RENEWABLE ENERGY DEVELOPMENT Title: DRAINAGE DETAILS 2 Figure No: D502 Drawing No: P1553-0-0223-A1-D502-RevA Sheet Size: A1
ENVIRONMENTAL Sungarvan Co. Waterford Ireland tel::::::::::::::::::::::::::::::::::::
UMMA MORE LTD Job: UMMA MORE RENEWABLE ENERGY DEVELOPMENT Title: DRAINAGE DETAILS 2 Figure No: D502 Drawing No: P1553-0-0223-A1-D502-RevA Sheet Size: A1 Project No.: P1553-0
Title: DRAINAGE DETAILS 2 Figure No: D502 Drawing No: P1553-0-0223-A1-D502-RevA Sheet Size: A1
Figure No:D502Drawing No:P1553-0-0223-A1-D502-RevASheet Size:A1Project No.:P1553-0
Sheet Size: A1 Project No.: P1553-0

GEOFABRIC ON DOWNSTREAM SPILLWAY PROTECTION TO



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AREA	
EADER LIP	
SPREADER LIP	09/02/23 Planning MG MG Date Description Chkd Signed Revisions
STABLE OVERFLOW AREA	22 Lower Main St tel: +353 (0) 58-44122 Dungarvan tel: +353 (0) 58-44244 Co. Waterford info@hydroenvironmental.ie Ireland web: www.hydroenvironmental.ie Client: UMMA MORE LTD
	Job: UMMA MORE RENEWABLE ENERGY DEVELOPMENT Title: DRAINAGE DETAILS 3
	Figure No: D503 Drawing No: P1553-0-0223-A1-D503-RevA
	-

Sheet Size: A1

Scale: as shown (A1)

Date: 09/02/2023

Project No.: P1553-0

Drawn By: MG/GD

Checked By: M.G.

SPREADER LIP