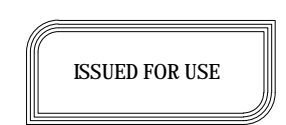


REVISION	DESCRIPTION	APPROVED BY	DATE
B	REVISED TO INCLUDE STAGING OPTION	TB	9/07/19
A	ORIGINAL ISSUE	TB	21/12/18

CLIENT	INLink
PROJECT	INLAND RAIL - PARKES TO NARROMINE
DRAWN	TB
DESIGNED	TB
DATE	21/12/18
PROJECT No	18-0101
DRAWING No	E01
REVISION	A



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CPESC: 6374

PROJECT	INLAND RAIL - PARKES TO NARROMINE
DRAWING TITLE	EROSION AND SEDIMENT CONTROL PLAN DRAINAGE
PROJECT No	18-0101
DRAWING No	E01
REVISION	A



TO NARROMINE

EXISTING CULVERT TO BE RETAINED, RELOCATED AND MODIFIED, REFER TO DRAWING 3-0001-240-SCU-00-DR-0131

INSTALL PORTION OF PERMANENT CAUSEWAY DURING EARLY WORKS OR FORM TEMPORARY, ROCK LINED CAUSEWAY IN FLOW-THROUGH UNTIL PERMANENT IS COMPLETE. INSTALL DRIVE OVER BUNDS TO PREVENT FLOW DOWN ROAD INTO FLOW-THROUGH.

EXISTING WINDOWS AND APRONS TO BE REMOVED

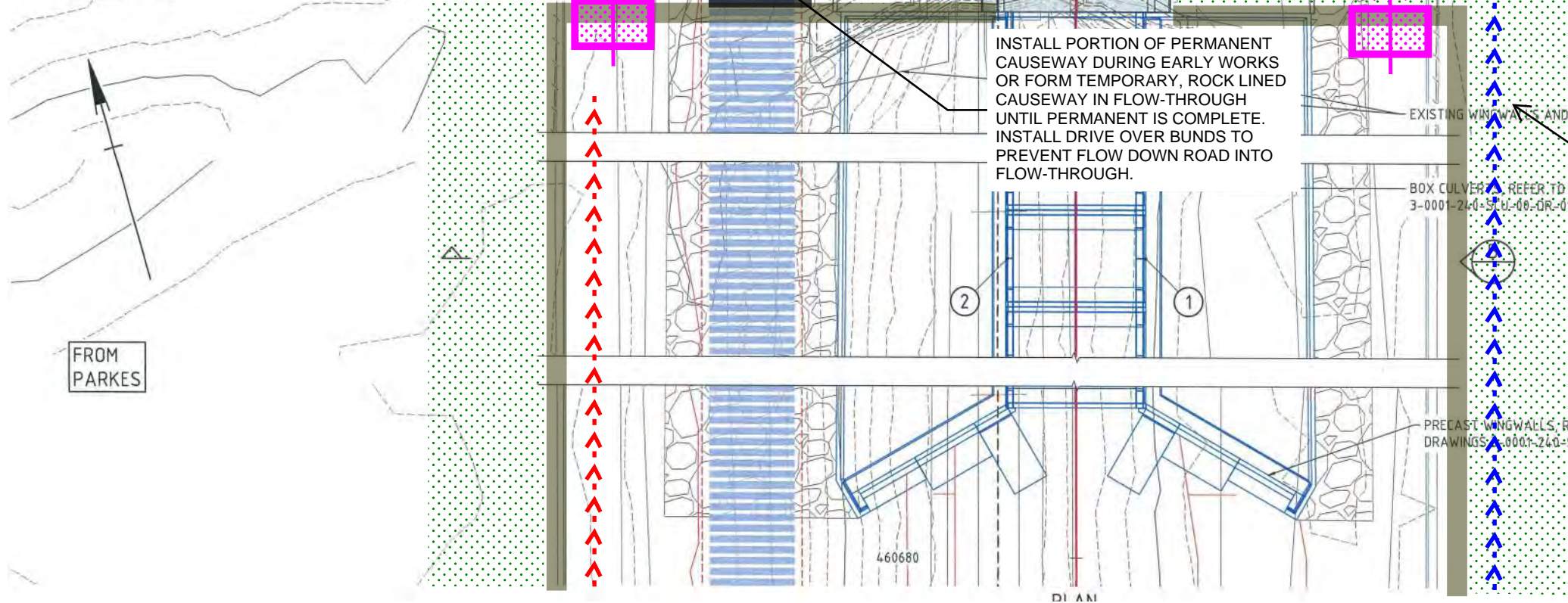
INFLOW DIVERTED TO EXISTING CULVERT. RETAIN EXISTING GROUND COVER IN FLOW PATH UNTIL NEW CULVERT IS INSTALLED

BOX CULVERT, REFER TO DRAWINGS 3-0001-240-SCU-00-DR-0110, 0130 AND 0131

PRECAST WINGWALLS, REFER TO DRAWINGS 3-0001-240-SCU-00-DR-0140 TO 0142

NOTES

1. FOR GENERAL NOTES REFER TO DRAWINGS FROM 3-0001-240-PEN-00-DR-0101
2. FOR LEGEND REFER TO DRAWING 3-0001-240-PEN-00-DR-0201
3. FOR CULVERT DETAILS REFER TO DRAWINGS FROM 3-0001-240-SCU-00-DR-0101
4. FOR SCOUR DETAILS REFER TO DRAWINGS 3-0001-240-CDR-00-DR-0001 TO 0207
5. FOR UTILITY IMPACT DETAILS REFER TO DRAWINGS FROM 3-0001-240-PUP-00-DR-1001



**SPECIFIC CULVERT INSTALLATION - 460.698BRa**

- 1) INSTALL DIVERSION BUNDING IN ACCORDANCE WITH TYPICAL DETAIL FOR FILL AREAS.
- 2) CONCENTRATE INFLOW AND UTILISE EXISTING CULVERT FOR FLOW-THROUGH.
- 3) DO NOT DISTURB GROUND COVER IN THE EXISTING FLOW PATH. IF DISTURBED, STABILISE WITH SOIL BINDER OR ROLLED EROSION CONTROL PRODUCT
- 4) COMPLETE THE NEW CULVERT INSTALLATION OFFLINE, INCLUDING HEADWALLS, APRONS AND DISSIPATER.
- 5) COMPLETE THE RMAR ACCESS TRACK IN PORTIONS, PARALLEL TO THE CULVERT INSTALLATION
- 6) ONCE COMPLETE, DIRECT INFLOW TO THE NEW CULVERT AND COMPLETE REMAINING WORKS ON THE OLD CULVERT (DISSIPATER AND RMAR)
- 7) REFER STAGING METHODOLOGY FOR INLINE CULVERT INSTALLATION OPTIONS (SHEET E09) UNDER DRY CONDITIONS



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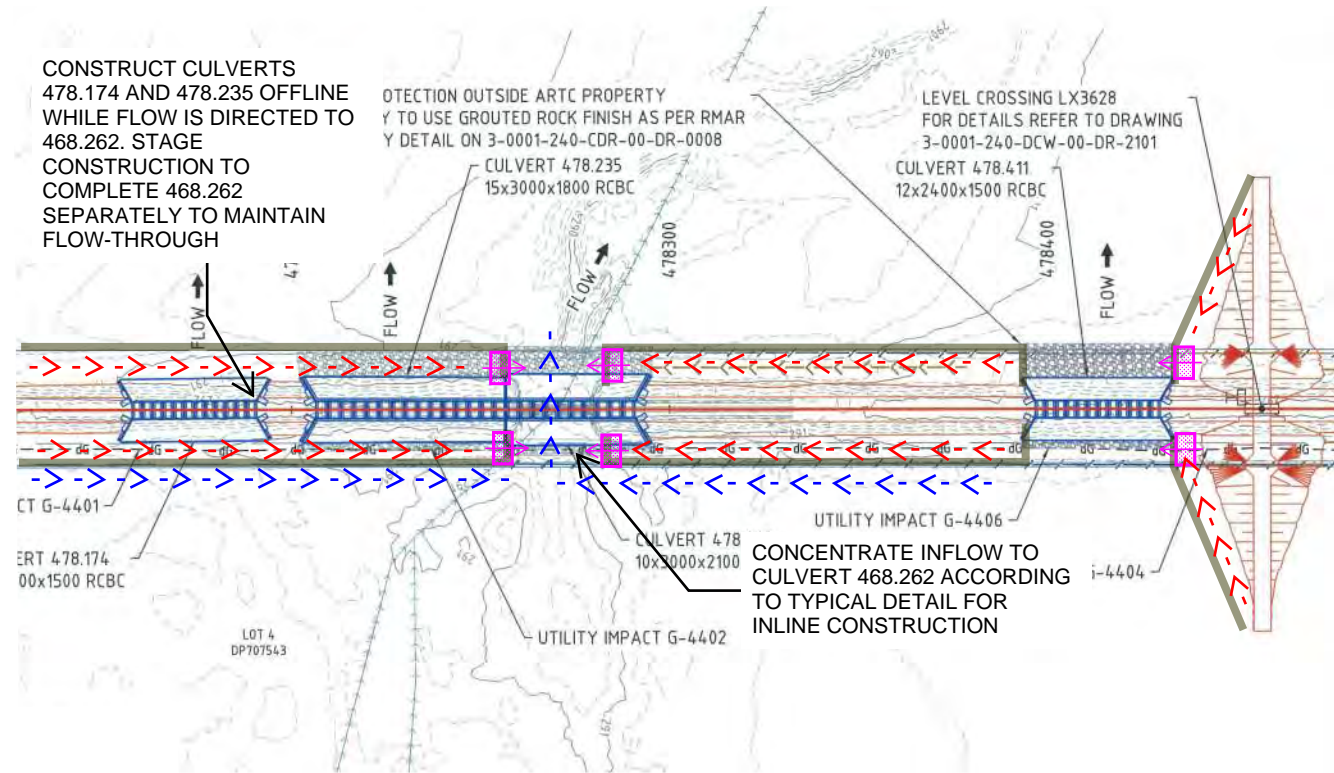
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PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN DRAINAGE		
PROJECT No 18-0101	DRAWING No E02	REVISION A



CONSTRUCT CULVERTS 478.174 AND 478.235 OFFLINE WHILE FLOW IS DIRECTED TO 468.262. STAGE CONSTRUCTION TO COMPLETE 468.262 SEPARATELY TO MAINTAIN FLOW-THROUGH

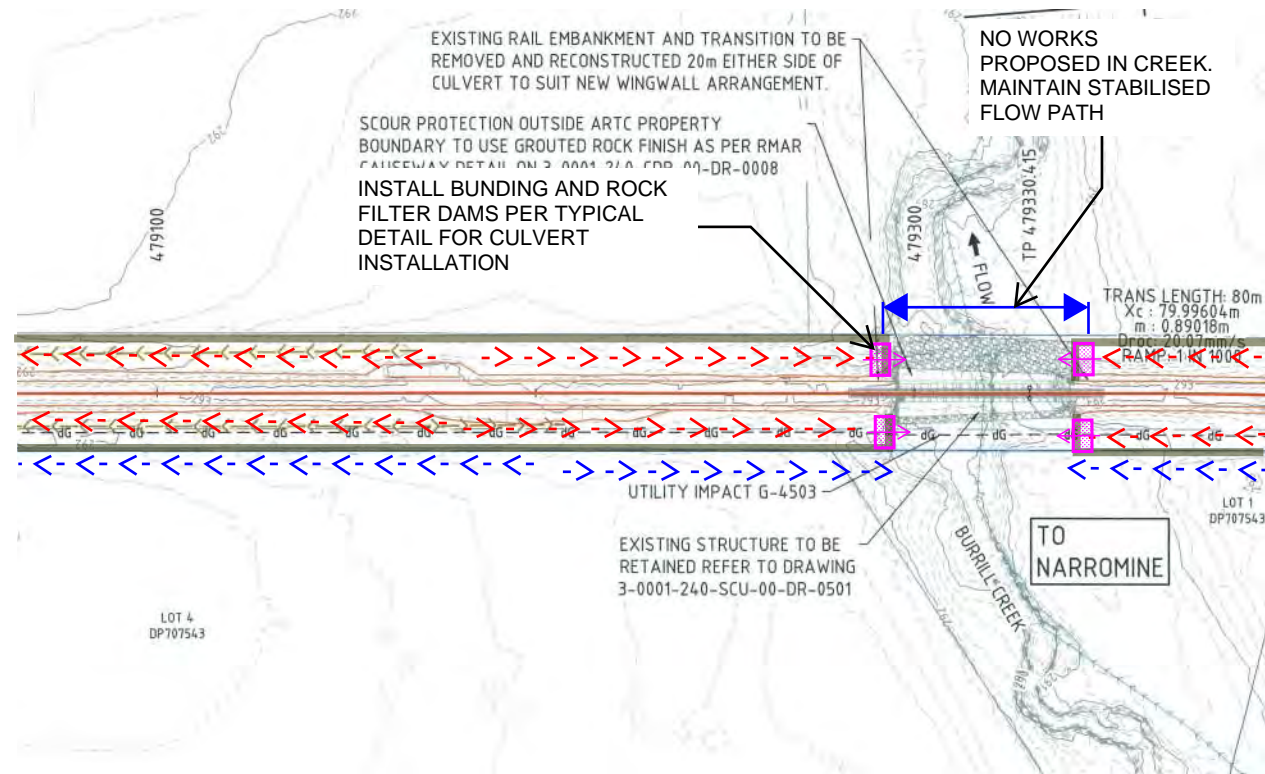


**SPECIFIC CULVERT INSTALLATION - 478.174, 478.235 and 478.262**

- 1) 468.262 INSTALLED ACCORDING TO TYPICAL DETAIL FOR INLINE CONSTRUCTION
- 2) 478.174 AND 478.235 ARE INSTALLED OFFLINE WHILE FLOW IS DIRECTED TO 468.262
- 3) IF POSSIBLE, STAGE CONSTRUCTION TO COMPLETE 468.262 SEPARATELY AND ALLOW FLOW-THROUGH AT ALL TIMES.
- 4) OPTION TO ADOPT STAGING METHODOLOGY FOR INLINE CULVERT INSTALLATION (SHEET E09) UNDER DRY CONDITIONS

CONCENTRATE INFLOW TO CULVERT 468.262 ACCORDING TO TYPICAL DETAIL FOR INLINE CONSTRUCTION

**FLOW PATH CROSSING - BURRILL CREEK**

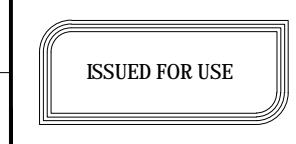


- 1) INSTALL DIVERSION BUNDING IN ACCORDANCE WITH TYPICAL DETAIL FOR FILL AREAS.
- 2) INSTALL ROCK FILTER DAMS IN ACCORDANCE WITH TYPICAL DETAIL FOR CULVERT INSTALLATION
- 3) THE EXISTING CREEK CROSSING IS TO REMAIN IN PLACE. MAINTAIN STABILISED FLOW PATH, SEPARATED FROM SITE RUNOFF.
- 4) IF ACCESS (EG. LV TRACK) IS REQUIRED THROUGH FLOW PATH, INSTALL AS WIDE, ROCK LINED CAUSEWAY. OPTION TO ADOPT STAGING METHODOLOGY FOR INLINE CULVERT INSTALLATION (SHEET E09) UNDER DRY CONDITIONS



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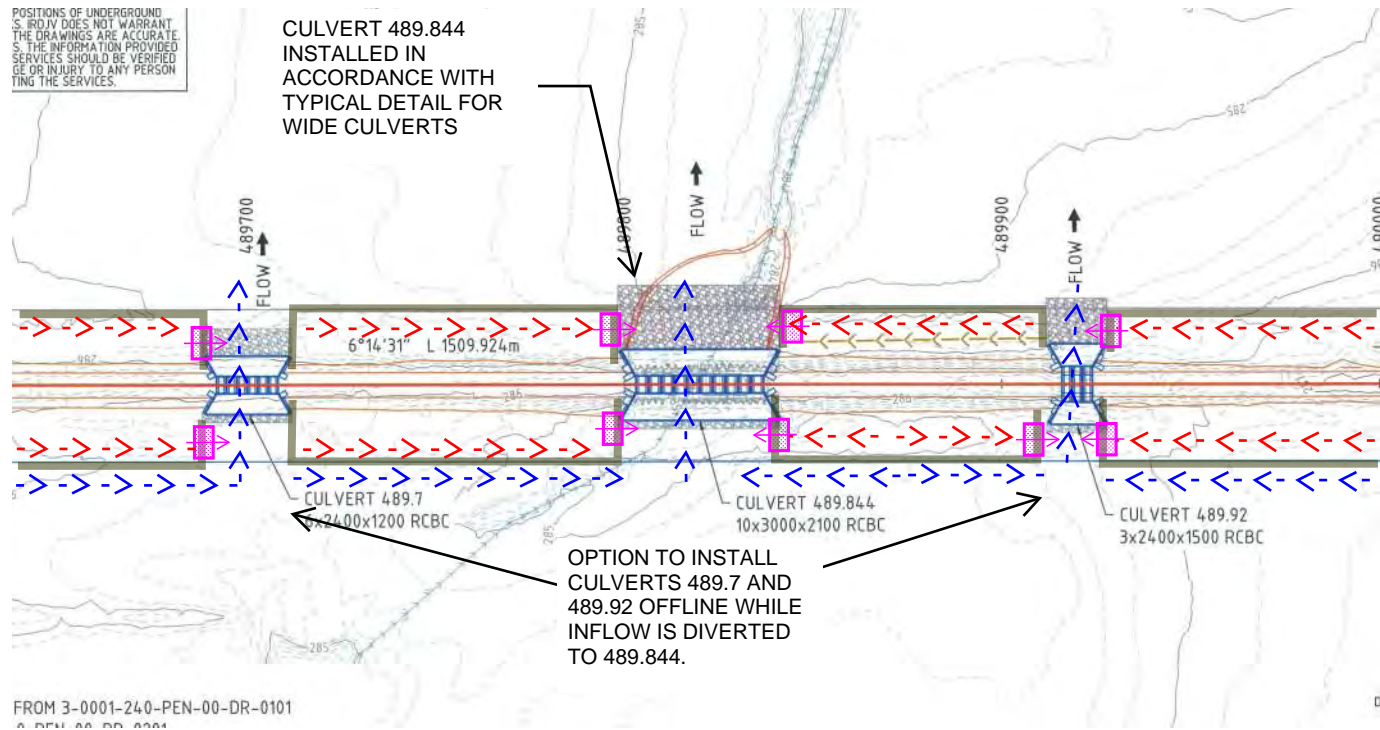
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PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN DRAINAGE		
PROJECT No 18-0101	DRAWING No E03	REVISION A



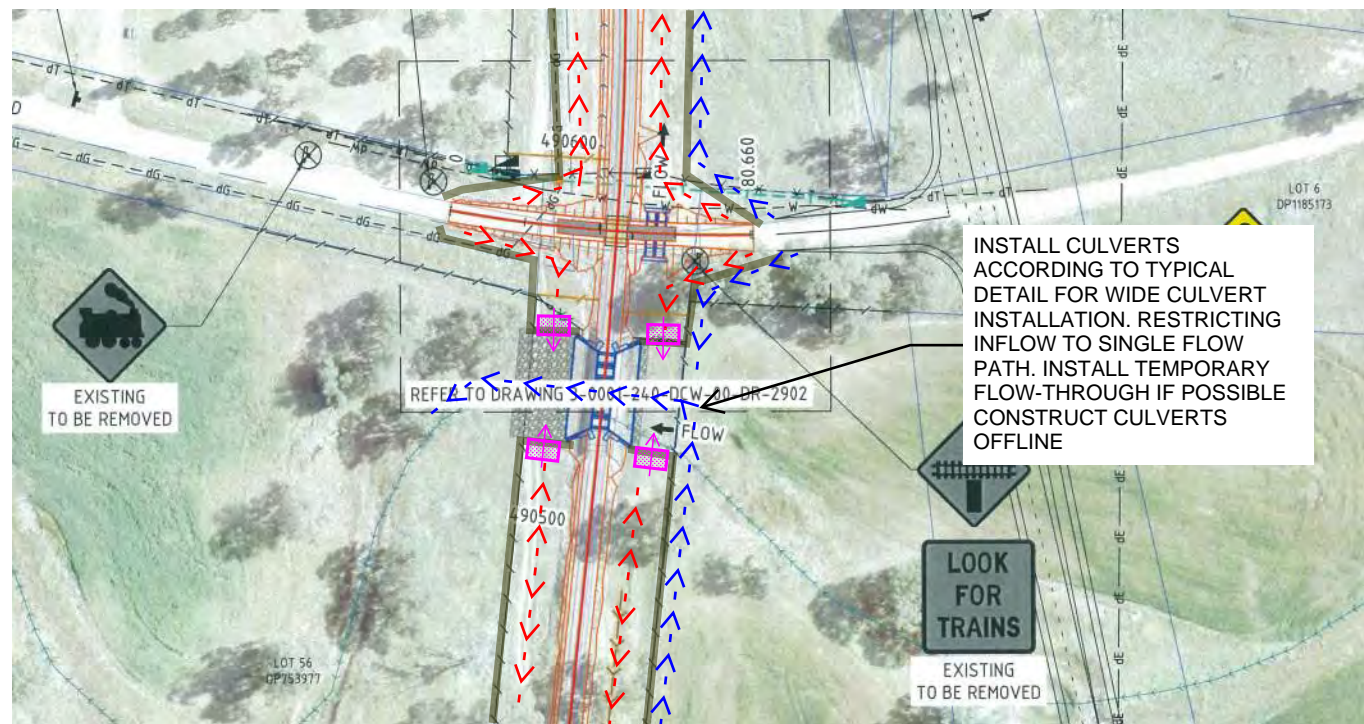
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**SPECIFIC CULVERT INSTALLATION - STANFORDS CREEK**

- 1) CULVERT 489.844 INSTALLED IN ACCORDANCE WITH TYPICAL DETAIL FOR WIDE CULVERTS
- 2) OPTION TO INSTALL CULVERTS 489.7 AND 489.92 OFFLINE WHILE INFLOW IS DIVERTED TO 489.844.
- 3) IF INFLOW IS EXPECTED PRIOR TO COMPLETION OF CULVERT, INSTALL TEMPORARY FLOW-THROUGH ADJACENT TO CULVERT ALIGNMENT. OPTION TO ADOPT STAGING METHODOLOGY FOR INLINE CULVERT INSTALLATION (SHEET E09) UNDER DRY CONDITIONS

FROM 3-0001-240-PEN-00-DR-0101  
6.0 PM 20.00.00



**SPECIFIC CULVERT INSTALLATION - TEN MILE CREEK**

- 1) INSTALL DIVERSION BUNDING IN ACCORDANCE WITH TYPICAL DETAIL FOR FILL AREAS.
- 2) INSTALL ROCK FILTER DAMS IN ACCORDANCE WITH TYPICAL DETAIL FOR CULVERT INSTALLATION
- 3) REFER TO STANDARD DETAIL FOR LEVEL CROSSINGS CONTROLS (TREWILGA ROAD)
- 4) IF ACCESS (EG. LV TRACK) IS REQUIRED THROUGH FLOW PATH, INSTALL AS WIDE, ROCK LINED CAUSEWAY. OPTION TO ADOPT STAGING METHODOLOGY FOR INLINE CULVERT INSTALLATION (SHEET E09) UNDER DRY CONDITIONS



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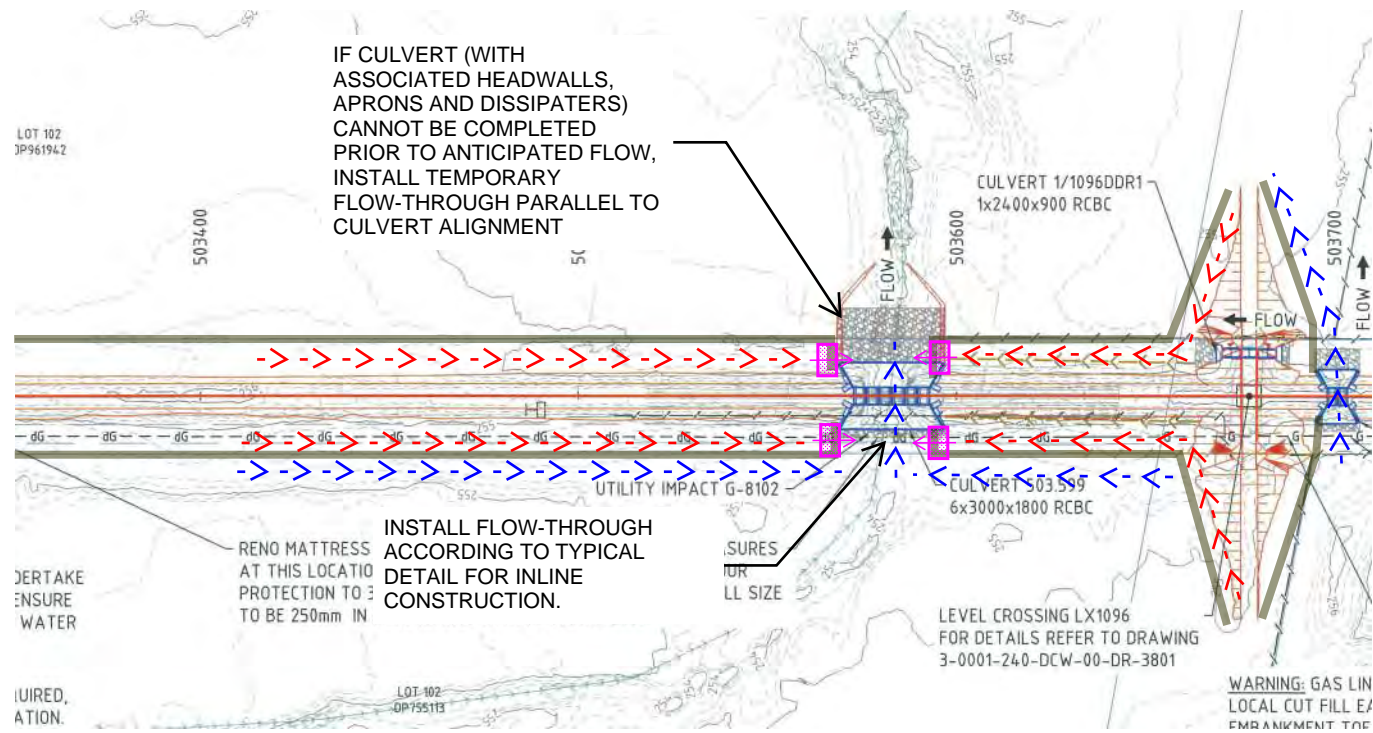
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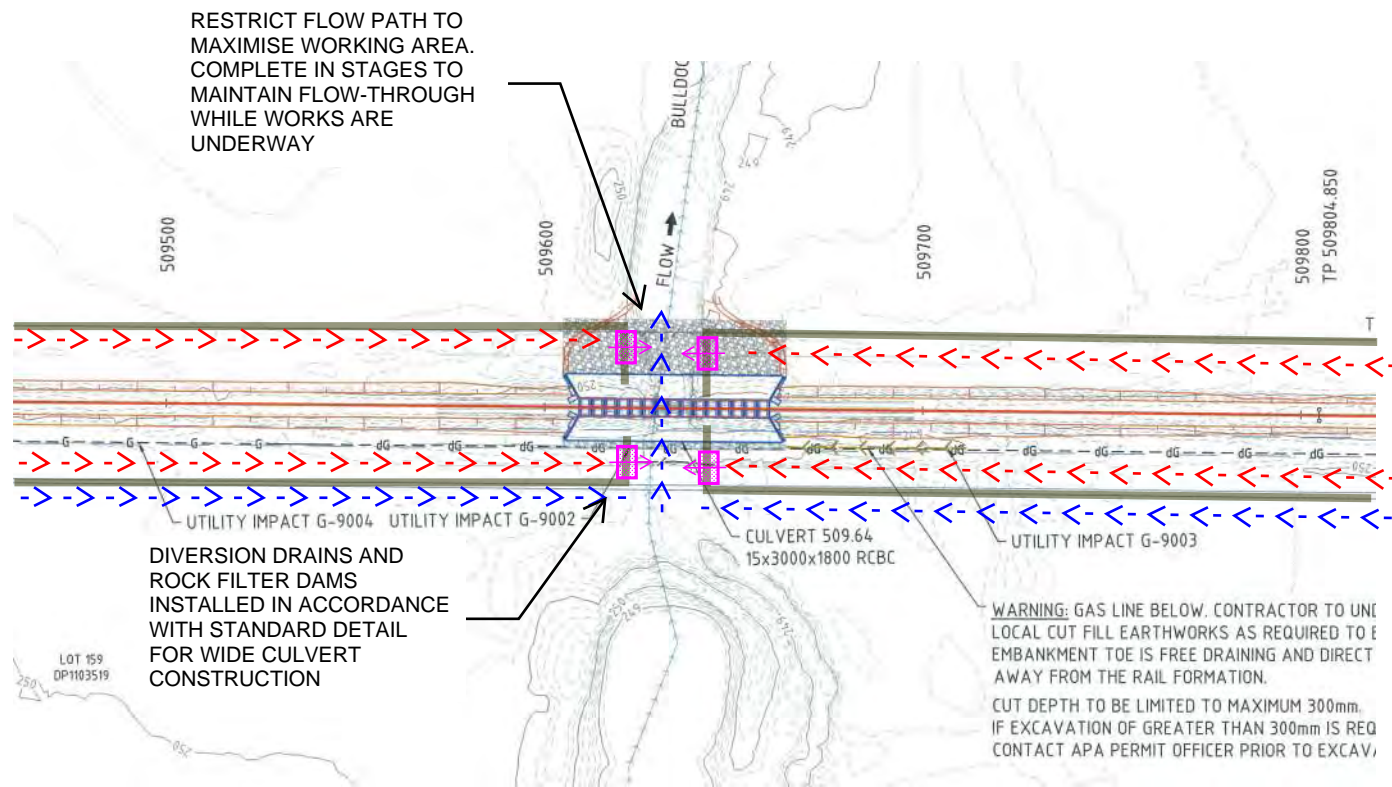
PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN DRAINAGE		
PROJECT No 18-0101	DRAWING No E04	REVISION A





**SPECIFIC CULVERT INSTALLATION - BARRABADEEN CREEK**

- 1) CULVERT 503.599 INSTALLED IN ACCORDANCE WITH TYPICAL DETAIL FOR WIDE CULVERTS
- 2) IF INFLOW IS EXPECTED PRIOR TO COMPLETION OF CULVERT, INSTALL TEMPORARY FLOW-THROUGH ADJACENT TO CULVERT ALIGNMENT.
- 3) LEVEL CROSSING LX1096 INSTALLED IN ACCORDANCE WITH STANDARD DETAIL FOR LEVEL CROSSING CONTROLS
- 4) OPTION TO ADOPT STAGING METHODOLOGY FOR INLINE CULVERT INSTALLATION (SHEET E09) UNDER DRY CONDITIONS



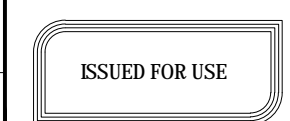
**SPECIFIC CULVERT INSTALLATION - BULLDOG CREEK**

- 1) CULVERT 509.64 INSTALLED IN ACCORDANCE WITH TYPICAL DETAIL FOR WIDE CULVERTS
- 2) EMPHASIS PLACED ON RESTRICTING INFLOW TO SINGLE FLOW PATH TO MAXIMISE 'DRY' WORKING AREA.
- 3) COMPLETE IN STAGES, USING EXISTING GROUND COVER AND NEWLY PLACED SLABS AND CULVERTS TO MAINTAIN FLOW THROUGH DURING CONSTRUCTION.
- 4) OPTION TO ADOPT STAGING METHODOLOGY FOR INLINE CULVERT INSTALLATION (SHEET E09) UNDER DRY CONDITIONS



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A	ORIGINAL ISSUE	TB	21/12/18

