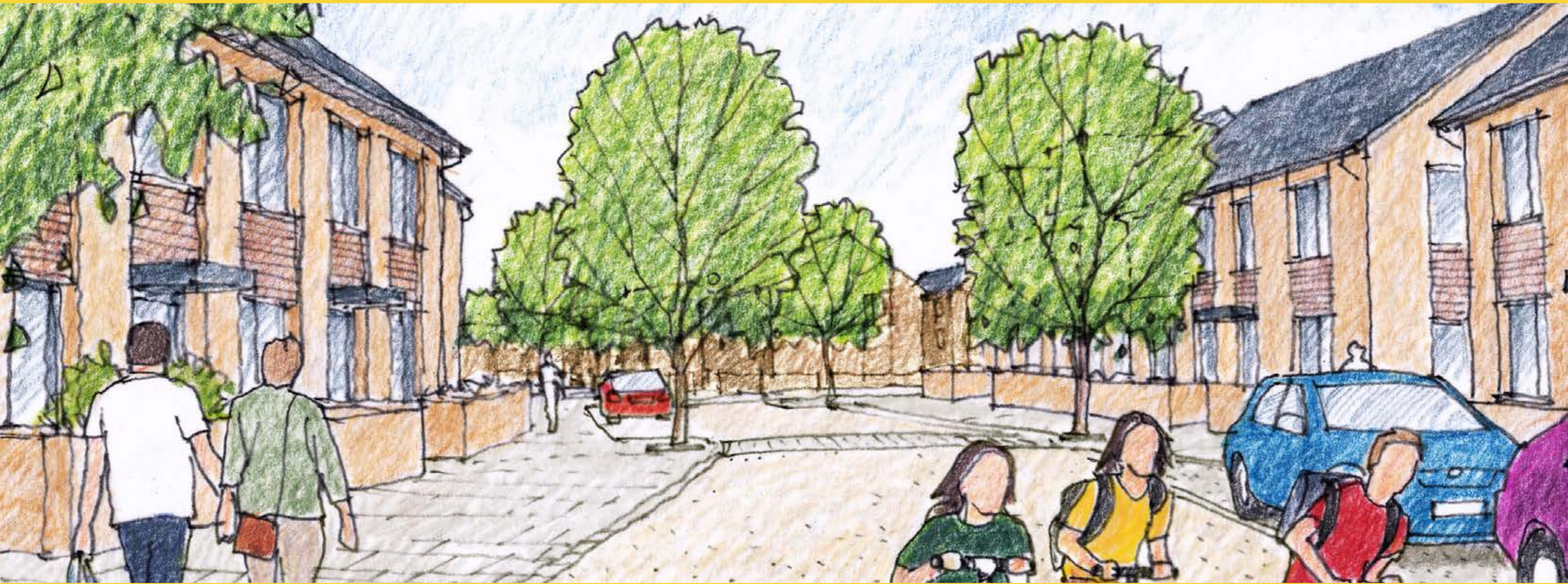


Design & Access Statement

Langarth Phase 1 & 2, Truro

December 2015





Foreword



This Design and Access Statement forms part of the Reserved Matters Application for the Outline Consent PA11/06124. The application is for 513 new homes.

This information has been prepared in line with the following consented documentation from Tetlow King:

1. Location Plan PL100116 LP-WOS Revision D.
2. Parameters Plan PL100116 PARP-02 Revision H.
3. Langarth Masterplan Design Code 26 April 2013 Revision K Final Version.

The design process has been developed to address three primary factors:

1. The consented proposals (as indicated above).
2. The detailed site constraints.
3. The detailed use and design requirements that are proposed for the site (housing).

By balancing these three factors, an attractive scheme has been prepared that meets with the demands of the consent, the constraints of the site and appropriate housing for future residents in this location.

As a part of the planning conditions relating to the outline consent, a Mini Design Code has been submitted to Cornwall Council prior to the planning application to address the majority of the design issues included in this document. Further detail is included in this document that supports the design proposals in the Mini Design Code.

The scheme has progressed in line with the following processes:

1. Regular monthly meetings with Cornwall Council. A number of key issues were discussed and resolved including public open space, urban design principles, affordable housing requirements, sustainability, phasing, connectivity, geology, landscape, ecology and highways.

2. Design Review Panel held on 5 August 2015. This event was generally supportive of the detailed design proposals and gave good guidance to explain how the detailed layout could be improved. This guidance has been included in these proposals.

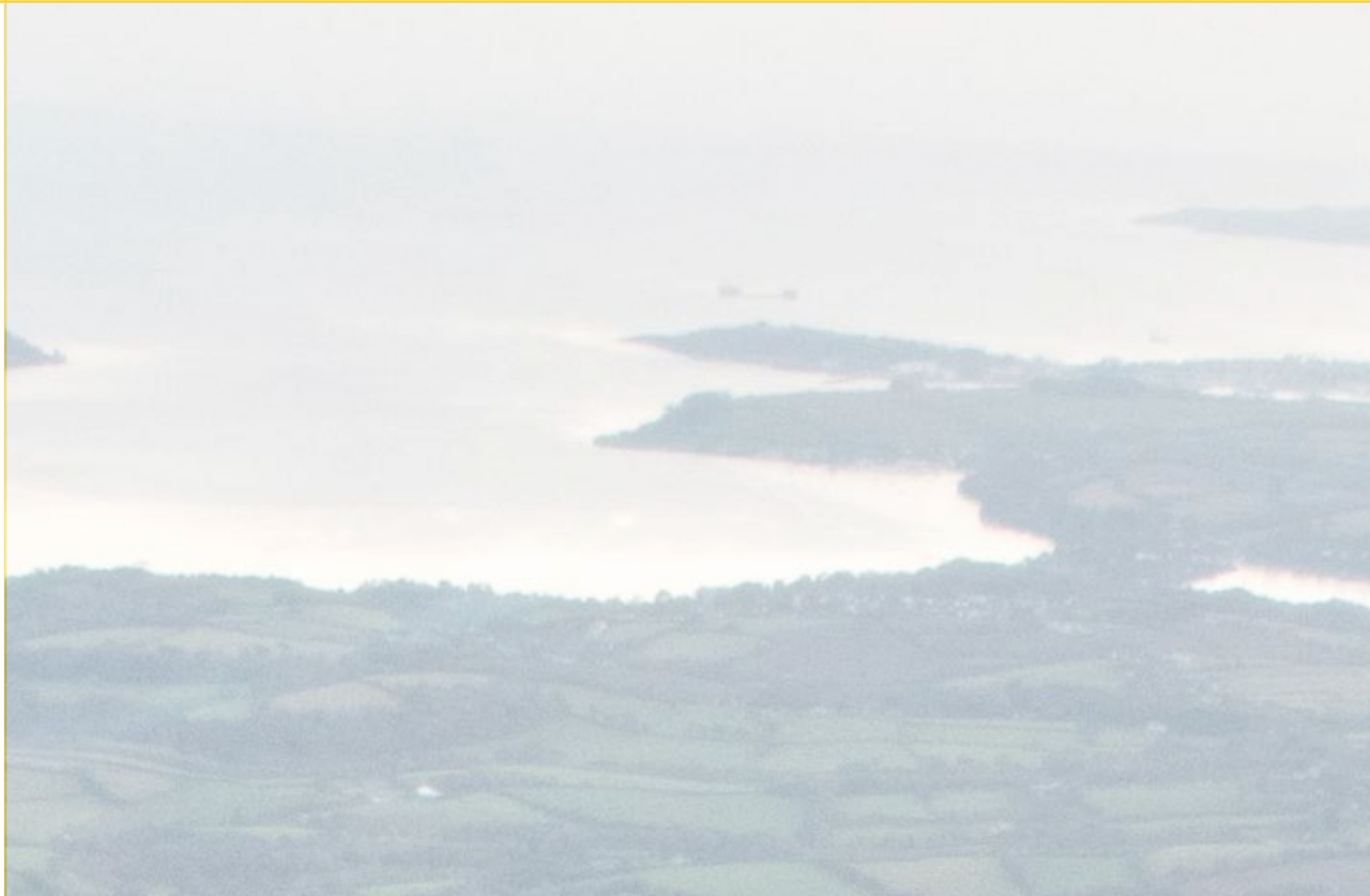
These meetings have ensured that the quality of the proposals have been enhanced and are in line with the vision of the overall consented masterplan.

A number of documents have been regularly referred to as the scheme has developed including:

1. Cornwall Design Code.
2. National Planning Policy Framework (2012).
3. By Design (2000) CABI.
4. Manual For Streets (2007).
5. Manual For Streets 2 (2010).
6. English Partnerships – Car Parking - What Works Where (2006).

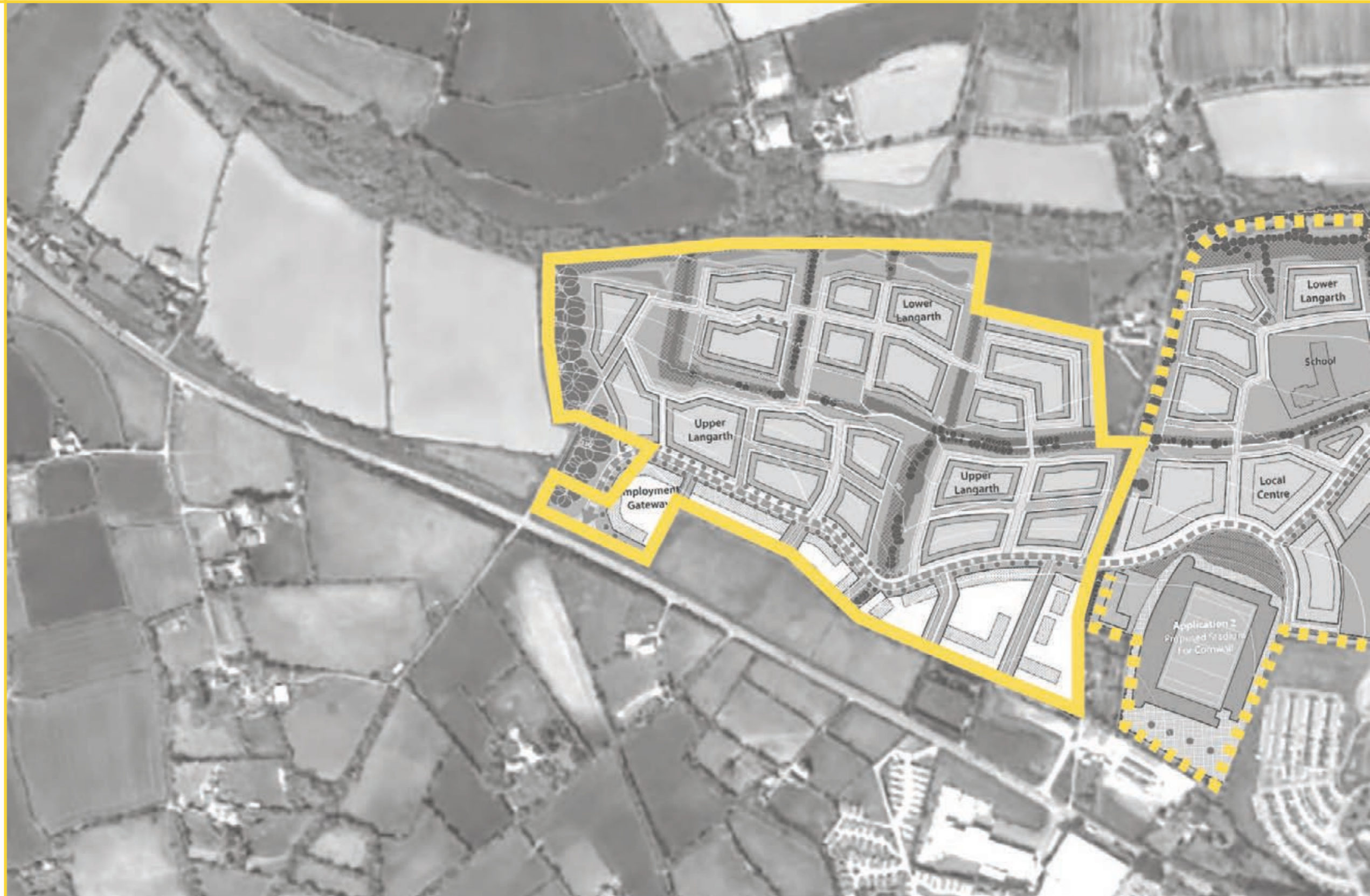
Meetings with housebuilders have been held to inform the design proposals. By understanding the demands of housebuilders and their customers, a realistic and commercially viable proposal has been produced.

By balancing all these factors noted above the resultant proposals are appropriate to this site and will ensure that this key initial stage will help the delivery of the overall vision for the Langarth Masterplan.



Contents

Foreword	3				
Contents	5				
Document Structure	7				
Team	9				
1. INTRODUCTION	10				
1.1. Development Overview	12				
1.2. The Approved Masterplan	14				
1.3. Phase 1 & 2 Reserved Matters Application	16				
2. THE SITE AND SURROUNDING AREA	18				
2.1. Site Evolution	20				
2.2. The Surrounding Context	22				
2.3. Truro's Location	24				
2.4. Flooding	26				
2.5. Transport Links	28				
2.6. Surrounding Facilities	30				
2.7. Access around the Site	32				
2.8. Heritage	34				
2.9. Landscape Character	36				
3. URBAN AND ARCHITECTURAL CONTEXT	38				
3.1. Surrounding Consented Developments	40				
3.2. Significant Local Buildings	46				
4. CONSTRAINTS AND OPPORTUNITIES	52				
4.1. Technical Constraints	54				
4.2. Opportunities	56				
4.3. Topography	58				
4.4. Slope Gradient	60				
4.5. Ecology (Flora)	62				
4.6. Ecology (Fauna)	64				
4.7. Geology	66				
4.8. Archaeology and Heritage	68				
4.9. Access and Transport	70				
4.10. Utilities	72				
4.11. Flooding	74				
5. OUTLINE PLANNING GUIDELINES	76				
5.1. Overall Masterplan	78				
5.2. The Proposals of the Outline Consent	80				
5.3. The Requirements of the Outline Consent	82				
6. MASTERPLAN	88				
6.1. Introduction	90				
6.2. Strategy	92				
6.3. Ecology	94				
6.4. Housing Requirements	96				
6.5. Strategy	98				
6.6. The Masterplan	102				
6.7. Site Sections	104				
6.8. Phasing	106				
6.9. Road Framework	108				
6.10. Housing Mix	110				
6.11. Building Form	112				
6.12. Building Heights	116				
6.13. Car Parking	118				
6.14. Frontages and Spaces	120				
6.15. Landscape	122				
6.16. Affordable Units	124				
6.17. Perimeter Treatment	128				
6.18. Boundary Treatment	130				
7. ACCESS AND MOVEMENT	138				
7.1. Movement Network	140				
7.2. Street Typologies	142				
7.3. Refuse Strategy	148				
7.4. Lighting Scheme	150				
7.5. Cycle and Pedestrian Activity	152				
8. APPEARANCE	154				
8.1. Key Areas	156				
8.2. General Elevations	164				
8.3. Key Elevations	166				
8.4. Materials	168				
8.5. Sunlight Study	170				
9. HOUSE TYPES	182				
9.1. Research	184				
9.2. House Types	189				
9.3. Schedule of Accommodation	190				
10. LANDSCAPE	198				
10.1. Landscape Design	200				
10.2. Green Infrastructure	202				
10.3. NAR Zone	204				
10.4. Spine Road Zone	205				
10.5. Green Edge Zone	206				
10.6. Green Spine Zone	207				
11. FURTHER CONSIDERATIONS	209				
11.1. Design Review Panel Response	210				
11.2. Cornwall Design Guide	214				
11.3. Lifetime Homes	216				
11.4. Secured by Design	217				
11.5. Building for Life	218				
11.6. Energy and Sustainability	219				
12. APPENDIX	220				
12.1. Architectural Drawings	222				
12.2. House Types Drawings	240				
12.3. List of Images	377				



Document Structure



The document is structured to explain a number of design factors and the detailed design proposals.

The first part of the document explains the planning consent and the wider parameters and context. Consideration is then given to the existing built form and surrounding planning consents.

The following section considers the existing technical constraints including topography, geology, ecology, hydrology, archaeology, utilities and highways.

The next section looks at the consented masterplan in detail and gives a response to the overall layout including a clear design strategy that works with the consent, technical constraints and needs for housebuilders. Detail is given to the housing type and mix along with urban design strategy, parking, landscaping, public realm and access.

Consideration is then given to the finer detail of the housing including frontages, natural surveillance, private gardens, scale and street types. Technical consideration is given to refuse collection, lighting strategy and the provisions of cycling, etc.

Appearance is then considered and how the scheme has different character in different areas. The elevations are explained and consideration is given to the materials. The landscape strategy is presented and it is demonstrated how the proposals relate to the unique characters of the site.

Finally a response is provided to the key documents and feedback during the detailed design process including Design Review Panel, Lifetime Homes, Secured By Design, Building for Life and The Cornwall Design Guide.

The appendices include the detailed design drawings including plans and elevations. All house types are provided in detail.



Team

Inox Property Ltd

Client – Strategic Lead



PCL Planning

Planning



Keep

Architecture, Masterplanning,
Design & Access Statement



FPCR

Landscape Architecture



AM Ecology

Ecology



Aspect Tree Consultancy

Arboriculture



Mott MacDonald

Project Management, Highways
Design (NAR), CDMC, QS



Shear

Earthworks, Surface Water Drainage,
Estate Roads



WSP /Parsons Brinckerhoff

Design of J278



Peter Brett Associates

Incoming Utilities



CgMs

Archaeology







1. Introduction

1.1. Development Overview

The proposals in this reserved matters application are for 513 new homes. The majority of the accommodation is in the form of housing including terrace, semi-detached and detached housing. All houses are provided with private gardens and allocated car parking. Visitor parking is also provided.

A variety of house types and sizes are provided. Smaller two bedroom houses are provided as well as larger family homes. The mix of different housing ensures that the proposals are attractive to a range of occupiers. Furthermore the layout has been developed so the proposals can be easily phased as dictated by market conditions.

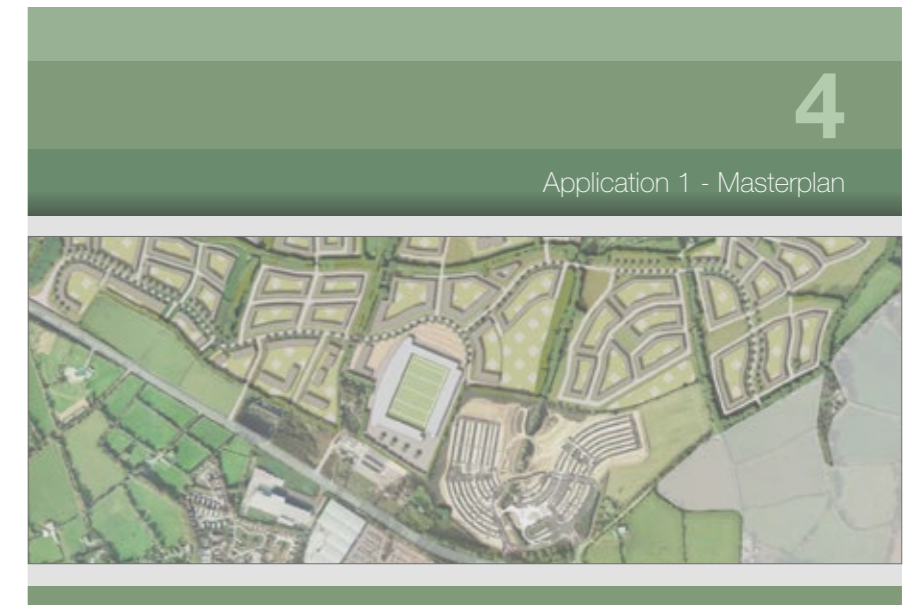
Apartments are provided. Due to the nature of flatted accommodation, these blocks tend to be larger than individual houses. These blocks have been located in key locations to adhere to good urban design principles and give visual nodes to the masterplan. The apartment blocks allow the design strategy to resolve the severe topography of the site and provide active frontages at grade in most locations.

Split level housing has also been provided. Split level housing is appropriate on sites with steep topography as the primary living area can be at first floor and have level access to rear gardens. Due to the orientation of the site and gradients, all the gardens of the split level housing are south facing. A variety of accommodation is provided at the lower levels of the split level housing (at road level). Garages are provided to some properties, 'studio' space is provide to others. This range of accommodation ensures a good mix and visual interest is provided at street level.

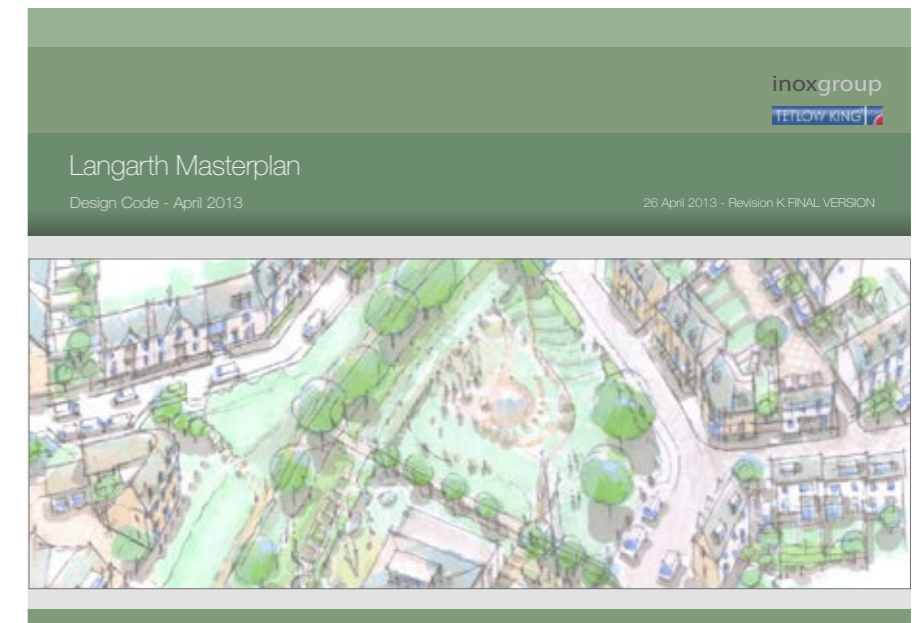
Allocated car parking is located close to homes and large areas of car parking is avoided. On street, courtyard, on plot and garaged parking is provided across the development. This strategy of providing a mix of parking is good for commercial reasons and is also good design practice as it provides variety and interest.

