

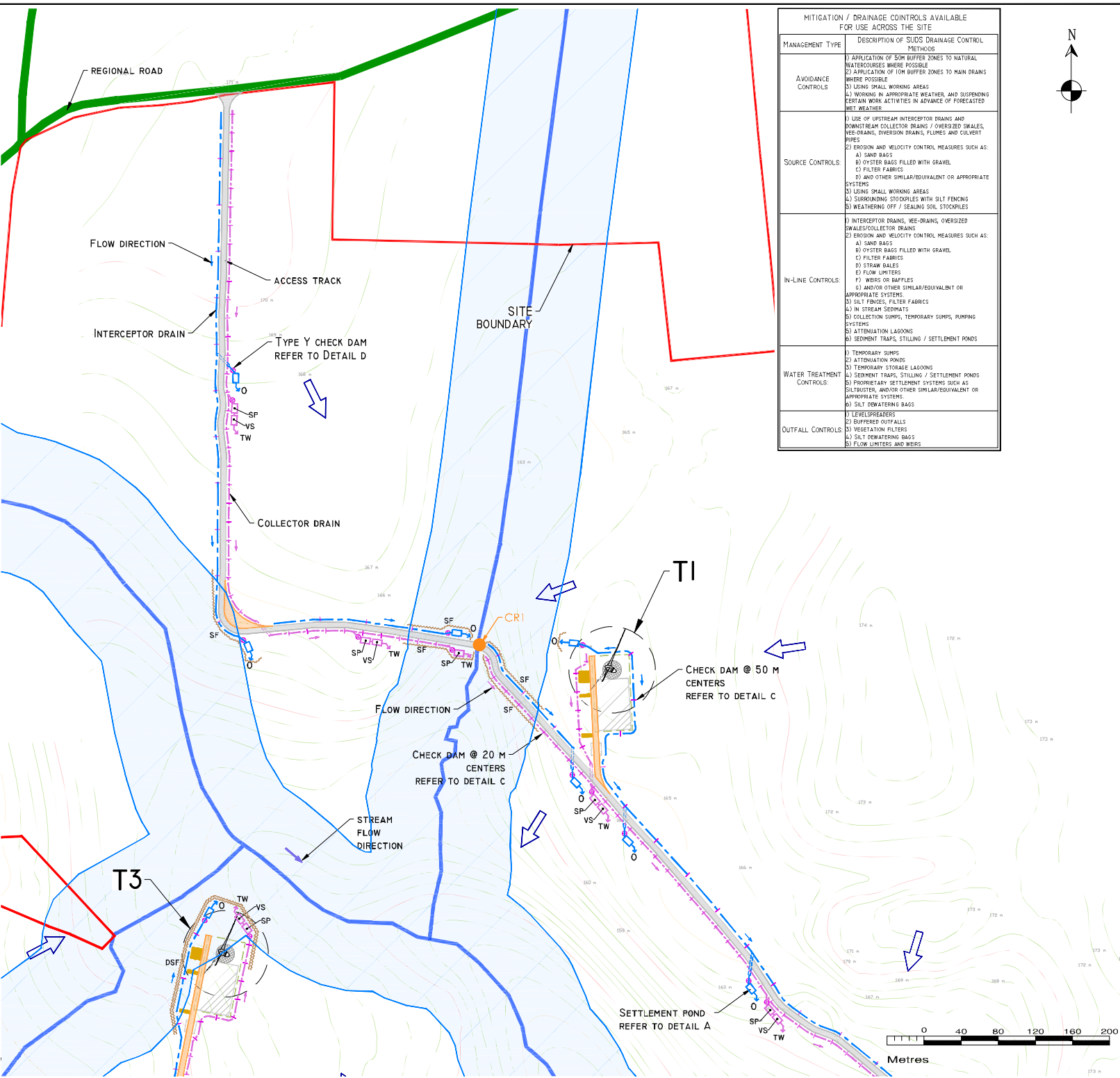
POLLUTION PREVENTION NOTES:

- 1. SITE MANAGEMENT PROCEDURES ARE INTRODUCED TO ENSURE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, EROSION AND EROSION.
 - 2. SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO OFF SITE RECEIVING WATERCOURSES.
 - 3. SILTY WATER CAN ARISE FROM DEWATERING EXCAVATIONS, EROSION OF EXPOSED/STURBED GROUND, TEMPORARY STOCKPILES, PLANT AND MHWEL WASH, SITE ROADS/TRACKS, AND DISTURBANCE OF EXISTING FIELD DRAINS AND DITCHES.
- DITCHES/DRAINS**
- 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 DRAIN WITH SILT TRAP AT A MINIMUM OF 50M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
 - 5. NO EXCAVED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
 - 6. PUMPED WATER WILL BE EJECTED INTO TRACK BODIE SPODES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE.
 - 7. PUMPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN DRAIN/DITCHES/STREAMS WILL BE COMPLETED IN A MANNER THAT DOES NOT CAUSE EROSION OR EROSION AT THE POINT OF RELEASE/DISCHARGE. THIS WILL BE DONE BY REDUCING THE FLOW VELOCITY 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**
- 9. WHERE DEEP EXCAVATIONS ARE PROPOSED CUT-OFF DRAINS WILL BE USED TO REDUCE THE AMOUNT OF SURFACE WATER ENTERING THE EXCAVATION. THIS WILL BE THE CASE AROUND TURNING 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.
- SILT TRAPS**
- 11. USE OF TRACK BODIE 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.
- REVEGETATION**
- 13. REVEGETATION OF MOBILE PLANT WILL BE COMPLETED IN DESIGNATED REVEGETATION AREAS ONLY, PREFERABLY ON AN IMPERMEABLE SURFACE AND AWAY FROM FIELD DRAINS / DITCHES AND WATERCOURSES / WATERBODIES.
 - 14. SILLI 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 DISCHARGE OCCURS.
 - 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:**
- STOP** - WORK IN THE IMMEDIATE AREA SHOULD BE STOPPED AND THE SOURCE OF THE POLLUTION IDENTIFIED.
 - CONTAIN** - THE SOURCE OF THE POLLUTION SHOULD BE BUNDED USING A SUITABLE METHOD. NATURAL WATERCOURSES SHOULD BE TEMPORARILY OVERTHEW 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.