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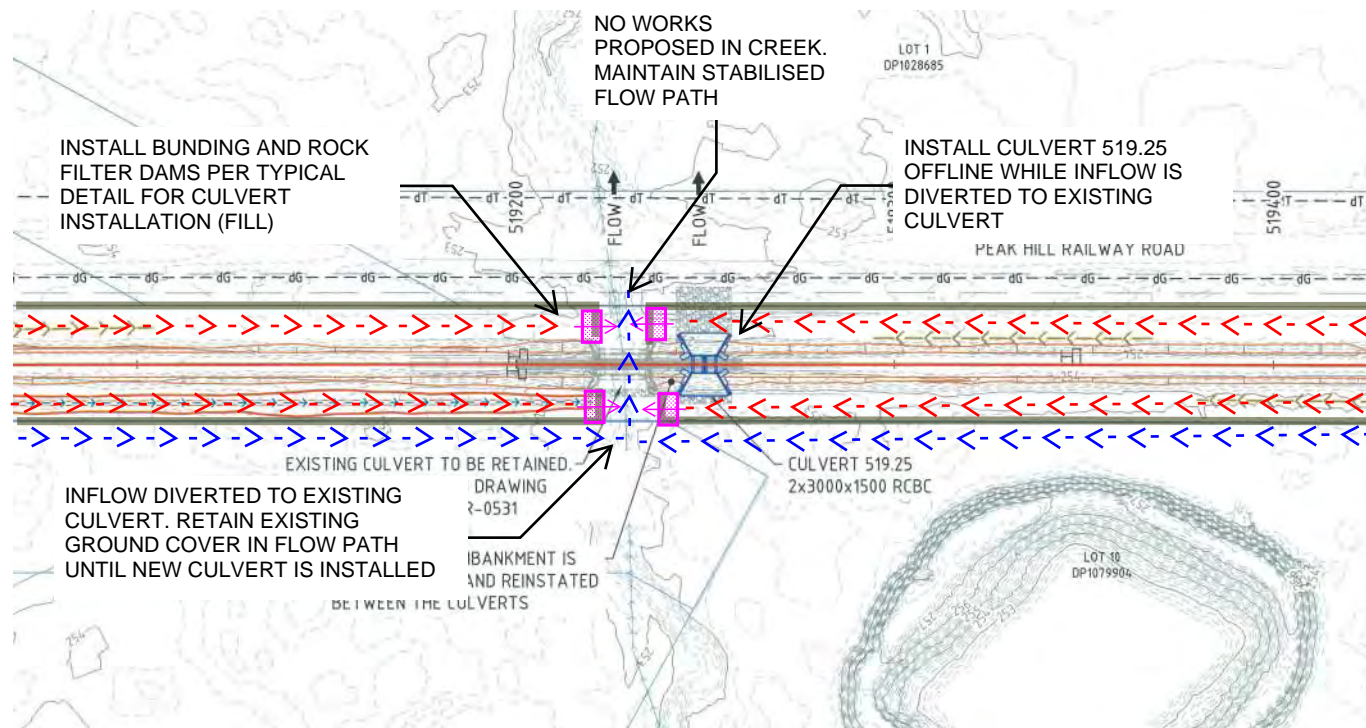


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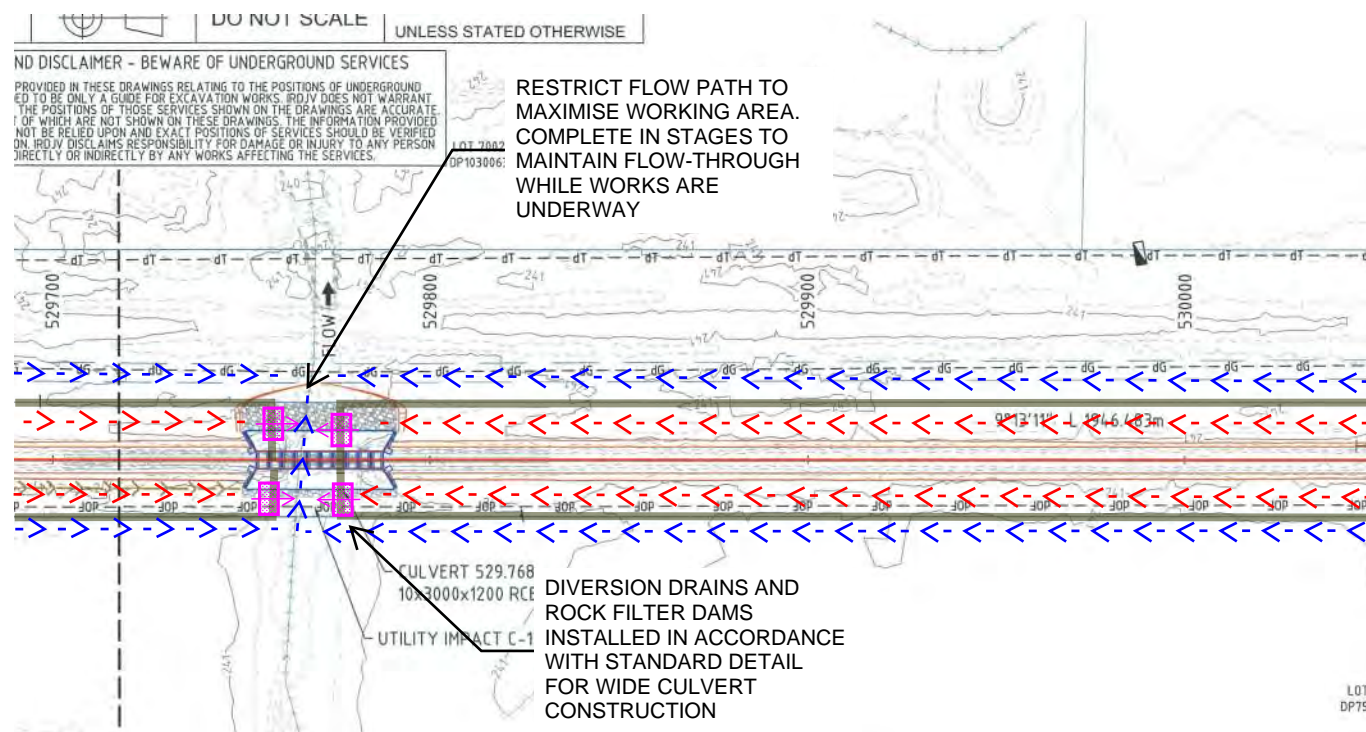
PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN DRAINAGE		
PROJECT No 18-0101	DRAWING No E05	REVISION A





**SPECIFIC CULVERT INSTALLATION - TOMINGLEY CREEK**

- 1) INSTALL DIVERSION BUNDING IN ACCORDANCE WITH TYPICAL DETAIL FOR FILL AREAS.
- 2) CONCENTRATE INFLOW AND UTILISE EXISTING CULVERT FOR FLOW-THROUGH.
- 3) DO NOT DISTURB GROUND COVER IN THE EXISTING FLOW PATH. IF DISTURBED, STABILISE WITH SOIL BINDER OR ROLLED EROSION CONTROL PRODUCT
- 4) COMPLETE THE NEW CULVERT INSTALLATION OFFLINE, INCLUDING HEADWALLS, APRONS AND DISSIPATER.
- 5) ONCE COMPLETE, DIRECT INFLOW TO THE NEW CULVERT AND COMPLETE REMAINING WORKS ON THE OLD CULVERT (DISSIPATER AND RMAR)
- 5) OPTION TO ADOPT STAGING METHODOLOGY FOR INLINE CULVERT INSTALLATION (SHEET E09) UNDER DRY CONDITIONS

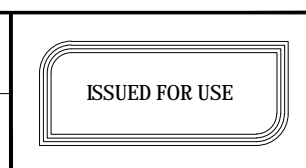


**SPECIFIC CULVERT INSTALLATION - BRADY'S COWAL**

- 1) CULVERT 529.768 INSTALLED IN ACCORDANCE WITH TYPICAL DETAIL FOR WIDE CULVERTS
- 2) EMPHASIS PLACED ON RESTRICTING INFLOW TO SINGLE FLOW PATH TO MAXIMISE 'DRY' WORKING AREA.
- 3) COMPLETE IN STAGES, USING EXISTING GROUND COVER AND NEWLY PLACED SLABS AND CULVERTS TO MAINTAIN FLOW THROUGH DURING CONSTRUCTION.
- 4) OPTION TO ADOPT STAGING METHODOLOGY FOR INLINE CULVERT INSTALLATION (SHEET E09) UNDER DRY CONDITIONS



REVISION	DESCRIPTION	APPROVED BY	DATE
B	REVISED TO INCLUDE STAGING OPTION	TB	9/07/19
A	ORIGINAL ISSUE	TB	21/12/18

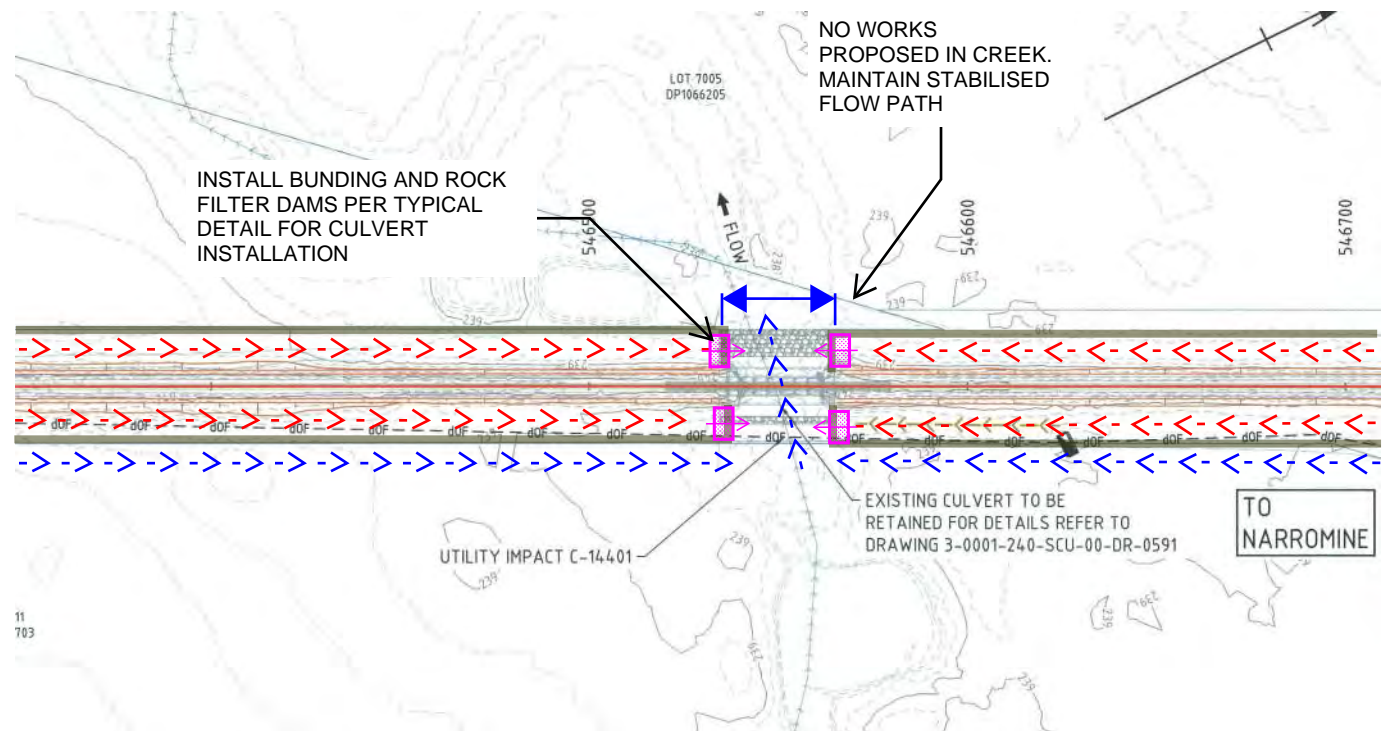



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PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN DRAINAGE		
PROJECT No 18-0101	DRAWING No E06	REVISION A





**FLOW PATH CROSSING - YELLOW CREEK**

- 1) INSTALL DIVERSION BUNDING IN ACCORDANCE WITH TYPICAL DETAIL FOR FILL AREAS.
- 2) INSTALL ROCK FILTER DAMS IN ACCORDANCE WITH TYPICAL DETAIL FOR CULVERT INSTALLATION
- 3) THE EXISTING CREEK CROSSING IS TO REMAIN IN PLACE. MAINTAIN STABILISED FLOW PATH, SEPARATED FROM SITE RUNOFF.
- 4) IF ACCESS (EG. LV TRACK) IS REQUIRED THROUGH FLOW PATH, INSTALL AS WIDE, ROCK LINED CAUSEWAY. OPTION TO ADOPT STAGING METHODOLOGY FOR INLINE CULVERT INSTALLATION (SHEET E09) UNDER DRY CONDITIONS



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B	REVISED TO INCLUDE STAGING OPTION	TB	9/07/19
A	ORIGINAL ISSUE	TB	21/12/18

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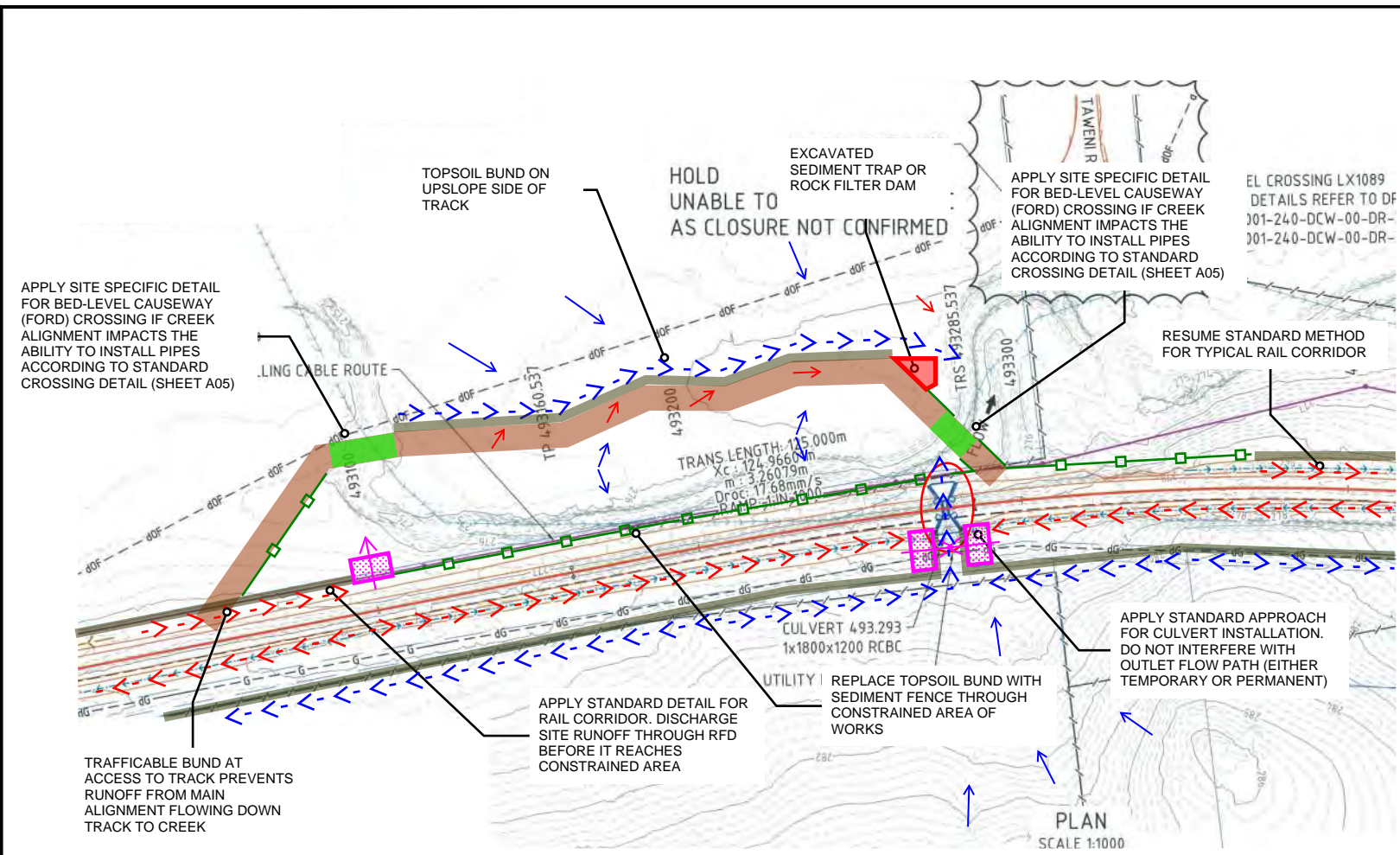
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PROJECT <b>INLAND RAIL - PARKES TO NARROMINE</b>		
DRAWING TITLE <b>EROSION AND SEDIMENT CONTROL PLAN DRAINAGE</b>		
PROJECT No <b>18-0101</b>	DRAWING No <b>E07</b>	REVISION <b>A</b>



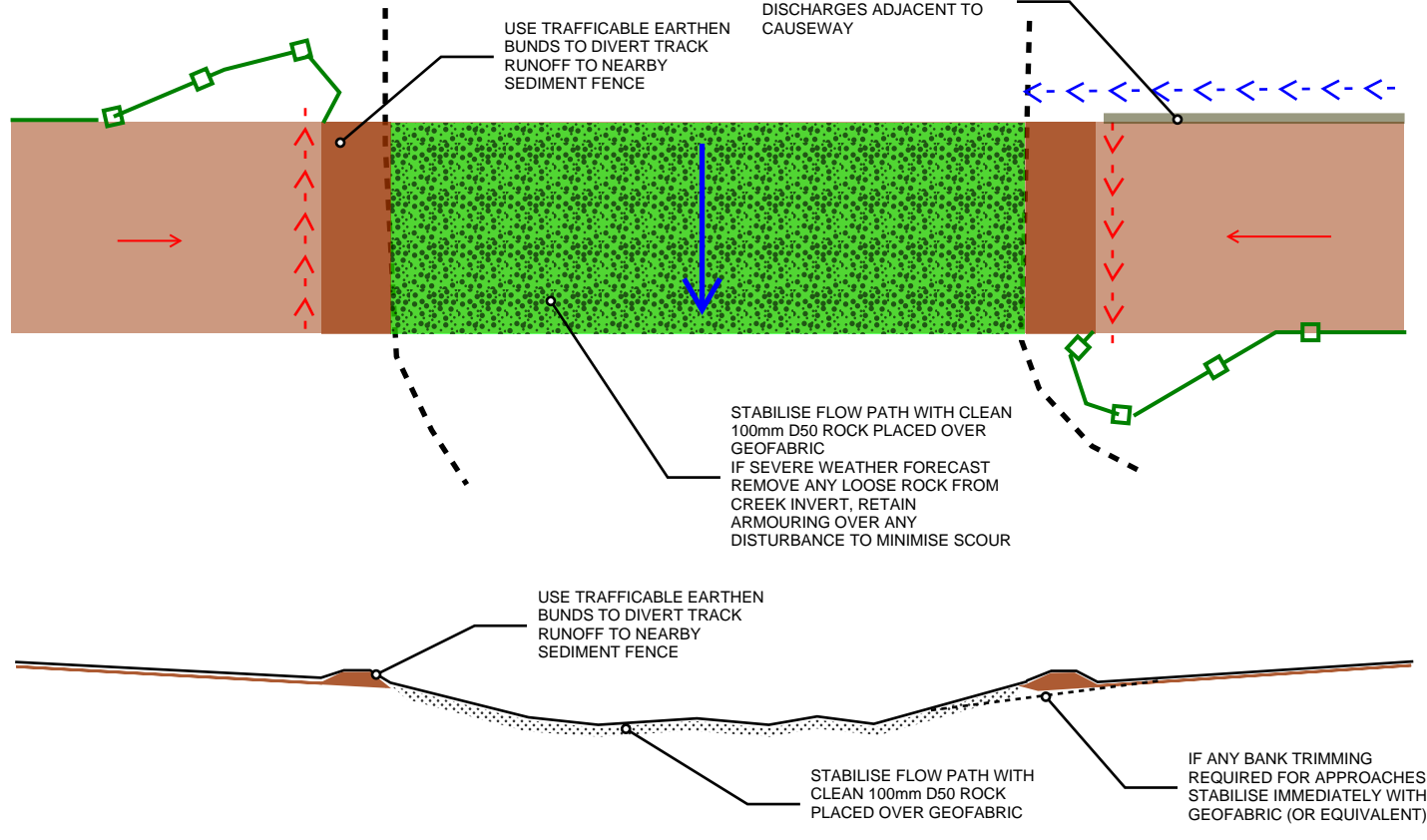


**TEN MILE CREEK ACCESS TRACK - TAWENI RD**

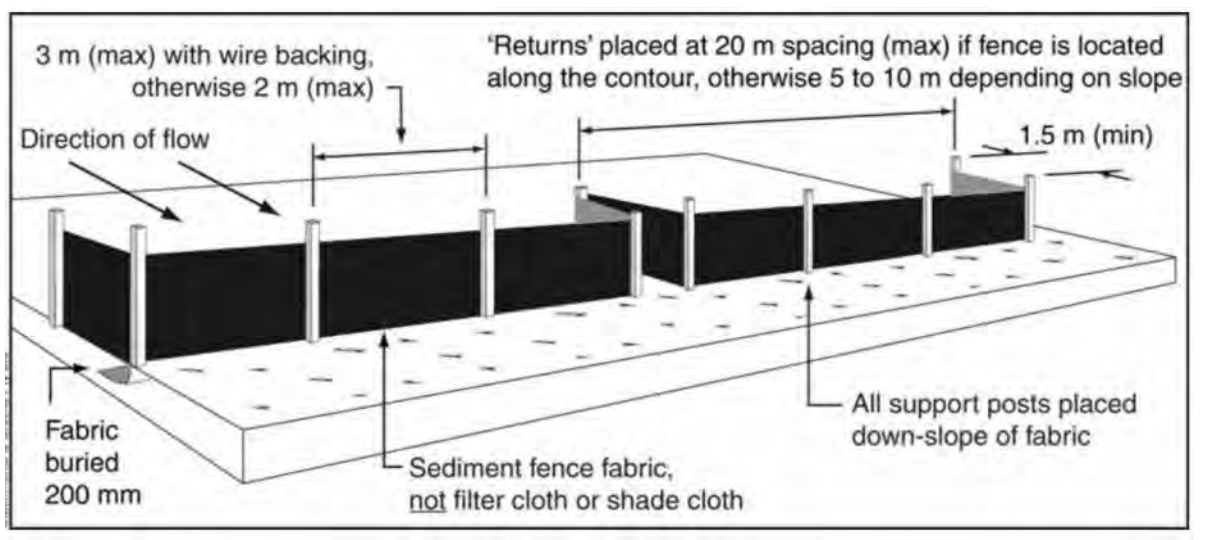
- 1) CLEARLY DEMARCATATE THE PROPOSED BOUNDARY OF CLEARING.
- 2) INSTALL CONTROLS ON THE MAIN RAIL ALIGNMENT ACCORDING TO TYPICAL RAIL CORRIDOR SETOUT
- 3) WHERE CORRIDOR IS CONSTRAINED BY NEARBY CREEK REPLACE TOPSOIL BUND WITH SEDIMENT FENCE
- 4) DISCHARGE UPSLOPE PORTION OF RAIL CORRIDOR THROUGH ROCK FILTER DAM BEFORE IT REACHES THE CONSTRAINED AREA
- 5) GRADE ACCESS TRACK INSTALLING A TRAFFICABLE BUND AT THE TIE-IN POINTS TO THE MAIN ALIGNMENT
- 6) FORM TOPSOIL BUND (WINDROW) ON UPSLOPE SIDE OF TRACK (CLEAN WATER DIVERSION), ENSURING THIS BUND INTERCEPTS ANY INFLOW FROM THE EXISTING TABLE DRAIN BESIDE TAWENI ROAD
- 7) STABILISE BUNDS WITH SOIL BINDER ACCORDING TO THE SPECIFICATIONS PROVIDED ON SHEET A03
- 8) INSTALL EXCAVATED SEDIMENT TRAP OR ROCK FILTER DAM AT DISCHARGE POINT OF ACCESS TRACK
- 9) DIRECT RUNOFF FROM ANY ADDITIONAL MARGINAL AREAS TO SEDIMENT FENCE
- 10) INSTALL TEMPORARY CREEK CROSSINGS ACCORDING TO STANDARD DETAIL PROVIDED ON SHEET A05, OR SITE SPECIFIC DETAIL ON THIS PAGE IF PIPES CANNOT BE INSTALLED
- 11) MINIMISE THE EXTENT OF DISTURBANCE AT ALL TIMES, RESTRICTING STRIPPING TO AREAS OF ACTIVE WORKS.
- 12) IF <50% OF MORE THAN 20mm FORECAST REMOVE ANY LOOSE ROCK FROM CREEK INVERT, RETAIN ARMOURING OVER ANY DISTURBANCE TO MINIMISE SCOUR
- 13) RE-ESTABLISH GROUND COVER VIA PERMANENT MEANS (BALLAST ROCK OR LANDSCAPING) OR TEMPORARY (SOIL BINDER) AS SOON AS POSSIBLE AFTER THE COMPLETION OF WORKS IN SPECIFIC SECTIONS.

BASED ON RESULTS SOURCED FROM AUSTRALIAN RAINFALL AND RUNOFF (2016), WITH INPUT FROM THE NSW OFFICE OF ENVIRONMENT AND HERITAGE THE REGION CAN EXPECT APPROXIMATELY 30MM OF INITIAL LOSSES PRIOR TO STREAM FLOW. NOTE THAT THIS FIGURE CAN BE CONSIDERED GENERAL IN NATURE, WITH STATISTICS REPORTING A CONSIDERABLE STANDARD DEVIATION BETWEEN AREAS. THE FIGURE INDICATED DOES NOT CONSIDER SPECIFIC CATCHMENT CHARACTERISTICS REPORTING TO THE SITE AREA, WHICH MAY VARY THE RESULTS. AS A RESULT, A CONSERVATIVE FORECAST TRIGGER OF 50% CHANCE OF GREATER THAN 20mm IS RECOMMENDED TO REMOVE ANY OBSTRUCTION TO NORMAL CREEK FLOW – IE. REMOVE THE ROCK CROSSING AND STABILISE ANY DISTURBANCE WITHIN THE FLOWPATH.

**BED-LEVEL CAUSEWAY (FORD) CROSSING**



**SEDIMENT FENCE WITH RETURNS (SOURCE: IECA 2008)**



REVISION	DESCRIPTION	APPROVED BY	DATE
B	AMENDED TO INCLUDE RAINFALL TRIGGER	TB	4/07/19
A	ORIGINAL ISSUE	TB	7/06/19

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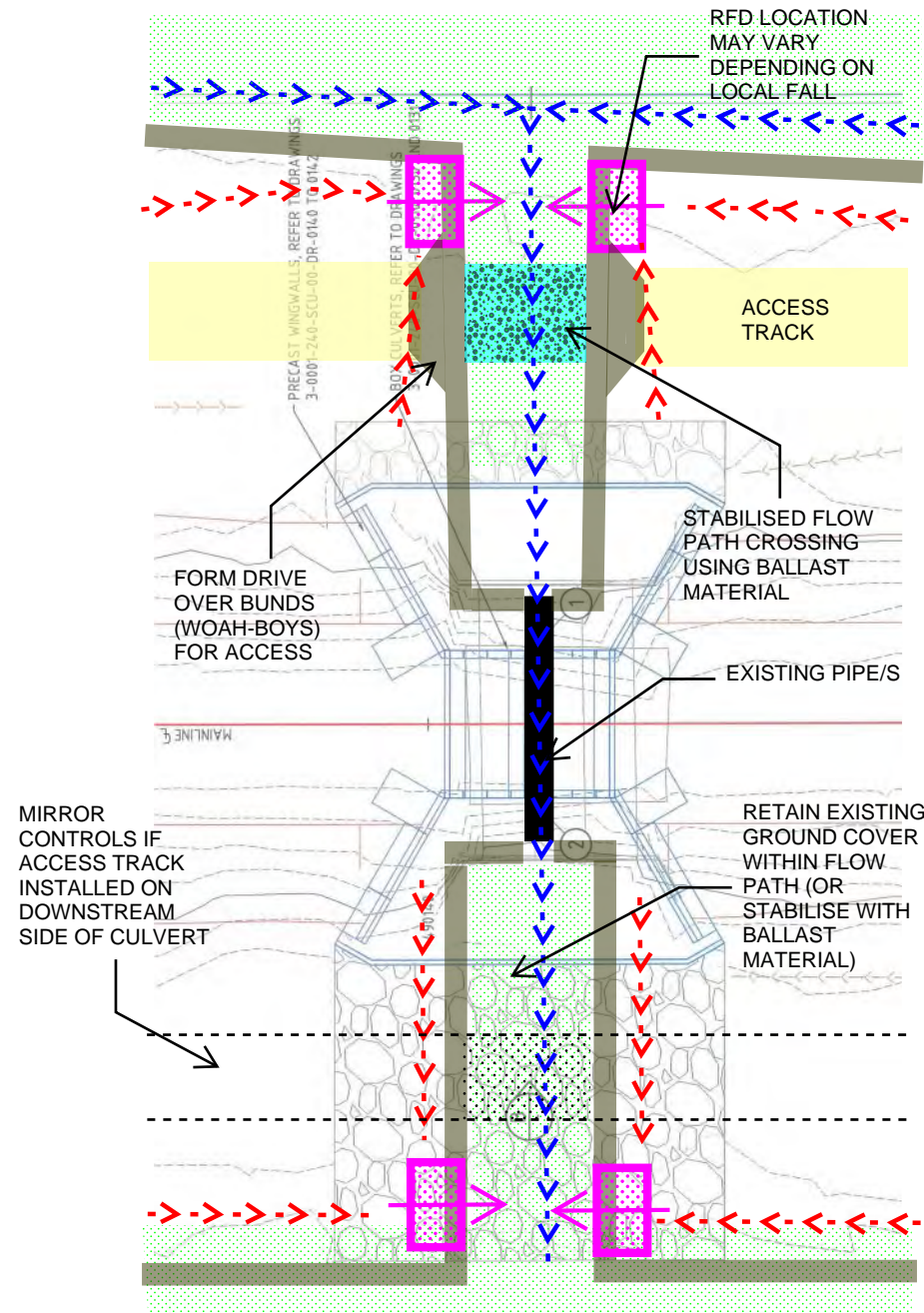
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PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN DRAINAGE		
PROJECT No 18-0101	DRAWING No E08	REVISION B

