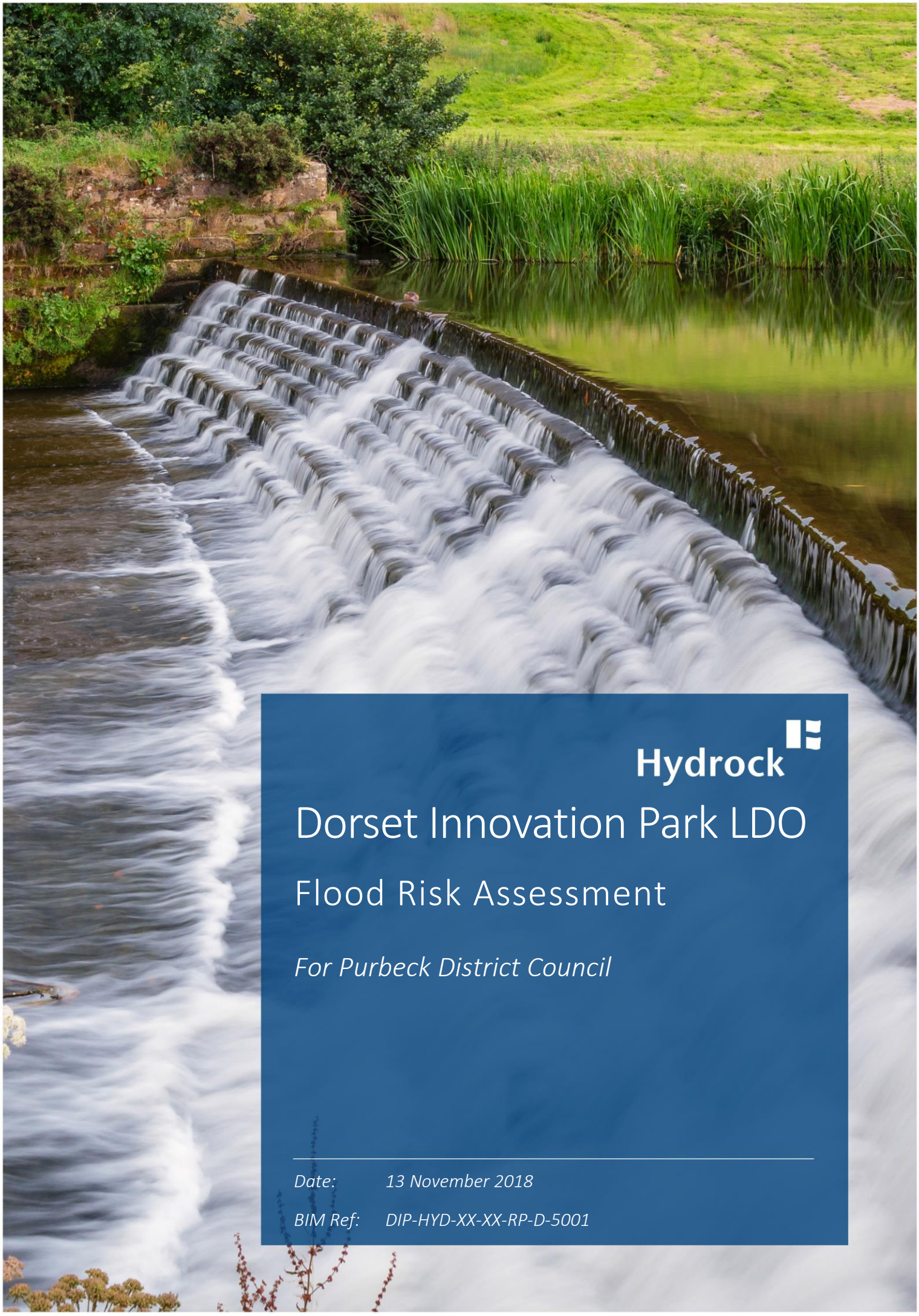

Hydrock

Dorset Innovation Park LDO

Flood Risk Assessment

For Purbeck District Council

Date: *13 November 2018*

BIM Ref: *DIP-HYD-XX-XX-RP-D-5001*

DOCUMENT CONTROL SHEET

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Title	Flood Risk Assessment	
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Approved by		Dr. David Lloyd BSc PhD

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P02	S2	04/07/2018	Final report
P03	S2	01/08/2018	Final report (issued for LDO submission)
P04	S2	13/11/2018	Final report (NPPF reference and appended technical note)

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Tables

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Appendices

1. INTRODUCTION

This Flood Risk Assessment (FRA) report has been prepared by Hydrock on behalf of Purbeck District Council in support of a local development order (LDO) to be submitted to Purbeck District Council for a proposed development at the Dorset Innovation Park. The Assessment will inform the drafting of the parameters, conditions and Design Guidance which, when read together, will ensure that appropriate development proposals are brought forward for consideration under applications for prior approval

Parts of the site are within Flood Zones 2 (Medium Risk) and Flood Zone 3 (High Risk). This FRA report has been prepared to address the requirements of the National Planning Policy Framework (NPPF), through:

- Assessing whether the site is likely to be affected by flooding.
- Assessing whether the proposed development is appropriate in the suggested location.
- Presenting any flood risk mitigation measures necessary to ensure that the proposed development and occupants will be safe, whilst ensuring flood risk is not increased elsewhere.

2. SITE INFORMATION

2.1 Location

The site is situated west of Wool, Dorset, roughly bounded by the Christchurch to Dorchester railway line to the north, other industrial buildings and minor access roads before Gatemore Road to the west and the River Win to the southeast. The site location is shown in Figure 1, with full address and Ordnance Survey Grid Reference in Table 1.

Site Referencing Information	
Site Address	Dorset Green Technology Park Winfrith Newburgh, Wool, Dorchester DT2 8ZB
Grid Reference	SY819869 381973, 86907

