

30th November 2022

Staffordshire County Council
2 Staffordshire Place
Tipping Street
Stafford
ST16 2DH

Application Ref: SMD/2022/0076

Dear Sir/Madam,

RE: LAND OFF BERMERSLEY ROAD, BROWN EDGE

Thank you for your response to the planning application submitted to Staffordshire Moorlands District Council (SMDC) (ref. SMD/2022/0076). The application is for construction of a Battery Energy Storage System (BESS) facility and will include the installation of battery containers, adjoining inverter and transformer containers, a customer substation, security fencing, landscaping and other associated infrastructure.

Your response, dated 20th July 2022, requests further information to demonstrate an acceptable drainage strategy, specifically relating to:

- Drainage Strategy
 - Ground levels
 - Details of the connection between the swales
 - Proposed connection details from the swale into the ditch
 - Point of Discharge
 - Explanation, ideally supported with photographs, of the existing outfall into the Trent it is likely that the discharge route will need to be more formalised depending on findings;
 - We need to see the design for the replacement culvert and, as above, be assured that it will have sufficient capacity to convey the required flows and volumes.
 - We need to be assured that the ditch capacity will be sufficient to convey the water discharging from the drainage network which will require detailed design of the swales and comparison between discharge volumes and ditch capacity figures;
 - Permeable Surfacing
 - Please provide build ups of the proposed permeable surfacing for the access tracks and vehicle movement areas.
 - Rainwater Harvesting
 - We would support the consultation comments made by Staffordshire Wildlife Trust that rainwater harvesting solutions should be investigated for this site;
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Drainage Strategy

Ground levels

Drawing 001 shows the key ground levels of the two swales. The northern swale is 500mm deep with a base level of 151.1m AOD, the southern swale is 600mm deep with a base level of 150.4m AOD. Both swales have a base width of 500mm, side slopes of 1:3 and an outlet set 100mm above the swale base level in order to encourage retention of water and create a more permanent wetland habitat in the base of the swales.

The swales have both been modelled in Autodesk's Civil 3D design software to tie into the site survey, the drawing shows proposed ground contours at 0.1m centres and typical sections through the swales are included on drawing 02.

Details of the connection between the swales

The two swales will be connected to each other by a 150mm pipe with a bagwork headwall to each connection, details of the headwalls are provided on drawing 02.

Proposed connection details from the swale into the ditch

The connection detail from the swale into the existing ditch will be via a 150mm diameter pipe with bagwork headwalls at both the swale and ditch connection points, a flow control manhole is provided on the discharge route with a hydrobrake limiting the discharge from the site to 0.5l/s. The discharge route is shown on drawing 01 with details of the headwalls, pipe bedding and flow control chamber included on drawing 02.

Point of Discharge

Existing outfall into the Trent.

The short section of ditch from the track to the River Trent is a well-defined channel that is overgrown by vegetation. The channel dimensions are comparable to the ditch dimensions immediately upstream of the farm track (approximately 1.5m wide and 50cm to 70cm deep). It is proposed that this section of ditch will be cleared of all vegetation debris and silts to improve its performance.

Design for replacement culvert.

Our letter dated 8th July 2022 assessed the capacity of the ditch immediately upstream of the culvert as 1.390m³/s, based on local land gradients, a maximum depth of flow of 0.5m and a Manning's n coefficient of 0.100 for poor condition overgrown channel. This figure has been taken as the maximum potential flow that the culvert could be required to take.

It is proposed that the existing culvert be replaced with a new culvert consisting of two number 525mm diameter pipes under the access track with a gradient of 1:45, each pipe would have a capacity of 0.720m³/s based on a pipe roughness value (ks) of 0.6. The capacity of the proposed culvert (1.44m³/s) would therefore be greater than that of the ditch immediately upstream.

Ditch capacity and discharge from the drainage network.

