

Cat and Fiddle, Clyst St Mary

St Austell Brewery Co. Ltd

Flood Risk Assessment



Cat and Fiddle, Clyst St Mary

Flood Risk Assessment

| | |
|----------------|--|
| Job Title | Cat and Fiddle, Clyst St Mary |
| Project Number | 0643 |
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| Revision | Initial Issue |
| Client | St Austell Brewery Co. Ltd |
| Prepared by | T Ball |
| Checked by | C Yalden |
| Authorised by | R Ward |
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- Appendix A Existing Site Plan
- Appendix B Preliminary Site Layout (Masterplan)
- Appendix C Preliminary Drainage Layout
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1 Introduction

- 1.1 Awcock Ward Partnership (AWP) has been commissioned by St Austell Brewery Co. Ltd to prepare a Flood Risk Assessment (FRA) in support of an application for a 33-bedroom hotel and customer car park at the existing Cat and Fiddle Public House located on the A3052. The location of the proposed development is shown on Figure 1.1 below:

Figure 1.1 - Site Location – Wide Area



National Planning Policy Framework

- 1.2 The National Planning Policy Framework (NPPF) and the Planning Practice Guidance were published by the Department for Communities and Local Government in March 2012 and March 2014 respectively.
- 1.3 The NPPF states that " a site-specific flood risk assessment is required for proposals of 1 hectare or greater in Flood Zone 1; all proposals for new development (including minor development and change of use) in Flood Zones 2 and 3, or in an area within Flood Zone 1 which has critical drainage problems (as notified to the local planning authority by the Environment Agency); and where proposed development or a change of use to a more vulnerable class may be subject to other sources of flooding".

- 1.4 The aim of a site-specific flood risk assessment is to demonstrate that *“the development will be safe for its lifetime taking account of the vulnerability of its users, without increasing flood risk elsewhere, and, where possible, will reduce flood risk overall”*.
- 1.5 Furthermore, the site-specific flood risk assessment must *“ assess the flood risk to and from a development site ... The assessment should demonstrate to the decision-maker how flood risk will be managed now and over the development’s lifetime, taking climate change into account, and with regard to the vulnerability of its users”*, as required by the Planning Practice Guidance.

Structure and limitations of this FRA

- 1.6 This site-specific FRA has been written in line with the above Framework. It also includes a Surface Water Management Plan (SWMP) that indicates how the surface water runoff can be managed in such a way as not to increase the flood risk to the downstream catchment.
- 1.7 It is important to note that this FRA does not attempt to present the final design of the surface water drainage system. This will be left until the detailed design stage when further site investigation work can be undertaken and other systems can be evaluated. This evaluation will also need to include assessments due to health and safety, CDM etc.

Consultation

- 1.8 To scope out any site specific or catchment specific flood risk or drainage requirements, we have engaged with various parties.
- 1.9 We met with Richard Rainbow from Devon County Council as the Lead Local Flood Authority (LLFA), Steve Moore from the Environment Agency (EA) and Michael Yates from St. Austell Brewery at an on-site meeting on 6 September 2017.
- 1.10 The output of the above consultation process has helped to inform this FRA and the inherent SWMP.

Reference

1.11 This FRA has been prepared by reference to the following documents:

- National Planning Policy Framework (March 2012);
- Planning Practice Guidance (March 2014);
- Environment Agency (EA) Flood Warning Information Service 'Flood Risk from Rivers or the Sea' and 'Flood Risk from Surface Water' (online);
- DEFRA SoilScape Data;
- CIRIA Guide 753 – The SuDS Manual (November 2015); and,
- South West Water's (SWW) Internet Mapping (online).

2 Existing Conditions

Context

- 2.1 The proposed site is located to the east of Clyst St Mary, at national grid reference SX 990 908, as shown on Figure 2.1 below:

Figure 2.1 - Site Location – Local Area



Existing land uses

- 2.2 The hotel is to be located on an existing car park to the west of the pub. The existing car park to the east of the pub is to be enlarged to serve both the hotel and the pub. The land to the east of the pub also includes a children's play area and a grassed playing field which will be replaced by car parking.

Surrounding land use

- 2.3 The proposed site is bound to the north and west by the Berkeley Parks Private Homes Estate, with the A3052 Sidmouth Road forming the southern frontage to the existing Public House.

Topography of the site

- 2.4 A topographic survey has been undertaken to a local datum. This shows the high point of the site to be within the north-west corner

