
From: Dominic Page <DPage@geraldeve.com>
Sent: 05 July 2022 09:07
To: Quinn, Mark
Cc: Aleksandra Iachinskaia
Subject: RE: External Mail: Response: 22/00099/FUL - FORMER CONTRACT CHEMICALS SITE
Attachments: 21065-BGL-XX-XX-DR-S-0203_P3 Assessment of Loading on Existing EA Culvert.pdf

Morning Mark,

Please see the attached drawing which provides further assessment of the structural implications of construction works over the river culvert, which has been prepared to respond to the EA's letter of 13 June 2022.

I'd be grateful if you could pass this on to the EA for review and further comment please, but please let me know if you have any immediate queries.

Kind regards,

Dom

Dominic Page
Partner

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From: Quinn, Mark <mark.quinn@knowsley.gov.uk>
Sent: 23 June 2022 10:29
To: Dominic Page <DPage@geraldeve.com>
Subject: FW: External Mail: Response: 22/00099/FUL - FORMER CONTRACT CHEMICALS SITE

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Hi Dominic ,

Please see the latest consultation response from the Environment Agency. Please note that the Environment Agency are still maintaining their objection.

I would be grateful to receive your response.

Regards

Mark Quinn
Principal Planner
Planning

Telephone: 0151 443 2223

Knowsley Council, Nutgrove Building - Second Floor, Westmorland Road, Huyton, Knowsley, L36 9FB



From: Willow, Liz <Liz.Willow@environment-agency.gov.uk>

Sent: 13 June 2022 08:47

To: DCSubmissions <DRES.DCSubmissions@knowsley.gov.uk>

Subject: External Mail: Response: 22/00099/FUL - FORMER CONTRACT CHEMICALS SITE

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FAO: Mark Quinn

Good morning

Please find attached our response to the above application.

Should you have any queries regarding this response, please do not hesitate to contact me.

Kind regards,

Liz Willow

Pronouns: she/her (*why is this here?*)

Planning Advisor | Sustainable Places | Greater Manchester, Merseyside, Cheshire

Co Bi Lead | Environment Agency LGBT+ Network

Environment Agency | Richard Fairclough House, Knutsford Road, Latchford, Warrington WA4 1HT