As discussed above the current maximum discharge through the existing culvert is 1.390m³/s (based on the capacity of the ditch upstream of the culvert), the proposed discharge from the drainage network is 0.5l/s (0.0005m³/s) and is restricted to this flow rate by a hydrobrake prior to the ditch connection. The addition of 0.5l/s into the ditch would equate to an increase of 0.036% to the maximum possible flow within the ditch and is not considered significant in terms of the potential peak discharge.

In addition, the discharge of 0.5l/s should not be considered as an increase in flow to the ditch as it is a rate that has been attenuated to greenfield runoff rates and would ultimately have discharged to the ditch anyway as part of the natural runoff regime from this area of land.

Permeable Surfacing

A typical section through the access track is provided on drawing 02, the fall on the road and vehicle movement areas will be set to shed water to the existing ground.

Rainwater Harvesting

We understand the desire to provide rainwater harvesting on new developments, however the proposed site does not have any water use requirements. As there is no potential use for water on this site rainwater harvesting is inappropriate and has been discounted.

Closure

We would welcome further comment on the additional information presented in this letter and the amended drainage design proposals presented by Anesco for the BESS facility. If Staffordshire County Council are minded to raise an objection to the planning application based on the information provided, we would be keen to arrange a meeting to discuss a way forward for achieving a safe and sustainable development.

If there are any further queries regarding the FRA or the detail contained within his letter, please do not hesitate to contact me.

