

TECHNICAL NOTE 3 (Rev. 1)

DATE:	23 April 2025	CONFIDENTIALITY:	Confidential
SUBJECT:	TN03 - Baseline Model Amendments for Haul Road and Bridge		
PROJECT:	South Wokingham Distributor Road	AUTHOR:	L. Davey
CHECKED:	M. Quinnell	APPROVED:	M. Quinnell

INTRODUCTION

WSP was commissioned by Wokingham Borough Council in 2020 to undertake hydraulic modelling in support of the Flood Risk Assessment prepared for the Central and Western section of the South Wokingham Distributor Road (SWDR). The purpose was to understand the baseline flood risk conditions at the site; determine the effect of the SWDR on flood risk within the vicinity of the proposed development; and identify & model mitigation measures. The baseline and post-development hydraulic models were submitted to and approved by the Environment Agency.

This technical note details a modification that has been made to the approved baseline model to test the sensitivity of flood levels and extents to the construction of a temporary haul road across the site. The proposed alignment of the haul road and required temporary crossing across the watercourse are shown in Figure 1.

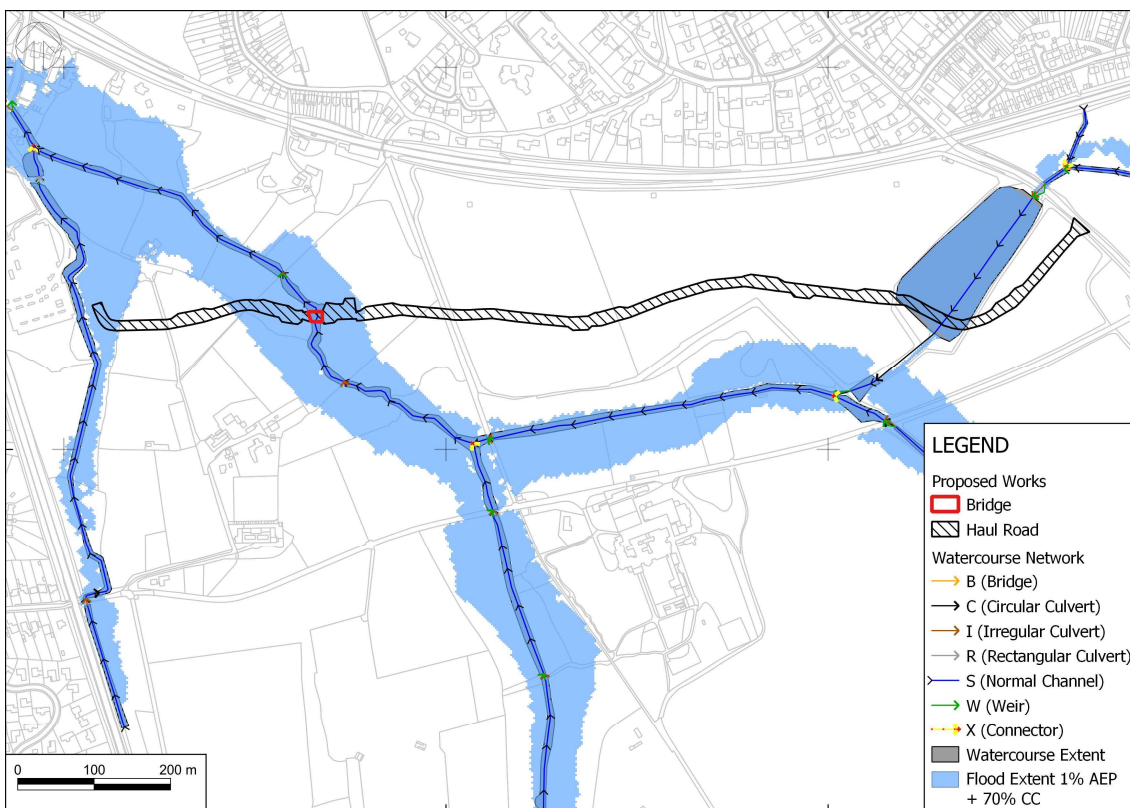


Figure 1: Proposed alignment of temporary haul road and crossing

MODEL AMENDMENTS

The haul road has been represented in the baseline model using a z_point shape. This alters ground levels in the model to reflect haul road levels which have been provided by the Contractor responsible for constructing it.