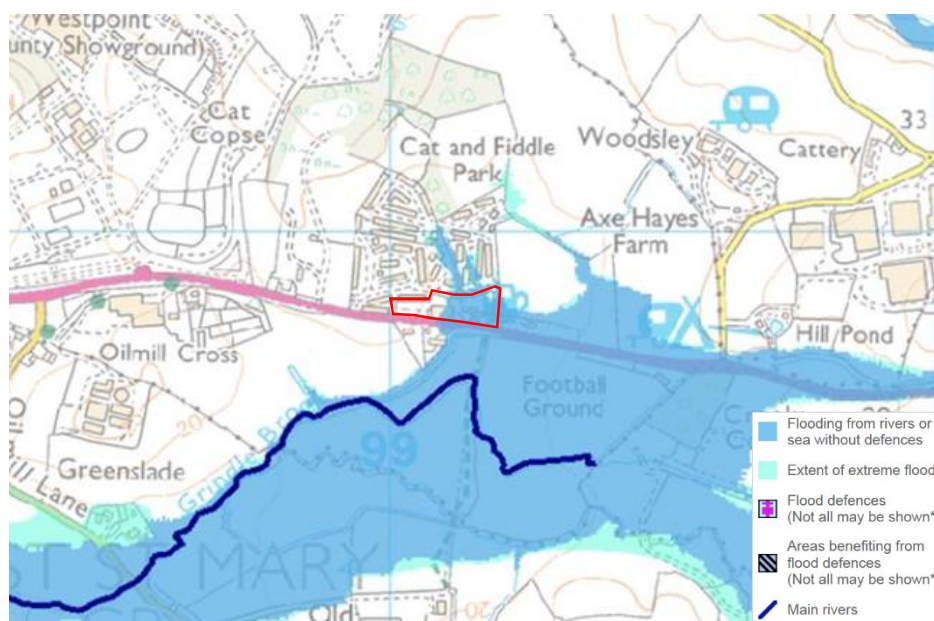
at a height of approximately 103.50 m AOD falling to a level of 99.90m AOD within towards the south-east.

- 2.5 An on-site walk over survey has been undertaken and indicates that the site generally falls from west to east towards a small watercourse.
- 2.6 An 'Existing Site Plan' has been prepared to set the context of the pre-development site and can be found as drawing 003 by Design Management Partnership, within Appendix A of this report.

Existing Flood Risk

- 2.7 The EA's 'Flood Warning Information Service' provides flood risk information and mapping throughout England.
- 2.8 An extract of the EA's 'Flood Map for Planning' has been reproduced as Figure 2.2 below and shows the eastern part the of the site proposed to contain the hotel building to be within an area of low flood risk (Flood Zone 1). The lower, eastern, end of the site are within an area of high flood risk (Flood Zone 3).
- 2.9 An on-site sequential test has concluded to locate the proposed hotel building within the low risk flood zone 1.

Figure 2.2 – Flood Map for Planning

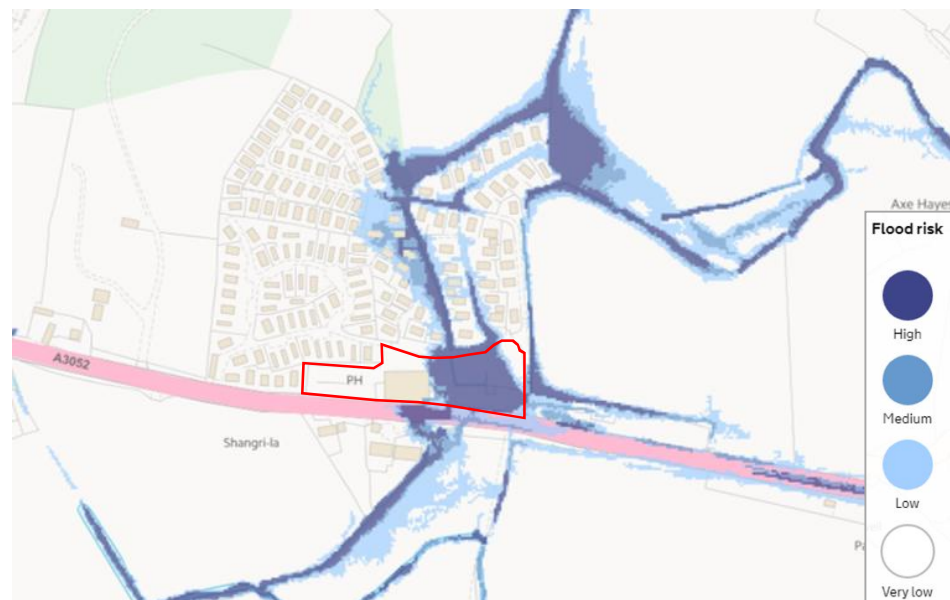


2.10 Flood Zones 1, 2 and 3 are defined below;

- 'Flood Zone 1' (Low probability) – Land assessed as having a less than 1 in 1,000 annual probability of river or sea flooding in any year (<0.1%).
- 'Flood Zone 2' (Medium Probability) – Land assessed as having between a 1 in 100 and 1 in 1000 annual probability of river flooding (1% - 0.1%) or between a 1 in 200 and 1 in 1000 annual probability of sea flooding (0.55% - 0.1%) in any year.
- 'Flood Zone 3' (High Probability) – Land assessed as having a 1 in 100 or greater annual probability of river flooding (>1%) or a 1 in 200 or greater annual probability of flooding from the sea (>0.5%) in any year.

2.11 An extract of the EA's 'Flood Risk from Surface Water' mapping has been reproduced as Figure 2.3 below. This mapping is based on LIDAR data and indicates the typical conveyance routes of surface water runoff. The mapping is consistent with the 'Flood Map for Planning' and identifies three minor watercourses join the Grindle Brook within the vicinity of the site. The westernmost of these watercourses is currently culverted under the car park within the east of the site.

