IBA Site, Saxon Works, Peterborough

Surface Water Drainage Strategy

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Issue & Revision History

Revision	Status	Originated	Checked	Approved	Date
A	FINAL	Richard Harrison BSc (Hons)	Stuart Argyle BSc (Hons) MSc	M. Baker C.Eng., F.I.Struct.E.	21.10.20
-	FINAL	Richard Harrison BSc (Hons)	Stuart Argyle BSc (Hons) MSc	M. Baker C.Eng., F.I.Struct.E.	14.10.20
Project Number: C3432				Document Reference: HSP2020-C3432-C&S-TR-18	

Contents

1. Quality Assurance

HSP Consulting confirms that all reasonable efforts have been made to ensure that information contained within this report is accurate. HSP Consulting would further confirm that due care, attention and technical skill were used in creation of this report.

Signed for and on behalf of HSP Consulting:

Mike Baker

Director

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3. Introduction

3.1.1 This report has been produced to support the associated permit application for the scheme.

3.1.2 In particular, this report discusses the surface water drainage strategy of the proposed scheme.

4. Site Description

4.1.1 The site is the location of a former brickworks, and is located within the excavation associated with the former works.

4.1.2 The application in question is located in the north west corner of the excavation and covers an area of approximately 4 ha.

4.1.3 A site location plan is included in Appendix 1.

4.1.4 The existing site is generally flat, set at an elevation of approximately -21m AOD. Steep slopes to the north and west batter up existing ground levels.

4.1.5 The site contains a number of existing buildings, areas of both concrete and asphalt hardstanding and areas of unmade ground/hardcore surfaces.

4.1.6 A copy of the topographical survey is included in Appendix 1.

5. Development Description

5.1.1 Proposals are for the receipt, storage, processing and distribution of Incinerator Bottom Ash (IBA)/Incinerator Bottom Ash Aggregates (IBAA).

5.1.2 A copy of the proposed site layout is included in Appendix 2.

5.1.3 It should be noted that large areas of the site are to be retained in their current state. In particular, the building proposed as the main processing shed and trommel is an existing building. Hardstanding to the front of this building is to be maintained, along with unmade ground to the north and west of the building. The area of new development, on which this report is focussed, is the IBA reception and storage area.

5.1.4 This are covers approximately 17400m^2.

5.1.5 The area is to be covered in a concrete slab with retaining structures to the boundaries on the north, east and south to allow stockpiling/retain surface water run-off.

5.1.6 Ground levels in this area are to be reprofiled to encourage surface water run-off to be collected in a proposed wedgepit/sump for re-use in dust suppression.

6. Surface Water Drainage Strategy

6.1.1 The IBA received is generally not considered to be a hazardous waste. However, trace quantities of heavy metals along with the nature of the material mean that it is unsuitable to discharge run-off from areas receiving IBA to ground, watercourses or sewer networks without appropriate treatment to allow suspended solids to be settled out.

6.1.2 Whilst the requirements of CIRIA report 736 and IPPC document S5.06 are considered in the surface water drainage strategy, current good practices, including return periods and climate change figures typically required by lead local flood authorities in drainage design, are considered to be more onerous than the requirements of the aforementioned documents.

6.1.3 Gradients on the proposed storage slab will ensure that all surface water is directed towards a wedgepit (essentially a sump/silt trap) against the southern edge of the slab.

6.1.4 Water collected in the wedgepit is then pumped to storage tanks to be used for dust suppression purposes.

6.1.5 When brought to site for processing, the IBA is substantially above ambient temperature, resulting in the majority of water used for dust suppression purposes evaporating.

6.1.6 As such, it is beneficial to the re-use of surface water run-off to limit any surface water discharge from the site.

6.1.7 The above approach is also in accordance with Section 3.9 of the IPPC document, which suggests that the Best Available Technique (BAT) in relation to suspended solids is to prevent or reduce emissions.

6.1.8 The IBA storage areas are bound by retaining walls in order to stockpile material against. Should a storm event generate a greater volume of run-off than is used for dust suppression/capacity of the storage tanks, all run-off will be contained within the extents of the storage area.

6.1.9 Should the above occur, surplus water should be appropriately tankered away by the site operator.

6.1.10 Based on a slab area of 1.74 ha, the volume of water generated by a 100 year storm event is 1801m.

6.1.11 A 20% allowance for climate change has been included in the above figure, which is considered appropriate in accordance wit Table 2 of the current Flood Risk Assessment PPG, a the lifespan of the development is not expected to extend beyond the year 2069.

6.1.12 Volumes have been calculated using the Source Control module of Microdrainage software, based on the impermeable area drained with no discharge allowance. Calculations are included in Appendix 3.