The proposed haul road design includes drainage ditches running parallel and on both sides of the road. These ditches will be full during a flood scenario and thus they have not been included in the model representation.

Where the haul road crosses the watercourse, a bridge node has been added to the 1D network, with its dimensions being based on Drawing No. WMHP-BB-SRWG1-SK-PM-555 (refer to Appendix A).

Where the haul road crosses an existing Thames Water storage basin, which is represented in the 1D network, the haul road levels have been represented using an irregular weir structure based on the crest levels in this location.

MODEL RESULTS

The haul road model has been run for the 1% Annual Exceedance Probability (AEP) event plus an allowance of 70% for climate change. The results of the haul road model run were compared to the results of the approved baseline model. Figure 2 below shows a comparison of these results at the location of the proposed bridge. Differences in channel water levels are shown at a series of inspection points and differences in flood levels and extent are shown in the water level difference colour ramp.

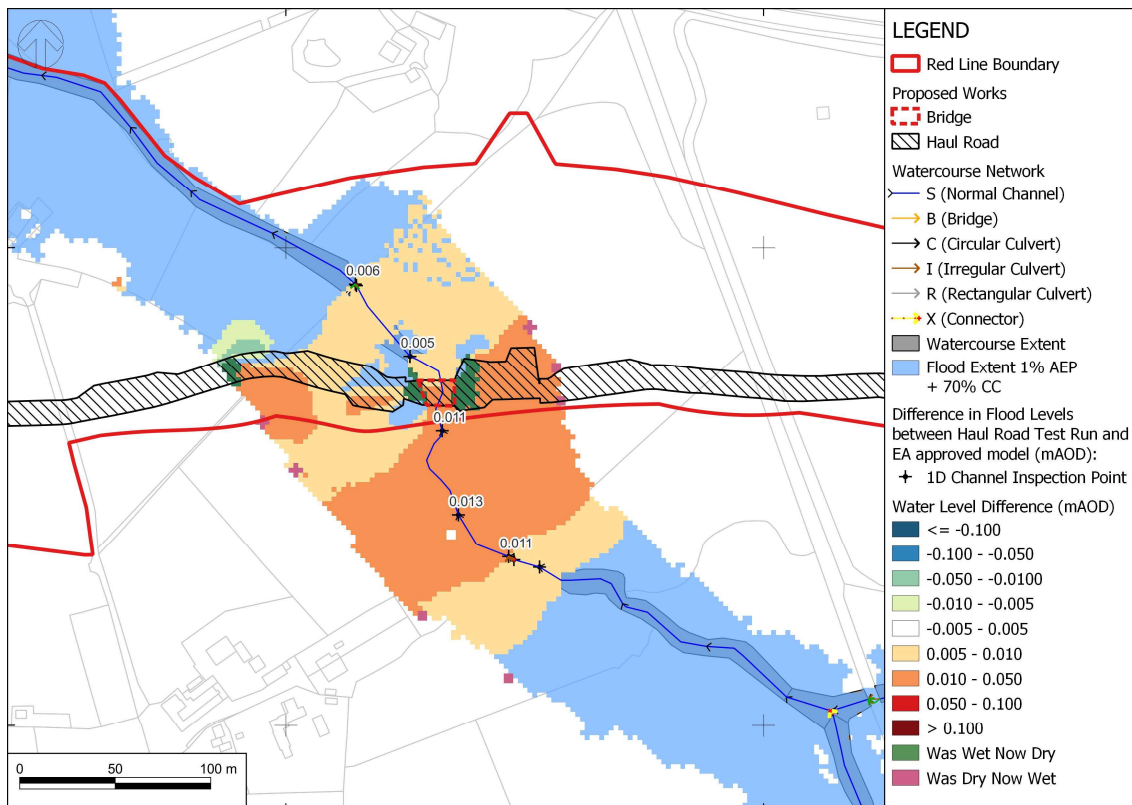


Figure 2: Water Level Difference Map for at Location of Proposed Bridge Structure

The model results show an increase in water level at the location of the bridge structure of approximately 11mm, with a maximum increase of approximately 29mm within the 2D floodplain extent. Minor variations

in flood extents are also visible in this area (was dry now wet). Elsewhere in the model domain, only negligible variations in water level are visible.