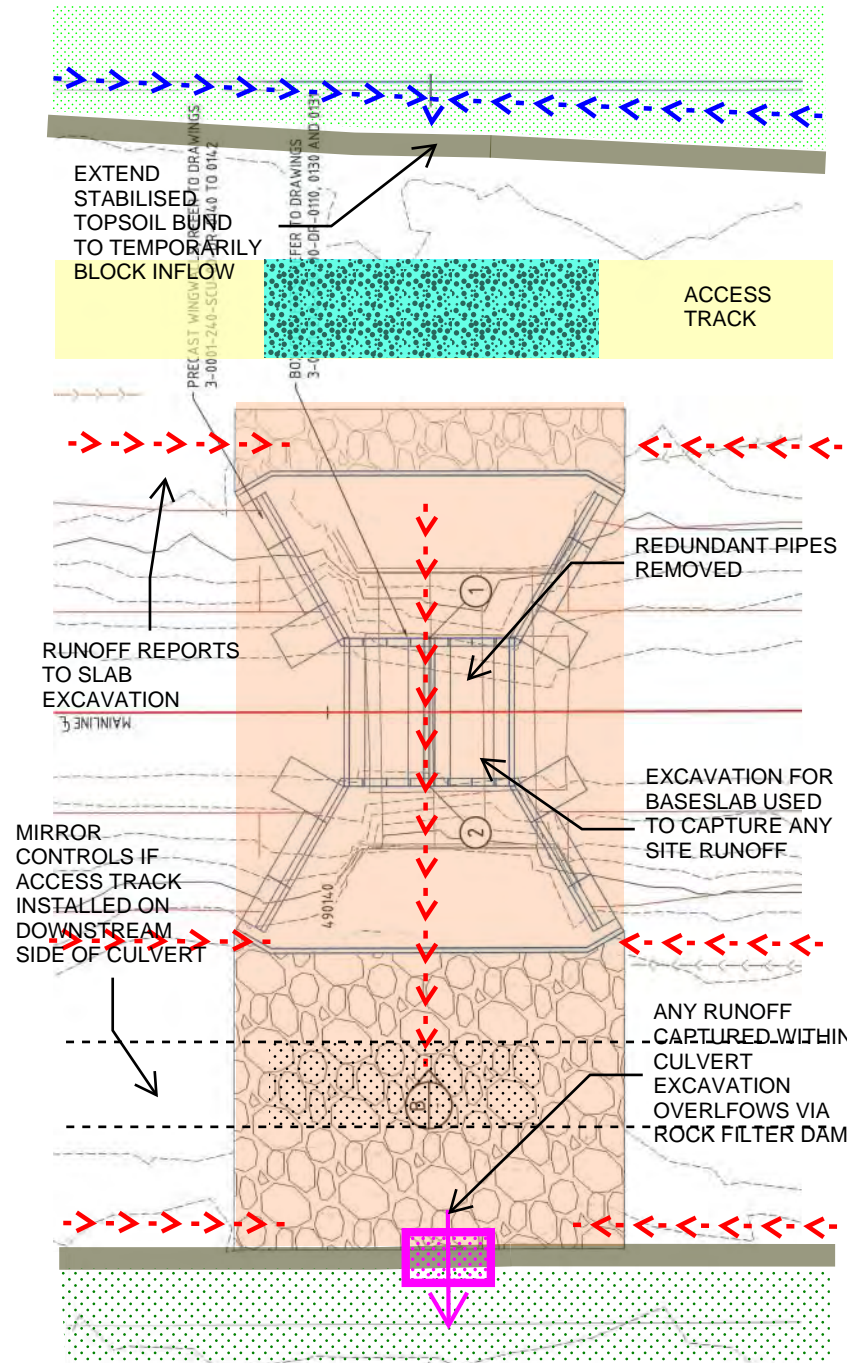


**TYPICAL INLINE CULVERT INSTALLATION METHODOLOGY**

**STAGE 1**  
CLEAN WATER ROUTED THROUGH SITE VIA EXISTING PIPE/S

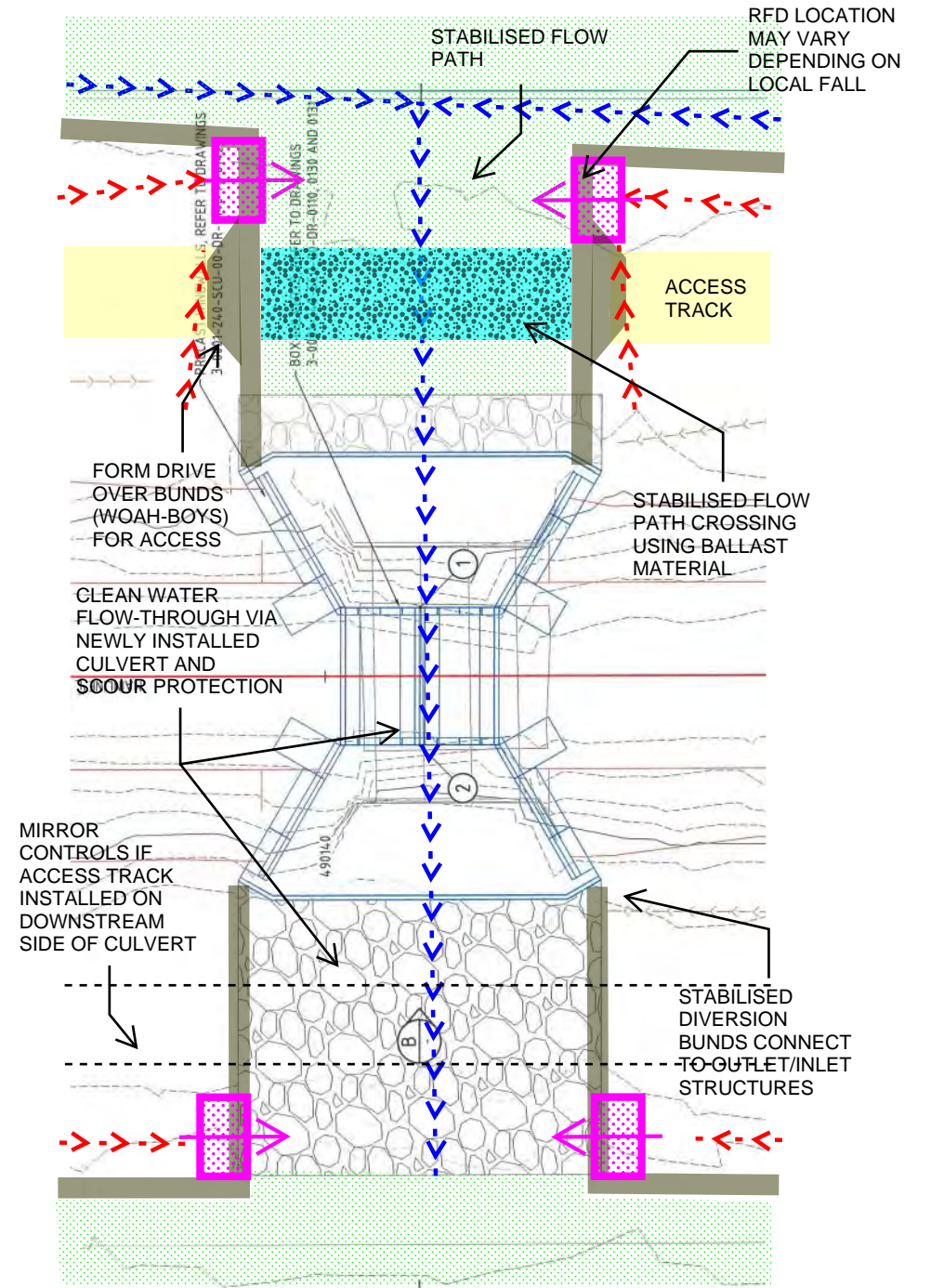


**STAGE 2**  
REDUNDANT PIPES REMOVED. NEW CULVERT AREA EXCAVATED. NO CLEAN WATER FLOW THROUGH REFER SPECIAL CONDITIONS



**STAGE 3**  
NEW CULVERTS AND INLET/OUTLETS INSTALLED AND COMPLETE.  
CLEAN WATER CONVEYED THROUGH SITE VIA NEW STORMWATER

**STAGE 3 IS NOT NECESSARY IF LANDSCAPING IS COMPLETED IMMEDIATELY AFTER STAGE 2 - IE. SURFACE TREATMENTS COMPLETED IN ACCORDANCE WITH THE CONTRACT (SCOPE OF WORKS)**



**SPECIAL CONDITIONS FOR STAGE 2**

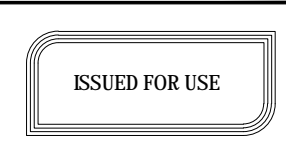
- PRIOR TO REMOVAL OF EXISTING PIPES AND COMMENCING PERMANENT STORMWATER WORKS, COMPLETE A FORMALISED FORECAST BASED RISK ASSESSMENT TO ENSURE:
- 1) SIGNIFICANT RAINFALL (<50% OF MORE THAN 20mm) IS NOT EXPECTED DURING STAGE 2 WORKS
  - 2) ADEQUATE MACHINERY AND MATERIALS ARE AVAILABLE TO TEMPORARILY STABILISE THE FLOW PATH AND SEPARATE SITE RUNOFF FROM CLEAN WATER SHOULD THE FORECAST CHANGE DURING STAGE 2 WORKS
  - 3) FLOCCULANT/COAGULANT IS AVAILABLE TO DEWATER THE CULVERT EXCAVATION (ROCK FILTER DAMS SHOULD NOT BE USED FOR DEWATERING UNLESS UNDER NORMAL FLOW CONDITIONS)

BASED ON RESULTS SOURCED FROM AUSTRALIAN RAINFALL AND RUNOFF (2016), WITH INPUT FROM THE NSW OFFICE OF ENVIRONMENT AND HERITAGE THE REGION CAN EXPECT APPROXIMATELY 30MM OF INITIAL LOSSES PRIOR TO STREAM FLOW. NOTE THAT THIS FIGURE CAN BE CONSIDERED GENERAL IN NATURE, WITH STATISTICS REPORTING A CONSIDERABLE STANDARD DEVIATION BETWEEN AREAS. THE FIGURE INDICATED DOES NOT CONSIDER SPECIFIC CATCHMENT CHARACTERISTICS REPORTING TO THE SITE AREA, WHICH MAY VARY THE RESULTS. AS A RESULT, A CONSERVATIVE FORECAST TRIGGER OF 50% CHANCE OF GREATER THAN 20mm HAS BEEN RECOMMENDED



D	PERMITS SKIPPING STAGE 3 IN FAVOUR OF LANDSCAPING TREATMENTS	TB	2/04/20
C	REVISED TO ADDRESS CLIENT COMMENT	TB	20/09/19
B	REVISED TO INCLUDE STAGING OPTION	TB	9/07/19
A	ORIGINAL ISSUE	TB	4/07/19
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PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN DRAINAGE		
PROJECT No 18-0101	DRAWING No E09	REVISION D



## TYPICAL INLINE CULVERT INSTALLATION NOTES

**STAGE 1:** RAIL CORRIDOR CLEARED, GRUBBED AND STRIPPED UP TO AND EXCLUDING THE EXISTING FLOW PATH. EXISTING CULVERTS TO REMAIN IN PLACE, WITH BALLAST USED TO FORM A STABILISED FLOW PATH. IF THE INLETS/OUTLETS ARE EXPOSED THEY WILL REQUIRE RE-STABILISATION USING TEMPORARY EROSION CONTROL (IE. GEOFABRIC WITH/WITHOUT BALLAST OR HEAVY SOIL BINDER APPLICATION). WHERE THE TEMPORARY ACCESS TRACK CROSSES THE FLOW PATH THE TRACK WILL BE STABILISED WITH BALLAST MATERIAL. WOAH BOYS SHALL BE CONSTRUCTED TO PREVENT RUNOFF FOLLOWING THE TRACK INTO THE SAG. ROCK FILTER DAMS ARE TO BE INSTALLED ON EITHER SIDE OF THE CLEAN FLOW-THROUGH TO TREAT WATER BEFORE ENTERING THE FLOW PATH.

**STAGE 2:** APPLIES TO INTERIM PERIOD WHILE OLD CULVERTS ARE REMOVED AND NEW CULVERTS INSTALLED. TEMPORARILY BLOCK POTENTIAL INFLOW BY EXTENDING STABILISED BUND ACROSS SAG ON UPSTREAM EXTENT OF DISTURBANCE. TEMPORARILY BLOCK OUTFLOW BY EXTENDING STABILISED BUND ACROSS SAG ON DOWNSTREAM EXTENT OF DISTURBANCE. DURING THIS STAGE THERE IS NO SEPARATE CLEAN AND DIRTY WATER, RUNOFF FROM THE ALIGNMENT IS ALLOWED TO REPORT TO THE SAG POINT WHERE IT IS CAPTURED WITHIN THE PIT EXCAVATED FOR CULVERT BASE-SLAB AND APRON CONSTRUCTION. AN ADDITIONAL ROCK FILTER

DAM IS INSTALLED AT THE DISCHARGE POINT TO PROVIDE A STABILISED OUTLET.

ANY RUNOFF CAPTURED WITHIN THE BASE SLAB EXCAVATION WILL BE TREATED AND TESTED PRIOR TO DEWATERING (REFER PRIMARY ESCP FOR WATER QUALITY OBJECTIVES AND TABLES ON THIS SHEET FOR FLOCCULANT/COAGULANT INFORMATION. BLOCKING OF INFLOW AND USING EXCAVATIONS FOR TREATMENT IS CONSIDERED APPROPRIATE ONLY FOR MINOR FLOW AND SUITABLE FOR WORKS DURING THE DRY SEASON. PRIOR TO REMOVAL OF EXISTING PIPES AND COMMENCING PERMANENT STORMWATER WORKS, COMPLETE A FORMALISED FORECAST BASED RISK ASSESSMENT (PROVIDED) TO ENSURE SIGNIFICANT RAINFALL (<50% OF MORE THAN 20mm) IS NOT EXPECTED DURING STAGE 2 WORKS, ADEQUATE MACHINERY AND MATERIALS ARE AVAILABLE TO TEMPORARILY STABILISE THE FLOW PATH AND SEPARATE SITE RUNOFF FROM CLEAN WATER SHOULD THE FORECAST CHANGE DURING STAGE 2 WORKS, AND FLOCCULANT/COAGULANT IS AVAILABLE TO DEWATER THE CULVERT

EXCAVATION (ROCK FILTER DAMS SHOULD NOT BE USED FOR DEWATERING UNLESS UNDER NORMAL FLOW CONDITIONS).

IT IS RECOMMENDED THAT, WHEREVER POSSIBLE, CULVERTS BE CONSTRUCTED PROGRESSIVELY TO MINIMISE THE NUMBER OF CULVERTS CURRENTLY UNDERGOING STAGE 2 WORKS ALONG THE ALIGNMENT AT ANY ONE TIME. HOWEVER IT IS ALSO ADVISED THAT AS MANY STAGE 2 CONSTRUCTIONS BE COMPLETED DURING SEASONALLY LOW RAINFALL. TOTAL NUMBER ACCEPTABLE MUST BE BASED ON THE CONTRACTORS ASSESSMENT OF RISK AND RESOURCING (INCLUDING RAINFALL OUTLOOK).

**STAGE 3:** APPLIES AFTER THE CONSTRUCTION OF CULVERTS AND ASSOCIATED HEADWALLS/APRONS COMPLETED DURING STAGE 2. SEPARATE CLEAN AND DIRTY WATER FLOW PATHS ARE RE-ESTABLISHED, USING THE NEWLY COMPLETED CULVERTS AND APRONS AS A STABILISED FLOW-THROUGH, AND TEMPORARY BUNDS WITH ROCK FILTER DAMS TO CAPTURE AND TREAT RUNOFF OUTSIDE THE CLEAN WATER FLOW-PATH. CONSISTENT WITH STAGE 1, THE TEMPORARY ACCESS TRACK MUST BE STABILISED (BALLAST MATERIAL MAY BE USED) WHERE IT CROSSES THE FLOW PATH (WITH WOAH BOYS TO PREVENT CONCENTRATING RUNOFF TO THE SAG). ALTERNATIVELY, CONSTRUCTION TRAFFIC MAY BE ROUTED ALONG THE NEW FORMATION.

**STAGE 3 IS NOT NECESSARY IF LANDSCAPING IS COMPLETED IMMEDIATELY AFTER STAGE 2 - IE. SURFACE TREATMENTS COMPLETED IN ACCORDANCE WITH THE CONTRACT (SCOPE OF WORKS)**

## EXAMPLE RISK ASSESSMENT (TO BE COMPLETED, UPDATED AND REVIEWED BY PROJECT STAFF)

STAGE 2 Risk Assessment			
Identify and list Hazards	List Current Risk Controls	Risk Rating	List Additional Controls (if any - where current controls are not adequately managing the level of risk)
1	Inflow from external catchment overwhelms upstream bund	BMD INPUT	Provide adequate machinery and materials to return work area to Stage 1, or complete Stage 3 prior to rainfall. Include provision for temporary erosion control (ballast, geofabric and soil binder).
2	Site runoff overtops downstream bund	BMD INPUT	Provide adequate machinery and materials to return work area to Stage 1, or complete Stage 3 prior to rainfall. Include provision for temporary erosion control (ballast, geofabric and soil binder).
3	Disturbance outside area reporting to sediment control	BMD INPUT	Add flagging in constrained "choke" points
4	Delays following rainfall with water pooled in excavations	BMD INPUT	Complete jar testing to select most effective product
5			
6			

Likelihood	Consequence					Risk	Action
	Insignificant	Minor	Moderate	Major	Severe		
Almost Certain	Medium	High	Extreme	Extreme	Extreme	Extreme	Notify Environmental Team. Cease works immediately.
Likely	Medium	Medium	High	Extreme	Extreme	High	Notify Environmental Team to discuss proposed actions
Possible	Low	Medium	Medium	High	Extreme	Medium	Notify Environmental Team. Proceed with works
Unlikely	Low	Low	Medium	Medium	High	Low	No action
Rare	Low	Low	Low	Medium	Medium	Low	

## COAGULANTS AND FLOCCULANTS

Agent	Indicative dosage & form	Pros	Cons	Precautions
Gypsum (calcium sulphate)	300-600 kg/ML Powder	Readily available. Can be used in passive system. Little pH change. Potentially Low ecotoxicity	Slow acting. Poor solubility (hard to mix). Large quantities required.	Causes an increase in EC.
Calcium Chloride	250-1000 kg/ML. Typically in flakes but can be supplied in liquid.	More soluble than gypsum. Can be used in passive system. Little pH change. Potentially Low ecotoxicity.	Generally slow acting.	Potentially large increase in EC.
Alum (aluminium sulphate)	50-150 kg/ML (powder) 100-250 L/ML (liquid) Liquid and powder form	High solubility, fast acting. Low dose rates. Can be used in both active and passive systems. Higher basicity than Alum.	Likely to require pH buffering post treatment. No basicity and requires high levels of alkalinity to perform.	Causes a decrease in pH. Potential ecotoxicity to aquatic organisms due to bioavailability at pH's < 5.
PAC (poly-aluminium chloride)	50-200 L/ML Liquid and powder form	High solubility, fast acting. Low dose rates. Can be used in both active and passive systems. Higher basicity than Alum.	Can cause a decrease in pH. Lower basicity than ACH. Requires medium levels of alkalinity to perform.	Can cause a decrease in pH. Potential ecotoxicity to aquatic organisms due to bioavailability at pH's < 5.

### Soil / water solution procedure:

- Obtain a soil sample from representative soils to be exposed during the life cycle of the sediment basin. Where multiple soil types are likely to be encountered within the life cycle of the basin, jar tests should be undertaken for the range of soil types.
- Crush the soil (if dry) and shake through a 2 mm sieve to remove any coarse material.
- Place approximately 100 grams of soil into 10 litres of water. Ensure the water has the same temperature as the expected water temperature within the sediment basin during the settling phase.
- Stir rapidly until soil particles are suspended.
- Leave solution for 10 minutes.
- Stir rapidly to resuspend any settled material.
- Decant into beakers for jar testing.

### Jar testing procedure:

- Fill the appropriate number of (matched) 1000 mL transparent beakers with well-mixed test water, using a 1000 mL graduate. Record starting pH, temperature and turbidity.
- Place the filled beakers on the gang stirrer, with the paddles positioned identically in each beaker.
- Mix the beakers at 40-50 rpm for 30 seconds. Discontinue mixing until coagulant or flocculant addition is completed.
- Leave the first beaker as a control, and add increasing dosages of the first coagulant/flocculant to subsequent beakers. Inject coagulant/flocculant solutions as quickly as possible, below the liquid level and about halfway between the stirrer shaft and beaker wall.
- Increase the mixing speed to 100-125 rpm for 15-30 seconds (rapid mix).
- Reduce the mixing to 40 rpm and continue the slow mix for up to 5 minutes.
- Turn the mixer off and allow settling to occur.
- After settling for a period of time, note clarity and record on Floc Performance Report. Record pH and turbidity.
- Remove the jars from the gang stirrer, empty the contents and thoroughly clean the beakers.
- Repeat the procedure as required for different chemicals, dose rates or soil/water mixtures.

Sometimes both a coagulant and flocculant are required to achieve the desired treatment efficiencies. In these situations, the coagulant should be tested first followed by the flocculant.

For all sediment basins, including Type A, B and D, a Floc Performance Report should be prepared to determine a suitable chemical and dose rate for the sediment basin. A report template is provided in this section. When a variety of soil properties are likely to enter a basin during its life cycle (e.g. subsoil and topsoil), testing should be completed for all soil types. A single floc report for multiple sediment basins on a site should only be undertaken when soil properties are uniform for all basins.

Agent	Indicative dosage & form	Pros	Cons	Precautions
ACH (aluminium chlorohydrate)	20-100 L/ML Liquid form only	High solubility, fast acting. Low dose rates. Higher basicity than PAC and Alum. Little pH change.	Requires low levels of alkalinity to perform.	Potential ecotoxicity to aquatic organisms due to bioavailability at pH's < 5.
Bio-polymers (Chitosan, Xanthum gums, starches)	Product dependent	Fast acting. Large stable flocs. Completely biodegradable. Can be used in both active and passive systems.	May need to be used in conjunction with a coagulant.	An anionic biopolymer may be required following the use of a cationic biopolymer to neutralise any excess so as to minimise potential ecotoxicity.
PAM (poly-acrylamide)	Product dependent	Can be used in both active and passive systems.	Excess dosing with cationic PAMs can result in potential ecotoxicity risk.	High ecotoxicity risk associated with the cationic form (poly DADMAC). Low environmental risk with anionic PAMs

## Floc Performance Report

BASIN IDENTIFICATION CODE/NUMBER: .....

SITE / PROJECT: .....

PREPARED BY: ..... DATE: .....

Chemical name:	Soil description:				
Dose rate:	0.00 Control				
Starting pH					
Starting turbidity					
Clarity <sup>[1]</sup> after 5 mins (mm)					
Clarity <sup>[1]</sup> after 15 mins (mm)					
Clarity <sup>[1]</sup> after 30 mins (mm)					
Clarity <sup>[1]</sup> after 60 mins (mm)					
Final pH					
Final turbidity					

Chemical name:	Soil description:				
Dose rate:	0.00 Control				
Starting pH					
Starting turbidity					
Clarity <sup>[1]</sup> after 5 mins (mm)					
Clarity <sup>[1]</sup> after 15 mins (mm)					
Clarity <sup>[1]</sup> after 30 mins (mm)					
Clarity <sup>[1]</sup> after 60 mins (mm)					
Final pH					
Final turbidity					

Note:  
[1] For the purposes of a floc report, 'clarity' is defined as a level of turbidity that is likely to meet discharge requirements at a depth from the water level surface in the beaker. Clarity can be estimated visually or with the use of a turbidity meter.

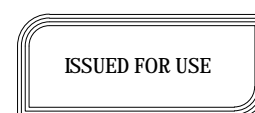
## ROCK FILTER DAM INSTALLATION NOTES

REFER TO SHEET A04 FOR ROCK FILTER DAM SIZING. RFD DIMENSIONS WILL VARY, DEPENDING ON THE MINIMUM PONDING (SURFACE) AREA AND CONTRIBUTING CATCHMENT AREA. IT IS HEAVILY DEPENDENT ON VARYING STAGES OF EARTHWORKS, CURRENT SLOPE AND OTHER AREA AND TIME SPECIFIC CONDITIONS. HOWEVER AS A GENERAL GUIDE, A 0.5M HIGH RFD (TO WEIR INVERT) WITH MATCHING PERIMETER BUND ON A 1% SLOPE AND 500M2 CATCHMENT WILL ACHIEVE APPROXIMATELY 500M2 PONDING SURFACE AREA. INCREASING SLOPE WILL DECREASE THIS AREA. PRIOR TO INSTALLATION ASSESS THE ACTUAL CATCHMENT REPORTING AT THE TIME AND RAISE OR LOWER THE RFD TO ACHIEVE THE MINIMUM PONDING AREA.



REVISION	DESCRIPTION	APPROVED BY	DATE
B	PERMITS SKIPPING STAGE 3 IN FAVOUR OF LANDSCAPING TREATMENTS	TB	2/04/20
A	ORIGINAL ISSUE	TB	20/09/19

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CPESC: 6374		

PROJECT		
INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE		
EROSION AND SEDIMENT CONTROL PLAN DRAINAGE		
PROJECT No	DRAWING No	REVISION
18-0101	E10	B

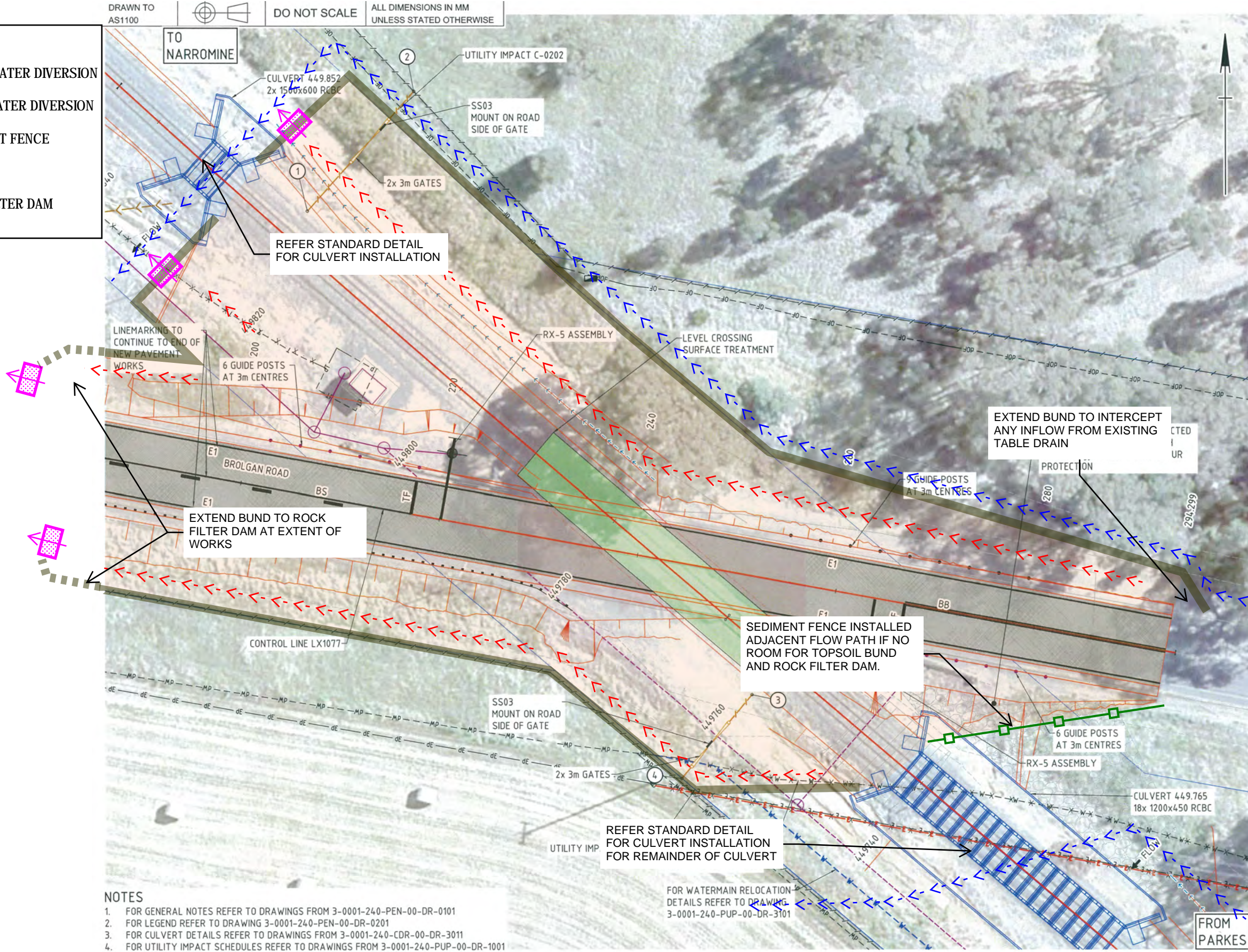






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- LEGEND:**
- > -> -> CLEAN WATER DIVERSION
  - > -> -> DIRTY WATER DIVERSION
  - SEDIMENT FENCE
  - BUND
  - ▶ ROCK FILTER DAM



- NOTES**
1. FOR GENERAL NOTES REFER TO DRAWINGS FROM 3-0001-240-PEN-00-DR-0101
  2. FOR LEGEND REFER TO DRAWING 3-0001-240-PEN-00-DR-0201
  3. FOR CULVERT DETAILS REFER TO DRAWINGS FROM 3-0001-240-CDR-00-DR-3011
  4. FOR UTILITY IMPACT SCHEDULES REFER TO DRAWINGS FROM 3-0001-240-PUP-00-DR-1001



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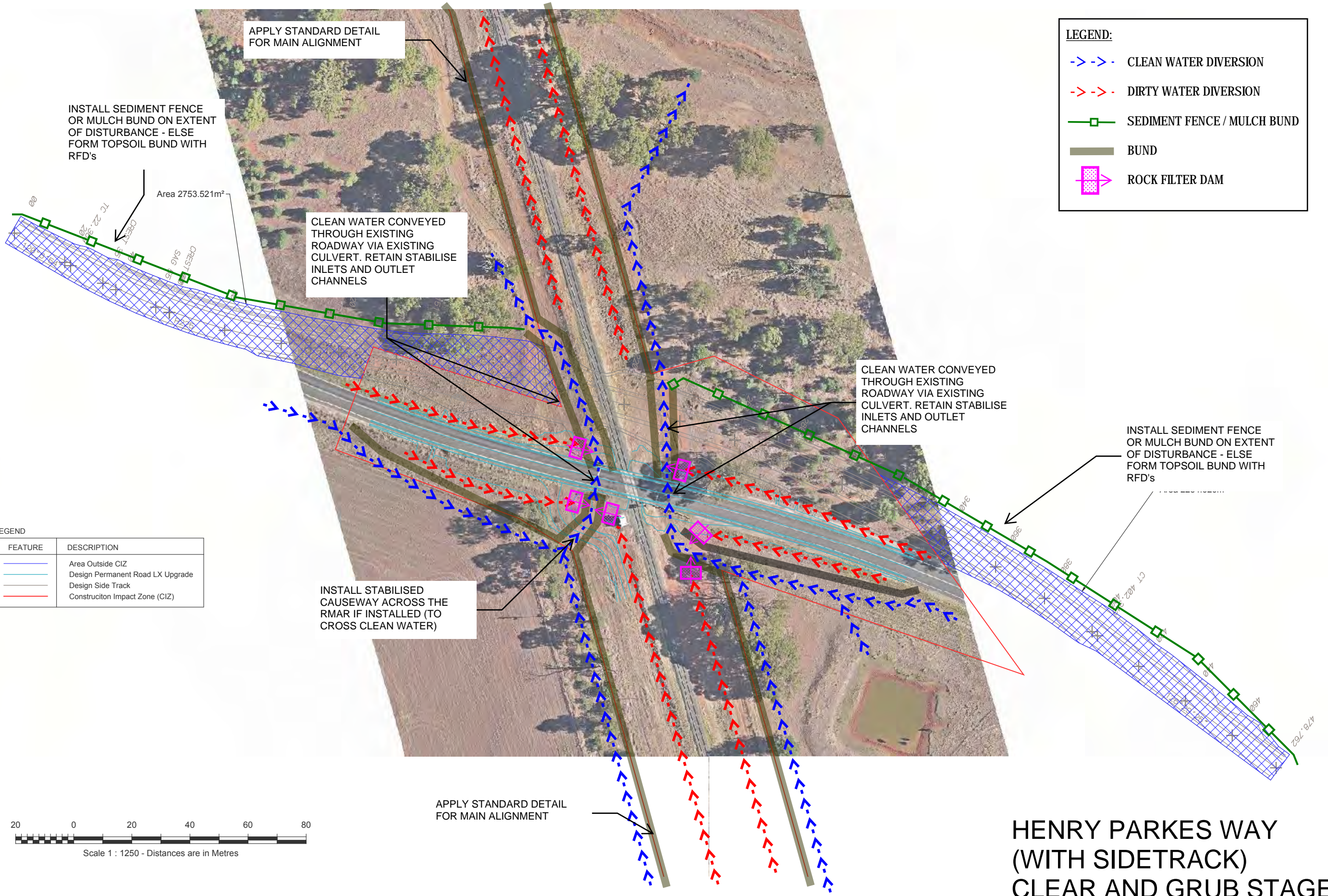
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DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN LEVEL CROSSINGS		
PROJECT No 18-0101	DRAWING No F01	REVISION A





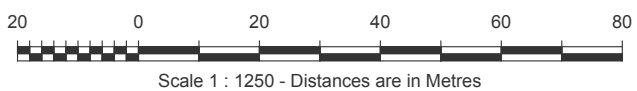
**LEGEND:**

- > -> -> CLEAN WATER DIVERSION
- > -> -> DIRTY WATER DIVERSION
- SEDIMENT FENCE / MULCH BUND
- BUND
- ROCK FILTER DAM



**LEGEND**

FEATURE	DESCRIPTION
— (Blue)	Area Outside CIZ
— (Cyan)	Design Permanent Road LX Upgrade
— (Grey)	Design Side Track
— (Red)	Construction Impact Zone (CIZ)