Email: SPPlanning.RFH@environment-agency.gov.uk

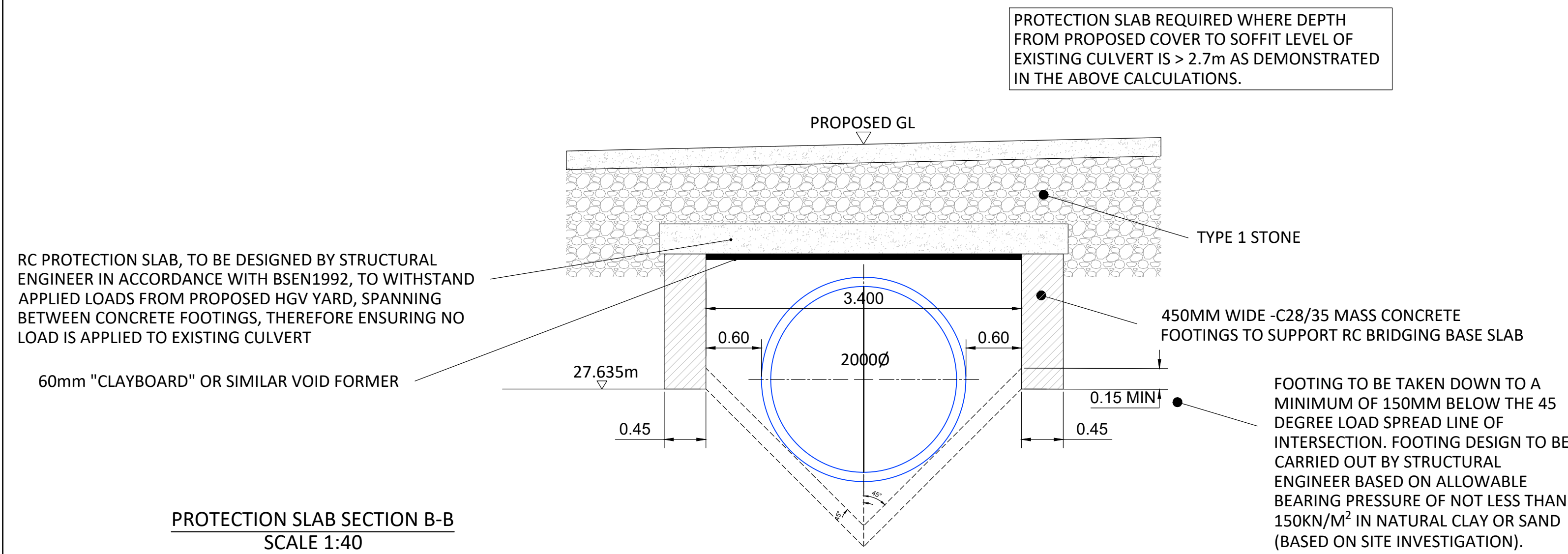