The variation in flood levels occurs both within the red line boundary (RLB) and in a section to the south of the RLB. This area to the south of the site is undeveloped land that consists of fields, which is primarily used for dog walking purposes, and contains no properties. This land is also part of a future development site which the construction of the SWDR will help to facilitate.

The increase in flood levels is minor; the increase in flood extent is insignificant; and there will be no increase in flood risk to people (dog walkers and other members of public are highly unlikely to use the area in a flood event) and property.

Therefore, the increase in flood level is considered acceptable.

CONCLUSION

The observed variations in water levels affect areas in the vicinity of the proposed bridge structure. There is a insignificant difference in the flood extent from the addition of the haul road and associated bridge structure, thus variations in water levels are located primarily in areas that are already at risk of flooding. These areas of increase are located within the site boundary or undeveloped land. Therefore, the effect of the temporary haul road and its associated temporary watercourse crossing on flood risk is considered acceptable.



APPENDIX A

Haul Road Construction Drawings

WMHP-BB-SRWG1-SK-PM-555

CRXSS080-BBR-00-XX-DR-W-0001-C1

CRXSS080-BBR-00-XX-DR-W-0014-C1

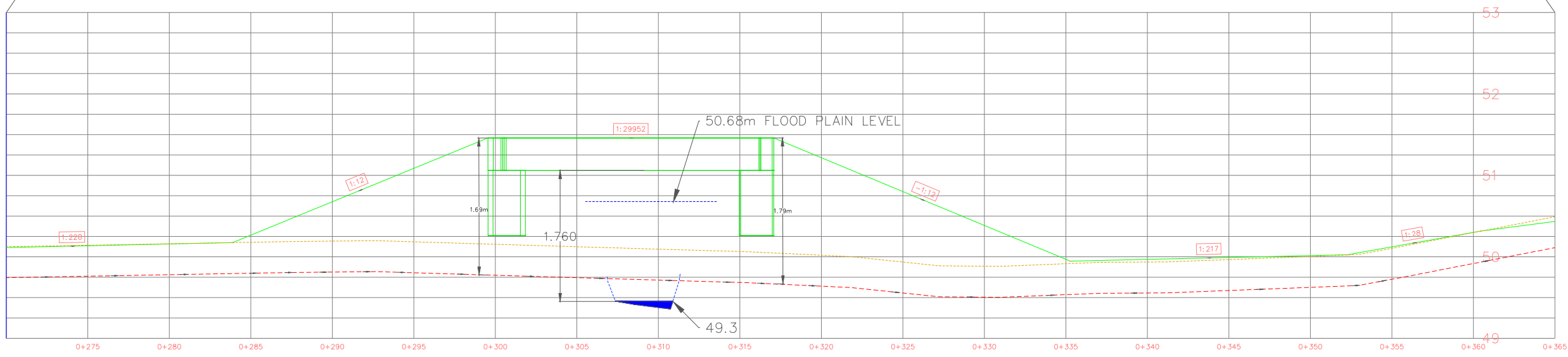


DO NOT SCALE

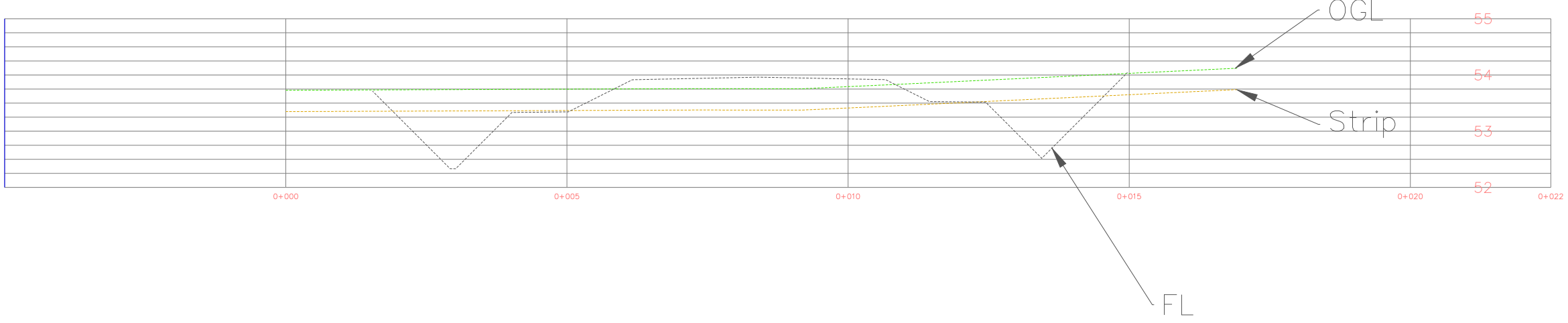
KEYPLAN

REV	DATE	BY	DESCRIPTION	CHK	APP
DRAWING STATUS:					
DESIGNER:					
CONTRACTOR:					
CLIENT:					
WOKINGHAM BOROUGH COUNCIL Shute End, Wokingham, Berkshire RG40 1BN Tel: (0118) 974 6000 Web: www.wokingham.gov.uk					
PROJECT:					
TITLE:					
Haul road alignment and profile					
SCALE @ A1:	NTS	CHECKED:	CM	APPROVED:	-
PROJECT NO:	CRXSS080	DESIGNED:	-	DRAWN:	MA
DRAWING No:				WMHP-BB-SRWG1-SK-PM-555	REV:
					01

