Appendix 4.3
Cut and Fill Analysis Report

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Cut and Fill Report

Herbata Data Centre Campus

Naas, County Kildare

Ireland

September 7, 2023

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P04	12/07/2023	S3	12/07/2023_UG	12/07/2023_CR	Issue for Planning
P05	07/08/2023	S3	07/08/2023_UG	07/08/2023_JM	Issue for Planning
P06	07/09/2023	S3	07/09/2023_UG	07/09/2023_JM	Issue for Planning
P07	01/05/2024	S3	01/05/2024_JJ	01/05/2024_UG	Issue for Planning

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1 Introduction

HDR has been commissioned by Herbata for the Herbata Data Centre Campus Naas County Kildare to provide information regarding the preliminary “cut and fill” so that and estimate of quantities can be determined for the purposes of setting the building and access road levels on the site only. This exercise can also assist in determining the volume of material to balance material movements on and off the site. This cut and fill exercise is based on bulk earthmoving and does not consider other aspects such as services, foundations etc.

2 Basis of Review

The cut and fill review has been carried out based on the following information provided by 3rd parties.

Table 2-1. Information Received

Document Title	Number and Revision	Author / Company	Date Received
Topographical Survey	No document references available	J&L Surveys	13/09/2022
Architectural Site Layout	22217-RKD-ZZ-ZZ-DR-A-1010 Rev P04	RKD	28/04/2023
Ground Investigation Reports	0	IGSL Ltd	31/01/2023

All information received is via 3rd parties and HDR have not validated this information nor can HDR be held responsible for the correctness and accuracy of the information received. If 3rd party information is not accurate and able to be used for the intended purpose and require alterations, HDR cannot be held liable inaccuracies of manipulated information.

3 Cut and Fill Methodology

A bulk cut and fill exercise has been carried out to set the finished floor levels of the buildings. The cut and fill volumes has been mostly driven by the buildings due to its size. Various iterations of the finished floor levels have been reviewed a cut and fill balance. This version of the cut and fill exercise includes the modeling of the landscape mounds and manual calculations for the approximate road cut and foundation allowances. The mounds of the development form of vegetation habitat as well as a screening to the site. The exact extent of the mound(s) has now been agreed.

This cut and fill exercised out to date only considers the bulk earthworks only which includes the finished floor levels (plus an allowance for approximate 500mm foundation depth) of the main data halls and the 1m step between the data halls and the associated plant enclosure, the current ponds sizes and a 200mm topsoil strip. In addition to this, a manual calculation on the roads, based on 700mm cut, have also been included. The foundations, topsoil and road thickness are an estimate at this point in time and would need to be verified at the next stage of the design.

As far as practicably possible, the existing topography will be retained to avoid unnecessarily disturbance of the site. The retaining walls currently shown will require further refinement at a later stage.

4 Cut and Fill Review

The results of our cut and fill review are as follows:

Cut: 146,500m^3 modelled

Cut: 35,000m^3 (manual calculation for roads at 700mm thick – guestimate)

Cut: 50,000m^3 (manual calculation for datacenter foundations at 500mm thick)

Fill: 239,800m^3 modelled

Net Fill **8300**m^3

All figures have been rounded to the nearest thousand.

This cut and fill values is an estimate based on various assumed factors and will need to be updated at the next stage. However, the basis of the cut and fill strategy would be to have no material exported or imported for the bulk earthworks.

The results are indicated on HDR drawing 10360452-HDR-XX-XX-DR-C-112220 as shown in Appendix A.

5 Notes, Clarifications and Assumptions

HDR have endeavored to carry out a preliminary review of the information received. However, there may be various unknowns which had have not been considered yet and will be subject to further review. Some assumptions, for example the road construction thicknesses, i.e., 700mm were a guestimate as well as the foundations for the datacenter, i.e., 500mm, at this stage. HDR cannot be held responsible for inaccurate information received or assumptions made.

For clarity of the review undertaken, we have made the following Notes, Clarifications and Assumptions:

The site investigation report has not been completed and should not be considered as a full investigation for determining “cut and fill” quantities and a more comprehensive investigation would be required to fully understand the ground conditions and all buried features.

The information contained within this report is provided to assist HDR and other design team members who will set the physical level of the building and the external realm.