## HENRY PARKES WAY (WITH SIDETRACK) CLEAR AND GRUB STAGE



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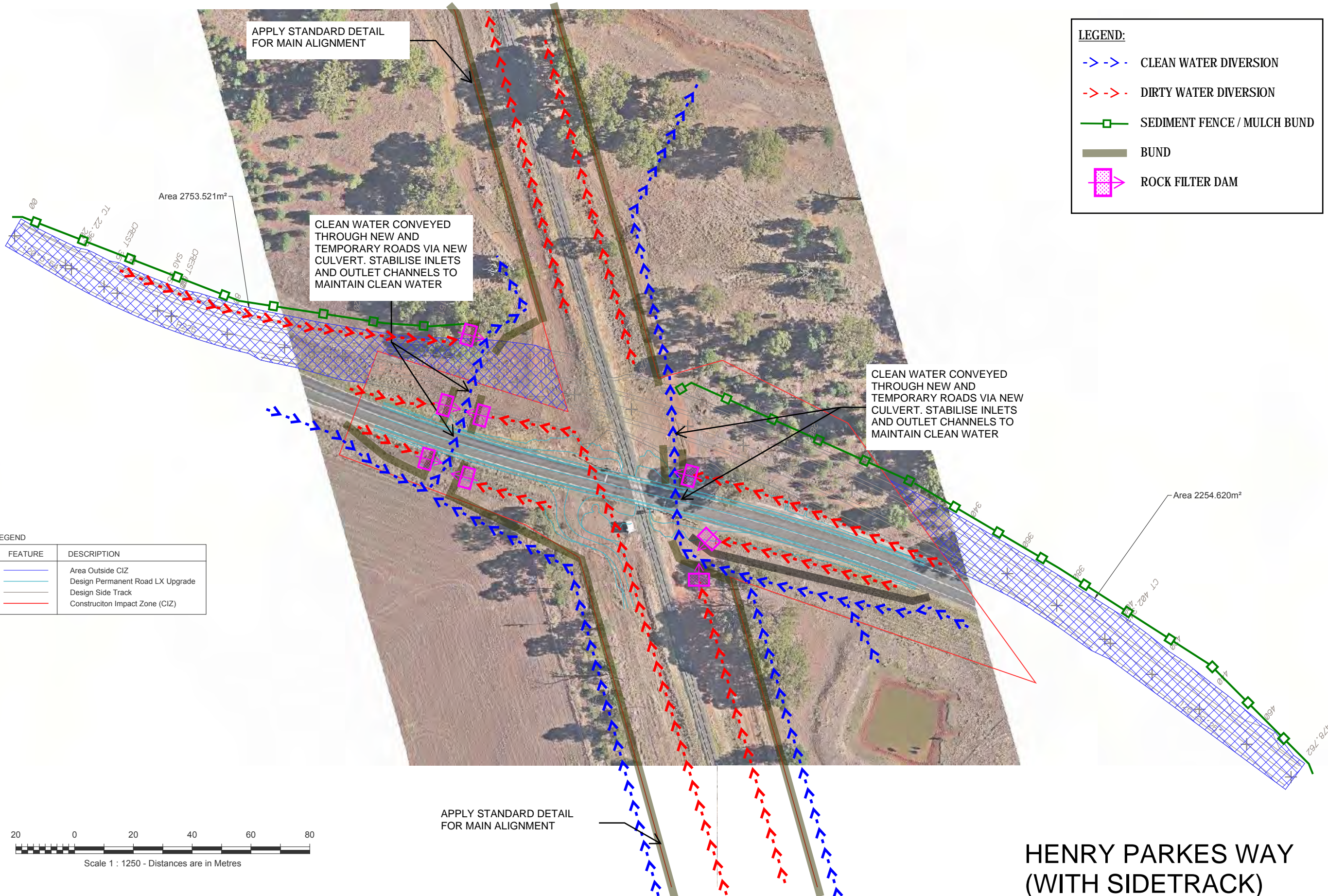
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PROJECT No 18-0101	DRAWING No F02	REVISION A





**LEGEND:**

- > -> -> CLEAN WATER DIVERSION
- > -> -> DIRTY WATER DIVERSION
- SEDIMENT FENCE / MULCH BUND
- BUND
- ROCK FILTER DAM

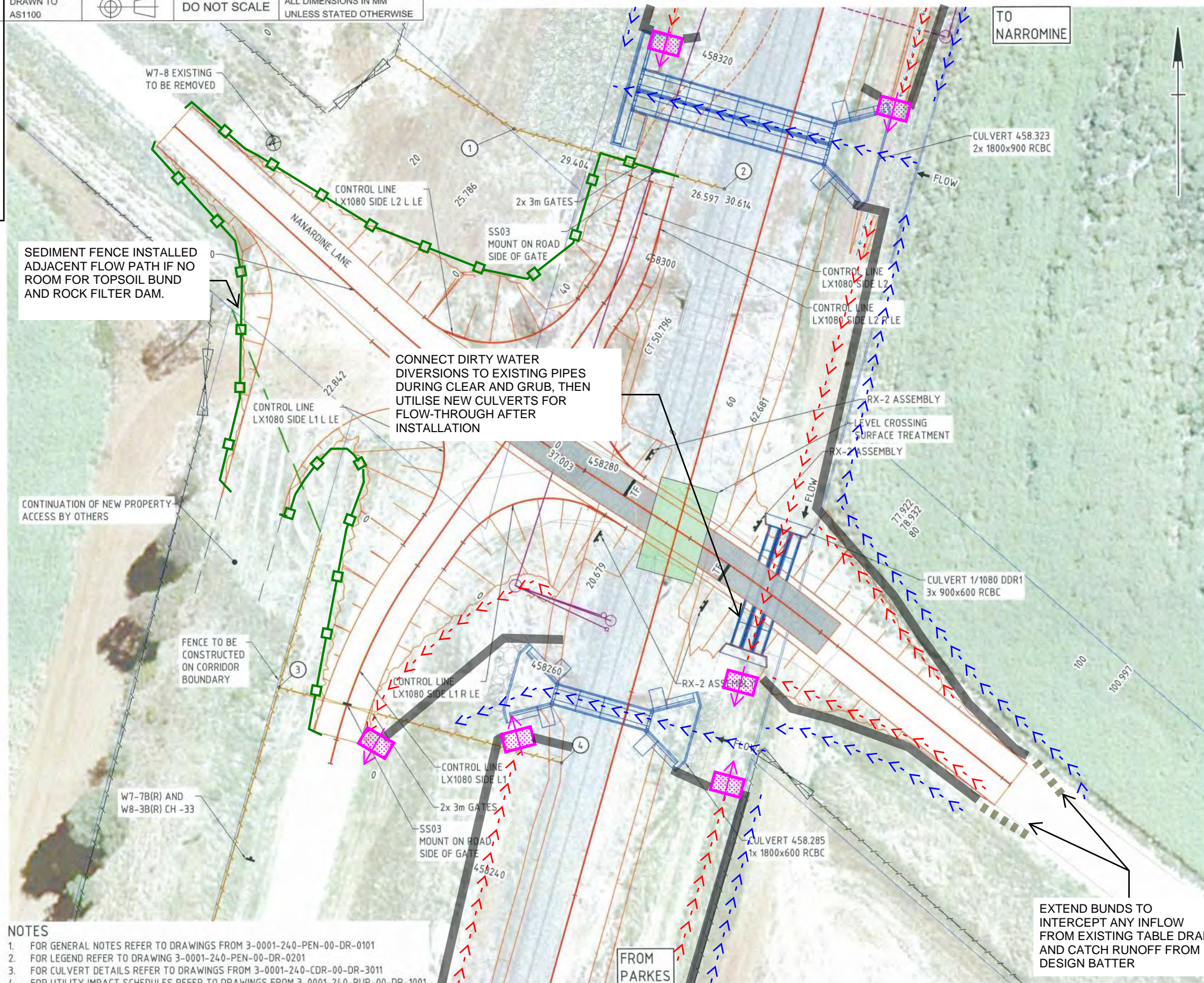




**LEGEND:**

- > -> -> CLEAN WATER DIVERSION
- > -> -> DIRTY WATER DIVERSION
- SEDIMENT FENCE
- BUND
- ▶ ROCK FILTER DAM

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SEDIMENT FENCE INSTALLED ADJACENT FLOW PATH IF NO ROOM FOR TOPSOIL BUND AND ROCK FILTER DAM.

CONNECT DIRTY WATER DIVERSIONS TO EXISTING PIPES DURING CLEAR AND GRUB, THEN UTILISE NEW CULVERTS FOR FLOW-THROUGH AFTER INSTALLATION

CONTINUATION OF NEW PROPERTY ACCESS BY OTHERS

FENCE TO BE CONSTRUCTED ON CORRIDOR BOUNDARY

EXTEND BUNDS TO INTERCEPT ANY INFLOW FROM EXISTING TABLE DRAIN AND CATCH RUNOFF FROM DESIGN BATTER

**NOTES**

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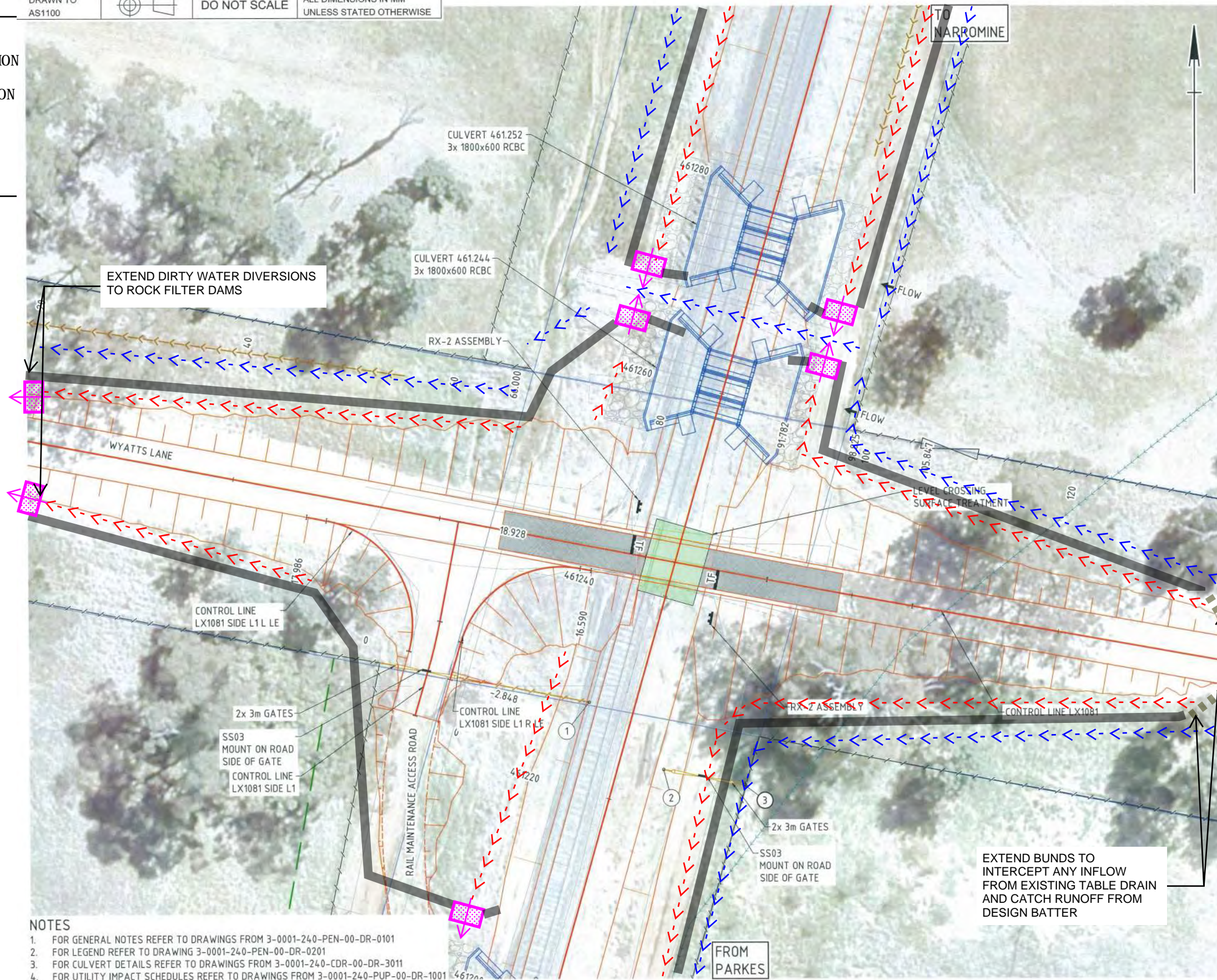
**LEGEND:**

->->- CLEAN WATER DIVERSION

->->- DIRTY WATER DIVERSION

BUND

ROCK FILTER DAM



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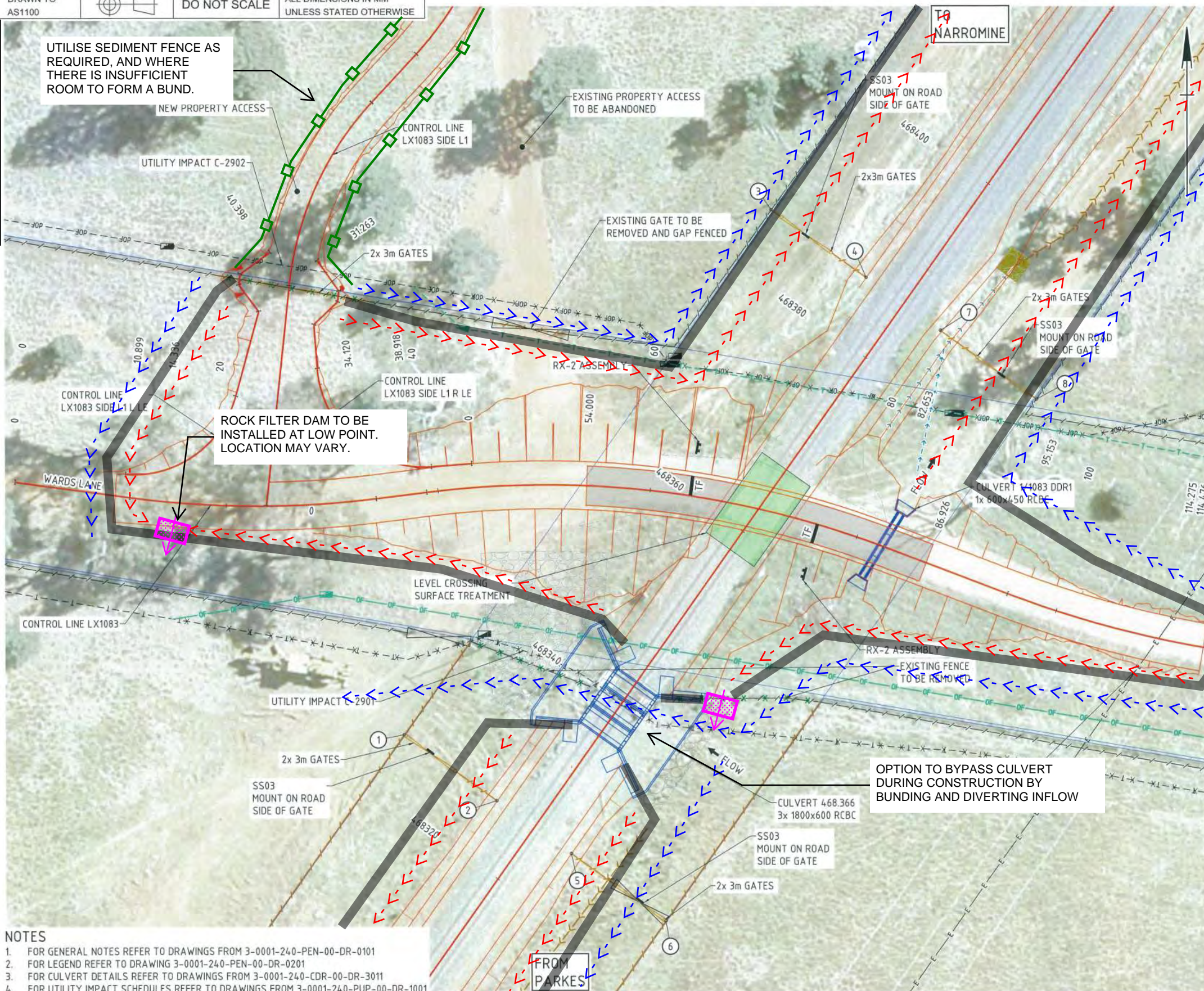


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**LEGEND:**

- > -> -> CLEAN WATER DIVERSION
- > -> -> DIRTY WATER DIVERSION
- SEDIMENT FENCE
- BUND
- [Rock Filter Dam Symbol] — ROCK FILTER DAM



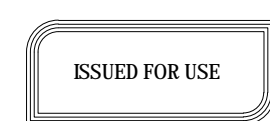
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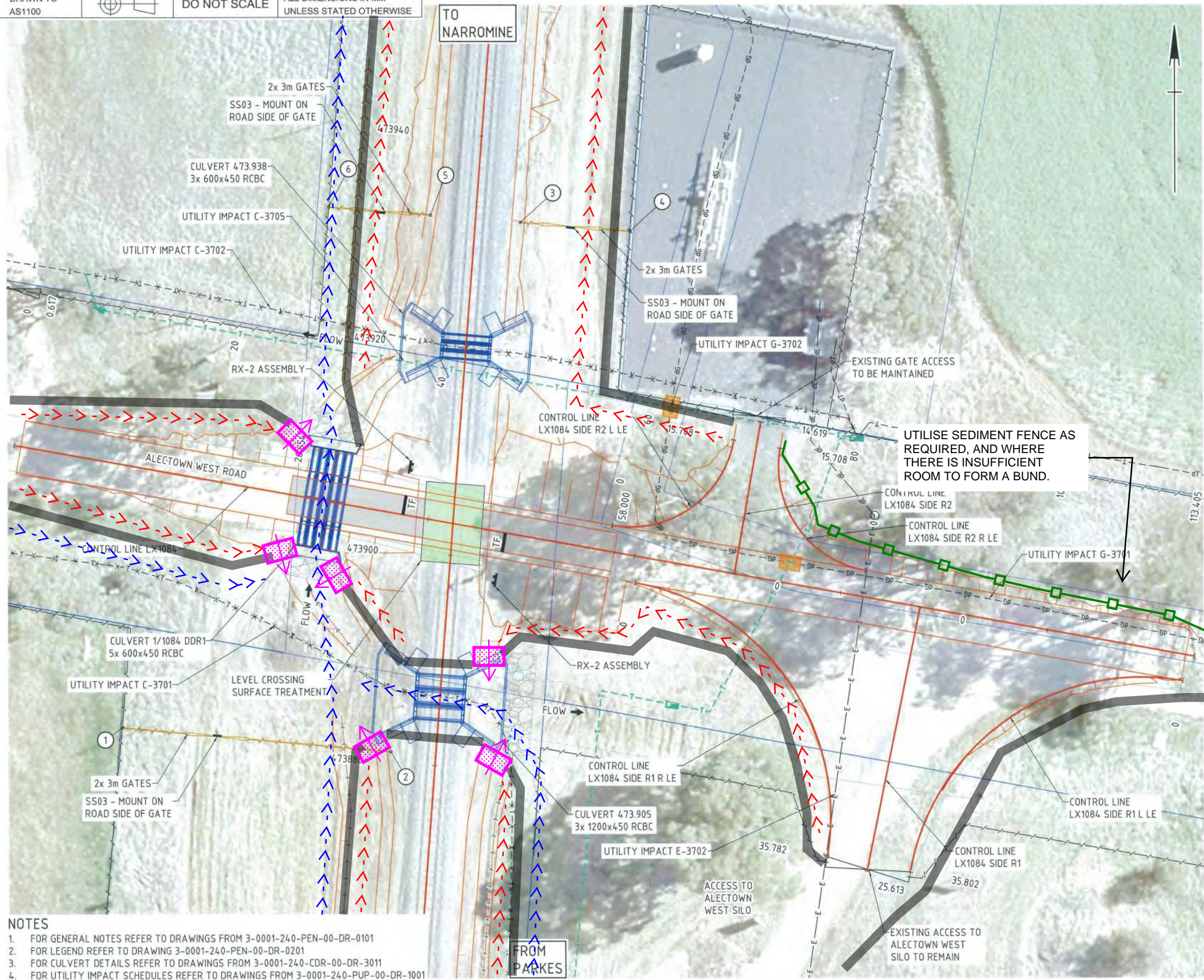
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- LEGEND:**
- >->- CLEAN WATER DIVERSION
  - >->- DIRTY WATER DIVERSION
  - SEDIMENT FENCE
  - BUND
  - ▶ ROCK FILTER DAM



- NOTES**
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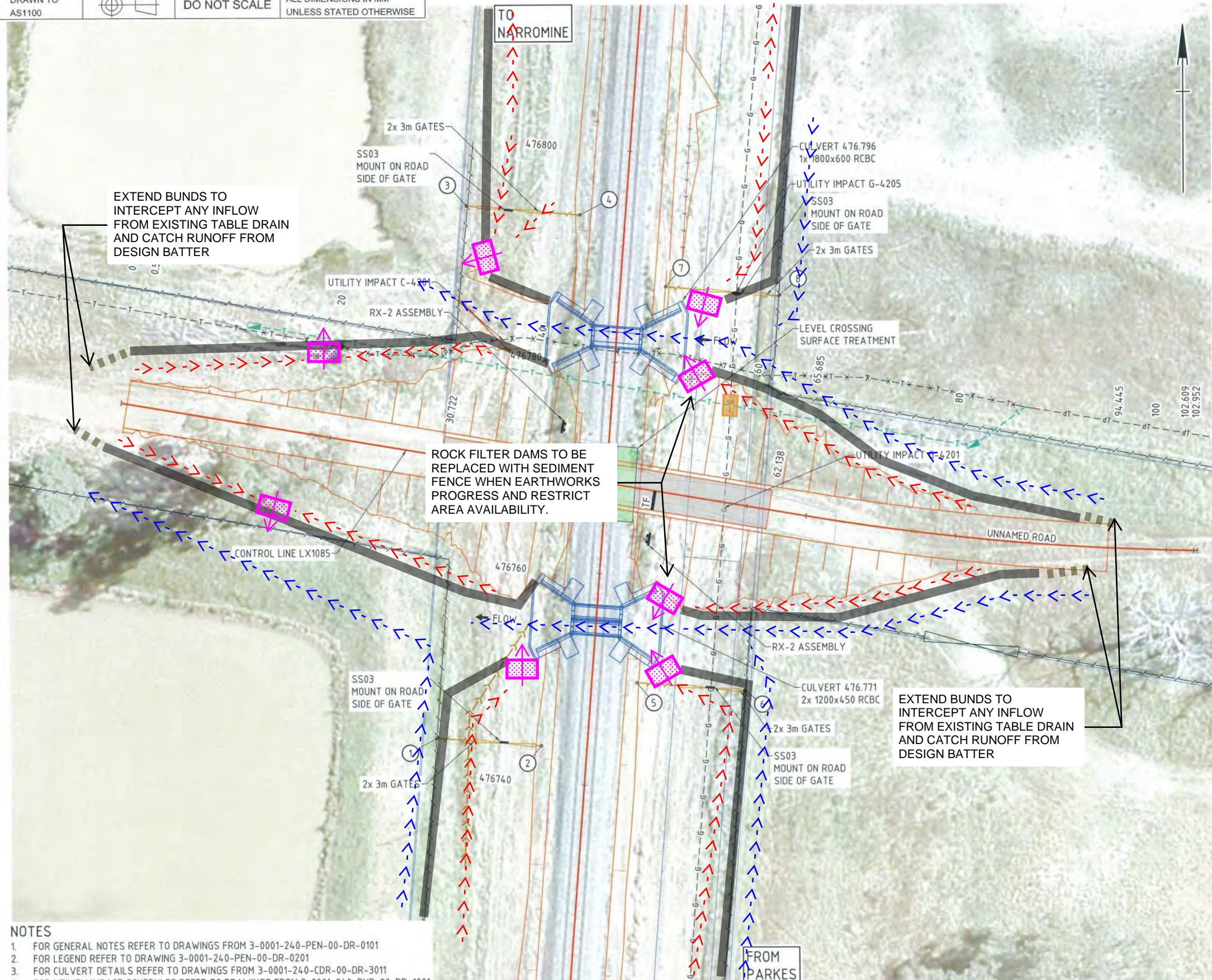
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		DATE	20/12/2018
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	CPESC 6374		

PROJECT	INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE	EROSION AND SEDIMENT CONTROL PLAN LEVEL CROSSINGS		
PROJECT No	18-0101	DRAWING No	F06
REVISION			A



**LEGEND:**

- > -> -> CLEAN WATER DIVERSION
- > -> -> DIRTY WATER DIVERSION
- BUND
- Rock Filter Dam Symbol ROCK FILTER DAM



EXTEND BUNDS TO INTERCEPT ANY INFLOW FROM EXISTING TABLE DRAIN AND CATCH RUNOFF FROM DESIGN BATTER

ROCK FILTER DAMS TO BE REPLACED WITH SEDIMENT FENCE WHEN EARTHWORKS PROGRESS AND RESTRICT AREA AVAILABILITY.

EXTEND BUNDS TO INTERCEPT ANY INFLOW FROM EXISTING TABLE DRAIN AND CATCH RUNOFF FROM DESIGN BATTER

- NOTES**
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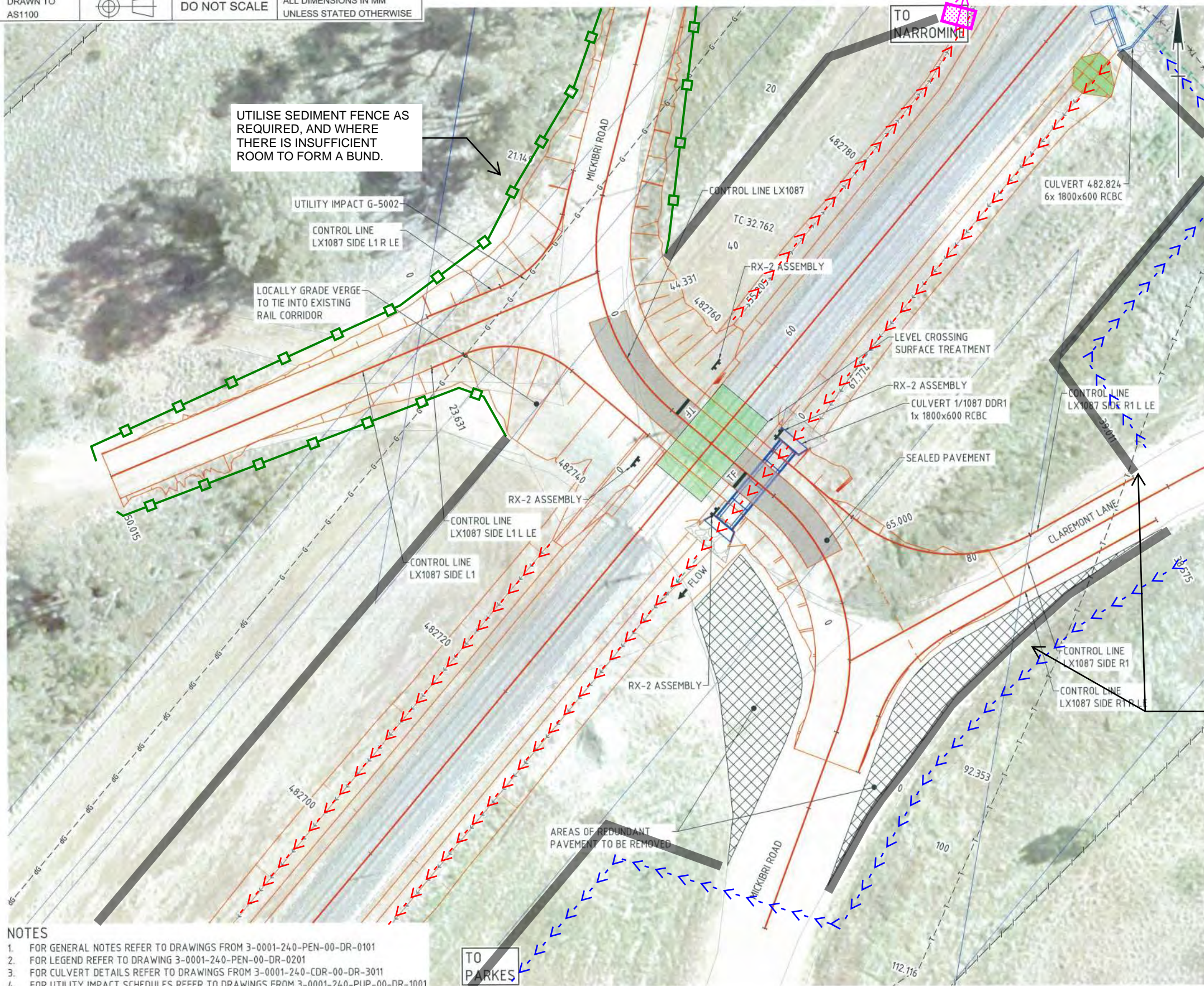
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PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN LEVEL CROSSINGS		
PROJECT No 18-0101	DRAWING No F07	REVISION A



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- LEGEND:**
- >->- CLEAN WATER DIVERSION
  - >->- DIRTY WATER DIVERSION
  - SEDIMENT FENCE
  - BUND
  -  ROCK FILTER DAM



UTILISE SEDIMENT FENCE AS REQUIRED, AND WHERE THERE IS INSUFFICIENT ROOM TO FORM A BUND.

INSTALL BUND AT AN ALIGNMENT THAT ACHIEVES INDICATED FALL AND FLOW DIRECTION.

- NOTES**
1. FOR GENERAL NOTES REFER TO DRAWINGS FROM 3-0001-240-PEN-00-DR-0101
  2. FOR LEGEND REFER TO DRAWING 3-0001-240-PEN-00-DR-0201
  3. FOR CULVERT DETAILS REFER TO DRAWINGS FROM 3-0001-240-CDR-00-DR-3011
  4. FOR UTILITY IMPACT SCHEDULES REFER TO DRAWINGS FROM 3-0001-240-PUP-00-DR-1001




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A	ORIGINAL ISSUE	TB	20/12/2018

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RPEQ / SIGNATURE (IF REQUIRED)  CPESC 6374		

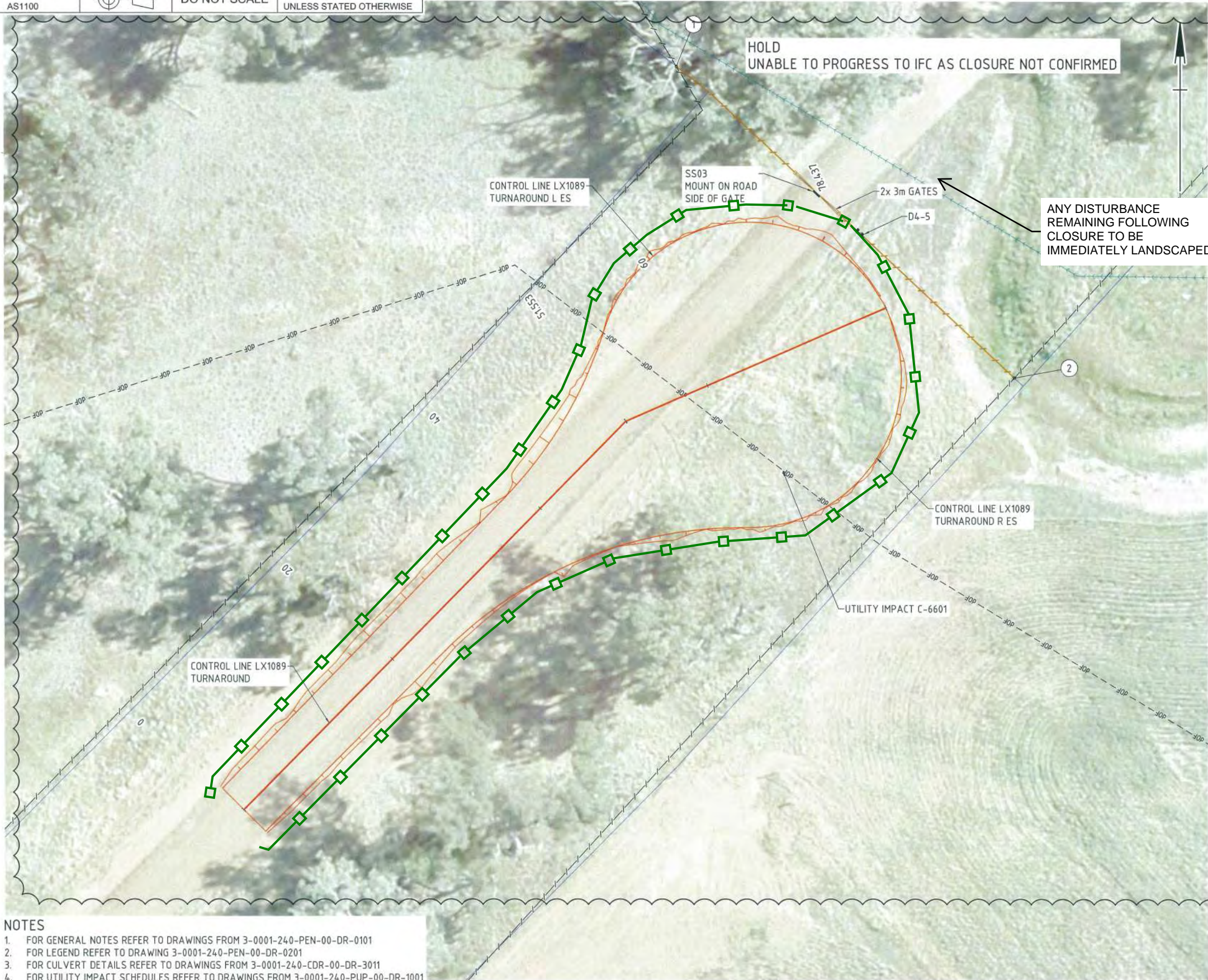
PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN LEVEL CROSSINGS		
PROJECT No 18-0101	DRAWING No F09	REVISION A



DRAWN TO AS1100 | DO NOT SCALE | ALL DIMENSIONS IN MM UNLESS STATED OTHERWISE

**LEGEND:**

—□— SEDIMENT FENCE



- NOTES**
1. FOR GENERAL NOTES REFER TO DRAWINGS FROM 3-0001-240-PEN-00-DR-0101
  2. FOR LEGEND REFER TO DRAWING 3-0001-240-PEN-00-DR-0201
  3. FOR CULVERT DETAILS REFER TO DRAWINGS FROM 3-0001-240-CDR-00-DR-3011
  4. FOR UTILITY IMPACT SCHEDULES REFER TO DRAWINGS FROM 3-0001-240-PUP-00-DR-1001