Yours sincerely

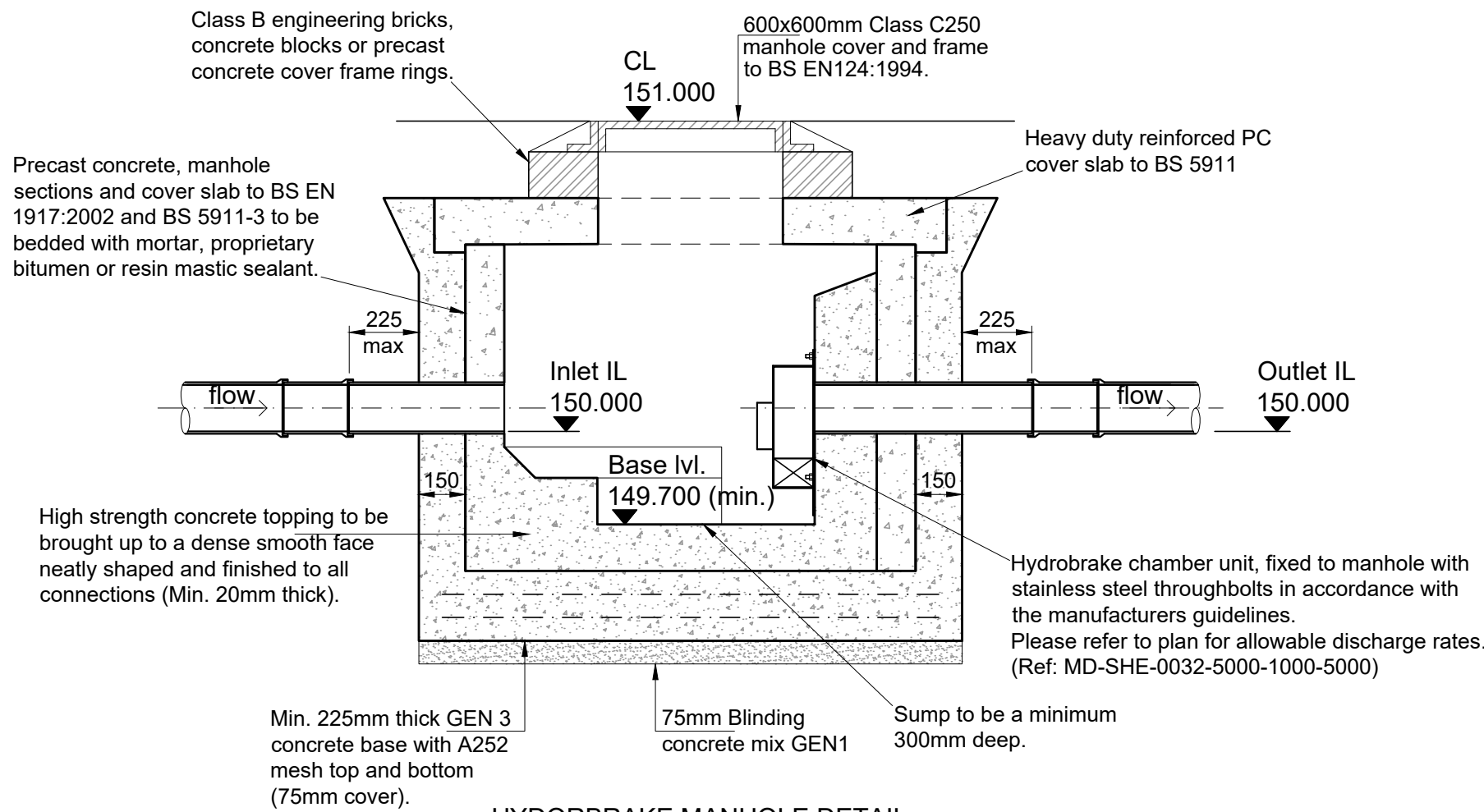
SLR Consulting Limited



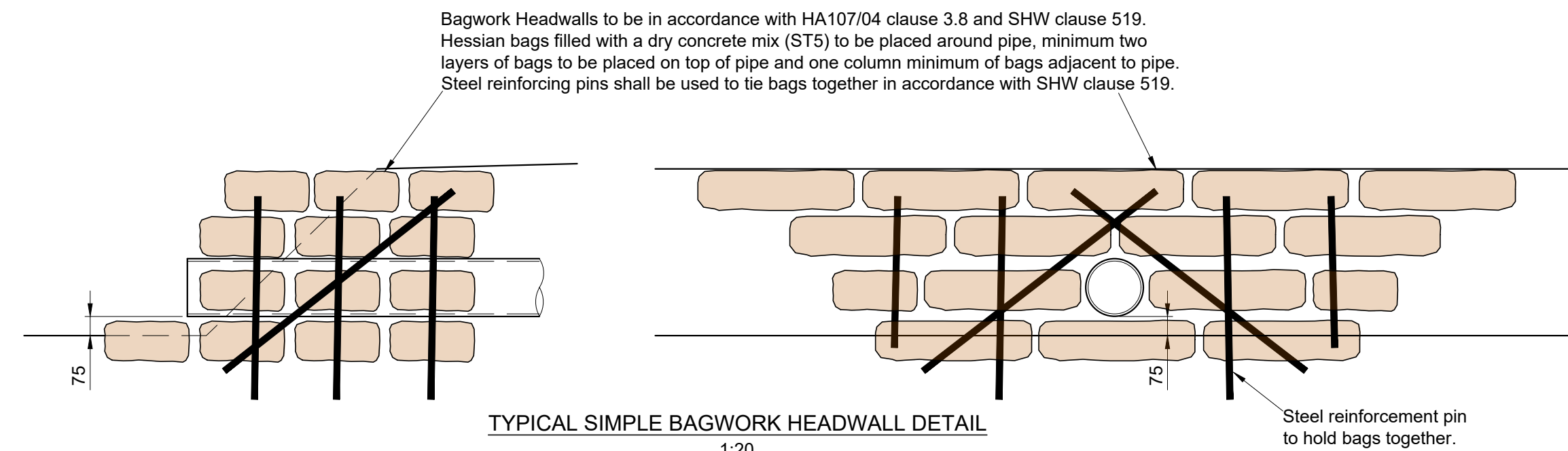