Typically, housing is two storeys with pitched roofs however some accommodation is provided at second floor to some housing with bedrooms in lofts and dorma windows (2.5 storeys). Apartment blocks are generally 2-3 storeys.

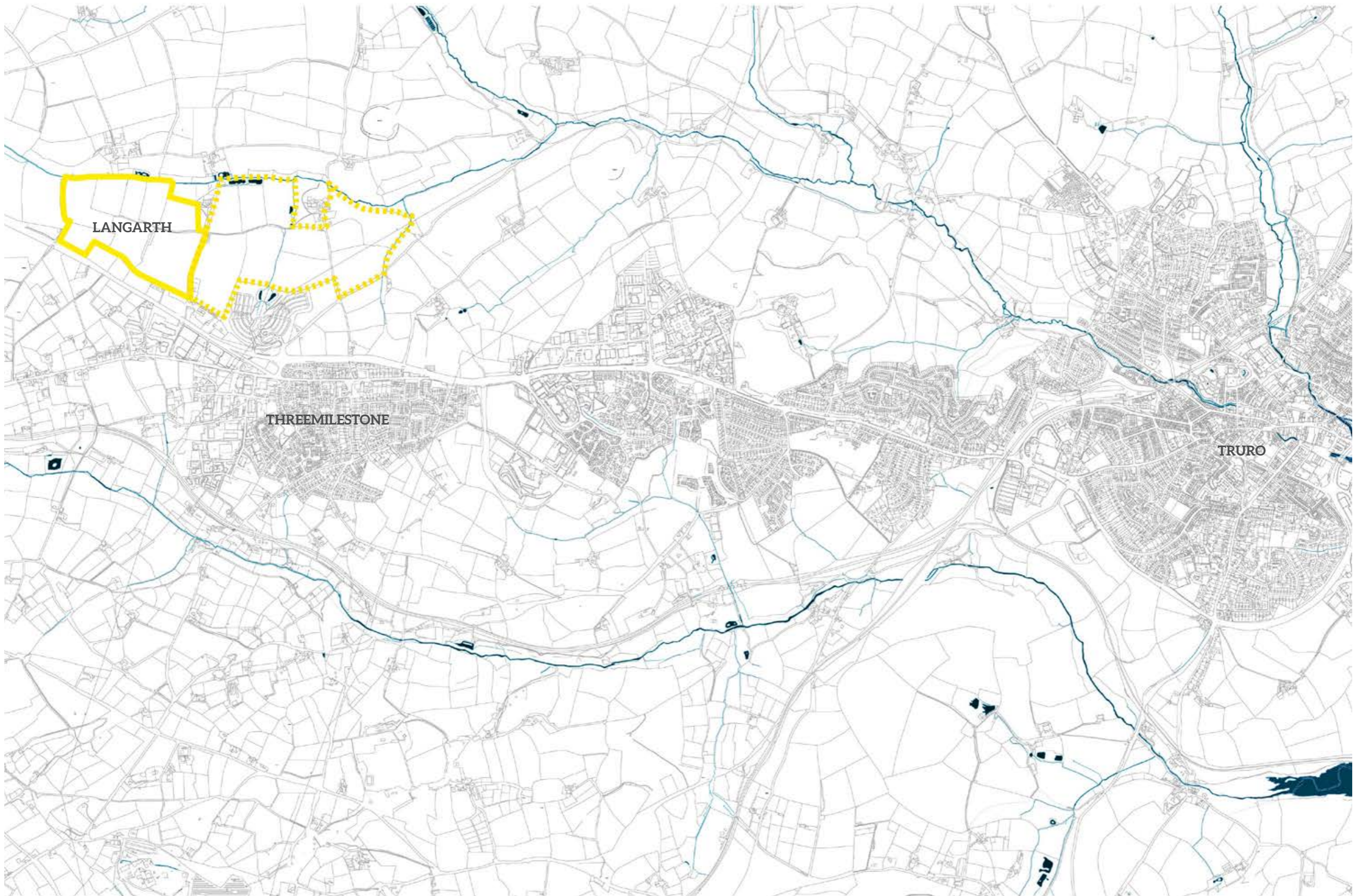
A strong landscape strategy has been instrumental in the design process from the outset and remains a key aspect that ensures the overall scheme is both distinctive and attractive to the new community and visitors.



Outline Consented Masterplan Document



Outline Consented Design Code Document



1.2. The Approved Masterplan

The approved masterplan is indicated in the outline consent PA11/06124 as prepared by Tetlow King. The following documentation is associated to the consent:

1. Location Plan PL100116 LP-WOS Revision D.
2. Parameters Plan PL100116 PARP-02 Revision H.
3. Langarth Masterplan Design Code 26 April 2013 Revision K Final Version.

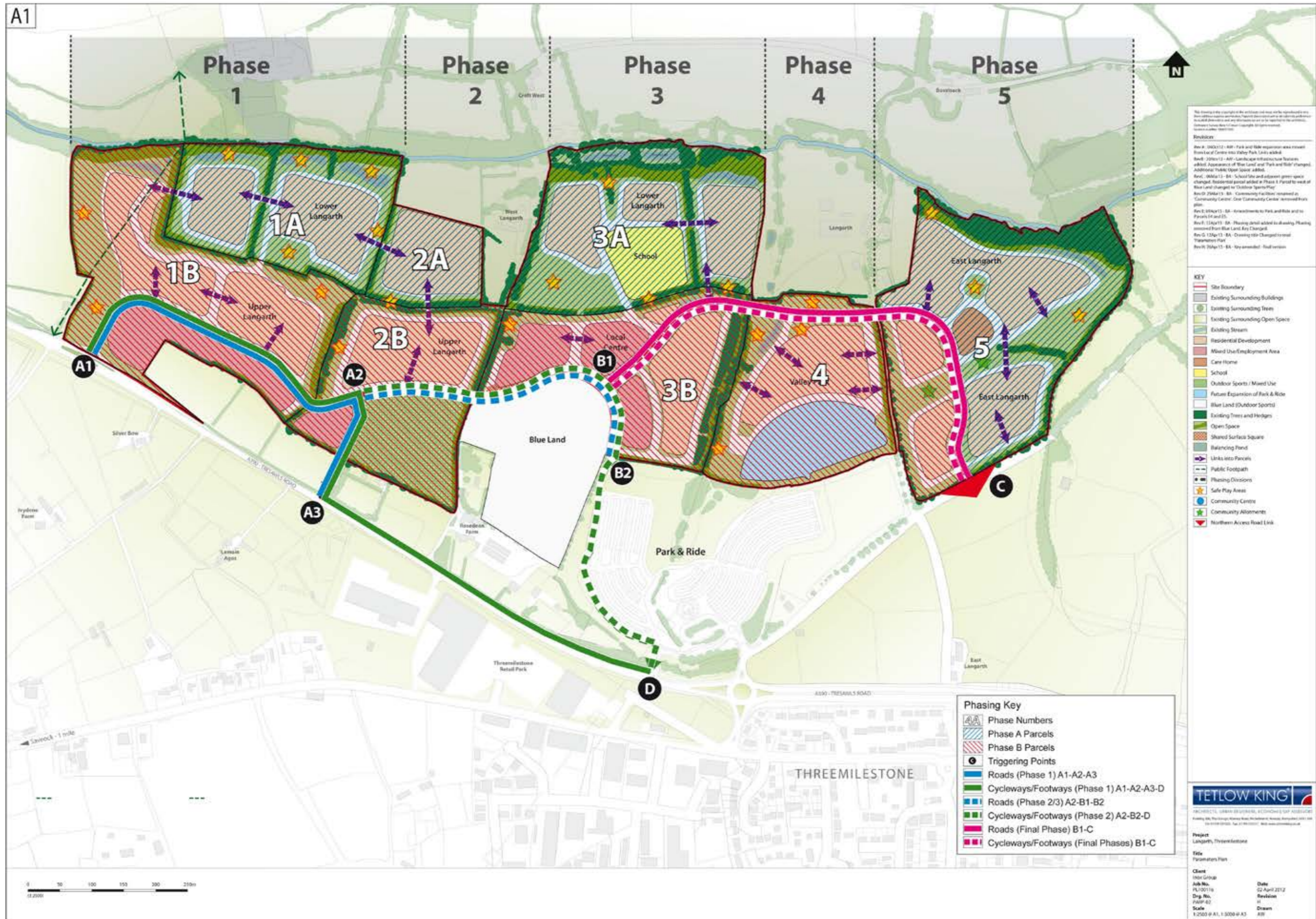
This information provides a clear design strategy for the overall site including the entire Northern Access Road (NAR), new homes (circa 1500), mixed use areas including employment and retail uses, landscaping and public realm.

The information has formed the basis of the design strategy for the reserved matters application.

The preparation of the Mini Design Code and regular meetings with Cornwall Council has ensured that the design strategy indicated in the outline consent has been adhered to and adapted where necessary. Many design improvements have been initiated by this process including an enhanced landscape strategy and improved housing and quality of detail.



Illustrative view of Lower Langarth from the outline consented Design Code



Outline consented Parameters Plan

1.3. Phase 1 & 2 Reserved Matters Application

The content of the reserved matters application is as follows:

Phase 1 & 2

- Total housing: 513 units
- Total site area: 33.28 acres / 13.47 ha
- Total built area: 499,457 sqf / 46,401 sqm
- sqf/acre: 15,008

Mix

Type	Required	Provided
Houses		
2-Bed	91	70
3-Bed	238	259
4-Bed	93	108
5-Bed	17	4
Flats		
1-Bed	18	20
2-Bed	54	52
Total	513	

Phase 1

- Total housing: 324 units
- Total site area: 20.50 acres / 8.30 ha
- Total built area: 307,664 sqf / 28,582 sqm
- sqf/acre: 15,008

Mix

Type	Required	Provided
Houses		
2-Bed	58	55
3-Bed	151	179
4-Bed	59	60
5-Bed	11	0
Flats		
1-Bed	11	10
2-Bed	34	20
Total	324	

Phase 2

- Total housing: 189 units
- Total site area: 12.78 acres / 5.17 ha
- Total built area: 191,793 sqf / 17,818 sqm
- sqf/acre: 15,007

Mix

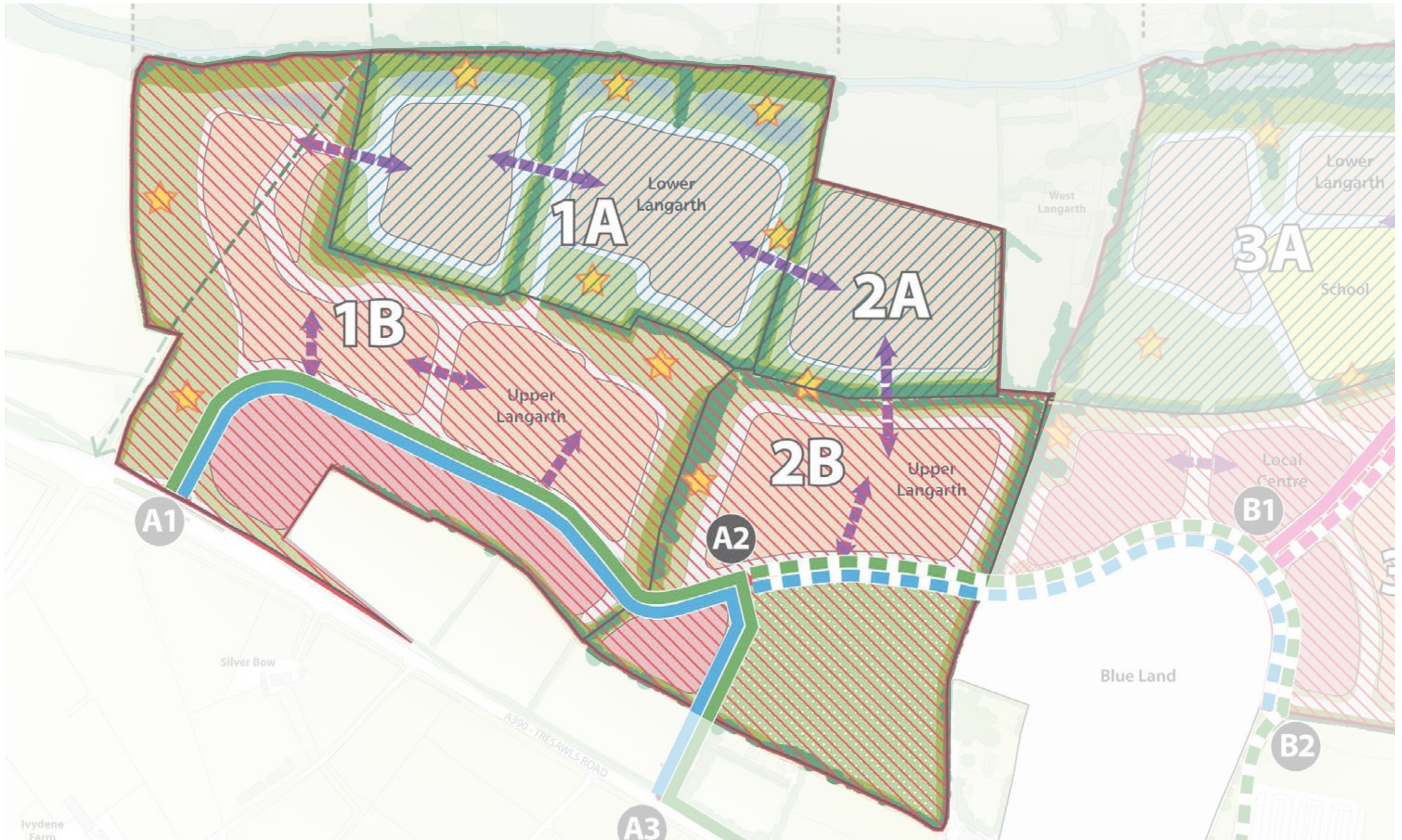
Type	Required	Provided
Houses		
2-Bed	33	15
3-Bed	87	80
4-Bed	35	48
5-Bed	6	4
Flats		
1-Bed	7	10
2-Bed	20	32
Total	189	

The other uses (commercial/retail/etc) that are proposed as part of the wider masterplan will be located on the adjoining sites and future phases. The layout indicated in this reserved matters application has considered these other uses and ensures good connectivity is provided as well as the provision of suitable and attractive urban design solutions.

A high level of detail has been provided in this reserved matters application. It is anticipated that further minor detail (exact materials for example) will be covered by planning conditions.



Illustrative view of split-level housing from the outline consented Design Code



Parameters plan for phase 1 & 2 from the outline consented Design Code





2. The Site and Surrounding Area

2.1. Site Evolution

History of the Area

Truro began as a small settlement in the 12th century following the construction of a castle, within the grounds of which, the settlement originated (the castle is no longer evident). At the beginning of the 14th century Truro was an important port with a flourishing fishing industry. It was also awarded stannary town status and was an important hub for tin and copper from local Cornish mines.

Truro continued to prosper and by the 18th and 19th century, boosted by improved mining methods and higher prices for tin, the town soon became the place of choice for wealthy mine owners. Substantial, elegant town-houses were built, such as those along Lemon Street.

Truro's importance increased further in the 19th century as an industrial centre and further major expansion came with the arrival of the railway in the 1860's with a direct line from London Paddington. In 1876 the cathedral was constructed and a year later Truro was granted city status.

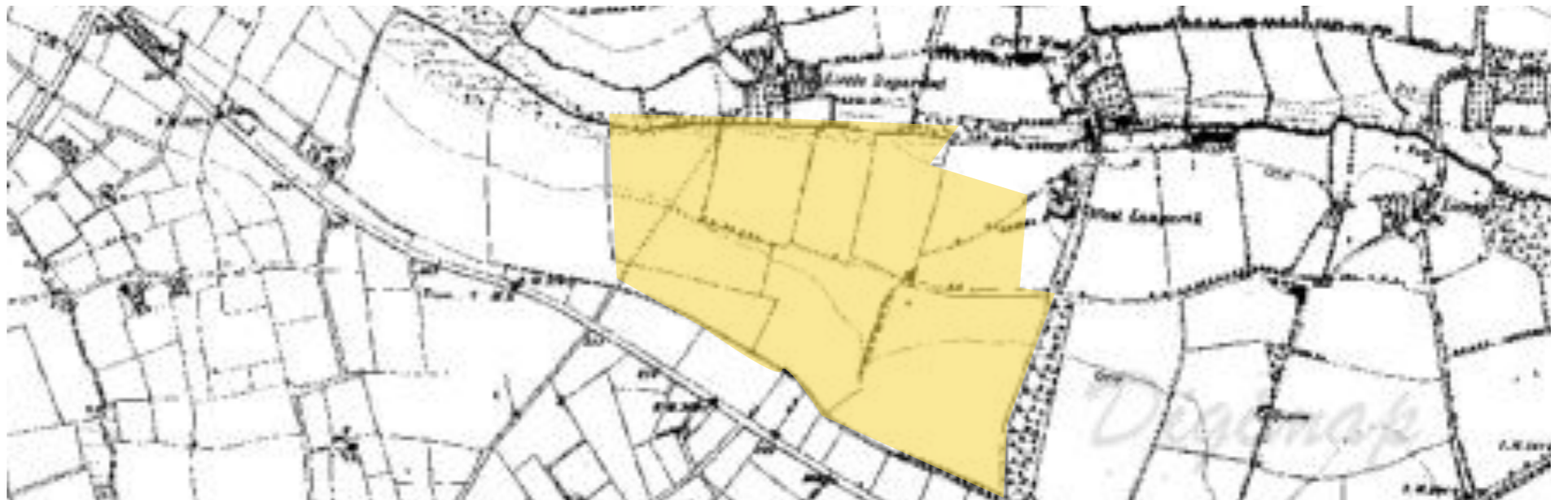
The start of the 20th century saw the decline of the mining industry, however Truro has remained prosperous and is recognized as being the civic and retail capital of the region, with a focus on public sector employment and tourism.



Truro Port



Interior of Truro Cathedral



Current Site on Historic map of Truro - 1880



Current Site on Historic Map of Truro - 1880

2.2. The Surrounding Context

The site lies 6km to the west of the centre of Truro, 3km west of Royal Cornwall Hospital and north west of the Threemilestone area and Truro Park & Ride.

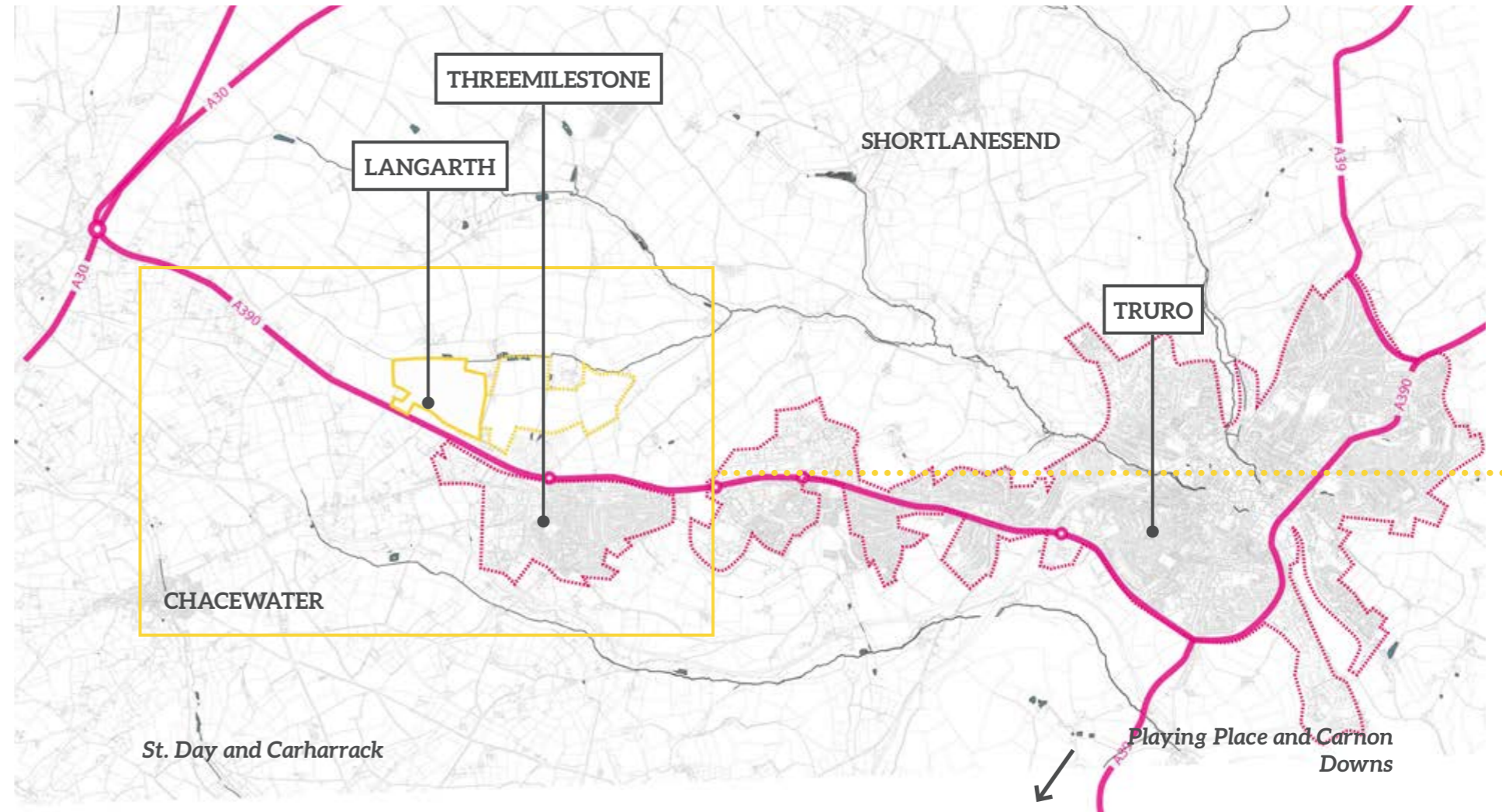
The A390 runs west to east to the south of the site forming a major transport corridor into Truro. The approach to Truro along this corridor is characterised by some private properties, a number of smaller industrial and business units and a retail park closer to Threemilestone.