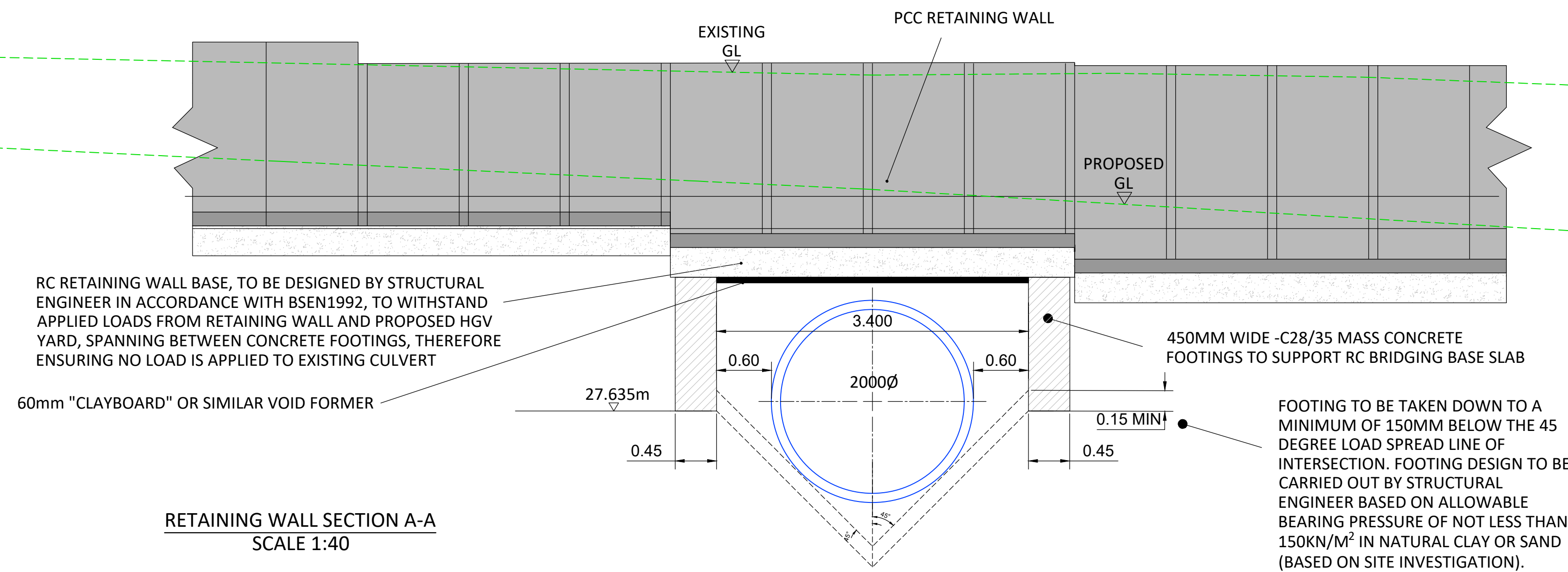
