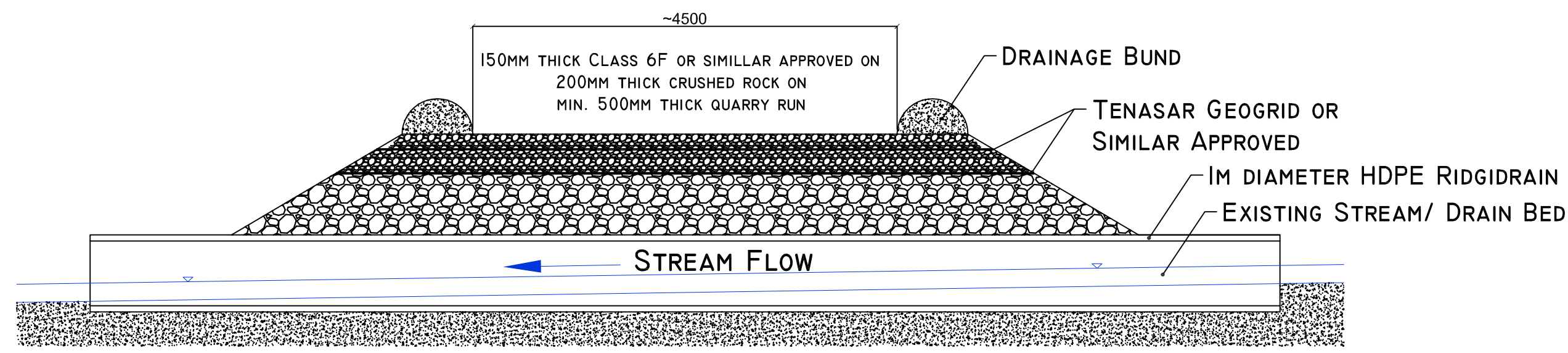
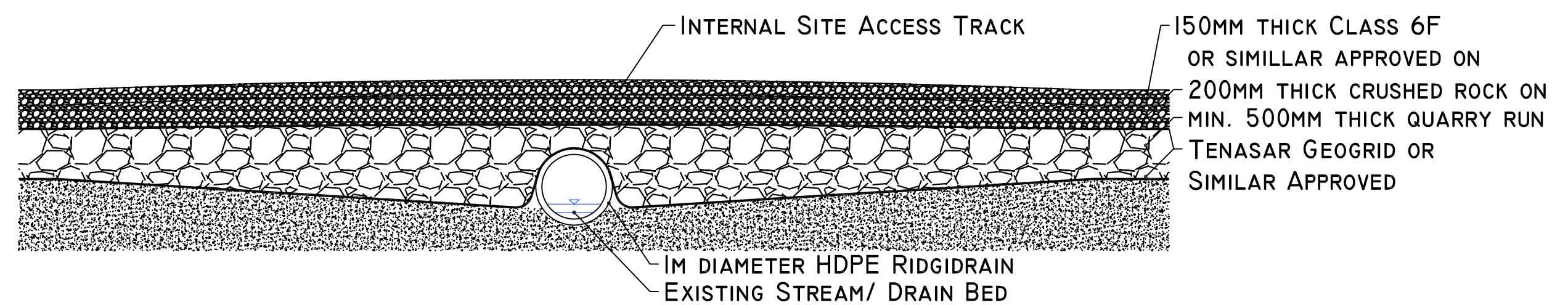