To the south east of the site on the other side of the A390 is the community of Threemilestone which largely consists of 20th century housing with a selection of amenities. This is the westernmost settlement in a string of towns/villages along the A390 including Gloweth and Highertown that connect to Truro.

To the north of the site, the settlement pattern is more scattered and rural both in character and building style with a number of isolated farmhouses and hamlets.

In close proximity to the site, being surrounded on all sides except the north are the small clusters of buildings at Langarth and West Langarth of various rural building styles. Approximately 3km north west of the site is the village of Shortlanesend on the B3284, a settlement consisting of largely late 20th century housing.

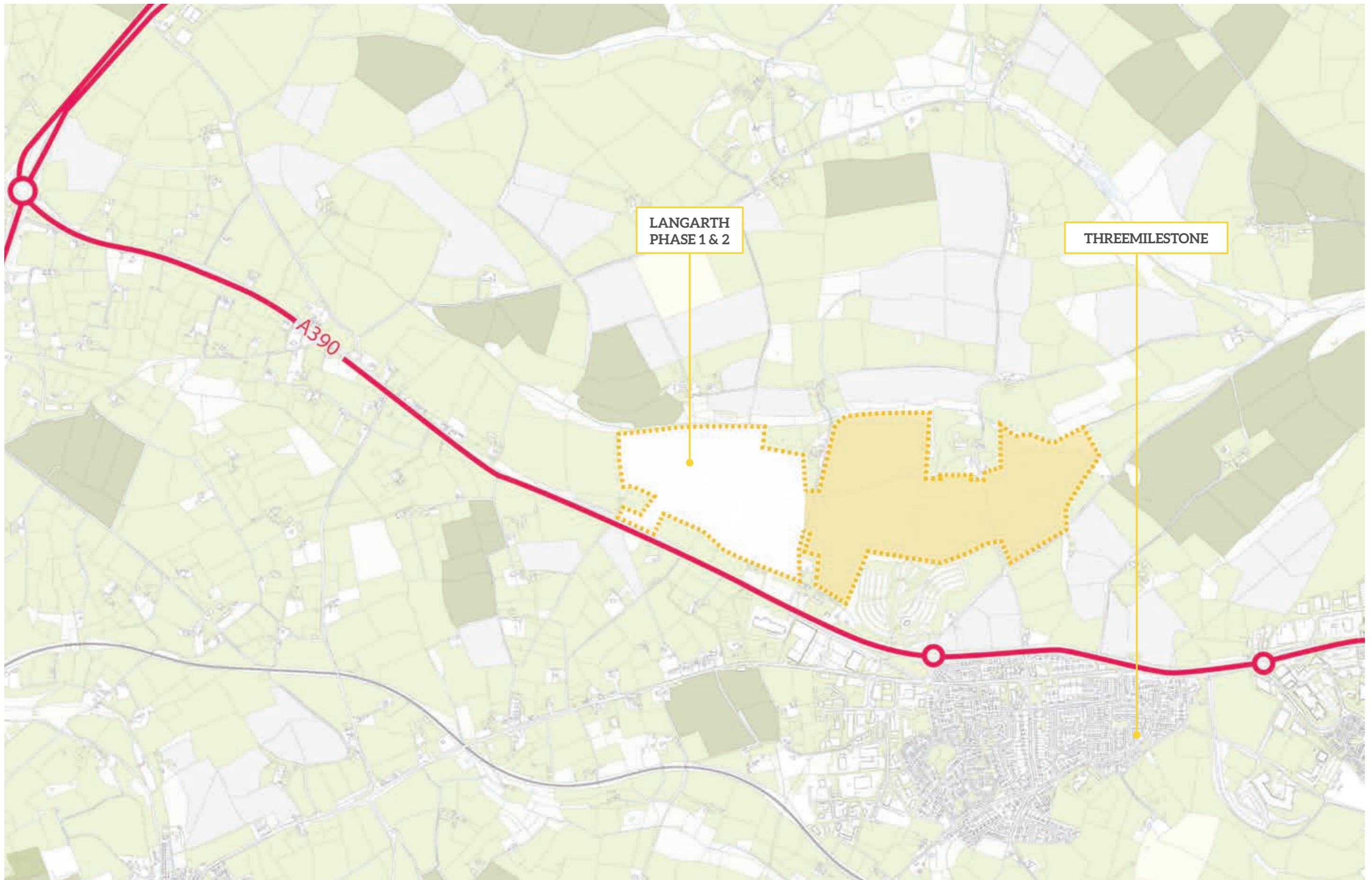
Further to the south east lies the former mining villages of Carnon Downs and Playing Place now both expanded with later 20th century residential areas. To the south west of the site are Chacewater, St. Day and Carharrack, all of which have 19th century housing typical of such mining villages.



Location of the site within Truro

Key:

- Site Boundary
- - - Settlement Boundary
- - - Langarth Masterplan
- A Roads



Location of the site in relation to the Langarth Masterplan

2.3. Truro's Location

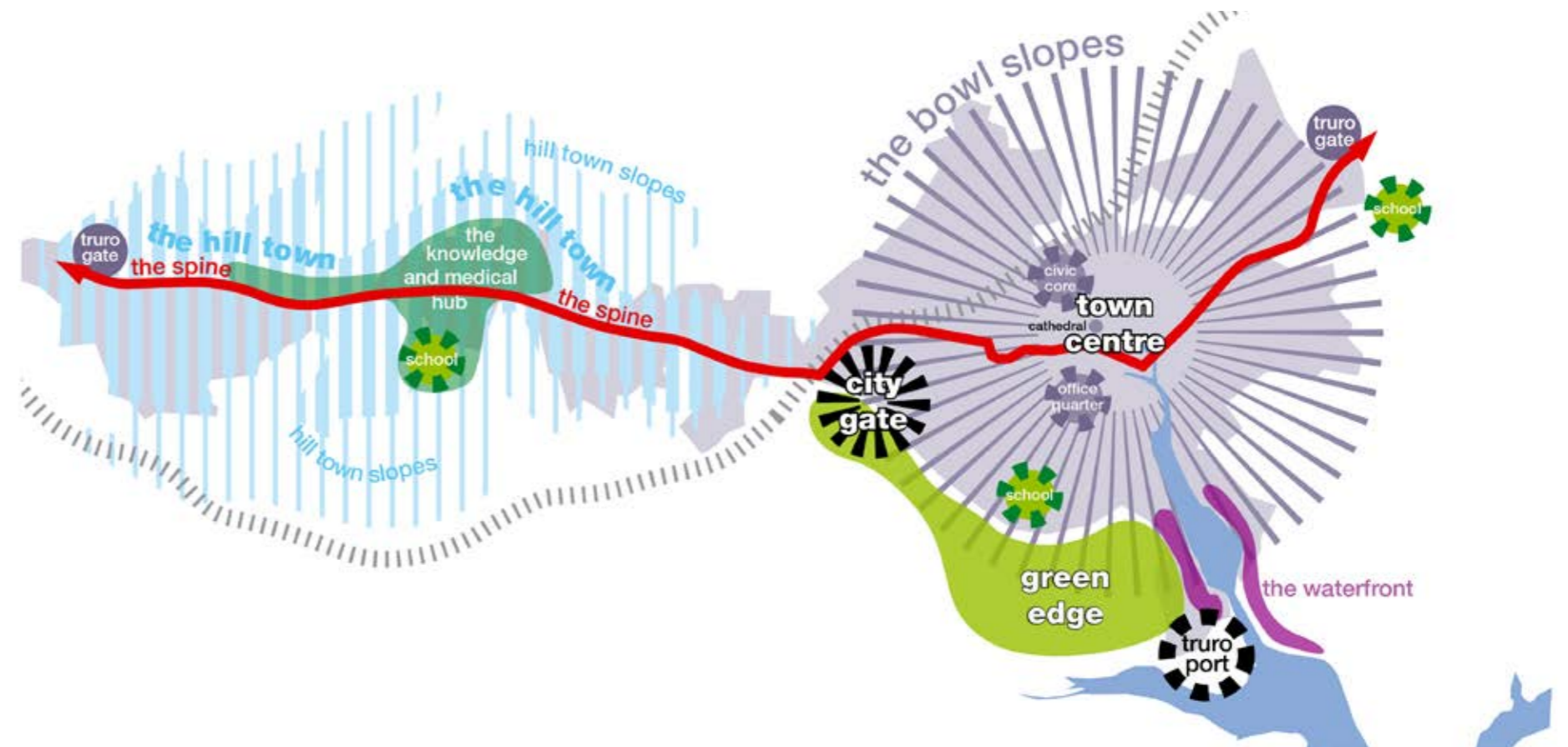
Pattern of Development and Growth

Truro is situated in a distinctive bowl landform, which forms a strong physical and visual boundary to the city's setting. The eastern, south western and north western fringes of the city have expanded up to this boundary, resulting in limited potential to expand the city further within its natural setting.

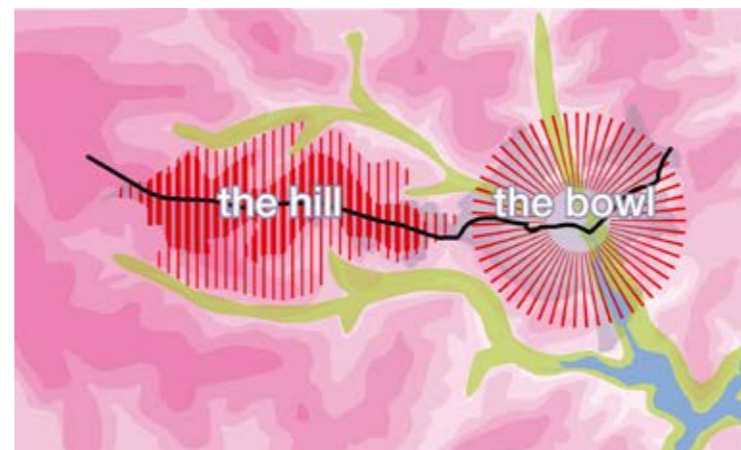
Much of the surrounding landscape, beyond the natural city boundary, is of high quality with several areas being designated areas of great landscape importance, making the settling of the city particular sensitive to landscape change.

Truro has grown and developed around the historic city centre in a nucleated fashion along the bowl valley slopes. With opportunities for 'in-filling' being limited, the late 18th century saw a period of growth away from the centre, with Lemon Street forming an upwards linear expansion. Following the arrival of the railway, terrace houses followed the rail line up the hillsides above the central core. Late Victorian and Edwardian villas spread away from the medieval centre, following main routes, along ridge lines.

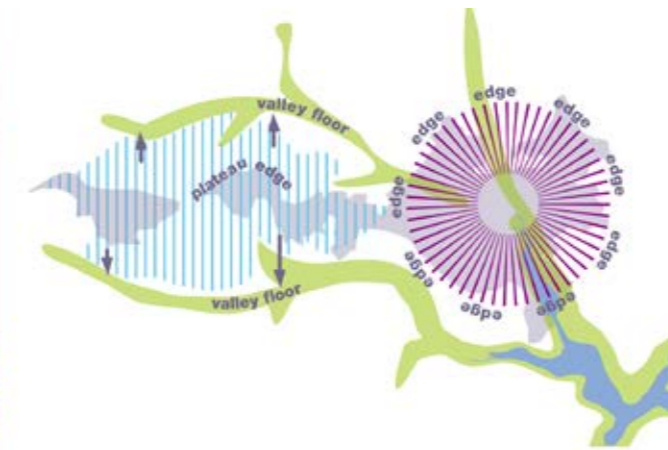
As Truro has continued to grow, the historic pattern of development, away from the centre, has continued and a number of settlements have been incorporated, creating suburbs. These include Kenwyn and Moresk to the north, Trelander to the east, Newham to the south and Highertown, Trelliske and Gloweth to the west.



Truro Landscape Strategy, 2008. Placemaking: integration of the landscape framework and the basic urban design and transport concepts to perpetuate legibility and local identity.

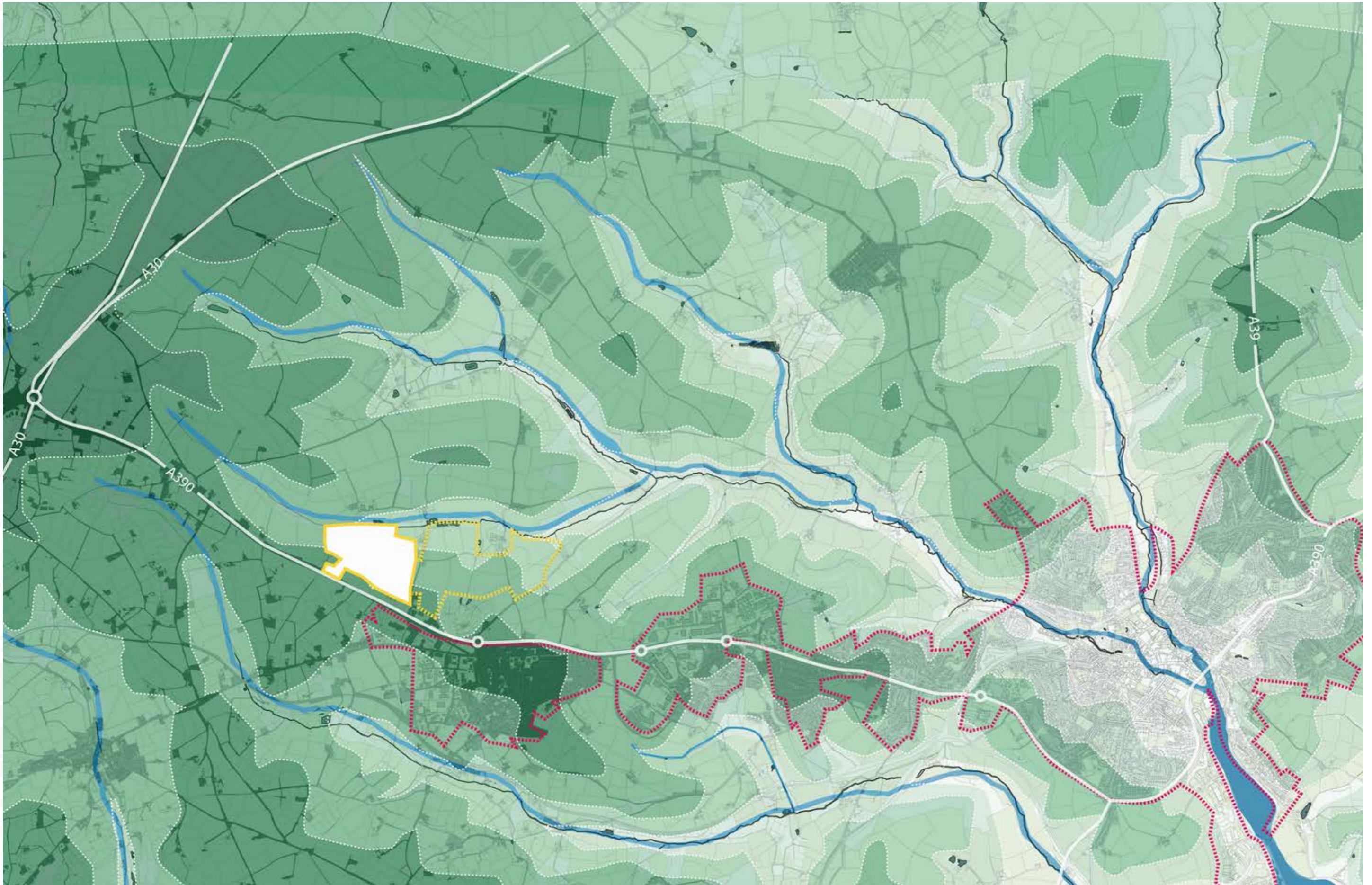


Truro Landscape Strategy, 2008: Diagram showing the hill and the bowl setting of Truro, which forms the structure of the city and limits its expansion.



Truro Landscape Strategy, 2008 : Diagram showing the structural edges provided by the edge of the bowl and the edge of the plateau. Structural paths provided by the river valleys.

- Key:**
- Site Boundary
 - - - Settlement Boundary
 - - - Langarth Masterplan
 - Landscape Features*
 - Water Courses
 - Topography
 - - - Contours



Topography of the site

2.4. Flooding

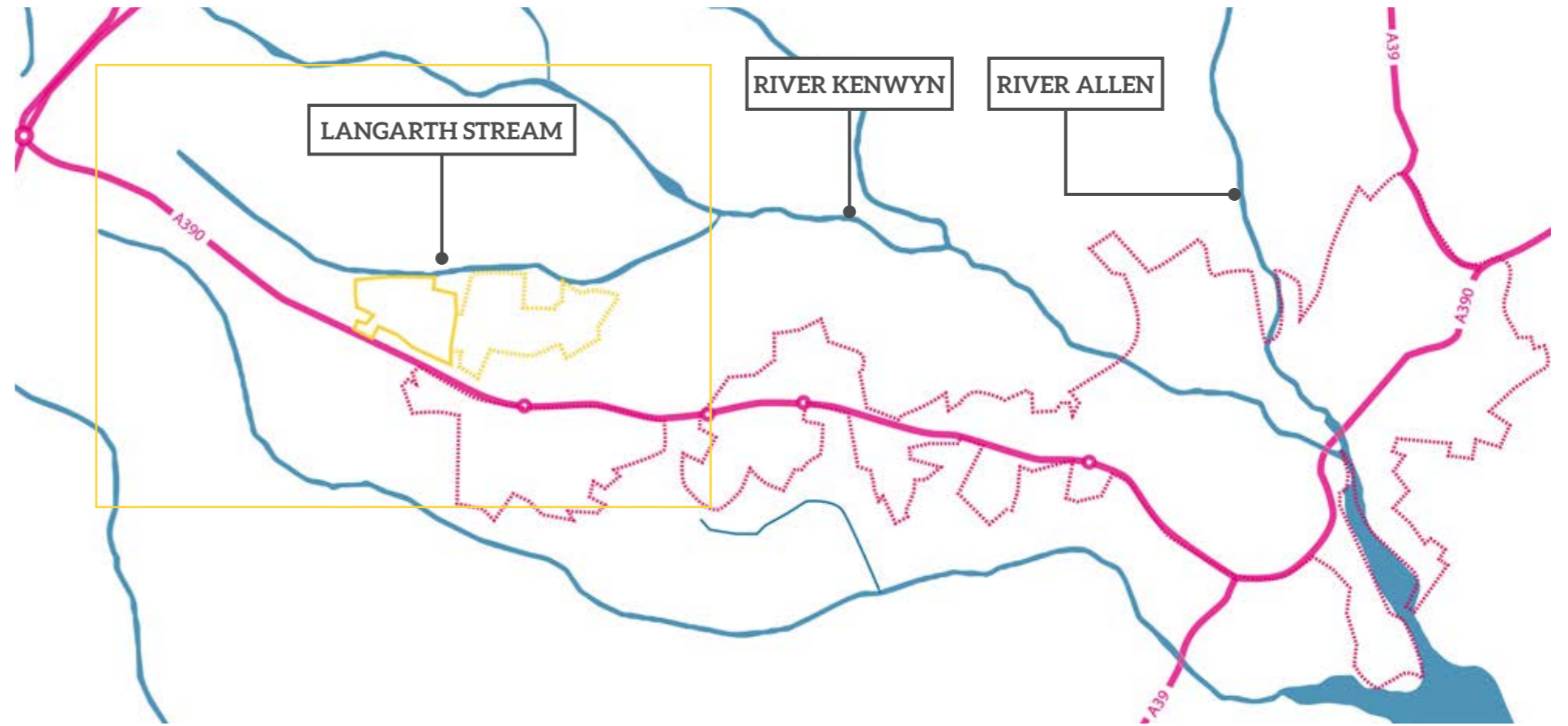
The Langarth Stream, a tributary to the River Kenwyn and designated as a Secondary River, is located to the east of the site at a lower elevation. To the north of the site a tributary to the Langarth Stream runs generally in a west to east direction, also at a lower elevation. The watercourse is designated as a tertiary river and six contributory sources are identified within a 500m radius of the approximate site centre. It is likely that these sources are springs / issues associated with the geology of the area.

A review of the publicly available Environment Agency Maps shows that the application site is within Flood Zone 1 and that no historic flood events have been identified or recorded within the vicinity of the proposed development site.

The topography of the area is such that the A390 forms the watershed of two catchments. The site is located adjacent to the watershed and therefore is unlikely to experience any major overland flow from adjacent land unless there is a failure of the drainage associated with the highway corridor.

The published geological conditions for the development area indicate that the site is underlain by the Porthowan Formation of the Gramscatho Group comprising mudstone and sandstone. Trial pits and soakage testing, undertaken within the adjacent Langarth site, indicates that the Porthowan Formation has weathered to a silty gravel and that the permeability of the weathered formation is suitable for infiltration systems.