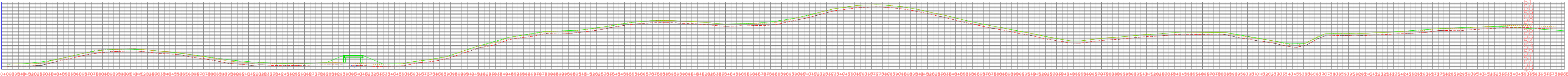
Temporary Bridge Long Section



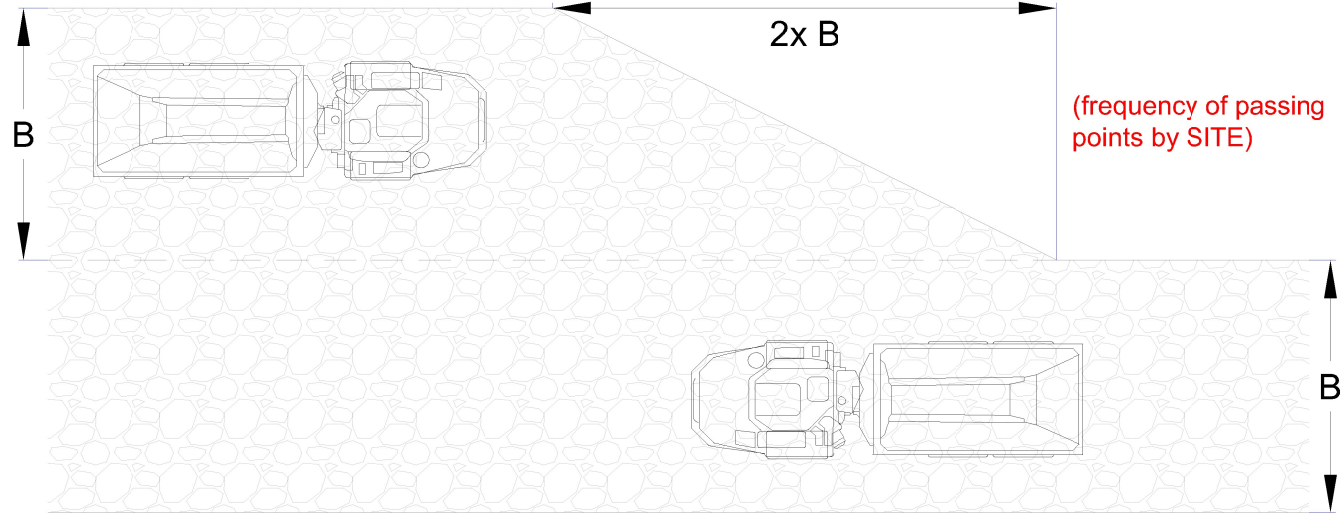
Typical Haul Road Crossection



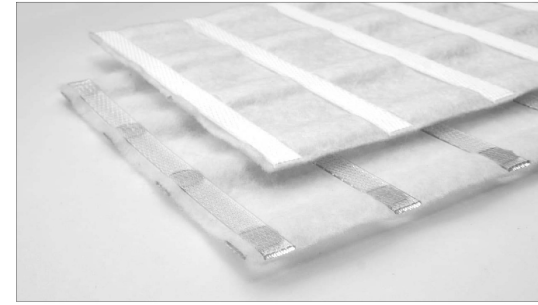
Haul Road Long Section



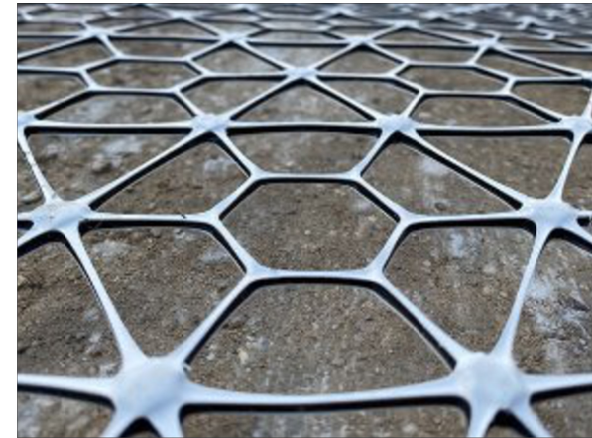