# TYPICAL CULVERT DETAIL - A

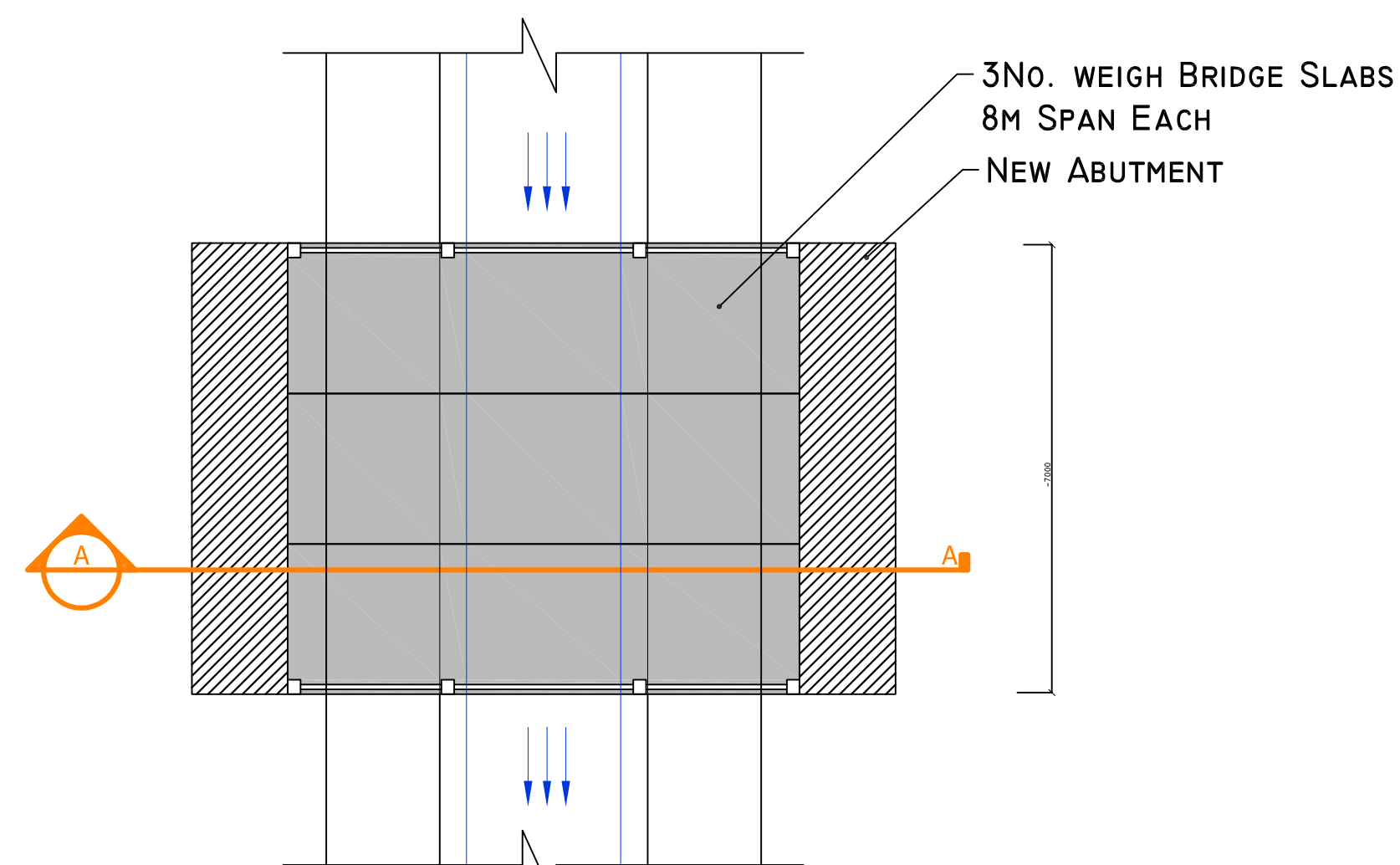


**TYPICAL LAND DRAIN/ EPHEMERAL STREAM CROSSING DETAIL - LONGITUDINAL SECTION**  
SCALE 1:200

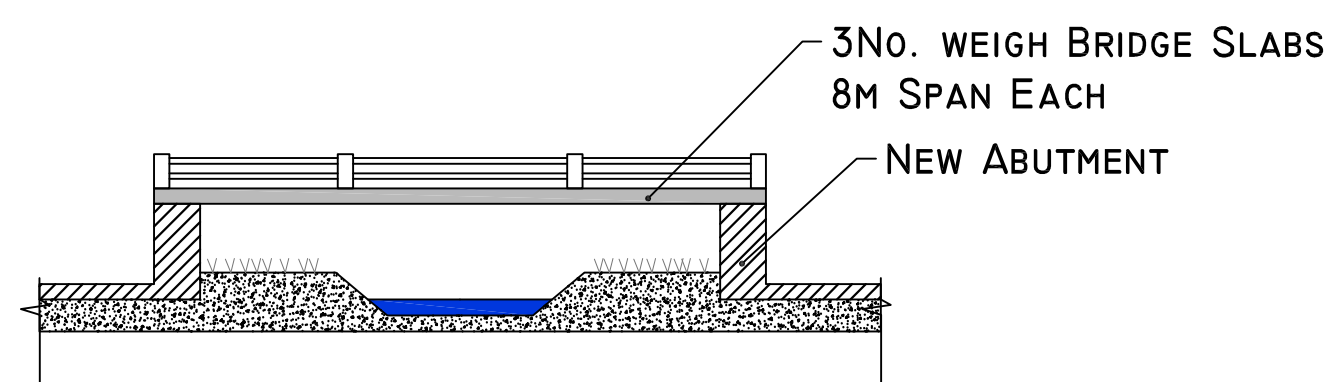


**TYPICAL LAND DRAIN/ EPHEMERAL STREAM CROSSING DETAIL- CROSS SECTION**  
SCALE 1:200

# TYPICAL CLEAR SPAN BRIDGE DETAIL

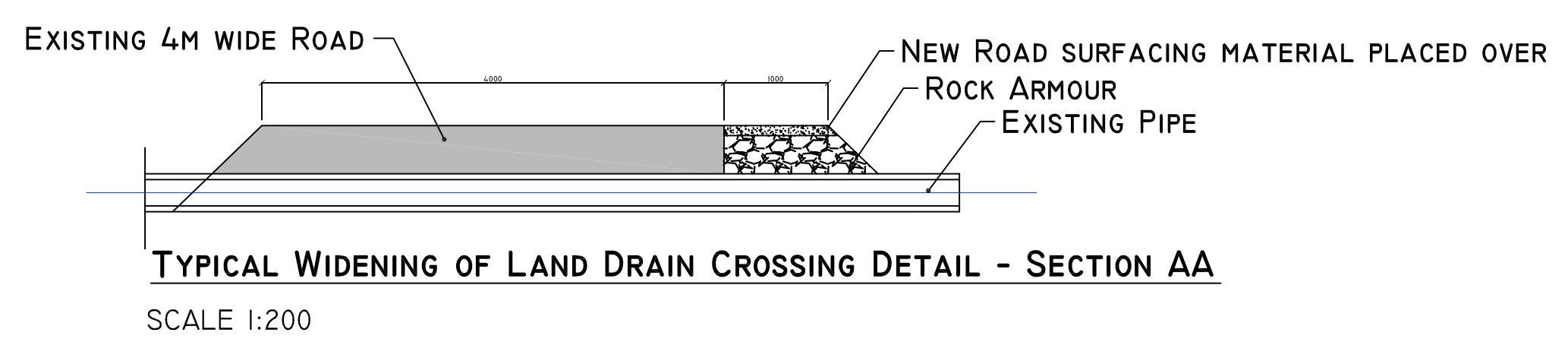


**WATERCOURSE CROSSING AT SITE ENTRANCE - PLAN**  
SCALE 1:200

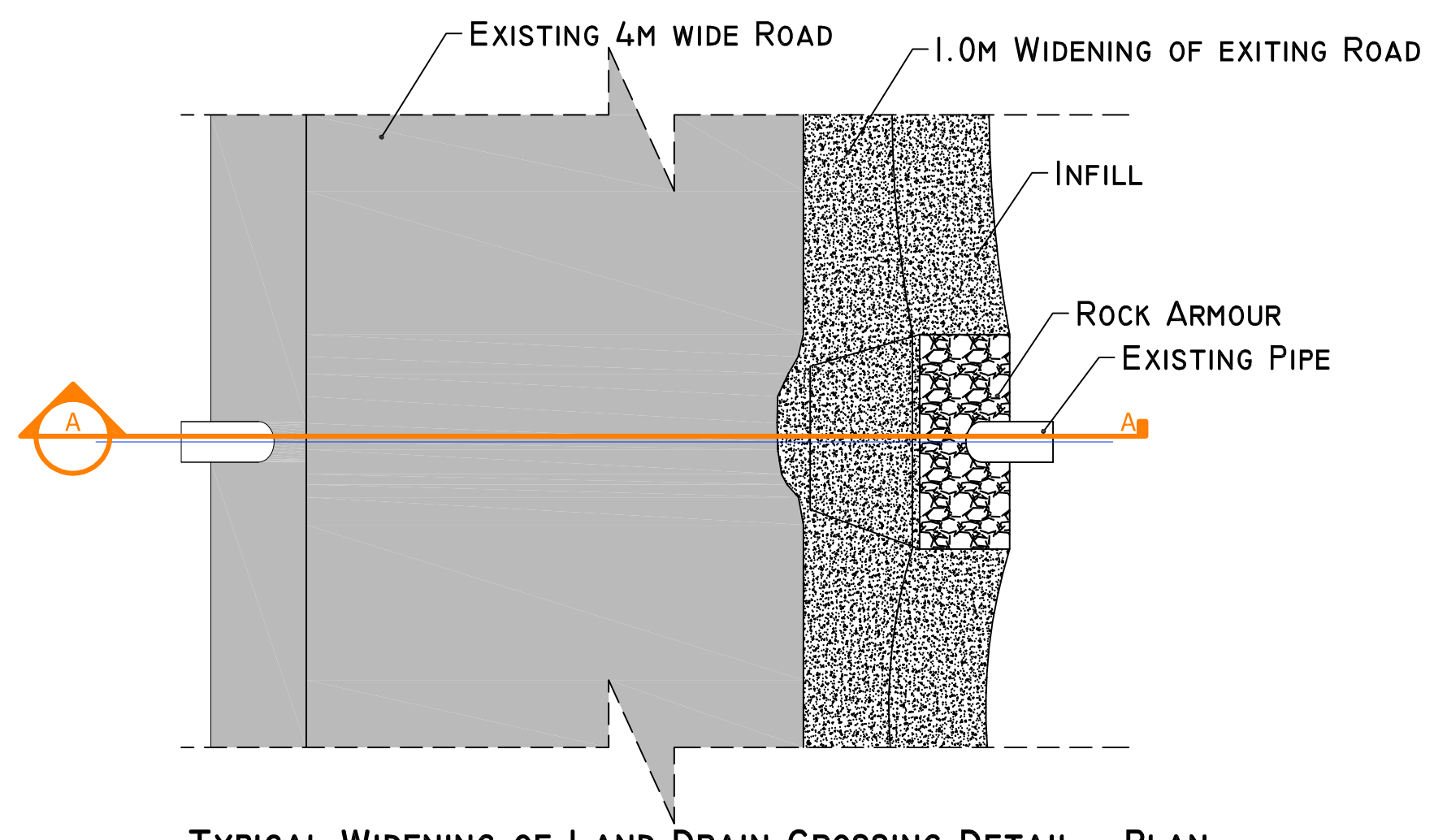


**WATERCOURSE CROSSING AT SITE ENTRANCE - SECTION A-A**  
SCALE 1:200

# TYPICAL CULVERT WIDENING DETAIL

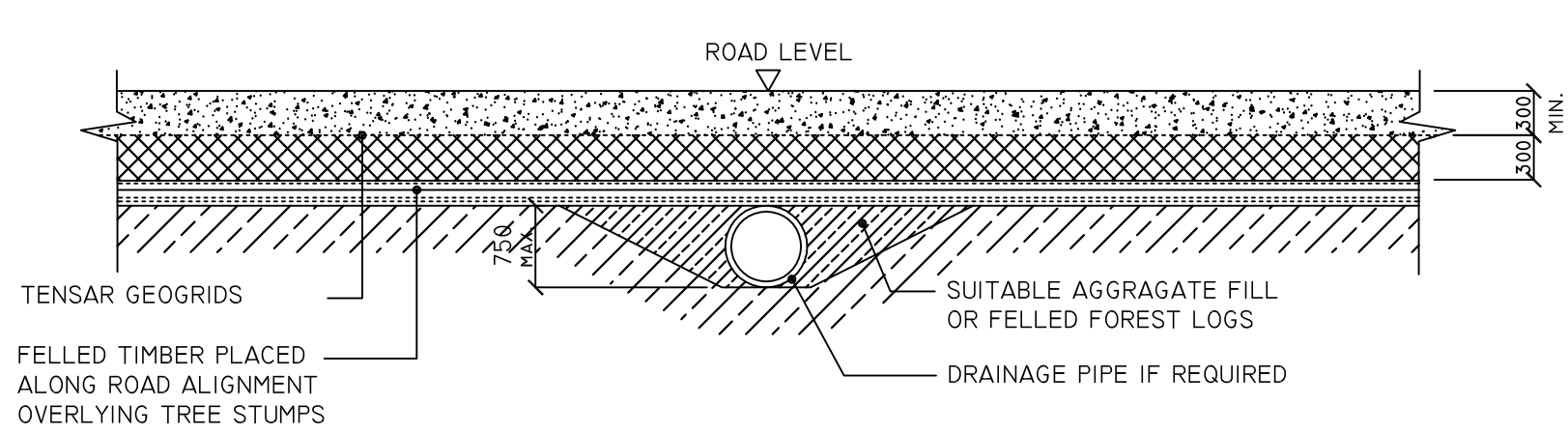


**TYPICAL WIDENING OF LAND DRAIN CROSSING DETAIL - SECTION AA**  
SCALE 1:200

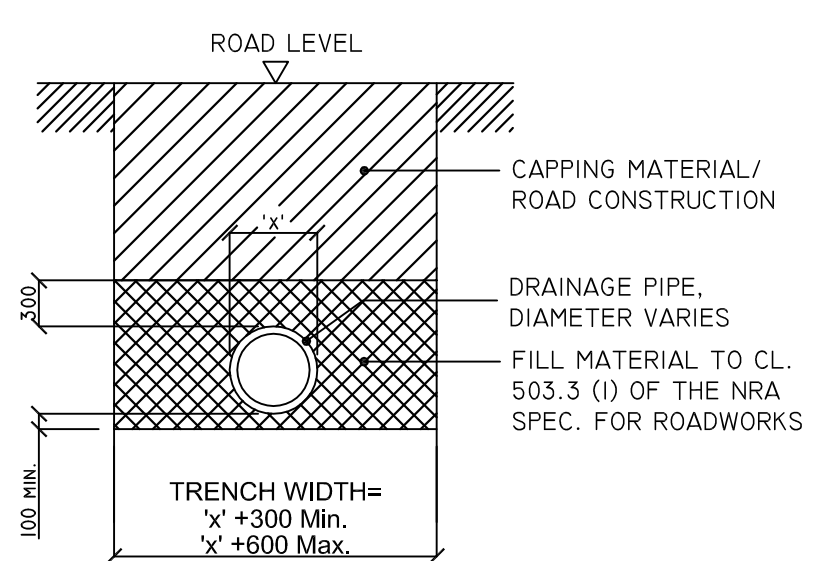


**TYPICAL WIDENING OF LAND DRAIN CROSSING DETAIL - PLAN**  
SCALE 1:200