6.1.13 The drainage strategy is illustrated in Appendix 3.

6.1.14 In addition to the above, joints within the external slab are to be appropriately sealed to ensure that no stockpiled materials come into contact with groundwater.

6.1.15 The above design criteria (i.e. 100 year return period) is in excess of the 1 in 10 year return period suggested within section 4.3.3 of CIRIA report 736, with an 8 day duration 10 year storm (as required by CIRIA C736) generating 54mm rainfall depth, or 940m^3 over the impermeable area (from Figure 4.2 of CIRIA 736).

6.1.16 The above approach can be considered a combination of secondary and tertiary containment as defined by CIRIA 736.

6.1.17 It should be noted that the above strategy relates to the surface water run-off associated with the IBA reception/storage area only.

6.1.18 An additional 300mm of freeboard above the 100 year plus climate change flood level is proposed.

6.1.19 Whilst adaptations/diversions to the surface water drainage serving the processing shed and hardstanding to the frontage of this area may be necessary to suit the excavations associated with the IBA reception area, it is not proposed to change the existing outfall from these areas.

6.1.20 Similarly, the storage areas to the north and west of the processing shed, containing IBAA and aggregates, is to be located on unsurfaced ground (as is presently the case). The processed aggregates are not considered to pose a risk in the same was as the unprocessed ash.

6.1.21 Excess run-off from these areas drains towards the existing building, and it is understood would ultimately pass through the balancing lagoon present on the site before being pumped into the Kings Dyke.

6.1.22 It should be noted that the existing balancing lagoon is outside of the boundary of the proposals in question, and the review of this feature/associated outfalls, do not form part of this report.

6.1.23 It should be noted that existing ditches surrounding the base of the excavations forming the site boundary should be maintained so as to ensure that additional run-off from unvegetated slopes do not impact on the development.

7. Conclusions

7.1.1 Proposals are for an IBA reception area.

7.1.2 The area is to be surfaced in a reinforced concrete slab.

7.1.3 Falls will direct surface water run-off towards a wedgepit (sump) from where water will be pumped for re-use in dust suppression.

7.1.4 Falls in the slab will provide sufficient storage for all storm water run-off for the 100 year storm event with a 20% allowance for climate change.