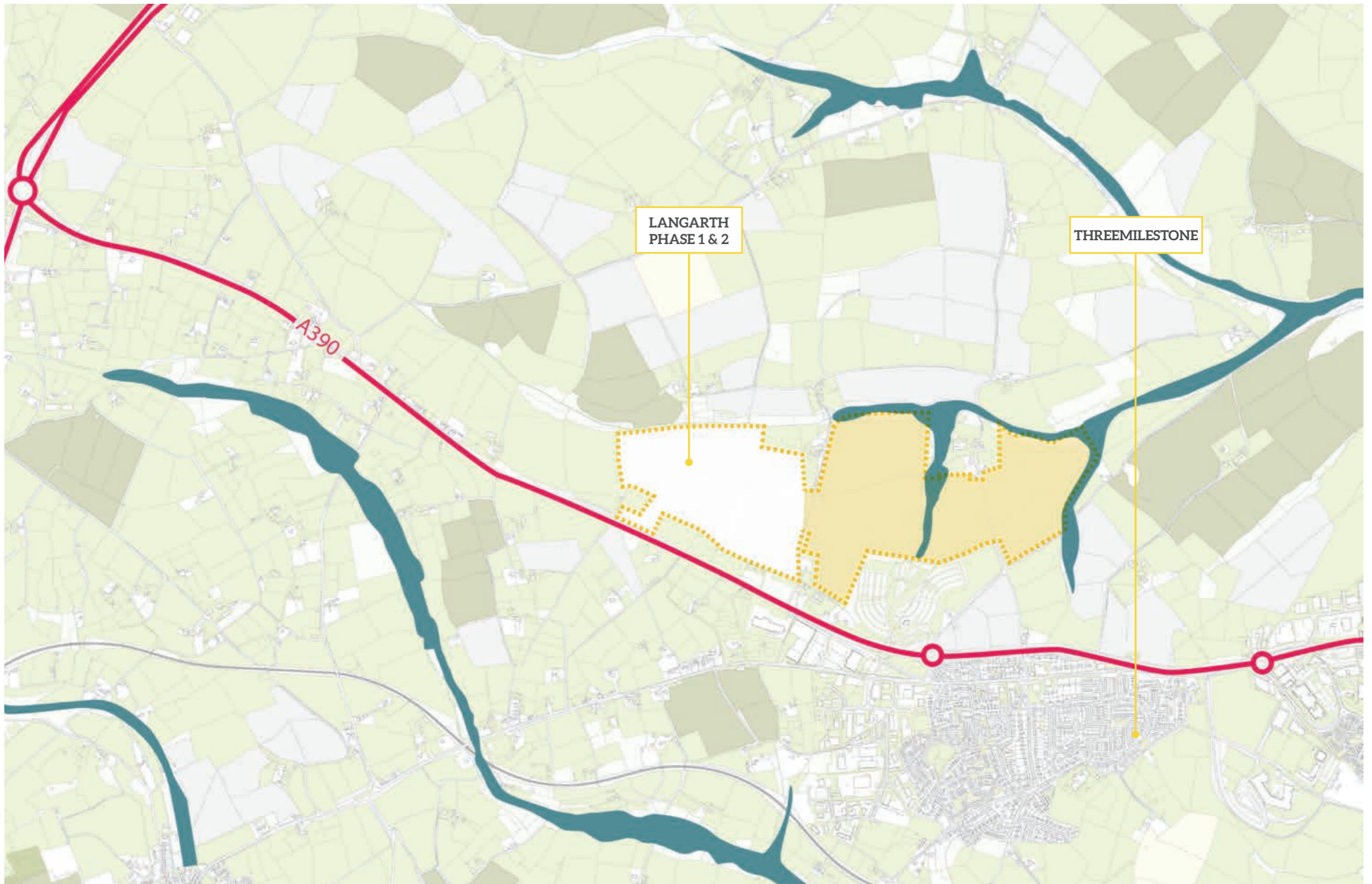
The proposed development will integrate Sustainable Drainage Systems into the green infrastructure to control and treat surface water runoff. The highway infrastructure will drain via positive drainage to storage basins located at the northern aspect of the site where the outfall to the adjacent watercourse will be restricted to the 1 in 1 year Greenfield runoff rate for the undeveloped site. The residential areas will drain to private infiltration systems comprising permeable paving and traditional soakaways. All systems will be sized to accommodate the 1 in 100 year plus 30% climate change rainfall event.



Plan showing watercourses in Truro

Key

- Site Boundary
- - - Langarth Masterplan
- Flood Zone
- Watercourse
- A- Road



Flood Zone Plan

2.5. Transport Links

The main spine road, the A390, provides access to Truro, and connects to the A30, linking Truro to Exeter to the north and Penzance to the south.

The A390 acts as a spine road due to the landscape constraints. This spine road and the topographic constraints limits the expansion of Truro, allowing expansion to continue to the west along this spine road.

The railway line runs through Truro with the Truro railway station being located in the centre of city. Truro lies on the Cornish Main Line between Penzance and Plymouth served by First Great Western and Cross County trains. Truro is also the start of the Maritime Line to Falmouth Docks.

There is a Park & Ride to the West of Truro, near the proposed site, and can be accessed from the Threemilestone roundabout. This western Park & Ride provides a major opportunity to promote sustainable travel into the city as this transport hub is already provided near the site.

The site is located 6km west of the centre of Truro and 3km west of the Royal Cornwall Hospital, on the northern side of the A390. The Strategic Road Network (SRN) is located some 2km to the west, via the A30-Chiverton Cross interchange.



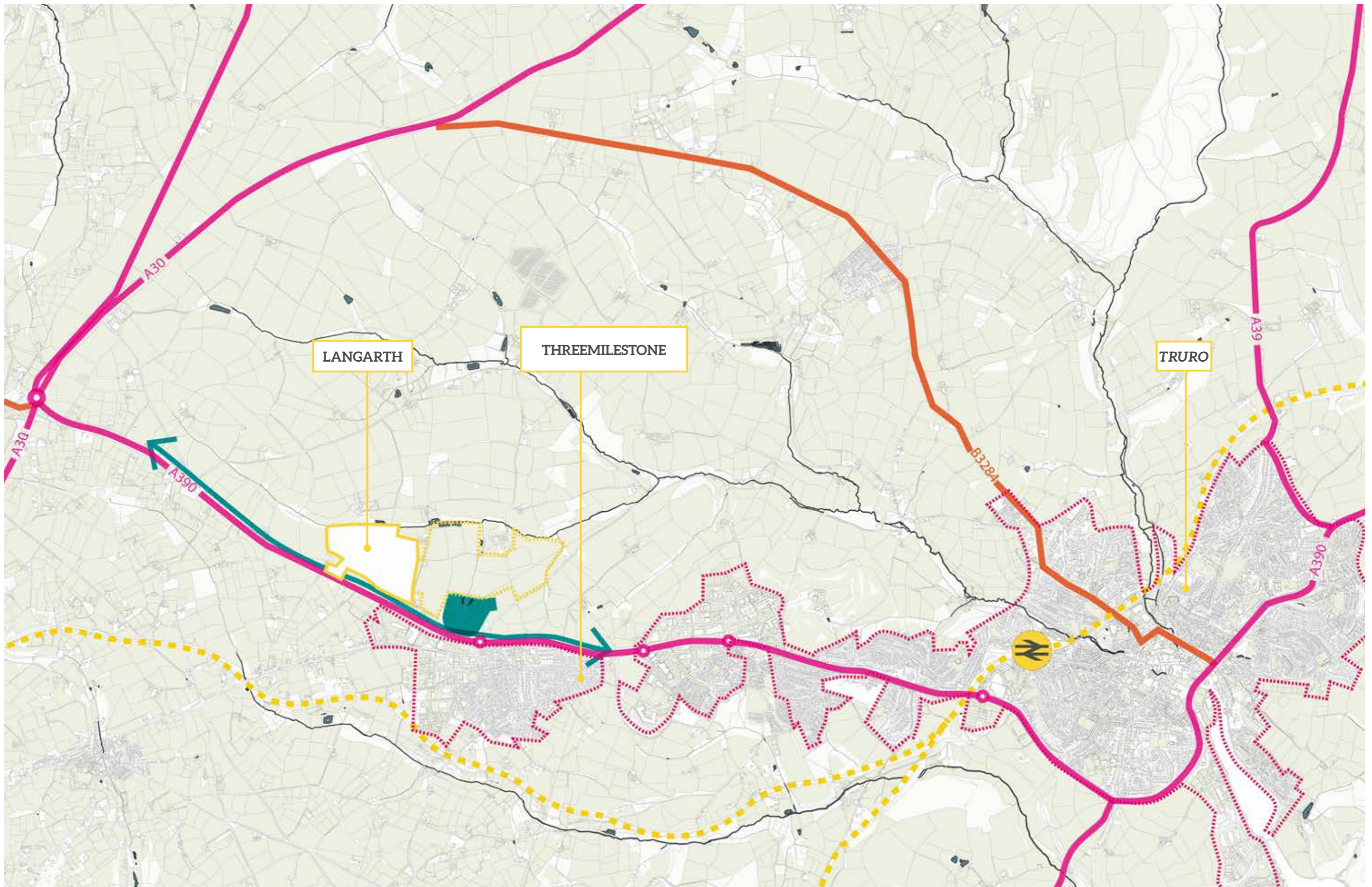
The A390 as a spine road



West Park and Ride Map

Key:

- Site Boundary
- - - Settlement Boundary
- - - - Langarth Masterplan
- Access
- A-Road
- B-Road
- Railway Station
- Railway Line
- Park and Ride Park
- Park and Ride Line



Major transport routes and locations in Truro

2.6. Surrounding Facilities

The centre of Truro is located 6km from the proposed site, with good bus links. The centre of Truro has facilities for the community including a library, the Cathedral and an extensive mix of shopping areas and high streets.

The site is 3km west of the Royal Cornwall Hospital, which is located on the northern side of the A390.

The Truro and Penwith College is located near the Royal Cornwall Hospital but to the south of the A390.

There are a number of schools near the site, within Threemilestone and Chacewater.



Truro Centre



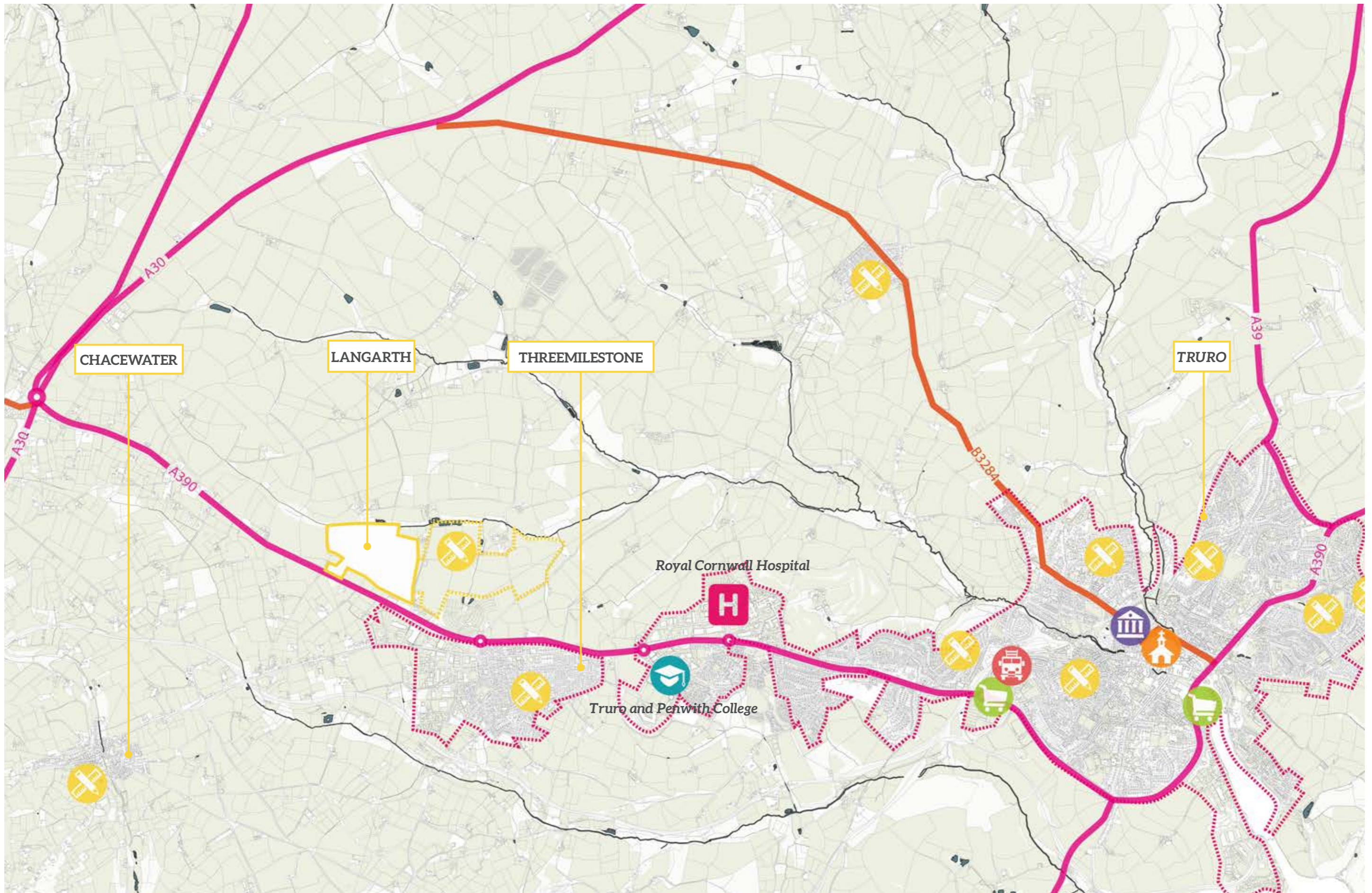
Lemon Quay

Key

- Site Boundary
- - - Settlement Boundary
- Langarth Masterplan
- A- Road
- B- Road

Facilities

-  School
-  College
-  Hospital
-  Superstore
-  Library
-  Cathedral
-  Fire station



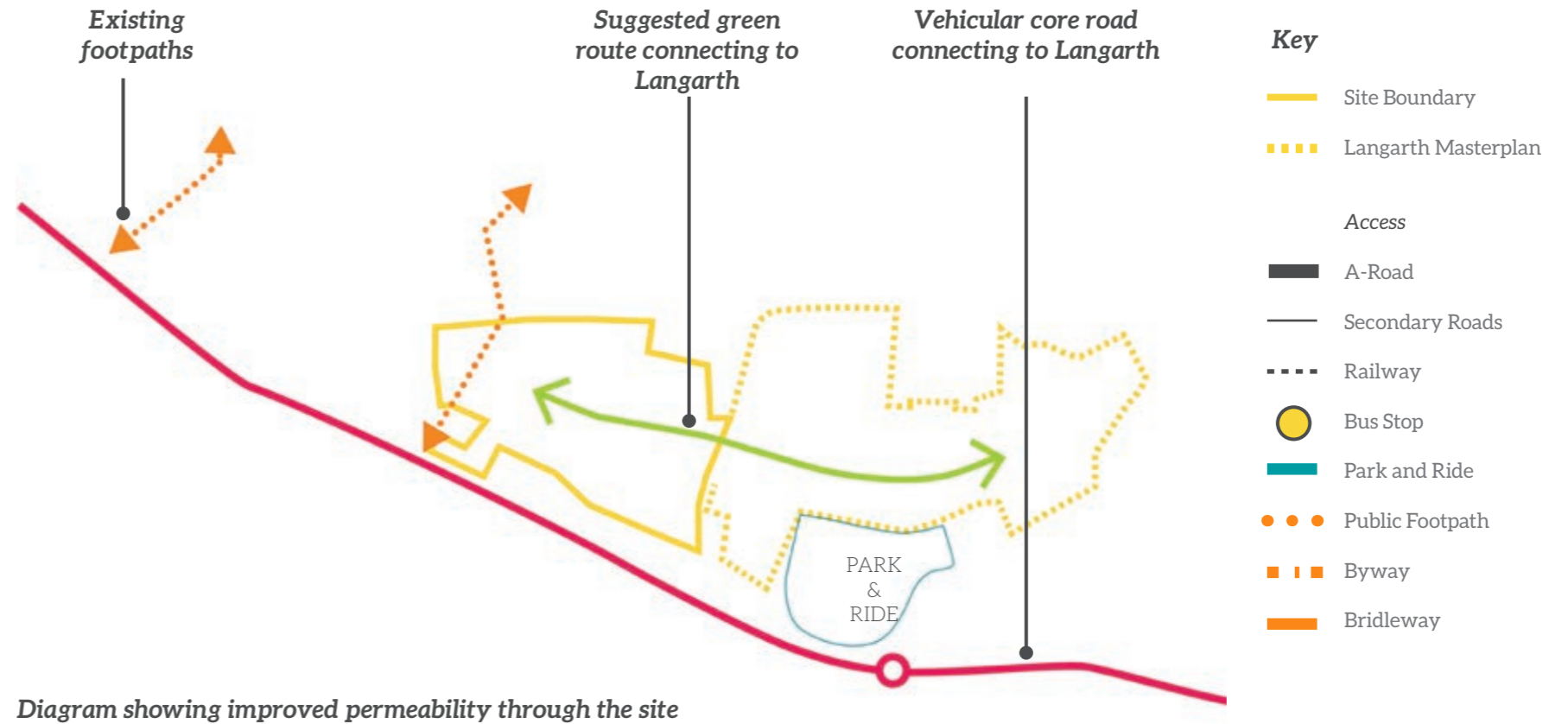
Facilities in and around Truro

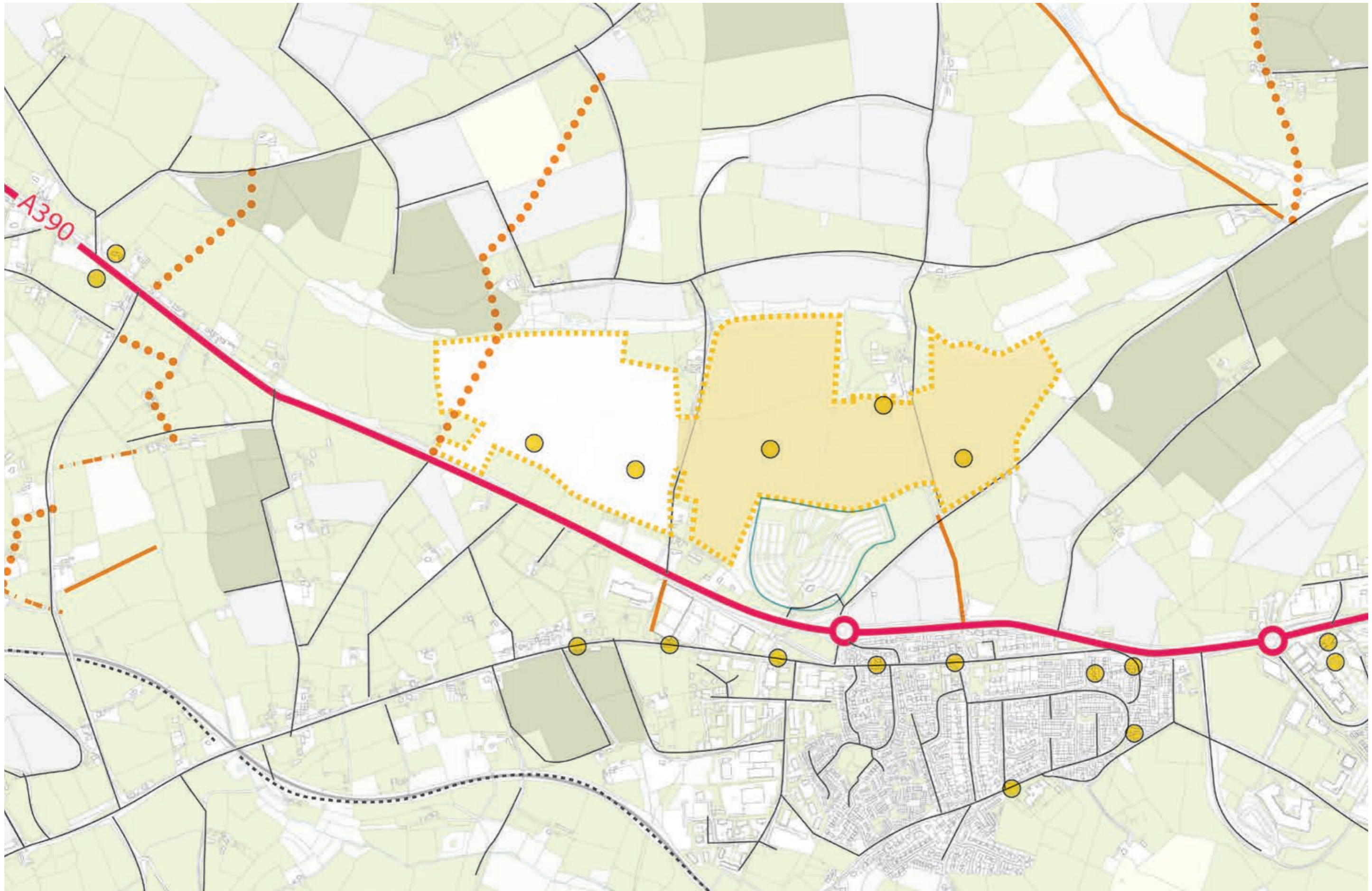
2.7. Access around the Site

The site lies close to two public footpaths, one running past the site's eastern boundary, and one running through the field to the west of the western boundary. As well as these, the scheme will look to provide a more permeable pedestrian access across the site (along the south north axis).

The site is located near Threemilestone which has a number of bus stops. There is also a bus stop to the north west of the site on the A390. These stops are the closest existing stops to the site.

As mentioned previously, the Park and Ride site is located to the south east of the site.