# TYPICAL CULVERT DETAIL - B



**'TYPE A' CULVERT - DRAINAGE CROSSING BENEATH FLOATING ROAD**  
SCALE 1:100



**'TYPE B' CULVERT - DRAINAGE CROSSING BENEATH EXCAVATED ROAD**  
SCALE 1:100

- PROJECT DESIGN DRAWING NOTES**
- DRAWINGS ISSUED ARE FOR PLANNING APPLICATION PURPOSES ONLY.
  - DRAWINGS NOT TO BE USED FOR CONSTRUCTION /CONTRACT CONDITIONS.
  - COPYRIGHT, ALL RIGHTS RESERVED. NO PART HERE WITH MAY BE COPIED OR REPRODUCED PARTIALLY OR WHOLLY IN ANY FORM WHATSOEVER WITHOUT THE PRIOR NOTICE OF THE COPYRIGHT OWNER HYDRO-ENVIRONMENTAL SERVICES.
  - DO NOT SCALE OFF THIS DRAWING. FIGURED METRIC DIMENSIONS ONLY SHOULD BE TAKEN OFF THIS DRAWING.
  - ALL CONTRACTORS, WHETHER MAIN OR SUB-CONTRACTORS, MUST VISIT THE SITE AND ARE RESPONSIBLE FOR TAKING AND CHECKING ANY AND ALL DIMENSIONS AND LEVELS THAT RELATE TO THE WORKS.