- An allowance of 500mm has been made for some foundations, however, not all arisings from foundations which include piles, pilecaps, ground beams, capping beams, retaining walls etc. has been included.
- No allowance has been made for arisings from any drainage related items which include foul and surface water trenches and manholes, attenuation tanks, rainwater harvesting tanks, pumping station, water treatment plant and tanks etc. However, some surface drainage features such as ponds and swales have been reviewed.
- No allowance has been made for arisings from any services related items which include power, fibre, ducting, services pits etc.
- No allowance has been made for any arisings from external works foundations such as roads, footpaths, landscaping, embankments etc. However, a preliminary manual calculation for the arising from the roads based on a 700mm excavation has been reviewed.
- No allowance has been made for any arisings from temporary works.
- No allowance has been made for any temporary stockpiling.
- No allowance has been made quantifying any reclamation of materials.
- No allowance has been made for the removal of any existing features and or structures.
- No allowance has been made for over-dig or fill associated with the demolition of the existing buildings, including grubbing out of existing foundations or back-filling of basements or pits.
- No allowance has been made for piling mats or any other temporary structural construction.

- No allowance has been made for bulking factor of material.
- No allowance has been made for the influence of stress on the soil quantities.
- No allowance has been made for, but are not limited to, “soft spots” or other geological features, swallow holes, contamination, mine working, etc.
- No allowance has been made for importing topsoil for the use to soft landscaping.
- No allowance has been made for unidentified unsuitable material.
- No allowance has been made arisings from contaminated materials.
- No allowance has been made for ground water, seepage, or deterioration of sub soil due to water / weathering.
- No allowance has been made for the arising of UXO’s.
- No allowance has been made for the arising of unknown ground obstructions.
- Unless requested to carry out further detailed analysis, the cut and fill exercise has not included for the review on the suitability of material of re-use.
- A nominal topsoil strip of 200mm have been assumed and included as part of this exercise.
- All cut and fill quantities are preliminary and are to be verified by quantity surveyor for cost estimating purposes.
- The levels and volumes on this drawing are preliminary only and not to be used for construction purposes.

Should the client seek to have any of the above, level of detail, clarifications and assumptions made included as part of the cut and fill report, HDR would review this and provide the additional services where possible. Any additions to the cut and fill report would be subject to a fee review.

6 Recommendations

Following HDR's review of the cut and fill review, we have identified the following options which could potentially reduce the cut / fill of the project:

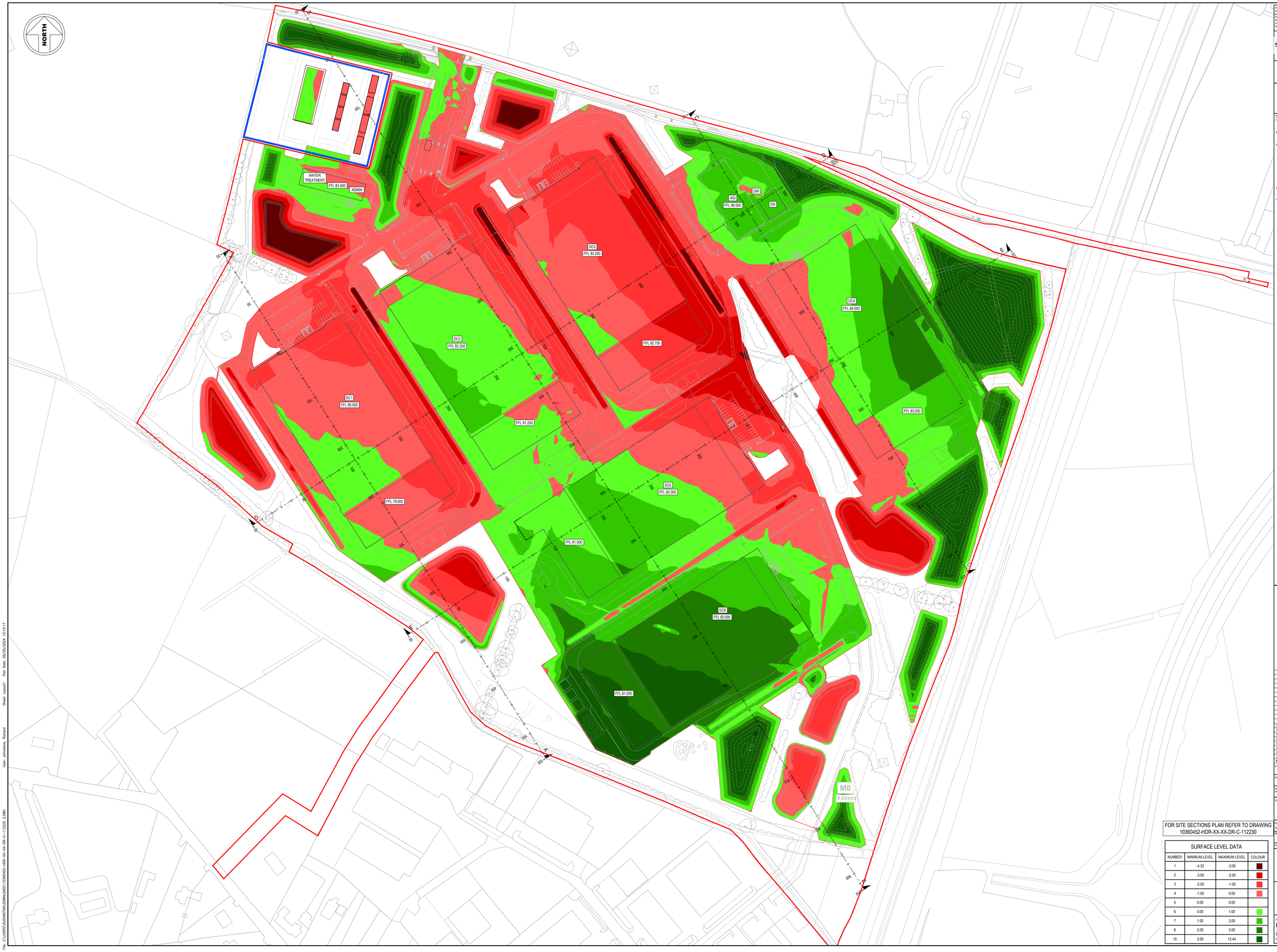
- Testing of the in situ CBR is found to be greater than 5%. This could reduce the external works construction makeup.
- The use of a ground improvement layer or membrane could increase the bearing capacity of the existing ground which could reduce the external works thicknesses.
- Pending the final 'mound' size and details, the proposed building Finished Floor Level could be reviewed.