- DESIGNING NOTES**
- 1. DESIGN A DRAINAGE DESIGN AND CONSTRUCTION TO ENHANCE THE SPECIFICATION (E.G. BY OTHERS).
 - 2. SPINE STONE CRASSELLET FENCING OR SIMILAR, TO BE STORED ON SITE. THE LEVEL OF 3.1 IN ALL IN ALL DURING CONSTRUCTION TO BE MONITORED VISUALLY AND RECORDS OF SILT TRAPS IN ANY AREA TO BE TEMPORARILY MARKED OFF (E.G. BY SILT FENCES, STRAW BALES, OR SIMILAR) OR ADDITIONAL CHECK DAMS AT THE PROBLEM AREAS. USE LL SILT TRAP SYSTEM TO BE AVAILABLE ON-SITE FOR USE AS REQUIRED ALSO.
 - 3. SILT TRAP SYSTEMS TO BE CONSTRUCTED PRIOR TO, OR AT THE SAME TIME AS THE ACCESS TRACKS, WITHIN PERIMETERS SUCH AS THE ALIGNMENT OF STRAW BALES/SILT FENCING OR SIMILAR APPROVED METHOD OF 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 SILT LOADING 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. REGULAR CROSS-DRAINS / DISCHARGES TO FIELD DITCHES/SWALES NOT BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER. INTERCEPTOR DRAINS TO BE LOCATED AT UPSTREAM SURFACE WATER FLOWS. REGULAR CROSS-DRAINS / DISCHARGES TO FIELD DITCHES/SWALES NOT BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER. INTERCEPTOR DRAINS TO BE LOCATED AT UPSTREAM SURFACE WATER FLOWS. REGULAR CROSS-DRAINS / DISCHARGES TO FIELD DITCHES/SWALES NOT BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER. INTERCEPTOR DRAINS TO BE LOCATED AT UPSTREAM SURFACE WATER FLOWS. REGULAR CROSS-DRAINS / DISCHARGES TO FIELD DITCHES/SWALES NOT BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER.

- 5. INTERCEPTOR DRAINS / DITCHES TO BE LOCATED AT UPSTREAM SURFACE WATER FLOWS. REGULAR CROSS-DRAINS / DISCHARGES TO FIELD DITCHES/SWALES NOT BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER. INTERCEPTOR DRAINS TO BE LOCATED AT UPSTREAM SURFACE WATER FLOWS. REGULAR CROSS-DRAINS / DISCHARGES TO FIELD DITCHES/SWALES NOT BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER.
- 6. DRAINAGE SWALES / DITCHES 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 FENCING ON SITE. SURFACE WATER W... NOT BE ALLOWED TO DISCHARGE DIRECTLY INTO EXISTING WATERCOURSES.
- 7. WHERE POSSIBLE, A BUFFER ZONE OF 500M TO 520M TO ANY EXISTING WATERCOURSE (WHY IF FENCED WHERE DRAINS AND DISCHARGES ARE PROPOSED FROM ACCESS TRACK SWALES / DITCHES).
- 8. BATTERS OF ALL PROPOSED DRAINS / DITCHES TO HAVE A SLOPE OF BETWEEN 1 : 5 TO 1 : 2 DEPENDING UPON DEPTH OF SWALE/DITCH AND WILL BE SET AT 30° TO 45° WHERE APPROPRIATE.
- 9. TRACK BODIE SWALES / DITCHES TO BE BUILT WITH MODERATE GRADIENTS TO PREVENT SCOURING. IN THESE AREAS CHECK DAMS SHOULD BE INSTALLED TO REDUCE FLOW VELOCITY AND PROMOTE SEDIMENTATION. DRAINAGE SWALES / DITCHES TO BE BUILT WITH MODERATE GRADIENTS TO PREVENT SCOURING. IN THESE AREAS CHECK DAMS SHOULD BE INSTALLED TO REDUCE FLOW VELOCITY AND PROMOTE SEDIMENTATION.
- 10. SETTLEMENT PONDS TO BE CONSTRUCTED FOR SILT REMOVAL AT TURNING BASES AND HARD STAND AREAS. POND DEEP DEPENDS ON CATCHMENT AREA SERVICE. SWALES TO BE BUILT WITH MODERATE GRADIENTS TO PREVENT SCOURING. IN THESE AREAS CHECK DAMS SHOULD BE INSTALLED TO REDUCE FLOW VELOCITY AND PROMOTE SEDIMENTATION.
- 11. STRAW BALES / OR SIMILAR AND SILT FENCES TO BE USED ALSO AND WHERE POSSIBLE SILT TRAPS TO BE LOCATED AT UPSTREAM SURFACE WATER FLOWS. REGULAR CROSS-DRAINS / DISCHARGES TO FIELD DITCHES/SWALES NOT BE REQUIRED TO TRANSFER / DISCHARGE SURFACE WATER.
- 12. SILT FENCES TO BE PROVIDED ALONG EDGE OF EXISTING WATERCOURSE WHERE BODIE CROSS BODIE OR BANKS OF ANY KIND (E.G. HIGHWAY CHANNELS).
- 13. SLOPES OF THE SWALES / DITCHES TO BE VEGETATED OR PROTECTED FROM EROSION. IN ALL VEGETATION HAS BEEN ESTABLISHED, STRIPPED VEGETATION LAYER (SOIL / SCAFF) FROM EXCAVATIONS TO BE STORED 'LOCALLY' AND USED TO COVER SLOPES AND BANKS OF SWALES / DITCHES OR 'CONVENTIONAL METHODS OF VEGETATION' ON SWALES AT FIELD DRAIN DISCHARGE POINTS.
- 14. AREAS (STREETS) OF VEGETATION SHOULD BE KEPT TO A MINIMUM.
- 15. CLEAN STONE FLOW COURSE CHECK DAMS TO BE MADE OF LOCALLY SOURCED CLEAN STONE OR CONCRETE. CONCRETE CHECK DAMS TO BE TYPICALLY 1.0M - 1.5M HIGH. CLEAN STONE OR CONCRETE CHECK DAMS TO BE TYPICALLY 1.0M - 1.5M HIGH. CLEAN STONE OR CONCRETE CHECK DAMS TO BE TYPICALLY 1.0M - 1.5M HIGH.
- 16. BUILD UP OF SILT BEHIND CHECK DAMS TO BE REMOVED AND DISPOSED OF APPROPRIATELY. SILT BEHIND CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING REGULAR MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. IF SILT BEHIND CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING REGULAR MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. IF SILT BEHIND CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING REGULAR MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE.
- 17. SPACING AND FREQUENCY OF CHECK DAMS WILL BE APPROPRIATE UPON LOCAL/NATIONAL GRADIENT OF SILE.
- 18. LOCATION OF 'BYPASS' ON CHECK DAMS (IF REQUIRED) TO BE AGREED ON SITE WITH ENGINEER. 'SETTLEMENT' BASINS TO BE CONSTRUCTED IN A MANNER WHERE THEY MAY BE EASILY INFILLED AT A LATER DATE (POST CONSTRUCTION) BY USING WASH AND WASHING SAND AND COARSE SAND. SUITABLE MATERIALS EXCAVATED FROM THE POND TO BE USED TO FORM PART OF THE ENVIRONMENT AROUND THE POND.
- 19. ALL FLOW SHOULD BE STORED WITHIN BODIE'S CONTAINMENT STRAITS.
- 20. SILT BAGS W... BE USED ON SITE AT FIELD DRAIN DISCHARGE LOCAL DRAIN AS NECESSARY.



MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE AROUND THE SITE

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

DRAWING LEGEND

- WATERCOURSES
- LAKES
- WATERCOURSE 75M BUFFER
- LAKES 50M BUFFER
- STREAM FLOW DIRECTION
- UPSTREAM INTERCEPTOR DRAIN
- SWALES/DOWNSTREAM COLLECTOR DRAIN
- DIRECTION OF FLOW
- SETTLEMENT POND - LEVEL SPREADER
- SETTLEMENT POND - VEGETATION FILTER
- LEVEL SPREADER
- CHECK DAM 'TYPE A'
- CHECK DAM 'TYPE B'
- PROPOSED NEW CULVERTS
- EXISTING CROSSING PROPOSED FOR SPRAW
- INTERCEPTOR DITCH CULVERT
- COLLECTOR DITCH CULVERT
- OVERLAND FLOW DISCHARGE
- TREATED WATER DISCHARGE
- SETTLEMENT POND
- SEM-NATURAL VEGETATION SWALE / FILTER BED (SECONDARY SP) FORMING SUMP
- LARGE DRAINAGE ARROWS
- SITE BOUNDARY
- EXISTING GROUND SURFACE
- MAJOR CONTOUR (10 M INTERVAL)
- EXISTING GROUND SURFACE
- INTERMEDIATE CONTOUR (5 M INTERVAL)
- EXISTING GROUND SURFACE
- MINOR CONTOUR (1 M INTERVAL)
- TURBINE AND SWEET AREA
- TURBINE FOUNDATION
- CRANE PLATFORM
- EXISTING ROAD TO BE UPGRADED
- PROPOSED ROAD
- REGIONAL ROAD
- THIRD ROAD
- FOURTH ROAD
- BORROW PIT
- SUBSTATION
- CONSTRUCTION COMPONENT
- NET MAST

DRAINAGE LAYOUT

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Title: PROPOSED DRAINAGE LAYOUT

Figure No: D101

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POLLUTION PREVENTION NOTES:

- SITE MANAGEMENT PROCEDURES ARE INTENDED TO ENSURE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SLURTING 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 AND DITCHES.

EXCAVATIONS:

- WATER CONTAINING SILT WILL NOT BE PUMPED DIRECTLY TO ANY NATURAL WATERCOURSE. ALL DISCHARGE TO BE MADE OVER OPEN GROUND OR INTO EXISTING FIELD DRAIN WITH SILT TRAP AT A MINIMUM OF 50M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
- NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
- PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DITCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE.
- PUMPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN DRENCH/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 VELOCITY 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 USED TO REDUCE THE AMOUNT OF SURFACE WATER ENTERING THE EXCAVATION. THIS WILL BE THE CASE AROUND TURNING BACK EXCAVATIONS.

EXPOSED GROUND & STOCKPILES:

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

SILT TRAPS:

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

REVEGETATION:

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

CONCRETE:

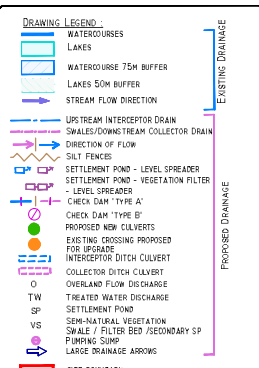
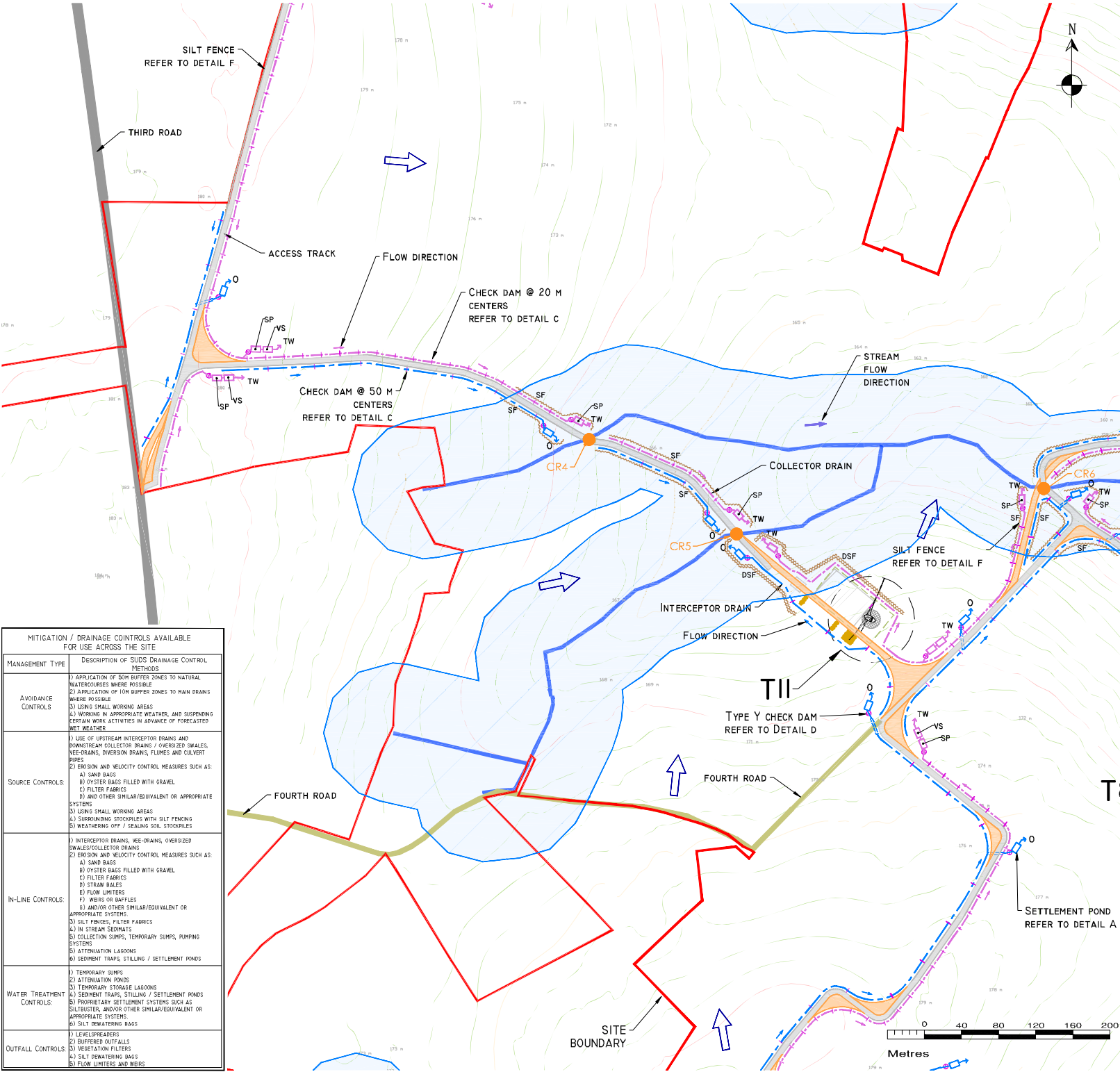
- CARE WILL BE TAKEN WHEN COMPLETING CONCRETE WORKS ON SITE TO ENSURE NO DISCHARGES OCCUR.
- CONCRETE WASH WATER, AND WASTE CONCRETE WILL BE MANAGED APPROPRIATELY ON SITE.