  - THE USE OF OR RELIANCE UPON THIS DRAWING SHALL BE DEEMED TO BE ACCEPTANCE OF THESE CONDITIONS OF USE UNLESS OTHERWISE AGREED IN WRITING, SUCH WRITTEN AGREEMENT TO BE SOUGHT FROM AND ISSUED BY THE COPYRIGHT HOLDER TO THE USE OR RELIANCE UPON THIS DRAWING.
  - LAYOUT PLANS SHOW TYPICAL TURBINE ROTOR DIAMETER AS PER TURBINE DRAWING.
- DRAINAGE DESIGN NOTES**
- ALL DRAINAGE SUBJECT TO MICRO-SITING AND OPTIMISATION ON SITE.
  - THE LOCATIONS OF THE INTERCEPTOR DRAINS, CHECK DAMS, CULVERTS, SWALES, STILLING PONDS AND LEVEL SPREADERS ARE SHOWN AS INDICATIVE, AND MAY BE CHANGED TO SUIT THE REQUIREMENTS OF THE LOCAL TOPOGRAPHY.
  - SUPERVISING HYDROLOGIST OR ENVIRONMENTAL CLERK OF WORKS (ENVIRONMENTAL SCIENTIST) TO OVERSEE INSTALLATION OF DRAINAGE FEATURES FOLLOWING DETAILED DRAINAGE DESIGN.
  - DRAINAGE MEASURES TO BE INSTALLED PRIOR TO, OR AT THE SAME TIME AS THE WORKS AREAS THEY ARE INTENDED TO DRAIN.