Table 1: Site Referencing Information

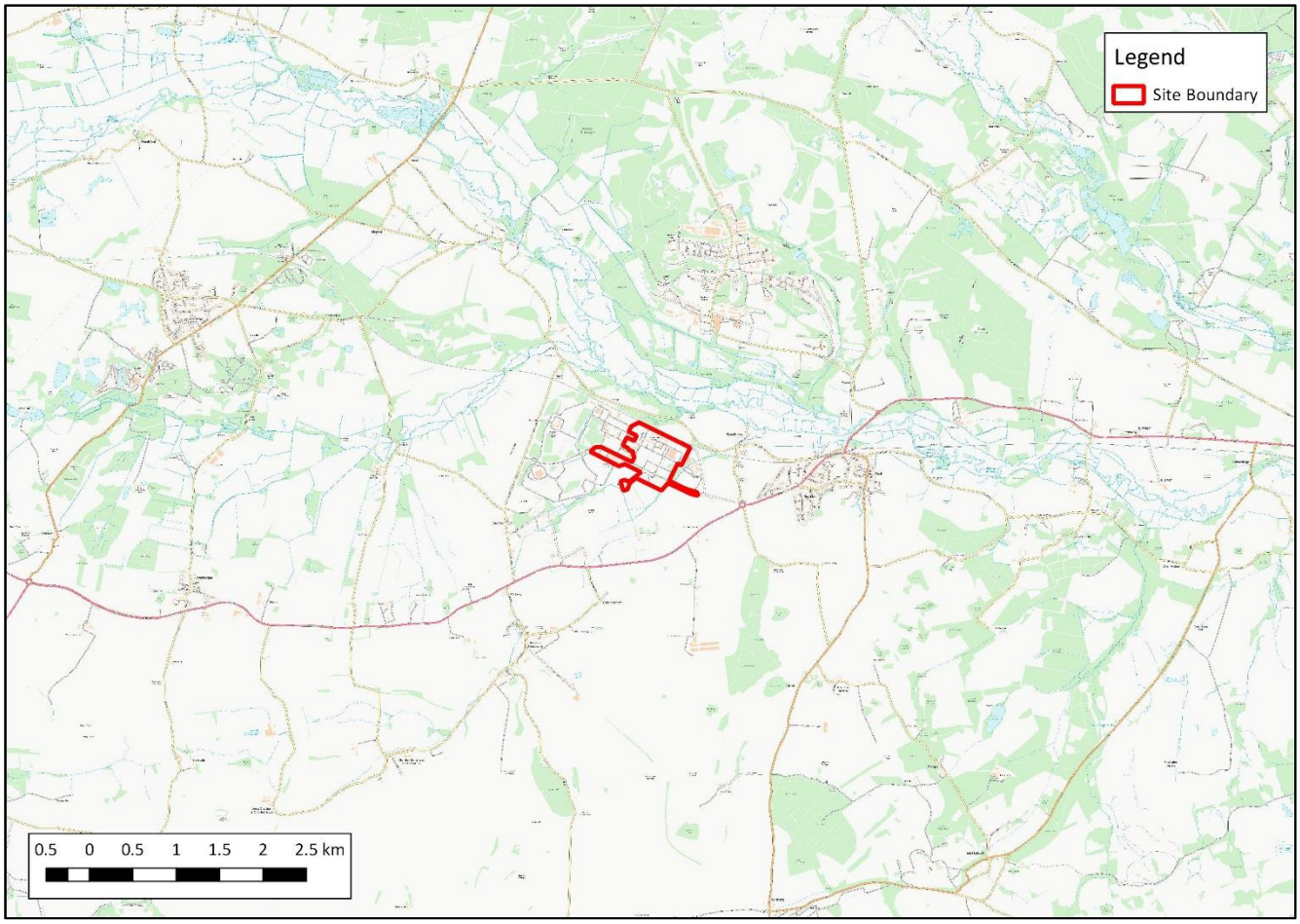

Figure 1: Site Location

Contains OS data © Crown copyright (2018) and Environment Agency data under OGLv3

2.2 Topography

Ground levels on site fall from approximately 26m AOD in the west to approximately 20m AOD in the east. A detailed topographical survey is included in Appendix A.

2.3 Existing Site

The site is currently partially developed with industrial buildings interspaced with areas of landscaping (i.e. grass and trees) and minor access roads. The existing site layout is shown in Appendix C and on the topographical survey in Appendix A.

2.4 Proposed Development

The proposed development is for the demolition of some of the existing buildings and construction of a number of new buildings. A draft layout proposal is included in Appendix C.

3. SOURCES OF FLOOD RISK

This section summarises the potential flood risk to the site from various potential sources. A summary of the flood risk from these sources is given in Table 2.

Summary of Potential Sources of Flood Risk	
Fluvial	Majority Low, some Medium and High from River Win
Tidal	Negligible
Surface Water	Low
Groundwater	Low
Sewer	Low
Infrastructure Failure	Low

Table 2: Summary of Potential Sources of Flood Risk

3.1 Fluvial Flooding

The River Win flows in a northeasterly direction along the eastern site boundary, and through the site below Monterey Avenue. This watercourse is designated a 'Main River' so the Environment Agency are responsible for the management of fluvial flood risk along the watercourse. Environment Agency mapping (Figure 2) shows that while there are areas of the wider site in Flood Zone 2 (Medium Risk) and in Flood Zone 3 (High Risk) around Chapman House and Monterey Avenue, the majority of the site is within Flood Zone 1 (Low Risk). These Fluvial Flood Zones are defined as follows (with relevance of Flood Zones 3a and 3b addressed in Section 5.1):

- Flood Zone 1 (Low Risk) comprises land assessed as having a ≤0.1% AEP of fluvial flooding in any given year, equivalent to the 1 in ≥1,000 year return period event.
- Flood Zone 2 (Medium Risk) comprises land assessed as having a 0.1-1% AEP of fluvial flooding in any given year, equivalent to the 1 in 1,000-100 year return period event.
- Flood Zone 3 (High Risk) comprises land assessed as having a ≥1% AEP of fluvial flooding in any given year, equivalent to the 1 in ≤100 year return period event.
  - » Flood Zone 3a (High Risk) comprises land assessed as having a 1-5% AEP of fluvial flooding in any given year, equivalent to the 1 in 100-20 year return period event.
  - » Flood Zone 3b (Functional Floodplain) comprises land assessed as having a ≥5% AEP of fluvial flooding in any given year, equivalent to the 1 in ≤20 year return period event.

