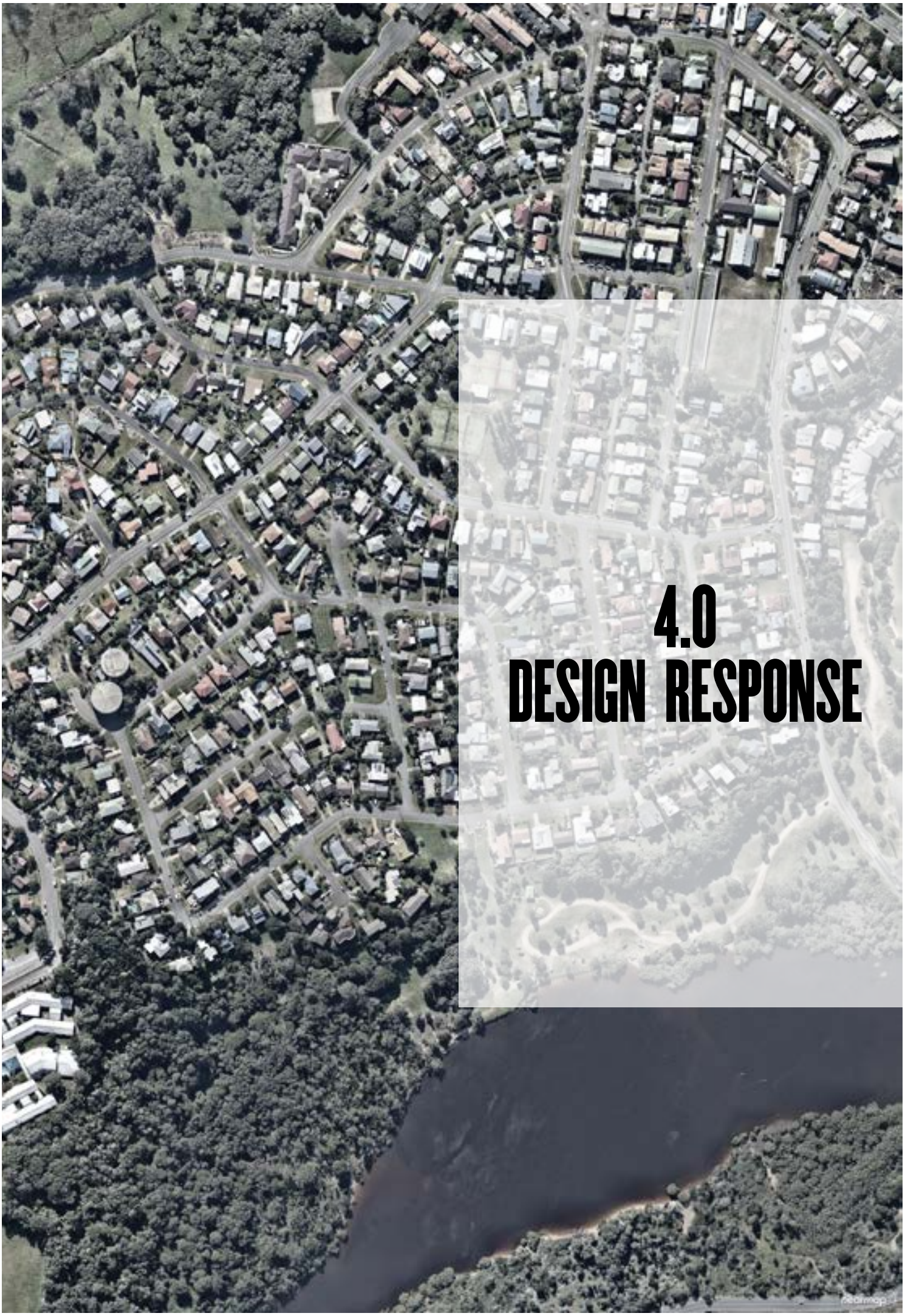

4.0
DESIGN RESPONSE

4.1 CONCEPT PROPOSAL OBJECTIVE & CHARACTER

The Masterplan design for the site establishes the “starting-case” hospital design and includes spatial strategies that accommodate future hospital expansion and renewal. Additionally, the long-term site Masterplan contemplates future provision of complementary services including; Education, Training & Research, Social Services and Health & Wellness to name a few, refer section 5.0. The principle planning objectives for this Project include;