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

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

MAINTENANCE NOTES:

- SOILWAY SPRING DESIGN AND CONSTRUCTION TO ENHANCE'S SPECIFICATION (I.E. BY OTHERS).
- SPRINKLING SHALL BE CONDUCTED ON THE SURFACE TO BE STORED ON SITE. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND FORWARDED BY TIME IN ANY AREA TO BE TEMPORARILY MANAGED BY FLOWING SILT FENCES, STRAW BALES / OR SIMILAR OF ABOUT 500MM DEPTH AT THE PROBLEM AREAS. POSSIBLE SILT TRAP SYSTEM TO BE AVAILABLE ON SITE FOR USE AS REQUIRED ALSO.
- SILT TRAP SYSTEM TO BE CONSTRUCTED PRIOR TO OR AT THE SAME TIME AS THE ACCESS TRACKS. INTERIM MEASURES SUCH AS THE ACCEPTANCE OF STRAW BALES/SILT FENCES OR SIMILAR APPROVED METHOD OR ABOUT SMALL CHECK DAMS AND SILT FENCES TO BE EMPLOYED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS TRACKS IS LIKELY TO CAUSE AVOIDABLE ENVIRONMENTAL EFFECTS THROUGH INCREASED SILT LOADING BE NOT GENERATED. EFFECTS THROUGH INCREASED SILT LOADING BE NOT GENERATED. EFFECTS THROUGH INCREASED SILT LOADING BE NOT PREVENT THE CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO RECEIVING WATERCOURSES. SEE NOTES ON POLLUTION PREVENTION.
- UPSTREAM INTERCEPTOR DRAINS / OVERSIZED SWALES / COLLECTOR DRAINS / DIVERSION DRAINS / SWALES AND CULVERT PIPES.
- EROSION AND VELOCITY CONTROL MEASURES SUCH AS:
 - A) SAND BAGS
 - B) OYSTER BAGS FILLED WITH GRAVEL
 - C) FILTER FABRICS
 - D) OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS
- USING SMALL WORKING AREAS
- SURROUNDING STOCKPILES WITH SILT FENCING
- WEATHERING OFF / SEALING SOIL STOCKPILES
- INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED SWALES/COLLECTOR DRAINS
- EROSION AND VELOCITY CONTROL MEASURES SUCH AS:
 - A) SAND BAGS
 - B) OYSTER BAGS FILLED WITH GRAVEL
 - C) FILTER FABRICS
 - D) OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS
- TEMPORARY SUMPS
- ATTENTION PONDS
- TEMPORARY STORAGE LAGOONS
- SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS
- PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTUSITER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS.
- SILT DETERIORATING BAGS
- LEVEL SPREADERS
- BUFFERED OUTFALLS
- VEGETATION FILTERS
- SILT DETERIORATING BAGS
- FLOW LIMITERS AND WEIRS