Appendix 1 – Site Location Plan and Topographical Survey

REV	BY	DATE	DETAILS	CKD
P01	-	-	-	-

STATUS: -SELECT-

CLIENT
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SCALE (A4)
N.T.S

DATE
15.10.20

PROJECT
IBA Site, Saxon Works Peterborough

DRAWN BY
RH

CHECKED BY
SA

TITLE
Site Location Plan

PROJECT NO.
C3432

DRAWING NO.
SK1

REV
P01

hsp consulting
Lawrence House, 6 Meadowbank Way, Eastwood, Nottingham, NG16 3SB
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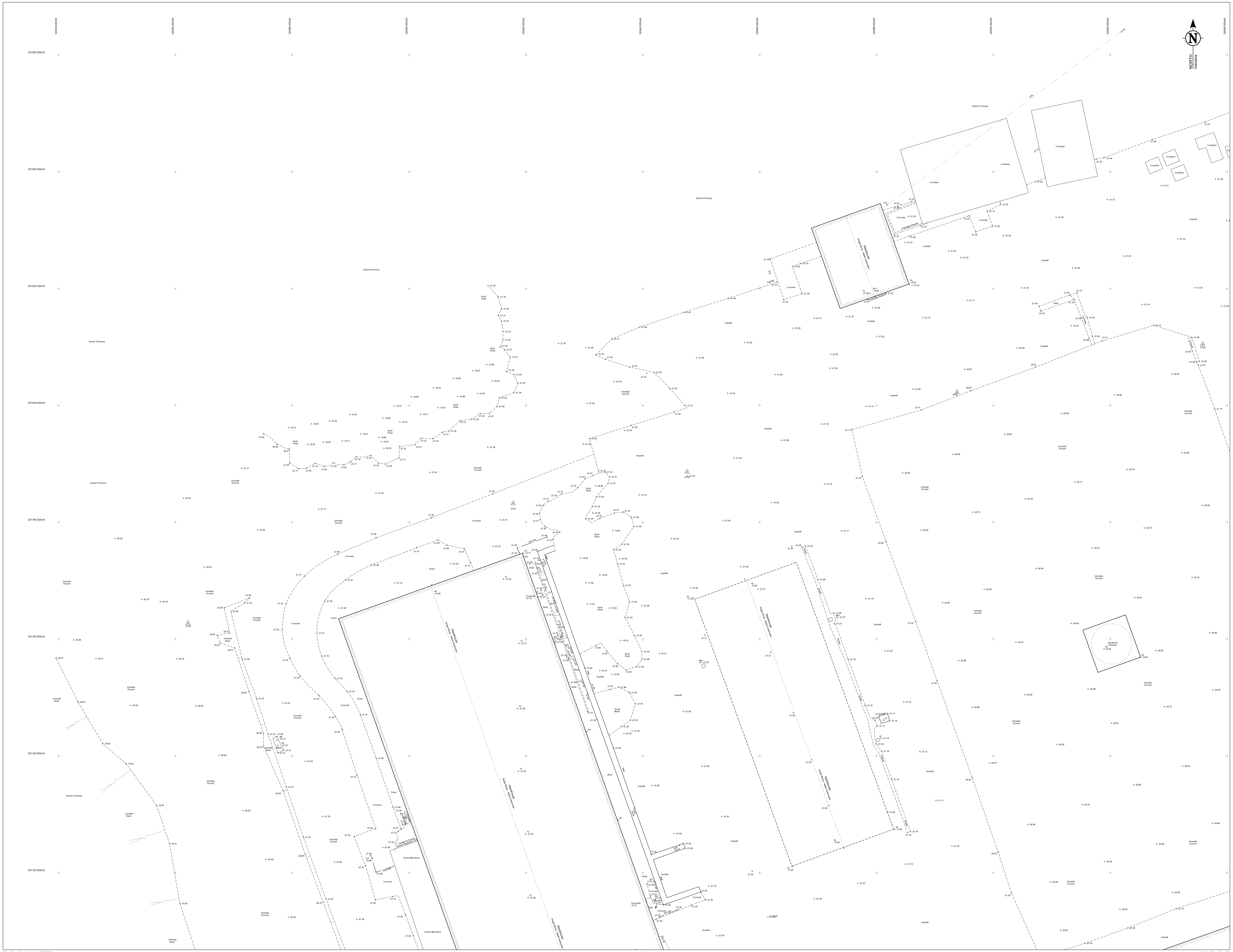

TOPOGRAPHICAL & MEASURED BUILDING SURVEYS

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DRAWING NOTES

Topographical Surveys

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Measured Building Surveys

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General

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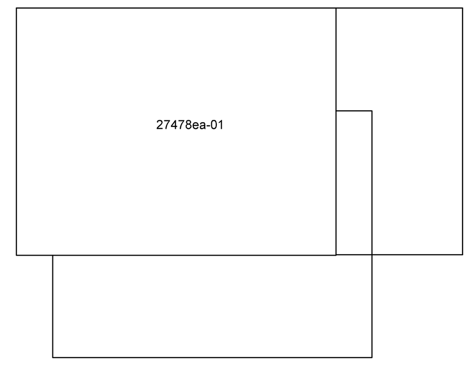

SURVEY CONTROL CO-ORDINATES

STATIONS	EASTINGS	NORTHINGS	LEVEL	DESCRIPTION
ST01	525564.716	297129.672	-20.985	Mag Nail
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SURVEY GRID AND LEVEL DATUM

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DRAWING DETAIL
TOPOGRAPHICAL SURVEY
Sheet 1 of 3

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DRAWING NUMBER			REVISION	ISSUE DATE
27478ea-01				13/10/2020