/ Developing a purpose-built major referral hospital with contemporary functional design and models of care to meet the needs of the catchment population of the Tweed Byron Bay Health Services Group in Northern NSW
/ Develop a Masterplan strategy that is demographically responsive, and supports efficient patient and staff movement through the various treatment regimes
/ Develop an intuitive campus entry and internal road network configuration, maintaining a clear hierarchy, promoting potential for decentralized departmental service access points
/ Develop a site and program responsive building design, that promotes a coherent salutogenic healing environment and enhances the local region
/ Positions the new hospital Project in response to site characteristics and features and efficiently supports future growth capacity requirements
/ The Concept Proposal, to be articulated in greater detail within the Stage 2 SSD submission, contemplates a complex tower on podium typology, consisting of a 3-level podium over main ground entry level, above a 2 level lower ground plinth level, taking advantage of the site ridge and slope. The podium is crowned with an IPU zone with roof level plant room and helipad above. The design will include internal open landscaped courtyards and active terraces, maximizing daylight access, opportunity for reliance on passive ventilation and views.
/ The ground floor of the new Tweed Valley Hospital will accommodate the main entrance functions, ambulatory services, medical imaging and retail.
/ Vehicular access to the site is from Cudgen Road with 3no. secondary street entrances, including new vehicle connection to the turning circle at the corner of Cudgen Road and Turnock Street.
/ The hospital site Masterplan incorporates a central main entrance opposite the TAFE and set-down area with pedestrianised forecourt link to public transport bus stops on Cudgen Road
/ Public surface carpark facilities are to be in close walking proximity of the hospital, situated to the east and west flanks of the building with access to either end of the hospital street (situated at ground level) via secondary entrances. Staff carparking is also provided, situated beyond the public parking areas on both flanks.
/ Logistics and Ambulance vehicular service yards are level-segregated and are provided with a dedicated site entrance located to the south west corner of the site off Cudgen Road. The logistics service yard is located at “basement” level to the north west of the hospital building and the ED located at lower ground level, directly adjacent.
/ A roof level Helipad (air ambulance landing pad) is located vertically over the west perioperative services block, with access via “hot-lift” direct to the lower ground level emergency department.
/ The long-term site development scenario, includes spatial allocation for the development of low-rise complementary health and education functions along Cudgen Road, including spatial provision for future hospital expansion and renewal.

