LAND WEST OF MAGNA PARK

CROSS IN HAND

RUGBY

FLOOD RISK AND DRAINAGE REPORT

Shepherd Gilmour Infrastructure Ltd.

3rd Floor Phoenix House,

45 Cross Street,

Manchester,

M2 4JF

Report Title: *Cross In Hand, Rugby*

Flood Risk and Drainage Strategy

Client: *Nurton Developments (Lutterworth) Ltd.*

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Prepared by: _____

Emyr Jones B.Eng (Hons)

Checked & Approved: _____

Emyr Jones B.Eng (Hons)

Version	Date	Initials	Comments
1	Jan 2024	EAJ	First version

Limitations

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INTRODUCTION

Appointment and Brief

1.1 This Flood Risk Assessment and Drainage Strategy has been prepared to support the preparation of an indicative masterplan to help promote the allocation of this site through a response to a call for sites. It has been commissioned by Nurton Development (Lutterworth) Ltd.

Limitations

1.2 This report is based on the interpretation and assessment of data provided by third parties. It should be noted that the detailed design of the drainage and associated Sustainable Drainage Systems (SuDS) features for the site has not been finalised and the assumptions and information presented here is therefore subject to design development. Operation and maintenance of all SuDS (including proprietary systems) will need to be considered once the proposed development has been finalised with all specific information presented to those responsible for the maintenance of this site. SGi cannot be held responsible for the accuracy of third-party data or the conclusions that come from this information or as a result of changes arising from the developing design. The conclusions and findings of this report may change if the proposed development is amended or updated after the date of publishing.

SITE DESCRIPTION

Existing Site

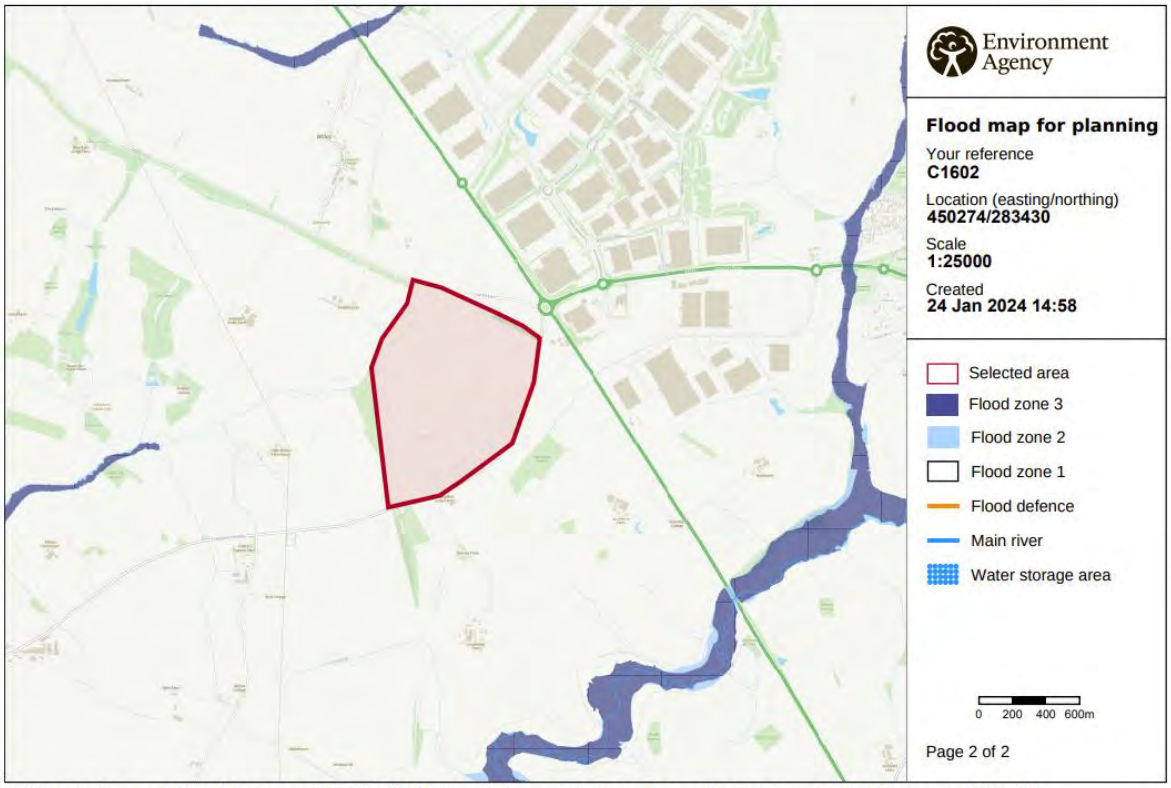
1.3 The site is circa 92.0 hectares in area and located in the county of Warwickshire, approximately 4.5km to the west of Lutterworth. The site is bounded by Coal Pit Lane directly to the North, Lutterworth Road (B4027) to the East and an area of land known as Newham Paddocks to the West. Fig 3.4 presents the site boundary and its relative location.

1.4 The site is currently farmland. In recent history a section of the site along the Western edge, was traversed by a railway line which was infilled in the 1950's. To the North and east of the site is a well-established industrial development known as Magna Park.

Figure 3-1 Existing site (Map data from Google Earth 2023)

Flood Risk

1.5 Based on the Flood Map for Planning the site is in Flood Zone 1 which is classified as having a less than 0.1% (1 in 1000) annual probability of river (fluvial) or sea (tidal) flooding.



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1.6 Any forthcoming planning application will need to be supported by a detailed Flood Risk Assessment to review flood risk from all sources, however based on this initial desk study the site's Flood Zoning is appropriate for the proposed end use.

Existing Topography

1.7 The highest point of the site is located towards the Northeast boundary with an approximate elevation of 133m AOD. The levels generally fall in a Westerly direction to a minimum elevation of approximately 118.2m. A copy of the topographical survey is provided in Appendix A.

Existing Waterbodies and Watercourses

1.8 There are two known watercourses or waterbodies within the boundary of the site. The nearest charted watercourse to the site is a tributary to the River Sowe Water Body which leaves the site via a 1m diameter brick culvert. It is believed that this culvert

was constructed to direct the watercourse beneath the historic railway. The culvert transitions to an open watercourse approximately 40m south-west of the site.

Existing Drainage

1.9 Whilst the site contains several piped sections of farmers ditches and historically constructed land drains, the site does not have any formal existing drainage system.

Public Drainage

1.10 Severn Trent Water records (2023) indicate that the nearest foul sewer is located some 2Km from the site.

Proposed Development

1.11 The development comprises of a series of carefully designed industrial buildings with associated infrastructure in the form of roads, car parks and a significant area dedicated natural SuDS features.

1.12 Refer to Figure 4—1 for the proposed technical masterplan of the proposed development.

Figure 4—1 Proposed Technical Masterplan

PROPOSED SURFACE WATER STRATEGY

General

1.13 All new developments are required to cater for all surface water that will be generated within the site, so as not to cause flooding, damage, or inconvenience to on-site or off-site areas. In accordance with associated legislation, local policy and general best practice, this will typically require the introduction of a dedicated surface water drainage network that intercepts, treats and stores surface water prior to it being discharged from site.

1.14 A surface water drainage system will be provided to collect surface water runoff from hardstanding areas. Primary runoff will be from hard impermeable surfaces such as roofs and any exposed areas of hardstanding. Allowance will be made to include landscaped areas that may fall towards the buildings, particularly where infiltration is not viable in the proposed development.