Access routes and public transport links around the site

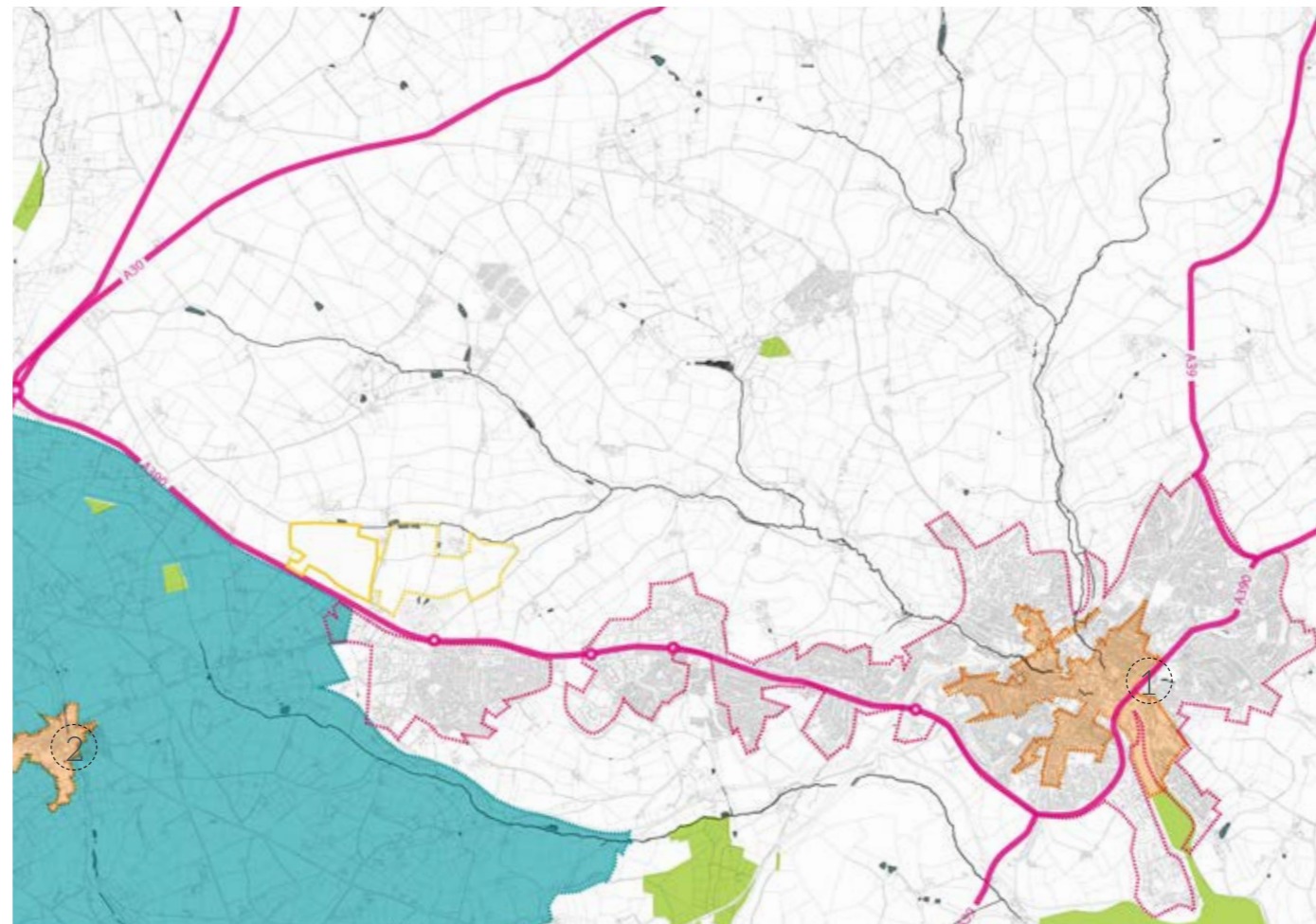
2.8. Heritage

The site is situated within a wider landscape with considerable heritage value. Key considerations in the wider area include the northern limits of the Cornwall and Devon Mining World Heritage Site (WHS) Gwennap Mining District, the sites of two scheduled monuments (comprising three round barrows in total), two listed milestones and a listed farmhouse. All of these are situated within 1km of the site.

A grade II listed milestone (NHL 1136637) is located within the south western part of the Application Site boundary. Current development plans would require the repositioning of this designated heritage asset which would require Listed Building Consent from the Local Planning Authority as part of the planning application. In order to minimise the impact of this repositioning, the milestone would need to be moved perpendicularly back as opposed to further along the road in order to preserve its mileage statement, and its current spatial arrangement will need to be re-established in the new location. The significance of the milestone strongly relates to its functional relationship with the road and development proposals relating to the milestone would need to maintain this relationship. However, the repositioning of the milestone should result in less than substantial harm to its significance.

The Application Site boundary extends southwards to encompass the line of the A390 highway. Proposed development in this area comprises the widening of the road and the creation of a new junction to access the Application Site. This development will take place within the current carriageway and on the northern verge and will therefore have no direct impact on the WHS. Site inspection confirmed that local topography, existing vegetation from field/enclosure boundaries and along the A390, and previous development along the A390, effectively screen the remainder of the proposed development. As a result of the proposed development's position set back from the A390 and the presence of dense hedges and tall earth banks, views of the proposed development within the Application Site would also be restricted from the northern boundary of the WHS. Also the Application Site is only a small element within the diverse wider landscape surrounding the WHS. Given the above, and the fact that the proposed development would not affect any of the elements which make up the outstanding universal value of the WHS, only a negligible impact would arise as a result of the proposed development.

The listed buildings and scheduled monuments further afield are effectively screened and sufficiently distant that the proposed development would not result in more than a negligible effect to their significance.



Key:

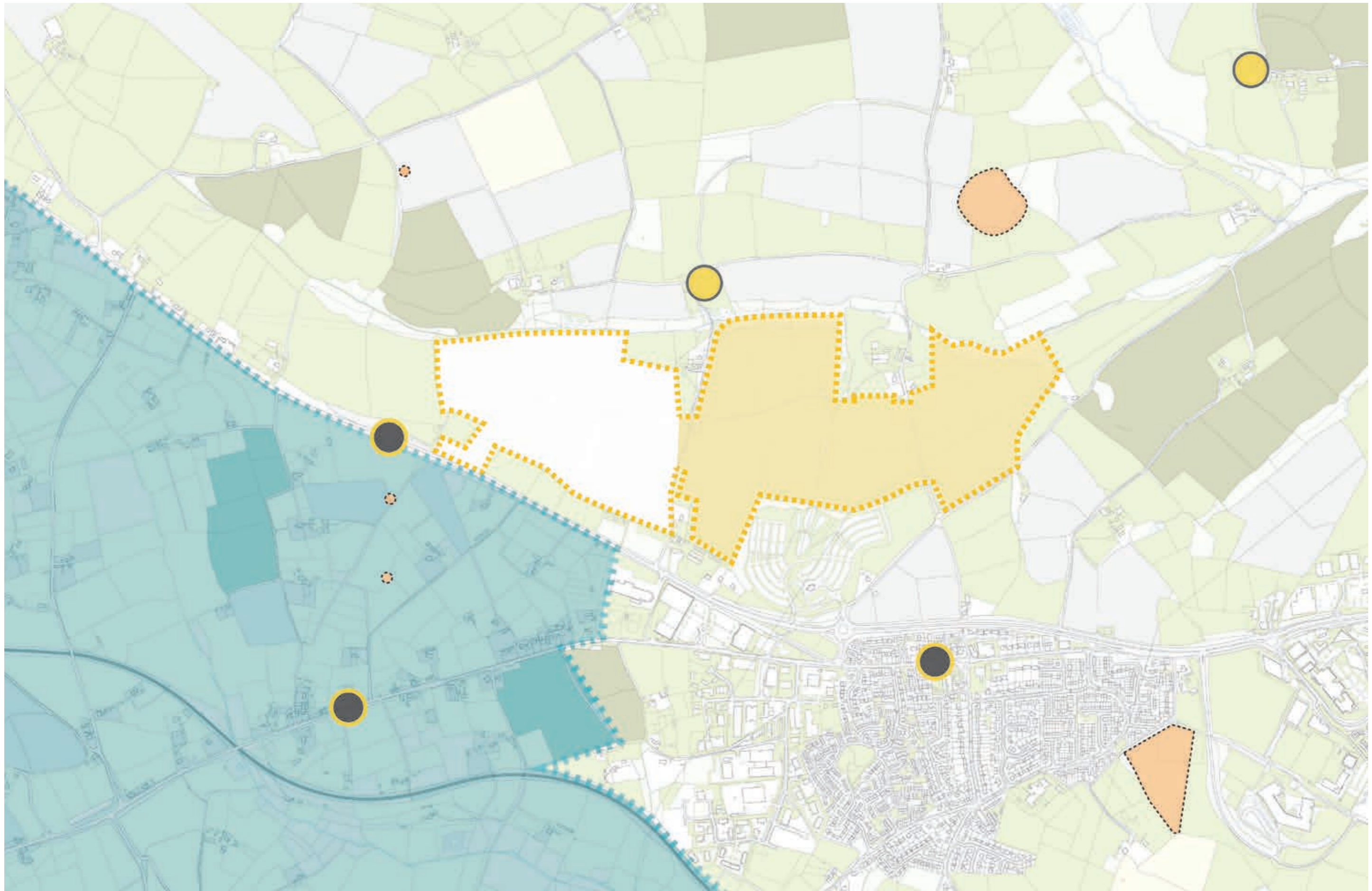
- Site Boundary
- - - Settlement Boundary
- - - Langarth Masterplan
- Heritage**
- Scheduled Ancient Monument
- Grade II Listed Building
- Grade II Listed Milestone
- World Heritage Site
- Conservation Area
- 1 Truro Conservation Area
- 2 Chacewater Conservation Area
- Site of Special Scientific Interest

Heritage and environmental designation around Truro

Non-designated buried archaeological remains are known in the wider area around the Application Site, and limited cropmarks are situated within the Application Site, which may represent evidence of Prehistoric activity. However the extent of cropmark activity within the Application Site is limited when compared to that in the wider area, and indicates that potential is focused on a relatively small area in the south western part of the Application Site and limited cropmarks are recorded within it. Subsequent geophysical surveys have been conducted within the Application Site, the results of which have not corroborated the presence of previously noted cropmarks, although other below ground anomalies of potential archaeological origin have been recorded, albeit the character of these suggest they likely represent evidence of former land use and/or associated activity

of Medieval to Modern date of limited local importance.

On the basis of the results produced by the geophysical survey on the Application Site and the limited archaeological interest identified within it, a further programme of archaeological works phased ahead of development has been agreed with the local planning authority in order to secure the record of this archaeological interest further as an appropriate mitigation response to off-set the impact of development.



Heritage designations around the site

2.9. Landscape Character

The site forms part of Langarth Farm.

Existing vehicular access into the site includes two narrow lanes, both running on a north south axis through the site. One in the eastern half of the site, the other in the western half.

A Public Right of Way crosses the most north western field diagonally. The majority of the site's perimeter and internal boundaries (with the exception of much of the northern boundary) consist of Cornish hedges. The vegetation on the Cornish hedges varies between sections, some having low scrub and grasses no more than 1 m above the earth and stone construction, while some have shrubs and broad-leaved trees up to approximately 20 m in height.

A narrow, shallow stream runs beyond the northern boundary of the site, eastwards along the wooded valley bottom. Two fishing lakes are located within the wooded stream corridor, close to the site. Drainage ditches are found on the site running along the northern edges of the fields adjacent to the stream and along the northern part of the far eastern boundary.

Several overhead electricity cables cross the site, including a major high voltage power line running north eastwards through the site from the Park & Ride.

The site is surrounded by a mix of mainly pasture and arable fields to the east, north and west. Enclosed on three sides within the northern part of the site are the separate hamlets of West Langarth and Langarth both with properties within 20m of the site. To the south of the central part of the site is the Langarth Park & Ride for Truro. West Langarth Bungalow also lies on the site's southern boundary. Rosedene Farm accommodates some shed-style business units that abut the southern edge of the site.





3



4



5





3. Urban and Architectural Context

3.1. Surrounding Consented Developments

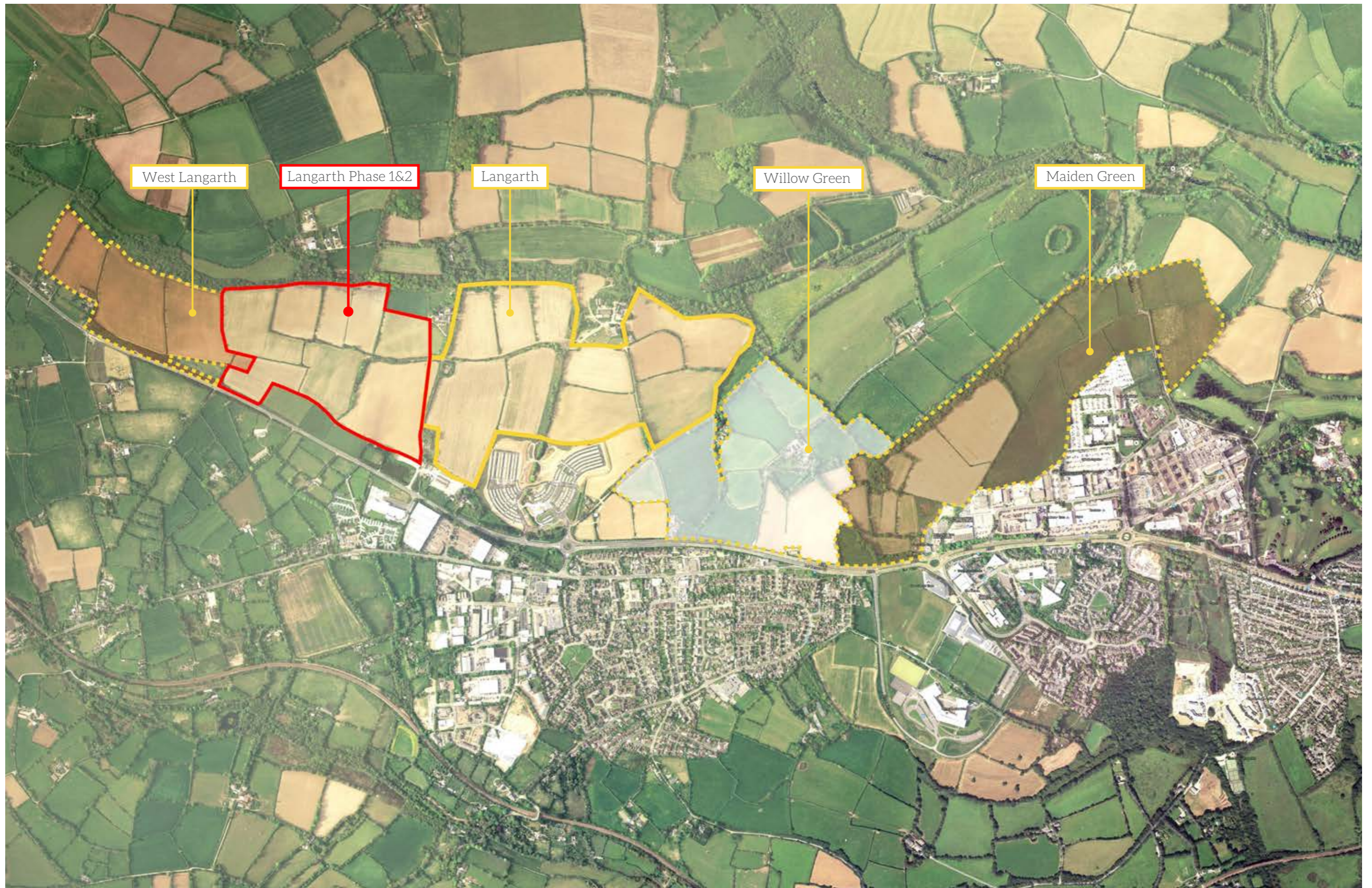
This page illustrates the approximate land area of the proposed development of neighbouring sites along the A390 corridor. The combined proposals will result in an entirely new settlement area linking the Park & Ride to the Royal Cornwall Hospital and beyond.

As part of our proposal we have looked at the broader overview of how connections and access across the 3 developments could be fostered to avoid duplication of facilities and to encourage sustainable links.

A strategic highways opportunity exists to connect the Langarth proposals with the adjoining land holdings to the east (potential development sites) via a new northern link road, helping to potentially relieve traffic congestion along the A390 and provide for a faster, more efficient public transport service along the existing road network to the Royal Cornwall Hospital.



Views from current site across surrounding countryside



Satellite view of the Langarth site and nearby consented schemes

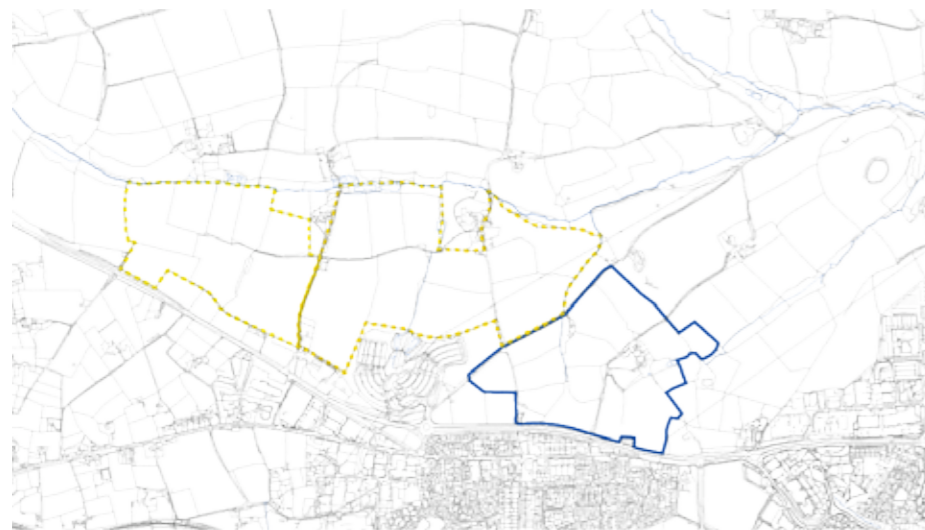
3.1.1. Willow Green

Planning Application Ref: PA13/10454

Willow Green is an outline planning application with some matters reserved for a proposed mixed use development comprising 435 dwellings, a nursing home, school, food store, petrol station, community hall, public house and public open space.

The scheme is located to the east of the Langarth boundary, and adjoins phase 5 of the Langarth outline plan.

The Willow Green site would provide a section of the NAR linking Langarth to the adjoining site (Maiden Green).



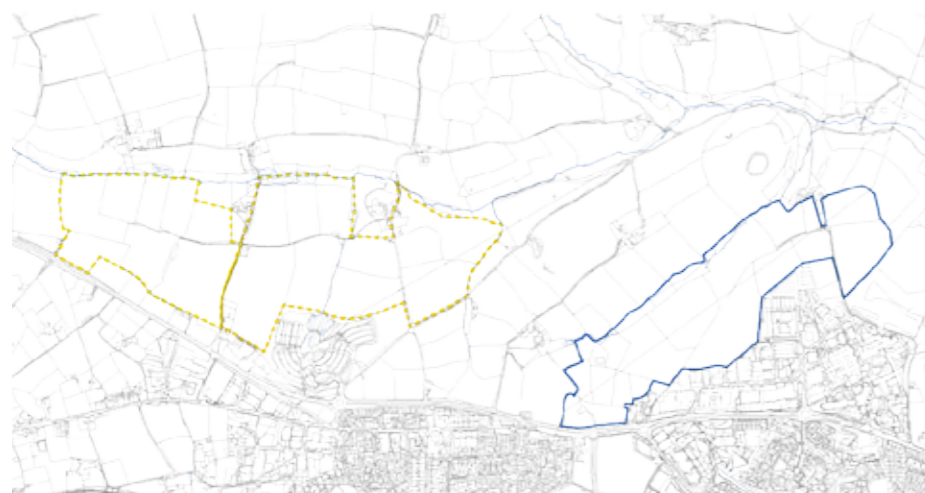
Indicative plan of Consented Scheme Willow Green

3.1.2. Maiden Green

Planning Application Ref: PA14/00703

The Maiden Green application is a hybrid planning application comprising in outline up to 515 dwellings (including extra care), a school, employment space, convenience shop, community pavilion, infrastructure works, landscaping and public open spaces; a district centre including supermarket, petrol station, retail units, community hall, restaurant/cafe uses, hotel, creche, medical centre, mobile library parking, parking and servicing, and in detail access from the A390, the Northern Access Road and connections to Penventinnie Lane within the Royal Cornwall Hospital, including Environmental Impact Assessment.

This scheme provides the final section of the NAR and links Langarth and Willow Green to the Hospital.



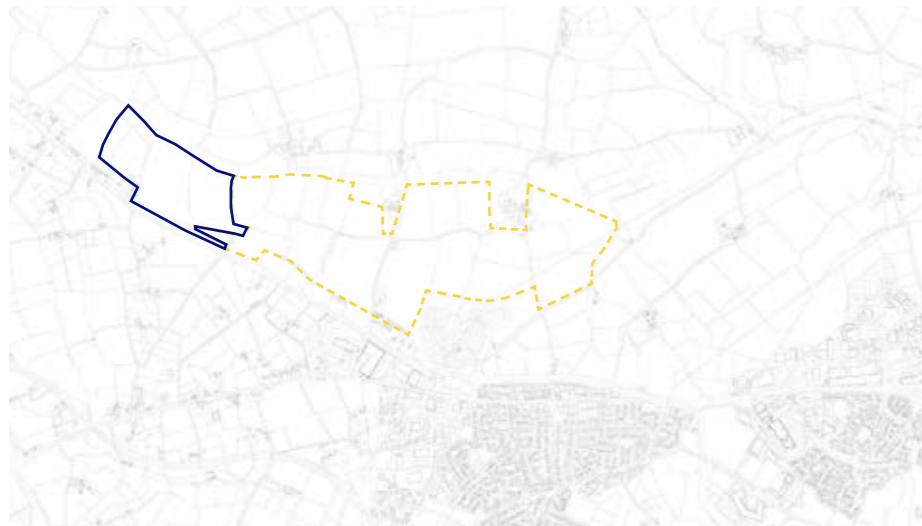
Indicative plan of Consented Scheme Maiden Green

3.1.3. West Langarth

Planning Application Ref: PA14/08092

West Langarth adjoins the Langarth Phase 1. It is an outline mixed use proposal for retail with associated petrol filling station and car parking (providing space for mobile library), food and drink, day nursery and residential alongside the provision of a community and sports facility, public open space (including formal playing pitch provision), and other associated infrastructure (inclusive of linkage to consented Langarth/Stadium sites).

The proposal for West Langarth related and integrated to the Langarth Farm consented outline scheme (Ref: PA11/06124).