4.1 CONCEPT PROPOSAL OBJECTIVE & CHARACTER (CONT.)

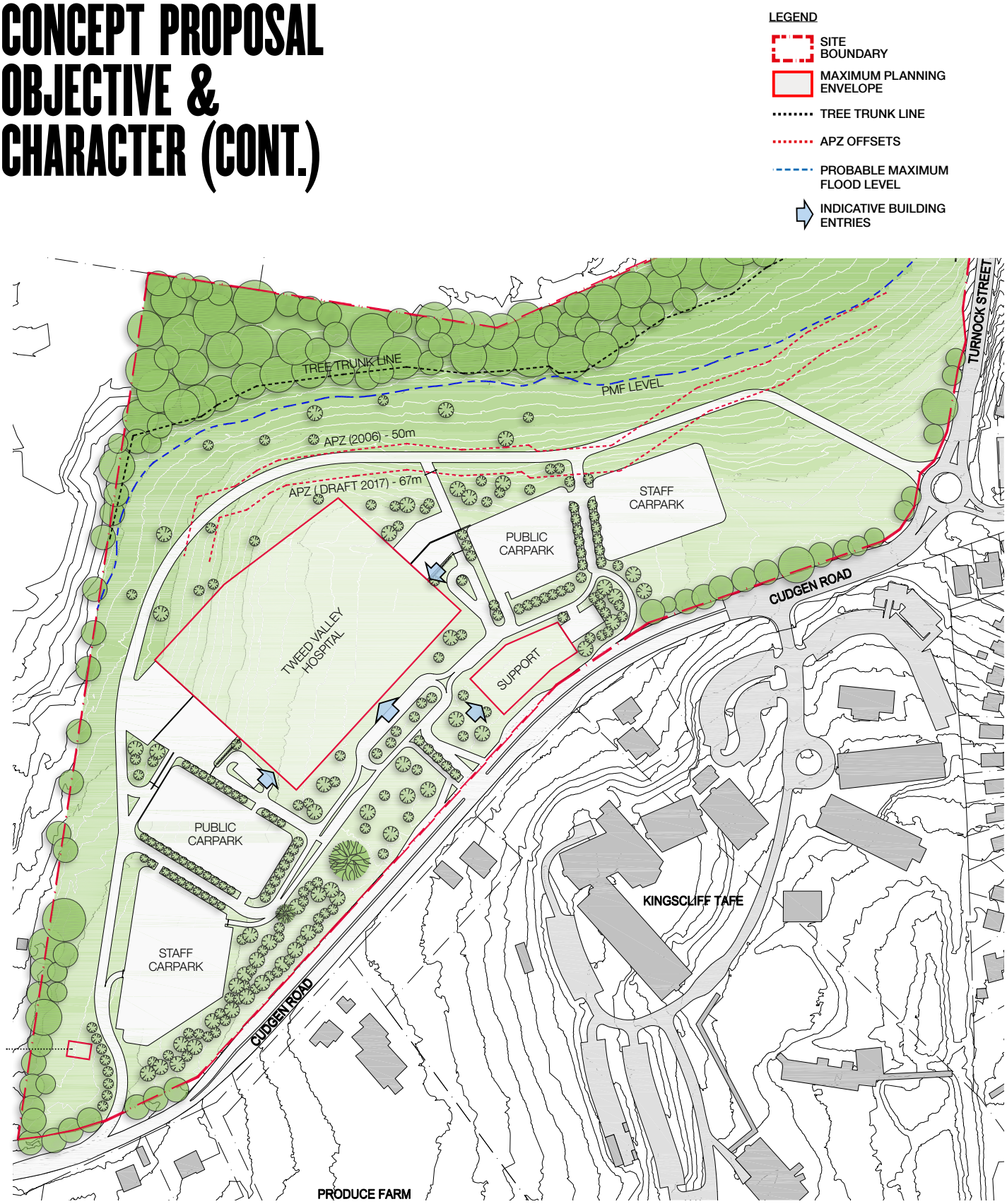

Figure 11: Masterplan - Concept Plan

4.2
BUILDING TYPOLOGY

The Concept Proposal presents a Masterplan arrangement for the Project Site, with maximum planning envelopes proposed for the main buildings on site within this arrangement. These envelopes do not represent actual built form, but rather the envelopes/ parameters within which the built form would be established as design development is ongoing to resolve the detailed “block and stack” composition of the hospital. The resulting building typology will be substantially informed by factors including; functionality, efficiency and flexibility, site topography and response to local urban context and will fit within the proposed maximum development envelope illustrated on the concept Masterplan drawing package.

Programmatically hospitals are composed of three principle functional elements, including; clinical, nursing and support service functions. To a large extent their spatial planning and composition determines the efficiency of the hospital. There are many precedent variants with differing interface relationships with accompanying service strategy principles. This composition is important and forms part of the design strategy which also needs to be site responsive, and considered within its wider urban setting. The functional program is often further influenced by the required clinical specialties included in the design brief, agreed model-of-care, state policies or project specific priorities determined by the relevant State Health Planning Authority.

The sites topography plays a further role in determining the most suitable arrangement. In this instance the preferred development zone is triangular plateau within the site. The long leg of the triangle (hypotenuse) fronts Cudgen Road. The two short legs of the triangle are topographically defined by the ridge line. This form has influenced the development of ordering principles of the site. The hospital has been located on the ridge edge at the deepest vertex of the triangular plateau, establishing the “nucleus” of the site and anchoring future hospital expansion and allied services development to the east and west flanks of the hospital. The ridge line accommodates planning of on-grade lower ground levels located below main entry level. This feature efficiently segregates functional zones from public interface. The design approach takes advantage of the ridge line, providing 2 floor levels below the main hospital entry level at AHD +28m. This contributes to lowering the perceived height of the hospital when viewed from the Cudgen Road and the immediate suburban areas to the east, south and west of the site. The forested environmental area to the north of the site helps conceal the hospital (and building mass) to the residential suburb beyond (Kingscliff West).

The site is located at the town edge of Kingscliff with neighbouring functions including; agriculture, education(TAFE) and residential suburbia. A planning strategy that has been considered is the anticipated future capacity of the hospital site to evolve to continue providing supporting state-of-the-art health services to the future growth and changing regions population demographic. In this respect it is essential to contemplate future on-site growth capacities designing a long-term site Masterplan strategy, which reserves land zones for future expansion and ancillary service development. The building footprint to height ratio (embodied in the preferred typology) plays a significant role in safeguarding this future capacity, with the building proportion balanced and appropriately articulated to have regard for the local urban context.