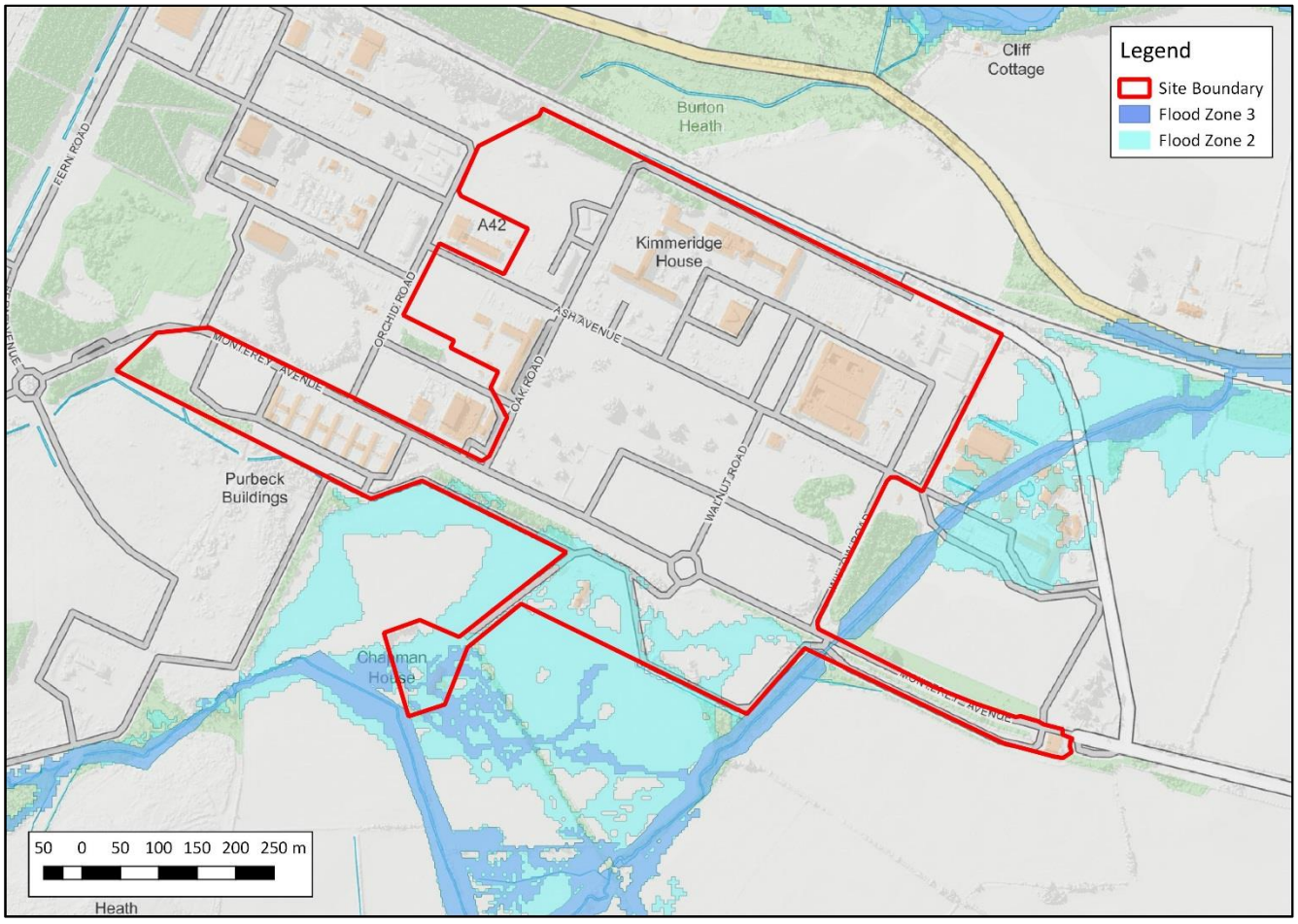

Figure 2. Environment Agency Fluvial Flood Map

Contains OS data © Crown copyright (2018) and Environment Agency data under OGLv3

3.2 Tidal Flooding

Given the site's significant elevation above sea level (>20m AOD) and geographical location upstream of tidal reaches of the River Frome into which the River Win flows, the site is concluded to be at negligible risk of tidal flooding.

3.3 Surface Water Flooding

Surface water flooding occurs as the result of an inability of intense rainfall to infiltrate to ground. This often happens when the maximum soil infiltration rate or storage capacity is reached. Such flows either drain into existing land drainage features or follow the general topography which can concentrate flows and lead to localised ponding/flooding.

Environment Agency surface water flood mapping (Figure 3) shows the majority of the site to be at a 'very low' risk of flooding from this source though there are isolated areas of 'low', 'medium' and 'high' risk across the site. The mapping does not take account of existing drainage infrastructure nor differentiate risk along lower lying channels (which by definition is fluvial) and on this basis the overall risk of surface water flooding is considered to be low.

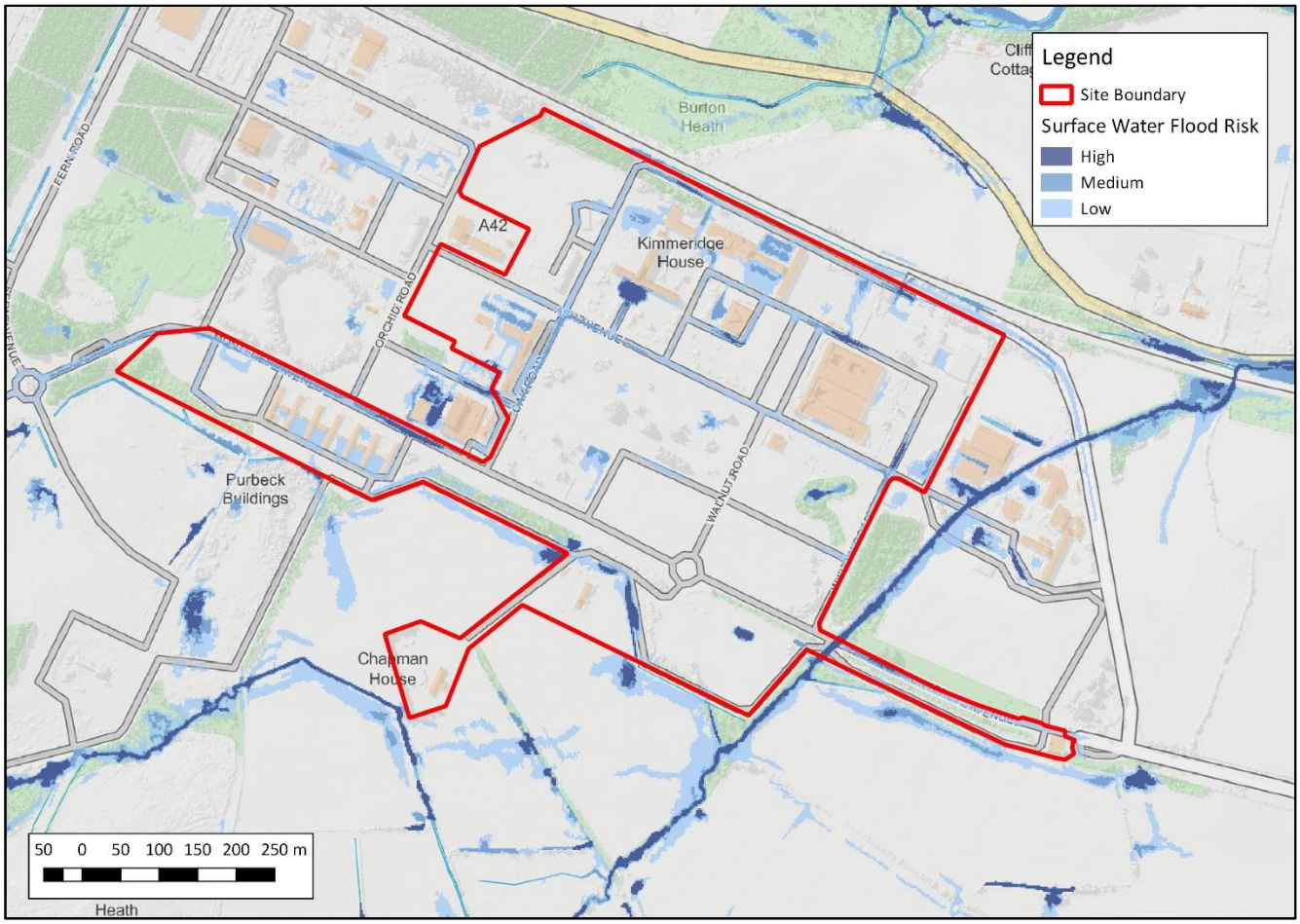

Figure 3. Environment Agency Surface Water Flooding Map

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3.4 Groundwater Flooding

British Geological Survey (BGS) bedrock mapping shows the southeast of the site is underlain by West Park Member Sand with the northwest underlain by Pool Formation Sand. It is likely that following heavy rainfall, groundwater flows through this permeable geology are likely and groundwater depths in areas adjacent to the River Win are likely to be comparable to water levels in the channel. As there is a lack of steep slopes across the site, actual emergence onto the site is unlikely, and so the overall risk of flooding from this source is considered to be low.

