5.2 LAYOUT PRINCIPLES

The layout of the development is arranged to suit the topography of each plateau as well as responding to environmental conditions such as solar path and prevailing wind direction. The layout synthesises placemaking, solar energy capture, natural surveillance and the maximisation of views, whether out to the sea, Penarth, the Lakes, the green corridors or the new park areas. It priorities an east-west and south house orientation to maximise natural daylight potentially with roof pitches facing south to maximise solar energy harvesting. The retained and enhanced hedgerows and wooded areas will shelter large areas of the site from the prevailing westerly wind.

Views from each of the development sub-areas have been considered and the layout exploits the site's dramatic views towards Bristol Channel and Penarth to the north and east, and the rolling hills of the Vale to the south.

Views to the east over the Severn Estuary will be spectacular upon gaining some height to get above the existing hedgerows which currently block the view from ground level. House typologies that place living accommodation on the first floor would be an excellent solution in these areas.

The layout of the development will provide most homes with views over the pleasant greenery of the preserved and enhanced woodland and hedgerow areas as well as the newly created parks. This will enhance the character of the development bringing about the sense of a parkland setting and enforcing a positive relationship between built environment and nature.

The layout respects regulatory and recommended design guidances for privacy distances between habitable rooms and also employs the use of more innovative house typologies to avoid over looking whilst increase density in order to maximise public open space and amenity.
Indeed, a key aspect of the development strategy is to retain significant areas of site as natural hedgerows, woodland and open, green amenity space, reducing the area of site which is built upon. The layout purposefully avoids the creation of large private garden spaces, opting to prioritise high quality public realm. This leads to higher densities within the housing development sub-areas, in contrast to earlier, adjacent developments.

This approach delivers a range of advantages;

- reducing the cost of infrastructure and land per home results in more sustainable development;
- higher densities are able to support a larger range of local services, social and transport infrastructure;
- creating the conditions for more cohesive and balanced communities by providing a greater variety of housing options and tenures;
- higher density of homes could provide opportunities for better energy efficiency and harvesting;
- more area is available for green infrastructure and public realm.

The layout arrangement addresses comprehensively the over arching goals. It will bring together ecology, placemaking and passive environmental measures such as building orientation and aspects that will lay a robust base for a future sustainable design.

5.2 LAYOUT PRINCIPLES

ENVIRONMENTAL CONSIDERATIONS AND VIEWS OUT

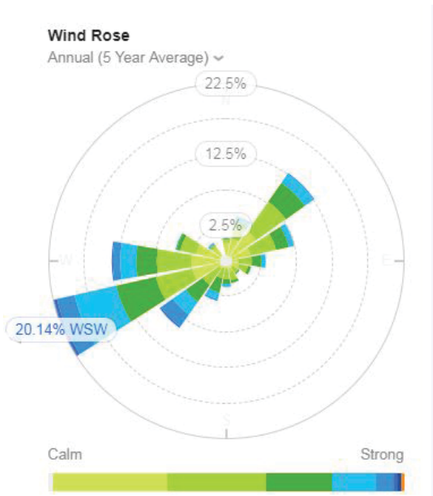
Primary views out

Views out to green areas and parklands

Sun Path

Elevated viewports

Lowlaying areas of the site



5.3 ACCESS & MOVEMENT

The masterplan will help to create a sustainable community promoting active travel and positively connecting with its immediate context giving, priority to pedestrian movement. A founding principle of the development is to provide a pedestrian route linking the National Coastal Path and Cosmeston Lakes.

Walking and cycling will be promoted as a primary mode of transport for the residents of the new development, providing the necessary pedestrian and cycling infrastructure within the site to encourage residents to walk and cycle along a network of interconnecting public open spaces.

The site will provide pedestrian and cycle routes that link with existing provision. The backbone of the cycling infrastructure will be the NCN88 Cycle route, which will be extended through the site, providing a direct active travel corridor to Penarth Town Centre.

A potential pedestrian link to Cosmeston Lakes Park has been discussed and agreed in principal with the Vale of Glamorgan Parks Team and Countryside Team. To reinforce this connection a new pedestrian crossing is proposed on Lavernock road linking the new development with Cosmeston Lakes Park.