1.15 The aspiration for all new developments is to reduce surface water runoff rates to the equivalent greenfield rate (Qbar). To replicate greenfield run off conditions, it will be necessary to provide stormwater storage in the form of an attenuation basin, permeable surfacing, and transportation swales/ditches.

1.16 As a new development adequate space for natural SuDS has been provided for. Careful consideration has been given to the development Masterplan to minimize the use of 'Engineered' solutions, and to maximise the use of natural SuDS features.

CONSULTATION

Lead Local Flood Authority

1.17 At this stage no discussions have been held with the Lead Local Flood Authority (LLFA).

Severn Trent Water

1.18 A record search has been carried out with Severn Trent Waters and a Developers Enquiry has been submitted to identify the most appropriate point of connection for the foul water.

1.19 Severn Trent Water has provided an appropriate Point of Connection for the redevelopment of the site.

Climate Change

1.20 Climate change allowances are based on the Avon Warwickshire Management River Severn Catchment management peak rainfall allowances table for the 1% annual exceedance rainfall event produced by the Environment Agency (EA). For the proposed development the design life is considered as more than 50 years and design is considered at the upper end.

Avon Warwickshire Management Catchment Peak River Flow Allowances

Allowance Category	Total potential change anticipated for the 2050's	Total potential change anticipated for the 2070's
Upper End	+40%	+40%
Central	+20%	+40%

Table 5—1 Climate change allowance for peak rainfall in England (1981-2000 baseline)

Drainage Hierarchy

1.21 Best practice for the management of surface water is based on Building Regulations 2010 Part H (2015 edition) and in line with Severn Trent Water guidance states that surface water runoff from a site should discharge in accordance with the drainage hierarchy. Surface water runoff should therefore discharge to one of the following in order of priority:

- To an adequate soakaway or some other adequate infiltration system; or, where that is not practicable,
- A watercourse; or, where that is not practicable,
- A surface water sewer; or, where that is not practicable,
- A combined sewer.

Soakaway

1.22 No intrusive Site Investigation has been carried out to date, however based on a Phase 1 Geo Environmental study undertaken, it is expected that the ground conditions will be cohesive in nature underlain by Blue Lias formation-mudstone.

Watercourse

1.23 As identified earlier, the site drains to two distinct outfalls running Easterly to the River Sowe waterbody. The onsite waterbodies are designated as Ordinary Watercourses.

Sewer

1.24 There is currently no foul water generated by the existing site and as such no onsite foul water sewers.

PROPOSED STRATEGY

Option 1 – Discharge to Soakaway

1.25 In line with the drainage hierarchy it is preferable to discharge surface water via soakaway or other infiltration systems where possible. It is proposed to discharge surface water via engineered soakaways at various locations throughout the site, where proximity to building footprints and other constraints permit. Attenuation will be provided primarily in the form of open attenuation, green/blue roofs were possible and permeable paving. The nature of the buildings are such that green/blue roofs will only be applicable to the Sub stations, Hub buildings and any offices.

Option 2 – Discharge to Onsite Watercourses

1.26 This option is the most likely solution based on the scale and nature of the development. An onsite walkaround has identified two primary outfalls on the site and the existing greenfield runoffs has been calculated.

Water Quality

1.27 It is widely recognised that diffuse pollution from urban surface water runoff is a significant factor which compromises receiving waterbodies including watercourses and groundwater. As such there is a requirement to identify and mitigate the impact of poor water quality originating from new developments.

1.28 The SuDS Manual (CIRIA C753) provides various methodologies for identifying potential sources of pollution within developments and a means of determining the treatment potential the various SuDS techniques can offer. The Simple Index Approach allocates

pollution hazard indices against the proposed land use, along with pollution mitigation indices for each SuDS component. To ensure adequate treatment is being provided, the selected SuDS components must have a total pollution mitigation index equal to or greater than the pollution hazard index associated with the land use of the contributing drainage area.

1.29 The pollution hazard indices for the proposed land use within the development are as follows, based on Table 26.2 of the SuDS Manual.

	Pollution Hazard Level	Total Suspended Soilds	Metals	Hydrocarbon
Commercial roofs	Low	0.3	0.2	0.05
Pedestrian areas and low trafficked roads	Low	0.5	0.4	0.4
Commercial yard and delivery areas	Medium	0.7	0.6	0.7

Table 5—2 Pollution Hazard Indices (based on Table 26.2 of the SuDS Manual

1.30 Following an initial screening exercise (see Sustainable Drainage Systems section below) the following table presents the mitigation indices for a range of SuDS components which may be appropriate for the proposed development.

SuDS Component	Total Suspended Solids	Metals	Hydrocarbons
Permeable Paving	0.7	0.6	0.7
Swale/open ponds	0.5	0.6	0.6
Green roofs	Not defined, but considered to offer adequate mitigation to treat runoff from commercial roof spaces.		
Proprietary treatment systems	Varies subject to product specifications and certification.		

Table 5—3 Indicative SuDS Mitigation Indices (based on Table 26.3 of the SuDS Manual)

1.31 It is currently envisaged that SuDS in combination of proprietary treatment systems will be employed on the development to provide sufficient mitigation to all runoff prior to discharge off site.

Sustainable Drainage Systems (SuDS)

1.32 Sustainable Urban Drainage Systems are used to reduce the impact of surface water from storm events on the existing environment mimicking the natural run-off characteristics of the site and removing pollutants from the urban run-off at source. There are various solutions which are described in the SuDS Manual (CIRIA C753) and include ground level features including swales and ponds, below ground systems (such as tanks, and infiltration techniques like soakaways) and above ground systems like green roofs.

1.33 The proposed development considers the use of sustainable drainage techniques in accordance with local policy. The CIRIA SuDS Manual contains a hierarchy of sustainable methods of capturing and storing rainwater in a descending order: from drainage into the ground to recharging water resources. Where infiltration is not possible, surface water should ideally be stored on site in open water features and then released at a controlled rate. The final option is to store surface water in tanks or cellular storage below ground.

1.34 Subject to the ground conditions and infiltration rates, SuDS features that could be considered through the detailed design (reserved matters) stage include permeable paving, underground tanks/cellular crates, green/blue roofs, rainwater harvesting and bioretention systems. Non-infiltration SuDS features will not reduce the amount of surface water discharged; however, it will significantly delay and mitigate the peak flood flows from the site.

The hierarchy of SuDS techniques is shown in Table 5—4.

SuDS Technique	Flood Reduction	Pollution Reduction	Landscape & Wildlife Benefit	Sustainability for the Proposed Development	Comments
Green / blue roofs	☐	☐	☐	Yes	Viability subject to the nature of the buildings and discussion with the client and wider design team. Likely to be suitable on Sub station, Office and Hub roof only
Basins and ponds				Yes	Careful consideration has been given to the site masterplan to ensure that sufficient space has been made to
Constructed wetlands				Yes	
Balancing ponds				Yes	

Retention ponds				Yes	allow the use of these SuDS features.
Filter stripes and swales	☐	☐	☐	Yes	Viable subject to coordination with proposed services and landscape design.
Bioretention systems	☐	☐	☐	Yes	Viable subject to coordination with proposed services and landscape design.
Rainwater harvesting	☐			Yes	Viability subject to the nature of the buildings and discussion with the client and wider design team.
Infiltration devices	☐	☐	☐	Yes	To be considered where viable subject to soakaway testing undertaken at a later stage.
Soakaways	☐	☐	☐	Yes	
Infiltration trenches and basins	☐	☐	☐	Yes	
Permeable surfaces	☐	☐		Yes	Car parking and pedestrian areas may be suitable for permeable surfacing.
Tanked systems	☐			Yes	Viable where external space permits. Site designed not to require such features
Over-sized pipes	☐			Yes	
Proprietary treatment devices		☐		Yes	Engineered devices such as media filtration systems, and oil and grit separators, can be used however non engineered solutions preferred.