3.5 Sewer Flooding

The Strategic Flood Risk Assessment (SFRA) (PDC, 2015, p6) states that surface water sewers are designed to 'a standard of around 1 in 20 to 30 years'. There is no specific risk of sewer flooding in or around the Dorset Innovation Park, and on this basis, the overall risk of sewer flooding at the site is considered to be low.

3.6 Infrastructure Failure Flooding

The site is not shown in the Environment Agency mapping to be at risk of flooding from reservoirs. There is also no known risk of flooding from canals or any other artificial source and so the site is concluded to be at low risk of flooding from infrastructure failure.

4. HISTORIC FLOODING

SFRA mapping (PDC, 2011, Map 3, included in Appendix D of this report) shows reported flooding incidents where the River Win passes below the railway line east of the site. Environment Agency records (Figure 4) show flooding along the River Frome north of the site in 1959. The records however show the site was not affected by this event.

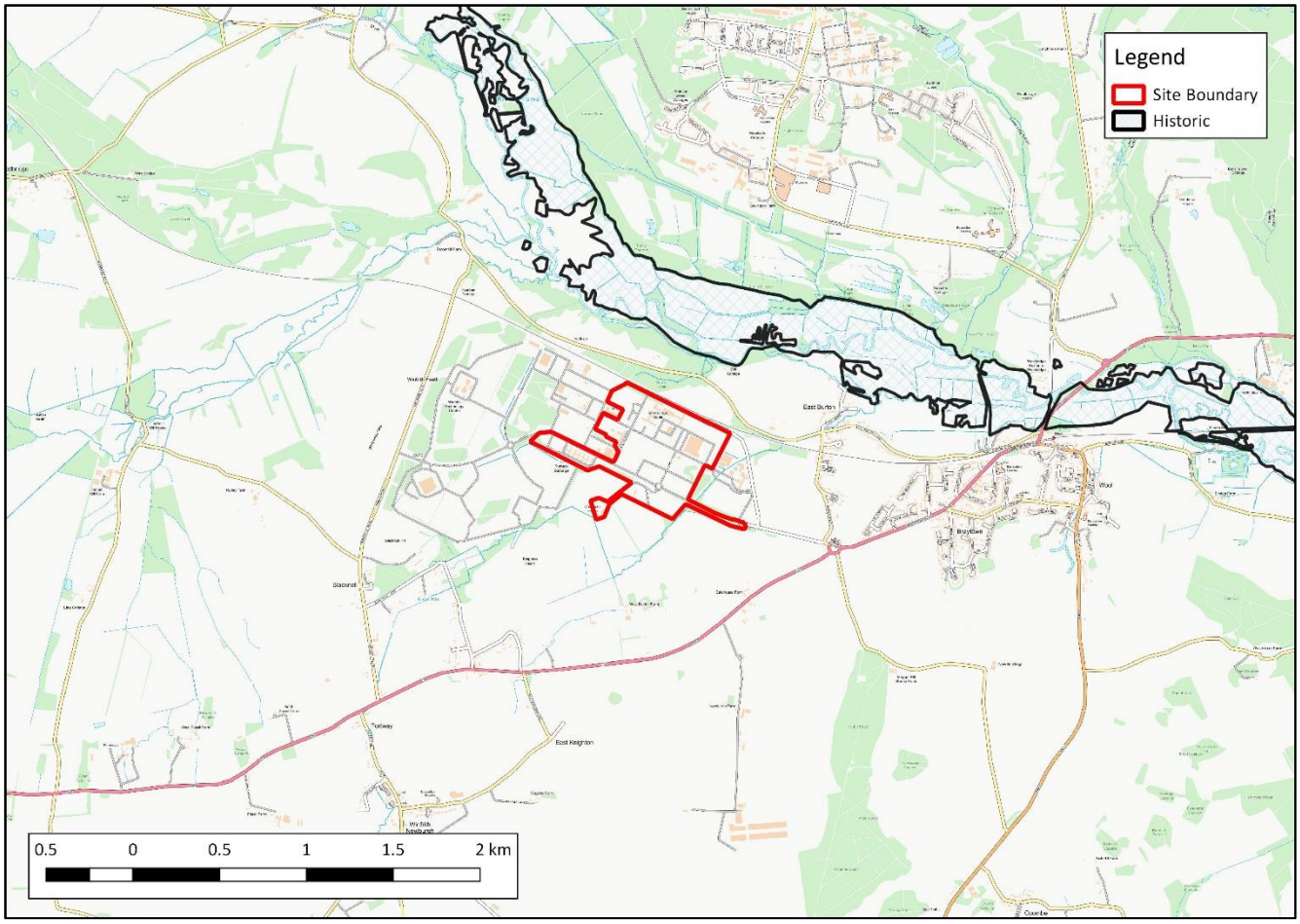

Figure 4. Environment Agency Historic Flooding Map

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5. NATIONAL PLANNING POLICY FRAMEWORK

5.1 Sequential Test

The National Planning Policy Framework (NPPF) Sequential Test requires that a sequential approach is followed to steer new development to areas with the lowest probability of flooding (i.e. Flood Zone 1, then 2, then 3).

An assessment has been made of the proposed development option's flood risk vulnerability (GOV.UK (B), Point 25, Table 2) and suitability of each within the Flood Zone in which it is proposed (GOV.UK (B), Point 25, Table 3). The proposed commercial development is considered 'less vulnerable' with respect to flood risk. Less vulnerable development is considered acceptable within the Flood Zone 1 (Low Risk) and Flood Zone 2 (Medium Risk) parts of the site in which they are proposed, and on this basis the proposals are demonstrated as being in accordance with the principles of the Sequential Test.

The site's allocation within the Purbeck District Council Adopted Local Plan is detailed further in the appended technical note (Appendix E).

5.2 Exception Test

A NPPF Exception Test (GOV.UK (B), Point 7) requires that a proposed development provides wider sustainability benefits to the community that outweigh flood risk, and that it will be safe for its lifetime, without increasing flood risk elsewhere and where possible reduce flood risk overall.

An Exception Test is not explicitly required as the proposals are in accordance with the principles of the Sequential Test. Further consideration has however been made to ensure the Exception Test conditions are met as far as practicable.

5.2.1 Flood Resistance

Details on recommended minimum Finished Floor Levels (FFLs) are included in the appended technical note (Appendix E).