Martin Baines

Technical Director

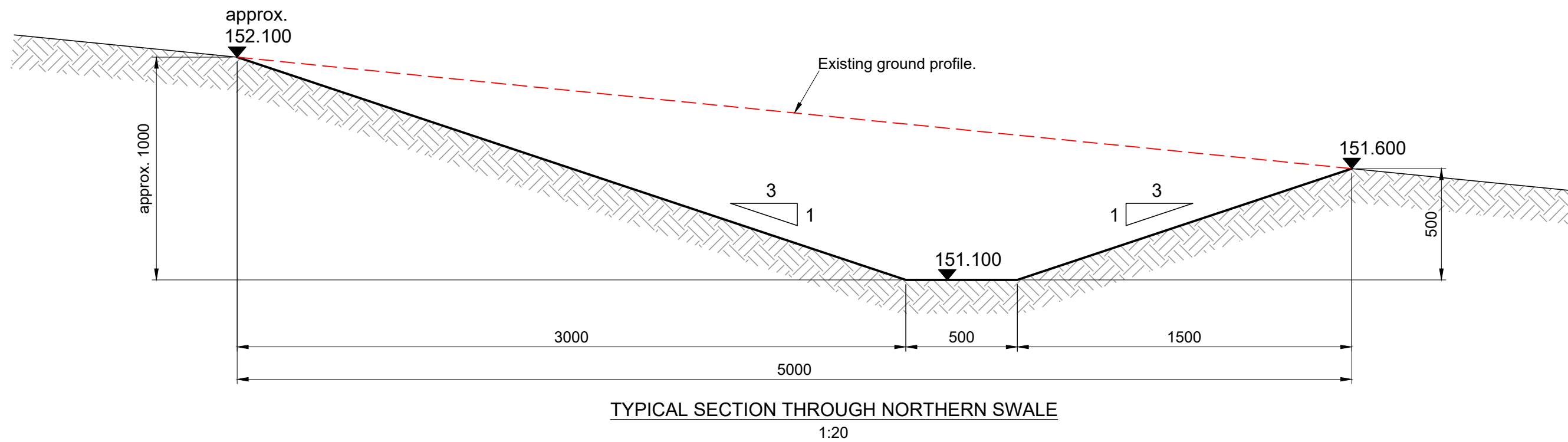
Enc. Proposed Drainage Plan.
Drainage Details.