Suggested length of passing point: 20m (min.)



PLAN
ACCESS ROAD PASSING AREA



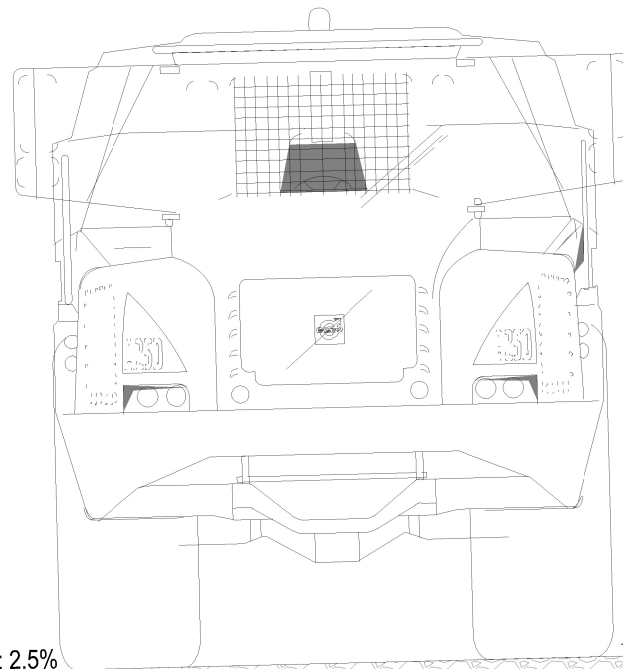
NAUE Combigrd 40/40



Tensar InterAx

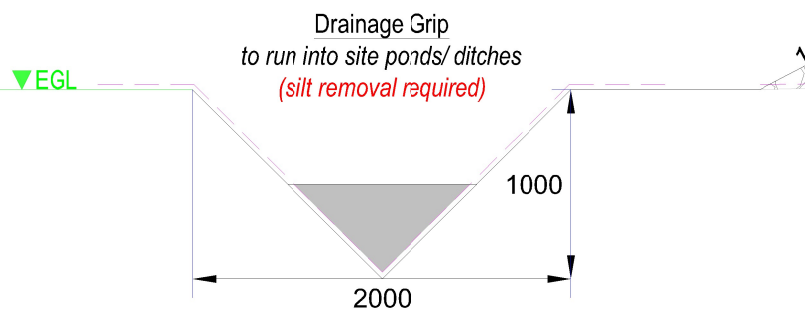
Construction Sequence:

1. Topsoil strip haul road area,
2. Proof roll formation and remediate any soft spots with compacted 6F5,
3. Test for CBR at formation level,
4. Install:
 - i) Terram T1000 (unreinforced), **OR**
 - ii) NAUE Combigrd 40/40 Q1 (reinforced), **OR**
 - iii) Terram T1000 & Tensar Interax (stabilised)across entirety of topsoil stripped area in accordance with manufacturer's instructions.
5. Place and compact required haul road thickness as per *Haul Road Stone Thickness* table in accordance with SfHWs Series 600 - Table 6/4 (Method Compaction).



Haul Road Stone Thickness, mm			
CBR, %	Option A Unreinforced	Option B Reinforced (NAUE Combigrd 40/40 Q1)	Option C Stabilised (Tensar InterAx)
<1	Contact Temporary Works Department		
1	560	380	450
2	430	225	400
3	330	150	360
4	225		325
5≤	225		295

Minimum edge distance = 2x Wheel width
TO BE MANAGED BY SITE



SECTION
HAUL ROAD CONSTRUCTION DETAIL

Quarried 6F5 granular fill

Haul Road Options	
	Geotextile
OPTION A	Terram T1000
OPTION B	NAUE Combigrd 40/40
OPTION C	Tensar Interax Terram T1000

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Health, Safety and Environmental Risks

RA Number | CRXSS076-BBR-00-XX-RA-W-0001

Risk No	Risk
01	Incorrect installation of TWs
02	Overloading surrounding ground
03	Local ground failure - inadequate ground strength parameters
04	Damage to underground services

ZERO HARM
MAKE SAFETY PERSONAL

SUSTAINABILITY
a collective responsibility

Notes

- Dimensions in mm UNO
- Route to be determined by SITE
- Allowable surface rut depth: 75mm
- It is recommended to install wheel washing facilities at all exit points to remove loose material from vehicles accessing public roads from site
- CBR tests to be completed at formation level to inform haul road construction. Results to be sent to BB TWs department for review
- 6F5 granular fill to be placed and compacted in accordance with *Specification for Highways Works Series 600 (Table 6/1 & Table 6/4)*
- All soft spots/ rutting to be removed and replaced with 6F5 granular fill in accordance with *IAN 73/06 Design Guidance for Road Pavement Foundations*
- Design does NOT allow for areas of high water table/ flood conditions within 1m of finished platform level. Separate design is required for this situation.

Loads Considered (**Total ESA: 4,107,009**):

- Site vehicles up to 3.5T: **50,000 vehicle passes**
- Moxy MT36 dump truck: **50,000 vehicle passes**
- 4-axle rigid HGV: **10,000 vehicle passes**
- 6m³ concrete wagon: **10,000 vehicle passes**
- Telehandler: **10,000 vehicle passes**
- Bauer BG30 Piling rig: **200 vehicle passes**
- Demag 350t Crane: **200 vehicle passes (Not to be used as a platform)**

GI report: GE21309/GAR/DEC22

Revision	Description	Date	Des	Chk
P1	Preliminary	24/07/24	TA	Site
C1	Issued for Construction	11/11/24	TA	TN