6. ENVIRONMENT AGENCY RIPARIAN RESPONSIBILITIES AND PERMITS

It should noted that:

- Riparian ownership responsibilities as outlined in the 'Owning a Watercourse' online guidance (EA, 2018) apply as the River Win flows along the edge and through the site.
- Any works within 8m of the River Win may be subject to an Environmental Permit for Flood Risk Activities (EA, 2016).

7. DRAINAGE

A drainage strategy has been undertaken by Hydrock and is included in a separate report (ref. DIP-HYD-ZZ-XX-RP-D-001).

8. SUMMARY

This Flood Risk Assessment (FRA) report has been prepared by Hydrock on behalf of Purbeck District Council in support of a local development order (LDO) to be submitted to Purbeck District Council for a proposed development at the Dorset Innovation Park. The Assessment will inform the drafting of the parameters, conditions and Design Guidance which, when read together, will ensure that appropriate development proposals are brought forward for consideration under applications for prior approval. The main findings are as follows:

- The site is currently partially developed with industrial buildings interspaced with areas of landscaping (i.e. grass and trees) and minor access roads.
- The proposed development is for the demolition of some existing buildings, and construction of new buildings.
- Environment Agency mapping (Figure 2) shows that while there are areas of the wider site in Flood Zone 2 (Medium Risk) and in Flood Zone 3 (High Risk) around Chapman House and Monterey Avenue, the majority of the site is within Flood Zone 1 (Low Risk). There is also concluded to be a low risk of flooding from all other sources.
- There are no records of historic flooding at the site.
- The proposed commercial development is considered 'less vulnerable' with respect to flood risk. Less vulnerable development is considered acceptable within the Flood Zone 1 (Low Risk) and Flood Zone 2 (Medium Risk) parts of the site in which they are proposed and on this basis the proposals are demonstrated as being in accordance with the principles of the Sequential Test.
- An appended technical note includes details on the site's allocation within the Purbeck District Council Adopted Local Plan and on recommended minimum Finished Floor Levels (FFLs).
- Riparian ownership responsibilities as outlined in the 'Owning a Watercourse' online guidance (EA, 2018) apply as the River Win flows along the edge and through the site.
- Any works within 8m of the River Win may be subject to an Environmental Permit for Flood Risk Activities (EA, 2016).
- A drainage strategy has been undertaken by Hydrock and is included in a separate report (ref. DIP-HYD-ZZ-XX-RP-D-001).

The LDO is therefore concluded to meet the flood risk requirements of the NPPF.

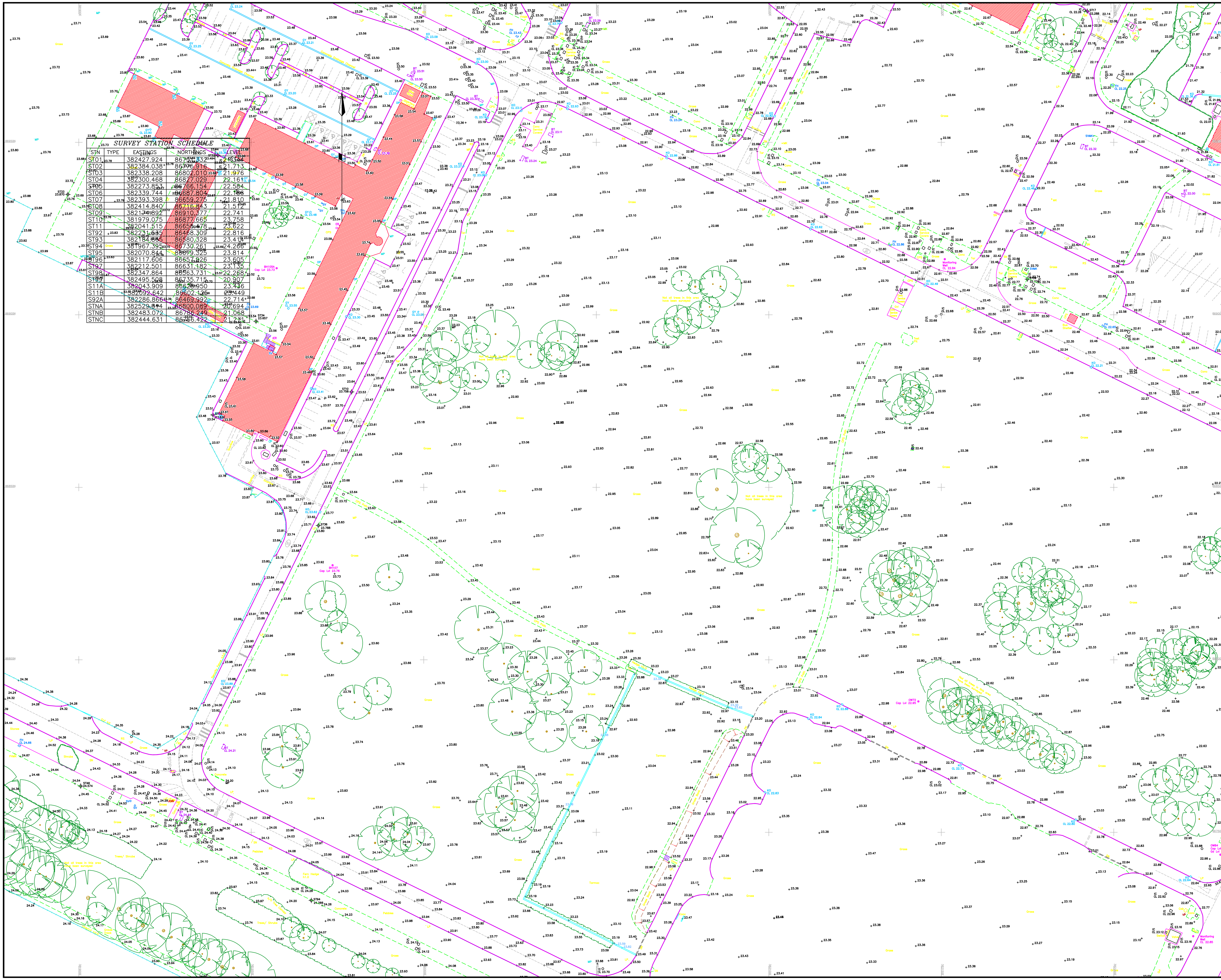
9. REFERENCES

Summary of Potential Sources of Flood Risk		
Author	Date	Description
Construction Industry Research and Information Association (CIRIA)	Nov 2015	C753 The SuDS Manual
Environment Agency (EA)	Feb 2018	Owning a Watercourse (https://www.gov.uk/guidance/owning-a-watercourse)
Environment Agency (EA)	Nov 2016	Flood Risk Activities: environmental permits (https://www.gov.uk/guidance/flood-risk-activities-environmental-permits)
GOV.UK	(A) Updated July 2018	National Planning Policy Framework (NPPF), 10. Meeting the challenge of climate change, flooding and coastal change (https://www.gov.uk/government/publications/national-planning-policy-framework--2)
GOV.UK	(B) Released 15/04/15, now evolving online guidelines	Planning Practice Guidance, Flood Risk and Coastal Change (http://planningguidance.planningportal.gov.uk/blog/guidance/flood-risk-and-coastal-change/)
GOV.UK	(C) Released 19/02/16	Environment Agency, Flood Risk Assessments: Climate Change Allowances (https://www.gov.uk/guidance/flood-risk-assessments-climate-change-allowances)
Hydrock Consultants	Aug 2018	Dorset Innovation Park Drainage Strategy
Purbeck District Council (PDC)	Sep 2011	Strategic Flood Risk Assessment v8
Purbeck District Council (PDC)	Jan 2015	Purbeck Local Plan Partial Review Strategic Flood Risk Assessment
Purbeck District Council (PDC)	Jan 2018	Purbeck Local Plan Partial Review Strategic Flood Risk Assessment