4.2 BUILDING TYPOLOGY (CONT.)

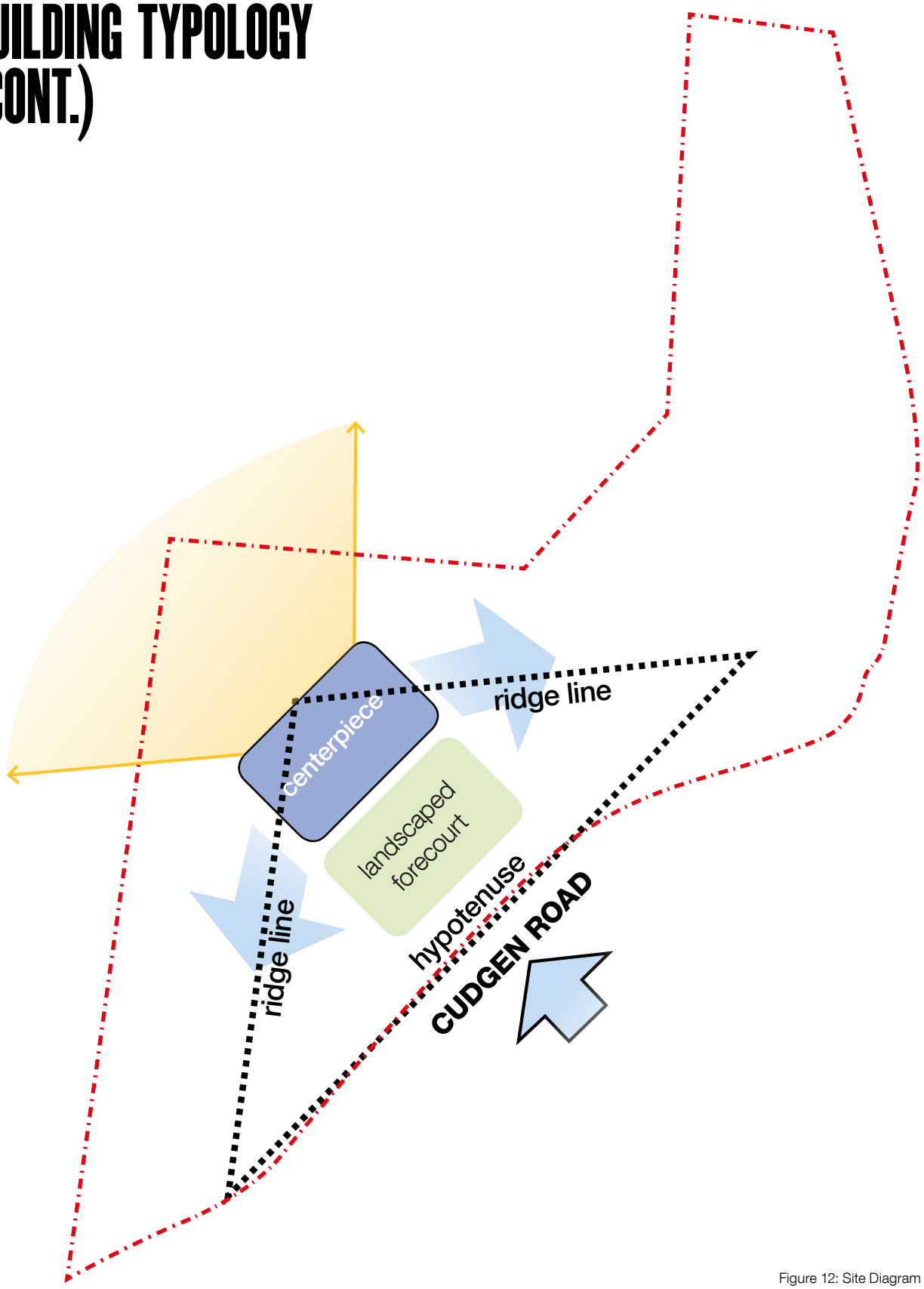

Figure 12: Site Diagram

4.2 BUILDING TYPOLOGY (CONT.)

Typologies that have been tested include the “spine and pavilion(horizontal)”, “vertical monolith over partial podium (hybrid)” and “complex tower on podium (vertical stacked)” typologies. The study which included a comparative analysis determined that a complex tower on podium typology was the most appropriate design arrangement.