New bus stop provision is proposed on the site's frontage to Lavernock Road. In addition the primary route is designed to a suitable width to accommodate a bus route in the future. Potentially a new bus stop could be located next to the main public realm 'Limestone Square'.

The implementation of a Travel Plan will improve the sustainability of the site through promotion and raising awareness of more sustainable modes of travel. This will be complemented by the infrastructure referred to above.

Car and Cycle parking will be provided in accordance with the Vale of Glamorgan's adopted parking standards.

Access is proposed via two new junctions from Lavernock Road which will prioritise the free-flow of vehicles along the main road via the provision of right turn lanes.

A key aspect of the masterplan is the proposal for active travel. A green pedestrian network has been created through the site that links to the existing bus network on Lavernock Road.

The provision of a new school within the development offers the potential for school pupils to walk, cycle or use scooters to get to school. By extending the existing cycle path that runs along the dis-used railway line an option for car free access into Penarth is created, providing public transport access to Cardiff beyond.

There is also the potential to use this site to encourage the use of electric cars, through publicly available electric charging facilities as well as individual homes charging provisions. Charging infrastructure will form an intrinsic part of any future detailed proposals. Car clubs and dedicated on-street car rental spaces could further encourage more efficient car usage in the development.

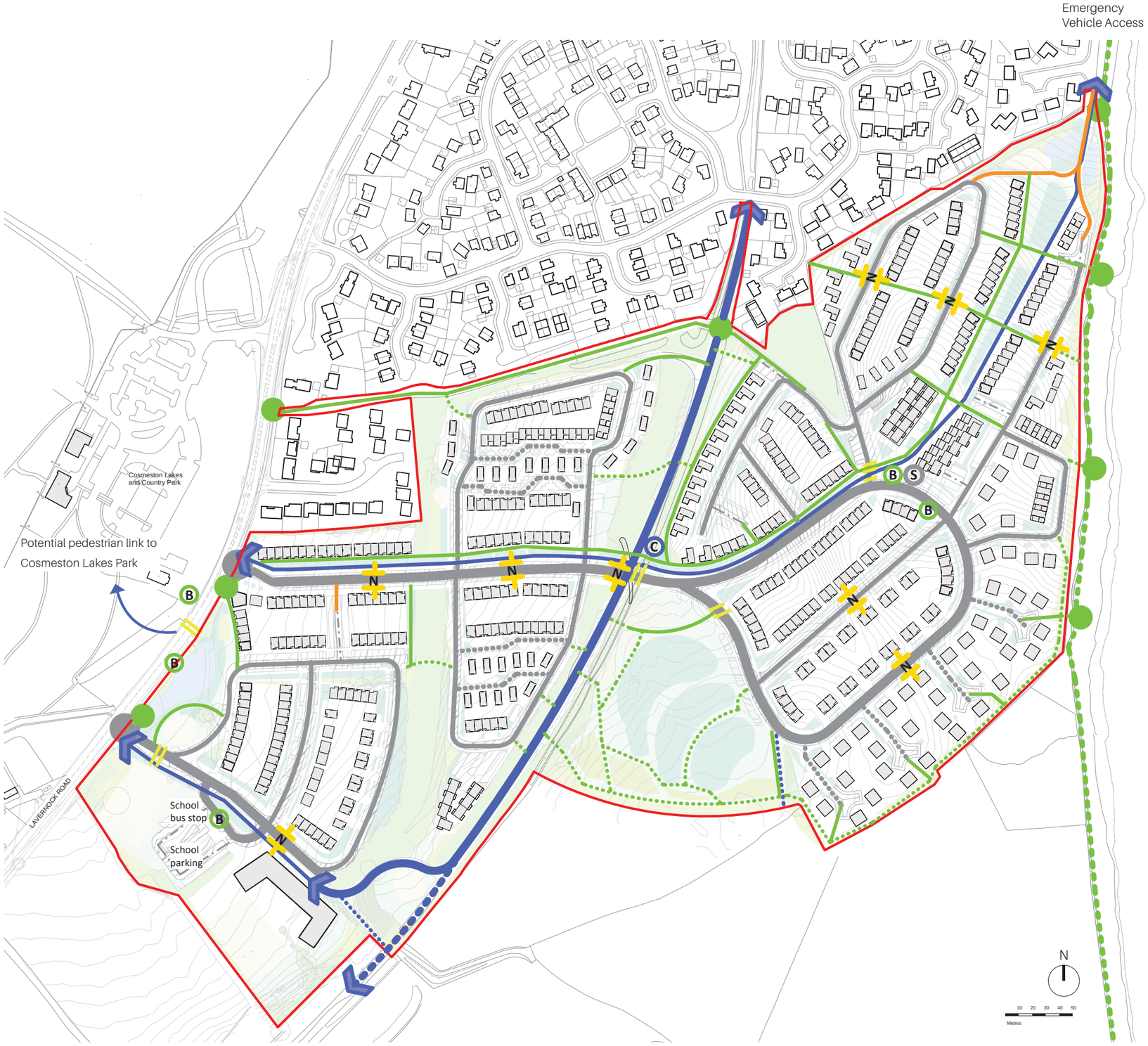
During Covid 19 epidemic the steady upward trajectory of the proportion of people working from home sharply increased to nearly half of the working population. Remote working has many economic, personal well-being and environmental benefits including significant reduction of car usage. The design of the new homes should make provisions for working from home both in terms of space and access to fast reliable broadband.