Appendix A

Topographical Survey

Reference	Title
V14391_SX	Topographical Survey A1 (1 of 14) by Lewis Brown Chartered Land Surveyors dated 02.2015
V14391_SX	Topographical Survey A1 (2 of 14) by Lewis Brown Chartered Land Surveyors dated 02.2015
V14391_SX	Topographical Survey A1 (3 of 14) by Lewis Brown Chartered Land Surveyors dated 02.2015
V14391_SX	Topographical Survey A1 (4 of 14) by Lewis Brown Chartered Land Surveyors dated 02.2015
V14391_SX	Topographical Survey A1 (5 of 14) by Lewis Brown Chartered Land Surveyors dated 02.2015
V14391_SX	Topographical Survey A1 (6 of 14) by Lewis Brown Chartered Land Surveyors dated 02.2015
V14391_SX	Topographical Survey A1 (7 of 14) by Lewis Brown Chartered Land Surveyors dated 02.2015
V14391_SX	Topographical Survey A1 (8 of 14) by Lewis Brown Chartered Land Surveyors dated 02.2015



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ST05		382273.853	86766.154	22.584
ST06		382339.744	86687.804	22.186
ST07		382393.398	86659.275	21.810
ST08		382414.840	86716.843	21.512
ST09		382174.892	86910.377	22.741
ST10		381979.075	86877.665	23.758
ST11		382041.515	86656.478	23.622
ST92		382231.5[illegible]5	86468.309	22.816
ST93		382184.865	86580.328	23.414
ST94		381967.395	86730.261	24.266
ST95		382070.844	86679.325	23.814
ST96		382117.606	86657.926	23.605
ST97		382212.501	86631.182	23.135
ST98		382347.864	86563.731	22.268
ST99		382495.508	86735.715	20.907
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S11B		382092.642	86602.125	23.449
S92A		382286.866	86469.992	22.714
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LEVEL INFORMATION

Heights in Metres
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OSBM Location: ST99
Value: 20.907m
Active Station Locations:
Conversions Used: OSTN02;OSGM02;

COORDINATE INFORMATION

Values in Metres
All Coordinates are: TRUE NATIONAL GRID
Scale Factor: 0.99959413166

SURVEY STATION SCHEDULE

STN	TYPE	EASTINGS	NORTHINGS	LEVEL

ABBREVIATIONS

General

(A)	Approximate	IC	Inspection Cover
AIF	Angle Iron Fence	IL	Invert Level
(AR)	Assumed Route	IRF	Iron Rail Fence
Avg	Average	IWF	Inter Woven Fence
BD	Bollard	KO	Kerb Outlet
Bin	Litter Bin	Ldr	Ladder
Bld	Building	LP	Lamp Post
BLW	Block Wall	MH	Manhole
BS	Bush	MHR	Metal Hand Rail
BT	British Telecom Inspection Chamber	MK	Marker
BW	Brick Wall	MP	Metal Post
BWF	Barbed Wire Fence	MPRF	Metal Post & Rail Fence
Cab	Cabinet	o/h	Overhead
CB	Crash Barrier	o/l	Outline
CBF	Close Boarded Fence	OSBM	Ordnance Survey Bench Mark
CDC	Concrete Drainage Channel	PalF	Pallisade Fence
CE	Concrete Edging	Pav	Paviors
ChP	Chestnut Paling	PI	Pipe Into Ground
CI	Cable Into Ground	Plt	Pavement Light
CIF	Corrugated Iron Fence	(R)	Records
CL	Cover Level	RE	Rodding Eye
CLF	Chain Link Fence	RS	Road Sign
CM	Cable Marker	RSJ	Rolled Steel Joist
Col	Column	RW	Retaining Wall
Conc	Concrete	SD	Slot Drain
CP	Concrete Post	SE	Stone Edging
CPS	Concrete Paving Slabs	SecF	Security Fence
CT	Cable TV Inspection Chamber	Shb	Shrubs
CW	Concrete Wall	SL	Soffit Level
d	Depth	Slt	Spotlight
Dil	Dilapidated	SN	Sign
DK	Drop Kerb	SV	Stop Valve
DP	Rainwater Down Pipe	SVMK	Stop Valve Marker
DSW	Dry Stone Wall	SW	Stone Wall
Ea	Earth	SWIC	Storm Water Inspection Chamber
EIC	Electricity Inspection Chamber	SY	Stay
EM	Electricity Meter	Tar	Tarmac
EP	Electricity Pole	ThL	Threshold Level
ER	Earth Rod	TL	Traffic Light
ETL	Electricity Transmission Lines	TMIC	Traffic Management IC
F	Fence	TP	Telegraph Pole
FH	Fire Hydrant	TPS	Tactile Paving Slabs
FHMK	Fire Hydrant Marker	TTL	Telephone Transmission Line
FL	Floor Level	u/g	Underground
Flb	Flowerbed	UTL	Unable To Lift
Flt	Floodlight	Veg	Vegetation
FP	Footpath	VP	Vent Pipe
FWIC	Foul Water Inspection Chamber	VT	Vent
GM	Gas Meter	W	Wall
GMK	Gas Marker	WE	Wood Edging
GP	Gate Post	WL	Water Level
Gr	Grass	WM	Water Meter
GV	Gas Valve	WMF	Wire Mesh Fence
Gvl	Gravel	WMK	Water Meter Marker
GY	Gully	WO	Wash Out
h	Height	WP	Wooden Post
Hc	Hardcore	WPR	Wooden Post & Rail Fence
IB	Illuminated Bollard		

Station Abreviations

HN	Hilti Nail	PKN	Parker Kalon Nail
PGM	Permanent Ground Marker	WP	Wooden Peg

NOTES

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Any enlargement should be verified on site.

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Pipe sizes and connections are determined from surface level inspection and service records where available.