HDR would recommend that the quantity surveyor review the figures in relation to current cost provision.

HDR would recommend that a contingency provision be included for unknown factors and the assumptions made.

Should the client wish to do so, with additional information available and further clarification, an enhancement to this cut and fill report could be carried out.

Appendix A.



SURFACE LEVEL DATA			
NUMBER	MINIMUM LEVEL	MAXIMUM LEVEL	COLOUR
1	-4.33	-3.00	
2	-3.00	-2.00	
3	-2.00	-1.00	
4	-1.00	0.00	
5	0.00	0.00	
6	0.00	1.00	
7	1.00	2.00	
8	2.00	3.00	
10	3.00	13.44	

All dimensions to be checked on site. Figured dimensions take preference over scaled dimensions. Any errors or discrepancies to be reported to the Engineer. Drawing may not be edited or modified by the recipient.

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HERBATA GREEN ENERGY DATA

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2. THIS DRAWING SHALL BE READ IN CONJUNCTION WITH ALL DISCIPLINE DRAWINGS, REPORTS AND SPECIFICATIONS.
3. THIS DRAWING IS FOR STAGE 2 PURPOSES ONLY. SERVICES SHOWN HAVE BEEN CO-ORDINATED AS FAR AS PRACTICABLE IN 2D. A FULL COORDINATION EXERCISE IS TO BE UNDERTAKEN AT STAGE 3.

PLANNING BOUNDARY

OTHER LANDS UNDER CONTROL OF THE APPLICANT

KEY PLAN

TRUE NORTH

Rev.	Date	Description
P08	01/05/24	ISSUE FOR PLANNING
P07	26/04/24	ISSUE FOR PLANNING
P06	07/09/23	ISSUE FOR PLANNING
P05	07/08/23	ISSUE FOR PLANNING
P04	12/07/23	ISSUE FOR PLANNING
P03	26/05/23	ISSUE FOR PLANNING
P02	28/04/23	STAGE 2 ISSUE
P01	28/02/23	DESIGN FREEZE - STAGE 2

STATUS: PLANNING

PROJECT: HERBATA NAAS

PROJECT ADDRESS: NAAS, CO. KILDARE

DWG TITLE: SITE CUT AND FILL PLAN

DWG NO.: 10360452-HDR-XX-XX-DR-C-112220 2

REV:	SUITABILITY:	PROJECT NO:	10360452
P08	S3	SCALE:	1:1000
DATE: 01/05/24	DRN: DSR	CHK:	UG

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