Impression of New Cycle connection to NCN route 88 looking north from inside the development.

5.3 ACCESS & MOVEMENT

KEY

- Extension of NCN88 Cycle Route
- Future Extended Connection Cycle Routes
- Cycle Route
- 4m wide Emergency Vehicle Access Pedestrian Route
- Pedestrian Route
- Pedestrian passages desinged for unobstructed wildlife movement
- Cliff Top Coastal Path
- Pedestrain Gateway
- Pedestrian crossing
- Vehicular Site Access
- Primary Vehicular Route - Future proofed for potential Bus route
- Secondary Vehicular Route
- Home Zone Route - Pedestrian Priority
- Parking Access only
- N — Traffic Calming Narrowing
- B — BUS Stop
- C — Bicycle Hire
- S — Dedicated Street Car Rental Spaces



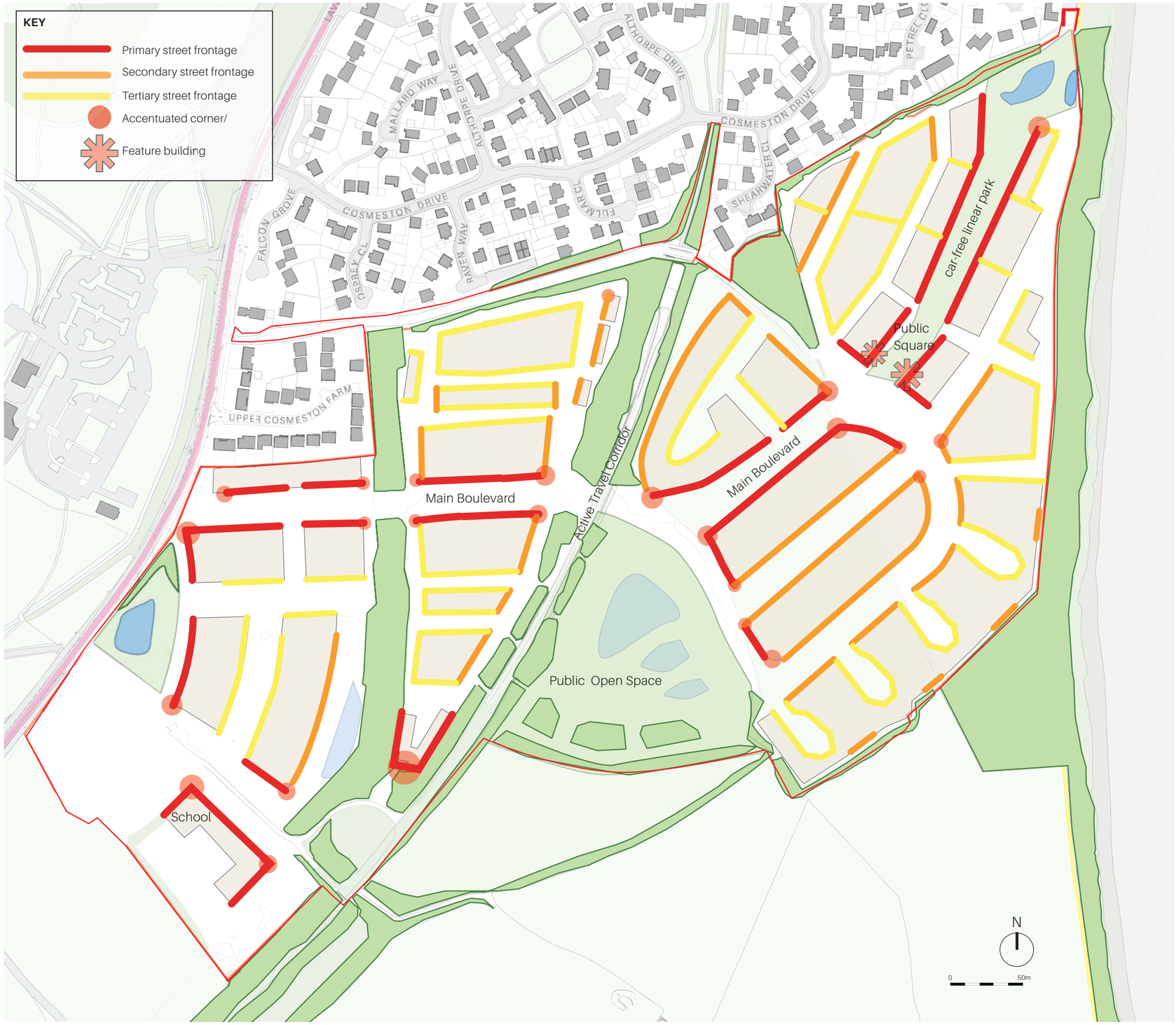
5.4 STREET FRONTAGE HIERARCHY

The underpinning concept of creating a pedestrian/cycle link from the Coastal Path to the Lakes is reinforced by Primary Frontage either side. The character of this route will change along its length, reflecting the fact that it is, in part, a car-free linear park and in-part, shared between pedestrians and cars. Here, the space is of significant width and also characterised by sustainable drainage swales. The primary on-site road has a 'lasso' layout to enable bus services to navigate the development. Whilst acting as a primary access road, the extended NCN88 cycle route takes priority where the two cross.

Each development plateau is characterised by outward facing homes along their perimeter, providing passive supervision over the retained nature corridors and taking advantage of views out of the site from elevated plateau edge locations. These secondary street frontages also signal the character of each development sub-area.

Within each development sub-area there will be tertiary streets providing access to homes and parking. The masterplan is indicative of how these may be arranged in detail at a future time.

The key destination areas identified previously, such as the public square, entrance gateways and plateau transition points, will be marked by feature buildings, helping to aid orientation and create a sense of place. In some cases this may be an opportunity to create buildings of greater height or accentuated corner buildings.