  - DESIGN ELEVATION OF THE WATER SURFACE ALONG THE ROUTE OF THE INTERCEPTOR DRAINS OR SWALES WILL NOT BE LOWER THEN THE DESIGN ELEVATION OF THE WATER SURFACE IN THE OUTLET AT THE LEVEL SPREADER OR STILLING POND.
  - THE SPACING AND FREQUENCY OF THE CHECK DAMS WILL BE DEPENDANT ON THE GRADIENT OF THE INTERCEPTOR DRAIN OR SWALE IN WHICH THEY ARE BEING INSTALLED.
  - CHECK DAM DESIGNS TO BE SELECTED BEST TO SUIT PARTICULAR TOPOGRAPHY AND HYDROLOGICAL ENVIRONMENT.
  - DOWN GRADIENT SLOPE BELOW LEVEL SPREADER ONTO WHICH THE WATER WILL DISSIPATE TO HAVE A GRADE <6%.  
9. NO DIRECT DISCHARGE OR PUMPING TO WATERCOURSES WILL BE PERMITTED. ALL DISCHARGES FROM LEVEL SPREADERS OR STILLING PONDS TO BE VIA VEGETATED FILTERS. SELECTION OF SUITABLE AREAS TO USE AS VEGETATION FILTERS WILL BE DETERMINED BY THE SIZE OF THE CONTRIBUTING CATCHMENT, SLOPE AND GROUND CONDITIONS.
  - STILLING PONDS TO BE SIZED ACCORDING TO THE AREA THEY WILL BE RECEIVING WATER FROM.