Table 5—4 Hierarchy of SuDS techniques

PROPOSED SUDS MEASURES

Permeable Paving

1.35 Permeable surfaces are underlain with a pavement construction that allows rainwater to percolate through the surface, be treated and stored in the granular sub-base, and infiltrate into the in-situ ground strata. For permeable paving to be most viable and effective, the area should be near flat. Permeable paving is proposed at ground level for all car parking areas within the development. As infiltration on site is not considered to be viable, the permeable paving will connect to the sitewide drainage network.

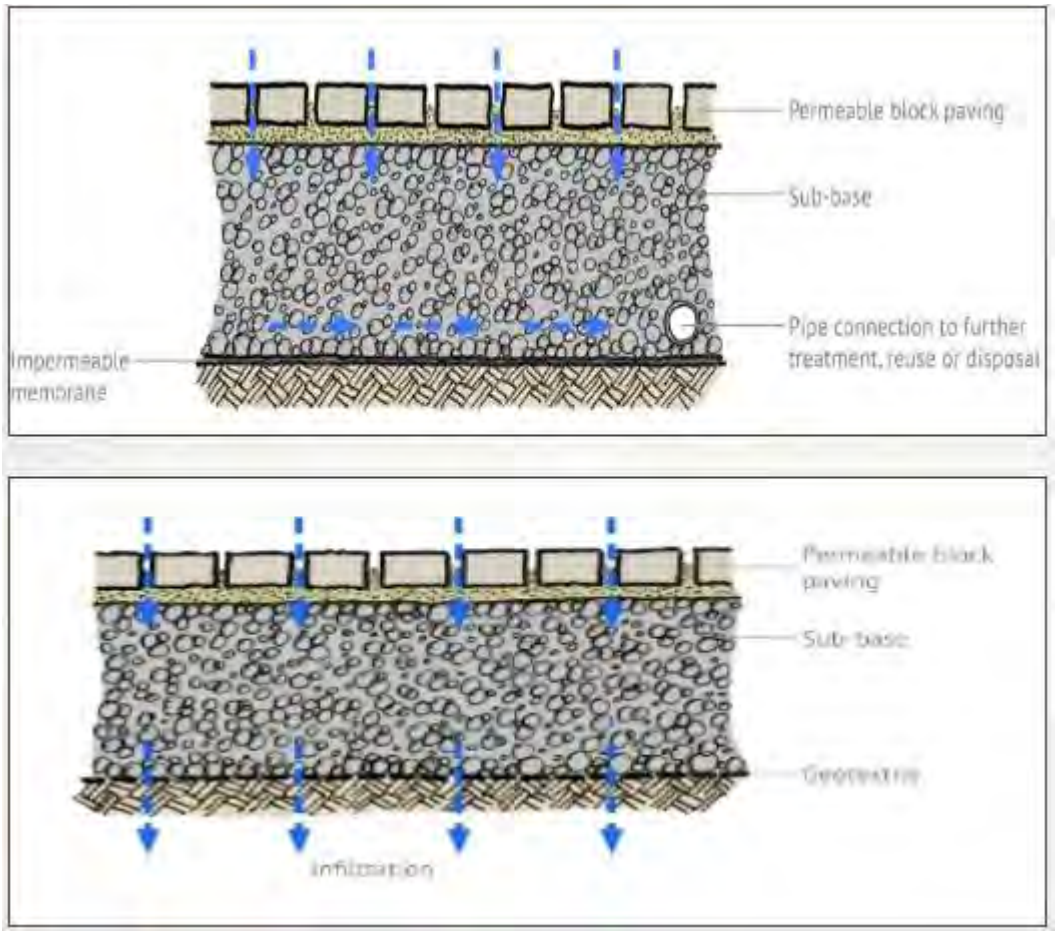

Figure 5—2 Permeable paving

Swales

1.36 Swales will capture run off from neighbouring walkways and are proposed to have a filter trench below to provide additional attenuation and water treatment capacity.

Figure 5—4 Swale

SuDS Operation and Maintenance Plan

1.37 Regular maintenance of the sustainable drainage system is essential to maintain its performance and avoid failure of any mechanical/electrical components. It is anticipated that all drainage, including SuDS features will remain within the ownership of the developer and maintenance of the SuDS features will be undertaken by an experienced contractor. An agreed maintenance programme will be prepared in accordance with the CIRIA guidance and will be included within the Operation and Maintenance Manual for the development on completion.

Existing and Proposed Impermeable Areas

1.38 The total developable area which forms the drainage assessment boundary is 92.0 hectares.

1.39 The existing and proposed permeable/impermeable areas are summarised in Table 5—5. for details of the existing and proposed impermeable areas.

	Existing Area (hectares)	Proposed Area (hectares)
Permeable	92.0	16.5
Impermeable	0	75.50

Table 5—5 Existing and proposed permeable/impermeable areas

Proposed Discharge Rate

Greenfield Runoff Rate

1.40 In consideration of FEH 2013 point rainfall data and a total drainage assessment boundary of 92 hectares, the site's greenfield runoff rate has been calculated using the HR Wallingford Greenfield Runoff Estimation Tool. A summary of the greenfield runoff calculation is summarised in Table 5—6.

Return Period	Greenfield Rboff Rate (l/s)
1 in 1 year	269
1 in 30 year	635
1 in 100 year	833

Table 5-6

Proposed Attenuation

1.41 To facilitate the reduction in discharge rates from the site, attenuation storage will be required. Using the flow rates calculated in section 5.11, the proposed attenuation volume for the site has been calculated based on the 100-year storm event plus 40% climate change. Using the MicroDrainage Source Control tool, the indicative attenuation volume for the site has been calculated. The surface water discharge rate from the site is dependent on further investigations and the implemented drainage strategy. Therefore, calculations have been undertaken for restricting surface water discharge to greenfield runoff rates (Qbar).

Attenuation volumes required based on calculated Developed areas varies between 48,000m3 and 65,000m3

Designing for Exceedance

1.42 Although the surface water drainage system will be designed to accommodate flows up to the 1 in 100-year storm event, including additional allowances for climate change, there is always a possibility of a storm event occurring which exceeds this design standard. In such an event, potential risks include the exceedance of the surface water network and attenuation systems and flooding of the site. It is proposed to design external pedestrian areas to shed water away from the buildings during such exceedance events and direct overland flood flows through the site towards off-site areas following the natural topography. It is anticipated that the local land topography will act as the wider overland flow network.

Exceedance routes are indicated in Figure 5—5.

Figure 5—5 Exceedance Routes

FOUL DRAINAGE STRATEGY

General

1.43 Foul water disposal should be in accordance with the Part H "Drainage and Waste Disposal" of the Building Regulations. This document sets requirements for the design and construction of underground foul water drains to the point of connection to an existing sewer.

Proposed Foul Water Drainage

1.44 A new onsite gravity system will be designed to collect the foul flows from the development and transport them to a central location. At this location a new adoptable foul pump station will be constructed, and the flows will be ejected from the site via a suitably designed pressure main. A predevelopment application has been made to Severn Trent Water and

an offsite Point of Connection has been provided by Severn Trent for the foul flows. The final connection to the public sewer will need to be designed and constructed under a Section 106 Agreement with Severn Trent Water.