5.5 LANDMARK BUILDINGS

The scale of the development, together with its specific topography and relationship with Penarth and the wider coastal landscape brings forward an opportunity to create a new landmark, such as a taller building or group of buildings. The site forms a natural counter-point to Penarth Head, celebrated by St. Augustine's church steeple. The rise of the headland creates a natural 'look-out' position; an attribute previously recognised by the Royal Ordnance in creating their observatory and also Marconi when conducting his experiments in telegraphy.

The masterplan proposes a taller element of building that will rise above the remainder of the development that is generally set at 2 or 3 storeys in height. This is an important element within the masterplan providing a visual marker at the point at which a new connection is created from the Coastal Path to Cosmeston Lakes.

This landmark will also be a destination in its own right, marking a new public square below with the opportunity for community facilities, cafes and shared amenities. In addition to creating a visual marker from outside the development, this taller building will afford spectacular views out of the site across the vale and Bristol Channel.

The detailed design of this building will emerge as further development proposals come forward and it will be essential that it is of the highest design quality. This building will contribute significantly to the character of the upper plateau and the development overall. It will also counter the potential for simple 'horizontal sprawl' and underline the Vision to 'create a high quality development with a strong identity and sense of place'.

This taller building group and public square is located at a natural high point within the site providing a resting place along the new public path, gathering space for community activities or simply a resting place for contemplation and taking in the views back towards Bristol Channel or onward to the rolling hills of the Vale.