  - DIVERSION OF DRAINAGE DITCHES WILL ONLY TAKE PLACE WHEN ALTERNATIVE DRAINAGE DITCH HAS BEEN INSTALLED TO HANDLE THE SAME WATER.
  - EXISTING DRAINS/DITCHES TO BE INCORPORATED OR REMOVED DURING WIND FARM CONSTRUCTION.
  - ALL DRAINAGE SYSTEM FEATURES TO BE SUBJECT OF INSPECTION AND MAINTENANCE PLAN.
  - THE LAYOUT SHOWN IS SLIGHTLY OFFSET FOR SCALE PURPOSES, AND ALL DRAINAGE WOULD BE INSTALLED AS CLOSE TO THE ROAD AS POSSIBLE.

Date	Description	Chkd	Signed
21.08.15	Issue for Planning	M.G.	<i>M.G.</i>

Revisions

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Client: **ESB**

Job: **GROUSEMOUNT WIND FARM PLANNING APPLICATION**

Title: **PROPOSED CULVERT DETAILS**

Figure No: **D115**

Drawing No: **P1293-0815-A1-D115-00A**

Sheet Size: **A1** Project No.: **P1293**

Scale: **as shown (A1)** Drawn By: **M.Gill**

Date: **21/08/15** Checked By: **MG**