Figure 2.3 – Flood Risk from Surface Water



2.12 The area to the east of the existing public is at the highest risk of surface water flooding. Steve Moore explained the history of the car park flooding in extreme events with surface water flowing along Sidmouth Road from the east. Water used to pond in the

eastern car park and then flow through a twin culvert under the Sidmouth Road and away to the south of the site. The entrance into the twin culvert was slabbed over by the previous owners of the car park which exacerbated subsequent flooding.

- 2.13 The proposed development does not fall within any designated Critical Drainage Areas (CDA).

Existing Drainage and Infrastructure

- 2.14 The current impermeable car park area to the east of the Public House contains a very basic existing surface water drainage system. A site walkover survey confirmed that the drainage of the existing carpark flows out on to the Sidmouth Road off the patio area to the east of the Cat and Fiddle.

- 2.15 Drainage for the remainder of the site appears to be of poor quality with limited gullies and catch-pits.

- 2.16 Two minor watercourses flow north to south through the eastern car park. These join together and are culverted under the Sidmouth Road and away to the south.

Ground conditions

- 2.17 The DEFRA Soilscape data has indicated that the underlying soils are loamy and clayey, within areas of elevated ground water. As such soakaways are unlikely to work in this area.

3 Development Proposals

Introduction

- 3.1 The development proposals comprise a new 33 room hotel to be constructed on an existing paved area, together with an extension to the existing eastern car park.
- 3.2 A copy of the proposed site plan for the scheme can be found within Appendix B of this report.

Vulnerability

- 3.3 In accordance with the Planning Practice Guidance, hotels are considered to be “More Vulnerable”. As the proposed hotel is located within ‘Flood Zone 1’, Table 3 of the Planning Practice Guidance confirms this as being an appropriate form of development at this site.

Sequential Test

- 3.4 The hotel is located within the higher western extents of the site within ‘Flood Zone 1’ and therefore passes the Sequential Test, as there are no competing sites with a lower flood risk classification.

Cross sections and finished levels

- 3.5 It is anticipated that the existing ground profile will be modified locally to reflect the requirements of the new development.
- 3.6 A small amount of re-profiling will be required around the inlet of the existing culvert under the A3052 along with the removal of the concrete slabbed car park extension currently placed over the inlet.

Safe access and egress

- 3.7 The proposed point of access to the hotel is within Flood Zone 1, and therefore safe access and egress will be available at all times.

Drainage strategy requirements

- 3.8 ‘CIRIA C753 – The SuDS Manual’ advises that surface water disposal should be prioritised in the following hierarchical order:

- Infiltration
- Discharge to surface waters
- Discharge to a surface water sewer, highway drain or other drainage system
- Discharge to a combined sewer

3.9 As required by the NPPF, the drainage strategy must demonstrate that the development will be safe throughout its lifetime, without increasing flood risk elsewhere, whilst also taking account of the impacts of climate change.

Outline drainage strategy

3.10 Publicly available Soilscape data source from DEFRA identifies 'Loamy and Clayey Soils with Naturally High Groundwater' within the site boundary. These drainage characteristics do not lend themselves to effective infiltration design. The outline drainage strategy therefore proposes to incorporate the following measures:

- Non-adoptable underground pipework from the hotel to the culvert;
- Partial daylighting of the culvert which continues beneath the A3052;
- Permeable paving within the eastern parking bays to promote infiltration and reduce runoff rate and volume;
- Remove existing impermeable areas within the western catchment and replace with landscaping;

3.11 The drawing included in Appendix C (reference 0643-PDL-101) shows a preliminary drainage layout for the site.

Climate change impacts

3.12 The NPPF requires that the impact of climate change be considered to minimise vulnerability and provide resilience. The NPPF and Planning Practice Guidance explain that an FRA should demonstrate how flood risk will be managed across the development's lifetime, taking climate change into account.

3.13 The Environment Agency, as the government's expert on flood risk, released the document 'Flood Risk Assessments: Climate Change Allowances Guidance' in February 2016.



3.14 Table 3.1 below provides an extract detailing the predicted increase in peak rainfall intensity due to climate change over the next 100 years.

Table 3.1 – Peak rainfall intensity allowances (applicable across all of England)

| Allowance category | Total potential change anticipated for (2015 to 2039) | Total potential change anticipated for (2040 to 2069) | Total potential change anticipated for (2070 to 2115) |
|---|---|---|---|
| Upper end (90 th Percentile) | 10% | 20% | 40% |
| Central (50 th Percentile) | 5% | 10% | 20% |

3.15 The guidance states for peak rainfall intensity, Flood Risk Assessments should “assess both the central and upper end allowances to understand the range of impact”.

3.16 The on-site attenuation requirements for this proposed development has been sized to offer flood protection for the development throughout its lifetime, with the upper end allowance of 40% climate change being utilised to present a worst-case scenario.