The buildings should be mixed-use housing commercial and community facilities along side houses. With the rapid increase of the proportion of people working from home this new centre could be a suitable location for co-working spaces for local people living in the new and existing neighbourhoods. The buildings could also facilitate various functions such as creche, clubs, ward meetings or a visiting doctor's surgery that will contribute to the activation of the public spaces and increase participation in community life.

A local convenience store and a range of small businesses such as barbershop, cafe, bakery, hairdresser positioned around the central square would greatly increase the vitality of the neighbourhood. They could also offer employment locally and significantly reduce the need of outward car journeys. Clearly these would need to be viable and sustainable.

People need places to gather and socialise, organise, volunteer and participate in the life of the community and those spaces should be the beating heart of any neighbourhood. The centre of the new development should facilitate these key functions and the taller buildings above will symbolically and physically landmark them, drawing people into the core of this new community.

The height of the buildings will be determined by future, detailed proposals but it can be seen from visualisation work to date that 7 storeys would be required to create the landmark desired.

Landmark buildings relationship diagramme

5.6 STREET ACTIVATION & USES

The masterplan seeks to address the needs of the community by including the following mix of uses:

- Creating a mix of well designed public and private housing of mixed tenure, mixed together throughout the site;
- The provision of a new two form entry primary school, which would also include new community facilities;
- The promotion of home working provision in the housing designs;
- The potential creation of a home working “hub” or meeting space within the development that would allow people to meet up, work in a communal environment or use a bookable meeting room / office space;
- Extending the existing cycle path from Penarth over to the Cosmeston Lakes Country Park and amenity space;
- Creating new links from the existing coastal path through the site to the Cosmeston Lakes Country Park;
- The opportunity to use the new public links through the site to tell the history of the community e.g. the Royal Ordinance Command Post, Marconi’s nearby experimentation, the quarry, the railway line, the orchards, through the use of interpretation boards.
- The potential inclusion of small scale local businesses that could support the new and existing communities.

Commercial and community facilities will be concentrated at the focal point of the upper plateau creating a public square & destination point. The square is located at a natural high point where grand vistas back towards Bristol Channel are afforded.

To summarise our proposals relating to healthy environments, our masterplan allows for:

- Public green spaces and playgrounds set within the green corridors and wedges throughout the site;
- A nature walk through the site running from the Coastal Path to Cosmeston Lakes Country Park;
- Active travel with a green pedestrian network running through the site largely independently or with priority over the vehicle network;
- Extending the existing cycle path through the site via the dis-used railway line and linking this to Cosmeston Lakes Country Park;
- On site secure cycle parking provision;
- The potential for extending the Nextbike hire scheme, or similar, from Cardiff;
- Working with Sustrans to improve local cycling and active travel facilities;
- Two new bus stops located on Lavernock Road linking into the existing bus network. The primary road within the development is designed to bus route width which would allow further bus stops within;
- Pedestrian friendly access to the proposed new school site;
- On-street electric car charging points for at least 10% of the public parking spaces on site and infrastructure future-proofed for 100% electric vehicle charging;
- Dedicated on-street car rental spaces and the potential for creating a community electric car club or extending an existing car club scheme to cover this development
- The potential for creating edible boundaries’, fruit tree orchards and community allotments.

5.6 STREET ACTIVATION & USES

This diagram is indicative of potential uses which would activate the streets and pedestrian routes. These would be subject to future viability tests and detailed design.

KEY

- Co-working, community and commercial spaces
- Bus stop
- Bicycle rental station
- Community allotments and orchards
- Playground
- Home Zone Areas for Play and Socialising
- Outdoor Gym
- Nature trail
- Community Sports Ground

5.7 COMMUNITY SAFETY

A key aspect of the masterplan layout is the provision of passive supervision to external public open spaces. This is especially pertinent where houses look onto the nature corridors. Whereas a more ruthlessly efficient layout may have placed back gardens on the edge of each plateau leaving a narrow alley between the garden fence and edge of the hedgerow, the proposed layout promotes building houses that face these areas to create higher quality public places which feel safe and maximise the enjoyment of the natural landscape. Densities within the development 'blocks' themselves have been increased to enable these more generous areas of public realm to be created.

A lighting strategy will be developed to create a safer environment and will be designed in such a way to minimise the impact on local wildlife and ecology.