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MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE	
MANAGEMENT TYPE	DESCRIPTION OF SUDD'S DRAINAGE CONTROL MEASURES
AVOIDANCE CONTROLS	<ul style="list-style-type: none"> APPLICATION OF 50M BUFFER ZONES TO NATURAL WATERCOURSES WHERE POSSIBLE APPLICATION OF 10M BUFFER ZONES TO MAIN DRAINS WHERE POSSIBLE USING SMALL WORKING AREAS WORKING IN APPROPRIATE WEATHER, AND SUSPENDING GREEN WORK ACTIVITIES IN ADVANCE OF FORECASTED WET WEATHER
SOURCE CONTROLS	<ul style="list-style-type: none"> USE OF UPSTREAM INTERCEPTOR DRAINS / DOWNSTREAM COLLECTOR DRAINS / OVERSIZED SWALES / VEEDRAINS, DIVERSION DRAINS, DRAINS AND CULVERT PIPES EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ul style="list-style-type: none"> A) SAND BAGS B) OYSTER BAGS FILLED WITH GRAVEL C) FILTER FABRICS D) OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS USING SMALL WORKING AREAS SURROUNDING STOCKPILES WITH SILT FENCING WEATHERING OFF / SEALING SOIL STOCKPILES INTERCEPTOR DRAINS, VEE-DRAINS, OVERSIZED SWALES/COLLECTOR DRAINS EROSION AND VELOCITY CONTROL MEASURES SUCH AS: <ul style="list-style-type: none"> A) SAND BAGS B) OYSTER BAGS FILLED WITH GRAVEL C) FILTER FABRICS D) OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS TEMPORARY SUMPS ATTENTION PONDS TEMPORARY STORAGE LAGOONS SEDIMENT TRAPS, STILLING / SETTLEMENT PONDS PROPRIETARY SETTLEMENT SYSTEMS SUCH AS SILTUSITER, AND/OR OTHER SIMILAR/EQUIVALENT OR APPROPRIATE SYSTEMS. SILT DETERIORATING BAGS LEVEL SPREADERS BUFFERED OUTFALLS VEGETATION FILTERS SILT DETERIORATING BAGS FLOW LIMITERS AND WEIRS
IN-LINE CONTROLS	<ul style="list-style-type: none"> AREAS OUTSIDE OF VEGETATION IS KEPT NEXT TO A HURDLE CLEAN STONE FLOW CONTROL CHECK DAMS TO BE MADE OF LOCALLY WON / LOCALS CALLY - SPALL WELL GRADED STONE. AGGREGATE SIZE FOR STONE CHECK DAMS TO BE 100MM TO 150MM. CLEAN STONE. CLEANING SECTIONS OF THE ACCESS TRACKS, DOWN CHECK DAMS TO BE PROTECTED FROM WASHING AWAY THROUGH THE ACCEPTANCE OF 100% STONE ON THE DOWNHILL FACE OF THE CHECK DAM AND BY WEAVING IN VEGETATION STRETCHES OF SILT LEVELS AT CHECK DAMS TO BE PROVIDED AND DEPOSED OF APPROPRIATELY. SILT JAILS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING DRAINAGE MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PERIOD. VISUAL CHECK DAMS SHOULD BE COVERED WITH SILT OF VEGETATION. STONE CHECK DAMS TO BE REMOVED AND REPLACED SUBSEQUENT TO THE REMOVAL OF SILT STAKES AND PROTECTIVE OF CUTTER DAMS WITH APPROPRIATE DOWN LOCALITY/ADJACENT OF SWALE LOCATION OF HALF-TONNAGE CHECK DAMS (EQUIPPED TO BE REMOVED ON SITE WITH EVIDENCE) SETTLEMENT PONDS TO BE CONSTRUCTED IN A MANNER WHERE THEY MAY BE EASILY REMOVED AT A LATER DATE (POST COMPLETION OF THE TURBINE AND FOUNDATION CONSTRUCTION). ONLY SUITABLE MATERIALS EXCAVATED FROM THE POND ARE TO BE USED FOR PART OF THE EMPHANTMENT AROUND THE POND. SOIL FILL SHOULD BE STORED WITHIN BUNDED GOVERNMENT STRUCTURES. SILT BAGS WILL BE USED ON SITE AT FIELD DRAIN DISCHARGE LOCALS ARE AS REQUIRED.
WATER TREATMENT CONTROLS	
OUTFALL CONTROLS	

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Job: LYBENCARRIGA W/F, Co. WATERFORD/Co. CORK

Title: PROPOSED DRAINAGE LAYOUT

Figure No: D104

Drawing No: PI453-0-0121-A1-D104-00A

Sheet Size: A1 Project No: PI453-0

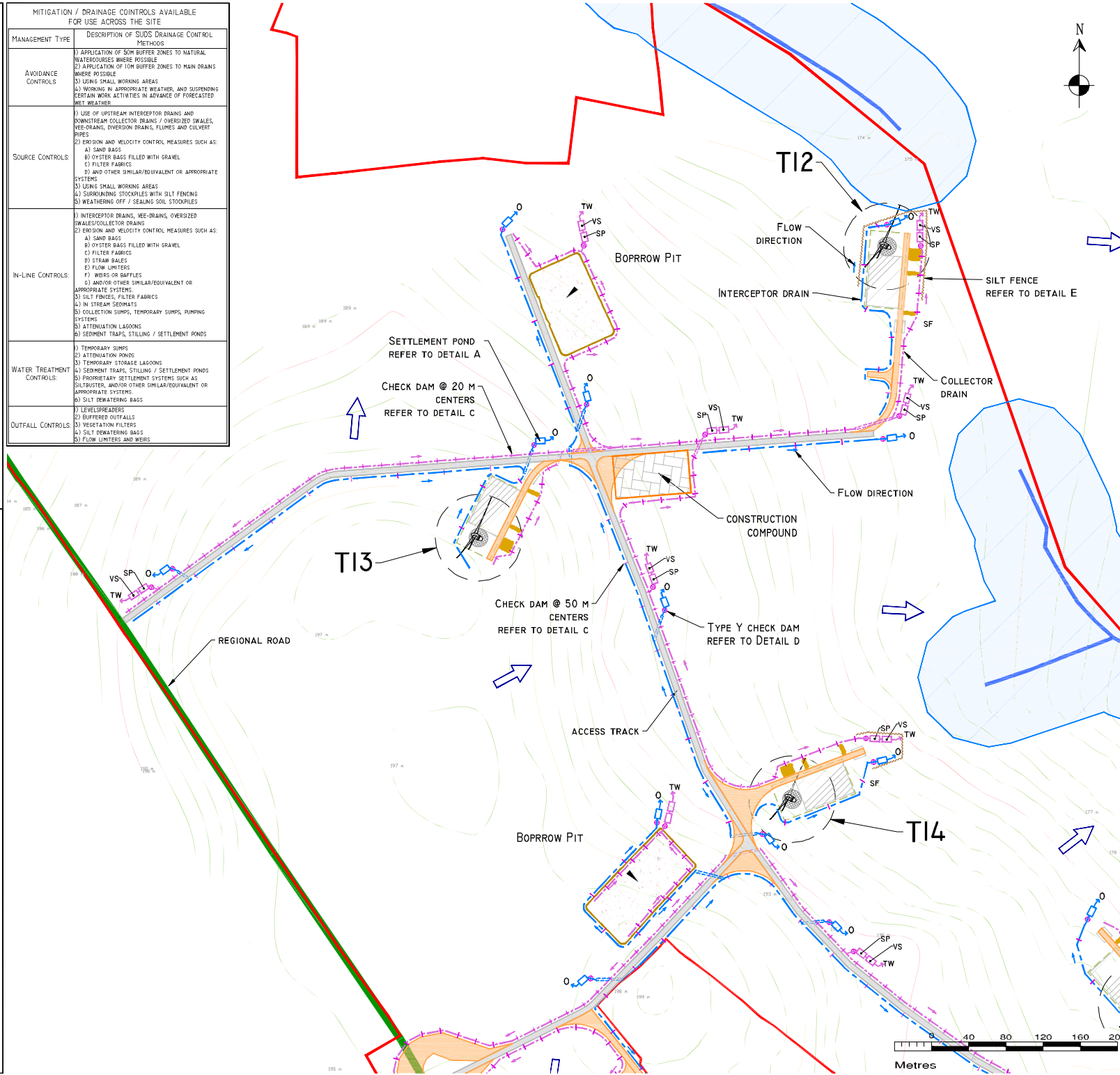
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Date: 04/01/2021 Checked By: MG