1.45 In addition to the S106 Agreement a S50 license will be required with the Highway Authority for the construction of the new rising main to be constructed in the verge of the A4303

CONCLUSIONS

1.46 This Flood Risk Assessment and Drainage Strategy has been prepared to support the preparation of an indicative masterplan to help promote the allocation of this site through a response to a call for sites. It has been commissioned by Nurton Development (Lutterworth) Ltd.

1.47 The site is wholly within Flood Zone 1 and the development proposal is appropriate for the flood zoning of the site. The final configuration and nature of the drainage will be determined at the detailed design (reserved matters) stage and is dependent on any discharge of planning conditions.

1.48 It is proposed to discharge surface water from the development in line with the drainage hierarchy as presented in the 2 options within this report, Attenuation storage will be required to facilitate the reduction of the proposed flows, and significant space has been made available to promote natural SuDS wherever practicable.

1.49 A separate foul drainage system will be provided to collect all foul water generated from site via gravitational flow from below ground floor level and a central foul pump station will be constructed to pump the foul into the agreed Point of connection dictated by Severn Trent Water. Severn Trent Water has confirmed that the foul water from this site can be drained at an unrestricted rate to the public combined sewer network.

APPENDIX A

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PLAN GRID NORTH

File Name: 524831-T.dwg

LEGEND

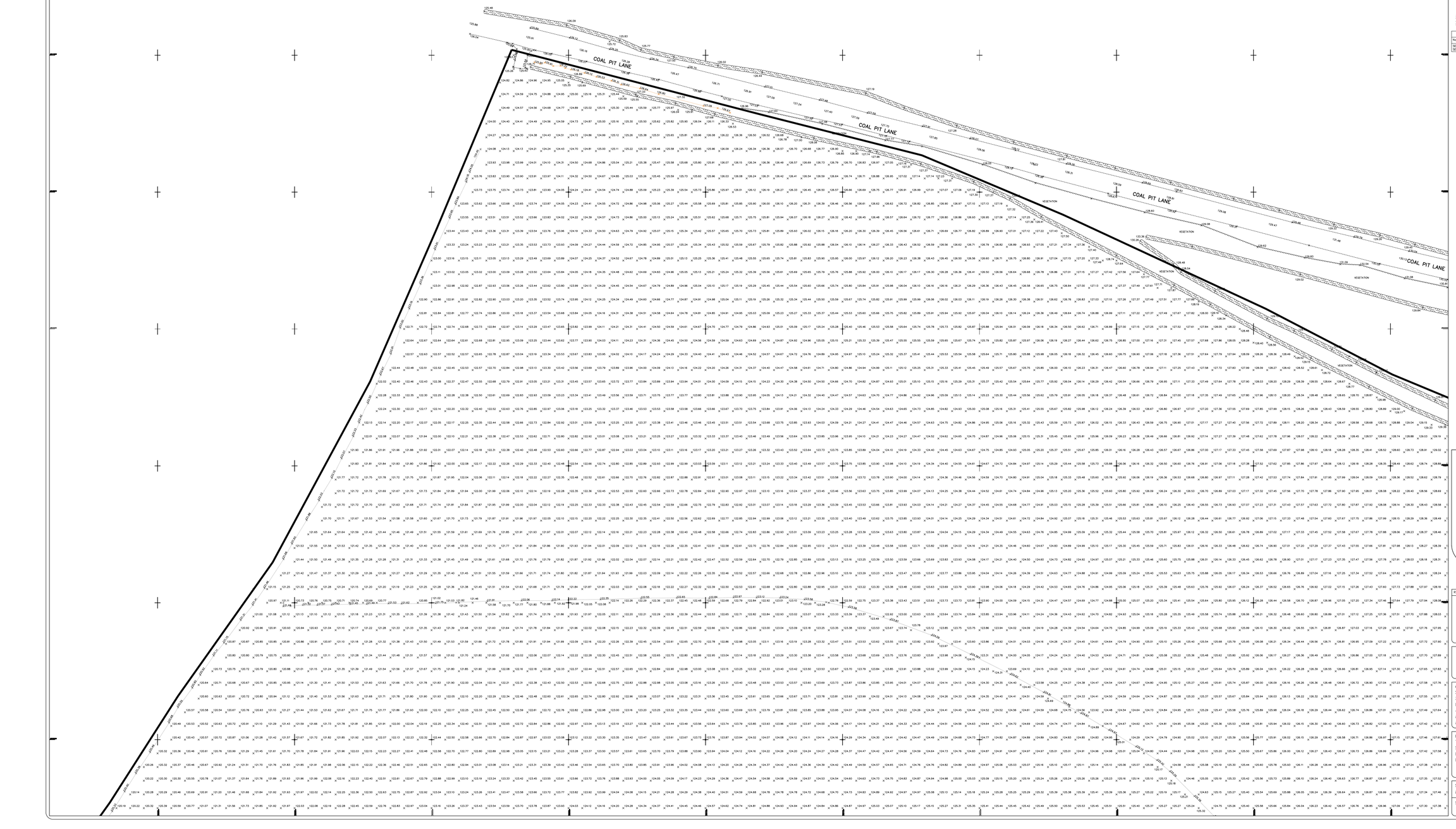
AV	AIR VALVE	LBY	LIFEBUOY
BB	BELISHA BEACON	MH	MANHOLE
BH	BOLLARD	MON	MONUMENT
BH	BORE HOLE	MS	MILE STONE
BM	BM	MP	MOORING POINT
BS	BENCH MARK	OP	OBSERVATION POINT
BS	BUS STOP	OP	OUTFALL PIPE
BT	BT INSPECTION COVER	PB	POST OFFICE BOX
CAB	CABLE DUCT	PB	PUSH BUTTON
CCTV	CCTV CAMERA POST	PP	PETROL PUMP
CH	CATCH PIT	PP	POWER POLE
COM	COMMUNICATIONS COVER	RE	RODDING EYE
CP	CONTROL PANEL/STATION	RL	ROAD LEVEL
CTV	CABLE TV COVER	SL	SIGN LEVEL
DC	DRAINAGE CHANNEL	RTW	RETAINING WALL
DP	DRAINAGE PIPE	SVP	SOIL VENTILATING PIPE
DR	DRAIN	SW	SWITCH
EIC	ELEC. INSPECTION COVER	SWP	NAME PLATE
EL	ELECTRIC LIGHT	TBM	TEMP BENCH MARK
ELB	ELECTRIC BOX	TOP	SOFFIT LEVEL
ER	EARTH ROD	TV	STOP VALVE
FB	FLOWER BED/POT	TV	TELEVISION GUARD
FL	FINISHED FLOOR LEVEL	TCB	TELEPHONE CALL BOX
FP	FLAG POLE	TL	TRAFFIC LIGHT
FP	FUEL PUMP	TL	TRAFFIC LIGHT
G	GULLY	TM	TRAFFIC MANAGEMENT BOX
G.T	GROUND LIGHT	UB	UNDERGROUND BOX
GP	GATE POST	UP	TELEGRAPH POLE
GV	GAS VALVE	VP	VENTILATION PIPE
GW	GAS VALVE	WM	WATER METER
IC	INSPECTION COVER	WO	WASH OUT
KO	KERB OUTLET	WT	WATER TROUGH TAP
KO	KERB OUTLET	WSV	WATER STOP VALVE
LAD	LADDER	123.94	TREE GIRTH (Dia.)
LP	LAMP POST	WS	TREE MULTI-GIRTH
LP	LAMP POST		

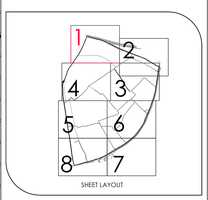
PAL	PALISADE		DRIP LINE
W.W	WIRE MESH		EDGE OF COURSE
R.W	RAILWAY LINE		KERB
C.W	CONC PANEL		RIDGE
F.W	CONC POST & WIRE		SURFACE CHANGE
F.W	POST AND RAIL		TOP
L.W	IRON RAIL		TOP BANK
C.W	CONC SLOPED		BOTTOM BANK
CALL	CHAIN LINK		BUILDING
(38.98)	TOP OF FEATURE		BUILDING CANOPY
(38.98)	TOP OF FEATURE HEIGHT		OVER HEAD ELECTRICAL
[Flat]	FLAT/FLAT ROOF		OVER HEAD TELECOM
	STATION		HEDGE
	BOREHOLE		
	BATTER		

NOTES:
All levels relate to O.S (Newlyn) Datum, Established using network RTK.
Survey plotted on a plane-local grid, orientated to National Grid.