4 Surface Water Management Plan

Existing surface water runoff

- 4.1 The western car park, where the hotel is to be located, drains informally onto the Sidmouth Road via a series of small drains. In extreme events, surface water floods into the rear of the pub.
- 4.2 The eastern part of the site comprises of a hardstanding area also used as car parking and a grassed park area. Due to the currently covered culvert inlet the car park is known to flood regularly.
- 4.3 The existing greenfield rates for the 0.212 ha existing permeable grass area of the site have been calculated using the MicroDrainage Source Control module and are summarised within Table 4.1.

Table 4.1 – Existing Greenfield Rates for Permeable Surfaces

| Storm Return Period | Greenfield Calculated Flow (l/s) |
|---------------------|----------------------------------|
| 2 years | 0.1 |
| 30 years | 0.2 |
| 100 years | 0.3 |

- 4.4 Runoff for the eastern impermeable catchment has been calculated using the Rational Method, as per Table 4.2.

Table 4.2 – Existing Modified Rational Rates (Eastern Catchment)

| Storm Return Period | Calculated Flow (l/s) |
|---------------------|-----------------------|
| 2 years | 18.6 |
| 30 years | 32.9 |
| 100 years | 44.7 |

- 4.5 The western catchment will receive an overall reduction in impermeable area and therefore the peak rate and volume of runoff will naturally decrease due to the development.

Proposed Surface Water Strategy

- 4.6 The proposed hotel will be drained by a new surface water sewer which will discharge around the northern side of the pub to the existing culverted watercourse beneath the eastern car park. It is recommended that this existing culvert is surveyed to assess its



current condition and to determine whether any remedial repair works are required.

- 4.7 The hotel will be bordered by new areas of landscaping which will reduce the impermeable area for this catchment, resulting in a reduced peak rate and volume of runoff.
- 4.8 The eastern car park will incorporate areas of permeable paving. The permeable paving will receive runoff from adjacent impermeable surfacing, with the final rate and volume of runoff being considerably less than the existing site conditions.
- 4.9 The inlet to the A3052 culvert will be daylighted to enable surface runoff to drain more effectively. This proposal will reduce the risk and frequency of flooding on the A3052 and has been agreed in principle by Steve Moore at the Environment Agency (EA).

Permeable Paving

- 4.10 The MicroDrainage Source Control module has been used to assess the impact of permeable paving within the proposed development. Copies of the respective modelling can be seen within Appendix D of this report, with the results summarised in Tables 4.3 and 4.4 below.

Table 4.3 – Permeable Surfacing Provision (eastern catchment)

| Feature | Proposed Area |
|------------------|----------------------|
| Permeable Paving | 1,360 m ² |
| Soft Landscaping | 515 m ² |
| Total | 1,875 m ² |

- 4.11 The permeable surfacing within the eastern catchment represents approximately 44% of the total eastern catchment. Utilising ICP SuDS method for greenfield runoff estimation, with a ‘partly urbanised catchment’ of 44%, generates the below runoff rates:

Table 4.4 – Runoff from Partly Urbanised Catchment (Eastern)

| Return Period | Peak Rate (l/s) |
|---------------|-----------------|
| 2 years | 0.4 |
| 30 years | 0.7 |
| 100 years | 0.8 |

4.12 By comparing the future peak rates of runoff for the eastern catchment (Table 4.4) with the existing rates (Table 4.2) it is evident that the use of permeable paving will offer a significant reduction in the peak rate and volume of runoff.

4.13 The drawing included within Appendix C (reference 0643-PDL-101) shows a preliminary drainage layout for the site.

Exceedance events

4.14 During exceedance events, beyond the 100 year critical storm, surface water runoff will overflow from the aforementioned systems.

4.15 Overland exceedance flows will follow the topography of the site towards its south eastern boundaries. A new filter drain will be installed at the site boundary to intercept any flows and direct them safely to the daylighted watercourse.

Proposed foul water strategy

4.16 The existing site is served by a Klargester private package treatment plant. This unit is located within the eastern car park.

4.17 The nearest adopted sewerage is located approximately 320m from the development site, beyond the A3052 and a series of well-established trees to the south.

4.18 Taking the previous points into consideration it is proposed that the existing Klargester treatment plant is appraised and upgraded or replaced to serve both the existing pub and the new hotel. The existing point of discharge for treated effluent will be retained, with any existing permits updated accordingly.

4.19 An indicative alignment of the proposed foul drainage strategy can be seen on drawing 0643-PDL-101 within Appendix C of this report.

Maintenance

4.20 On site sewerage networks will be designed in accordance with Sewers for Adoption (SfA). It is envisaged that the package treatment plant will be placed any a routine maintenance schedule by a third party.



- 4.21 The new storm drainage will be privately owned as the public house and hotel is the sole user.

5 Miscellaneous Issues

Construction issues

- 5.1 It is good practice to offer a Construction Environmental Management Plan (CEMP) to allow the construction and phasing of drainage works to be closely monitored. Prior to the commencement of construction, it is recommended the contractor produce a CEMP and agree it with the LLFA.
- 5.2 Any facilities for the storage of oils, fuels or chemicals need to be situated in suitable bunded bases that will be equivalent to at least the volume of the tank plus 10%.