POLLUTION PREVENTION NOTES:

1. SITE MANAGEMENT PROCEDURES ARE INTENDED TO ENSURE PROTECTION AGAINST SURFACE WATER AND GROUNDWATER POLLUTION, SILTATION AND EROSION.
 2. SUITABLE DRAINAGE CONTROL MEASURES SHOULD BE IN PLACE AT ALL TIMES TO PREVENT CONVEYANCE OF SIGNIFICANT VOLUMES OF SILT TO OFF SITE RECEIVING WATERCOURSES.
 3. SILTY WATER CAN ARISE FROM 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 DRAIN WITH SILT TRAP AT A MINIMUM OF 50M FROM NEAREST WATERCOURSE UNLESS OTHERWISE STATED.
 5. NO EXCAVATED MATERIAL IS TO BE STORED WITHIN ANY SURFACE WATER BUFFER ZONE.
 6. PUMPED WATER WILL BE DIRECTED INTO TRACK SIDE DRENCHES AND TREATED IN SETTLEMENT PONDS AND VEGETATION SWALES PRIOR TO OVERLAND DISCHARGE.
 7. PUMPING OF CLEAN WATER FROM EXCAVATIONS / OR OVER-PUMPING IN DRENCHES/DRENCHES/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 VELOCITY OR BY USE OF STRAW PLAYES AND OTHER SIMILAR DISCHARGE CONTROLS.
 8. VEGETATION WILL NOT BE STRIPPED FROM EXISTING DRAINS/DRENCHES UNLESS ABSOLUTELY NECESSARY.
- EXCAVATIONS**
9. WHERE DEEP EXCAVATIONS ARE PROPOSED CUT-OFF DRAINS WILL BE USED TO REDUCE THE AMOUNT OF SURFACE WATER ENTERING THE EXCAVATION. THIS WILL BE THE CASE ARISING THROUGH BASE EXCAVATIONS.
- FENCES, BARRIERS & STOCKPILES**
10. THE AMOUNT OF EXPOSED GROUND AND TEMPORARY STOCKPILES OPEN AT ANY ONE TIME WILL BE MINIMISED, AS FAR AS PRACTICABLE.
- SILT TRAPS**
11. USE OF TRACK SIDE SWALES WITH CHECK DAMS, AND/OR PLANTATION CHECK DAMS WILL REDUCE SILT IN RUNOFF WATER AS REQUIRED.
 12. CHECK DAMS TO BE INSPECTED AND CLEANED REGULARLY.
- REPAIRS**
13. REPAIRING OF MOBILE PLANT WILL BE COMPLETED IN DESIGNATED REPAIRING AREAS ONLY, PREFERABLY IN AN IMPERMEABLE SURFACE AND AWAY FROM FIELD DRAINS / DRENCHES AND WATERCOURSES / WATERBODIES.
 14. 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.
 16. CONCRETE WASH WATER, AND WASTE CONCRETE WILL BE MANAGED APPROPRIATELY ON SITE.
- IF WATER POLLUTION IS IDENTIFIED THE FOLLOWING STEPS SHOULD 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 STOPPED 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 RELEVANT WORK IS IMPLEMENTED DOWNSTREAM TO PROTECT FISHERIES AND OTHER SENSITIVE AREAS.
- MAINTENANCE NOTES:**
1. ROADWAY SIGN - LONG SIGNS ON AND CONSTRUCTION TO ENHANCE SPECIFICATION (I.E. BY OTHERS).
 2. SPACE STAKES INDICATING FENCING OR SIGNAGE TO BE STORED ON SITE. THE LEVEL OF SILT IN RUNOFF DURING CONSTRUCTION IS TO BE MONITORED VISUALLY AND EXPRESSIONS TO IT FIVE 5 IN ANY AREA TO BE TEMPORARILY FLAGGED TO PLACE SIGN STAKES, STRAW BALES / OR SIMILAR OR A SIGN ONAL CHECK DAMS AT THE PROBLEM AREAS. POSSIBLE SLOTTED SYSTEM TO BE AVAILABLE ON SITE FOR USE AS REQUIRED ALSO.
 3. SLOTTED SYSTEM TO BE CONSTRUCTED PRIOR TO OR AT THE SAME TIME AS THE ACCESS TRACKS, INTERIOR INFRASTRUCTURE SUCH AS THE 'X' SIGNPOST OF STRAW BALES/SLIT FENCING OR SIMILAR APPROVED METHOD OF SILT TRAP CHECK DAMS AND 500 M FENCING TO BE DEVELOPED IN ALL INSTANCES WHERE WORK CARRIED OUT TO CONSTRUCT THE ACCESS TRACKS IS LIKELY TO CAUSE ADVERSE ENVIRONMENTAL EFFECTS THROUGH SILT LOADING. BENS GENERATED DURING THE CONSTRUCTION PHASE.
 4. SUTHERLY FERTILISATION 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 / DRENCHES TO BE USED TO COLLECT SURFACE WATER FLOWS, REGULAR CROSS DRAINS / JOGGING TO FIELD STAFFWORKS ARE NOT REQUIRED TO TRANSPORT / DISCHARGE RUNOFF WATER IN INTERCEPTOR DRAINS TO SUITABLE FIELD DRAIN OUTFALL POINTS.
 6. DRENCHAL SWALES / DRENCHES TO BE LOCATED AT A MINIMUM OF 50M FROM ACCESS TRACKS, INTERIOR INFRASTRUCTURE TO BE LOCATED ALONG ACCESS TRACKS TO PRESENT EXCESSIVE VOLUMES OF WATER COLLECTING IN THE SWALES / DRENCHES. LOCATIONS OF CROSS DRAINS TO BE AGREED WITH THE OWNER 5 TO 15M. SURFACE WATER WILL NOT BE ALLOWED TO FLOW/WHIP DIRECTLY INTO EXISTING WATERCOURSES.
 7. WHERE POSSIBLE, A BUFFER ZONE OF 1500m TO ANY EXISTING WATERCOURSE WILL BE REQUIRED WHERE OVERLAND DISCHARGES ARE PROPOSED FROM ACCESS TRACK SWALES / DRENCHES.
 8. BATTERS OF ALL PROPOSED SWALES / DRENCHES TO HAVE A SLOPE OF BETWEEN 1 : 1.5 TO 1 : 2 DEPENDING UPON WIDTH OF SWALE/DRENCH AND WILL BE LEFT AS SUCH TO REVERSE AT THE LOCAL SLOPES.
 9. TRACK SIDE SWALES / DRENCHES TO BE FILLED WITH HORTICULTURE GRADIENTS TO PREVENT SCOURING. IN STEEP AREAS CHECK DAMS SHOULD BE REPAIRED TO REDUCE FLOW VELOCITY AND AN IMPERMEABLE COASTING OF SILT CONTAINMENT, WHERE NECESSARY THESE MAY BE REPAIRED IN CONJUNCTION WITH SETTLEMENT PONDS AND SILT TRAPS, PRIOR TO COMMENCEMENT.
 10. SETTLEMENT PONDS TO BE CONSTRUCTED FOR 6 T REMOVAL AT TURNING BARRIERS AND HARD STANDING AREAS. FENCE SIZES DEPENDING ON CATCHMENT AREA SHOULD SAMPLE POST PRESSURE ON EXHAUSTION DISCH.
 1. STRAW BALES / OR SIMILAR AND SILT FENCES TO BE USED ALSO AND MONITOR WELLS TO MONITOR SILT. MONITOR SILT FENCES WILL BE REMOVED WHERE SUITABLE VEGETATION COVER IS ESTABLISHED.
 2. SILT FENCES TO BE PROVIDED ALONG EDGE OF EXISTING WATERCOURSES WITH MONITOR CHECK WELLS. SP. TO BE USED ON ANY EXISTING WATERCOURSES CHANNELS.
 11. SLOPES OF THE SWALES / DRENCHES TO BE RESEALED OR PROTECTED FROM EROSION UNTIL VEGETATION HAS BEEN ESTABLISHED. STROPPED VEGETATION LAYER (EOL. SOO OR SKOAV) FROM EXCAVATION TO BE STORED LOCALLY AND USED TO LINE SLOPES AND BASE OF SWALES / DRENCHES OF LONGITUDINAL BANDS OF VEGETATION SWALES AT FIELD DRAIN EXCHANGE POINTS.
 12. AREAS STRIPPED OF VEGETATION SHOULD BE KEPT TO A MINIMUM.
 1. CLEAN STONE FLOW CONTROL CHECK DAMS TO BE MADE OF LOCALLY WORN / HERCULONAL SIMILAR WELLS COARSE STONE. AGGREGATE SIZE FOR SLOTTED CHECK DAMS TO BE 75MM TO 150MM CLEAN STONE. CHECKING SECTIONS OF THE ACCESS TRACKS, LOWER CHECK DAMS TO BE INSPECTED FROM A SHORT DISTANCE AWAY THROUGH THE PLACEMENT OF LOOK STONE ON THE DOWNHILL FACE OF THE CHECK DAM AND BY WEATHENS IN GEOTECHNICAL.
 2. BUILD UP OF SILT LEVELS AT CHECK DAMS TO BE REPORTED AND SPORES OF APPROPRIATELY SILT JAMS AT CHECK DAMS TO BE VISUALLY INSPECTED AS PART OF AN ONGOING DRAINAGE MAINTENANCE PROGRAMME DURING THE CONSTRUCTION PHASE. UPPER CHECK DAMS SHOULD BE COVERED WITH SILT OF VEGETATION. STONE CHECK DAMS TO BE REPAIRED AND RESEALED IMMEDIATELY ON DISCOVERY OF EROSION OR INFLUENCE UPON LONGITUDINAL GRADIENT OF SWALE.
 3. LOCATION OF STATION CHECK DAMS TO BE REPAIRED TO BE AVOIDED ON SITE WITH ENGINEER. SETTLEMENT PONDS TO BE CONSTRUCTED IN A MANNER WHERE THEY MAY BE EASILY INITIATED AT A LATER DATE (POST COMPLETION OF THE LAMBRE WAYS AND HARDSTANDS CONTINGENCY). ONLY SUITABLE MATERIALS EXCAVATED FROM THE POND TO BE USED TO FORM PART OF THE IMPERMEABLE AROUND THE POND.
 4. OIL TRAP SHOULD BE STORED WITHIN BUNDLED CONTAINMENT STRUCTURES.
 5. SILT TRAPS WILL BE USED ON SITE AT FIELD DRAIN DISCHARGE POINTS, AS NECESSARY.