Designer

Balfour Beatty

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Client



**WOKINGHAM
BOROUGH COUNCIL**

Paper Size	Scale	Designer	Checker
A3	NTS	TA	TN

Project

CRXSS080 South Wokingham Distributor Road

Drawing Title

Traditional Haul Road

Status

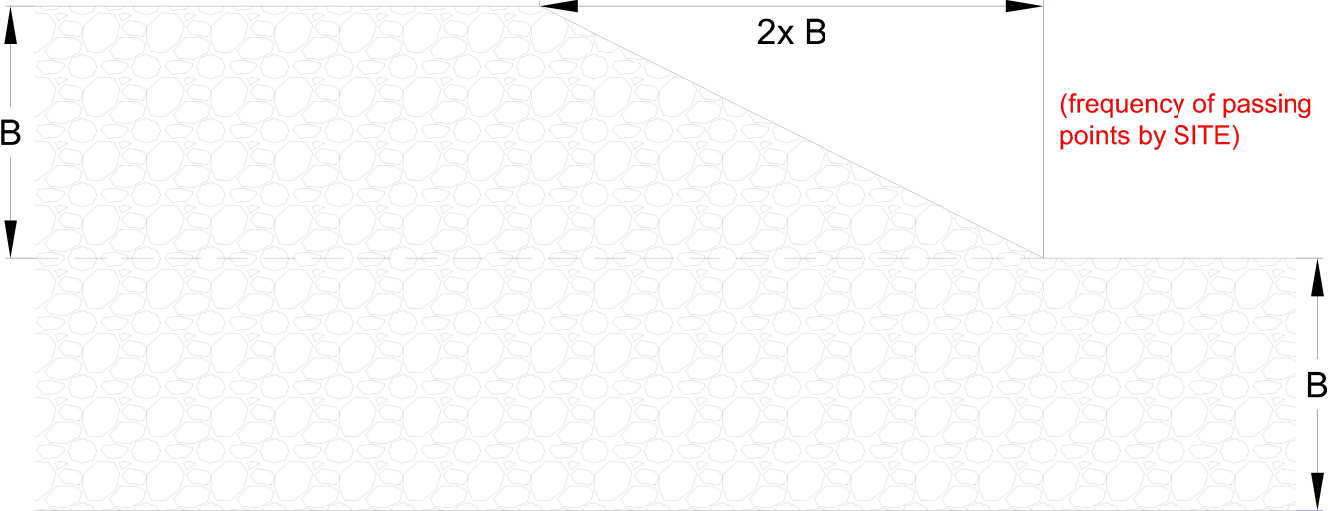
Construction

Client Drawing Number	Revision
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Drawing Number	Revision
CRXSS080-BBR-00-XX-DR-W-0001	C1

0mm Scale 1:1 40mm Scale 1:1 80mm

Suggested length of passing point: 20m (min.)

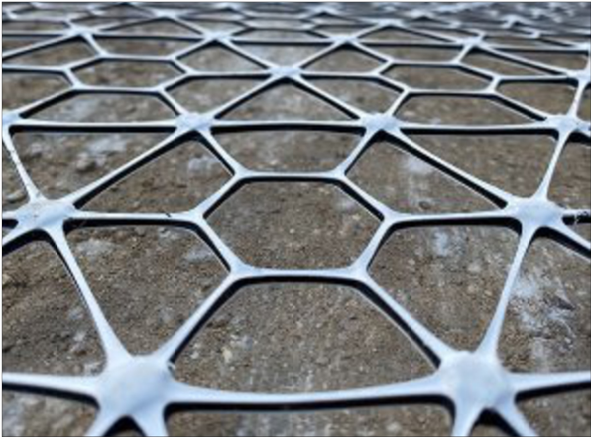


PLAN

ACCESS ROAD PASSING AREA

Construction Sequence:

1. Topsoil strip haul road area.
2. Excavate the drainage ditches to the required depth and width
3. Proof roll formation and remediate any soft spots with compacted 6F5,
4. Carry out plate bearing equivalent CBR tests at formation level,
5. Install 175mm deep 6C Starter layer and compact in accordance with SfFHs Series 600 - Table 6/1 (Method Compaction). Layer to be wrapped in Terram T1000 or similar geotextile,
6. Install Tensor Interax geogrid (stabilised) in accordance with manufacturer's instructions.
7. Place and compact required haul road thickness as per *Haul Road Stone Thickness* table in accordance with SfHWs Series 600 - Table 6/4 (Method Compaction).