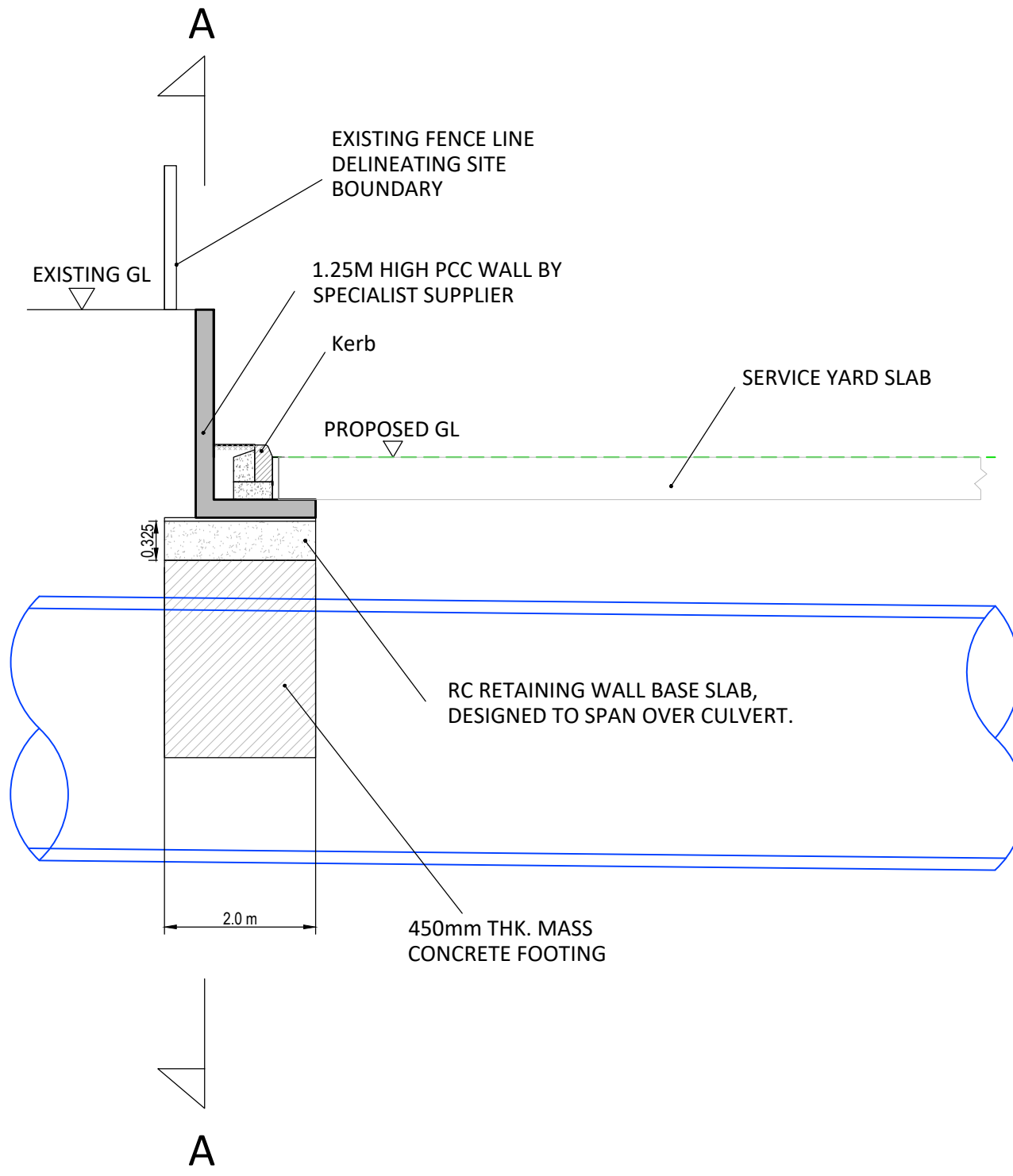
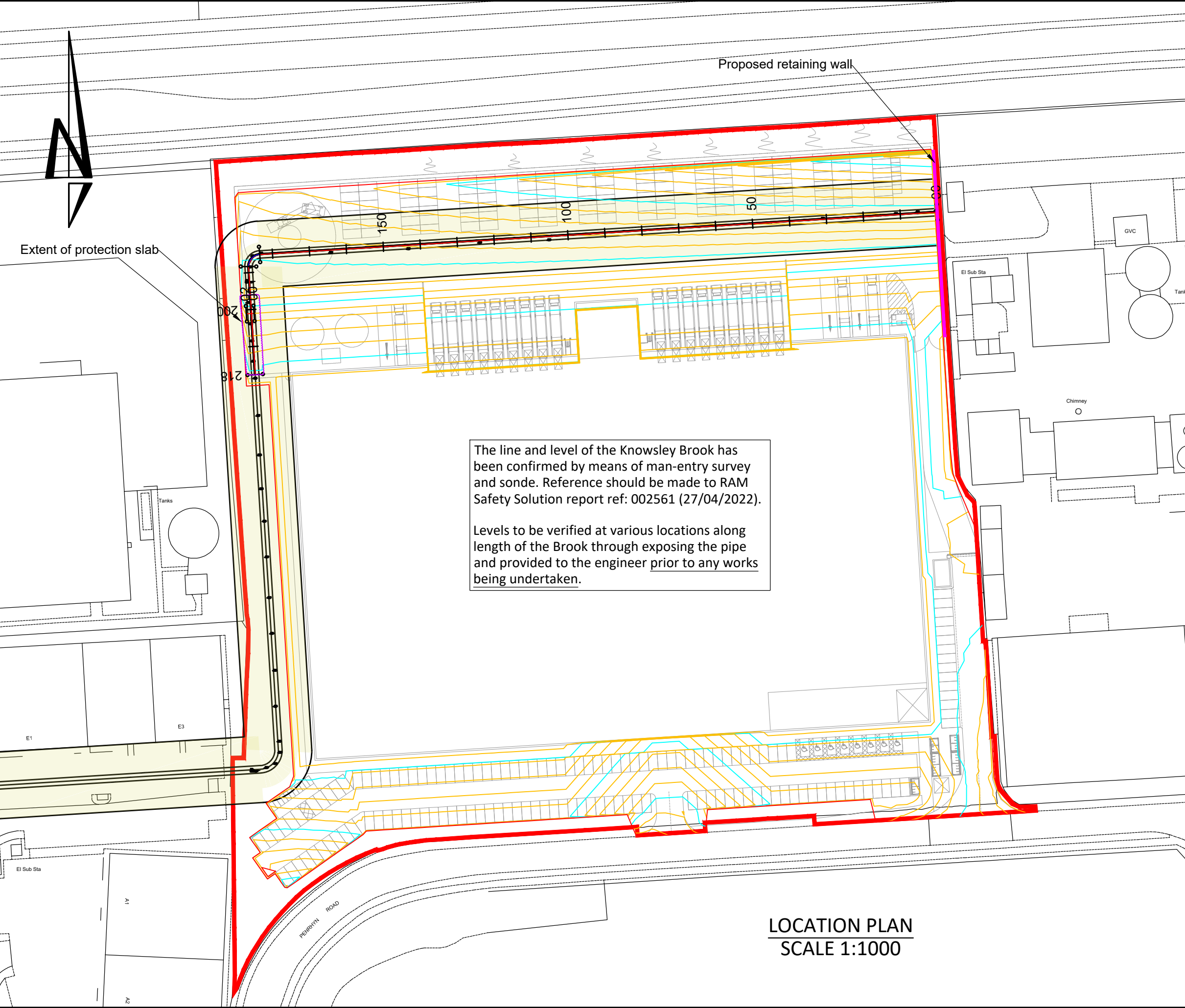