To summarize, the “spine and pavilion” typology, while providing a lower building height was considered advantageous, this arrangement was considered undesirable as it resulted in long inefficient clinical circulation route connections to IPU’s (wards). Furthermore, the large floorplate characteristic of this scheme demanded future vertical expansion to maintain proximate relationships to core hospital functional areas undermining its primary virtue. The “vertical monolith over partial podium (hybrid)” takes advantage of the topography however still resulted in long travel distances and potentially challenging in regard to mass articulation and future expansion.

The preferred arrangement which is currently undergoing design development will fit with the proposed maximum development envelope and takes the form of the “complex tower on podium (vertical stacked)” typology. This typology allows for a broad based integrated clinical and support services podium, comprising two major vertical lift cores from which IPU levels above the podium will be planned. The proposed scheme includes provision of a rooftop helipad located vertically above peri-operative and ED departments, directly connected with emergency hot-lift links. The tower IPU’s will be designed relying on shallow plan depths taking advantage of daylight access and minimizing excessive circulation demand. The IPU’s will be orientated to take advantage of the 360 degree views from the site. Lower ground levels below entry level accommodate segregated ED access and logistics from the main public entrance interface.

This scheme is undergoing further refinement the detail of which will be provided within the Stage 2 SSD/DA submission.

4.2 BUILDING TYPOLOGY (CONT.)

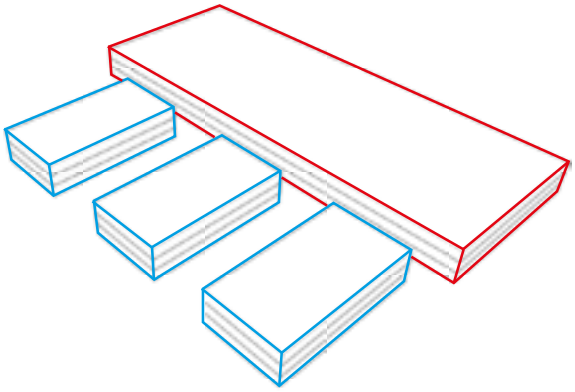

Figure 13: Spine and pavilion typology

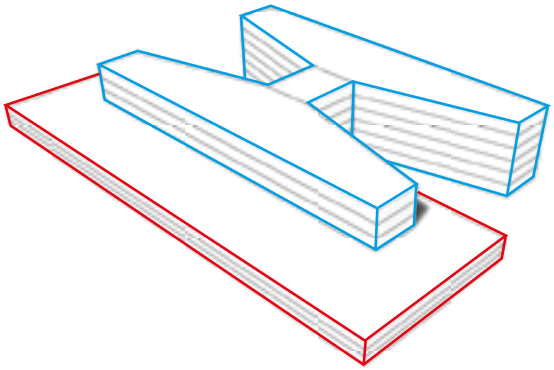

Figure 14: vertical monolith over partial podium (hybrid) typology

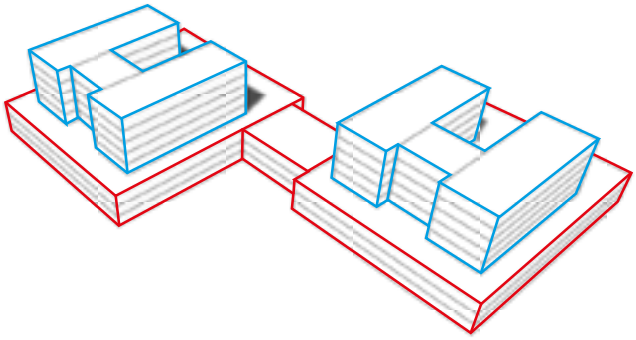

Figure 15: Complex tower on podium (stacked) typology

4.3 BUILDING ENVELOPE

The Concept Proposal drawing AR-SKE-10-006 sets out a maximum planning envelope within which the proposed starting-case hospital will be designed. The intent of the maximum planning envelope, is to establish the maximum scale (width, depth and height) limits of the hospital building design, which will be entirely accommodated within this spatial volume. The EIS and supporting drawings illustrate the visual impact of the maximum planning envelope, defining the greatest building mass extents.