The masterplan aims to create a cohesive community with a sense of place that will help make people feel safe. Incorporating a well observed community park will help achieve this. The inclusion of community and commercial facilities will also help create a cohesive community whilst also promoting activity at different times of the day.

Legibility is an essential aspect of the masterplan layout. The route that links the coastal path with Cosmeston lakes is intended to follow natural desire lines and creates a recognisable network of key spaces to help aid navigation. Cul de Sacs have been generally avoided to enhance connectivity across the site and avoid dead ends. Pedestrian movement is prioritised over vehicular movement across the majority of the site.

'Natural' boundaries will be established between public and private spaces for example where possible the sustainable drainage swales will divide front gardens from the street and hedgerows will be encouraged instead of back garden fencing. Where front boundary walls could not be avoided, they should be no higher than 1.2m to allow passive supervision of the street and landscaped walkways.

Impression of pedestrian lane and the New Cycle connection to NCN route 88 looking north from inside the development.

Austin·Smith:Lord

5.7 COMMUNITY SAFETY

This diagram is indicative of potential layout arrangement which would provide sufficient passive supervision to public areas and pedestrian routes. It would be subject to future detailed design.

passive supervision from properties to public open spaces, playgrounds and hedgerow areas

5.8 LANDSCAPE OBJECTIVES

The landscape design aims to build on the existing high quality natural environment and enhance the existing range of habitats. Green infrastructure created as part of the sustainable drainage design will provide a green network through the site that will improve connectivity for both the future community and existing wildlife.

The key objectives are:

- To create a landscape which is fitting for the existing natural environment of the site which is located between the Penarth Coastal Path and the Cosmeston Lakes Country Park.

- To include an extension to the National Cycle Route No. 88 which will enhance site connections and provide active travel opportunities into and out of the site.

- To provide multiple pedestrian and cycling options within the site, and improve links to Penarth, adjacent housing, the Coastal Path and Cosmeston Lakes Country Park.

- The vast majority of hedgerows and mature vegetation will be retained and the green corridors strengthened, supporting the movement of wildlife such as bats, birds and dormice.

- To utilise the network of proposed drainage swales to create a green network throughout the site to support existing habitats as well as creating a framework of pathways.

- To create a series of public open spaces throughout the site including an ascending linear park, natural play areas, public square, community event space, playstreets, orchards, outdoor gym and nature trails.

- To introduce stimulating natural play opportunities within the proposal, reflective of the natural surroundings.

- To consider “foraging” opportunities for the future community including features such as orchard trees, edible hedgerows and raised planting beds.












5.8 LANDSCAPE OBJECTIVES

PLANTING STRATEGY

The existing planting throughout the site consists of mature trees and significant large hedgerows within a greenfield area. The landscape strategy, associated with and supported by ecology strategy, will aim to retain the existing mature tree and the existing hedgerows, where the condition of the vegetation and new development makes this viable. This existing planting structure will be supplemented by a green SUDs system thereby integrating the drainage strategy. Open spaces and areas unsuitable for development will support the SUDS system through the use of reed beds. These areas can also provide open space, grassed and meadow areas for recreation and amenity.

The existing hedgerows will be supplemented by new hedgerows reinforcing and extending these important ecological corridors. The resulting planting structure reinforces the north south active travel routes and coastal path route. New east-west planting corridors reflect and enhance the circulation across the site and connections to the surrounding context and introduce further ecological corridors.

There are opportunities to introduce character areas, variety and scale through the approach to the planting associated with the SUDS system. Reed beds, swales and rain gardens will be used, providing natural planting filtration. Dry swales may also be considered adding variety to the hard landscape palette. Ponds/ retention basins are also included. The planting response to each of these SUDS methods will be reflective of the topography thereby creating a strong planting framework unique to the site and supporting legibility and orientation.

The development of the site provides scope for management and succession planning of the existing vegetation to ensure longevity and viability of this asset. The areas of open space throughout the site create opportunities for recreation, informal and formal play space. A variety of grass seed/turf mixes can be used in these spaces, such as a local meadow mix in addition to an amenity seed mix, which retains the openness of the space, but still provides seasonal interest and a range of textures and colour. Simple measures can also be considered with regards to using a variety of grass cutting regimes in these spaces to obtain more variety which can also supplement the informal play spaces. Additional structural native shrub planting will provide scale, structure and ecological benefits to these spaces. The planting structure will also benefit from additional tree planting at key locations to integrate some further formal structure, landmarks and succession planting to reflect the existing tree species mix, creating further character zones.