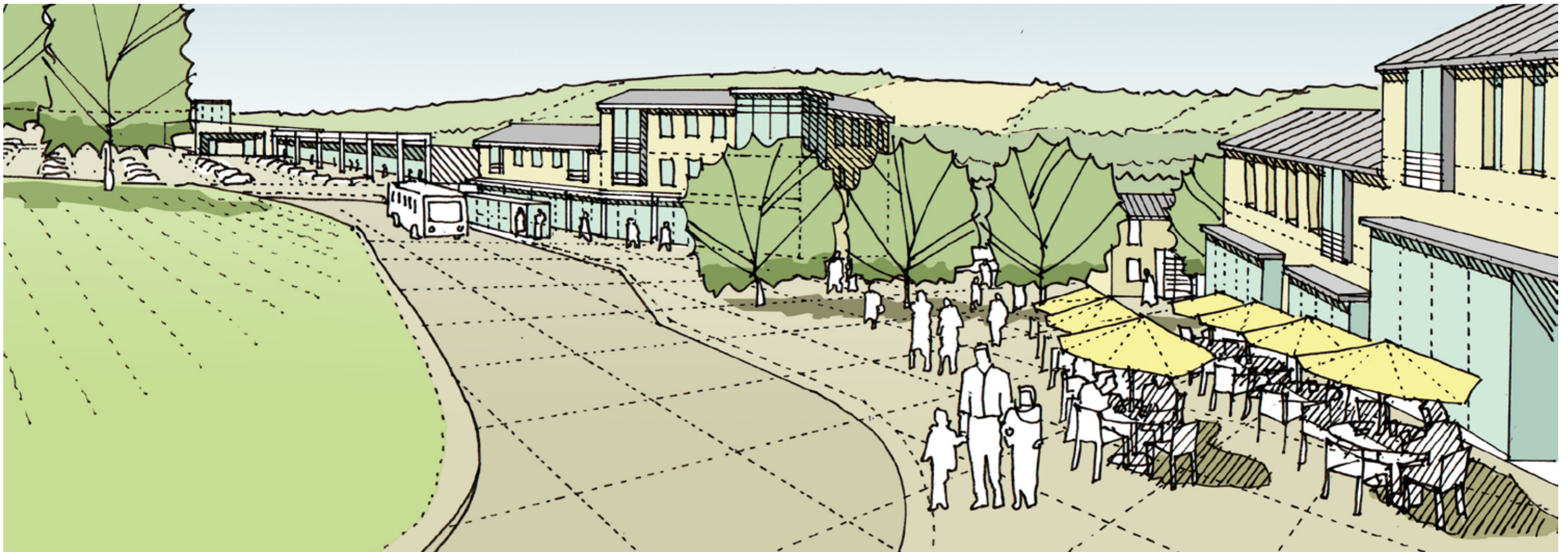
Indicative plan of Consented Scheme West Langarth



Indicative sketches of consented scheme for West Langarth showing the sports pitches and food store



Indicative sketches of consented scheme for West Langarth showing the sports pitches and food store



Indicative sketches of consented scheme for West Langarth

3.2. Significant Local Buildings

There are a number of key buildings in the surrounding area providing important facilities to the site. Threemilestone industrial park and retail park, located to the south of the site, offer a number of employment opportunities.

Richard Lander secondary school, Truro College and Truro Leisure Centre are located approximately 2km from the site and are accessible by safe on and off road pedestrian/cycle routes. Park & Ride bus services also operate to the bus stops situated on the A390 at the Truro College/A390 roundabout, from which it is a short walk to the secondary school, college and leisure facility.

Royal Cornwall Hospital and the adjacent retail park and industrial estates are located approximately 2km west of the site. A direct shuttle bus operates between the Park & Ride and the hospital, available to all employees, patients and hospital visitors. Safe walking/cycling routes are also available, complemented by the controlled pedestrian crossing facilities at the hospital/A390 roundabout junction.

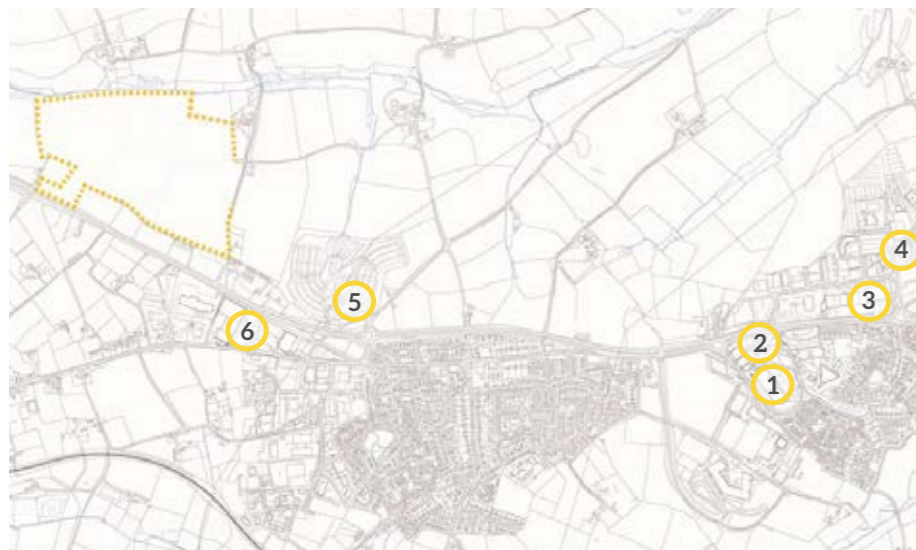
The proximity of the Park & Ride to the Langarth site provides sustainable travel to the centre.



1 Truro College



2 Truro Leisure Centre



1. Truro College, with Richard Lander secondary school and Truro Leisure Centre located nearby.
2. Truro Leisure Centre.
3. Retail Park.
4. Royal Cornwall Hospital.
5. Park and Ride.
6. Threemilestone industrial park and retail park.



3 Retail Park



5 Park and Ride



4 Royal Cornwall Hospital



6 Threemilestone Industrial and Retail Park

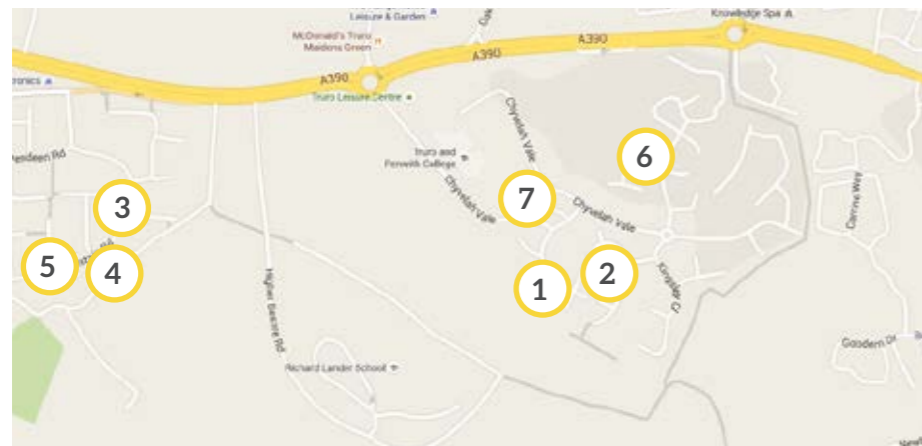
3.3. Local References

Apart from the consented masterplan for Langarth, Threemilestone is the most significant development close to the site.

The vast majority of development is post war though there are some older rubble stone groups of terraced cottages. Threemilestone comprises two thirds residential and one third industrial estate with a school and other local facilities.

The street network mainly reflects the planning patterns of the post war period with highways designed to ease access for cars and other vehicles, adoptable footpaths and pockets of residences served by cul-de-sacs. Existing links to the new Park & Ride across the A390 are currently poor. The residential built form is nearly all 2 storeys with some streets of bungalows. Density varies from 20 per hectare to 30 per hectare, this fairly uniform character results in very little hierarchy to the streets and visually the residential area has the appearance of a fragmented housing estate rather than a village or garden suburb. Some later smaller developments respond to recent PPG3 guidelines on density and design guidelines.

The employment areas are a mix of some smaller older units with double pitch roofs that have painted sheet or brick walls; 1980's style units with a reconstituted stone base and profiled metal sheet; and the neat and tidy Threemilestone Retail Park which is a group of external steel frame units with metal cladding of a unified design. The units are mainly set back from the road and do not address the main street, the more recently constructed units having good landscaping with grass verges and rubble stone walling.



1 Streets of bungalows



2 Semi-detached brick



3 Steep sloping roofs



4 Entrance canopy



5 Changes in materiality add variety to the street elevations



6 Eaves typically run parallel to street



7 Street elevations are typically stone, render or weatherboarding

3.3. Local References

Residential Materials Palette

The palette of materials used within Threemilestone are generally considered to be not particularly distinctive when compared to nearby traditional settlements and this reflects its predominantly 20th century character. In summary the materials can be characterised as follows:

Walls: Older properties are painted rubble stone. Post war residential areas are mainly render with some rubble stone and some reconstituted rubble stone. There are some examples of tile hanging but these reflect the late 1970's style of the houses rather than being typical of the area. (Slate hanging is more commonly seen in the more traditional villages). There are some examples of red brick. Changes in materiality are used in some areas to animate the street elevation.

Roofs: Slates and concrete tile.

Boundaries: There is a fairly consistent use of low rubble stone for front boundaries to properties and these work very nicely. Other front boundaries such as decorative railings on low walls or fences are less successful.

Residential Built Form

The majority of residential properties in this area are two storey, with the bulk of the dwelling's mass having the eaves parallel to the street and the gable elevation perpendicular to the street as seen in the two examples to the right. Gable ends are seen but mostly as a secondary mass such as a garage or to break up the main mass of the dwelling.



Analysis of built form



Analysis of built form





4. Constraints and Opportunities

4.1. Technical Constraints

As with any development, it is crucial that a thorough understanding of the site is obtained. This understanding then has to be balanced with the proposed use. Following the undertaking of these processes, the opportunities for the site and subsequent realisation of the overall vision is achieved.

By analysing the site information, the following items are considered as the primary constraints for the site:

The Steeply Sloping Topography

The topography gives this site a distinct character; therefore, it is vital to retain the character of the sloping land and the natural valley.

Landscape

The Cornish hedges, which demarkate the field boundaries, are an important feature of this site, and as such must be preserved as much as possible. It is also vital to minimising the loss of important trees.

Geology

The site is steep in areas with much of the 'developable' land at gradients greater than 1:8, but the underlying level of rock is close to the existing surface.

Ecology

Careful consideration must be given to the existing environment and species on the site. Where possible, the existing biodiversity must be sustained and enhanced. The appropriate mitigation must also be provided to avoid any biodiversity loss.

Watercourse

At the base of the site is a 'blue' corridor. The ecological value of this, as well as the tranquility it provides to the site must be protected, and where possible enhanced.

Flood Risk

A comprehensive rainwater drainage scheme must be designed to protect the site from flood risk and ensure no knock-on effects.

Local Character and Identity











The scheme will need to reflect the character and built form of the area.

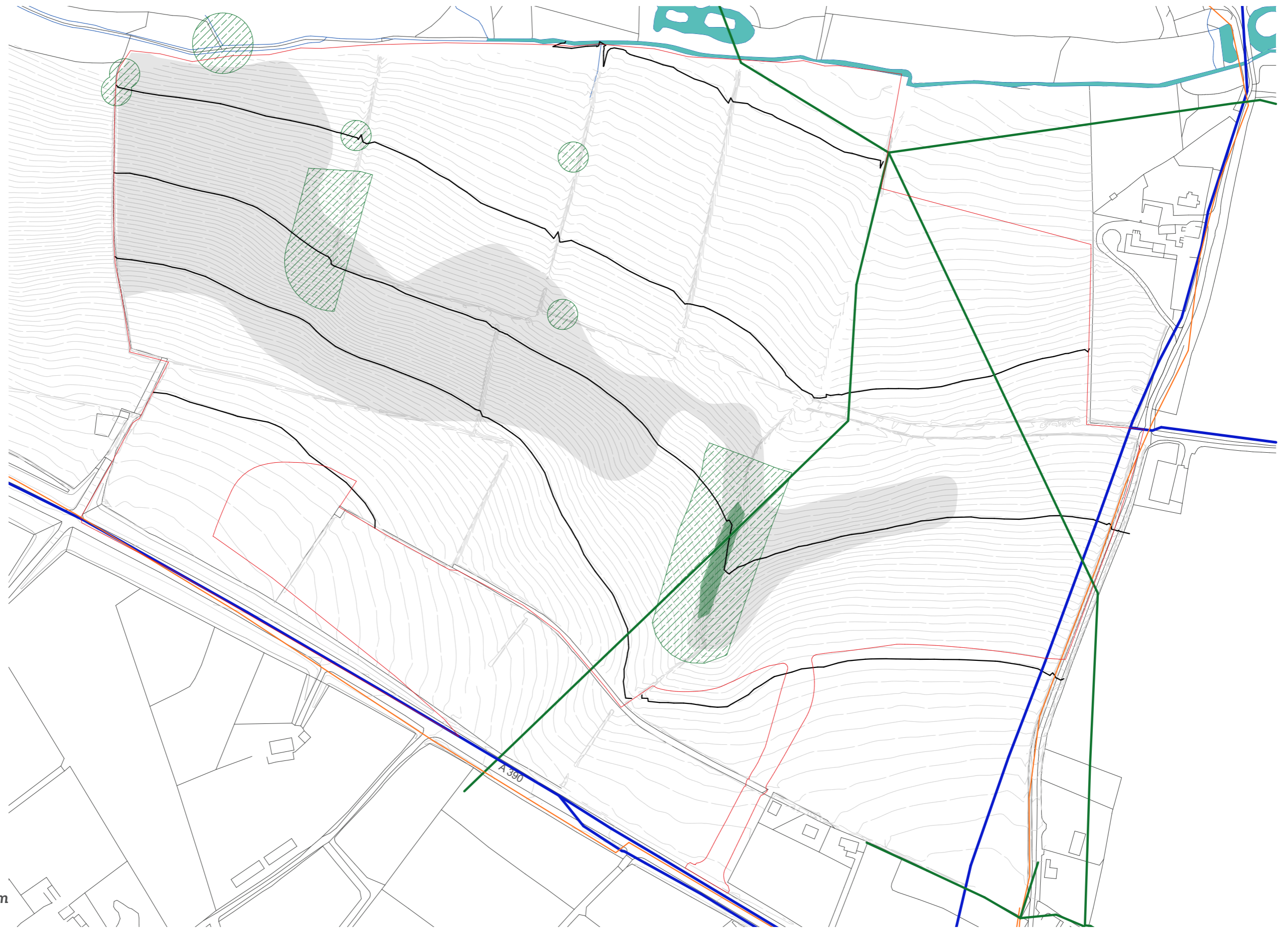
Transport

A suitable road network will need to be designed to minimise impact on existing surrounding roads. The consented NAR design needs to be adhered to.



Key:

-  Site Boundary
-  Existing Trees and Hedgerows
-  Buffer Zones for Hedges, Tree Belts and Woods
-  Ecological Mitigation Area
-  Stream
-  Overhead Electric Line
-  Water Main
-  Overhead BT Line
-  10m Contour
-  Gradient steeper than 1:8



Site Constraints Diagram
1:2500 @ A3

4.2. Opportunities

Based on the constraints of the site and content of development, the following design opportunities exist:

Urban Design and Housing

- Create attractive places to live with a clear sense of place by using the opportunity of the sites natural landscape and assets to create a distinct setting for the proposed residential character areas.
- Create a development that responds to the morphology of traditional local settlements particular with regards to the topography.
- Provide a mix of housing types including affordable housing types and family houses with gardens for local people.
- Use distinctive and, where possible, locally sourced materials.

Landscape and Ecology

- Create a scheme that responds to the existing contours, which will minimise the need for ground remodelling.
- Retain, maintain and enhance the stream corridor along the northern boundary which can act as a feature in the scheme.
- Enhance the biodiversity value and ecological functioning of the hedgerow network by establishing appropriate vegetated buffers.
- Bring forward a design that retains the high quality trees and hedgerows within the layout ensuring their long term survival and maintenance.
- Provide a variety of public open spaces for recreation and leisure, using the existing topography and landscape to influence the locations for these areas.

Pedestrian Access

- Retain the network of existing lanes on the site to encourage local travel by non car means: walking and cycling.
- Retain existing Public Rights of Way that connect the site to the wider countryside and surrounding areas.
- Create a 'green' corridor along existing hedgerows, to allow for a pedestrian route that runs along the east-west axis.

Vehicular Access

- Provide a scheme with vehicular routes through the site which respond to the topography and natural contours.
- Provide a clear street hierarchy.



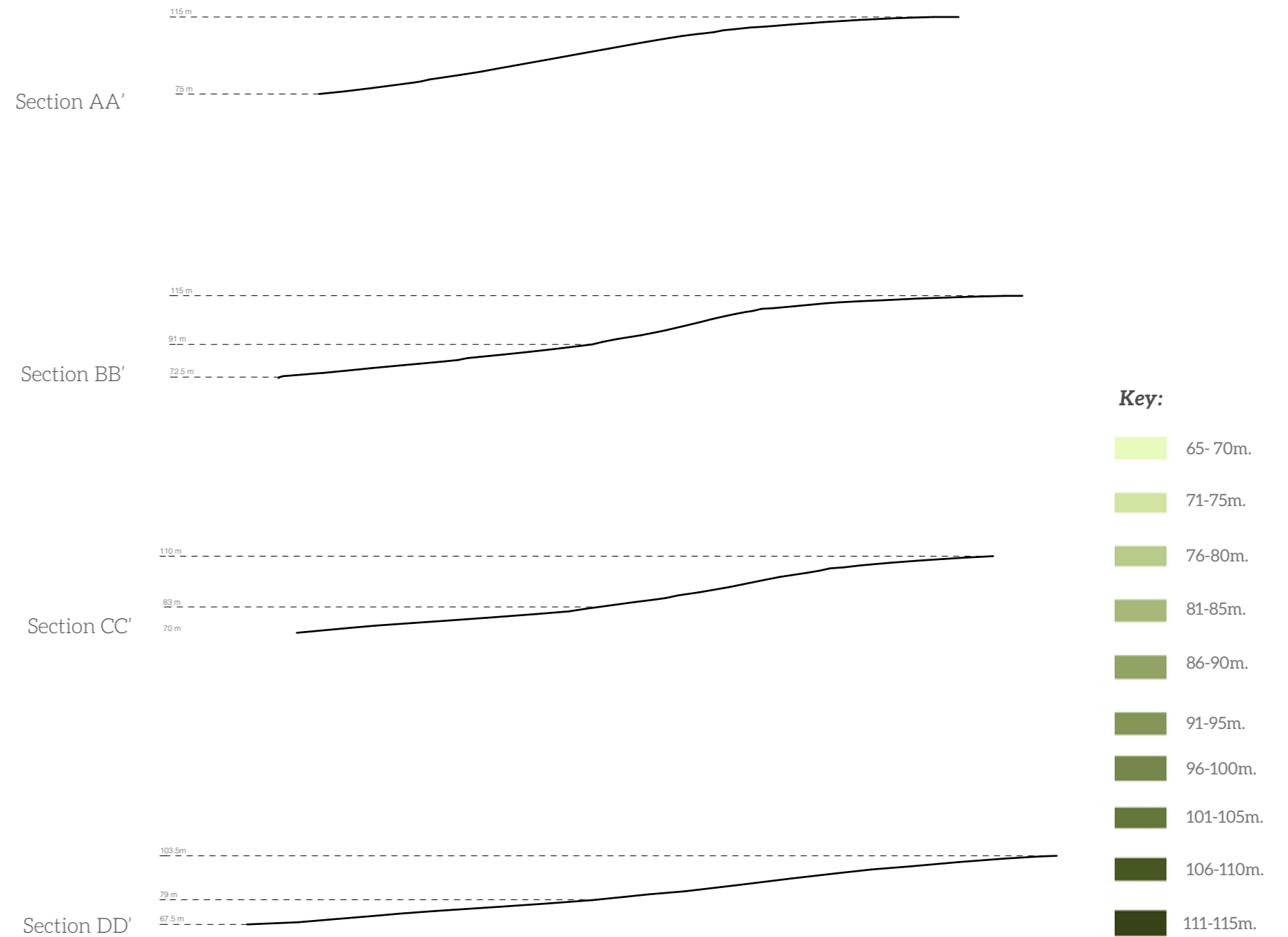
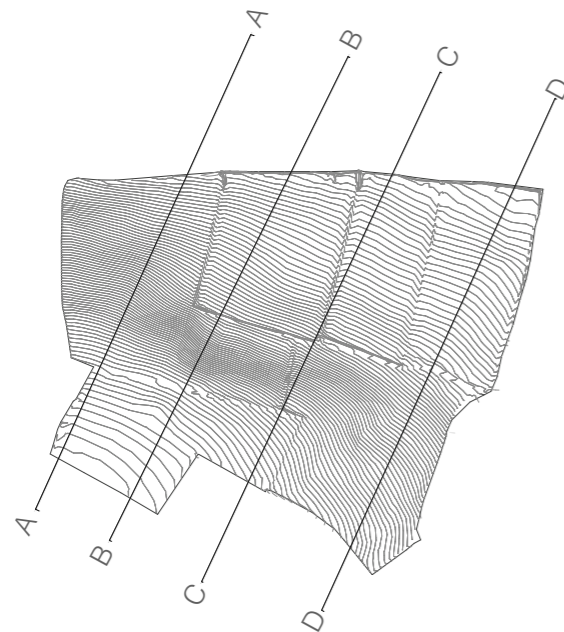
Key:

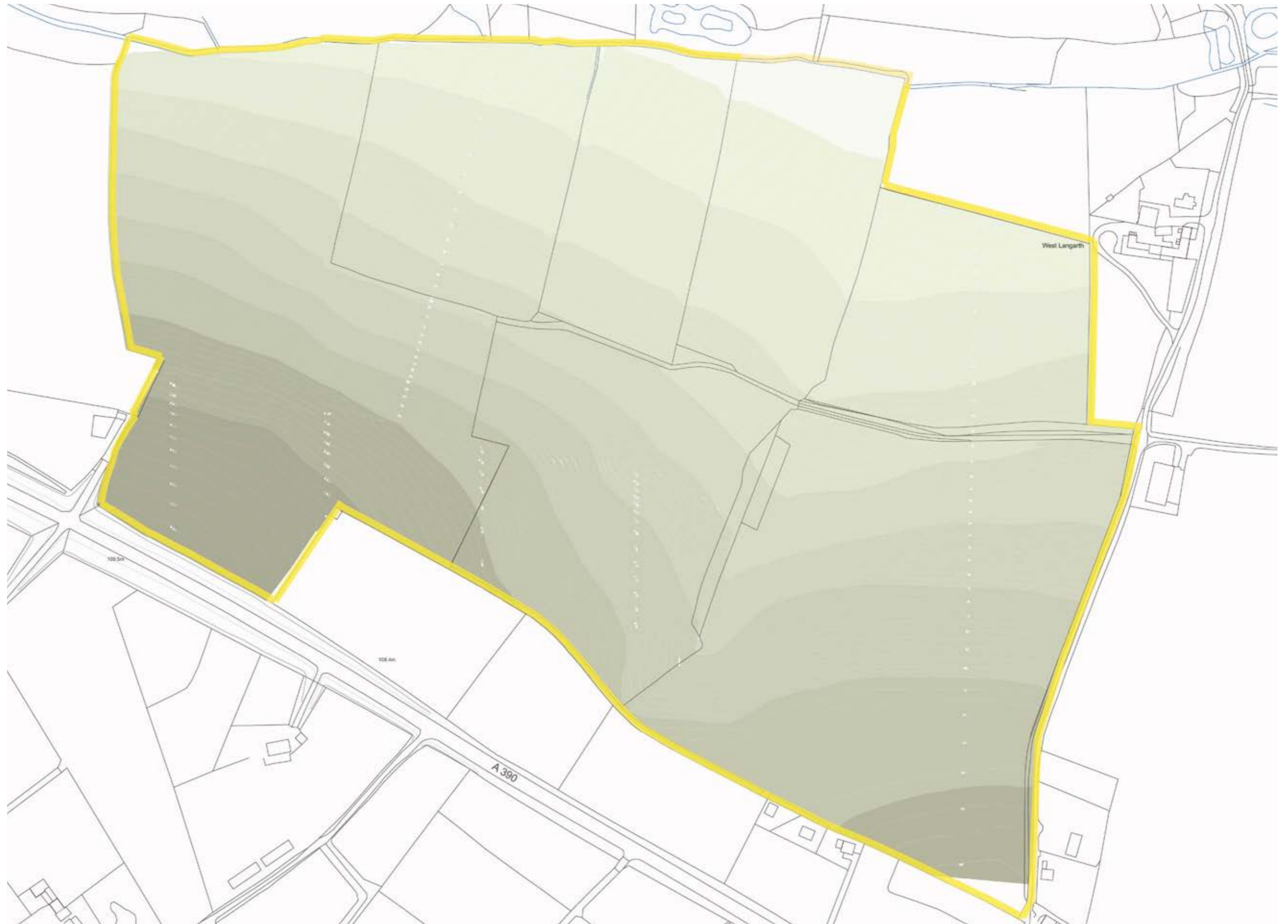
- Site Boundary
- Vehicular Access
- Pedestrian Access
- Stream
- Hedgerow
- Green Space
- Existing Trees
- Views

4.3. Topography

Across the whole Langarth site from the A390 from the south to the River Kenwyn in the north, the site drops around 40m.

One main natural feature within the topography is the natural north south running concave hollow that extends from the centre of the Park & Ride down the slope past Langarth Farm to the River Kenwyn. This is only really apparent from the lane that runs along the northern boundary of the site and is a clear feature at eye level and on the contour plan. While parts of the site have a gentle fall, other areas have a significant cross fall of around 1 in 5 and require a design solution that resolves and integrates the requirements of inclusive access and amenity.





Topography Diagram
1:2500 @ A3

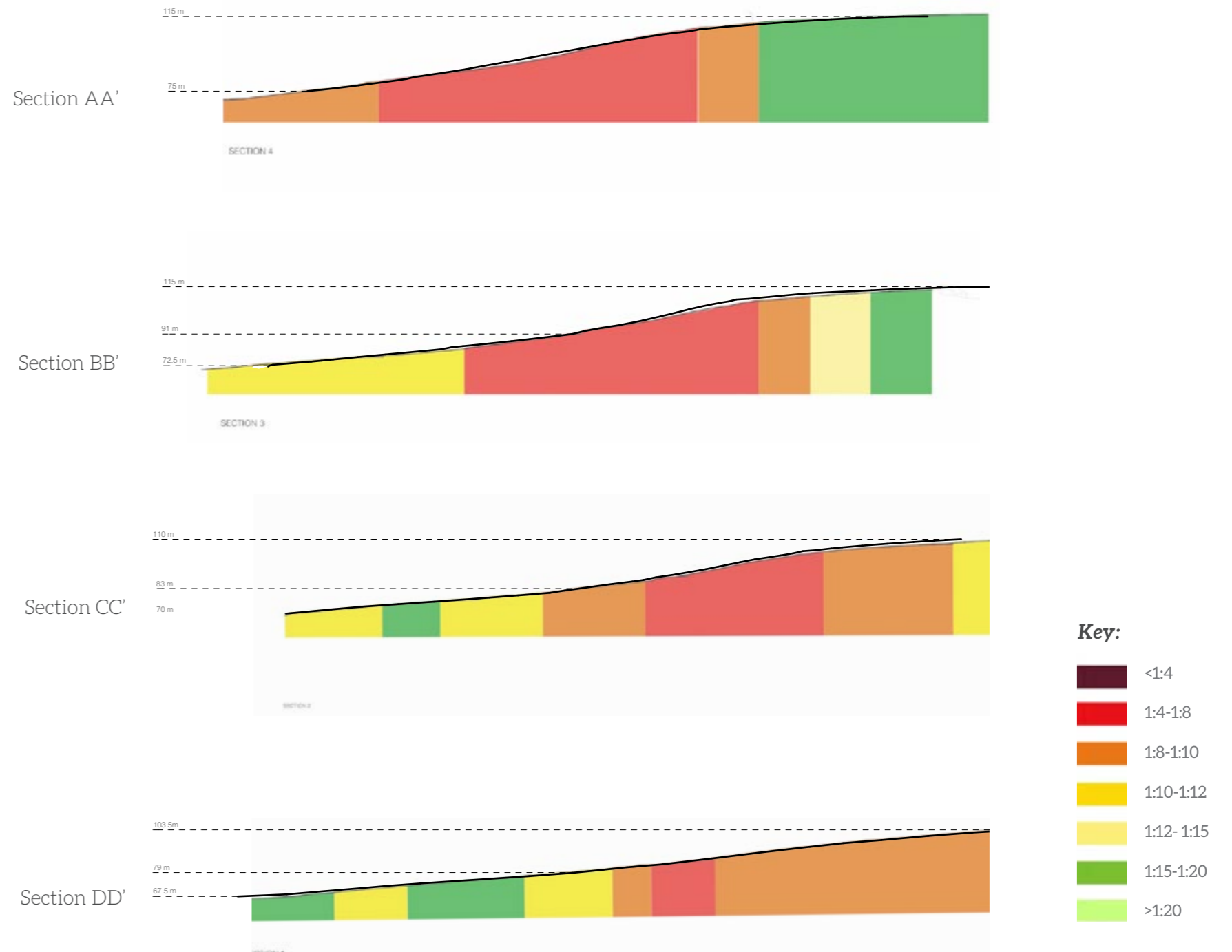
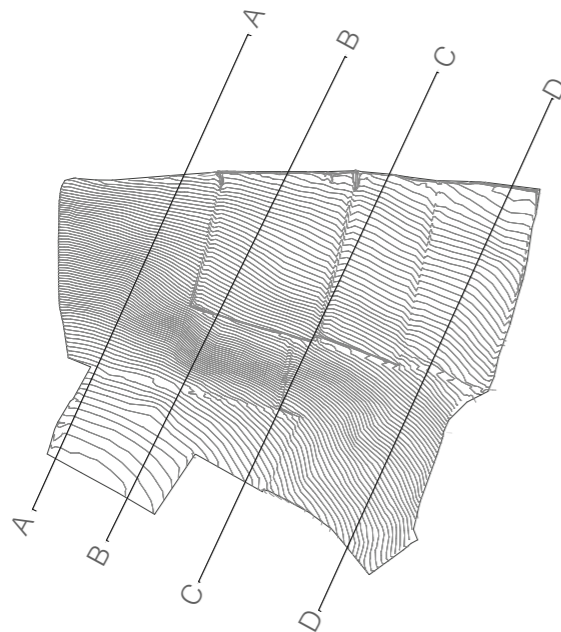
4.4. Slope Gradient

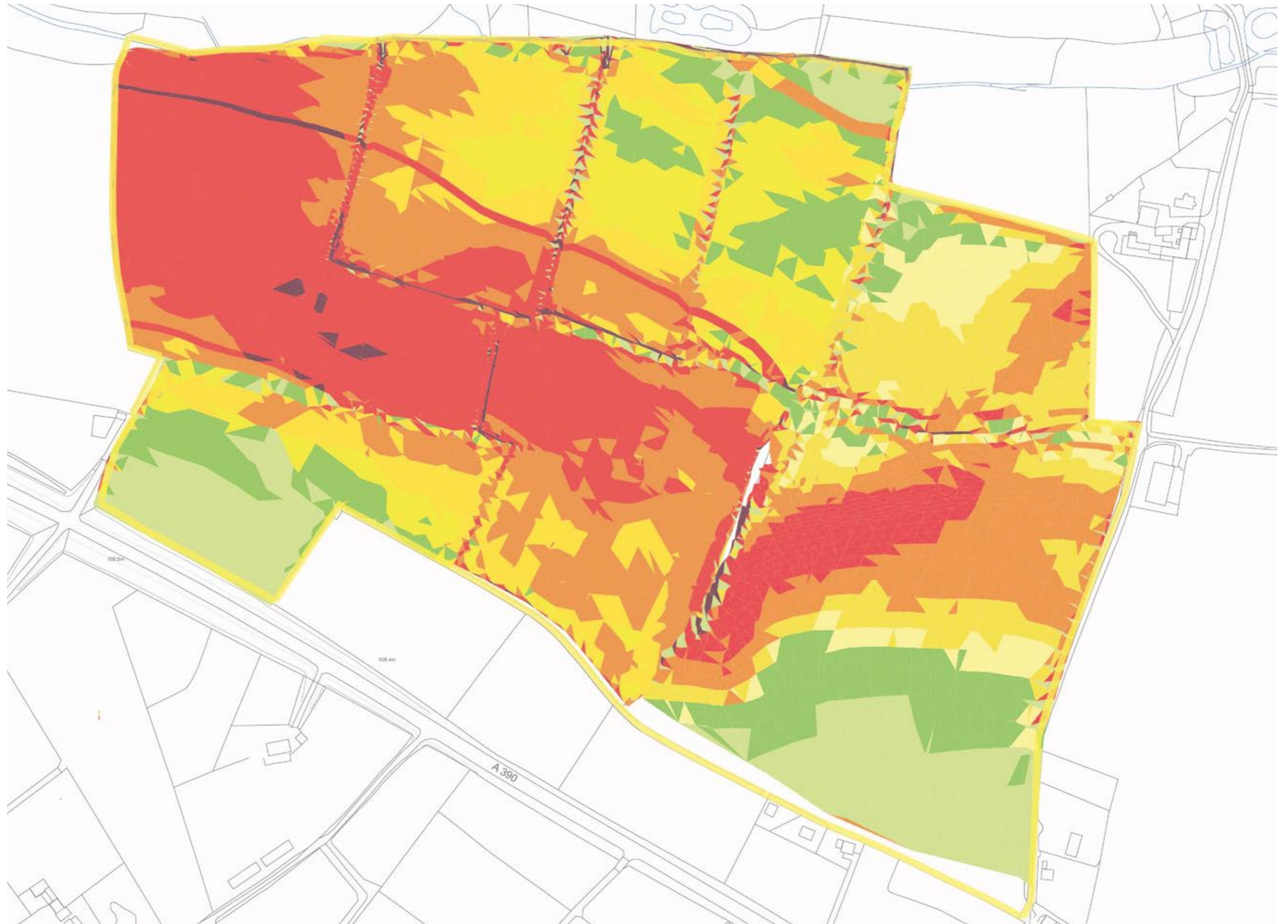
The varied and steeply sloping topography at Langarth presents unique design constraints and opportunities which need to be addressed within a successful design. The approach to working with the natural topography has the advantages of providing a development that:

- Is distinctive to its setting.
- Reduces transportation to fill and form the site and associated costs.
- Reduces the need for large scale retaining structures and associated costs.
- Enables natural features such as trees and hedgerows to be better preserved.

Strategy

- Utilise split level buildings to take up extreme level changes.
- Utilise a series of low retaining structures and banks within gardens in preference to a single high and visually dominating retaining wall.
- Avoid unusable steeply sloping gardens by use of terracing or split level buildings. Ensure gardens have usable space at gradients of around 1:10 or better.





**Gradient of the Site
Diagram**
1:2500 @ A3

4.5. Ecology (Flora)

The original Phase 1 Habitat survey and subsequent revision work in spring 2015 recorded several UK BAP habitats within the Reserved Matters and wider survey area; notably mixed broadleaved woodland, wet woodland, marshy grassland and a watercourse (the Langarth Stream, which forms the northern boundary of the site).





Habitats with the most importance for wildlife are the species-rich hedges and wooded habitats; in particular those along Langarth Stream. Many field margins in the west of the Reserved Matters area comprise Cornish banks with species-poor scrub, such as Gorse and Bramble. In contrast, the hedges either side of the central 'green lane' are well-structured and species-rich, with tree species including Oak, Ash, Hazel, Blackthorn and Hawthorn.

Most fields are managed under arable rotation; often for daffodil cultivation, but also with cereal crops. Whilst arable habitats were considered to be of generally low importance for wildlife, arable field margins are a BAP habitat and these can at certain times of year provide valuable foraging habitat for birds, particularly during winter (see 4.6 below). Some arable margins provide habitat for notable plant species - for example the nationally scarce wavy St. John's-wort was found in small patches of marshy-grassland along Langarth Stream during the 2010 surveys. This species is expected to persist here post-development, since the mitigation scheme includes retention of a damp grassland buffer strip along this watercourse.

The highly invasive, non-native plant species Japanese knotweed was recorded during the Phase 1 habitat survey and subsequently; the largest stand was found in the eastern section of the site (outside the Reserved Matters application area).



Key:

-  Proposed Ownership Outline
-  Buffer Zones for Hedges, Tree-Belts and Woods
-  Stream
-  Tree Belt Surrounding Site



Ecology Diagram
1:2500 @ A3

4.6. Ecology (Fauna)

Fauna

With the exception of the wintering bird assemblage, which is covered below, the fauna interest within this intensively farmed landscape is confined mainly to the network of hedges and wooded belts around field margins. These linear features provide breeding and foraging habitat for birds, linear navigational features and foraging habitat for bats, as well as foraging habitat and movement corridors for badgers. Wooded banks provide ideal habitat for construction of badger setts and Langarth Stream supports Otters, which is a European protected species. Otters use riparian habitats and the provision of a buffer along the northern edge of the site in the master plan design should enable Otters to remain unaffected by the development over the long-term. In respect of key receptors such as bats, breeding birds and badgers, many hedges and wooded banks have been retained and are expanded in places with a planted thorn buffer in the master plan design. The intention is that these features will continue to provide the same movement and feeding corridor function as at present, post-development.

Bats

Hedges and other wooded linear features provide routes through the landscape for bats, and some features – for example the central east-west 'green lane' – are clearly important corridors for these animals to move between roosting sites and feeding areas elsewhere within Langarth and offsite. As discussed above, the most important features have been retained in the scheme design and adjacent areas of development are carefully designed so as to enable dark conditions to remain alongside these corridors post-development, in order that bats can continue to use them.

The 2015 update surveys include a check of all trees within the Reserved Matters zone for potential bat roost sites; trees considered to have significant roosting potential have been subject to a climbing survey where necessary (2015). No tree bat roosts were found.

Badgers

Two main setts have been recorded in the Reserved Matters area as well as several currently active outliers, and the Langarth area is widely used by badgers. With only small areas of permanent grassland currently present at Langarth, hedges are likely to be important for foraging, as well as providing cover to enable these animals to reach richer feeding areas off-site. The master plan has taken these points

into account and, as well as ensuring that badgers can continue to move through the site post-development, appropriately sized buffers have been retained around the existing setts, such that there will be minimal requirement for licensed sett removal; the only sett that may require removal under licence is an active (as of October 2015) single-hole outlier sett on the north west corner of the Park and Ride; close to the point where the NAR enters it. In addition, the scheme includes provision of new and improved foraging habitat post-development; for example new community fruit orchards will be established, in part to provide replacement foraging for badgers. Given the adaptability of badgers and their success in urban environments generally, the local badger population here is expected to be retained in the long-term as a result of the mitigation measures incorporated in the master plan.

Otters

The presence of otters was confirmed during a survey carried out in spring 2011, when several sightings were seen at points along the Langarth Stream. Although no confirmed resting or breeding places were seen during the survey, the regular movement of otters along the northern boundary of the site is confirmed. Otters use riparian habitats and the provision of a wide buffer along the northern edge of the site in the master plan design should enable Otters to be unaffected by the development in the long-term.

Harvest Mice and Dormice

No dormice were identified during the survey, it is therefore likely they are absent from hedges at Langarth farm. A survey for harvest mice similarly failed to find positive evidence of their presence, although this is considered less conclusive because of the difficulty of surveying for this species.

Birds

Hedges at Langarth Farm are important for wintering and breeding birds and the varied wooded and scrub habitat present alongside Langarth Stream in particular provide excellent habitat for a variety of breeding species. Large flocks of wintering birds were also recorded feeding in arable fields during the surveys for the original planning application, including the nationally scarce species wood-lark in a small number of fields in the eastern part of Langarth Farm. Discussions are ongoing with Cornwall Council in respect of appropriate mitigation for this species.

Reptiles

While no species were recorded during the reptile survey, there are several independent and reliable reports of grass snake from locations close to the Langarth Stream. Although the movement of this species is likely to be confined to the stream corridor, individual snakes may use nearby hedge-banks for hibernation. Other widespread species of reptile, such as common lizard and slow worm may be present in very low numbers in other parts of the site, though the intensity of farming activity there is likely to confine them to the immediate vicinity of hedge-banks.

Key:

	Proposed Ownership Outline
	Badger Sett Protection Zones
	Existing Bat Roost
	Buffer Zones
	Tree-Belt



Ecology (Fauna) Diagram
1:2500 @ A3

4.7. Geology

The site is predominantly agricultural. Initial limited investigations were carried out for the new access junction and the alignment of the NAR. These identified refusal of excavations into shallow rock beds between 2 and 2.4m below

The desk study historical maps verify the agricultural land use.

The ground conditions encountered during the intrusive investigation were generally in accordance with the published geology and the results of the previous investigations undertaken by CGL. Topsoil was encountered across the site which was underlain by the Weathered Porthtowan Formation, comprising generally of sandy slightly gravelly silt grading into medium dense silty sandy gravel.

Initial trial pits identified refusal at rock depths of 2.1 to 2.4m depth using standard excavation plant. Due to the extent of excavations associated with earthworks cut and fill on a steep site a 20 tonne excavator was used for further trial pits and rock refusal was at depths of 2.5m down to 3.5m depth with the larger plant.

Based on the site investigation works to date the existing site is not contaminated and the proposed development represents no risk to human health or the aquatic environment.



Testings

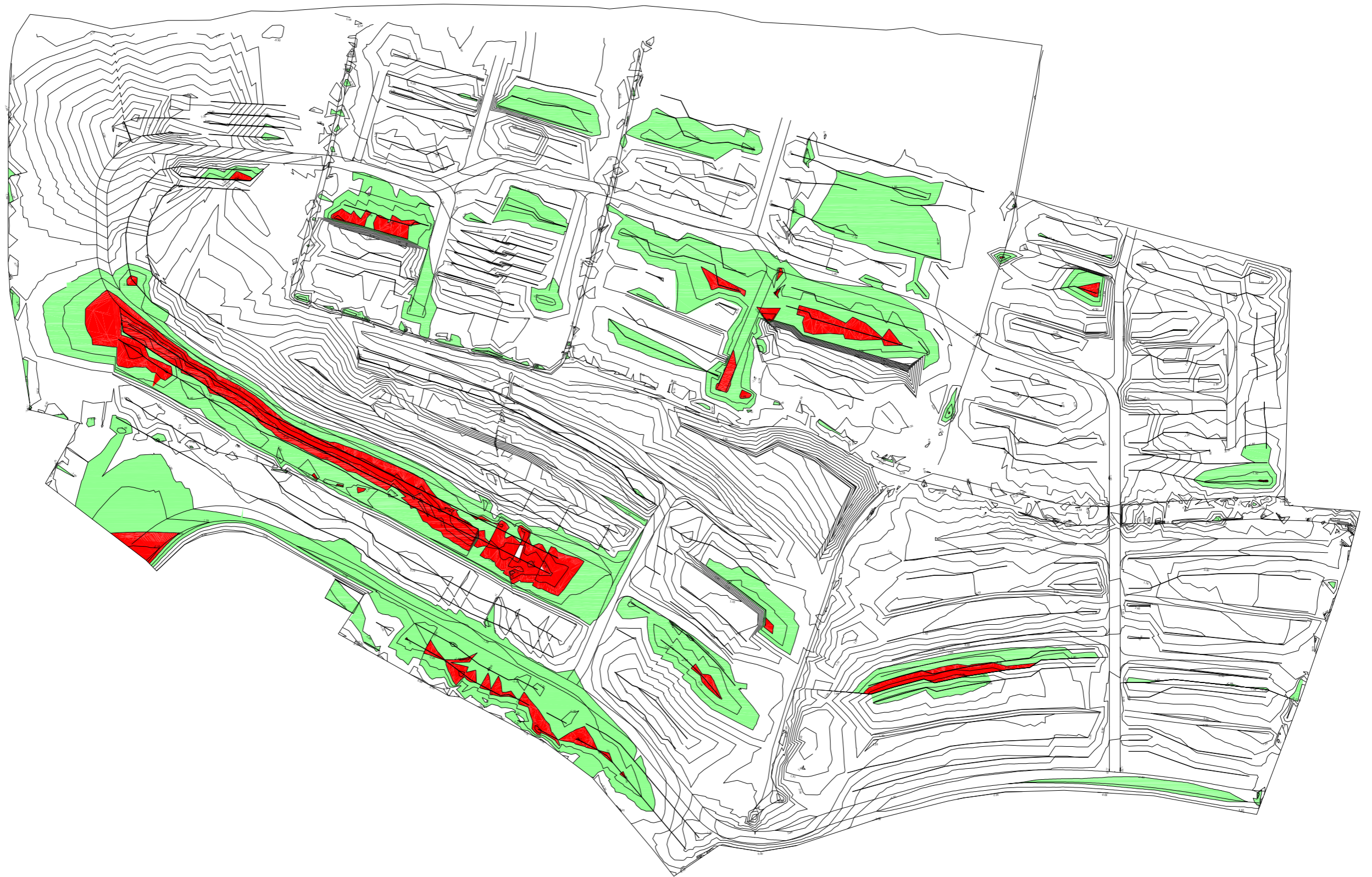
The site investigation works have also assessed the engineering properties of the soils testing indicates the Weathered Porthtowan Formation generally conforms to Class 1A type material (well graded granular material) in accordance with the Specification for Highways Works (SHW) 9. It is therefore considered that excavated material from the re-profiling works could be re-used as engineered fill to make up levels.