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Design Commentary

This drawing is intended to demonstrate that the proposed loading on the existing EA culvert will not exceed the existing loading.

The culvert current lies below an area of previous industrial development. The previous structures and hardstandings have been removed. Ground levels will be lowered / raised as required above the culvert to achieve the required development levels. The culvert will be under a proposed area of HGV yard with reinforced concrete pavement. A retaining wall will be constructed above the culvert on the eastern boundary.

The long section on this drawing shows that the maximum ground level above the culvert is 3.614 m at chainage 217m. Taking the soil density as 18kN/m³, the maximum pressure currently exerted on the culvert is 3.6'18 = 64.8 kN/m².

Surveys have been carried out, demonstrating that the culvert construction and condition is the same over the full length. Therefore, this assessment is made on the basis that the culvert can withstand the maximum pressure applied at any point along its length.

Proposed Retaining Wall Location

Where the proposed retaining wall is above the culvert, the design of the wall foundation will include a reinforced concrete bridging slab, to be designed in accordance with BSEN1992 to span over the culvert, with loads being transferred to the ground each side of the culvert with mass concrete trench footings. Therefore, no additional loading will be applied to the culvert at this location.

Location where pressure exerted on culvert post development is more than 64.8 kN/m²

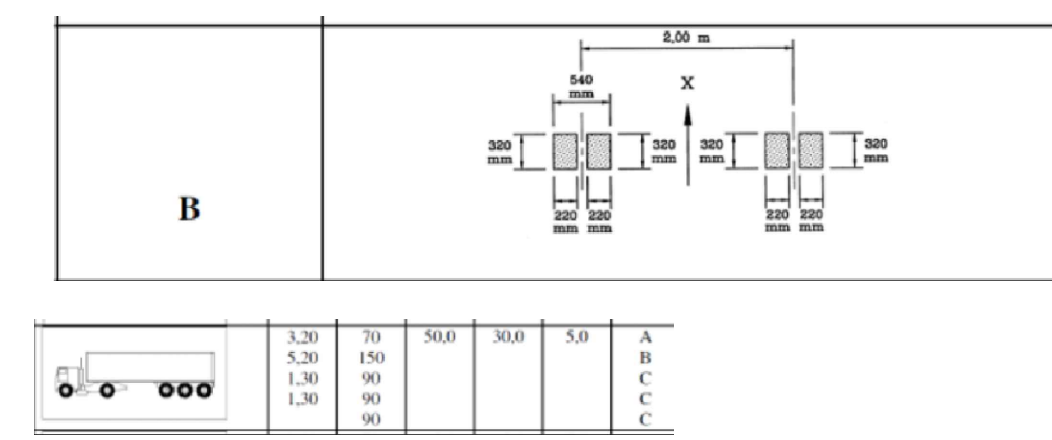
At this location a bridging slab will be provided similar to proposed at the retaining wall location, such that no additional loading will be applied

Location where pressure exerted on culvert post development is less than 64.8 kN/m²

Here, the wheel load diagrams and calculations on this drawing demonstrate that the applied pressure on the culvert due to HGV wheel loads, with load spread through the concrete pavement and at 45 degrees through the ground below will not exceed the pressure currently being exerted on the culvert due to weight of soil. Therefore there will be no increase in loading on the culvert compared with the previous ground pressure.

This assessment has been carried out by Jordan McGlacken MEng, checked by Mark Graham BEng CEng MICE.