The planting hierarchy will also reflect the scale and sequence of spaces that the development provides ranging from; the adjacent coastal paths, links to adjacent amenities, the housing development, the active travel network, trafficked areas, generous open space provision, water bodies, play spaces and civic spaces.

Impression of attenuation feature pond and park at the eastern gateway to the development

5.10 ENVIRONMENTAL SUSTAINABILITY - NET ZERO CARBON DEVELOPMENT

Sustainable principles have been integral to the development of the masterplan. The design process has been guided by the requirements of the Wellbeing and Future Generations Act and Planning Policy Wales Edition 10. The Sustainable Development Integrated Toolkit was used at an early stage in the design process, holding a sustainability workshop with Welsh Government representatives and the design team to discuss each of the sustainable development objectives, identify the crunch issues and agree the objectives and solutions that required further discussion.

The design team and Welsh School of Architecture at Cardiff University collaborated through a dedicated Cosmeston Sustainability Task Group. The Group held a series of workshops to establish potential site specific strategies targeting the carbon footprint, renewable energy generation and energy consumption of the future development. In developing these strategies we have calculated the likely energy performance of the dwellings which will be built to meet a low energy performance standard. Using solar modelling to predict how much energy is available on the footprint of the site we have shown that it is possible for this development to deliver **Net Zero Operational Energy**. Operational energy is defined as the amount of energy needed over the life of a building to operate the heating, lighting, ventilation and to power electrical appliances. This figure is used in life cycle assessments of a building to give a whole life understanding of the total energy used.

A substantial opportunity identified was for renewable energy generation. Individual roof spaces that could potentially be used for solar PV energy generation dependent on their detailed design. This would substantially offset the amount of electricity that would be required to run those houses and provide clean electricity generation It would also help provide national energy security by having local, small scale energy generation spread out over many units rather than in fewer and larger facilities.

Alongside the potential for generating electricity it is proposed that the new housing be targeted as being low energy use homes. There are a number of simple, good practice passive design strategies used that will help to reduce energy use. Terraces and blocks of apartments also provide good form factor, by minimising the amount of exposed walls, floors and roofs where energy can be lost. Specific energy efficiency measures such as designing buildings with a low u-value building fabric, higher levels of airtightness, the effect of different window sizes, types, orientation, composition and shading all play significant roles in the energy efficiency of a building and should be fully considered in at the next stages of the project.

All communal and private parking areas will have infrastructure future proofed for electric vehicle charging. There could be also dedicated on-street rental spaces and car pooling schemes to increase car use efficiency. Community and commercial amenities available on site could further reduce car-dependency.

The potential for bicycle hire station on or in close proximity to NCN route 88 should be explored. There should be public bicycle parking provision at key locations such as the proposed public square, parks, playgrounds and the school. All homes should have access to secure bicycle storage.

As part of our proposals for creating home working provision in some of the new housing units it is key that there is a fast and reliable IT network provision. Research by the Office for National Statistics showed that in 2019 just under 5% of the workforce worked full time from home and 18% worked from home on two or more days. During Covid 19 epidemic this steady upward trajectory sharply increased to nearly half of people in employment working from home. Remote working has many economic, personal well-being and environmental benefits including significant reduction of car usage. The design of the new homes should make provisions for working from home both in terms of space and access to fast reliable broadband. In addition co-working spaces including reprographics facilities and bookable meeting rooms could be provided at key locations in the development.

As the climate change forecast maps for this part of Wales predict that the summers will become warmer and drier, the creation of “green” water management structures will also play a significant role in supporting the existing ecosystem. The use of retention ponds, swales and reed beds will help to keep more water on the site over these drier months, increasing the resilience of the ecosystem.