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



DRAWING LEGEND:

- WATERCOURSES
- LAKES
- WATERCOURSE 75M BUFFER
- LAKES 50M BUFFER
- STREAM FLOW DIRECTION
- UPSTREAM INTERCEPTOR DRAIN
- SWALES/DOWNSTREAM COLLECTOR DRAIN
- DIRECTION OF FLOW
- SILT FENCES
- SETTLEMENT POND - LEVEL SPREADER
- SETTLEMENT POND - VEGETATION FILTER
- LEVEL SPREADER
- CHECK DAM TYPE 'A'
- CHECK DAM TYPE 'B'
- PROPOSED NEW CULVERTS
- EXISTING GROUND SURFACE
- PROPOSED GROUND SURFACE
- INTERCEPTOR DITCH/CULVERT
- COLLECTOR DITCH/CULVERT
- OVERLAND FLOW DISCHARGE
- TREATED WATER DISCHARGE
- SETTLEMENT FUND
- SEMI-NATURAL VEGETATION SWALE / FILTER BED / SECONDARY SP
- FLOW DIR
- LARGE DRAINAGE AREAS
- SITE BOUNDARY
- EXISTING GROUND SURFACE
- MAJOR CONTOUR (10 M INTERVAL)
- EXISTING GROUND SURFACE
- INTERMEDIATE CONTOUR (5 M INTERVAL)
- EXISTING GROUND SURFACE
- MINOR CONTOUR (1 M INTERVAL)
- TURBINE AND SWEET AREA
- TURBINE FOUNDATION
- CRANE PLATFORM
- EXISTING ROAD TO BE UPGRADED
- PROPOSED ROAD
- REGIONAL ROAD
- THIRD ROAD
- FOURTH ROAD
- BORROW PIT
- SUBSTATION
- CONSTRUCTION COMPOUND
- MET MAST

KEY PLAN

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Title: PROPOSED DRAINAGE LAYOUT

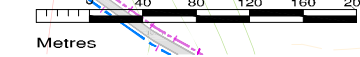
Figure No: D106

Drawing No: P1453-0-D106-1-A1-D106-00A

Sheet Size: A1 **Project No:** P1453-0

Scale: 1:2,000 (A1) **Drawn By:** MG/GD

Date: 04/01/2021 **Checked By:** MG



POLLUTION PREVENTION NOTES:

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

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

EXPOSED GROUND & STOCKPILES

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

SITE TRACKS

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, 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

15. 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:

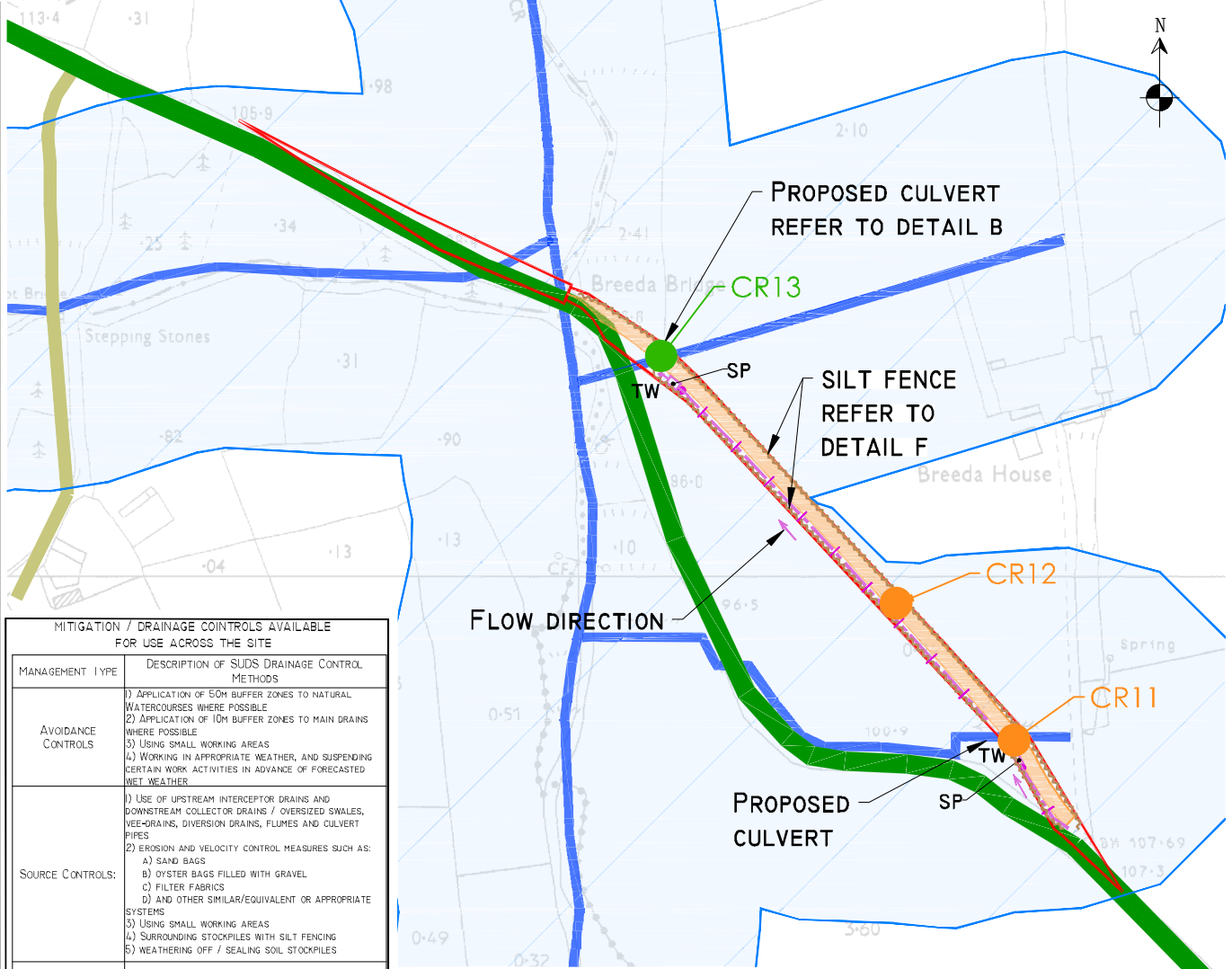
STOP - WORK IN THE IMMEDIATE AREA SHOULD BE STOPPED AND THE SOURCE OF THE POLLUTION IDENTIFIED.

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

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

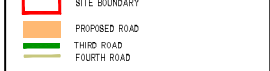
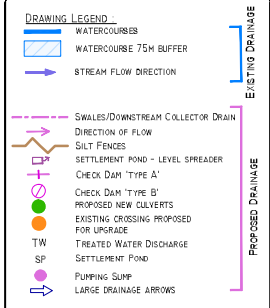
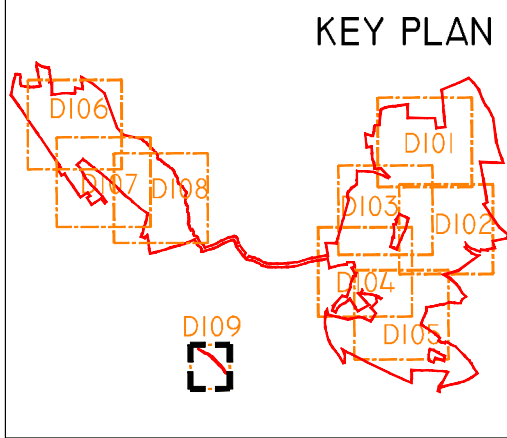
DRAINAGE NOTES:

1. ROADWAY SURFACING DESIGN AND CONSTRUCTION TO ENGINEER'S SPECIFICATION (I.E. BY OTHERS).
2. SPARE STRAW BALES/SILT FENCINGS/ 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 FENCINGS/ 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 1 : 1.5 TO 1 : 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 HEAPS TO MITIGATE SILT RUNOFF. SILT FENCES MAY BE REMOVED WHEN SUITABLE VEGETATION COVER IS ESTABLISHED.
12. SILT FENCES TO BE PROVIDED ALONG EDGE OF EXISTING WATERCOURSE WHERE WORKS COMES WITHIN 1/5M 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 (SOIL, SODS OR 'SCKAW') 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 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 FILLED AT A LATER DATE (POST COMPLETION OF THE TURBINE BASE AND HARDBAND 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.



MITIGATION / DRAINAGE CONTROLS AVAILABLE FOR USE ACROSS THE SITE

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



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Date	Description	Chkd	Signed
Revisions			

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Client: INNOGY RENEWABLES

Job: LYRENACARRIGA WF, CO. WATERFORD/CO. CORK

Title: PROPOSED DRAINAGE LAYOUT

Figure No: D109

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