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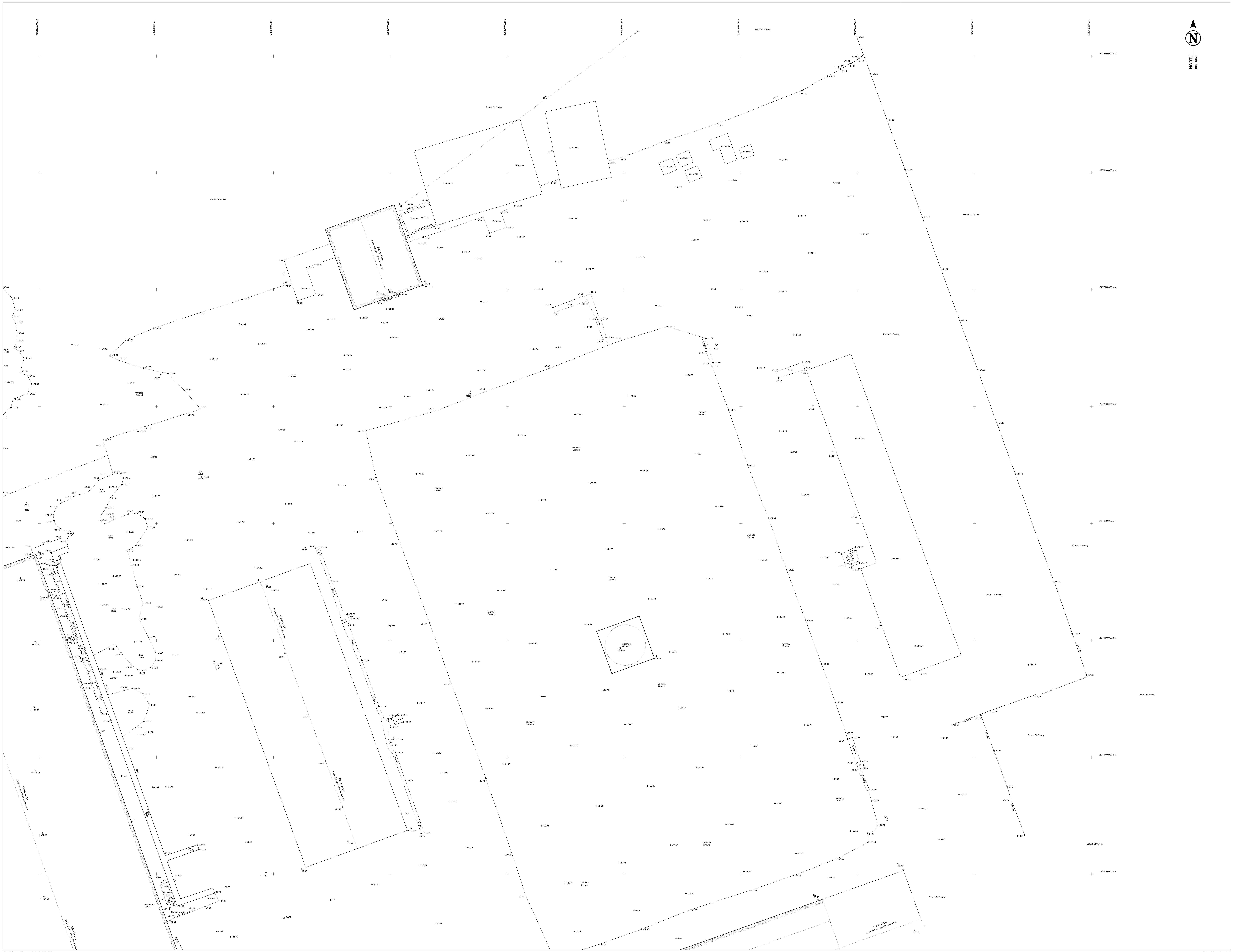

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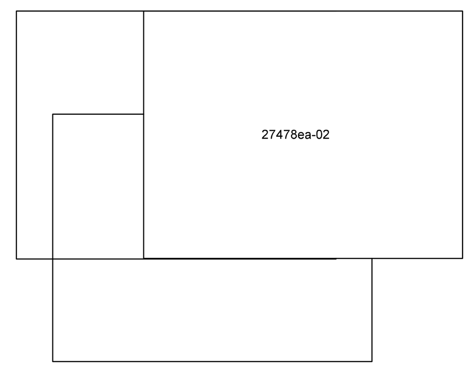