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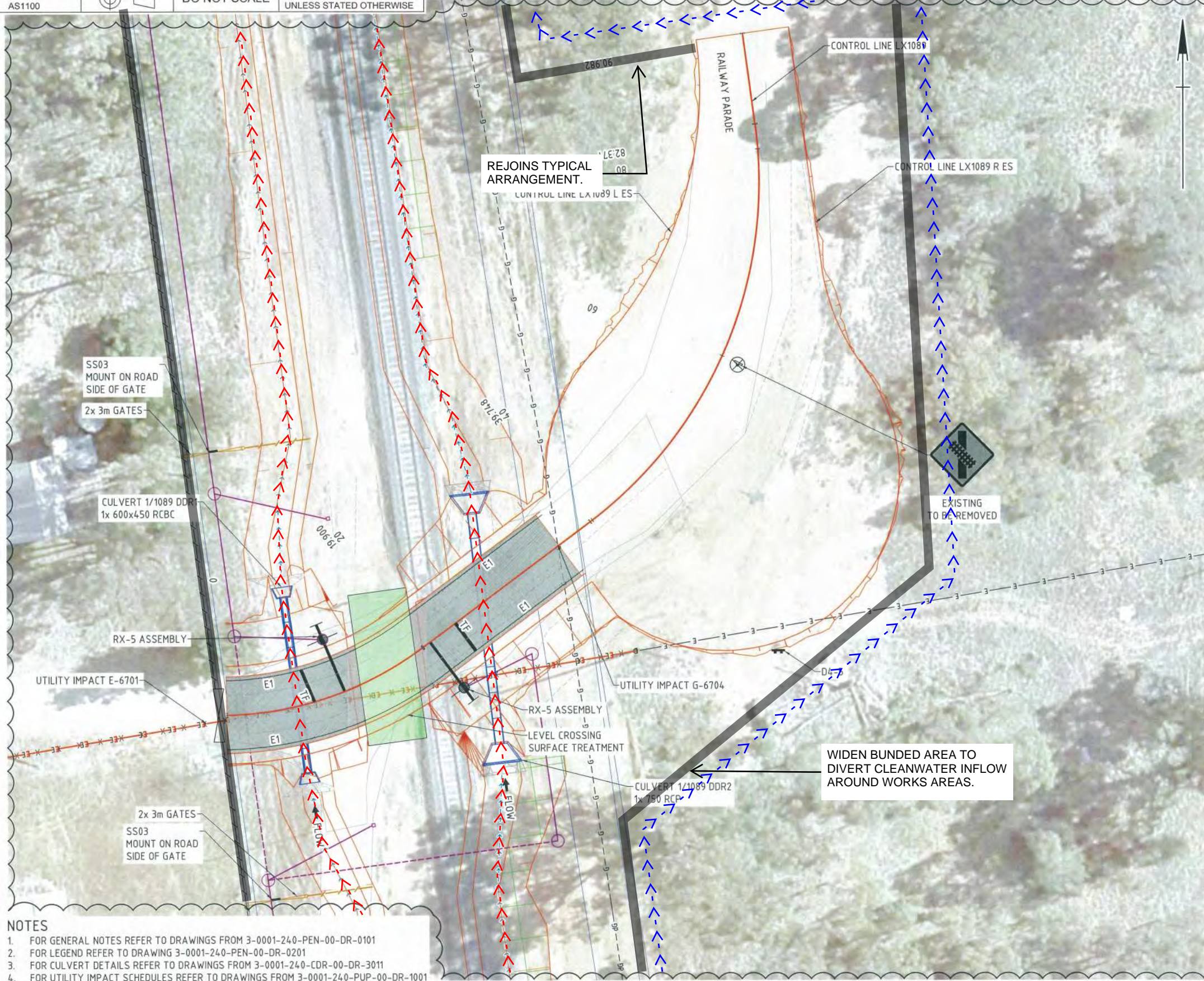
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DRAWN TB	DESIGNED TB	DATE 20/12/2018
RPEQ / SIGNATURE (IF REQUIRED) <i>[Signature]</i> CPESC: 6374		

PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN LEVEL CROSSINGS		
PROJECT No 18-0101	DRAWING No F10	REVISION A



DRAWN TO AS1100 | DO NOT SCALE | ALL DIMENSIONS IN MM UNLESS STATED OTHERWISE

**LEGEND:**  
 -> -> -> CLEAN WATER DIVERSION  
 -> -> -> DIRTY WATER DIVERSION  
 ——— BUND



- NOTES**
1. FOR GENERAL NOTES REFER TO DRAWINGS FROM 3-0001-240-PEN-00-DR-0101
  2. FOR LEGEND REFER TO DRAWING 3-0001-240-PEN-00-DR-0201
  3. FOR CULVERT DETAILS REFER TO DRAWINGS FROM 3-0001-240-CDR-00-DR-3011
  4. FOR UTILITY IMPACT SCHEDULES REFER TO DRAWINGS FROM 3-0001-240-PUP-00-DR-1001



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A	ORIGINAL ISSUE	TB	20/12/2018

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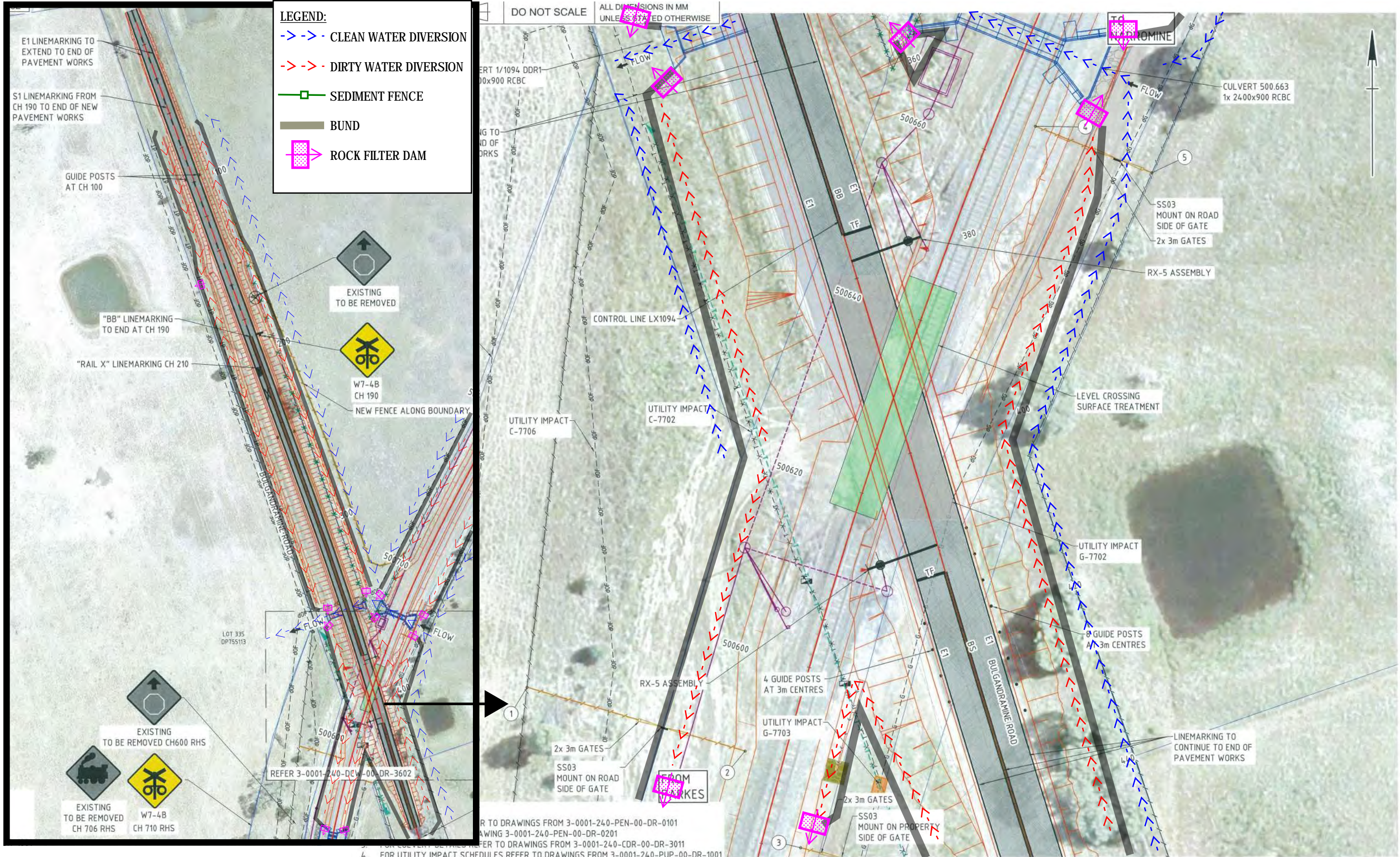
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RPEQ / SIGNATURE (IF REQUIRED) <i>[Signature]</i> CPESC: 6374		

PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN LEVEL CROSSINGS		
PROJECT No 18-0101	DRAWING No F11	REVISION A





**LEGEND:**

- > -> -> CLEAN WATER DIVERSION
- > -> -> DIRTY WATER DIVERSION
- SEDIMENT FENCE
- BUND
- ▨ ROCK FILTER DAM

DO NOT SCALE ALL DIMENSIONS IN MM UNLESS STATED OTHERWISE

REFER TO DRAWINGS FROM 3-0001-240-PEN-00-DR-0101  
 DRAWING 3-0001-240-PEN-00-DR-0201  
 FOR CULVERT DETAILS REFER TO DRAWINGS FROM 3-0001-240-CDR-00-DR-3011  
 4. FOR UTILITY IMPACT SCHEDULES REFER TO DRAWINGS FROM 3-0001-240-PUP-00-DR-1001



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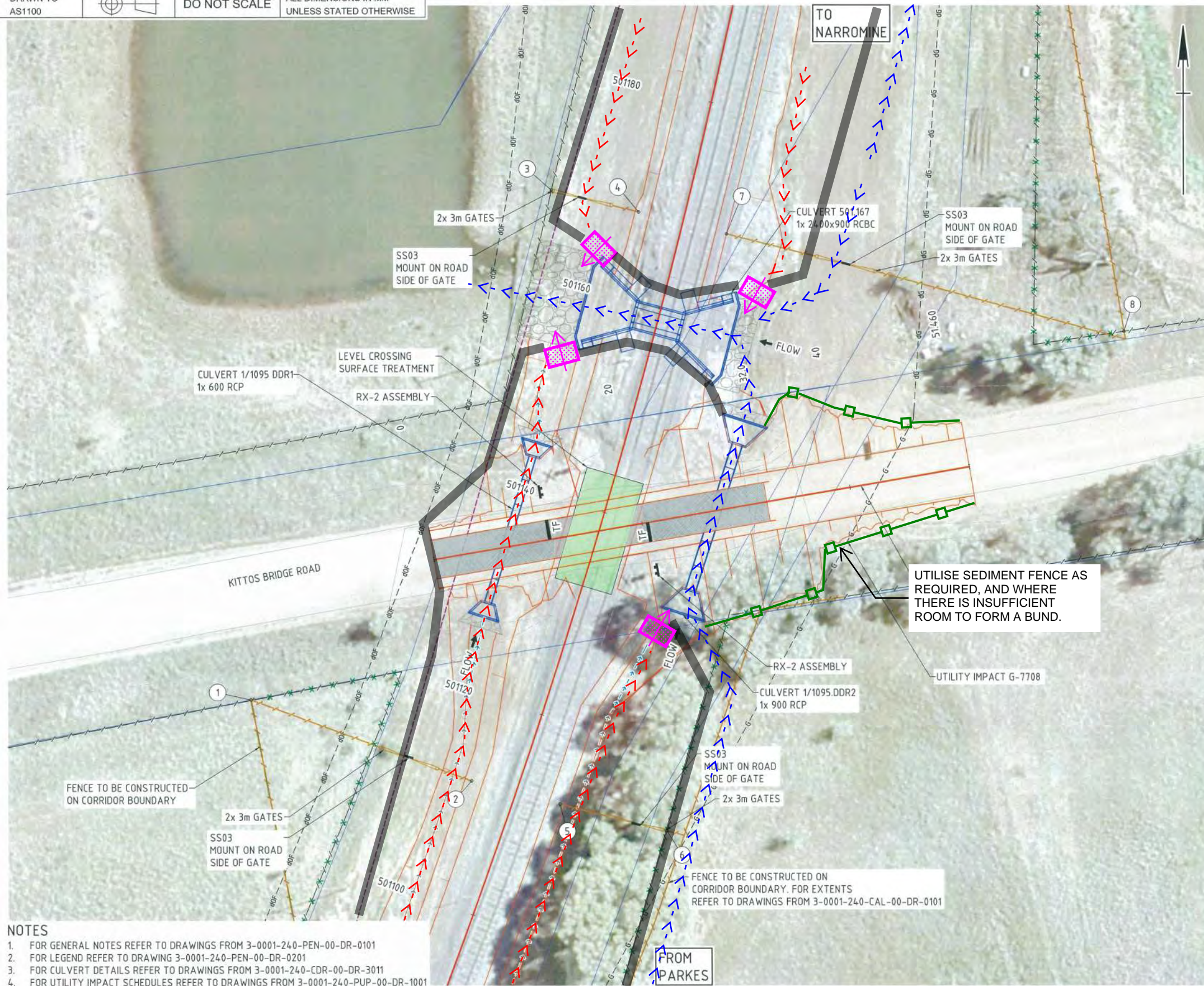
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RPEQ / SIGNATURE (IF REQUIRED) <i>Debra</i> CPESC: 6374		

PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN LEVEL CROSSINGS		
PROJECT No 18-0101	DRAWING No F12	REVISION A



DRAWN TO AS1100 | DO NOT SCALE | ALL DIMENSIONS IN MM UNLESS STATED OTHERWISE

- LEGEND:**
- > -> -> CLEAN WATER DIVERSION
  - > -> -> DIRTY WATER DIVERSION
  - SEDIMENT FENCE
  - BUND
  - ▶ ROCK FILTER DAM



- NOTES**
1. FOR GENERAL NOTES REFER TO DRAWINGS FROM 3-0001-240-PEN-00-DR-0101
  2. FOR LEGEND REFER TO DRAWING 3-0001-240-PEN-00-DR-0201
  3. FOR CULVERT DETAILS REFER TO DRAWINGS FROM 3-0001-240-CDR-00-DR-3011
  4. FOR UTILITY IMPACT SCHEDULES REFER TO DRAWINGS FROM 3-0001-240-PUP-00-DR-1001



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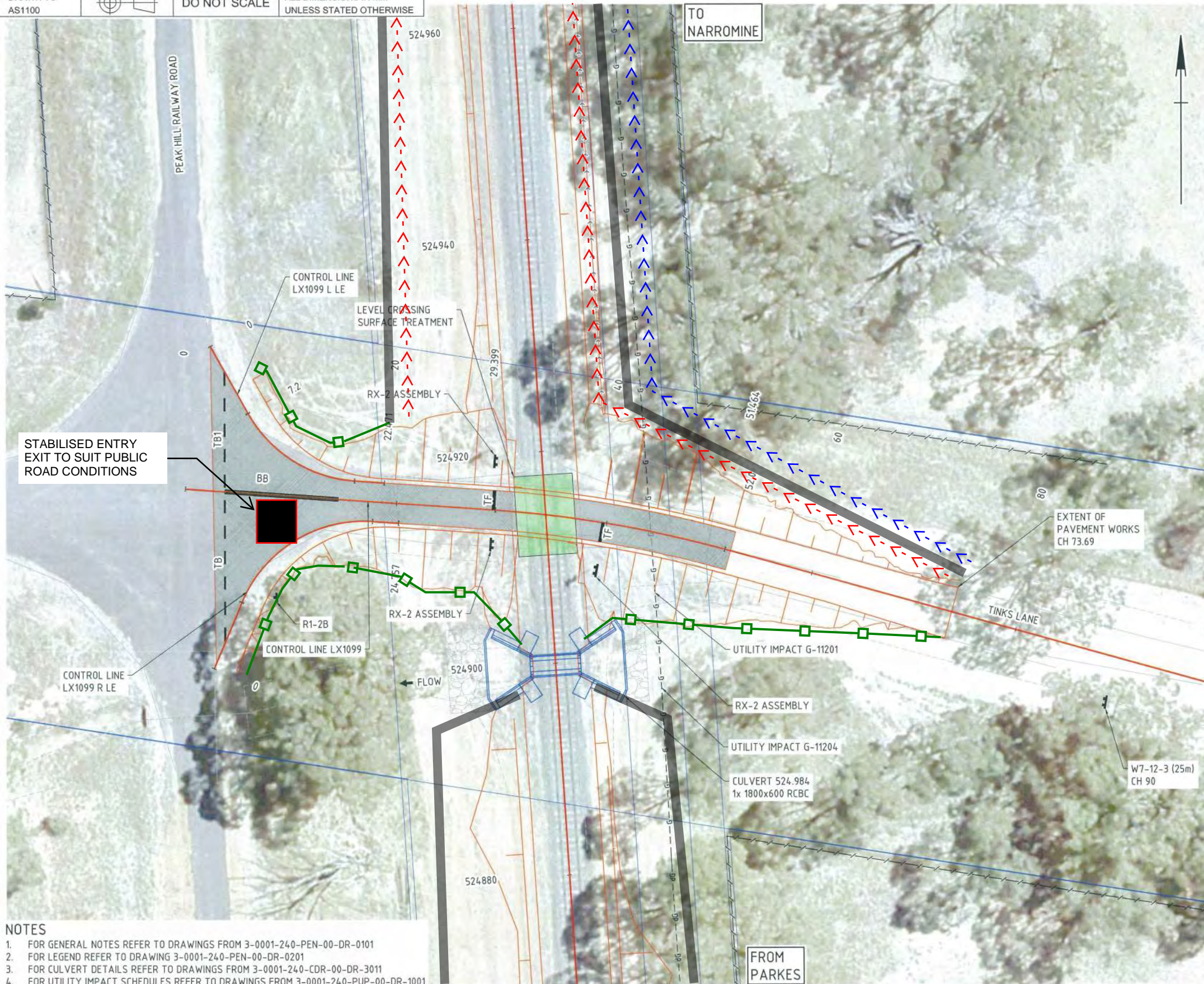
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RPEQ / SIGNATURE (IF REQUIRED) <i>Dealy</i> CPESC: 6374		

PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN LEVEL CROSSINGS		
PROJECT No 18-0101	DRAWING No F13	REVISION A



DRAWN TO AS1100 | DO NOT SCALE | ALL DIMENSIONS IN MM UNLESS STATED OTHERWISE

- LEGEND:**
- > -> -> CLEAN WATER DIVERSION
  - > -> -> DIRTY WATER DIVERSION
  - SEDIMENT FENCE
  - BUND
  - STABILISED ENTRY/EXIT



- NOTES**
1. FOR GENERAL NOTES REFER TO DRAWINGS FROM 3-0001-240-PEN-00-DR-0101
  2. FOR LEGEND REFER TO DRAWING 3-0001-240-PEN-00-DR-0201
  3. FOR CULVERT DETAILS REFER TO DRAWINGS FROM 3-0001-240-CDR-00-DR-3011
  4. FOR UTILITY IMPACT SCHEDULES REFER TO DRAWINGS FROM 3-0001-240-PUP-00-DR-1001



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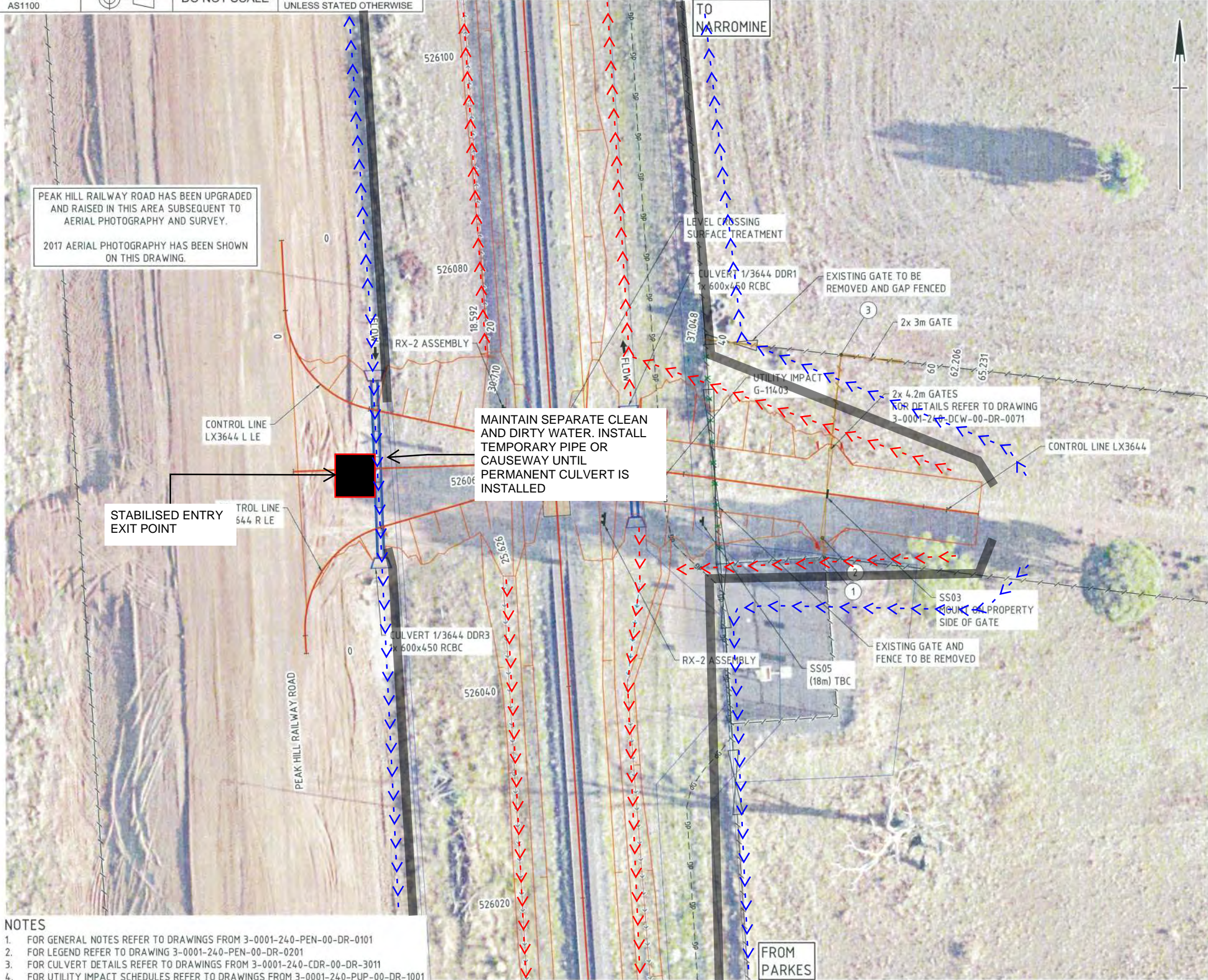
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DRAWN TB	DESIGNED TB	DATE 20/12/2018
RPEQ / SIGNATURE (IF REQUIRED) <i>[Signature]</i> CPESC: 6374		

PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN LEVEL CROSSINGS		
PROJECT No 18-0101	DRAWING No F14	REVISION A



DRAWN TO AS1100 | DO NOT SCALE | ALL DIMENSIONS IN MM UNLESS STATED OTHERWISE

- LEGEND:**
- >->- CLEAN WATER DIVERSION
  - >->- DIRTY WATER DIVERSION
  - SEDIMENT FENCE
  - BUND
  - STABILISED ENTRY/EXIT



- NOTES**
1. FOR GENERAL NOTES REFER TO DRAWINGS FROM 3-0001-240-PEN-00-DR-0101
  2. FOR LEGEND REFER TO DRAWING 3-0001-240-PEN-00-DR-0201
  3. FOR CULVERT DETAILS REFER TO DRAWINGS FROM 3-0001-240-CDR-00-DR-3011
  4. FOR UTILITY IMPACT SCHEDULES REFER TO DRAWINGS FROM 3-0001-240-PUP-00-DR-1001



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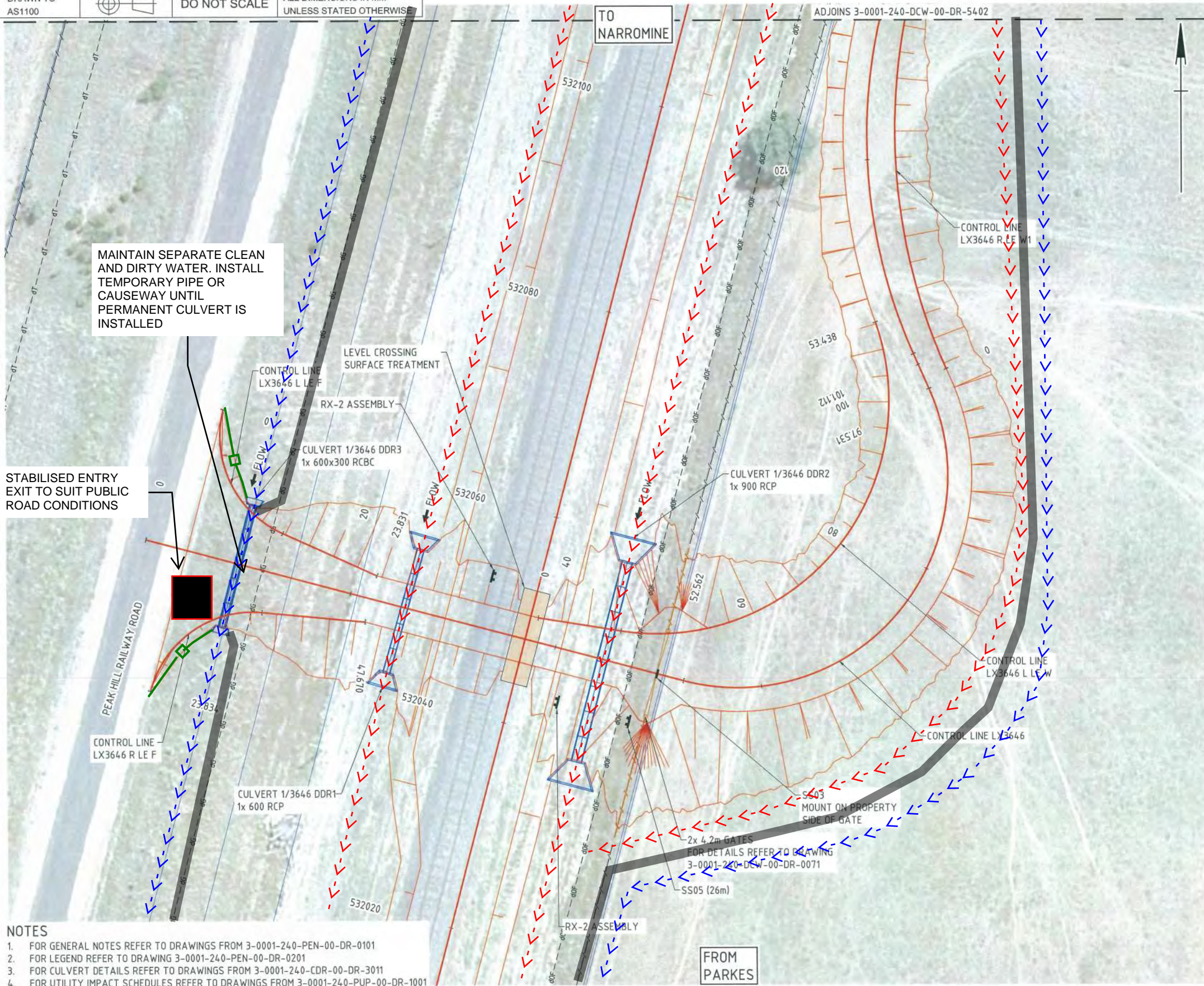
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DRAWN TB	DESIGNED TB	DATE 20/12/2018
RPEQ / SIGNATURE (IF REQUIRED) <i>[Signature]</i> CPESC: 6374		

PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN LEVEL CROSSINGS		
PROJECT No 18-0101	DRAWING No F15	REVISION A



DRAWN TO AS1100 | DO NOT SCALE | ALL DIMENSIONS IN MM UNLESS STATED OTHERWISE

- LEGEND:**
- > -> CLEAN WATER DIVERSION
  - > -> DIRTY WATER DIVERSION
  - SEDIMENT FENCE
  - ▬ BUND
  - STABILISED ENTRY/EXIT



MAINTAIN SEPARATE CLEAN AND DIRTY WATER. INSTALL TEMPORARY PIPE OR CAUSEWAY UNTIL PERMANENT CULVERT IS INSTALLED

STABILISED ENTRY EXIT TO SUIT PUBLIC ROAD CONDITIONS

- NOTES**
- FOR GENERAL NOTES REFER TO DRAWINGS FROM 3-0001-240-PEN-00-DR-0101
  - FOR GENERAL NOTES REFER TO DRAWINGS FROM 3-0001-240-PEN-00-DR-0201
  - FOR CULVERT DETAILS REFER TO DRAWINGS FROM 3-0001-240-CDR-00-DR-3011
  - FOR UTILITY IMPACT SCHEDULES REFER TO DRAWINGS FROM 3-0001-240-PUP-00-DR-1001



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TB	TB	20/12/2018	
RPEQ / SIGNATURE (IF REQUIRED)			
		CPESC: 6374	

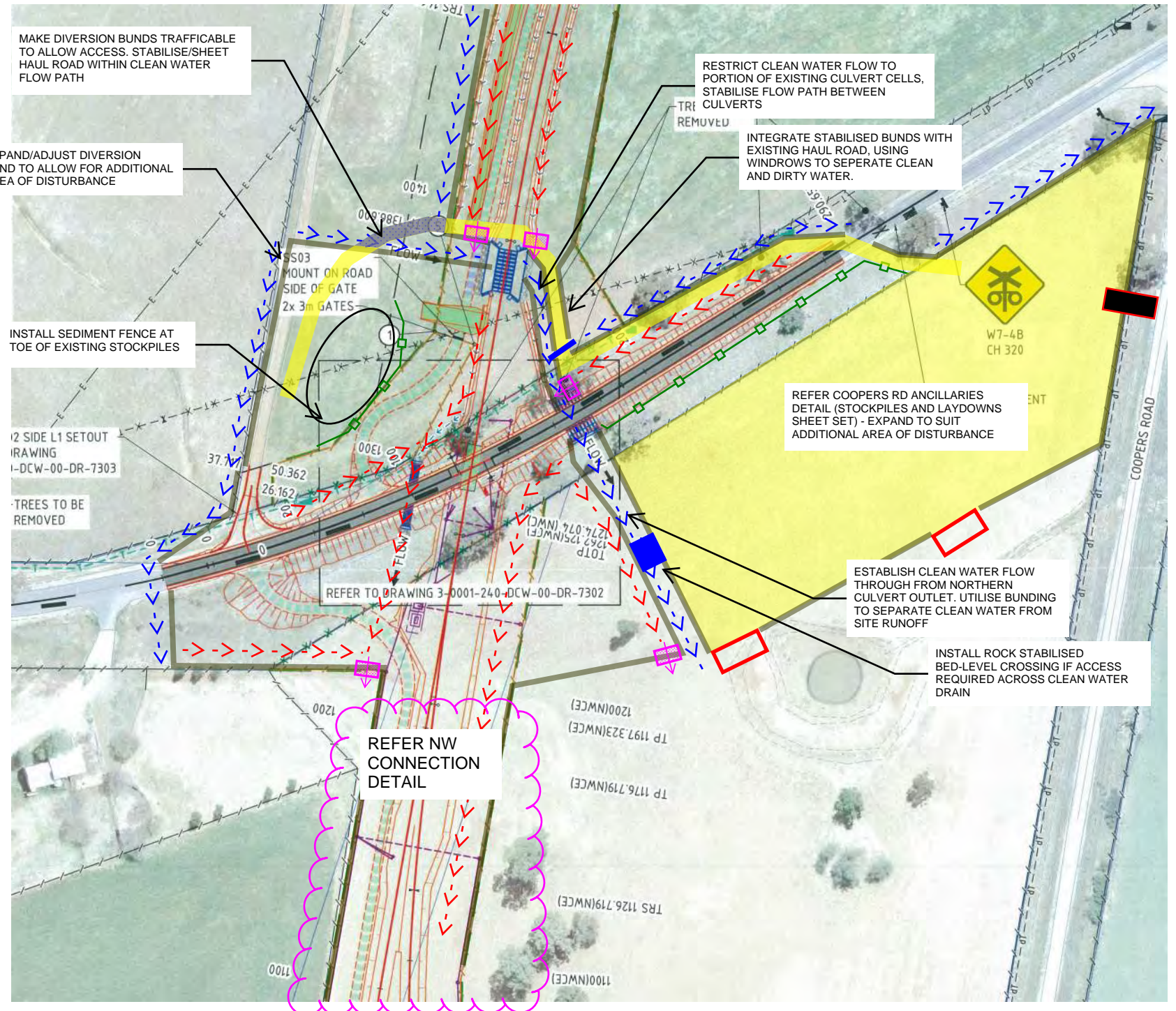
PROJECT		INLAND RAIL - PARKES TO NARROMINE	
DRAWING TITLE		EROSION AND SEDIMENT CONTROL PLAN LEVEL CROSSINGS	
PROJECT No	DRAWING No	REVISION	
18-0101	F16	A	