EXTRACTS FROM BS EN 1991-2



LOADING ON THE PIPE

- Taking a 3.5m notational lane width.
- Maximum 150 kN HGV axle load, taken from BS EN 1991-2.
- Assumed 0.4m THK R.C. Slab in yard with a unit weight of 24 kN/m³. The R.C slab in yard will be 0.2m THK but has been taken as 0.4m THK for the calculations (conservative approach).
- 0.32m Width of wheel, with 0.5m load spreading from the slab.

$$P1 = \text{pressure from soil} = [(18 \times D) + (24 \times 0.4)]$$

$$P2 = \text{pressure from axle} = \frac{150}{[1.32 + (2 \times D)] \times 3.5}$$

$$P = P1 + P2$$

EXISTING WORST CASE LOAD ON PIPE

- Maximum depth between existing Ground level and Soffit is 3.614m (see chainage 217m on long section).
- Unit Weight of the Soil is 18 kN/m³

$$\text{Maximum existing pressure on culvert} = 3.6\text{m} \times 18 \text{ kN/m}^3 = \mathbf{64.80 \text{ kPa}}$$

MAXIMUM DEPTH WITHOUT BRIDGING SLAB

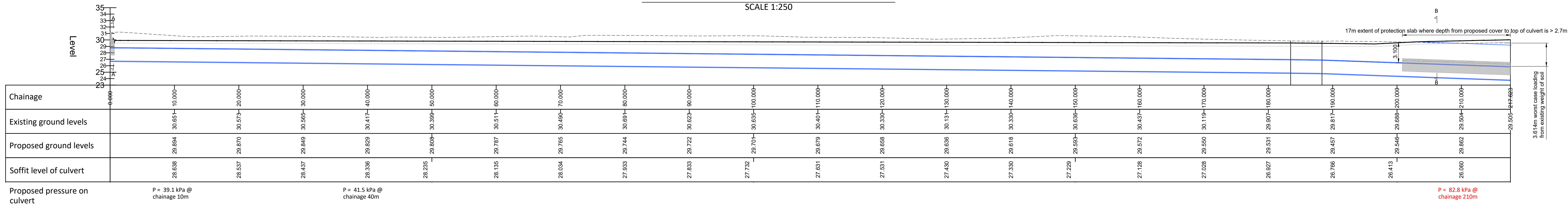
- Future loading on culvert based on 3.11m depth to cover:

$$P = [(18 \times D) + (24 \times 0.4)] + \left[\frac{150}{[1.32 + (2 \times D)] \times 3.5} \right]$$

$$P = [(18 \times 2.71) + (24 \times 0.4)] + \left[\frac{150}{[1.32 + (2 \times 2.71)] \times 3.5} \right] = \mathbf{64.74 \text{ kPa}}$$

- Therefore, where depth of cover to soffit of culvert is greater than 3.1m (conservative), the force on the culvert will exceed the maximum existing force on the culvert produced by the ground above, and a bridging protection slab is required.
- Where the depth of cover is less than 3.1m, calculations confirm that the force applied on the culvert is always less than 64.8 kPa, and a bridging slab is not required.

LONGSECTION THROUGH LENGTH OF EXISTING CULVERT IN YARD SCALE 1:250



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P3	04/07/22	JAM	Diagrams and design commentary added Drawing title amended.	MG
P2	17/05/22	JAM	Developed detail	MG
P1	11/05/22	JAM	First Issue	MG
REV	DATE	BY	REVISION	CHK'D

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PROJECT

PENRHYN ROAD, MERSEYSIDE
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DRAWING TITLE			
ASSESSMENT OF LOADING ON EXISTING EA CULVERT			
OUR PROJECT NUMBER	DRAWING STATUS	OFFICE	
21065	PRELIMINARY	NORTH	
SCALE @ AD	DATE	DRAWN BY	CHECKED BY
VARIES	11.05.2022	JAM	MG
DRAWING No			REV
21065-BGL-XX-XX-DR-S-0203			P3