Residual flood risks

- 5.3 The residual risk of blockage or failure of any key component within the proposed drainage strategy will be reduced through appropriate operation and maintenance procedures.
- 5.4 At the detailed design stage, the residual risks from exceedance storms will be reduced through appropriate design of the external works and highway alignments. The design will aim to steer exceedance flows towards convenient holding points, beyond which a cut off ditch will seek to intercept flows and offer additional on-site storage at the south of the site.

Health and safety

- 5.5 Until such time as the hazards relating to the site or location are known, we are unable to confirm that our recommendations will be acceptable in terms of safe buildability / maintainability.
- 5.6 Under the CDM Regulations, adequate information about the site must be provided by the client in order to allow the potential hazards to be reviewed by the designer, and avoidance / mitigation measures taken where reasonably practicable.

6 Mitigation, Conclusions and Recommendations

Mitigation

- 6.1 The proposed development has been assessed in line with the NPPF, to show that the development can be undertaken in an acceptable manner from a flood risk perspective.
- 6.2 The proposed hotel site is located within 'Flood Zone 1', which means it is not at risk of flooding from fluvial sources in up to the 1 in 1000 year return period flood.
- 6.3 The drainage strategy accounts for runoff from all storms up to the 100 year return period plus a 40% allowance for climate change. This ensures the development will be safe throughout its lifetime, without increasing flood risk elsewhere.
- 6.4 DEFRA Soilscape data identifies Loamy and Clayey soils within areas of elevated groundwater, this would suggest flow attenuation would be the prioritised strategy for the site due to impeded drainage through the underlying strata.
- 6.5 Runoff from by the proposed hotel building will be conveyed via a new storm sewer to the on-site culvert which continues offsite beneath the A3052.
- 6.6 The application of permeable paving and soft landscaping will reduce both the rate and volume of runoff compared to the pre-development site, actively reducing flood risk within the downstream areas.
- 6.7 During exceedance events, runoff will overflow from the aforementioned systems and will follow the topography of the site towards the south eastern extents of the site. Flows will be intercepted by a new filter drain and directed to the watercourse, upstream of the A3052 culvert.
- 6.8 The existing Klargester treatment plant will be appraised and upgraded or replaced to serve both the existing pub and the new hotel. The existing point of discharge for treated effluent will be retained, with any existing permits updated accordingly.

Conclusions

This Flood Risk Assessment has been assessed in line with the NPPF. It is concluded that the development can be undertaken in a sustainable manner, whilst also reducing the flood risk to existing properties in the downstream catchment.

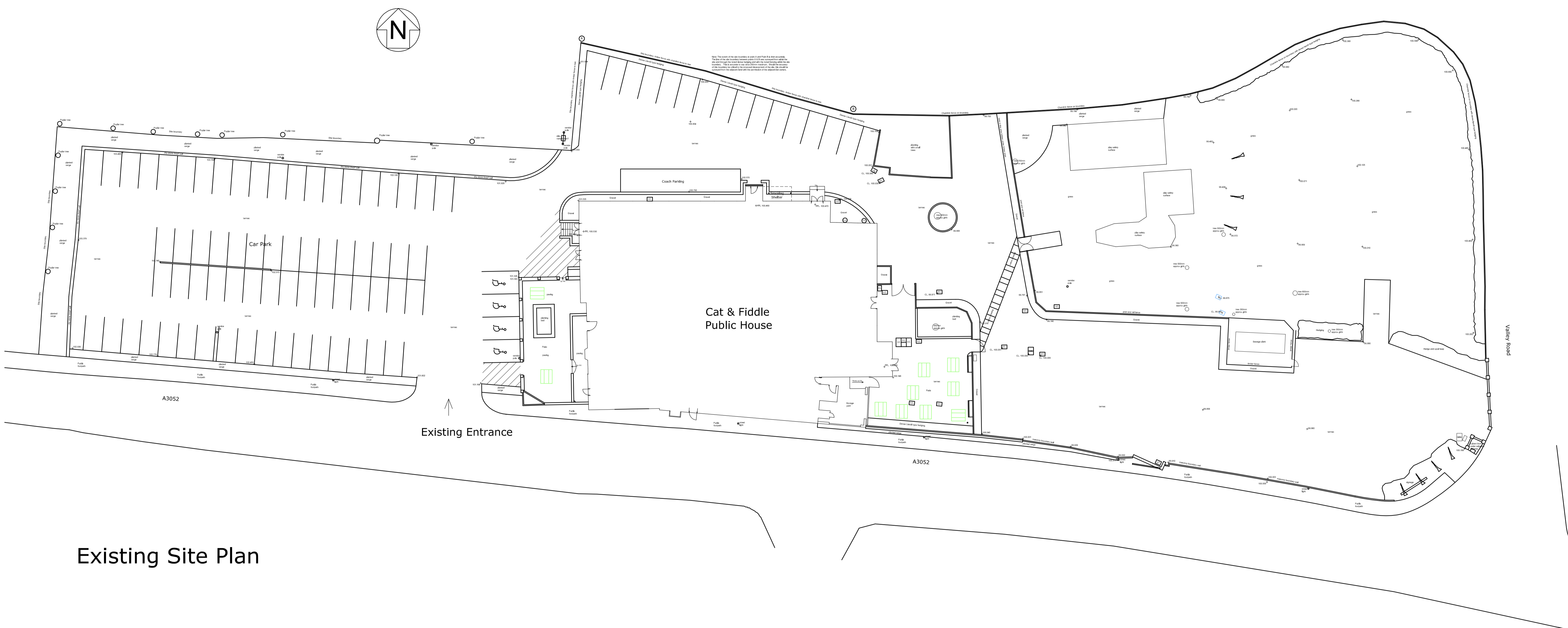
The FRA does not attempt to present a final design of the surface water system. Detailed design of the surface water network and inherent features will commence upon approval of the outline strategy and will include assessments due to further site investigations, health and safety, CDM