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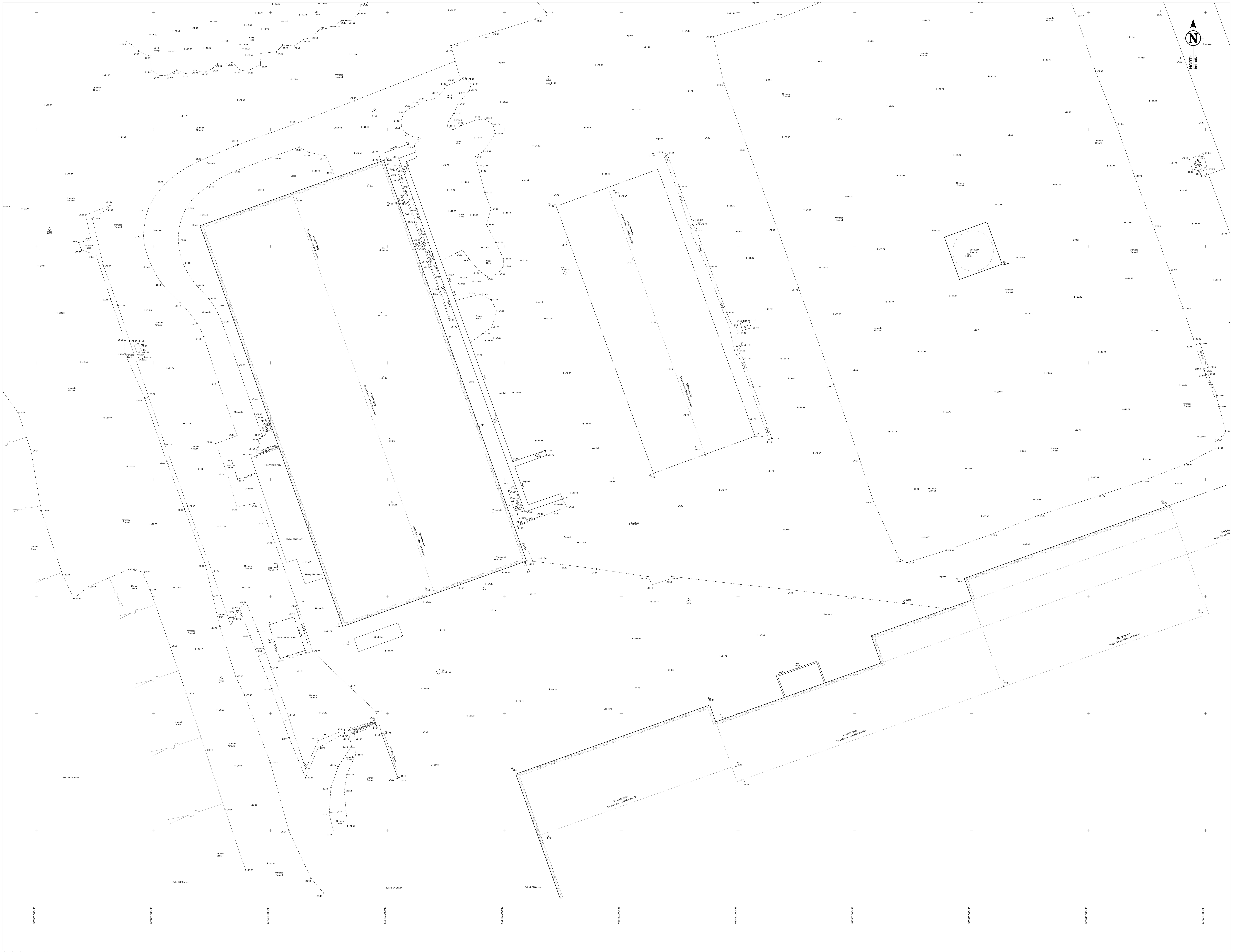

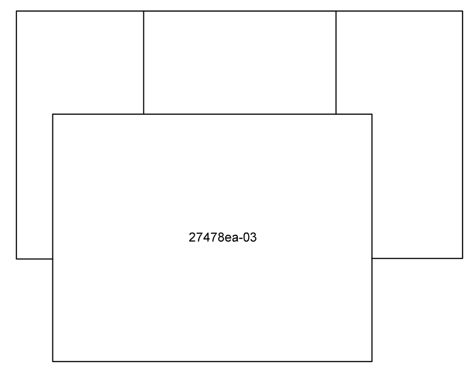

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PROJECT TITLE PETERBOROUGH ROAD, WHITTLESEY, PETERBOROUGH, PE7 1PD.				
DRAWING DETAIL TOPOGRAPHICAL SURVEY Sheet 3 of 3				
CLIENT HSP CONSULTING ENGINEERS LTD				SCALE 1:200
SURVEYOR TWL	SURVEY DATE 09/10/2020	CHECKED BY CAE	APPROVED BY JIA	DWG STATUS FINAL
DRAWING NUMBER 27478ea-03			REVISION	ISSUE DATE 13/10/2020