Soil samples recovered were also tested for contaminants. These results have verified that there are no contaminants of concern with the developable land. Based on this the site investigation works to date the existing site is not contaminated and the proposed development represents no risk to human health or the aquatic environment.

Percolation tests were carried out in the shallower Weathered Porthtowan Formation across the site. The percolation results were between 8.6×10^{-5} to 6×10^{-4} m/s and indicate that the use of soakaways is achievable within the existing ground; however a combination of the proposed levels, earthworks and development density have proven that the use of soakaways for the majority of Phases 1 and 2 are not achievable due to re-engineered soils, slope stabilities of new batters and proximities to new buildings or retaining walls.

Key:

-  Cut between -1 & -2 m depth below existing level into machine excavatable rock
-  Cut at more than -2m depth below existing ground level into rock requiring mechanical removal



Rock Cuts Plan
Shear Design, Not to scale

4.8. Archaeology and Heritage

An archaeological assessment has been carried out by CgMs and further details are included in their report 'Archaeological Desk Based Assessment', dated March 2010. In summary the key findings are as follows:

- There are no scheduled Ancient Monuments on the site itself.
- There are three scheduled sites of earthwork barrows and the site of a hill fort called the Bosvisack Round that are within a 500m radius.
- There are a number of barrows or tumuli to the west of the site.

The site lies to the north of the Cornwall and Devon Mining District World Heritage Site that includes the mining villages such as St. Day and Chacewater both of which are studied in more detail in this document.

It is concluded that the proposed development will have a negligible effect on the significance and setting of the monuments as it is the visual links to the monument that are important and these will either be unaffected, have already been eroded by existing Highertown Ridge development, or in the case of the Bosvisack Hillfort, will not impact or impair the long distance view afforded from the monument even though the development will constitute a visual change.






With regard to the Cornwall and Devon Mining District World Heritage Site; the proposed development would have no adverse impact on the

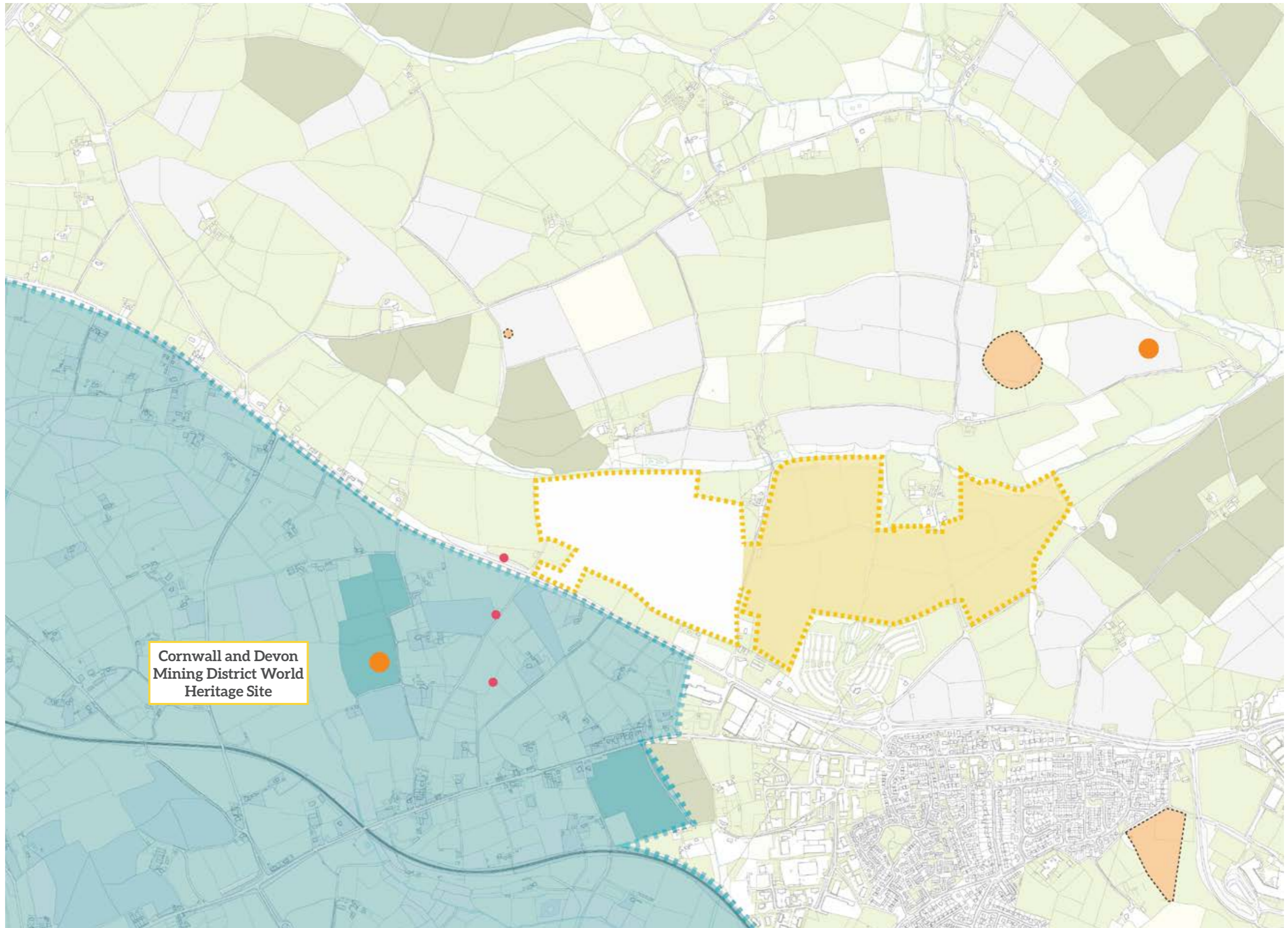
setting of the World Heritage Site and contains no component site that would be eligible for inclusion within the World Heritage Site.

However there are two aspects raised in the archaeological study that could be used to inform the development of the masterplan. These are:

1. The landscape of the site with its pattern of enclosure with field boundaries and tracks that are both indicated on the 1788-1789 Estate Plan and 1840 Kenwyn Tithe map. Maintaining these established field boundaries and routes will both preserve the historic link that the site has with an aspect of its later history whilst maintaining their ecological value. They also serve as a natural means of creating sustainable routes and open spaces across the site, informing the opportunity to establish a food growing strategy and the use of Cornish hedges and stone walls within the public realm.
2. Whilst the industrial character of the World Heritage Site with its industrial and mining history is to the south of Threemilestone has not influenced the landscape to the north of the A390, the architectural character of the settlements at St Day and Chacewater are such that they do represent a good precedent for Cornish settlement. Character areas within the new proposal could make reference to the street pattern, street widths and continuous frontages of these historic Cornish villages.

Key:

-  Proposed ownership outline
-  World Heritage Site
-  Scheduled Monuments
-  Bosvisack Round
-  Bronze Age Barrows



Archaeology and Heritage Diagram

4.9. Access and Transport

Site Accessibility





Threemilestone is located immediately south of the site, within reasonable walking/cycling distance. Threemilestone industrial park and retail park offer a number of employment opportunities including, office (B1), light industry (B2), warehousing/distribution (B8) and retail (A1) land-uses. There is also the potential to upgrade the existing crossing facility on the A390 to improve pedestrian/cycle access connectivity, which is included in the proposed off-site improvements works. Threemilestone's primary school, Richard Lander secondary school, Truro College and Truro Leisure Centre are located approximately 2km from the site and are accessible by safe, on and off road, pedestrian/cycle routes. Park & Ride bus services also operate to the bus stops situated on the A390 at the Truro College A390 roundabout, from which it is a short walk to the secondary school, college and leisure facility. Royal Cornwall Hospital is one of Truro's largest employers, the hospital, adjacent retail park and industrial estates are located approximately 2km west of the site. A direct shuttle bus operates between the Park & Ride and the hospital, available to all employees, patients and hospital visitors. Safe walking/cycling routes are also available, complimented by the controlled pedestrian crossing facilities at the hospital/A390 roundabout junction.

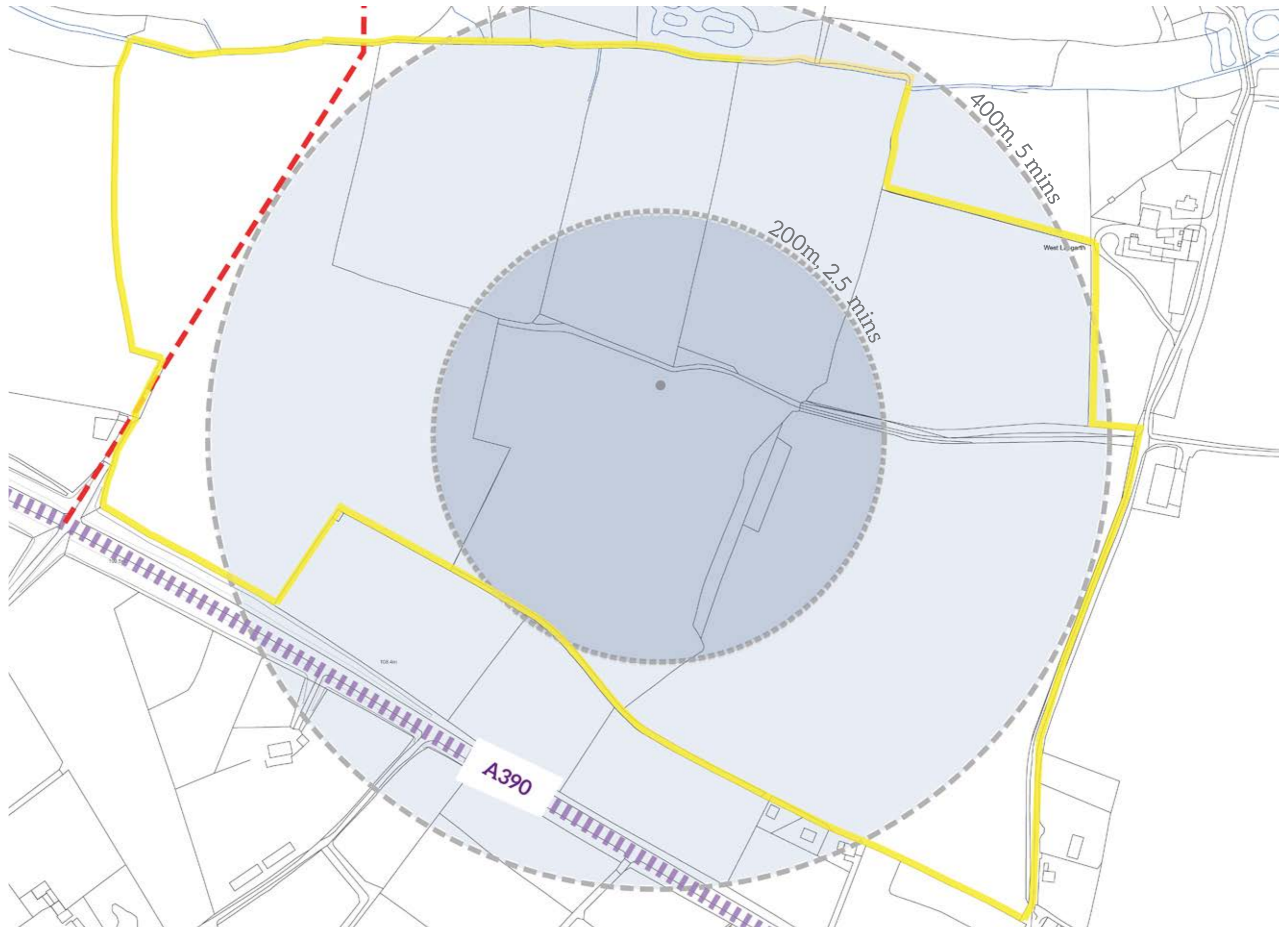
Further employment, leisure and shopping facilities are available in Truro city centre, situated approximately 5km from the city centre, and can easily be accessed by bicycle or public bus services. Frequent bus services operate along the A390 corridor to the city centre and rail station.

It is evident that the site is accessible by a variety of travel modes, benefiting from being located within reasonable walking/cycling distance of local employment areas, primary and secondary schools, leisure centre, hospital and the city centre. The proximity of the Park & Ride and the opportunity to provide bus services on-site will further enhance accessibility by sustainable travel modes.



Key:

-  Proposed Outline Ownership
-  A390
-  Footpath
-  Walking Distance



**Access and transport
Diagram**
1:2500 @ A3

4.10. Utilities

Telecommunications

A BT Openreach overhead line runs north to south across the middle of the site, this will be under-grounded as part of the development infrastructure.

Electricity:

Western Power Distribution (WPD) has three 11kV high voltage overhead lines operated by Western Power Distribution across the site generally on a north south alignment together with an individual 33kV high voltage overhead line.

It is proposed these lines will be put underground where required within the application site and diverted along alignments which will follow the internal estate roads, i.e. within footways and cycleways.

An initial assessment by WPD has advised that existing infrastructure will support a small first phase of development. Above this threshold a new high voltage supply will be required. The extent of any off-site reinforcement works will be determined from more detailed studies based on site layout and use.

Gas:

The development area is located within the region which is served by Wales and West Utilities (WWU) for gas supply.

An existing 300mm diameter local high pressure gas main, reference Indian Queens - St. Day, is located to the west of the site running through West Langarth.

WWU have advised that the site can be supplied from the 63mm diameter medium pressure main located to the east of the development site within Curlew Industrial Estate. The new mains infrastructure would be laid through the industrial estate and along the A390 road corridor to the site entrance where it would reduce to a low pressure supply via a pressure regulating system in a suitable location.

Water:





South West Water (SWW) has a 300mm diameter trunk main and a 100mm diameter distribution main aligned along the A390 corridor. SWW has undertaken reinforcement works of their existing distribution mains and as a result sufficient capacity is available within the network to serve the development.

Foul Drainage:

SWW has confirmed that there are two options available for waste water disposal and are currently undertaking further study to determine their preferred option. The options comprise of either a requisitioned gravity connection from the eastern boundary of the site to the upgraded sewers within Truro, or a pumped connection to the existing combined sewers within the industrial estate to the south of the development.



Key:

-  Proposed Ownership Outline
-  Overhead BT Line
-  Water Mains
-  Overhead Electric Line



Utilities Diagram
1:2500 @ A3

4.11. Flooding

An assessment has been undertaken by Stuart Michael Associates (SMA), Consulting Civil Engineers and the full details are set out in the Flood and Surface water Drainage Statement, dated September 2010. The assessment considers the proposed development in relation to flood risk, water quality and surface water drainage and proposes mitigation and enhancements in response to the identified effects. The key findings are:

Fluvial Flood Risk

The main portion of the site is located within an area at low risk of fluvial flooding within Zone 1. A narrow corridor of land along the northern boundary associated with the Langarth Stream is located within Flood Zone 2 and 3. It is proposed that no buildings will be constructed within the areas indicated as Flood Zones 2 and 3 and that these areas should be left as landscaped ecological areas. Therefore the risk of flooding is low.

Safe Access

The flood map indicates that the A390 is located within Flood Zone 1. The proposed access roads served by A390 will be located within an area at low risk from flooding. Therefore access to the development will not be restricted.

Surface Water Runoff

Surface water runoff from the proposed development will be retained and infiltrated. Therefore flows to Langarth Stream, a tributary to the River Kenwyn, will not be increased. The proposed development will include sustainable surface water drainage solutions to maximise water quality treatment and control of runoff volume. The infiltration facilities will be designed to accommodate surface water flows up to and including the 1:100 year rainfall event plus a 30% allowance to account for the possible effects of climate change. The key recommendations for surface water control are as follows:

1. The mixed use development should look to utilise source control measures (e.g. rainwater harvesting and pervious pavement) where practical, for roof and significant car parking areas associated with the employment areas and communal services.






2. The residential areas will utilise combinations of porous paving to private residential parking courts, soakaways for roof drainage or drainage systems discharging to linear infiltration basins.
3. Where possible the highway infrastructure will utilise infiltration trenches or soakaways. If infiltration trenches or highways soakaways cannot be utilised the carriageway shall be drained to the linear infiltration basins located within the green areas of the development.

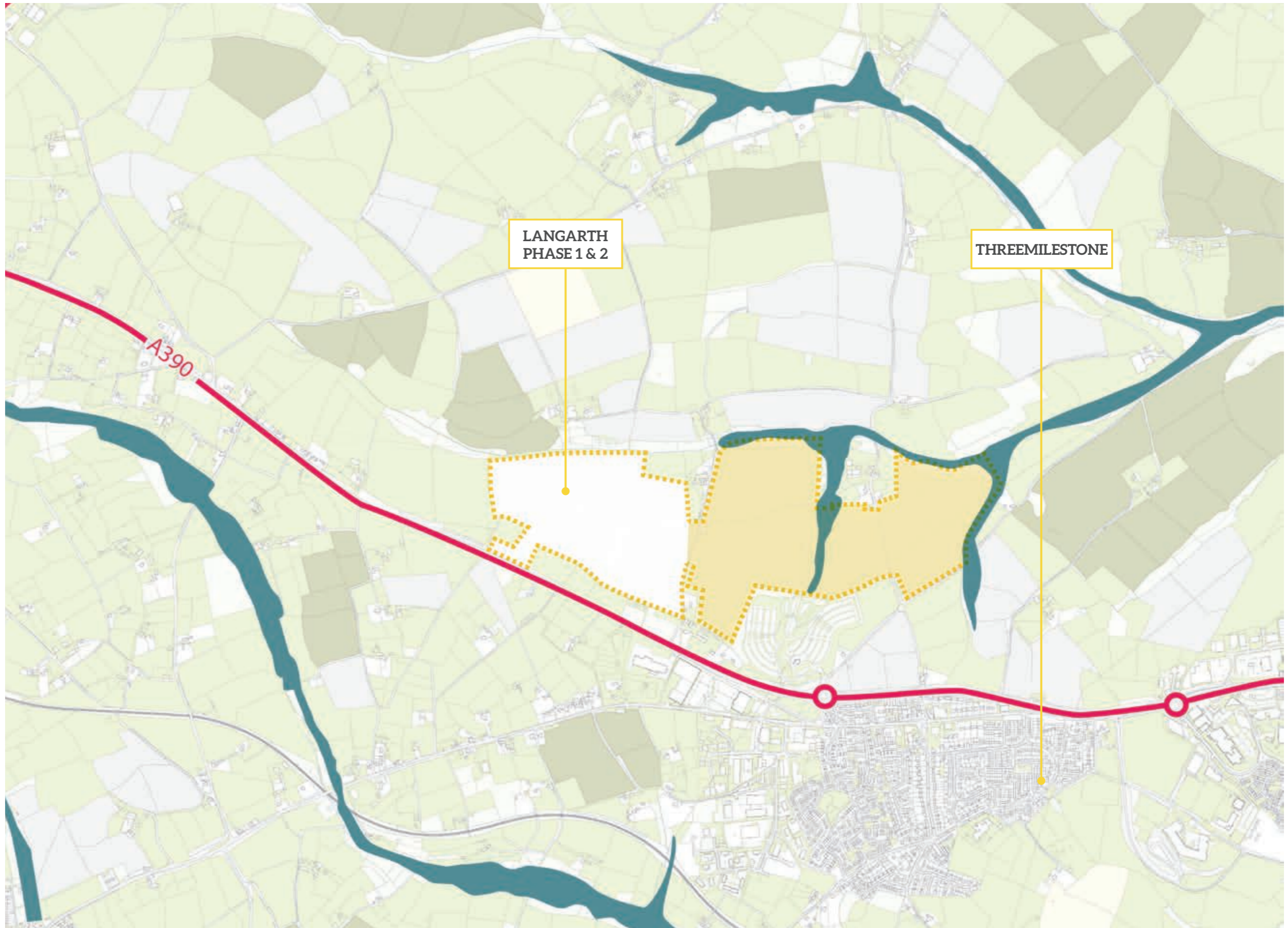
Natural Design of Storage Ponds Along Stream Corridor

The outline proposals show indicative SUDS facilities within the stream buffer area. Those are envisaged to be natural pond features, not engineered, steep sloped basins. They will form part of the open space and habitat network in this area and must be designed accordingly.



Key:

-  Site Boundary
-  Langarth Masterplan
-  Flood Zone
-  Watercourse
-  A-Road



Flood Zone Plan