- LEGEND:**
- > -> - CLEAN WATER DIVERSION
  - > -> - DIRTY WATER DIVERSION
  - SEDIMENT FENCE
  - STABILISED BUND
  - EXISTING HAUL ROAD / HARDSTAND
  - ⊠ RFD
  - TEMPORARY PIPE



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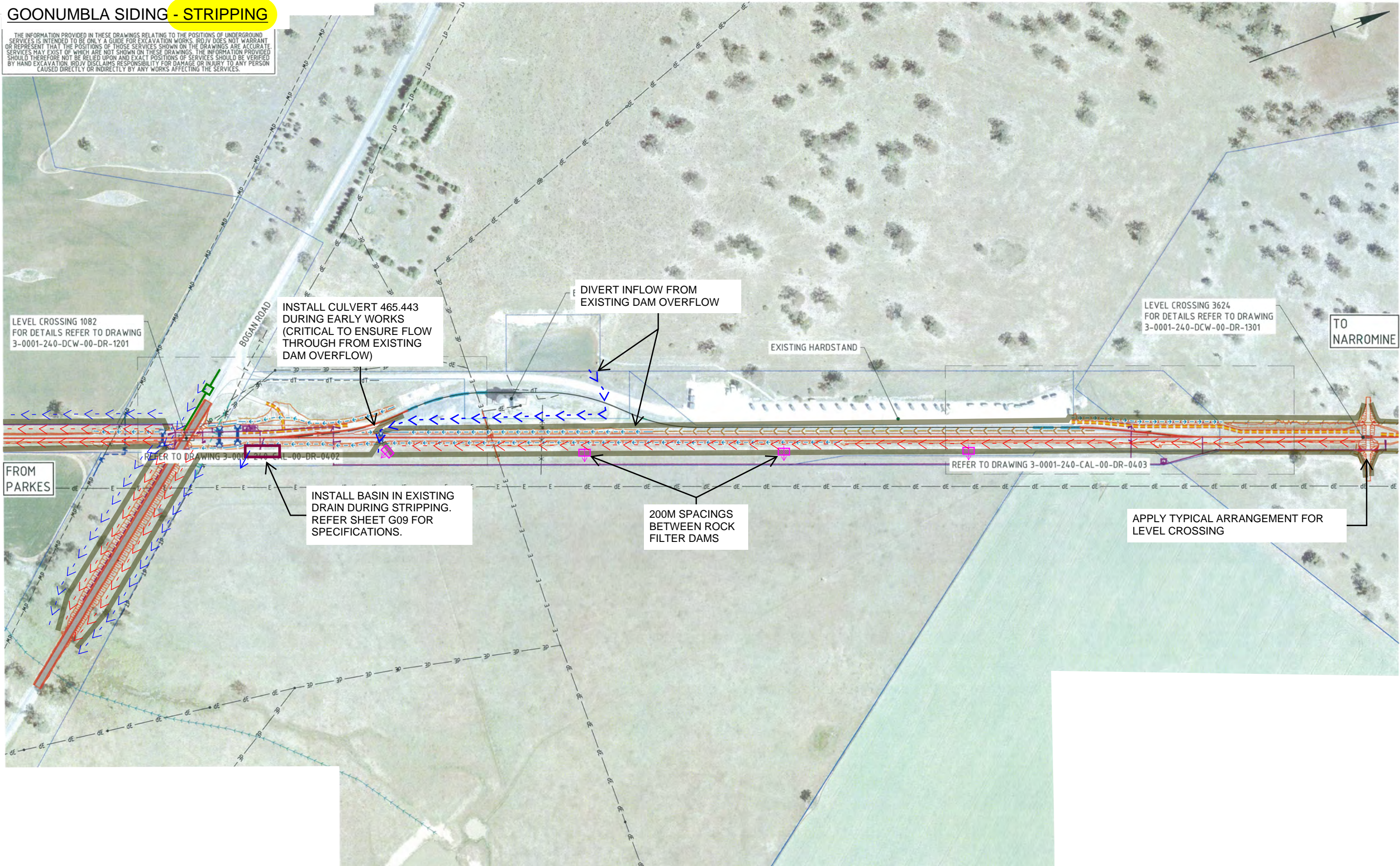
CLIENT INLink		
DRAWN TB	DESIGNED TB	DATE 9/7/2019
RPEQ / SIGNATURE (IF REQUIRED) <i>Debra</i> CPESC: 6374		

PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN LEVEL CROSSINGS		
PROJECT No 18-0101	DRAWING No F18	REVISION A



# GOONUMBLA SIDING - STRIPPING

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RPEQ / SIGNATURE (IF REQUIRED) CPESC: 6374		

PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN SIDINGS		
PROJECT No 18-0101	DRAWING No G00	REVISION A



**WARNING AND DISCLAIMER - BEWARE OF UNDERGROUND SERVICES**  
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REPLACE SEDIMENT FENCE WITH DIVERSION BUND TO DIRECT INFLOW TO NEARBY CULVERT AFTER INSTALLATION

USE BUND TO INTERCEPT INFLOW FROM EXISTING TABLE DRAIN

EXISTING ROAD DIVERTS INFLOW TO EXISTING DAM

EXISTING LEVEL CROSSING TO BE REMOVED  
 INSTALL BUND TO PREVENT CONTAMINATION OF CLEAN WATER INFLOW

LEVEL CROSSING LX1082 FOR DETAILS REFER TO DRAWING 3-0001-240-DCW-00-DR-1201

NEW SIGNALING EQUIPMENT ROOM

CESS DRAIN TO BE LOCALLY SHAPED TO TIE INTO EXISTING ROAD

FROM PARKES

TOTP CH 465317.000  
 NEW 1 IN 10.5 (LH -R250) TURNOUT  
 60kg RAIL ON CONCRETE SLEEPERS  
 D<sub>max</sub> - 15.79 mm/s (25km/h)

CLEARANCE POINT  
 CH 465377.128  
 N - 6348370.674429  
 E - 605459.178312

NEW CATCH POINT (TOS)  
 TOS CH 465392.128  
 60kg RAIL ON CONCRETE SLEEPERS  
 N - 6348385.971987  
 E - 605460.742544

PLAN SCALE 1:500

STABILISED ACCESS POINTS

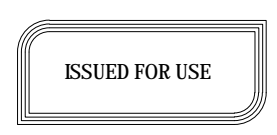
RELOCATE BASIN AFTER EARTHWORKS

DIVERT FLOW FROM TABLE DRAIN INTO BASIN



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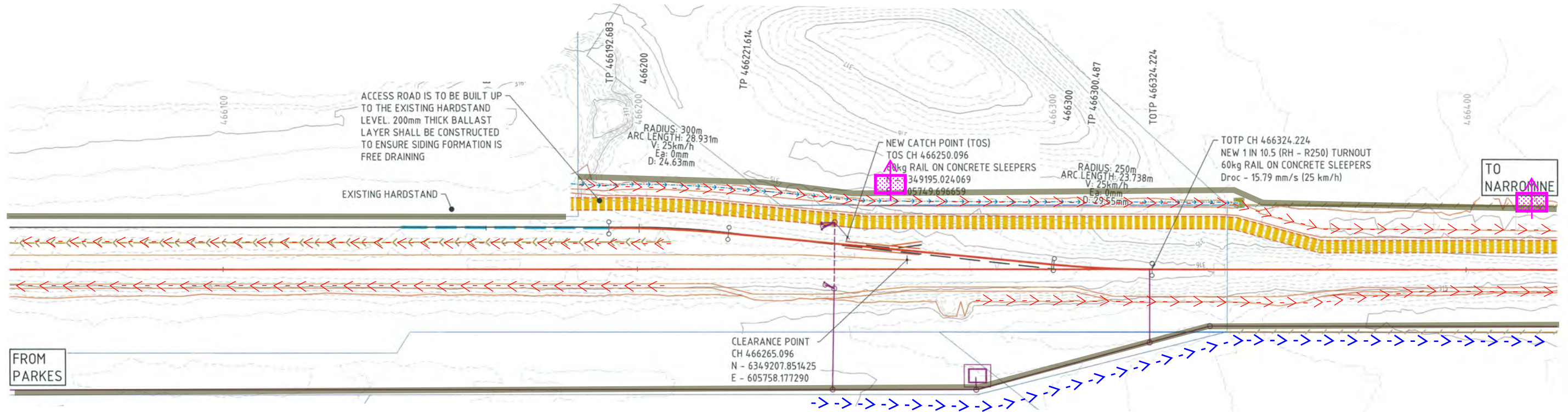
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RPEQ / SIGNATURE (IF REQUIRED) CPESC: 6374		

PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN SIDINGS		
PROJECT No 18-0101	DRAWING No G01	REVISION A



**LEGEND:**

- > -> -> CLEAN WATER DIVERSION
- > -> -> DIRTY WATER DIVERSION
- █ BUND
- ⊞ ROCK FILTER DAM



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PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN SIDINGS		
PROJECT No 18-0101	DRAWING No G02	REVISION A



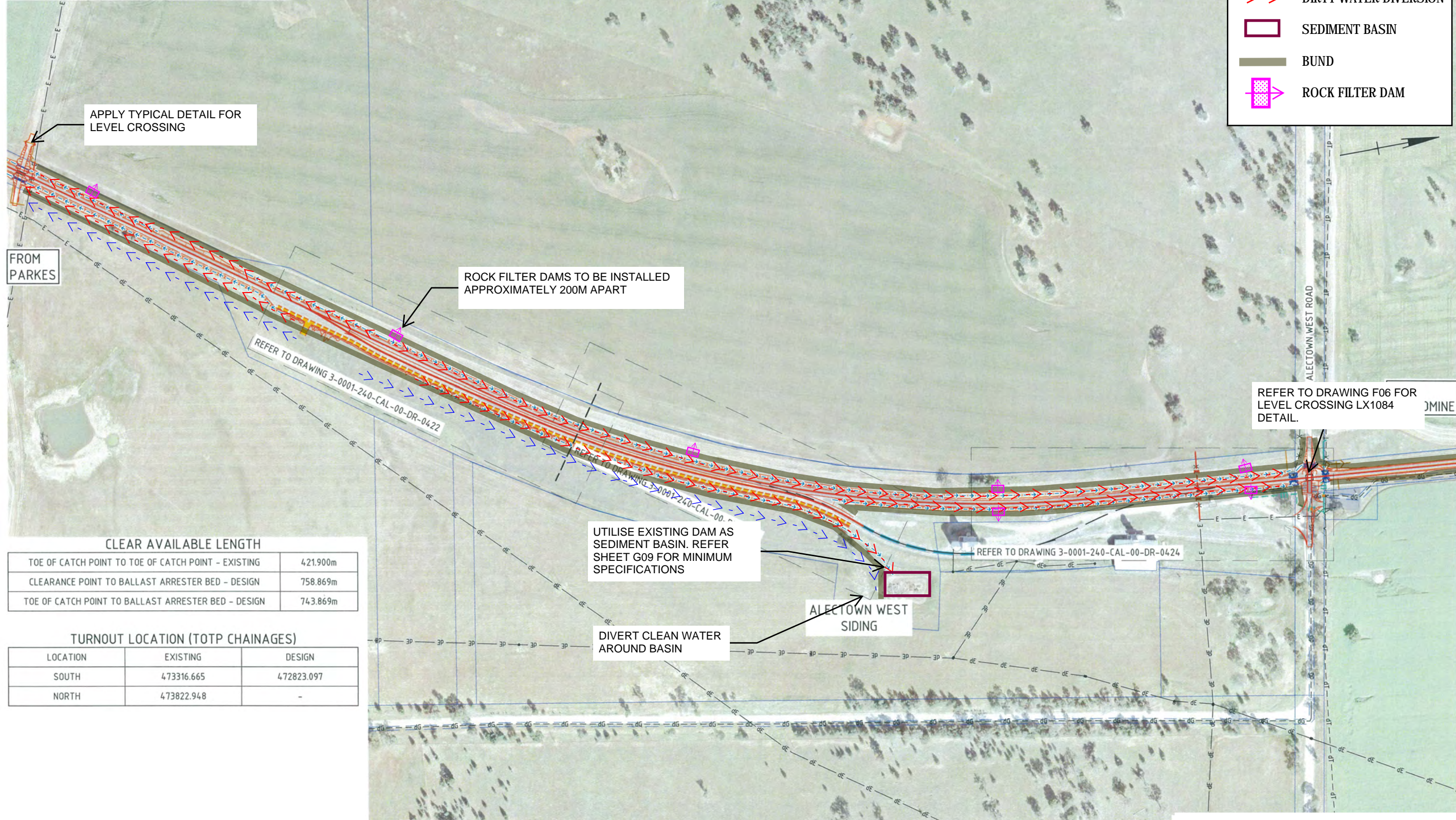
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SERVICES

**LEGEND:**

- > -> CLEAN WATER DIVERSION
- > -> DIRTY WATER DIVERSION
- SEDIMENT BASIN
- BUND
- ⊞ ROCK FILTER DAM



**CLEAR AVAILABLE LENGTH**

TOE OF CATCH POINT TO TOE OF CATCH POINT - EXISTING	421.900m
CLEARANCE POINT TO BALLAST ARRESTER BED - DESIGN	758.869m
TOE OF CATCH POINT TO BALLAST ARRESTER BED - DESIGN	743.869m

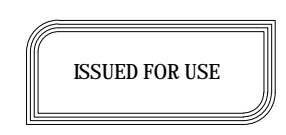
**TURNOUT LOCATION (TOTP CHAINAGES)**

LOCATION	EXISTING	DESIGN
SOUTH	473316.665	472823.097
NORTH	473822.948	-



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A	ORIGINAL ISSUE	TB	11/01/2019

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RPEQ / SIGNATURE (IF REQUIRED)			
CPESC: 6374			

PROJECT	INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE	EROSION AND SEDIMENT CONTROL PLAN SIDINGS		
PROJECT No	DRAWING No	REVISION	
18-0101	G03	A	

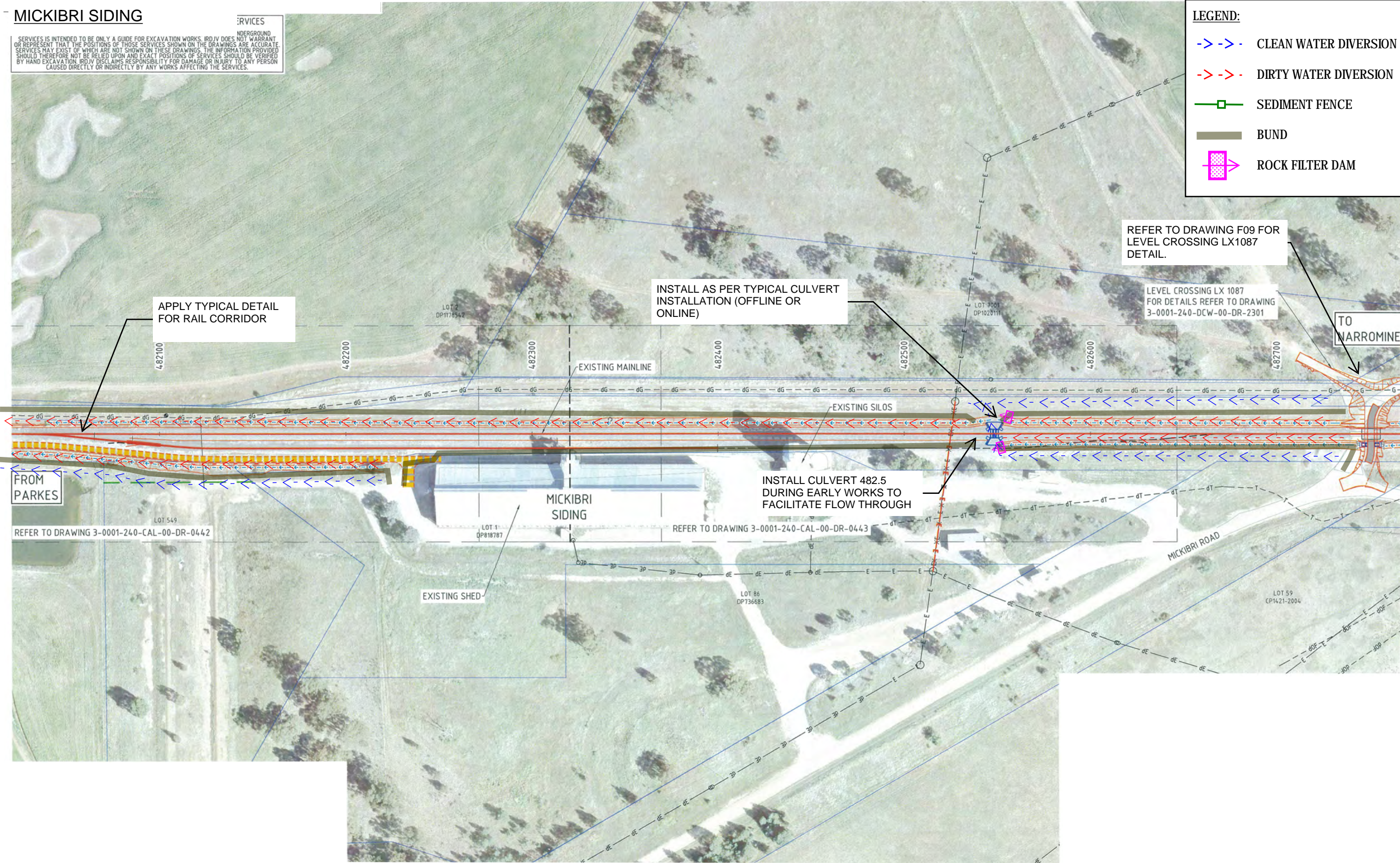


**MICKIBRI SIDING**

**SERVICES**  
 UNDERGROUND SERVICES IS INTENDED TO BE ONLY A GUIDE FOR EXCAVATION WORKS. IRDJV DOES NOT WARRANT OR REPRESENT THAT THE POSITIONS OF THOSE SERVICES SHOWN ON THE DRAWINGS ARE ACCURATE. SERVICES MAY EXIST OF WHICH ARE NOT SHOWN ON THESE DRAWINGS. THE INFORMATION PROVIDED SHOULD THEREFORE NOT BE RELIED UPON AND EXACT POSITIONS OF SERVICES SHOULD BE VERIFIED BY HAND EXCAVATION. IRDJV DISCLAIMS RESPONSIBILITY FOR DAMAGE OR INJURY TO ANY PERSON CAUSED DIRECTLY OR INDIRECTLY BY ANY WORKS AFFECTING THE SERVICES.

**LEGEND:**

- > -> -> CLEAN WATER DIVERSION
- > -> -> DIRTY WATER DIVERSION
- SEDIMENT FENCE
- BUND
- ▶ ROCK FILTER DAM



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RPEQ / SIGNATURE (IF REQUIRED) CPESC: 6374		

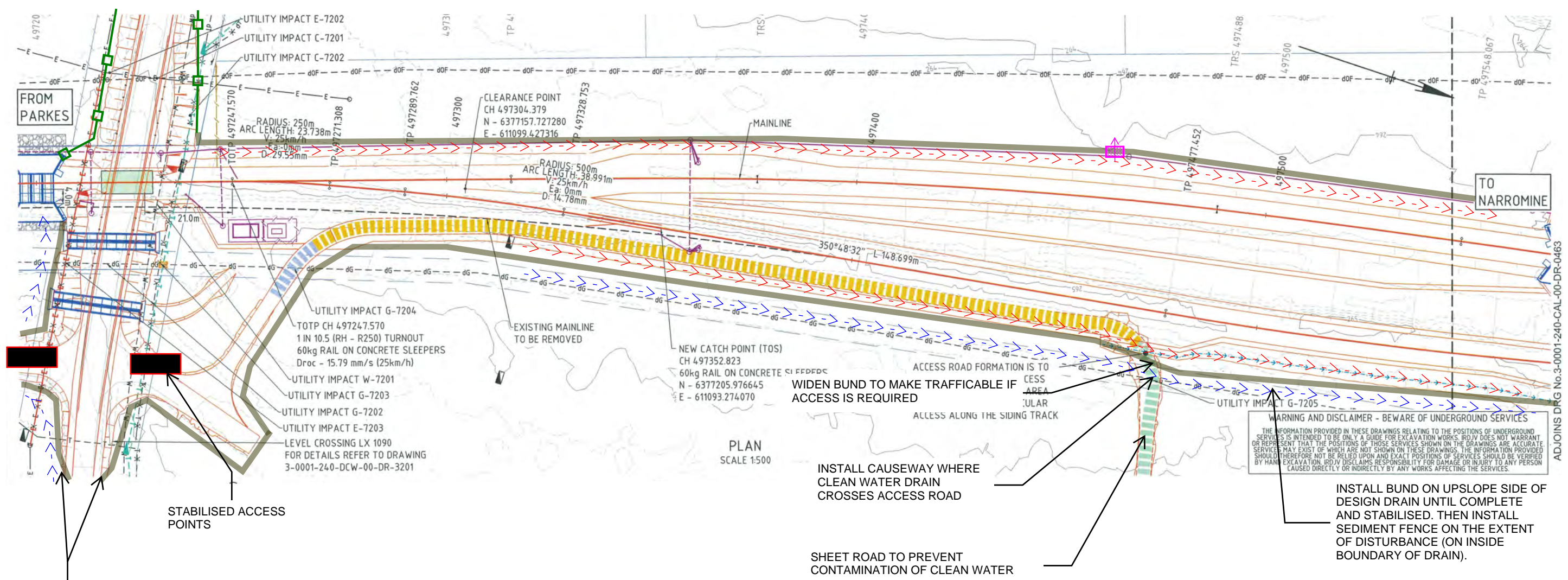
PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN SIDINGS		
PROJECT No 18-0101	DRAWING No G04	REVISION A



PEAK HILL SIDING

LEGEND:

- > -> -> CLEAN WATER DIVERSION
- > -> -> DIRTY WATER DIVERSION
- SEDIMENT FENCE
- BUND
- [ ] — ROCK FILTER DAM



PLAN SCALE 1:500

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EXTEND BUNDS TO INTERCEPT INFLOW FROM EXISTING TABLE DRAIN

STABILISED ACCESS POINTS

INSTALL CAUSEWAY WHERE CLEAN WATER DRAIN CROSSES ACCESS ROAD

SHEET ROAD TO PREVENT CONTAMINATION OF CLEAN WATER

INSTALL BUND ON UPSLOPE SIDE OF DESIGN DRAIN UNTIL COMPLETE AND STABILISED. THEN INSTALL SEDIMENT FENCE ON THE EXTENT OF DISTURBANCE (ON INSIDE BOUNDARY OF DRAIN).



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PROJECT	INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE	EROSION AND SEDIMENT CONTROL PLAN SIDINGS		
PROJECT No	DRAWING No	REVISION	
18-0101	G05	A	

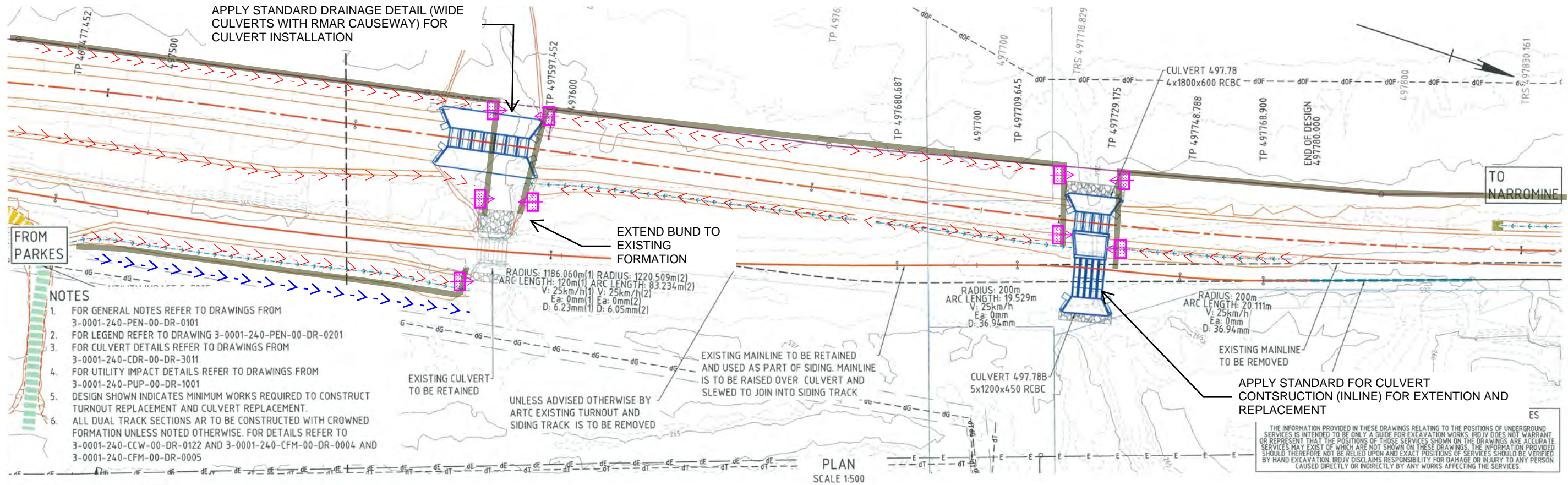
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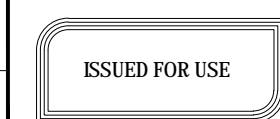
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- > -> -> DIRTY WATER DIVERSION
- █ BUND
- ▣ ROCK FILTER DAM

**PEAK HILL SIDING**



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PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN SIDINGS		
PROJECT No 18-0101	DRAWING No G06	REVISION A



PEAK HILL SIDING

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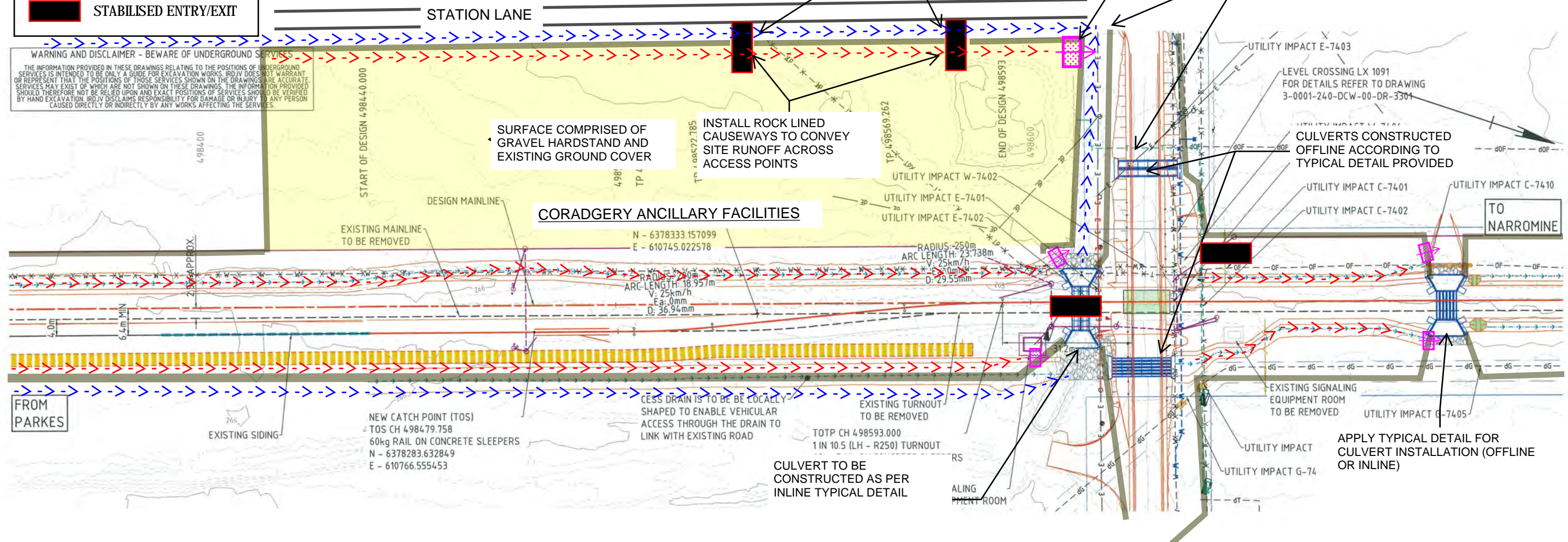
- > -> -> CLEAN WATER DIVERSION
- > -> -> DIRTY WATER DIVERSION
- SEDIMENT FENCE
- BUND
- ▶ ROCK FILTER DAM
- STABILISED ENTRY/EXIT

STABILISED ACCESS FROM STATION LANE. INSTALL PIPES TO MAINTAIN FLOW IN EXISTING SWALE/TABLE DRAIN.

ROCK FILTER DAM OR EXCAVATED SEDIMENT TRAP AT OUTLET

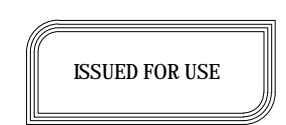
AFTER FILLING TO STATION LANE BLOCKS OUTLET, DIRECT INFLOW TO NEWLY INSTALLED CULVERTS

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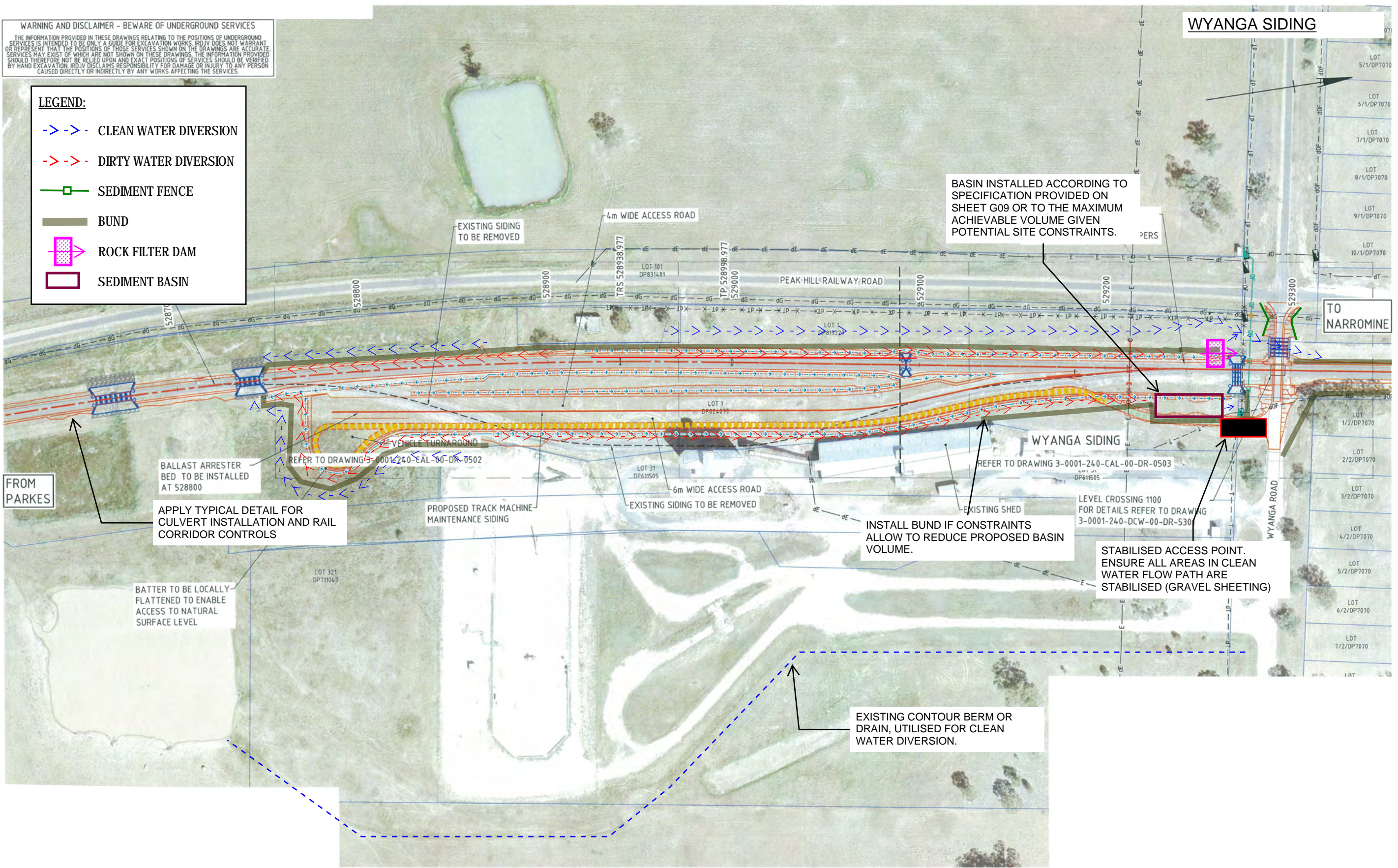
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PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN SIDINGS		
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- LEGEND:**
- >->- CLEAN WATER DIVERSION
  - >->- DIRTY WATER DIVERSION
  - SEDIMENT FENCE
  - BUND
  - ▶— ROCK FILTER DAM
  - SEDIMENT BASIN



FROM PARKES

WYANGA SIDING

TO NARROMINE

EXISTING CONTOUR BERM OR DRAIN, UTILISED FOR CLEAN WATER DIVERSION.