SURVEY STATIONS

Name	Easting	Northing	Height
SEP1	446790.838	283627.369	118.540
SEP2	446815.823	283631.513	119.510





SHEET LAYOUT

0 5m 10m 20m 30m 40m

SCALE BAR

REV	DATE	DESCRIPTION

SURVEY & ENGINEERING PROJECTS

Client
Shepherd Gilmour Infrastructure Ltd
3rd Floor,
Phoenix House,
45 Cross Street,
Manchester,
M2 4JF

Project Title
Topographical Survey of Land at:
Streetfields Farm,
Lutterworth,
LE17 4HU

Surveyed	Drawn	Checked
M.Hayes	R.Jones	R.Critchley

Scale	Date	Drawing Ref.	No.	Size	Rev
1:500	Nov 23	524831-T	01	A0	–

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G.L	GROUND LIGHT	TP	TIMBER POST
GP	GATE POST	TP	TELEGRAPH POLE
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LD	LAND DRAIN	MS	TREE MULTI-GIRTH
LP	LAMP POST		

PAL PALISADE	DRIP LINE
W.W WIRE MESH	KERB COURSE
R.W RAIL WAY	ACCESS
C.W CONC PANEL	EDGE
C.W CONC WALL	SURFACE CHANGE
P.W POST AND RAIL	TOP
T.W IRON RAIL	BOTTOM BANK
C.W CONC COVERED	BUILDING
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Phoenix House,
45 Cross Street,
Manchester,
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Project Title
Topographical Survey of Land at:
Streetfields Farm,
Lutterworth,
LE17 4HU

Surveyed	Drawn	Checked
M.Hayes	R.Jones	R.Critchley

Scale	Date	Drawing Ref.	No.	Size	Rev
1:500	Nov 23	524831-T	02	A0	--

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N

PLAN GRID NORTH

File Name: 524831-T.dwg

LEGEND

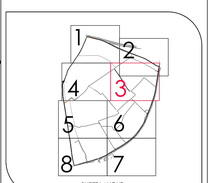
AV	AIR VALVE	LBY	LITTERBOY
BB	BELISHA BEACON	MH	MANHOLE
BH	BOLLARD	MK	MARKER POST
BO	BORE HOLE	MS	MILE STONE
BW	BIN	MP	MOORING POINT
BM	BENCH MARK	OP	OBSERVATION POST
BS	BUS STOP	OF	OUTFALL PIPE
BT	BT INSPECTION COVER	PO	POST OFFICE BOX
CB	CATCH PIT	PP	POLE
CC	CCTV CAMERA POST	PU	PETROL PUMP
CH	CHIMNEY	RE	RAIL
COM	COMMUNICATIONS COVER	RG	RODDING EYE
CP	CONCRETE POST	RS	ROAD SIGN
CT	CABLE TV CONDUIT	SA	SACRIFICIAL ANODE
DC	DRAINAGE CHANNEL	RTW	RETAINING WALL
DI	DRAIN INLET	SVP	SOIL VENT PIPE
DN	DRAIN	SAT	SATELLITE
EIC	ELEC. INSPECTION COVER	SNP	SIGN PLATE
EK	EARTH KERB	TP	TELEGRAPH POLE
ELB	ELECTRIC BOX	TOP	TOP SOIL
EK	EARTH POST	TV	STOP VALVE
FB	FLOWER BED/TROUGH	TB	TELEPHONE BOLLARD
FL	FINISHED FLOOR LEVEL	TCB	TELEPHONE CALL BOX
FH	FIRE HYDRANT	TK	TANK
FP	FLAG POLE	TR	TRAFFIC LIGHT
GA	GAS VALVE	TSP	TRAFFIC SIGNAL POST
GL	GRADING LIGHT	TW	TRANSFORMER
GP	GATE POST	TP	TELEGRAPH POLE
GR	GRATE	VC	VENT COLUMN
GSV	GAS VALVE	WM	WATER METER
IC	INSPECTION COVER	WO	WASH OUT
KO	KERB OUTLET	WSV	WATER SCOUR TAP
LO	LAYBY OUTLET	WV	WATER STOP VALVE
LAD	LADDER	XX.M	TREE GIRTH (Dbh)
LD	LAMP DOWN	MG	TREE MULTI-GIRTH
LP	LAMP POST		

PAL	PALISADE		DRIP LINE
RW	RETAINING WALL		TOP OF SLOPE
BCN	BEACON		HEDGE
CHV	CHEVRON		TREE CANOPY
CVR	CONC PANEL		SURFACE CHANGE
EDG	EDGE OF ROAD		KERB
ESP	EDGE AND RAIL		TOP
LTR	IRON RAIL		BOTTOM BANK
OHL	OVER HEAD WIRES		FENCE
CAL	CHAIN LINK FENCE		ROOF OVERHANG
(38.98)	TOP OF FEATURE		OVER HEAD ELECTRICAL
(38.98)	EAVES FLAT ROOF HEIGHT		OVER HEAD TELECOM
	STATION		
	BOREHOLE		HEDGE
	BATTER		

NOTES:
All levels relate to O.S (Newlyn) Datum, Established using network RTK.
Survey plotted on a plane local grid, orientated to National Grid.

SURVEY STATIONS

Name	Easting	Northing	Height
SEP1	449790.808	285827.369	118.540
SEP2	449815.823	285831.513	119.510



SHEET LAYOUT

0 5m 10m 20m 30m 40m
SCALE BAR

REV	DATE	DESCRIPTION

SURVEY & ENGINEERING PROJECTS

Client
Shepherd Gilmour Infrastructure Ltd
3rd Floor,
Phoenix House,
45 Cross Street,
Manchester,
M2 4JF

Project Title
Topographical Survey of Land at:
Streetfields Farm,
Lutterworth,
LE17 4HU