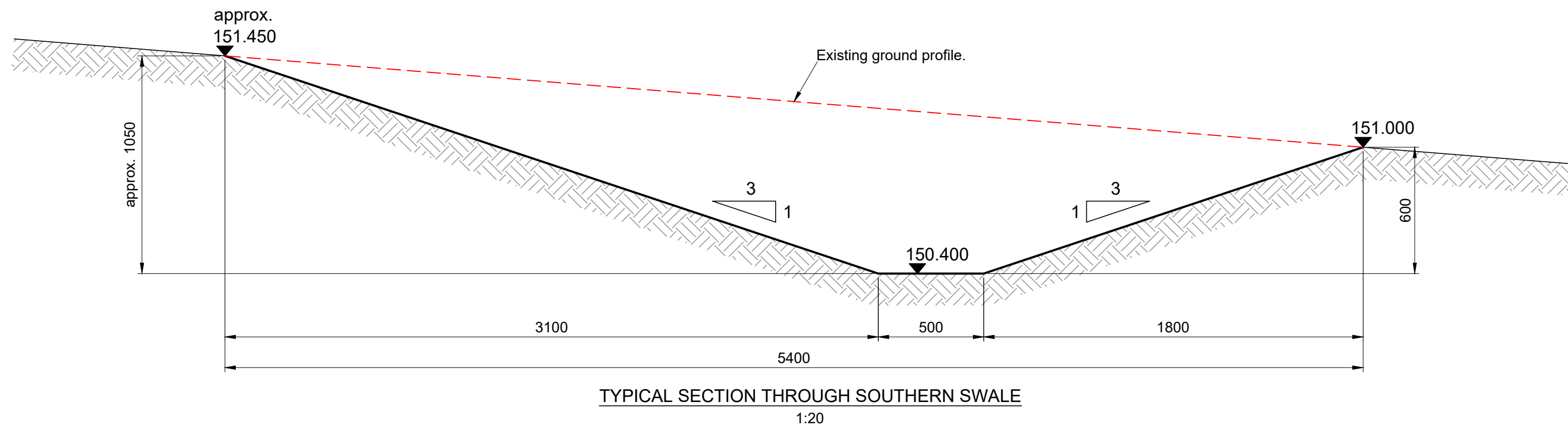
HYDORBRAKE MANHOLE DETAIL
1:20



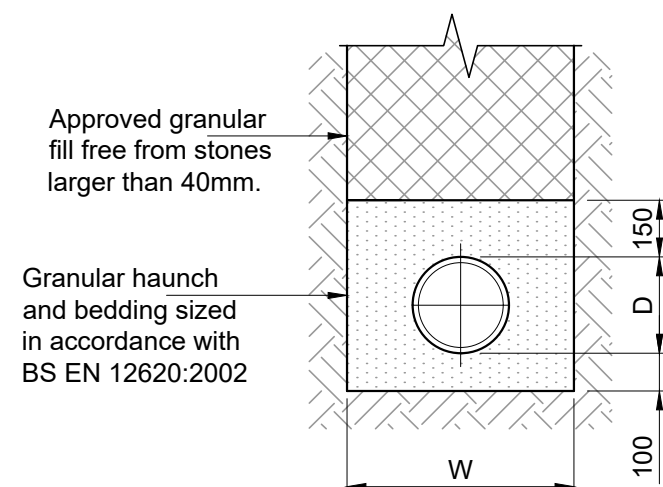
TYPICAL SIMPLE BAGWORK HEADWALL DETAIL
1:20



TYPICAL SECTION THROUGH NORTHERN SWALE
1:20



TYPICAL SECTION THROUGH SOUTHERN SWALE
1:20



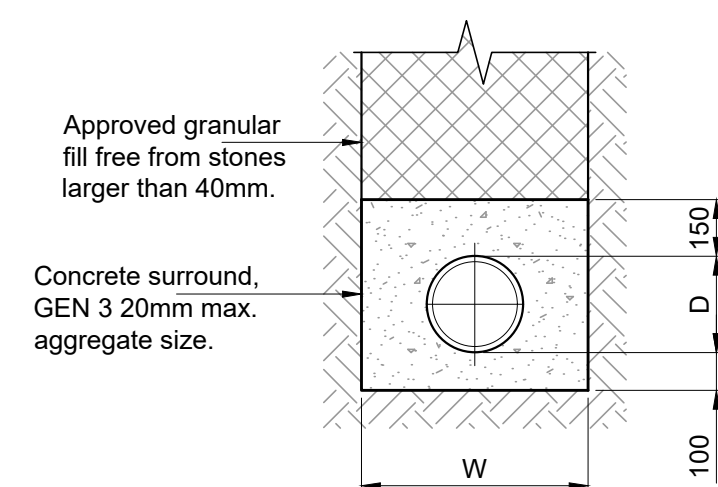
CLASS 'S' PIPE BEDDING & BACKFILLING DETAIL
pipes where cover to crown is greater than 1200mm under roads and footpaths