ISO 9001 REGISTERED FIRM
RICS
chartered ices
THE SURVEY ASSOCIATION

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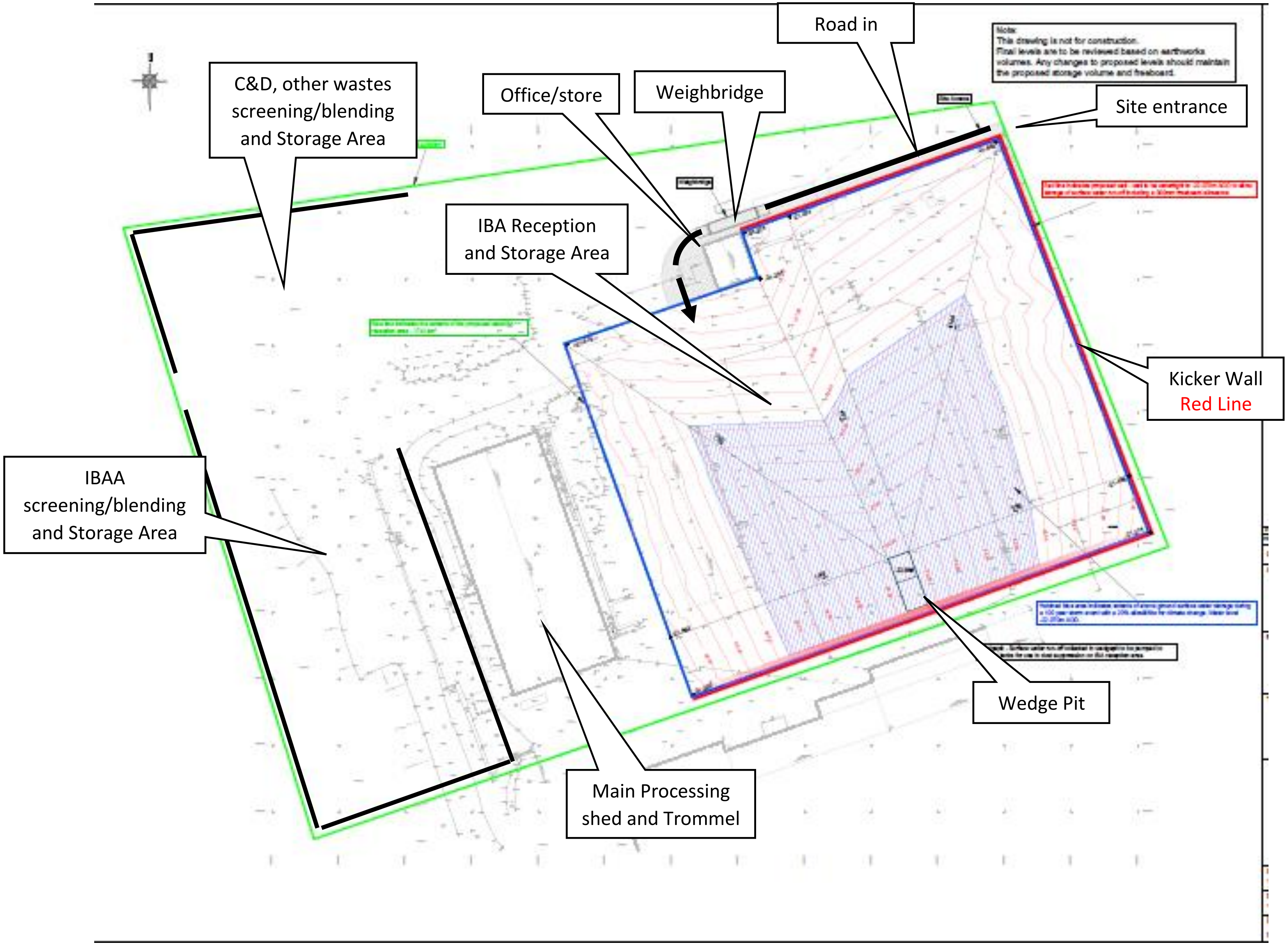
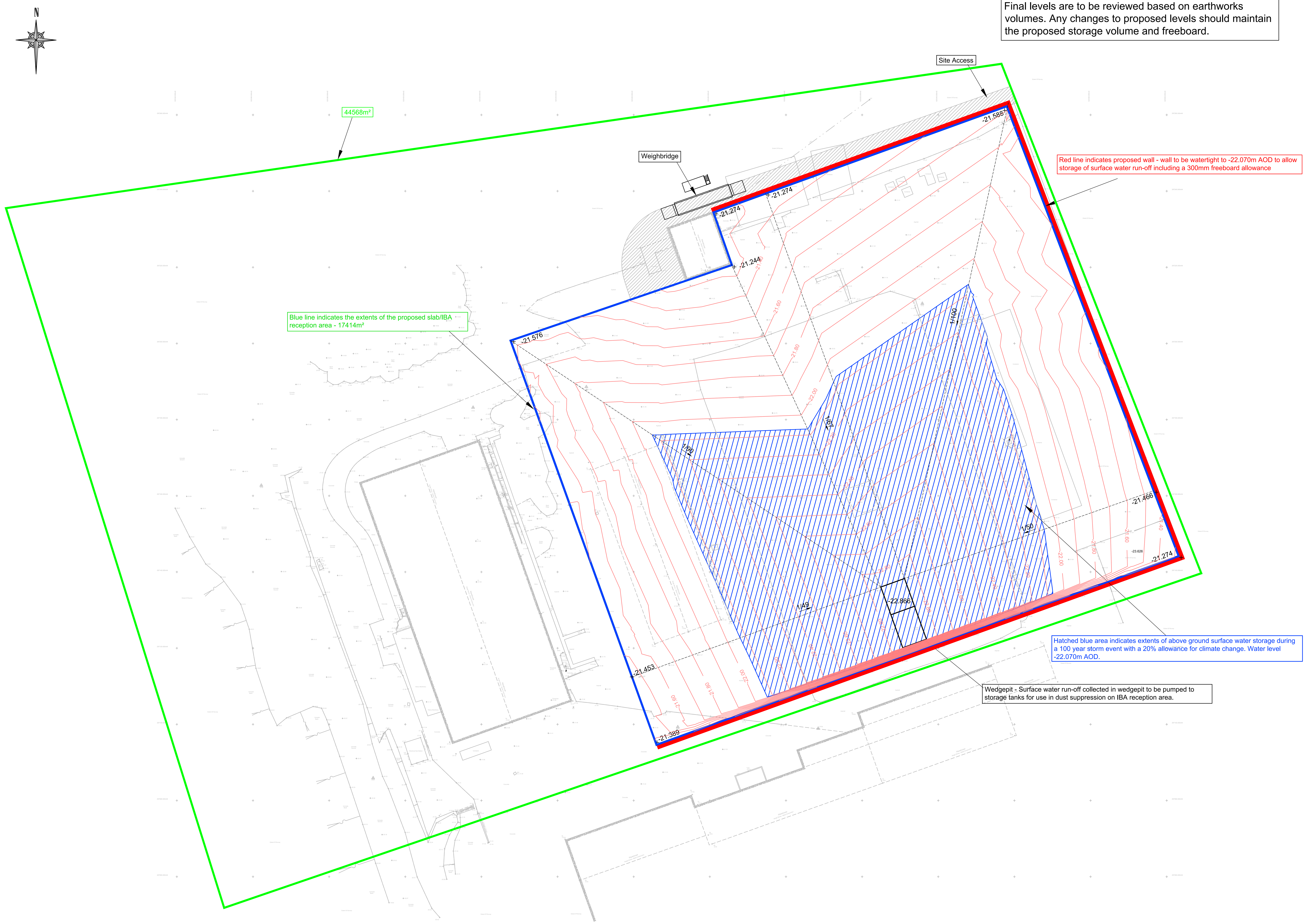
Original Sheet Size A0H