Surveyed	Drawn	Checked
M.Hayes	R.Jones	R.Critchley

Scale	Date	Drawing Ref.	No.	Size	Rev
1:500	Nov 23	524831-T	03	A0	–

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N

PLAN GRID NORTH

File Name: 524831-T.dwg

LEGEND

AV	AIR VALVE
BB	BELISHA BEACON
BH	BOLLARD
BO	BORE HOLE
BR	BIN
BM	BENCH MARK
BS	BUS STOP
BT	BT INSPECTION COVER
CB	CATCH PIT
CCTV	CCTV CAMERA POST
CH	CHAMBER
COM	COMMUNICATIONS COVER
CP	CAR PARKING STATION
CS	CABLE TV CONSTRUCTION
DC	DRAINAGE CHANNEL
DG	DRAINAGE GULLY
DP	DOWN PIPE
ELEC	ELEC. INSPECTION COVER
EM	ELEC. METER
ELB	ELECTRIC BOX
ER	EARTH ROD
FC	FINISHED FLOOR LEVEL
FL	FINISHED FLOOR LEVEL
FP	FLAG POST
GV	GAS VALVE
GL	GLASS CHAMBER
GP	GATE POST
GU	GULLY
GW	GAS VALVE
IC	INSPECTION COVER
LB	LETTER BOX
MO	MINOR OUTLET
LAD	LADDER
LP	LAMP DOWN
LP	LAMP POST
LBY	LAYBY/CV
MH	MANHOLE
MK	MARKER
MS	MILK STAND
MP	MOORING POINT
OC	OPTICAL COMMS COVER
OP	OUTFALL PIPE
PB	POST OFFICE BOX
PI	PIT
PU	PETROL PUMP
PC	POWER
RE	RODDING EYE
RG	ROAD GRID
SL	SAFE TY LOOP
RTW	RETAINING WALL
SDP	SURFACE DRAIN PIPE
SMP	SIMPLEX
SWC	SWAY PLATE
TC	TRAFFIC COUNT
TOP	SOFFIT LEVEL
TV	STOP VALVE
TB	TELEPHONE BOLLARD
TJB	TELEPHONE CALL BOX
TP	TRIAL PIT
TL	TRAFFIC LIGHT
TSP	TELEPHONE SPUR BOX
UU	TRAFFIC UNDERGROUND
UP	TELEGRAPH POLE
VP	VENT PIPE
WM	WATER METER
WO	WASH OUT
WSV	WATER STOP TAP
WV	WATER STOP VALVE
XX.M	TREE GIRTH (Dia.)
WS	TREE GIRTH-GIRTH

PAL	PALISADE
RAIL	RAILWAY
RW	RETAINING WALL
CVR	CONC PANEL
CVW	CONC WALL
SBW	SLEEPER WALL
STN	STONE WALL
BRK	BRICK WALL
BW	BLOCK WORK
GAL	GALVANISED
(38.98)	TOP OF FEATURE
(38.98)	EAVES FLAT ROOF HEIGHT
S	STATION
B	BOREHOLE
BATTER	

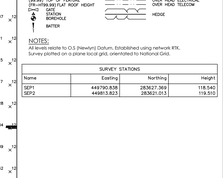
	DRIP LINE
	HEDGE
	SURFACE CHANGE
	TOP
	TOP BANK
	BOTTOM BANK
	BUILDING
	BUILDING CANOPY
	OVER HEAD ELECTRICAL
	OVER HEAD TELECOM
	HEDGE

NOTES:

All levels relate to O.S (Newlyn) Datum, Established using network RTK.
Survey plotted on a plane local grid, orientated to National Grid.

SURVEY STATIONS

Name	Easting	Northing	Height
SEP1	446790.808	283627.369	118.540
SEP2	446815.823	283631.513	119.510



SHEET LAYOUT

0 5m 10m 20m 30m 40m

SCALE BAR

REV	DATE	DESCRIPTION

SURVEY & ENGINEERING PROJECTS

Client
Shepherd Gilmour Infrastructure Ltd
3rd Floor,
Phoenix House,
45 Cross Street,
Manchester,
M2 4JF

Project Title
Topographical Survey of Land at:
Streetfields Farm,
Lutterworth,
LE17 4HU

Surveyed	Drawn	Checked
M.Hayes	R.Jones	R.Critchley

Scale	Date	Drawing Ref.	No.	Size	Rev
1:500	Nov 23	524831-T	04	A0	--

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N

PLAN GRID NORTH

File Name: 524831-T.dwg

LEGEND

AV	AIR VALVE
BB	BELOW BEACON
BH	BOREHOLE
BV	BORE VOLE
BM	BM
BS	BENCH MARK
BS	BUS STOP
BT	BT INSPECTION COVER
CB	CATCH PIT
CP	CATH CAMERA POST
CL	CLEAR
COM	COMMUNICATIONS COVER
CCTV	CCTV CAMERA STATION
DC	DRAINAGE CONNECTION
DC	DRAINAGE CHANNEL
DP	DOWN PIPE
D	DRAIN
EVC	ELEC. INSPECTION COVER
EP	ELEC. POST
ELB	ELECTRIC BOX
ER	EARTH ROD
FFL	FINISHED FLOOR LEVEL
FFL	FINISHED FLOOR
FP	FLAG POST
FL	FLAT ROOF
GL	GROUND LEVEL
GP	GATE POST
GL	GAS LAMP
GV	GAS VALVE
IC	INSPECTION COVER
KO	KERB OUTLET
KO	KERB OUTLET
LAD	LADDER
LD	LAND DRAIN
LP	LAMP POST
LBV	LITTERBUOY
MH	MANHOLE
MP	MARKER POST
MS	MILE STONE
MP	MOORING POINT
OHL	OVERHEAD CABLE
OP	OUTFALL PIPE
PB	POST OFFICE BOX
PP	PIPE
PP	PETROL PUMP
PC	PLANTER
RE	RODDING EYE
RL	ROOF LIGHT
SL	SIGN LAMP
RTW	RETAINING WALL
SVP	SOIL VENT PIPE
SMP	SIMPLEX
SVC	SERVICE COVER
SP	SIGN POST
SLP	SLOPE LEVEL
SV	STOP VALVE
TB	TELEGRAPH BOLLARD
TCB	TELEPHONE CALL BOX
TP	TEST PIT
TL	TRAFFIC LIGHT
TMP	TRAFFIC LIGHT BOX
TV	TRAFFIC LIGHT VOLE
TP	TELEGRAPH POLE
TP	TELEPHONE POST
WM	WATER METER
WO	WASH OUT
WT	WATER STOP TAP
WV	WATER STOP VALVE
00.94	TREE GIRTH (Dia.)
WG	TREE MULTI-GIRTH

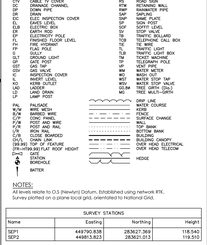
PAL	PALISADE
WAL	WALL SECTION
R/W	RETAINING WALL
C/W	CONC PANEL
C/W	CONC POST
P/R	POST AND RAIL
S/B	IRON RAIL
S/B	SLEEPER BOARDED
CAL	CHAIN LINK
(98.98)	TOP OF FEATURE
(98.98)	FLAT TOP ROOF HEIGHT
[ ]	CULVERT
	STATION
	BOREHOLE
	BATTER

	DRIP LINE
	EDGE COURSE
	KERB
	HEDGE
	SURFACE CHANGE
	TOP
	TOP BANK
	BOTTOM BANK
	BUILDING
	BUILDING CANOPY
	OVER HEAD ELECTRICAL
	OVER HEAD TELECOM
	HEDGE

NOTES:
All levels relate to O.S (Newlyn) Datum, Established using network RTK.
Survey plotted on a plane local grid, orientated to National Grid.