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Any underground services shown on this survey are from information on service enquiries and tracing with Electrolocation equipment.
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TOPOGRAPHICAL SURVEY

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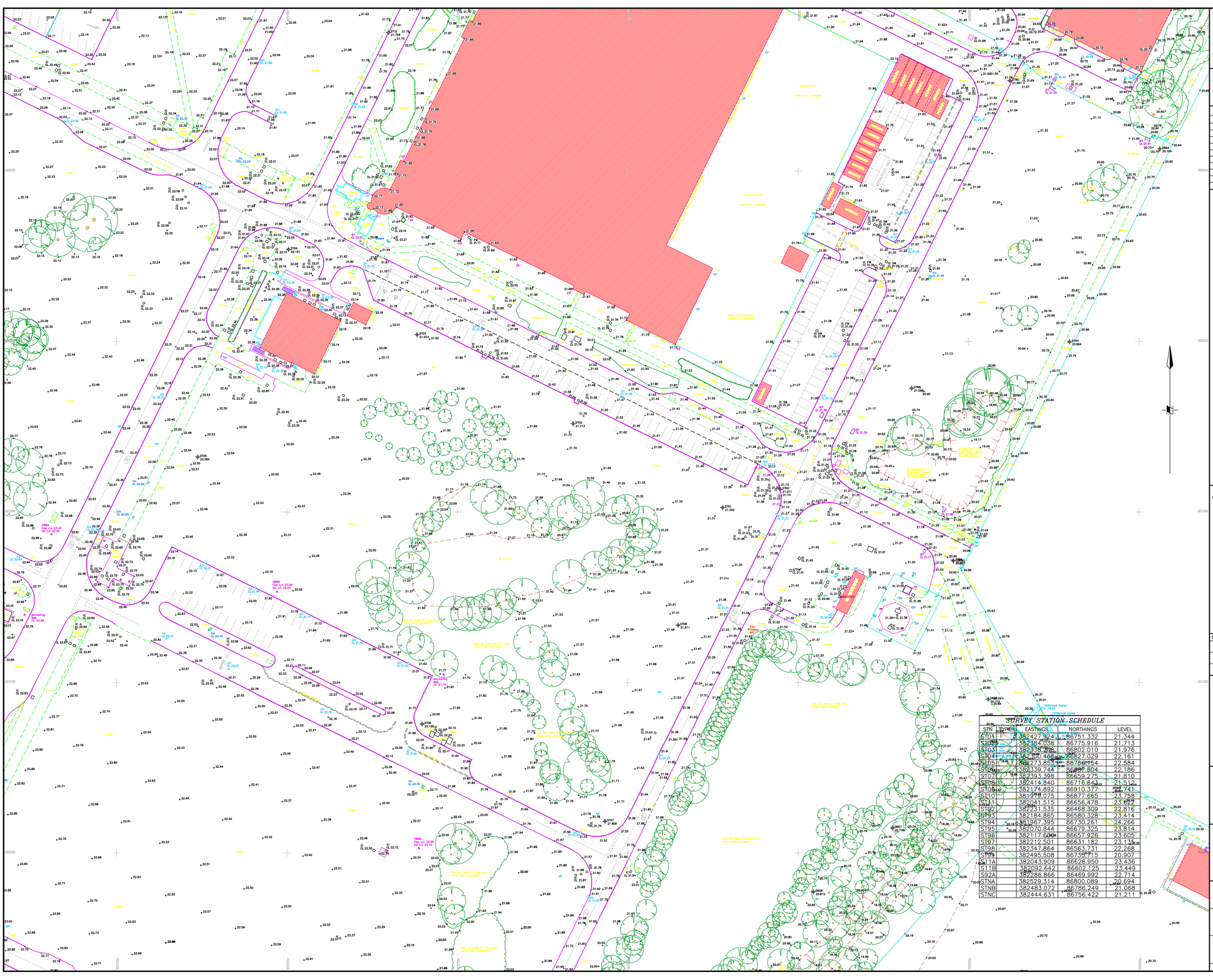

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BS	Bush	MHR	Metal Hand Rail
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TOPOGRAPHICAL SURVEY

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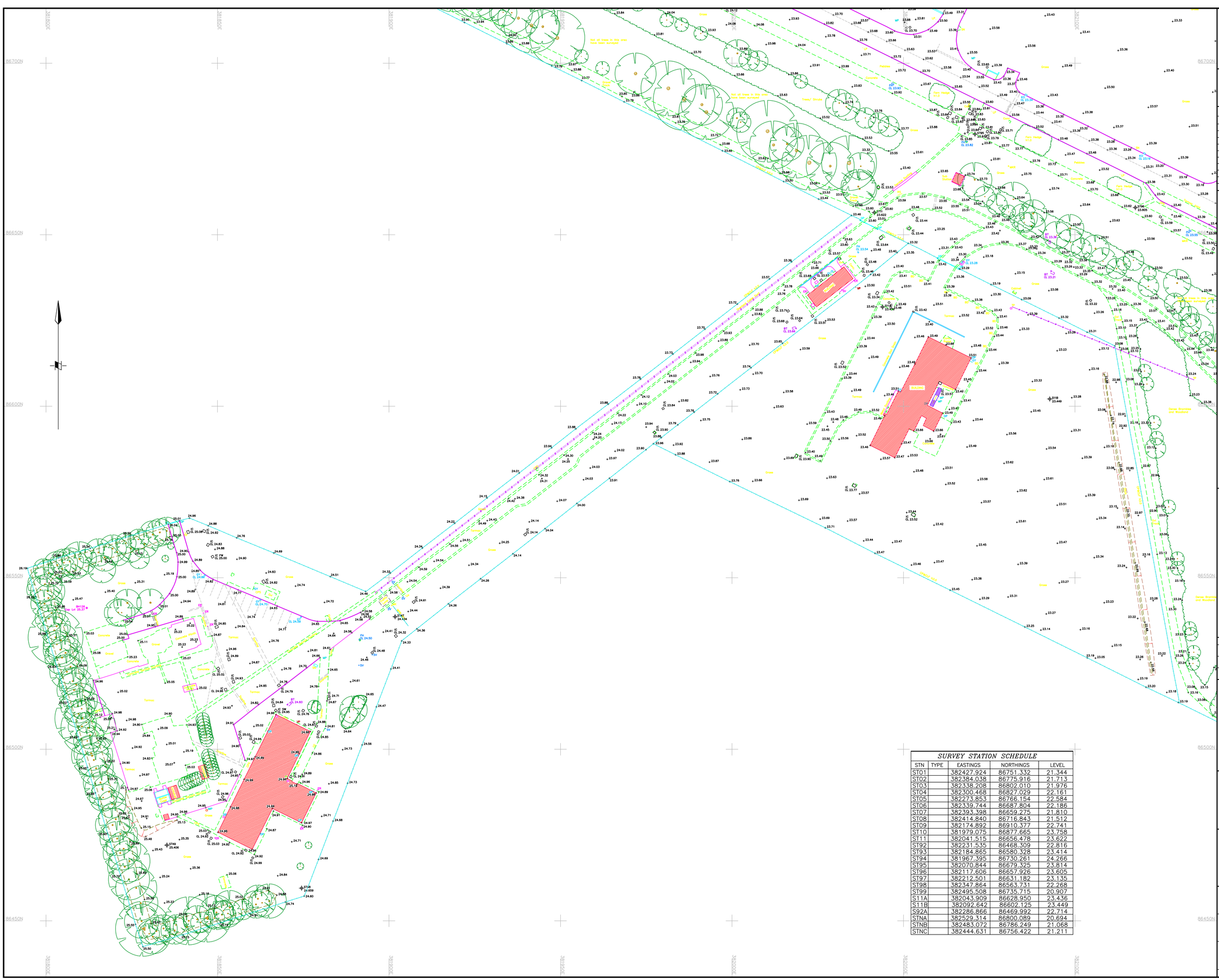
Drawn:	*Checked:*	*Project Number:*
RDJB/KB	DIL	V14391