The proposed hospital planning envelope is illustrated in figure 12 Masterplan – Concept Plan. The slope of the land will be used to achieve entries at different levels for optimum clinical and operational functionality and build two levels of the building below the main entry level from Cudgen road. The anticipated building typology will comprise a basement zone to service the hospital. Emergency department on lower ground (being the ground level at the northern aspect of the sites plateau), main entry with a range of outpatient and other clinical services at ground level from Cudgen Road. The remainder of the lower zone of the building above ground level will comprise operating theatres and associated services. Overall the building is proposed to include basement, lower ground and ground levels, with five levels of occupied space above, with increasing reduction in building density. Plant space, helipad and associated lifts will be situated at the roof level of the building.

The main ground level entrance from Cudgen Road is to be situated at AHD +28, with the lowest basement level at approximately AHD +19m.

The planning envelope for the main building includes zones of anticipated densities. These provide general parameters for the detailed design and massing of the built form and are as follows:

- Basement: 10-30%
- Zone 1: 50-70%
- Zone 2: 25-45%
- Plant 5-20%

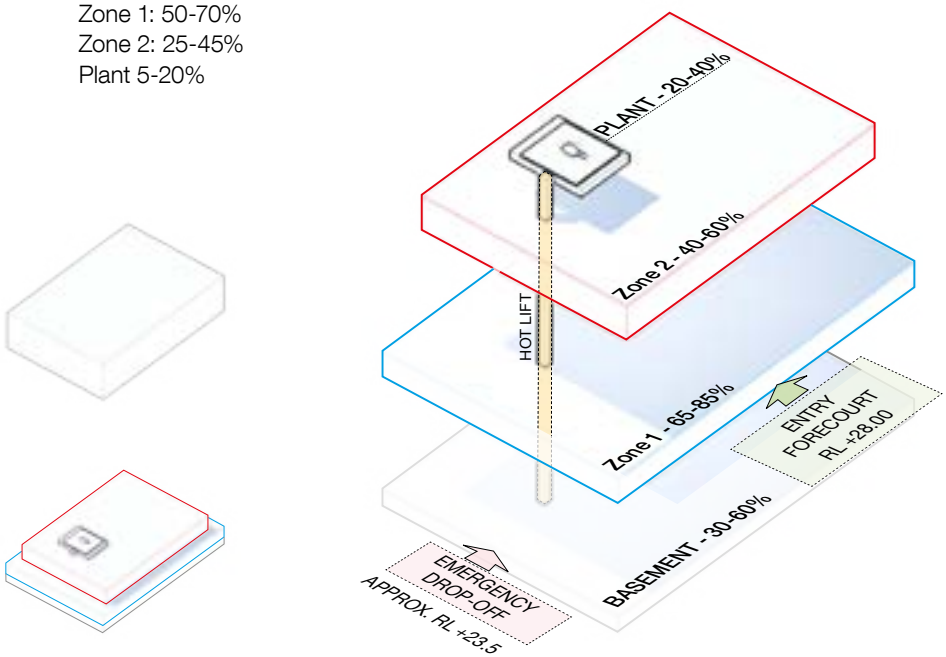

Figure 16: Proposed Volumetric Stack

4.3 BUILDING ENVELOPE (CONT.)

Zone 1 will accommodate functions that service daytime and acute functions of the hospital. The intent is to take maximum advantage of the natural surrounding landscape views and idyllic climate conditions, adopting features such as deep overhangs and roofed terrace/balcony spaces. Within this zone large compact floor plates are typically required to effectively collocate dependent medical modalities. All be this the case strategies will be explored to introduce courtyards and facade "indents zones" providing landscape, daylight and passive ventilation to reach the deeper floor-plate zones. Where appropriate podium functions will have direct access to surrounding gardens. Landscape courtyards will be used to link and terminate primary circulation routes where possible. Public waiting and staff social spaces will be collocated alongside these spaces to improve user amenity.

Internal Amenity

The residential IPU levels will be located above in zone 2. A design strategy is to explore achieving a sense of "residential address" at the public entrance to the ward. Ward arrival and complimentary social spaces will be structured intuitively around generous landscaped balcony/terrace spaces which will provide physical access to outdoor landscape, sunlight and fresh air. The ward wings will be planned with patient rooms/beds orientated to maximize of the surrounding 360degree feature views. Shallow ward floor-plates will be considered, to reduce circulation inefficiencies and provide opportunities for reliance on daylight and passive ventilation. Interior design strategies will be informed by salutogenic inspired design philosophy. Design incorporating natural forms and materials provide a natural therapeutic healing environment and is known to improve patient healing outcomes.