Recommendations

- 6.9 As the hotel will be safe from flooding for its design life and the reduction in permeable areas across the whole site will actively reduce flood risk to properties in the downstream catchment, it is recommended that the Lead Local Flood Authority advise the Local Planning Authority that they have no objections to the proposed development.



Appendix A Existing Site Plan



Existing Site Plan

DRAWING SUB-TITLE (text size 4 for all scales and sheet sizes)
 SUB SUB-TITLE e.g. GROSS AREA 000sqm / 0000sqft (text size 3 for all scales and sheet sizes)

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| notes | rev | date | revision note |
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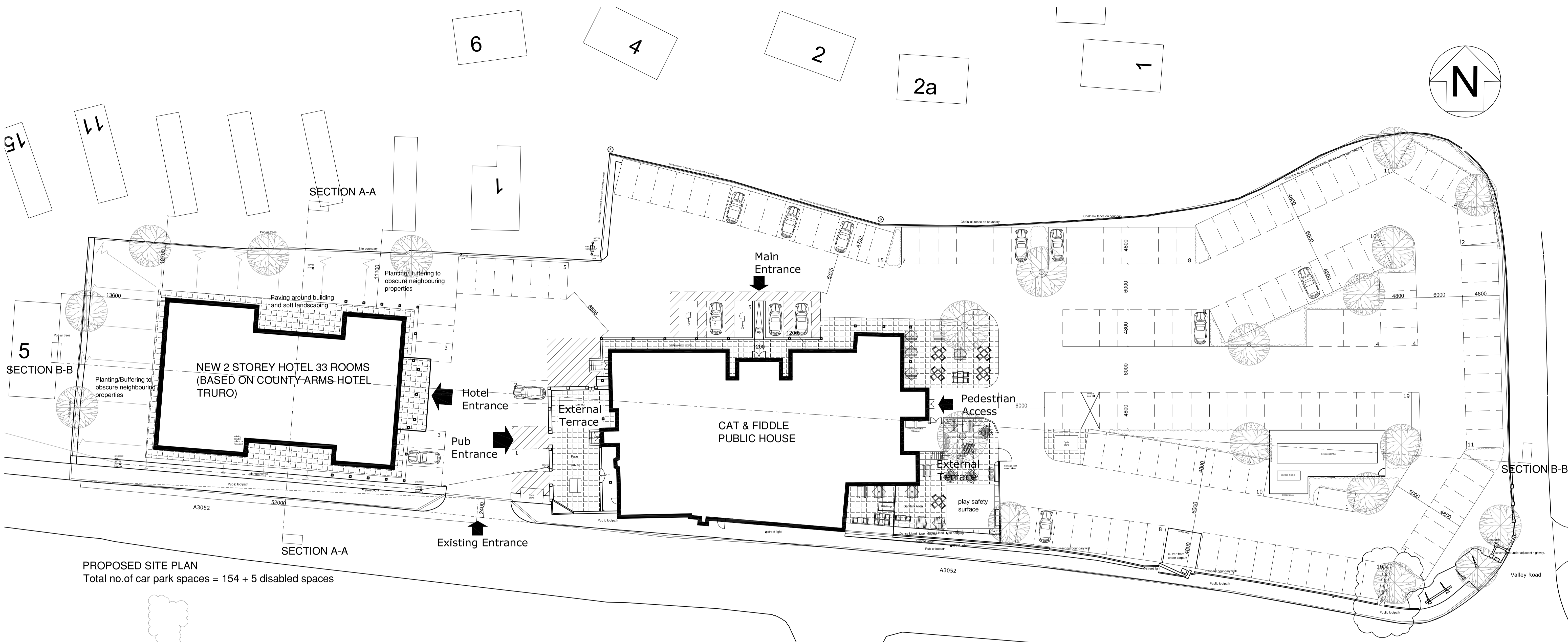
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Figured dimensions to be used in preference to scaled sizes
 All dimensions to be checked by the contractor before commencing work and any discrepancies reported to the Architect
 Drawings to be read in conjunction with Structural Engineers and other consultants drawings.
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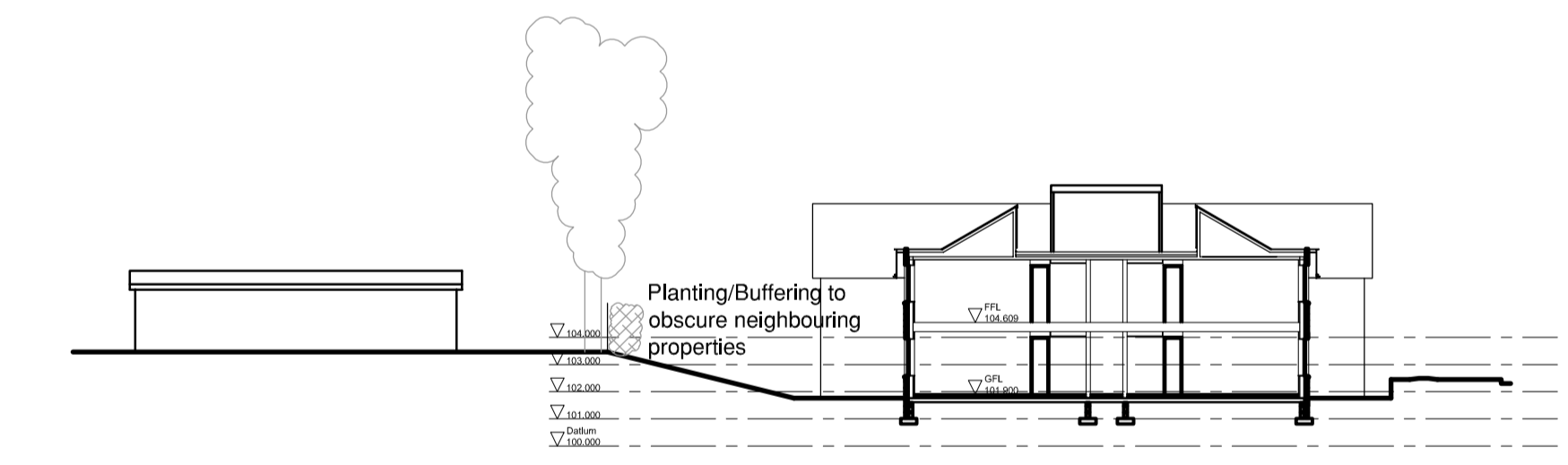
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| 1/250 | AE | - | 16/08/16 | Planning | 16.011 | - |
| title | | | | client | | drawing number |
| Existing Site Plan | | | | Cat and Fiddle Clyst St. Mary Exeter EX5 1DP St. Austell Brewery | | 003 |