SURVEY STATIONS

Name	Easting	Northing	Height
SEP1	449790.838	283627.369	118.540
SEP2	449815.823	283631.513	119.510



SHEET LAYOUT

0 5m 10m 20m 30m 40m
SCALE BAR

REV	DATE	DESCRIPTION

SURVEY & ENGINEERING PROJECTS

Client
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M2 4JF

Project Title
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LE17 4HU

Surveyed	Drawn	Checked
M.Hayes	R.Jones	R.Critchley

Scale	Date	Drawing Ref.	No.	Size	Rev
1:500	Nov 23	524831-T	05	A0	–

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N

PLAN GRID NORTH

File Name: 524831-T.dwg

LEGEND

AV	AIR VALVE	LBY	LITTERBOY
BB	BELISHA BEACON	MH	MANHOLE
BH	BOREHOLE	MK	MARK POST
BN	BORE HOLE	MS	MILE STONE
BM	BM	MP	MOORING POINT
BS	BENCH MARK	OP	OPTICAL POINT
BT	BT INSPECTION COVER	OT	OUTFALL PIPE
BT	BT MANHOLE	PB	POST OFFICE BOX
CCTV	CCTV CAMERA POST	PI	PIT
CCTV	CCTV CAMERA POST	PO	PETROL PUMP
COM	COMMUNICATIONS COVER	PP	POWER POLE
COM	COMMUNICATIONS POLE	RE	RODDING EYE
CP	CONTROL POINT	RG	ROAD GULLY
CV	CABLE TV COVER	RM	RISER MAIN
DC	DRAINAGE CHANNEL	RTW	RETAINING WALL
DP	DRAIN POINT	SP	SOIL VENT PIPE
DR	DRAIN	SAT	SATELLITE
EIC	ELEC. INSPECTION COVER	SMP	SAMP PLATE
EL	ELECTRIC LIGHT	SP	SIGN POST
ELB	ELECTRIC BOX	SOFT	SOFT VERGE
ER	EARTH ROD	TV	STOP VALVE
FC	FINISHED CEILING	TB	TELEPHONE BOLLARD
FL	FINISHED FLOOR LEVEL	TCB	TELEPHONE CALL BOX
FP	FLAG POLE	TP	TEST PIT
FW	FLAT WORK	TL	TRAFFIC LIGHT
G	GAS	TMP	TRAFFIC MAST POST
G.T	GAS GOVERNOR	TRIG	TRIGONOMETRY POINT
GP	GATE POST	TP	TELEGRAPH POLE
GV	GAS VALVE	TS	TRAFFIC SIGN
GW	GAS VALVE	WM	WATER METER
IC	INSPECTION COVER	WO	WASH OUT
LC	LAMP COLUMN	WSC	WATER STOP TAP
LO	KERB OUTLET	WV	WATER STOP VALVE
LAD	LADDER	00.84	TREE GIRTH (Dia.)
LP	LAMP POST	WS	TREE MULTI-GIRTH
LP	LAMP POST		

PAL	PALISADE
HW	HEDGE WIDTH
CON	CONIFER
CHP	CONIC PANEL
CHR	CHAIN LINK FENCE
POST	POST AND RAIL
CRS	IRON RAIL
CRS	CRASH BARRIER
(00.00)	TOP OF FEATURE
(00.00)	BOTTOM OF FEATURE HEIGHT
	STATION
	BOREHOLE
	BATTER

	DRIP LINE
	EDGE OF COURSE
	KERB
	RIDGE
	SURFACE CHANGE
	TOP
	TOP BANK
	BOTTOM BANK
	CLIFF
	OVER HEAD GRADIENT
	OVER HEAD ELECTRICAL
	OVER HEAD TELECOM
	HEDGE

NOTES:
All levels relate to O.S (Newlyn) Datum, Established using network RTK.
Survey plotted on a plane local grid, orientated to National GRID.

SURVEY STATIONS

Name	Easting	Northing	Height
SEP1	449790.838	283627.369	118.540
SEP2	449815.823	283631.513	119.510

LUTTERWORTH ROAD

WOODLAND

1 2 3 4 5 6 7 8

SHEET LAYOUT

0 5m 10m 20m 30m 40m

SCALE BAR

REV	DATE	DESCRIPTION

SURVEY & ENGINEERING PROJECTS

Client
Shepherd Gilmour Infrastructure Ltd
3rd Floor,
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Project Title
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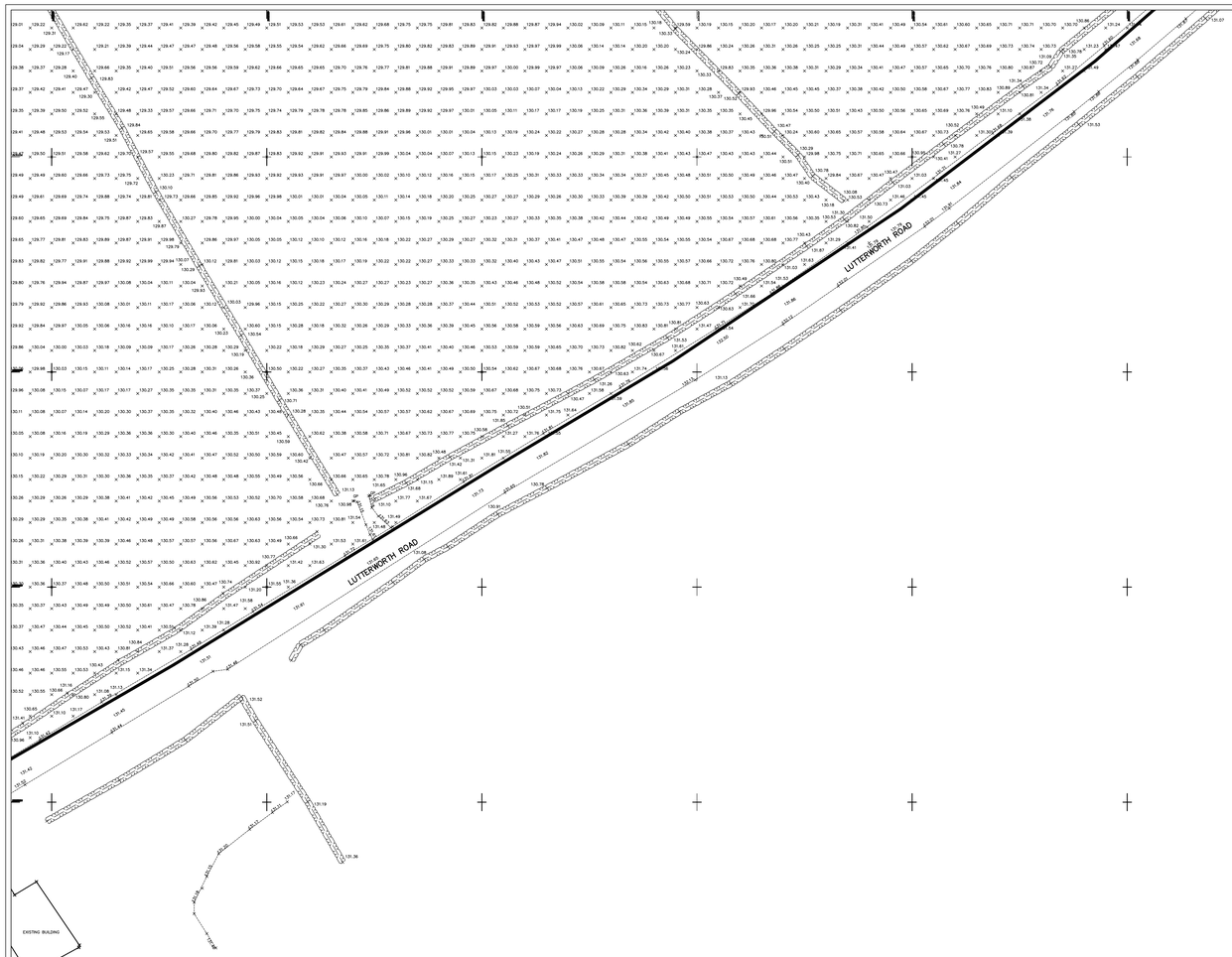
Surveyed	Drawn	Checked
M.Hayes	R.Jones	R.Critchley