TRENCH DIMENSIONS					
D	100	150	225	300	375
W	450	600	700	850	1050

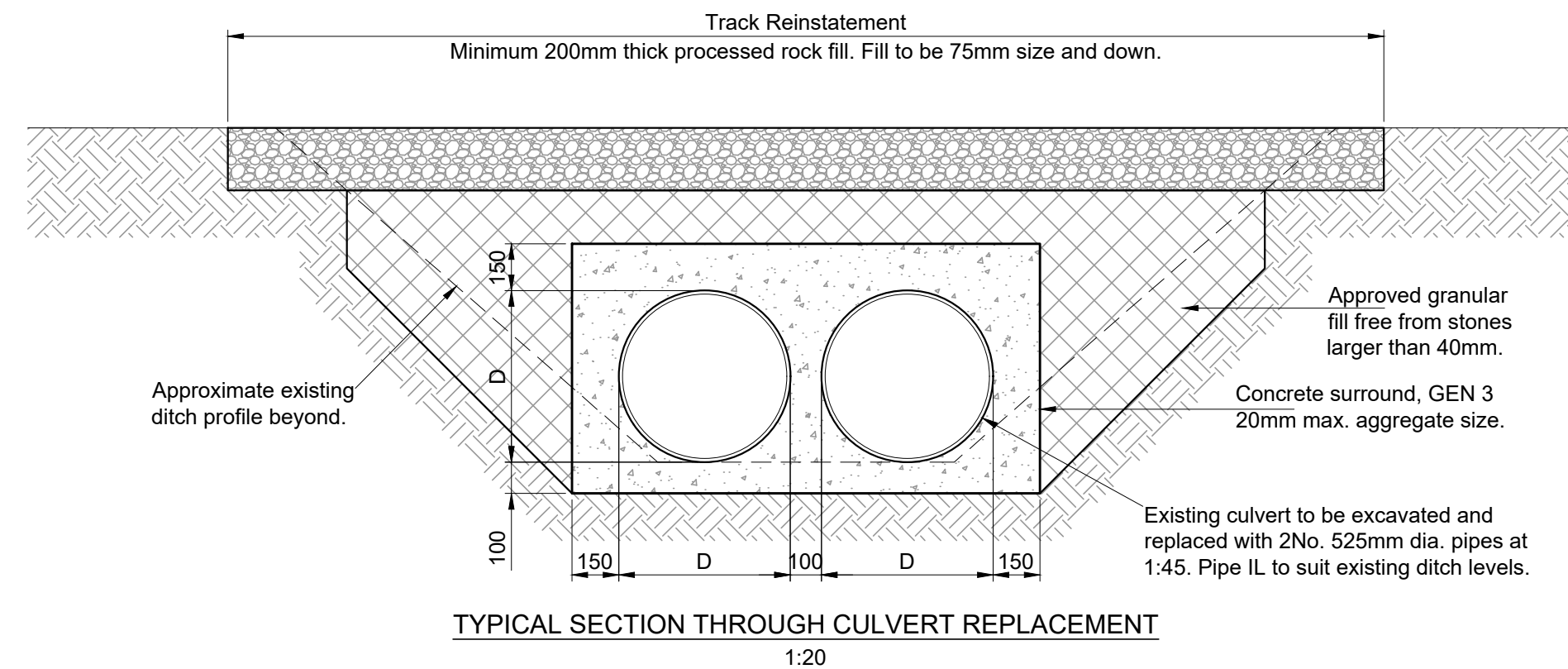
TRENCH BEDDING AND FILL MATERIALS					
GRANULAR BEDDING TYPE 'A'			% PASSING BY MASS		
USE FOR			B.S. 410 SIEVE SIZES (mm)		
TYPE	NOMINAL PIPE (DIA.)		63	37.5	20
A10	<300	-	-	-	-
			100	85.1	0.25
					2.36

TYPE 'B' FILL MATERIAL
Fill type 'B' will consist of readily compacted material free from tree roots, vegetable matter, building material, frozen soil, clay lumps retained on a 75mm sieve and stones larger than permitted for type 'A' material.