Appendix B Preliminary Site Layout (Masterplan)



PROPOSED SITE PLAN
Total no. of car park spaces = 154 + 5 disabled spaces



PROPOSED SITE SECTION A-A



PROPOSED SITE SECTION B-B

DRAFT

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| rev | date | revision note |
|-----|----------|---|
| A | 30/09/16 | Public House Floor Plan updated to suit Proposed Floor plan |
| B | 15/09/17 | hotel plan moved accordingly agree with planning consultant recommendations |
| C | 25/09/17 | Site Sections A-A and B-B added Valley road entrance moved, vision splay added to main road existing entrance, general notes added |
| D | 12/09/17 | Valley road entrance removed, cycle stands added |
| E | 21/09/17 | Car Park Layout adjusted to suit current recommendations |
| F | 21/09/17 | Car Park Layout adjusted to suit new design |
| G | 25/09/17 | Car Park Layout adjusted to Main Entrance and footpath added Valley Road junction External terrace and play area changed to suit access routes |

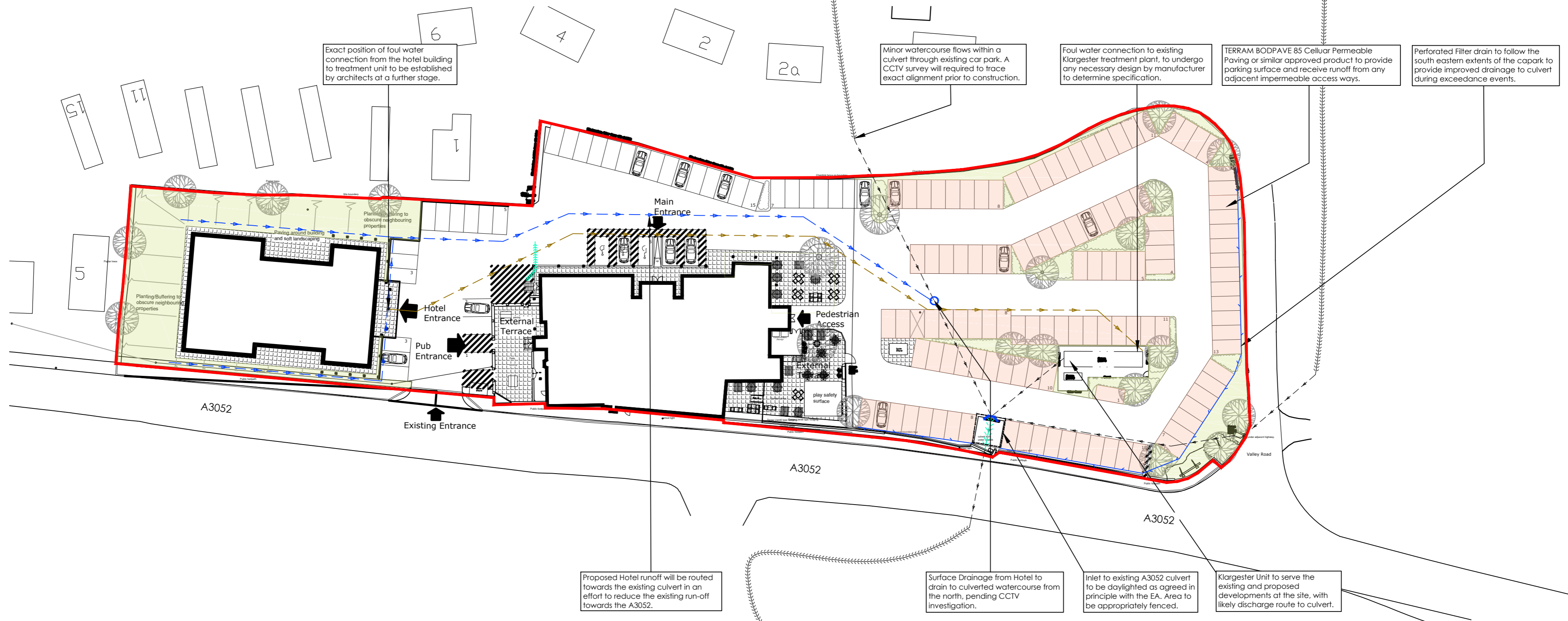
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All dimensions to be used in preference to scaled sizes
 All dimensions to be checked by the contractor before commencing work and any discrepancies reported to the Architect
 Drawings to be read in conjunction with Structural Engineers and other consultants drawings.
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| 1/250 | cl | - | 16/08/16 | Information | 16.011 | G |
| Proposed Site Plan | | | | client: | Cat and Fiddle Clyst St. Mary Exeter EX5 1DP St. Austell Brewery | |
| | | | | | drawing number 203 | |



Appendix C Preliminary Drainage Layout



| Key | | Proposed Drainage | | Eastern Car Park Catchments | |
|--------------------------|-------------------------------------|-------------------|-----------------------------|-----------------------------|--|
| | Assumed Site Boundary | | Private Surface Water Drain | | Permeable 'BODPAVE' Paving (or similar approved) |
| | Additional Impermeable Area | | Private Foul Water Drain | | Other Permeable Areas |