Appendix 2 – Development Proposals


Road in
Note:
This drawing is not for construction.
Final levels are to be reviewed based on earthworks volumes. Any changes to proposed levels should maintain the proposed storage volume and freeboard.
C&D, other wastes screening/blending and Storage Area
Office/store
Weighbridge
Site entrance
IBA Reception and Storage Area
Kicker Wall
Red Line
IBAA screening/blending and Storage Area
Wedge Pit
Main Processing shed and Trommel

Appendix 3 – Surface Water Drainage Strategy and Calculations

Note:
This drawing is not for construction.
Final levels are to be reviewed based on earthworks volumes. Any changes to proposed levels should maintain the proposed storage volume and freeboard.



REV	BY	DATE	DETAILS	CKD
P01	-	-	-	-

STATUS: -SELECT-

CLIENT
Johnsons Aggregates and Recycling

PROJECT
IBA Site
Saxon Works
Peterborough

TITLE
Levels Strategy
Surface Water Drainage Strategy

hsp consulting

Lawrence House, 6 Meadowbank Way, Eastwood, Nottingham, NG16 3SB
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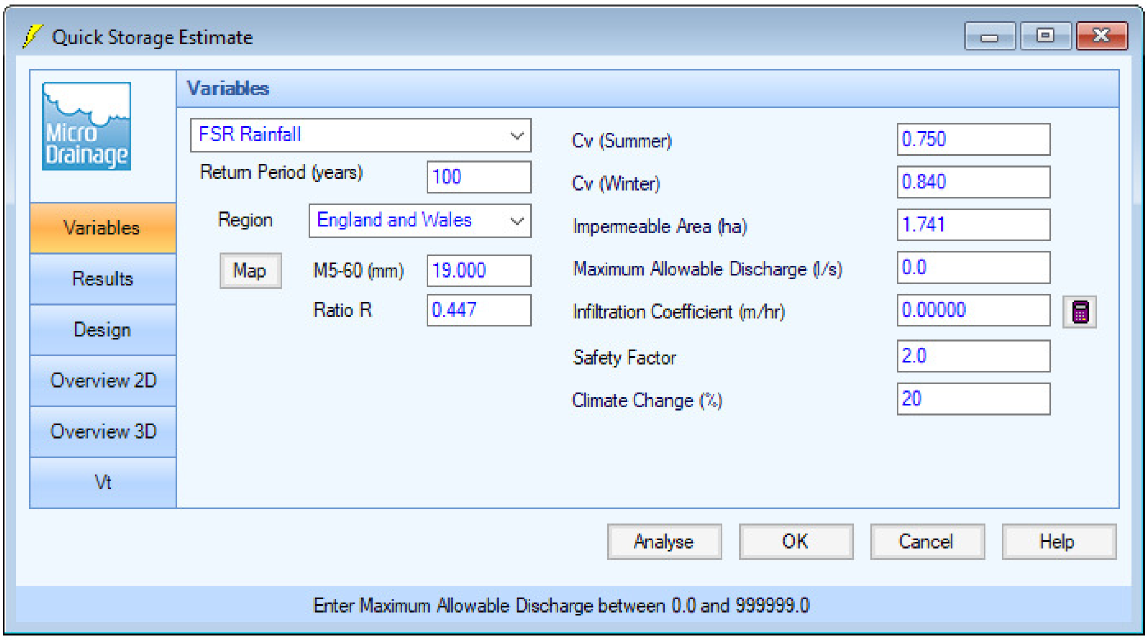
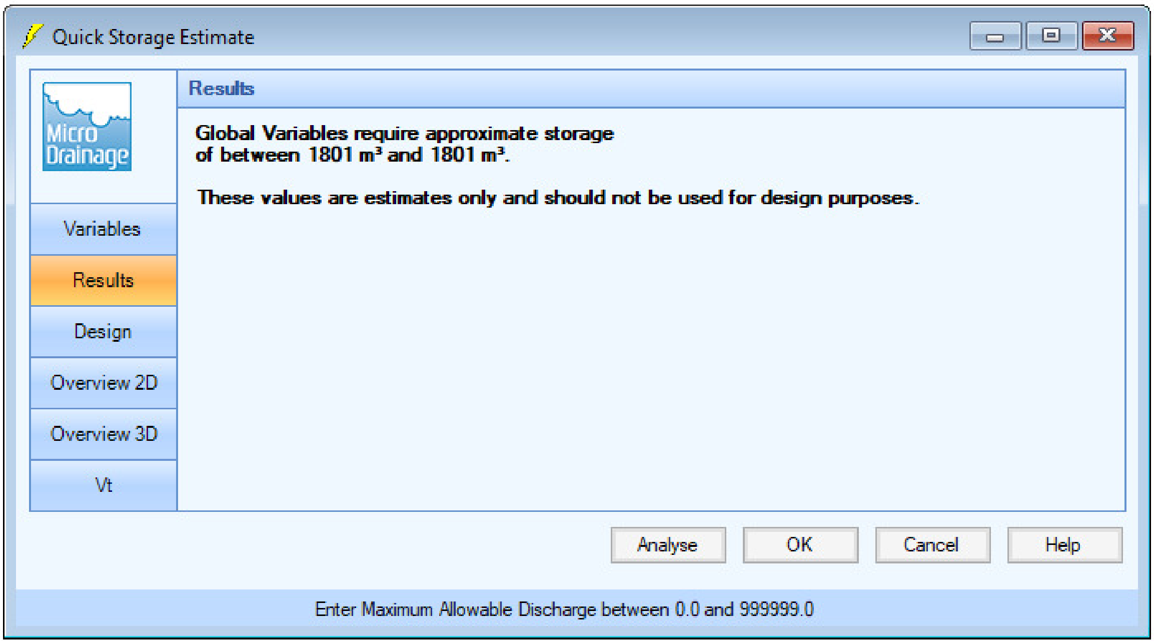
SCALE	PROJECT NO.	SHEET SIZE A1
1:500	C3432	

DATE	DRAWN	CHECKED
15.10.20	RH	SA

DRAWING NO.	REV
C3421-100	P01


Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Variables
FSR Rainfall
Return Period (years) 100
Region England and Wales
Map
M5-60 (mm) 19.000
Ratio R 0.447
Cv (Summer) 0.750
Cv (Winter) 0.840
Impermeable Area (ha) 1.741
Maximum Allowable Discharge (l/s) 0.0
Infiltration Coefficient (m/hr) 0.00000
Safety Factor 2.0
Climate Change (%) 20
Analyse
OK
Cancel
Help
Enter Maximum Allowable Discharge between 0.0 and 999999.0


Quick Storage Estimate
Micro Drainage
Variables
Results
Design
Overview 2D
Overview 3D
Vt
Results
Global Variables require approximate storage
of between 1801 m³ and 1801 m³.
These values are estimates only and should not be used for design purposes.
Analyse
OK
Cancel
Help
Enter Maximum Allowable Discharge between 0.0 and 999999.0