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PROJECT INLAND RAIL - PARKES TO NARROMINE		
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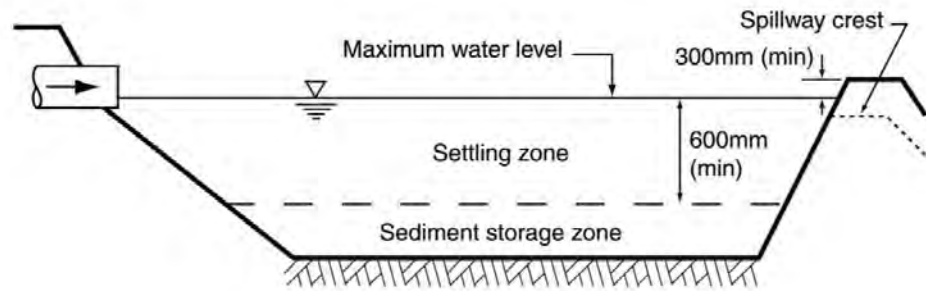
## SEDIMENT BASIN SIZING

	Catchment Area (Ha)	R (80 <sup>th</sup> % <sub>10</sub> <sup>5</sup> -day) (mm)	Runoff Coefficient (Cv)	Settling Zone Vol. (Vset) (m <sup>3</sup> )	Sediment Storage Vol. (Vstor) (m <sup>3</sup> )	Total Volume (m <sup>3</sup> )
Goonumbla Siding	1.5	22.8	0.7	239	5	244
Alectown West Siding	1.1	22.8	0.7	176	3	179
Wyanga Siding	6.3	22.8	0.7	1005	21	1026

80th percentile 5 day rainfall depth adopted for Dubbo, considered conservative for entire site with increased IFD data observed in the north.

## SPILLWAY SIZING

	Flow		Weir and Chute				Dissipater			
	Q <sub>10</sub> (m <sup>3</sup> /s)	V (m/s)	Depth* (m)	Base Width (m)	Side Slope	Lining	Rock Size D <sub>50</sub> (mm)	Width 1 (m)	Width 2 (m)	Length (m)
Goonumbla Siding	0.23	0.72	0.50	2	2	50mm D50 Rock	100	4.4	4.4	1.0
Alectown West Siding	0.18	0.67	0.50	2	2	50mm D50 Rock	100	4.3	4.3	1.0
Wyanga Siding	0.84	0.88	0.50	5	2	50mm D50 Rock	100	7.5	7.5	1.0



TYPE D SEDIMENT BASIN - PROFILE (TYPICAL)

### SEDIMENT BASIN - MATERIALS

EARTH FILL: CLEAN SOIL WITH EMERSON CLASS 2(1), 3, 4, OR 5, AND FREE OF ROOTS, WOODY VEGETATION, ROCKS AND OTHER UNSUITABLE MATERIAL. SOIL WITH EMERSON CLASS 4 AND 5 MAY NOT BE SUITABLE DEPENDING ON PARTICLE SIZE DISTRIBUTION AND DEGREE OF DISPERSION. CLASS 2(1) SHOULD ONLY BE USED UPON RECOMMENDATION FROM GEOTECHNICAL SPECIALIST. THIS SPECIFICATION MAY BE REPLACED BY AN EQUIVALENT STANDARD BASED ON THE EXCHANGEABLE SODIUM PERCENTAGE.

RISER PIPE: MINIMUM 250mm DIAMETER.

SPILLWAY ROCK: HARD, ANGULAR, DURABLE, WEATHER RESISTANT AND EVENLY GRADED ROCK WITH 50% BY WEIGHT LARGER THAN THE SPECIFIED NOMINAL (d50) ROCK SIZE. LARGE ROCK SHOULD DOMINATE, WITH SUFFICIENT SMALL ROCK TO FILL THE VOIDS BETWEEN THE LARGER ROCK. THE DIAMETER OF THE LARGEST ROCK SIZE SHOULD BE NO LARGER THAN 1.5 TIMES THE NOMINAL ROCK SIZE. THE SPECIFIC GRAVITY SHOULD BE AT LEAST 2.5.

GEOTEXTILE FABRIC: HEAVY-DUTY, NEEDLE-PUNCHED, NON-WOVEN FILTER CLOTH, MINIMUM 'BIDIM' A24 OR EQUIVALENT.

### SEDIMENT BASIN - CONSTRUCTION

1. NOTWITHSTANDING ANY DESCRIPTION CONTAINED WITHIN THE APPROVED PLANS OR SPECIFICATIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SATISFYING THEMSELVES AS TO THE NATURE AND EXTENT OF THE SPECIFIED WORKS AND THE PHYSICAL AND LEGAL CONDITIONS UNDER WHICH THE WORKS WILL BE CARRIED OUT. THIS SHALL INCLUDE MEANS OF ACCESS, EXTENT OF CLEARING, NATURE OF MATERIAL TO BE EXCAVATED, TYPE AND SIZE OF MECHANICAL PLANT REQUIRED, LOCATION AND SUITABILITY OF WATER SUPPLY FOR CONSTRUCTION AND TESTING PURPOSES, AND ANY OTHER LIKE MATTERS AFFECTING THE CONSTRUCTION OF THE WORKS.

2. REFER TO APPROVED PLANS FOR LOCATION, DIMENSIONS, AND CONSTRUCTION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

3. BEFORE STARTING ANY CLEARING OR CONSTRUCTION, ENSURE ALL THE NECESSARY MATERIALS AND COMPONENTS ARE ON THE SITE TO AVOID DELAYS IN COMPLETING THE POND ONCE WORKS BEGIN.

4. INSTALL REQUIRED SHORT-TERM SEDIMENT CONTROL MEASURES DOWNSTREAM OF THE PROPOSED EARTHWORKS TO CONTROL SEDIMENT RUNOFF DURING CONSTRUCTION OF THE BASIN.

5. THE AREA TO BE COVERED BY THE EMBANKMENT, BORROW PITS AND INCIDENTAL WORKS, TOGETHER WITH AN AREA EXTENDING BEYOND THE LIMITS OF EACH FOR A DISTANCE NOT EXCEEDING FIVE (5) METRES ALL AROUND MUST BE CLEARED OF ALL TREES, SCRUB, STUMPS, ROOTS, DEAD TIMBER AND RUBBISH AND DISPOSED OF IN A SUITABLE MANNER. DELAY CLEARING THE MAIN POND AREA UNTIL THE EMBANKMENT IS COMPLETE.

6. ENSURE ALL HOLES MADE BY GRUBBING WITHIN THE EMBANKMENT FOOTPRINT ARE FILLED WITH SOUND MATERIAL, ADEQUATELY COMPACTED, AND FINISHED FLUSH WITH THE NATURAL SURFACE.

CUT-OFF TRENCH:

7. BEFORE CONSTRUCTION OF THE CUT-OFF TRENCH OR ANY ANCILLARY WORKS WITHIN THE EMBANKMENT FOOTPRINT, ALL GRASS GROWTH AND TOPSOIL MUST BE REMOVED FROM THE AREA TO BE OCCUPIED BY THE EMBANKMENT AND MUST BE DEPOSITED CLEAR OF THIS AREA AND RESERVED FOR TOPDRESSING THE COMPLETING THE EMBANKMENT.

8. EXCAVATE A CUT-OFF TRENCH ALONG THE CENTRE LINE OF THE EARTH FILL EMBANKMENT. CUT THE TRENCH TO STABLE SOIL MATERIAL, BUT IN NO CASE MAKE IT LESS THAN 600mm DEEP. THE CUT-OFF TRENCH MUST EXTEND INTO BOTH ABUTMENTS TO AT LEAST THE ELEVATION OF THE RISER PIPE CREST. MAKE THE MINIMUM BOTTOM WIDTH

WIDE ENOUGH TO PERMIT OPERATION OF EXCAVATION AND COMPACTION EQUIPMENT, BUT IN NO CASE LESS THAN 600mm. MAKE THE SIDE SLOPES OF THE TRENCH NO STEEPER THAN 1:1 (H:V).

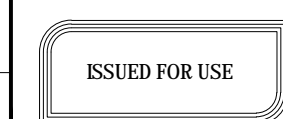
9. ENSURE ALL WATER, LOOSE SOIL, AND ROCK ARE REMOVED FROM THE TRENCH BEFORE BACKFILLING COMMENCES. THE CUT-OFF TRENCH MUST BE BACKFILLED WITH SELECTED EARTH-FILL OF THE TYPE SPECIFIED FOR THE EMBANKMENT, AND THIS SOIL MUST HAVE A MOISTURE CONTENT AND DEGREE OF COMPACTION THE SAME AS THAT SPECIFIED FOR THE SELECTED CORE ZONE.

10. MATERIAL EXCAVATED FROM THE CUT-OFF TRENCH MAY BE USED IN CONSTRUCTION OF THE EMBANKMENT PROVIDED IT IS SUITABLE AND IT IS PLACED IN THE CORRECT ZONE ACCORDING TO ITS CLASSIFICATION.



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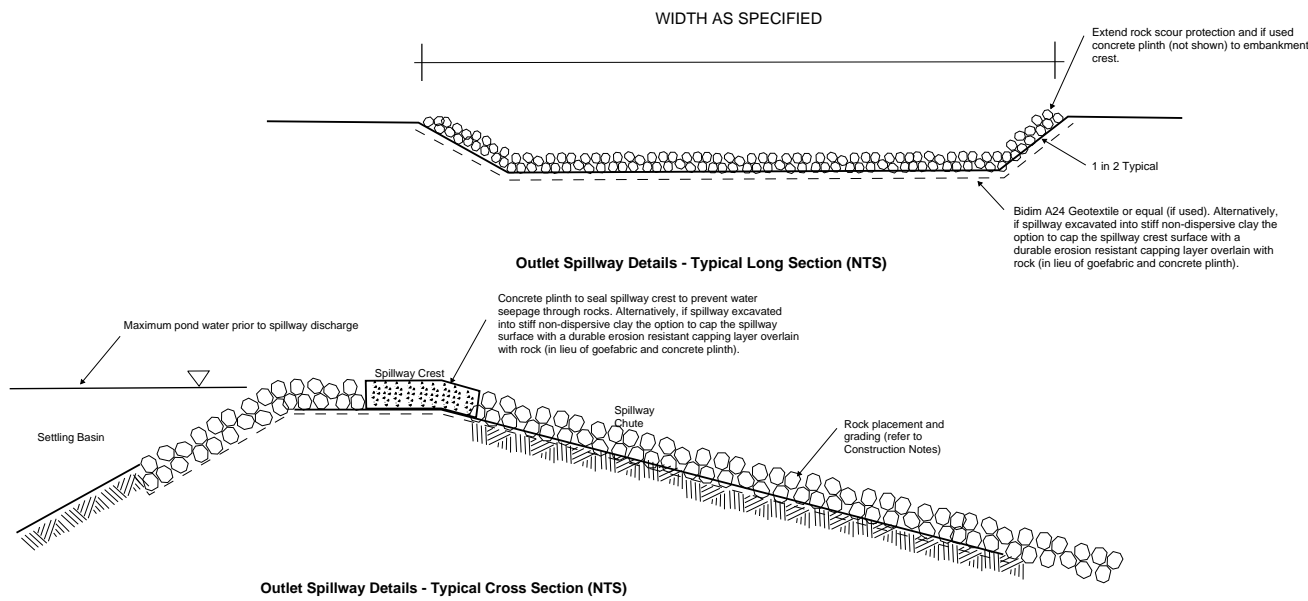
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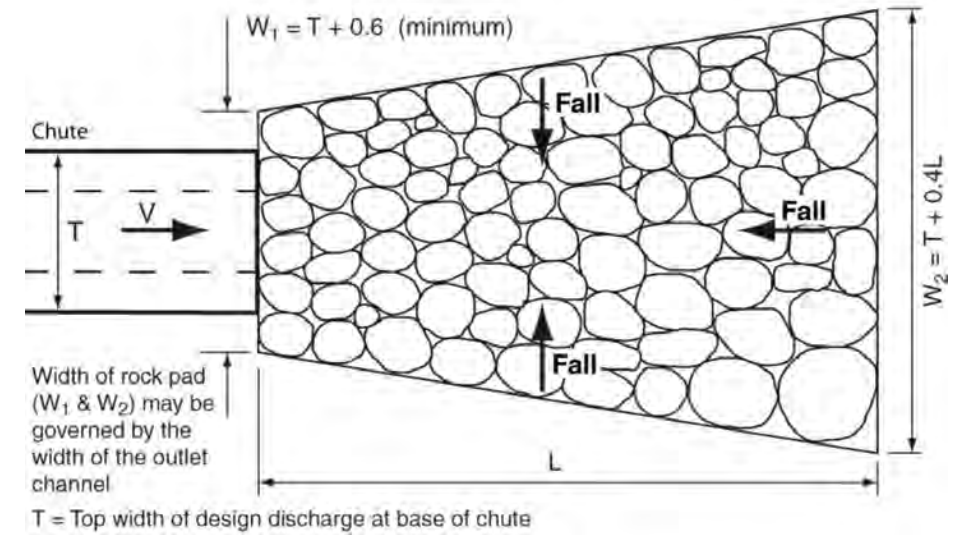
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DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN SIDINGS		
PROJECT No 18-0101	DRAWING No G09	REVISION A



**SPILLWAY**



**DISSIPATER**



**SEDIMENT BASIN - SPILLWAY**

- 21. THE SPILLWAY MUST BE EXCAVATED AS SHOWN ON THE PLANS, AND THE EXCAVATED MATERIAL IF CLASSIFIED AS SUITABLE, MUST BE USED IN THE EMBANKMENT, AND IF NOT SUITABLE IT MUST BE DISPOSED OF INTO SPOIL HEAPS.
- 22. ENSURE EXCAVATED DIMENSIONS ALLOW ADEQUATE BOXING-OUT SUCH THAT THE SPECIFIED ELEVATIONS, GRADES, CHUTE WIDTH, AND ENTRANCE AND EXIT SLOPES FOR THE EMERGENCY SPILLWAY WILL BE ACHIEVED AFTER PLACEMENT OF THE ROCK OR OTHER SCOUR PROTECTION MEASURES AS SPECIFIED IN THE PLANS.
- 23. PLACE SPECIFIED SCOUR PROTECTION MEASURES ON THE EMERGENCY SPILLWAY. ENSURE THE FINISHED GRADE BLENDS WITH THE SURROUNDING AREA TO ALLOW A SMOOTH FLOW TRANSITION FROM SPILLWAY TO DOWNSTREAM CHANNEL.
- 24. IF A SYNTHETIC FILTER FABRIC UNDERLAY IS SPECIFIED, PLACE THE FILTER FABRIC DIRECTLY ON THE PREPARED FOUNDATION. IF MORE THAN ONE SHEET OF FILTER FABRIC IS REQUIRED, OVERLAP THE EDGES BY AT LEAST 300mm AND PLACE ANCHOR PINS AT MINIMUM 1m SPACING ALONG THE OVERLAP. BURY THE UPSTREAM END OF THE FABRIC A MINIMUM 300mm BELOW GROUND AND WHERE NECESSARY, BURY THE LOWER END OF THE FABRIC OR OVERLAP A MINIMUM 300mm OVER THE NEXT DOWNSTREAM SECTION AS REQUIRED. ENSURE THE FILTER FABRIC EXTENDS AT LEAST 1000mm UPSTREAM OF THE SPILLWAY CREST.
- 25. TAKE CARE NOT TO DAMAGE THE FABRIC DURING OR AFTER PLACEMENT. IF DAMAGE OCCURS, REMOVE THE ROCK AND REPAIR THE SHEET BY ADDING ANOTHER LAYER OF FABRIC WITH A MINIMUM OVERLAP OF 300mm AROUND THE DAMAGED AREA. IF EXTENSIVE DAMAGE IS SUSPECTED, REMOVE AND REPLACE THE ENTIRE SHEET.
- 26. WHERE LARGE ROCK IS USED, OR MACHINE PLACEMENT IS DIFFICULT, A MINIMUM 100mm LAYER OF FINE GRAVEL, AGGREGATE, OR SAND MAY BE NEEDED TO PROTECT THE FABRIC.

- 27. PLACEMENT OF ROCK SHOULD FOLLOW IMMEDIATELY AFTER PLACEMENT OF THE FILTER FABRIC. PLACE ROCK SO THAT IT FORMS A DENSE, WELL-GRADED MASS OF ROCK WITH A MINIMUM OF VOIDS. THE DESIRED DISTRIBUTION OF ROCK THROUGHOUT THE MASS MAY BE OBTAINED BY SELECTIVE LOADING AT THE QUARRY AND CONTROLLED DUMPING DURING FINAL PLACEMENT.
- 28. THE FINISHED SLOPE SHOULD BE FREE OF POCKETS OF SMALL ROCK OR CLUSTERS OF LARGE ROCKS. HAND PLACING MAY BE NECESSARY TO ACHIEVE THE PROPER DISTRIBUTION OF ROCK SIZES TO PRODUCE A RELATIVELY SMOOTH, UNIFORM SURFACE. THE FINISHED GRADE OF THE ROCK SHOULD BLEND WITH THE SURROUNDING AREA, NO OVERFALL OR PROTRUSION OF ROCK SHOULD BE APPARENT.
- 29. ENSURE THAT THE FINAL ARRANGEMENT OF THE SPILLWAY CREST WILL NOT PROMOTE EXCESSIVE FLOW THROUGH THE ROCK SUCH THAT THE WATER CAN BE RETAINED WITHIN THE SETTLING BASIN AN ELEVATION NO LESS THAN 50mm ABOVE OR BELOW THE NOMINATED SPILLWAY CREST ELEVATION. ESTABLISHMENT OF SETTLING POND:
- 30. THE AREA TO BE COVERED BY THE STORED WATER OUTSIDE THE LIMITS OF THE BORROW PITS MUST BE CLEARED OF ALL SCRUB AND RUBBISH. TREES MUST BE CUT DOWN STUMP HIGH AND REMOVED FROM THE IMMEDIATE VICINITY OF THE WORK.
- 31. ESTABLISH ALL REQUIRED INFLOW CHUTES AND INLET BAFFLES, IF SPECIFIED, TO ENABLE WATER TO DISCHARGE INTO THE BASIN IN A MANNER THAT WILL NOT CAUSE SOIL EROSION OR THE RE-SUSPENSION OF SETTLED SEDIMENT.
- 32. INSTALL A SEDIMENT STORAGE LEVEL MARKER POST WITH A CROSS MEMBER SET JUST BELOW THE TOP OF THE SEDIMENT STORAGE ZONE (AS SPECIFIED ON THE APPROVED PLANS). USE AT LEAST A 75mm WIDE POST FIRMLY SET INTO THE BASIN FLOOR.

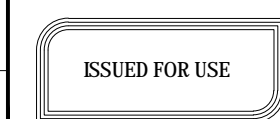
- 1. INSPECT THE SEDIMENT BASIN DURING THE FOLLOWING PERIODS:
  - (i) DURING CONSTRUCTION TO DETERMINE WHETHER MACHINERY, FALLING TREES, OR CONSTRUCTION ACTIVITY HAS DAMAGED ANY COMPONENTS OF THE SEDIMENT BASIN. IF DAMAGE HAS OCCURRED, REPAIR IT.
  - (ii) AFTER EACH RUNOFF EVENT. INSPECT THE EROSION DAMAGE AT FLOW ENTRY AND EXIT POINTS. IF DAMAGE HAS OCCURRED, MAKE THE NECESSARY REPAIRS.
  - (iii) AT LEAST WEEKLY DURING THE NOMINATED WET SEASON (IF ANY) OTHERWISE AT LEAST FORTNIGHTLY.
  - (iv) PRIOR TO, AND IMMEDIATELY AFTER, PERIODS OF 'STOP WORK' OR SITE SHUTDOWN.
- 2. CLEAN OUT ACCUMULATED SEDIMENT WHEN IT REACHES THE MARKER BOARD/POST, AND RESTORE THE ORIGINAL STORAGE VOLUME. PLACE SEDIMENT IN A DISPOSAL AREA OR, IF APPROPRIATE, MIX WITH DRY SOIL ON THE SITE.
- 3. DO NOT DISPOSE OF SEDIMENT IN A MANNER THAT WILL CREATE AN EROSION OR POLLUTION HAZARD.
- 4. CHECK ALL VISIBLE PIPE CONNECTIONS FOR LEAKS, AND REPAIR AS NECESSARY.
- 5. CHECK ALL EMBANKMENTS FOR EXCESSIVE SETTLEMENT, SLUMPING OF THE SLOPES OR PIPING BETWEEN THE CONDUIT AND THE EMBANKMENT. MAKE ALL NECESSARY REPAIRS.
- 6. REMOVE ALL TRASH AND OTHER DEBRIS FROM THE BASIN AND RISER.
- 7. SUBMERGED INFLOW PIPES MUST BE INSPECTED AND DE-SILTED (AS REQUIRED) AFTER EACH INFLOW EVENT.

- 1. WHEN GRADING AND CONSTRUCTION IN THE DRAINAGE AREA ABOVE A TEMPORARY SEDIMENT BASIN IS COMPLETED AND THE DISTURBED AREAS ARE ADEQUATELY STABILISED, THE BASIN MUST BE REMOVED OR OTHERWISE INCORPORATED INTO THE PERMANENT STORMWATER DRAINAGE SYSTEM. IN EITHER CASE, SEDIMENT SHOULD BE CLEARED AND PROPERLY DISPOSED OF AND THE BASIN AREA STABILISED.
- 2. BEFORE STARTING ANY MAINTENANCE WORK ON THE BASIN OR SPILLWAY, INSTALL ALL NECESSARY SHORT-TERM SEDIMENT CONTROL MEASURES DOWNSTREAM OF THE SEDIMENT BASIN.
- 3. ALL WATER AND SEDIMENT MUST BE REMOVED FROM THE BASIN PRIOR TO THE DAM'S REMOVAL. DISPOSE OF SEDIMENT AND WATER IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.
- 4. BRING THE DISTURBED AREA TO A PROPER GRADE, THEN SMOOTH, COMPACT, AND STABILISE AND/OR REVEGETATE AS REQUIRED TO ESTABLISH A STABLE LAND SURFACE.



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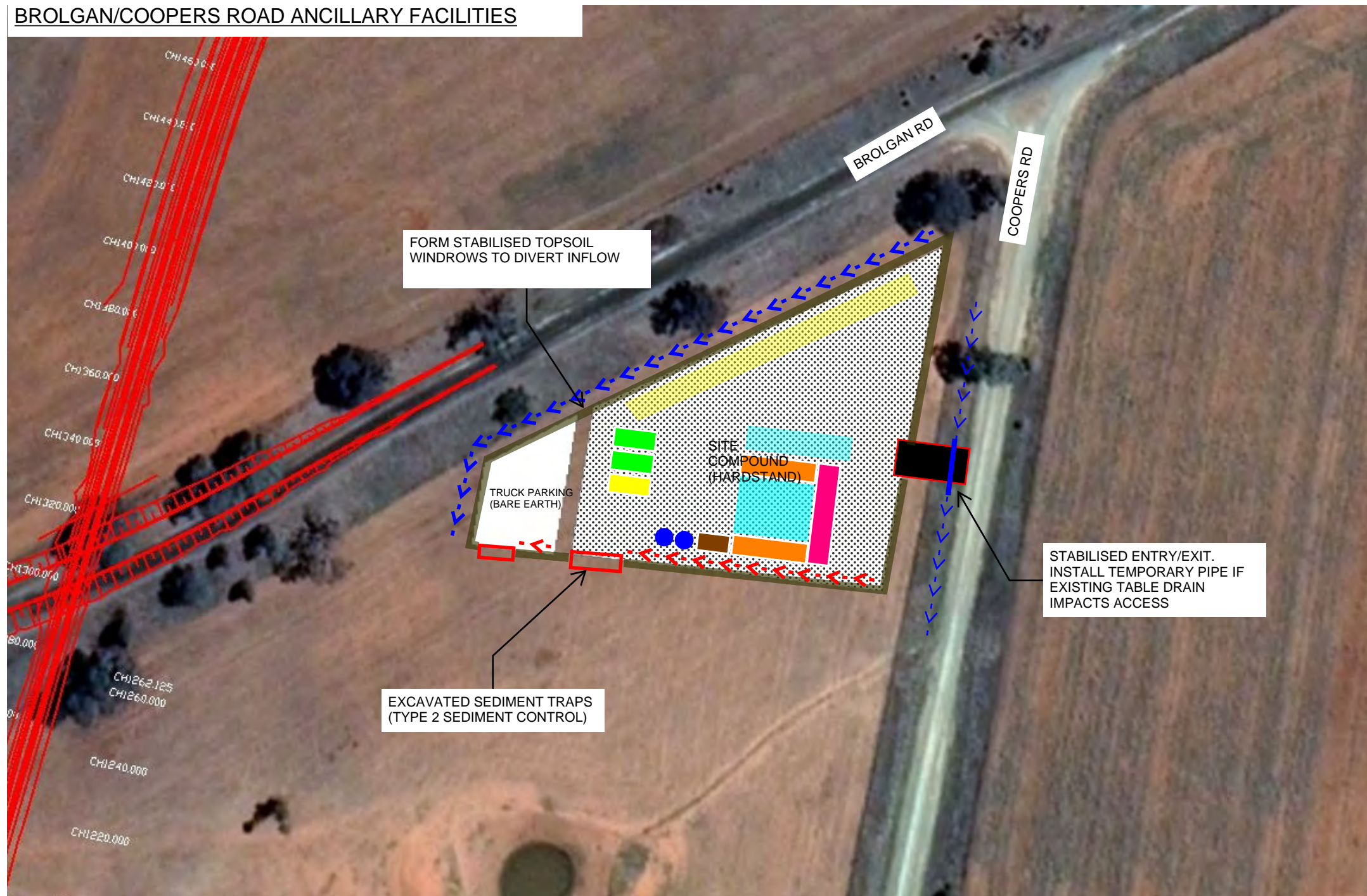
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DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN SIDINGS		
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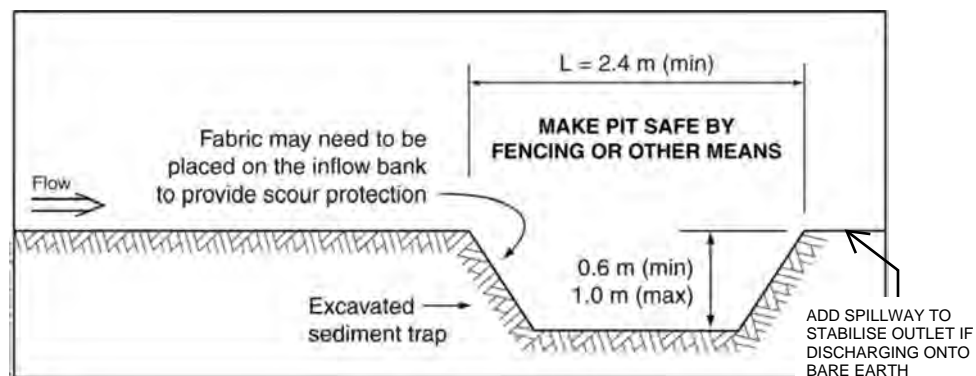


**BROLGAN/COOPERS ROAD ANCILLARY FACILITIES**

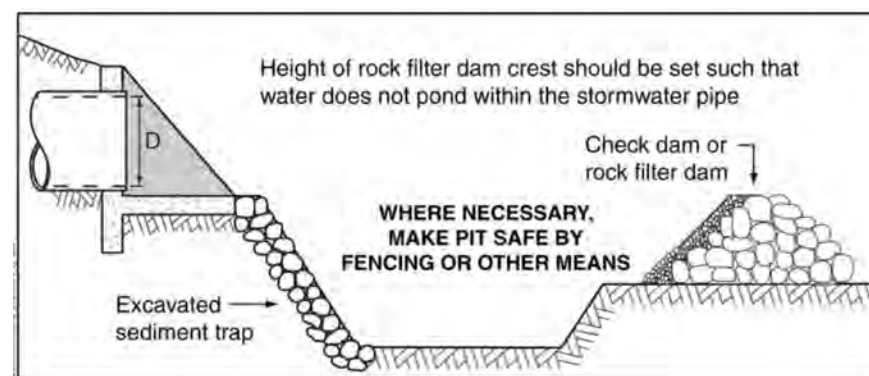


**LEGEND:**

- > -> - CLEAN WATER DIVERSION
- > -> - DIRTY WATER DIVERSION
- SEDIMENT FENCE
- BUND
- ROCK FILTER DAM
- EXCAVATED SEDIMENT TRAP



EXCAVATED SEDIMENT TRAP MINIMUM DIMENSIONS



EXCAVATED SEDIMENT TRAP WITH RFD (OPTIONAL)



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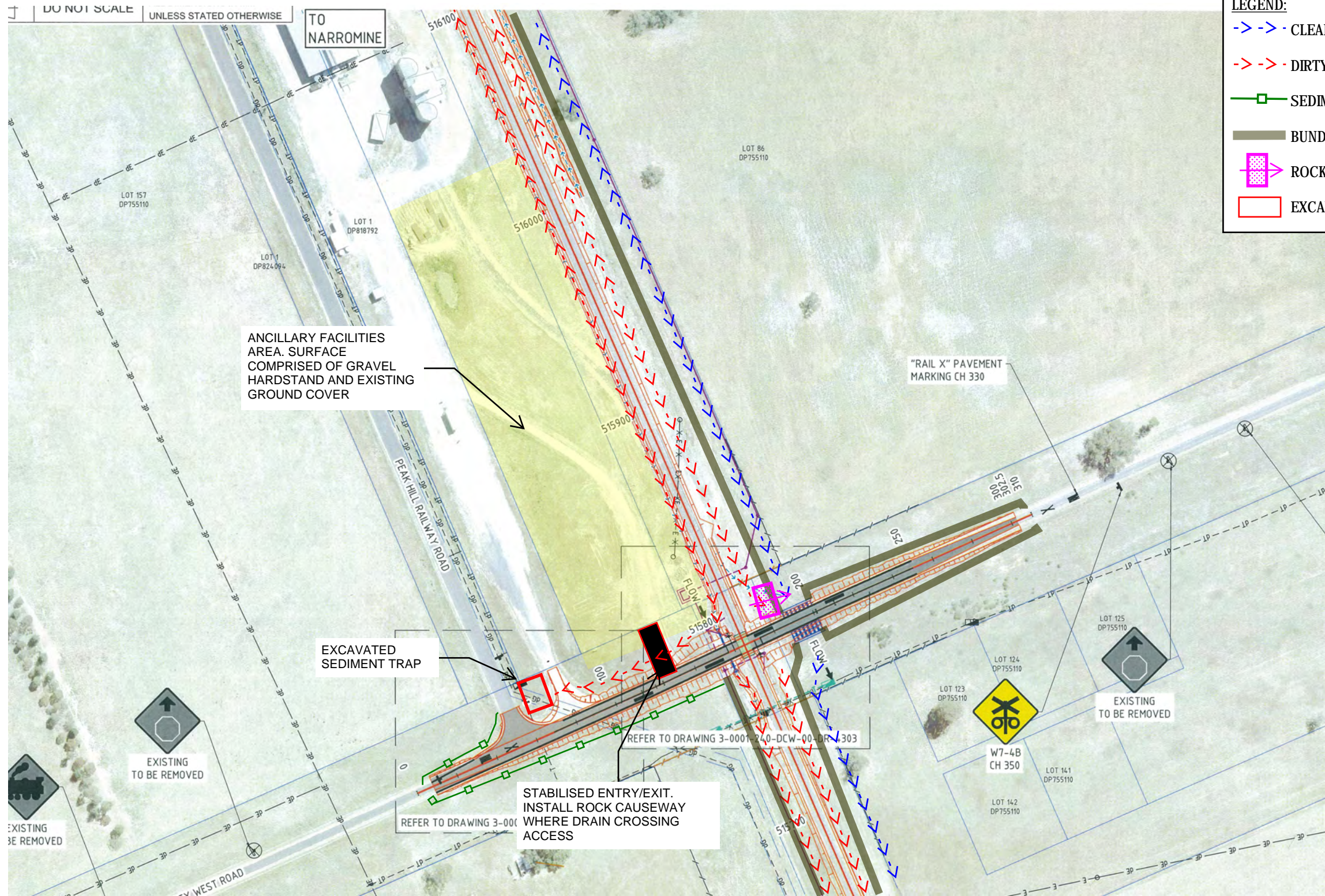
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PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN STOCKPILES AND LAYDOWNS		
PROJECT No 18-0101	DRAWING No H01	REVISION A



**TOMINGLEY WEST LEVEL CROSSING AND ANCILLARY FACILITIES AREA**

DO NOT SCALE UNLESS STATED OTHERWISE



**LEGEND:**

- > -> -> CLEAN WATER DIVERSION
- > -> -> DIRTY WATER DIVERSION
- SEDIMENT FENCE
- BUND
- ROCK FILTER DAM
- EXCAVATED SEDIMENT TRAP



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PROJECT INLAND RAIL - PARKES TO NARROMINE		
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PROJECT No 18-0101	DRAWING No H02	REVISION A



## SEDIMENT BASIN SIZING

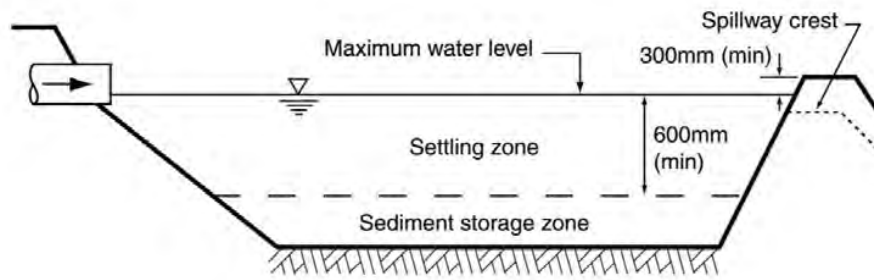
	R (80 <sup>th</sup> % <sub>ie</sub> 5-day) (mm)	Runoff Coefficient (Cv)	Settling Zone Vol. (Vset) (m <sup>3</sup> )	Sediment Storage Vol (Vstor) (m <sup>3</sup> )	Total Volume (m <sup>3</sup> )
7ha Stockpile or Laydown	22.8	0.7	1117	20	1137
5ha Stockpile or Laydown	22.8	0.7	798	14	812
3ha Stockpile or Laydown	22.8	0.7	479	9	487
1ha Stockpile or Laydown	22.8	0.7	160	3	162

80th percentile 5 day rainfall depth adopted for Dubbo, considered conservative for entire site with increased IFD data observed in the north.