| Existing Drainage | | | | | |
| | Ditch | | Ditch / Drainage Channel | | Headwall |
| | Culverted Ditch (Alignment Assumed) | | Perforated Filter Drain | | |

| | | | | | |
|--|--|--|--|--|--|
| CLIENT: ST AUSTELL BREWERY CO. LTD | | | | | |
| DRAWING STATUS: PLANNING APPLICATION | | | | | |

| | | | | | |
|--|--|-------------------------------|--|------------------|--|
| PROJECT: CAT AND FIDDLE, CLYST ST MARY | | | | | |
| TITLE: PRELIMINARY DRAINAGE LAYOUT | | | | | |
| PROJECT No: 0643 | | DRAWING No: PDL-101 | | REV: A | |
| SCALE @ A2: 0 1:500 25 metres | | | | | |


DESIGN BY:



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Appendix D MicroDrainage Source Control Reports

| | | |
|---|--|---|
| AWP | | Page 1 |
| Kensington Court Woodwater Park Pynes Hill Exeter EX2 5TY | Proposed Western Catchment Cat and Fiddle Clyst St. Mary |  |
| Date 27/09/2017 10:27 File | Designed by Toby.Ball Checked by | |
| XP Solutions | Source Control 2016.1 | |


ICP SUDS Mean Annual Flood

Input

| | | | |
|-----------------------|-------|---------------|----------|
| Return Period (years) | 2 | Soil | 0.150 |
| Area (ha) | 0.337 | Urban | 0.443 |
| SAAR (mm) | 800 | Region Number | Region 8 |

Results 1/s

| | |
|------------|-----|
| QBAR Rural | 0.2 |
| QBAR Urban | 0.4 |
| Q2 years | 0.4 |
| Q1 year | 0.3 |
| Q30 years | 0.7 |
| Q100 years | 0.8 |

| | | |
|---|---|---|
| Awcock Ward Partnership Consulting Ltd | | Page 1 |
| Kensington Court Woodwater Park Pynes Hill Exeter EX2 5TY | 0643 - Cat and Fiddle Greenfield Run-off Rates ICP SuDS |  |
| Date 04/09/2017 12:36 File | Designed by toby.ball Checked by | |
| XP Solutions | Source Control 2016.1 | |

ICP SUDS Mean Annual Flood

Input

| | | | |
|-----------------------|-------|---------------|----------|
| Return Period (years) | 2 | Soil | 0.150 |
| Area (ha) | 0.212 | Urban | 0.000 |
| SAAR (mm) | 821 | Region Number | Region 8 |

Results 1/s

| | |
|------------|-----|
| QBAR Rural | 0.1 |
| QBAR Urban | 0.1 |
| Q2 years | 0.1 |
| Q1 year | 0.1 |
| Q30 years | 0.2 |
| Q100 years | 0.3 |