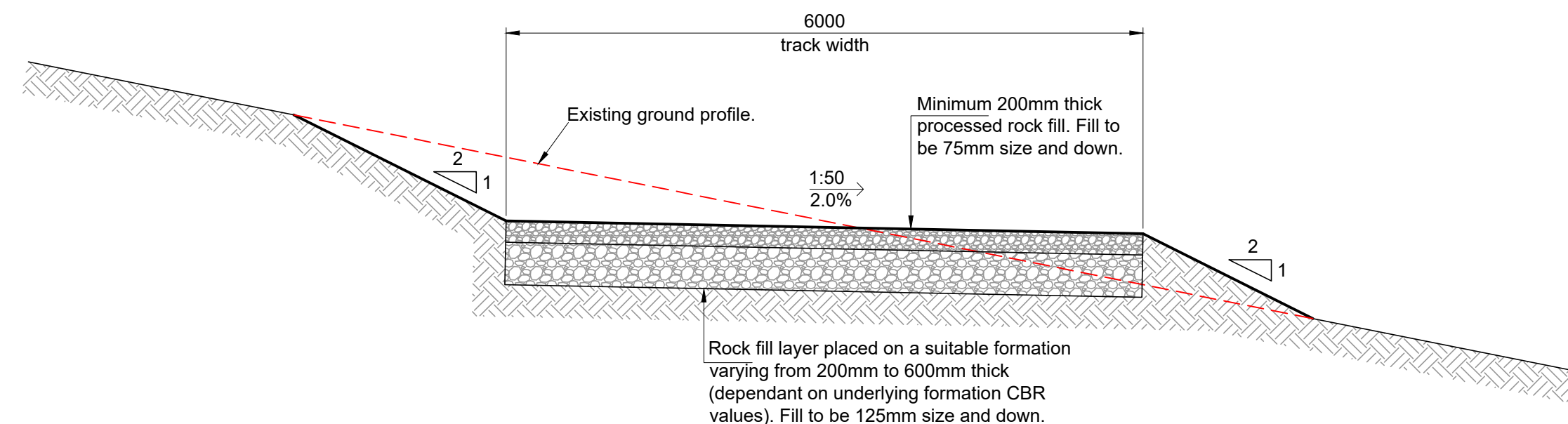
NOTE: Type 'B' not to be used under carriageways and parking areas on clay sites indicated on sections. It is to be substituted by DCT Type 2.



CLASS 'Z' PIPE BEDDING & BACKFILLING DETAIL
pipes where cover to crown is less than 1200mm under roads and footpaths



TYPICAL SECTION THROUGH CULVERT REPLACEMENT
1:20



TYPICAL SECTION THROUGH ACCESS TRACK
1:20

NOTES

1. Do not scale this drawing. If in doubt ask.
2. This drawing to be read in conjunction with all relevant Specialists and Engineers drawings and specifications.
3. Method statement must be agreed before work is carried out.
4. Engineered granular fill material in accordance with Specification for Highway Works. Class 6F1, 6F2 or 6N granular material in accordance with Table 6/1. Grading requirements to Table 6/2 and compaction to conform to Table 6/4.
5. Concrete grades are to be in accordance with BS8500-1: 2002 and BS8500-2 :2002 placed, compacted and protected in accordance with the National Standard Concrete Specification.
6. All drainage to be kitemark certified and installed in accordance with the latest edition of 'Sewers for Adoption' and 'Design and Construction Guidance (DCG)'.

T0	DH	IMR	NOV 22	PLANNING ISSUE
Revision	By	Chk'd By	Date	Discharge of Conditions Comments
 AMAZING ENERGY				
 TREENWOOD HOUSE ROWDEN LANE BRADFORD-ON-AVON WILTS. BA15 2AR T: 01225 30941 F: 01225 30944 www.slrcounselling.co.uk				
Site BALL GREEN FARM, BEMERSLEY ROAD, BROWN EDGE, STAFFORDSHIRE, ST6 8UL				
Project BALL GREEN BESS DRAINAGE DESIGN				
Drawing Title DRAINAGE DETAILS				
Scale 1:250 @ A1			Date NOVEMBER 2022	
Drawing Number 02			Revision P0	
PLANNING				