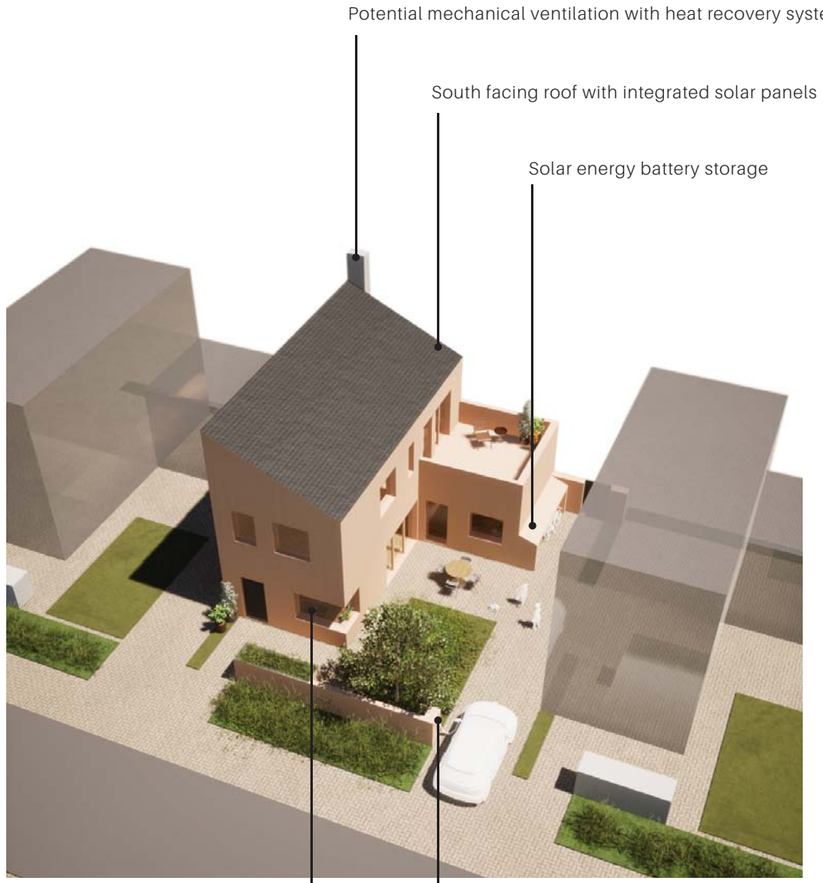
Several of the sustainability principles are embedded within the key placemaking elements of the masterplan layout and include:

- Retaining and adding to the existing hedgerows, green corridors and tree lines on the boundary and the plateau edges;
- Linking the existing primary green corridors with new secondary green corridors to provide alternative routes for wildlife to move around the site;
- Paying special attention to the habitat of protected species on site and ensuring that there are safe routes for them to pass through the site;
- Creating a new primary green pedestrian corridor through the site, joining the main public spaces with the SUDS ponds and using water management as a wayfinding strategy;
- Using above ground SUDS drainage throughout all parts of the site with the use of retention basins, swales, reed beds and permeable paving at parking spaces and driveways;
- Creating a green pedestrian network through the site, separated from vehicle routes, linked to the cycle route and giving access to the bus stops on Lavernock Road.

5.10 ENVIRONMENTAL SUSTAINABILITY - NET ZERO CARBON DEVELOPMENT

The next stage of design for the development should consider the following strategies:

- Energy efficient building design;
- Specifying low water use fittings;
- The efficient use of materials and identifying where waste can be avoided through good design;
- Re-using existing materials and resources on site;
- Using materials that have environmental performance declarations;
- Using materials that have a high recycled content;
- Using materials that do not create poor indoor air quality;
- Using off-site construction for key components;
- Re-using excavated material on site rather than sending it to a waste facility; and
- Reducing waste materials generated on site to as low as possible, through segregated waste streams, re-use of off cuts, take back of waste materials and packaging schemes with suppliers, gifting of palette remainder stock to community groups and by ensuring that any waste removed from site is recycled and not sent to landfill.



fast and reliable broadband

electric vehicle charging infrastructure

5.11 SUSTAINABLE DRAINAGE

Sustainable Drainage Approval Bodies have been introduced under new legislation relating to Schedule 3 of the Flood and Water management Act 2010. The aim of the new legislation is to ensure a natural approach to managing rainwater.

The drainage strategy incorporates site-wide swales and attenuation ponds. They are embedded within the scheme and are used to help define the character of the development. In particular the drainage strategy creates welcoming 'gateway' features to the east and west, through attenuation ponds.

KEY

Attenuation Pond

Swale