The hospital building is set-back approximately 76m from the Cudgen Road title boundary and is located at the deepest part of the develop-able plateau. The location has been selected to mitigate overshadowing impacts to surrounding properties and to accommodate future hospital expansion and facility renewal as well as support future development of allied health services and functions on site.

The hospital has been orientated in parallel alignment with Cudgen Road to the south. This establishes an ordered entrance forecourt space and approach with centralized main public set-down. The Project also currently accommodates close-proximity surface car-parking to its east and west flanks, adjacent to secondary public entrances to feeding into the east-west orientated hospital street. From the east access will be from lower ground level adjacent to the Emergency Department entrance and will incorporate a public circulation connection to the main hospital street occurring at ground level.

The development site has been strategically planned (defined by the internal road network) to accommodate future low-rise development along Cudgen Road responding in a scale sensitive manner to the local built environment scale along Cudgen Road and neighbouring sites - illustrated in figure 33. The starting-case development proposal also includes provision of a support service building located adjacent to the main entrance.

The hospital design will have regard for helicopter flight paths and landing constraints.

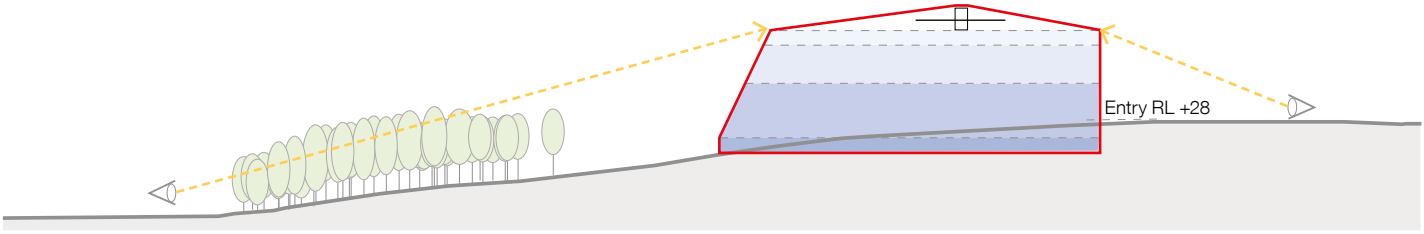

Figure 17: Diagrammatic Section

4.4 MATERIALITY AND COLOUR

The design process is currently in its early stages and therefore detailed façade material selection and colour palettes are yet to be determined. As a consequence of the early stage in the design process we have outlined a range of practical considerations and design philosophies that we intend to work through to develop the design, the detail of which will be included in the Stage 2 DA submission to be issued at a future date.

Design studies focused on materiality and colour will be conducted during the design process as the detail block and stack form of the hospital develops, within the limits of maximum planning envelope reflected in this EIS submission. The evolving building design concept suggests materiality that expresses upper IPU levels distinctly from a more human scaled podium. We will take inspiration from the site's topographical form and natural context, drawing from the environmental area to the north and west, the geology of the site, as well as the region's climatically responsive architectural vernacular. In addition to developing ephemeral concepts, each element will need to respond to a range of practical determinants including (but not limited to); statutory compliance, maintenance, internal/ external functionality, climate response and ESD targets, cost efficiency and buildability.

The overarching building design philosophy is to develop a building form which in its spatial proportions, textures, materiality, colours, art and landscape integration is experienced as coherent and balanced, harmonising with the site and local region while promoting a high-quality therapeutic environment. Based on salutogenic design principles (refer section 3.1) that look to create a healing and restorative environment, we have a preference for timeless natural materials and finishes which foster a closer connection to nature. We are also mindful of selecting resilient materials which are appropriate to the building's context and close proximity to the ocean. There will be a preference for local materials and construction techniques (where feasible and appropriate) with a colour and material palette inspired by the site and its breath-taking context (refer Figure 18).