LEVEL INFORMATION

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OSBM Location: ST99
Value: 20.907m
Active Station Locations:
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COORDINATE INFORMATION

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Scale Factor: 0.99959413166

SURVEY STATION SCHEDULE

STN	TYPE	EASTINGS	NORTHINGS	LEVEL

ABBREVIATIONS

General

(A)	Approximate	IC	Inspection Cover
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IB	Illuminated Bollard		

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NOTES

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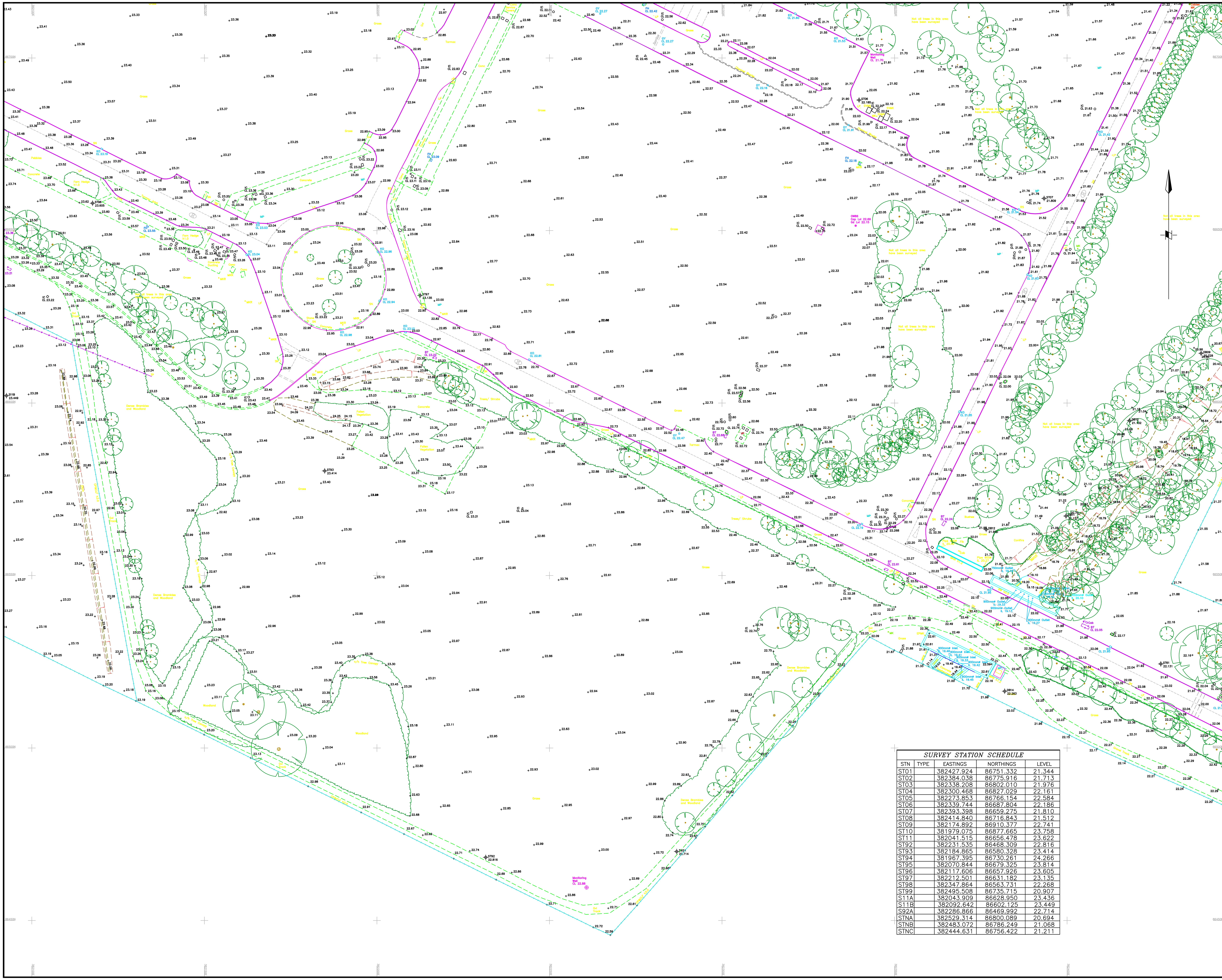
BS1 6EH

TITLE:
TECHNOLOGY CENTRE
DORSET GREEN
WINFRITH
DORSET
TOPOGRAPHICAL SURVEY

Drawing Number:		*Revision:*
V14391_SX		
Scale: 1:500	*Sheet:* A1 3of14	*Survey Date:* 02.2015
Drawn: RDJB/KB	*Checked:* DIL	*Project Number:* V14391

SURVEY STATION SCHEDULE

STN	TYPE	EASTINGS	NORTHINGS	LEVEL
ST01		382427.924	86751.332	21.344
ST02		382384.038	86775.916	21.713
ST03		382338.208	86802.010	21.976
ST04		382300.468	86827.029	22.161
ST05		382273.853	86766.154	22.584
ST06		382339.744	86687.804	22.186
ST07		382393.398	86659.275	21.810
ST08		382414.840	86716.843	21.512
ST09		382174.892	86910.377	22.741
ST10		381979.075	86877.665	23.758
ST11		382041.515	86656.478	23.622
ST92		382231.535	86468.309	22.816
ST93		382184.865	86580.328	23.414
ST94		381967.395	86730.261	24.266
ST95		382070.844	86679.325	23.814
ST96		382117.606	86657.926	23.605
ST97		382212.501	86631.182	23.135
ST98		382347.864	86563.731	22.268
ST99		382495.508	86735.715	20.907
S11A		382043.909	86628.950	23.436
S11B		382092.642	86602.125	23.449
S92A		382286.866	86469.992	22.714
STNA		382529.314	86800.089	20.694
STNB		382483.072	86786.249	21.068
STNC		382444.631	86756.422	21.211



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TITLE:
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DORSET GREEN
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TOPOGRAPHICAL SURVEY

Drawing Number:		*Revision:*
V14391_SX		
Scale: 1:500	*Sheet:* A1 4of14	*Survey Date:* 02.2015
Drawn: RDJB/KB	*Checked:* DIL	*Project Number:* V14391

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