## SPILLWAY SIZING

	Flow		Weir and Chute				Dissipater			
	Q <sub>10</sub> (m <sup>3</sup> /s)	V (m/s)	Depth* (m)	Base Width (m)	Side Slope	Lining	Rock Size D <sub>50</sub> (mm)	Width 1 (m)	Width 2 (m)	Length (m)
7ha Stockpile or Laydown	0.91	0.91	0.50	5	2	50mm D50 Rock	100	7.5	7.5	1.0
5ha Stockpile or Laydown	0.69	0.88	0.50	4	2	50mm D50 Rock	100	6.5	6.5	1.0
3ha Stockpile or Laydown	0.44	0.81	0.50	3	2	50mm D50 Rock	100	5.4	5.4	1.0
1ha Stockpile or Laydown	0.17	0.65	0.50	2	2	50mm D50 Rock	100	4.3	4.3	1.0

\*Including Freeboard



TYPE D SEDIMENT BASIN - PROFILE (TYPICAL)

### SEDIMENT BASIN - MATERIALS

EARTH FILL: CLEAN SOIL WITH EMERSON CLASS 2(1), 3, 4, OR 5, AND FREE OF ROOTS, WOODY VEGETATION, ROCKS AND OTHER UNSUITABLE MATERIAL. SOIL WITH EMERSON CLASS 4 AND 5 MAY NOT BE SUITABLE DEPENDING ON PARTICLE SIZE DISTRIBUTION AND DEGREE OF DISPERSION. CLASS 2(1) SHOULD ONLY BE USED UPON RECOMMENDATION FROM GEOTECHNICAL SPECIALIST. THIS SPECIFICATION MAYBE REPLACED BY AN EQUIVALENT STANDARD BASED ON THE EXCHANGEABLE SODIUM PERCENTAGE.

RISER PIPE: MINIMUM 250mm DIAMETER.

SPILLWAY ROCK: HARD, ANGULAR, DURABLE, WEATHER RESISTANT AND EVENLY GRADED ROCK WITH 50% BY WEIGHT LARGER THAN THE SPECIFIED NOMINAL (d50) ROCK SIZE. LARGE ROCK SHOULD DOMINATE, WITH SUFFICIENT SMALL ROCK TO FILL THE VOIDS BETWEEN THE LARGER ROCK. THE DIAMETER OF THE LARGEST ROCK SIZE SHOULD BE NO LARGER THAN 1.5 TIMES THE NOMINAL ROCK SIZE. THE SPECIFIC GRAVITY SHOULD BE AT LEAST 2.5.

GEOTEXTILE FABRIC: HEAVY-DUTY, NEEDLE-PUNCHED, NON-WOVEN FILTER CLOTH, MINIMUM 'BIDIM' A24 OR EQUIVALENT.

### SEDIMENT BASIN - CONSTRUCTION

1. NOTWITHSTANDING ANY DESCRIPTION CONTAINED WITHIN THE APPROVED PLANS OR SPECIFICATIONS, THE CONTRACTOR SHALL BE RESPONSIBLE FOR SATISFYING THEMSELVES AS TO THE NATURE AND EXTENT OF THE SPECIFIED WORKS AND THE PHYSICAL AND LEGAL CONDITIONS UNDER WHICH THE WORKS WILL BE CARRIED OUT. THIS SHALL INCLUDE MEANS OF ACCESS, EXTENT OF CLEARING, NATURE OF MATERIAL TO BE EXCAVATED, TYPE AND SIZE OF MECHANICAL PLANT REQUIRED, LOCATION AND SUITABILITY OF WATER SUPPLY FOR CONSTRUCTION AND TESTING PURPOSES, AND ANY OTHER LIKE MATTERS AFFECTING THE CONSTRUCTION OF THE WORKS.

2. REFER TO APPROVED PLANS FOR LOCATION, DIMENSIONS, AND CONSTRUCTION DETAILS. IF THERE ARE QUESTIONS OR PROBLEMS WITH THE LOCATION, DIMENSIONS, OR METHOD OF INSTALLATION, CONTACT THE ENGINEER OR RESPONSIBLE ON-SITE OFFICER FOR ASSISTANCE.

3. BEFORE STARTING ANY CLEARING OR CONSTRUCTION, ENSURE ALL THE NECESSARY MATERIALS AND COMPONENTS ARE ON THE SITE TO AVOID DELAYS IN COMPLETING THE POND ONCE WORKS BEGIN.

4. INSTALL REQUIRED SHORT-TERM SEDIMENT CONTROL MEASURES DOWNSTREAM OF THE PROPOSED EARTHWORKS TO CONTROL SEDIMENT RUNOFF DURING CONSTRUCTION OF THE BASIN.

5. THE AREA TO BE COVERED BY THE EMBANKMENT, BORROW PITS AND INCIDENTAL WORKS, TOGETHER WITH AN AREA EXTENDING BEYOND THE LIMITS OF EACH FOR A DISTANCE NOT EXCEEDING FIVE (5) METRES ALL AROUND MUST BE CLEARED OF ALL TREES, SCRUB, STUMPS, ROOTS, DEAD TIMBER AND RUBBISH AND DISPOSED OF IN A SUITABLE MANNER. DELAY CLEARING THE MAIN POND AREA UNTIL THE EMBANKMENT IS COMPLETE.

6. ENSURE ALL HOLES MADE BY GRUBBING WITHIN THE EMBANKMENT FOOTPRINT ARE FILLED WITH SOUND MATERIAL, ADEQUATELY COMPACTED, AND FINISHED FLUSH WITH THE NATURAL SURFACE.

7. BEFORE CONSTRUCTION OF THE CUT-OFF TRENCH OR ANY ANCILLARY WORKS WITHIN THE EMBANKMENT FOOTPRINT, ALL GRASS GROWTH AND TOPSOIL MUST BE REMOVED FROM THE AREA TO BE OCCUPIED BY THE EMBANKMENT AND MUST BE DEPOSITED CLEAR OF THIS AREA AND RESERVED FOR TOPDRESSING THE COMPLETING THE EMBANKMENT.

8. EXCAVATE A CUT-OFF TRENCH ALONG THE CENTRE LINE OF THE EARTH FILL EMBANKMENT. CUT THE TRENCH TO STABLE SOIL MATERIAL, BUT IN NO CASE MAKE IT LESS THAN 600mm DEEP. THE CUT-OFF TRENCH MUST EXTEND INTO BOTH ABUTMENTS TO AT LEAST THE ELEVATION OF THE RISER PIPE CREST. MAKE THE MINIMUM BOTTOM WIDTH

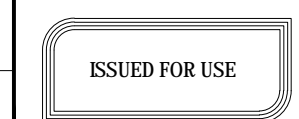
WIDE ENOUGH TO PERMIT OPERATION OF EXCAVATION AND COMPACTION EQUIPMENT, BUT IN NO CASE LESS THAN 600mm. MAKE THE SIDE SLOPES OF THE TRENCH NO STEEPER THAN 1:1 (H:V).

9. ENSURE ALL WATER, LOOSE SOIL, AND ROCK ARE REMOVED FROM THE TRENCH BEFORE BACKFILLING COMMENCES. THE CUT-OFF TRENCH MUST BE BACKFILLED WITH SELECTED EARTH-FILL OF THE TYPE SPECIFIED FOR THE EMBANKMENT, AND THIS SOIL MUST HAVE A MOISTURE CONTENT AND DEGREE OF COMPACTION THE SAME AS THAT SPECIFIED FOR THE SELECTED CORE ZONE.

10. MATERIAL EXCAVATED FROM THE CUT-OFF TRENCH MAY BE USED IN CONSTRUCTION OF THE EMBANKMENT PROVIDED IT IS SUITABLE AND IT IS PLACED IN THE CORRECT ZONE ACCORDING TO ITS CLASSIFICATION.



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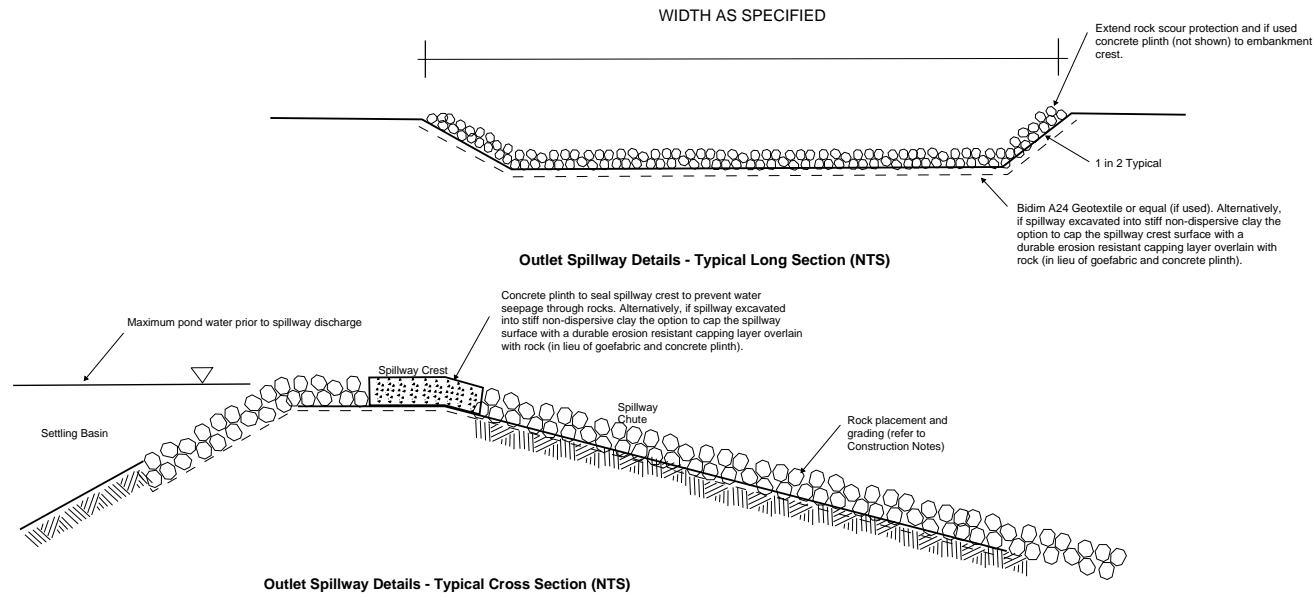
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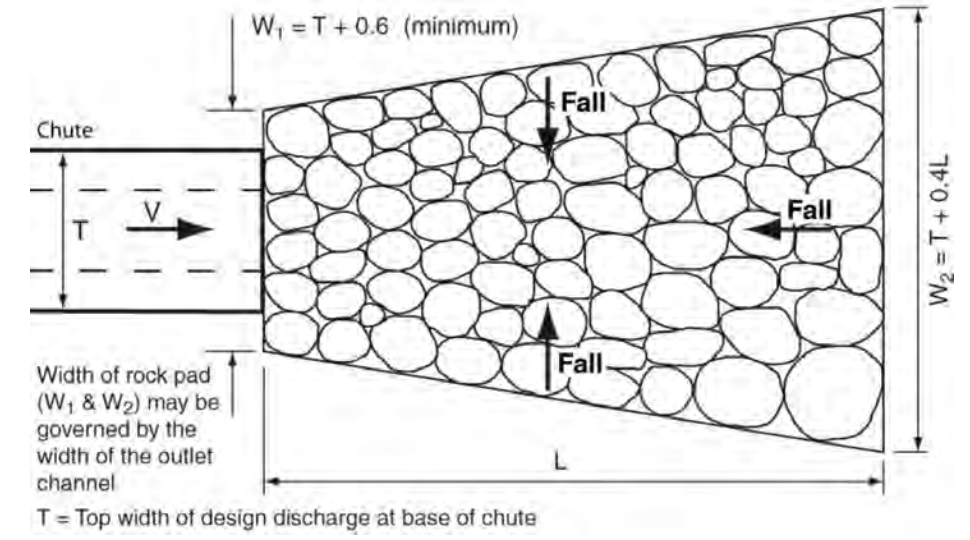
PROJECT INLAND RAIL - PARKES TO NARROMINE		
DRAWING TITLE EROSION AND SEDIMENT CONTROL PLAN STOCKPILES AND LAYDOWNS		
PROJECT No 18-0101	DRAWING No H03	REVISION A



**SPILLWAY**



**DISSIPATER**



**SEDIMENT BASIN - SPILLWAY**

- 21. THE SPILLWAY MUST BE EXCAVATED AS SHOWN ON THE PLANS, AND THE EXCAVATED MATERIAL IF CLASSIFIED AS SUITABLE, MUST BE USED IN THE EMBANKMENT, AND IF NOT SUITABLE IT MUST BE DISPOSED OF INTO SPOIL HEAPS.
- 22. ENSURE EXCAVATED DIMENSIONS ALLOW ADEQUATE BOXING-OUT SUCH THAT THE SPECIFIED ELEVATIONS, GRADES, CHUTE WIDTH, AND ENTRANCE AND EXIT SLOPES FOR THE EMERGENCY SPILLWAY WILL BE ACHIEVED AFTER PLACEMENT OF THE ROCK OR OTHER SCOUR PROTECTION MEASURES AS SPECIFIED IN THE PLANS.
- 23. PLACE SPECIFIED SCOUR PROTECTION MEASURES ON THE EMERGENCY SPILLWAY. ENSURE THE FINISHED GRADE BLENDS WITH THE SURROUNDING AREA TO ALLOW A SMOOTH FLOW TRANSITION FROM SPILLWAY TO DOWNSTREAM CHANNEL.
- 24. IF A SYNTHETIC FILTER FABRIC UNDERLAY IS SPECIFIED, PLACE THE FILTER FABRIC DIRECTLY ON THE PREPARED FOUNDATION. IF MORE THAN ONE SHEET OF FILTER FABRIC IS REQUIRED, OVERLAP THE EDGES BY AT LEAST 300mm AND PLACE ANCHOR PINS AT MINIMUM 1m SPACING ALONG THE OVERLAP. BURY THE UPSTREAM END OF THE FABRIC A MINIMUM 300mm BELOW GROUND AND WHERE NECESSARY, BURY THE LOWER END OF THE FABRIC OR OVERLAP A MINIMUM 300mm OVER THE NEXT DOWNSTREAM SECTION AS REQUIRED. ENSURE THE FILTER FABRIC EXTENDS AT LEAST 1000mm UPSTREAM OF THE SPILLWAY CREST.
- 25. TAKE CARE NOT TO DAMAGE THE FABRIC DURING OR AFTER PLACEMENT. IF DAMAGE OCCURS, REMOVE THE ROCK AND REPAIR THE SHEET BY ADDING ANOTHER LAYER OF FABRIC WITH A MINIMUM OVERLAP OF 300mm AROUND THE DAMAGED AREA. IF EXTENSIVE DAMAGE IS SUSPECTED, REMOVE AND REPLACE THE ENTIRE SHEET.
- 26. WHERE LARGE ROCK IS USED, OR MACHINE PLACEMENT IS DIFFICULT, A MINIMUM 100mm LAYER OF FINE GRAVEL, AGGREGATE, OR SAND MAY BE NEEDED TO PROTECT THE FABRIC.

- 27. PLACEMENT OF ROCK SHOULD FOLLOW IMMEDIATELY AFTER PLACEMENT OF THE FILTER FABRIC. PLACE ROCK SO THAT IT FORMS A DENSE, WELL-GRADED MASS OF ROCK WITH A MINIMUM OF VOIDS. THE DESIRED DISTRIBUTION OF ROCK THROUGHOUT THE MASS MAY BE OBTAINED BY SELECTIVE LOADING AT THE QUARRY AND CONTROLLED DUMPING DURING FINAL PLACEMENT.
- 28. THE FINISHED SLOPE SHOULD BE FREE OF POCKETS OF SMALL ROCK OR CLUSTERS OF LARGE ROCKS. HAND PLACING MAY BE NECESSARY TO ACHIEVE THE PROPER DISTRIBUTION OF ROCK SIZES TO PRODUCE A RELATIVELY SMOOTH, UNIFORM SURFACE. THE FINISHED GRADE OF THE ROCK SHOULD BLEND WITH THE SURROUNDING AREA. NO OVERFALL OR PROTRUSION OF ROCK SHOULD BE APPARENT.
- 29. ENSURE THAT THE FINAL ARRANGEMENT OF THE SPILLWAY CREST WILL NOT PROMOTE EXCESSIVE FLOW THROUGH THE ROCK SUCH THAT THE WATER CAN BE RETAINED WITHIN THE SETTLING BASIN AN ELEVATION NO LESS THAN 50mm ABOVE OR BELOW THE NOMINATED SPILLWAY CREST ELEVATION. ESTABLISHMENT OF SETTLING POND:
- 30. THE AREA TO BE COVERED BY THE STORED WATER OUTSIDE THE LIMITS OF THE BORROW PITS MUST BE CLEARED OF ALL SCRUB AND RUBBISH. TREES MUST BE CUT DOWN STUMP HIGH AND REMOVED FROM THE IMMEDIATE VICINITY OF THE WORK.
- 31. ESTABLISH ALL REQUIRED INFLOW CHUTES AND INLET BAFFLES, IF SPECIFIED, TO ENABLE WATER TO DISCHARGE INTO THE BASIN IN A MANNER THAT WILL NOT CAUSE SOIL EROSION OR THE RE-SUSPENSION OF SETTLED SEDIMENT.
- 32. INSTALL A SEDIMENT STORAGE LEVEL MARKER POST WITH A CROSS MEMBER SET JUST BELOW THE TOP OF THE SEDIMENT STORAGE ZONE (AS SPECIFIED ON THE APPROVED PLANS). USE AT LEAST A 75mm WIDE POST FIRMLY SET INTO THE BASIN FLOOR.

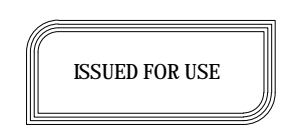
- 1. INSPECT THE SEDIMENT BASIN DURING THE FOLLOWING PERIODS:
  - (i) DURING CONSTRUCTION TO DETERMINE WHETHER MACHINERY, FALLING TREES, OR CONSTRUCTION ACTIVITY HAS DAMAGED ANY COMPONENTS OF THE SEDIMENT BASIN. IF DAMAGE HAS OCCURRED, REPAIR IT.
  - (ii) AFTER EACH RUNOFF EVENT. INSPECT THE EROSION DAMAGE AT FLOW ENTRY AND EXIT POINTS. IF DAMAGE HAS OCCURRED, MAKE THE NECESSARY REPAIRS.
  - (iii) AT LEAST WEEKLY DURING THE NOMINATED WET SEASON (IF ANY) OTHERWISE AT LEAST FORTNIGHTLY.
  - (iv) PRIOR TO, AND IMMEDIATELY AFTER, PERIODS OF 'STOP WORK' OR SITE SHUTDOWN.
- 2. CLEAN OUT ACCUMULATED SEDIMENT WHEN IT REACHES THE MARKER BOARD/POST, AND RESTORE THE ORIGINAL STORAGE VOLUME. PLACE SEDIMENT IN A DISPOSAL AREA OR, IF APPROPRIATE, MIX WITH DRY SOIL ON THE SITE.
- 3. DO NOT DISPOSE OF SEDIMENT IN A MANNER THAT WILL CREATE AN EROSION OR POLLUTION HAZARD.
- 4. CHECK ALL VISIBLE PIPE CONNECTIONS FOR LEAKS, AND REPAIR AS NECESSARY.
- 5. CHECK ALL EMBANKMENTS FOR EXCESSIVE SETTLEMENT, SLUMPING OF THE SLOPES OR PIPING BETWEEN THE CONDUIT AND THE EMBANKMENT; MAKE ALL NECESSARY REPAIRS.
- 6. REMOVE ALL TRASH AND OTHER DEBRIS FROM THE BASIN AND RISER.
- 7. SUBMERGED INFLOW PIPES MUST BE INSPECTED AND DE-SILTED (AS REQUIRED) AFTER EACH INFLOW EVENT.

- 1. WHEN GRADING AND CONSTRUCTION IN THE DRAINAGE AREA ABOVE A TEMPORARY SEDIMENT BASIN IS COMPLETED AND THE DISTURBED AREAS ARE ADEQUATELY STABILISED, THE BASIN MUST BE REMOVED OR OTHERWISE INCORPORATED INTO THE PERMANENT STORMWATER DRAINAGE SYSTEM. IN EITHER CASE, SEDIMENT SHOULD BE CLEARED AND PROPERLY DISPOSED OF AND THE BASIN AREA STABILISED.
- 2. BEFORE STARTING ANY MAINTENANCE WORK ON THE BASIN OR SPILLWAY, INSTALL ALL NECESSARY SHORT-TERM SEDIMENT CONTROL MEASURES DOWNSTREAM OF THE SEDIMENT BASIN.
- 3. ALL WATER AND SEDIMENT MUST BE REMOVED FROM THE BASIN PRIOR TO THE DAM'S REMOVAL. DISPOSE OF SEDIMENT AND WATER IN A MANNER THAT WILL NOT CREATE AN EROSION OR POLLUTION HAZARD.
- 4. BRING THE DISTURBED AREA TO A PROPER GRADE, THEN SMOOTH, COMPACT, AND STABILISE AND/OR REVEGETATE AS REQUIRED TO ESTABLISH A STABLE LAND SURFACE.



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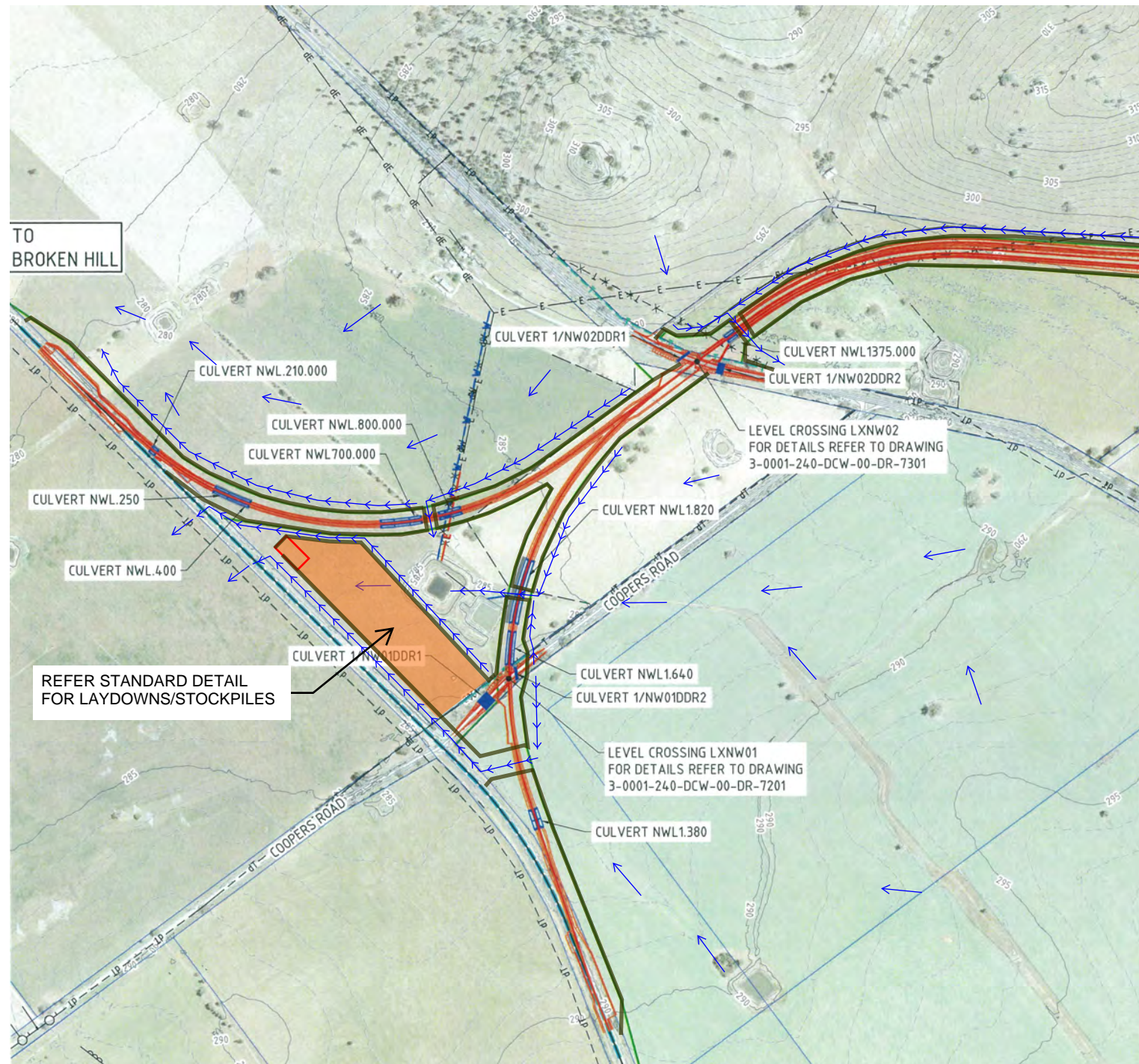
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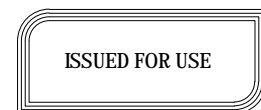
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PROJECT No 18-0101	DRAWING No 100	REVISION A



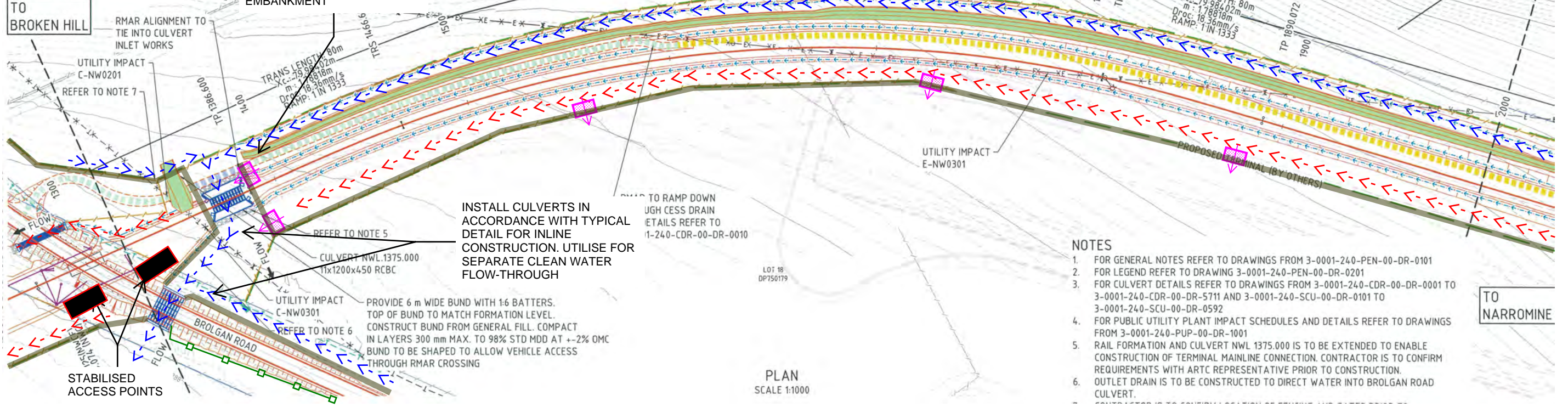




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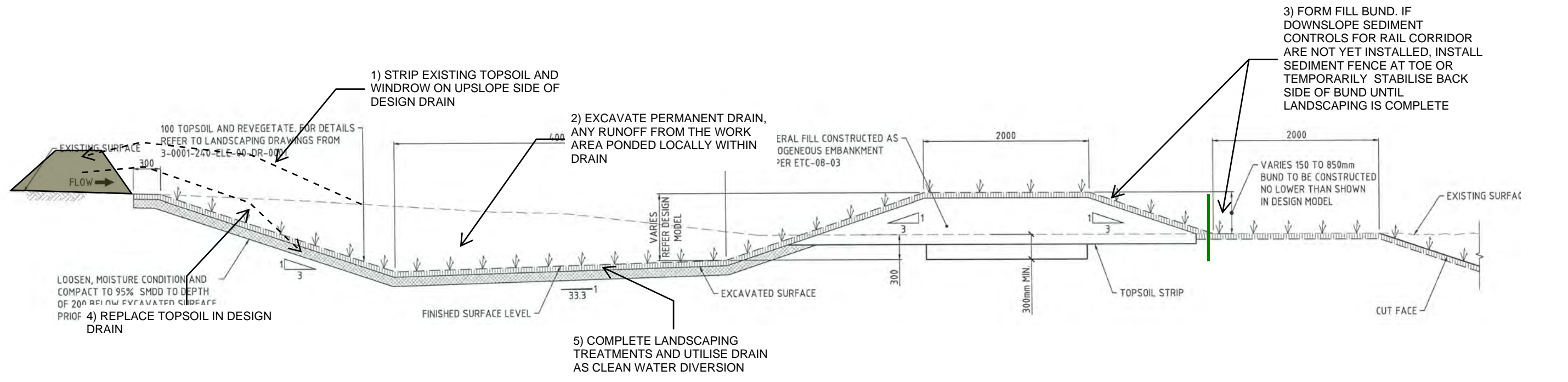
**ADDITIONAL ROCK FILTER DAM REQUIRED AFTER FORMATION OF FILL EMBANKMENT**

**INSTALL PERMANENT DIVERSION DRAIN DURING EARLY WORKS FOR UTILISATION DURING LATER RAIL CORRIDOR WORKS. REFER INSTALLATION METHODOLOGY BELOW**



- NOTES**
1. FOR GENERAL NOTES REFER TO DRAWINGS FROM 3-0001-240-PEN-00-DR-0101
  2. FOR LEGEND REFER TO DRAWING 3-0001-240-PEN-00-DR-0201
  3. FOR CULVERT DETAILS REFER TO DRAWINGS FROM 3-0001-240-CDR-00-DR-0001 TO 3-0001-240-CDR-00-DR-5711 AND 3-0001-240-SCU-00-DR-0101 TO 3-0001-240-SCU-00-DR-0592
  4. FOR PUBLIC UTILITY PLANT IMPACT SCHEDULES AND DETAILS REFER TO DRAWINGS FROM 3-0001-240-PUP-00-DR-1001
  5. RAIL FORMATION AND CULVERT NWL 1375.000 IS TO BE EXTENDED TO ENABLE CONSTRUCTION OF TERMINAL MAINLINE CONNECTION. CONTRACTOR IS TO CONFIRM REQUIREMENTS WITH ARTC REPRESENTATIVE PRIOR TO CONSTRUCTION.
  6. OUTLET DRAIN IS TO BE CONSTRUCTED TO DIRECT WATER INTO BROLGAN ROAD CULVERT.

PLAN SCALE 1:1000



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