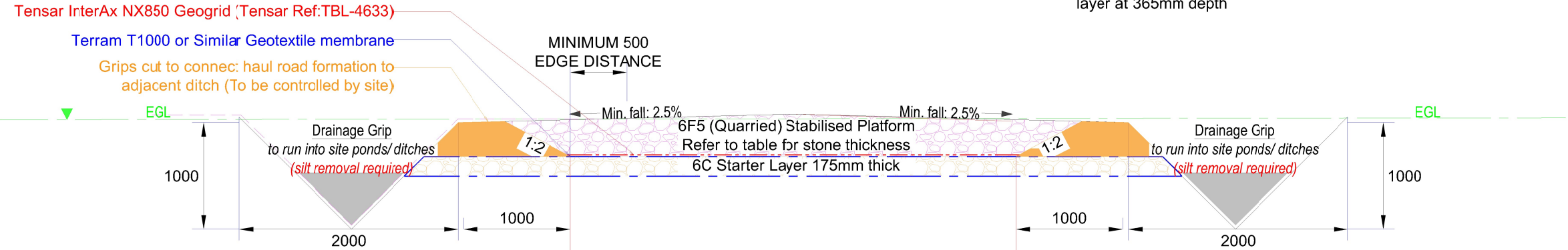
Tensor InterAx

Notes continued:

- Minimum required CBR value for formation level is 1%. Values below 1% are considered to be soft spots and are to be removed, backfilled with 6F5 and compacted in accordance with *Specification for Highways Works Series 600 (Table 6/1 & Table 6/4)*
- Plate bearing equivalent CBR tests to be completed at formation level to inform haul road construction. Results to be sent to BB TWs department for review

Haul Road Stone Thickness, mm	
CBR, %	Stabilised (Tensor InterAx) Tensor Ref: TBL-4633
<1	Further ground remedial works required
1	515*
2	320
3	260
4	220
5≤	190

*Requires additional geogrid layer at 365mm depth



SECTION

HAUL ROAD CONSTRUCTION DETAIL

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Health, Safety and Environmental Risks

RA Number | CRXSS076-BBR-00-XX-RA-W-0014

Risk No | Risk

01	Incorrect installation of TWs
02	Overloading surrounding ground
03	Local ground failure - inadequate ground strength parameters
04	Damage to underground services
05	Increased use of road - Exceeding ESALs
06	Presence of groundwater at formation level

ZERO HARM
MAKE SAFETY PERSONAL

SUSTAINABILITY
a collective responsibility

Notes

- Dimensions in mm UNO
- Route to be determined by SITE
- Allowable surface rut depth: 75mm
- It is recommended to install wheel washing facilities at all exit points to remove loose material from vehicles accessing public roads from site
- CBR tests to be completed at formation level to inform haul road construction. Results to be sent to BB TWs department for review
- 6F5 granular fill to be placed and compacted in accordance with *Specification for Highways Works Series 600 (Table 6/1 & Table 6/4)*
- All soft spots/ rutting to be removed and replaced with 6F5 granular fill in accordance with *IAN 73/06 Design Guidance for Road Pavement Foundations*
- Due to presence of high water table, design requires use of Tensor InterAx geogrid to counteract waterbed effect (maximum allowable elastic deformation = 18mm)

Loads Considered (Total ESA: 1,211,253):

- Site vehicles up to 3.5T: 10,000 vehicle passes
- Moxy MT36 dump truck: 10,000 vehicle passes
- 4-axle rigid HGV: 5,000 vehicle passes
- 6m³ concrete wagon: 10,000 vehicle passes
- Telehandler: 10,000 vehicle passes
- Bauer BG30 Piling rig: 200 vehicle passes
- Demag 350t Crane: 200 vehicle passes (Not to be used as a platform)

(Haul road to be reggraded and compacted when the ESALs are exceeded)

GI report: WMHP-TG-SRWG1-RP-GE-0601 - Ground Investigation Report

Document History

Revision	Description	Date	Des	Chk
P1	Preliminary	14/03/25	TA	--
C1	Construction	27/03/25	TA	DM

Designer

Balfour Beatty

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Client



WOKINGHAM
BOROUGH COUNCIL

Paper Size	Scale	Designer	Checker
A3	NTS	TA	DM

Project

CRXSS080 South Wokingham Distributor Road

Drawing Title

**High Water Table
Haul Road**

Status

Construction

Client Drawing Number	Revision
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Drawing Number	Revision
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CRXSS080-BBR-00-XX-DR-W-0014	C1
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0mm Scale 1:1 40mm Scale 1:1 80mm