Scale	Date	Drawing Ref.	No.	Size	Rev
1:500	Nov 23	524831-T	06	A0	–



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N

PLAN GRID NORTH

File Name: 524831-T.dwg

LEGEND

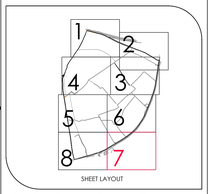
AV	AIR VALVE	LBY	LITTERBUOY
BB	BELISHA BEACON	MH	MANHOLE
BH	BOLLARD	MK	MARKER POST
BO	BORE HOLE	MS	MILE STONE
BM	BM	MP	MOORING POINT
BS	BENCH MARK	OP	OBSERVATION POL
BS	BUS STOP	OP	OUTFALL PIPE
BT	BT INSPECTION COVER	PB	POST OFFICE BOX
CB	CATCH PIT	PB	PILLAR
CCTV	CCTV CAMERA POST	PP	PETROL PUMP
CH	CHAINAGE	PP	POWER POLE
COM	COMMUNICATIONS COVER	RE	RODDING EYE
CP	CONTROL POINT STATION	SL	STREET LIGHT
CTV	CABLE TV CONDUIT	SL	HOSE LEVEL
DC	DRAINAGE CHANNEL	RTW	RETAINING WALL
DI	DRAINAGE PIPE	SVP	SOIL VENTILATE PIPE
DR	DRAIN	SP	SAPLING
EIC	ELEC. INSPECTION COVER	SNP	NAME PLATE
EM	ELEC. METER	SP	SIGN POST
ELB	ELECTRIC BOX	SVP	SOFFIT LEVEL
ER	EARTH ROD	TV	STOP VALVE
FB	FINISHED FLOOR LEVEL	TB	TRAFFIC BOLLARD
FL	FINISHED FLOOR LEVEL	TCB	TELEPHONE CALL BOX
FP	FLAG POLE	TL	TRAFFIC LIGHT
FW	FLAG POST	TL	TRAFFIC LIGHT
G	GULLY	TMB	TRAFFIC MANAGER BOX
GL	GROUND LIGHT	TP	TRIAL HOLE
GP	GATE POST	TP	TELEGRAPH POLE
GV	GAS VALVE	TP	TELEPHONE POLE
GW	GAS VALVE	WM	WATER METER
IC	INSPECTION COVER	WO	WASH OUT
IL	INVERT LEVEL	WT	WATER STAND TAP
KO	KERB OUTLET	WSV	WATER STOP VALVE
LAD	LADDER	22.34	TREE GIRTH (Dia.)
LD	LAND DRAIN	WS	TREE MULTI-GIRTH
LP	LAMP POST		

PAL	PALISADE		DRIP LINE
RW	RETAINING WALL		EDGE OF COURSE
R/W	RIGHT OF WAY		KERB
C/W	CONC WALL		RAIL
C/F	CONC FENCE		SURFACE CHANGE
W/F	WOOD FENCE		TOP
P/R	POST AND RAIL		TOP BANK
L/H	IRON RAIL		BOTTOM BANK
W/M	WIRE MESH		BUILDING
CALL	CHAIN LINK		BUILDING CANOPY
(58.66)	TOP OF FEATURE		OVER HEAD ELECTRICAL
(58.66)	TOP FLAT ROOF HEIGHT		OVER HEAD TELECOM
	STATION		HEDGE
	BOREHOLE		
	BATTER		

NOTES:
All levels relate to O.S (Newlyn) Datum, Established using network RTK.
Survey plotted on a plane local grid, orientated to National GAS.

SURVEY STATIONS

Name	Easting	Northing	Height
SEP1	449790.808	285627.369	118.540
SEP2	449815.823	285631.513	119.510



SHEET LAYOUT

0 5m 10m 20m 30m 40m
SCALE BAR

REV	DATE	DESCRIPTION

SURVEY & ENGINEERING PROJECTS

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N

PLAN GRID NORTH

File Name: 524831-T.dwg

LEGEND

AV	AIR VALVE
BB	BELISHA BEACON
BH	BOLLARD
BN	BORE HOLE
BM	BM
BS	BENCH MARK
BT	BUS STOP
BT	BT INSPECTION COVER
CB	CATCH PIT
CCTV	CCTV CAMERA POST
CH	CHAMBER
COM	COMMUNICATIONS COVER
CP	CONCRETE POST
CV	CAT 'V' DITCH
DC	DRAINAGE CHANNEL
DP	DRAINAGE PIPE
DW	DOWN
ELEC	ELEC. INSPECTION COVER
EP	ELECTRIC POST
ELB	ELECTRIC BOX
ER	EARTH ROD
FL	FINISHED FLOOR LEVEL
FF	FINISHED FLOOR LEVEL
FH	FLAG POLE
FL	FLAT
GL	GROUND LEVEL
GP	GATE POST
GT	GATE
GV	GAS VALVE
IC	INSPETION COVER
KO	KERB OUTLET
KO	KERB OUTLET
LAD	LADDER
LD	LAMP DOWN
LP	LAMP POST
LBY	LITTERBOY
MH	MANHOLE
MK	MARKER
MS	MILE STONE
MP	MOORING POINT
OP	OBSERVATION POST
OP	OUTFALL PIPE
PB	POST OFFICE BOX
PH	PIPE
PP	PETROL PUMP
PP	POST
RE	RODDING EYE
RL	ROOF LEVEL
SL	SIGN LEVEL
RTW	RETAINING WALL
SOIL	SOIL VENTILATING PIPE
SP	SPLAYS
SWP	SWAN PLATE
TOC	TOP OF CUTTING
TOF	TOP OF FILL
TV	STOP VALVE
TB	TELEPHONE BOLLARD
TCB	TELEPHONE CALL BOX
TL	TRAFFIC LIGHT
TL	TRAFFIC LIGHT
TP	TRANSFORMER POST
TP	TELEGRAPH POLE
VP	VENT PIPE
WM	WATER METER
WO	WASH OUT
WSV	WATER STOP TAP
WSV	WATER STOP VALVE
00.84	TREE GIRTH (Dia.)
WS	TREE MULTI-GIRTH
PAL	PALISADE
RCW	RETAINING WALL
SCW	SCREEN WALL
CVR	CONC PANEL
F/W	POST AND WIRE
F/R	POST AND RAIL
L/S	IRON RAIL
CLD	CLOSE BOARDED
CHA	CHAIN LINK
(88.88)	TOP OF FEATURE
(88.88)	TOP OF FLAT ROOF HEIGHT
⊕	STATION
⊕	BOREHOLE
⊕	BATTER
	DWF LINE
	FOUL SEWERAGE
	ADSE
	KERBS
	SURFACE CHANGE
	TOP
	TOP BANK
	BOTTOM BANK
	BUILDING
	BUILDING CANOPY
	OVER HEAD ELECTRICAL
	OVER HEAD TELECOM
	HEDGE

NOTES:
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Name	Easting	Northing	Height
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SEP2	449815.823	285631.513	119.510

LUTTERWORTH ROAD

EXISTING BUILDING

EXISTING BUILDING

EXISTING BUILDING

EXISTING BUILDING

SHEET LAYOUT

1 2 3 4 5 6 7 8

0 5m 10m 20m 30m 40m

SCALE BAR

REV	DATE	DESCRIPTION

SURVEY & ENGINEERING PROJECTS

Client
Shepherd Gilmour Infrastructure Ltd
3rd Floor,
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Surveyed	Drawn	Checked
M.Hayes	R.Jones	R.Critchley

Scale	Date	Drawing Ref.	No.	Size	Rev
1:500	Nov 23	524831-T	08	A0	--