01 - Light / Air
02 - Ocean / Space
03 - Driftwood / Sand Dunes
04 - Canopy / Dappled Light
05 - Contextual / Shading
06 - Vernacular / Screening
07 - Layering / Core Samples on Site
08 - Ground / Rocks on site

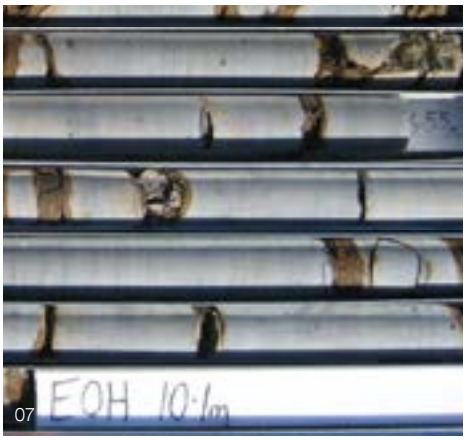

Figure 18: Mood Board

4.5 FLOOR AREA & HEIGHT

The gross floor area of the Concept Proposal is in the 55,000sqm to 65,000sqm range , including acute and sub-acute facilities, emergency medicine and ancillary uses such as retail and service infrastructure buildings.

The overall height of the hospital described in drawings AR-SKE-50-101, 201, 301 and 401 includes roof top helipad and vertical access lift core/ above roof level. There are lower ground levels below entrance level. The main ground level public entrance is to be at AHD +28 being Cudgen Road entry level, with the lowest basement level at approximately AHD +19m. The top of the helipad lift/stair core is at AHD +67m.

The support building fronting Cudgen Road, comprising lower floor to floor heights achieving ground level AHD +28m and roof level AHD +39.5m, with lift overruns occurring above this level.

Figure 19: Elevated Views from the Site

4.6 LANDSCAPING

An established melaleuca and she-oak environmental area defines the northern boundary of the site. This area ranges in elevation above sea level from AHD +1.00 to AHD +8.00, and forms a vegetated buffer between Kingscliff west residential suburb to the north and the proposed new hospital development at the top of the ridge at AHD +27.2. This area is also prone to flooding and is classified by local Town Council, as having a “Coastal Wetland” overlay

The preferred hospital development zone achieves the recommended 50m APZ (2006) separation from the environmental area tree-line, and further exceeds this to accommodate the revised 67m APZ (Draft 2017 guideline) separation, ensuring all current and future proposed development is viable. Approved plant species will be planted to manage bushfire risk where required within the agreed APZ zone.

Refer to Landscape Design report and landscape zonal diagram for further detail.

The design intent is to harness and integrate the local natural landscape context of the site and local region within the design and planning of the hospital building. Integration of landscape within the hospital enhances the healing environment and promotes a healing workplace environment. The introduction of integrated landscaping to the ground level public areas and internal hospital courtyards and terrace spaces will be considered. Internal planning will have regard for maximizing high quality distant views of the bay, tree canopies and mountain ranges beyond.

Figure 20: Masterplan - Asset Protection Zone

4.7
VEHICULAR ACCESS

The Project Site for the Tweed Valley Hospital is located in close proximity to the townlands of Kingscliff and Cudgen and is accessed via Tweed Coast Road being approximately 4 kilometres from the M1 Pacific Motorway off-ramp in the north which is single carriage motorway. Site access to the proposed Hospital will be predominantly via Tweed Coast Road, which spans from Chinderah, to Wooyung situated to the south down the coastline. In addition, the site provides access to Kingscliff Town Centre via Turnock Street.

As advised by Bitzios Consulting Traffic Engineers, Cudgen Road will need to be upgraded to provide for the main entry to the Project Site. This will occur via provision of a new signalized intersection off Cudgen Road which will also provide for vehicle egress. Additionally, the campus road network will include a secondary access point linking to the existing turning circle at the intersection of Cudgen Road and Turnock Street. Two further interspersed secondary “left-in” slip roads will be provided, accommodating ambulance and logistics vehicle traffic from the west (most efficient on approach from Tweed Coast Road) and direct staff/public carpark access and future growth scenario access via the east slip road. The internal road network includes provision for a north service link road, also connecting east and west staff car parking areas. The link road will also be used to maintain landscaping within the APZ zone.

The Project Site is serviced by two existing bus routes. New bus lay-by to be provided in front of the hospital either side of the street, and within close walking distance of Kingscliff TAFE.
These will be complemented by a pedestrian crossing (with close-proximity positions to hospital main entrance) integrated with the new signalized intersection of the proposed main hospital entrance. The pedestrian crossing will connect to a pedestrianized hospital forecourt area, activated the functions accommodated within the class 5 building on route to the main hospital entrance.

The internal road network provides for public set-down along the south edge of the hospitals main entrance approach, with service entrances to the east and west ends of the hospital. Public carparking will be provided on site with close-proximity access to hospital secondary entrances, leading to the east-west orientated hospital street. Staff car parking is situated beyond the public parking on both sides respectively.