Construction Management Plan

Development Application 2023/1832
5 Portions Lovett Bay
DP 590990

Introduction

The construction of a dwelling and studio is proposed at the property 5 Portions Lovett Bay, situated on the northern side of Lovett Bay in Pittwater. The site is adjacent to the Ku-ring-gai Chase National Park and is water access only. As a result of the isolated nature of the site, a number of construction constraints, risks, and requirements typical of residential developments on the western foreshores of Pittwater must be managed and mitigated through the planning and construction process. Building materials must be brought across water and manually transported up the hill to on-site storage. This construction management plan identifies and outlines the opportunities, strategies and workflow proposed to mitigate the constraints and risks associated with the proposed development. Detailed construction plans will be designed and certified at the construction certificate phase but the following principle elements and general procedure will be as outlined in this construction management plan.

Site description

The proposed building site for the development at 5 Portions Lovett Bay is an existing flat, grassed terrace (the site of a previous building) situated approximately 17 m above the Australian Height Datum. The site is accessible by a 4.5 m wide right of carriageway from the water. There is no public road access to the site and there is native vegetation to the north and east of the site, with managed neighbouring properties to the south and west. The building envelope for the proposed development at 5 Portions Lovett Bay is on the same contour and directly aside of 4 Portions Lovett Bay, inhabited by the same owners and family of 5 Portions Lovett Bay. As such, the amenities and facilities of 4 Portions Lovett Bay (kitchen, WC, 20 square meter undercover workshop) are available to support the building activities planned for 5 Portions Lovett Bay, as needed during the initial phases of construction.

General construction and logistics approach to address constraints and risks associated with remote site

The majority of constraints and risks associated with building on the western foreshores of Pittwater arise from the lack of direct road access to properties, complicating the delivery of building materials and access to and from sites. In the case of 5 portions Lovett Bay, a number of opportunities mitigate or remove these constraints and can reduce the costs and difficulty sometimes associated with building offshore. These constraints (C1-C5), risks (R1-R7) and opportunities (O1-O10) are listed below and detailed in the following paragraphs.

Construction constraints

- C1: Water access only site (no road access for material delivery)
- C2: Slope access from waterfront
- C3: Isolated nature of site for miscellaneous materials
- C4: No connection to mains sewer or water
- C5: Additional construction costs associated with offshore building

Construction risks

- R1: Weather conditions, especially during barge transportation, may impact construction schedules.
- R2: Building goods and material handling around water.
- R3: Limited Emergency Access
- R4: Environmental Risks
- R5: Natural Hazards (Rough terrain, ticks, leaches, spiders, snakes)
- R6: Extreme environmental threats (e.g. bushfires and severe storms)

Opportunities

- O1: Lightweight modular design approach from architects experienced with offshore construction.
- O2: Local offshore builders – experience working in water access only location with respect to building logistics and workplace safety and runabout boat for miscellaneous and emergency water transport.
- O3: Public cargo wharf in close proximity at Church Point managed by Northern Beaches Council for all bulky goods deliveries and barge haulage.
- O4: Family owned barge service will bring down material transport costs across water
- O5: Existing pontoon and flat waterfrontage for unloading of goods for transport uphill to site
- O6: Existing concrete slab for onsite materials storage, that out of site from neighbouring properties
- O7: Fully accessible utilities (power, water, WC, kitchen, first aid) at 4 Portions Lovett Bay to support builders at 5 Portions Lovett Bay during initial site works.

- O8: Fully equipped undercover workshop adjacent to site at 4 Portions Lovett Bay, which will be utilised for on-site fabrication, dressing and preparation of structural timber elements for build as needed during initial construction phase.
- O9: Flexibility of clear site so that work can be prioritised to minimise and mitigate construction risks and constraints.

Addressing constraints and risks by leveraging opportunities

The largest constraint for the proposed development is the water access only nature of the 5 Portions Lovett Bay site (C1). Many of the challenges associated with building offshore are derived from the lack of vehicular access and the additional logistics and costs of transporting materials, goods and people across the water (C3, C5). The architects Richard Leplastrier and Karen Lambert have designed and overseen the successful construction of many beautiful residential buildings on the western foreshores of Pittwater and Scotland Island and have considerable collective experience addressing these challenges using appropriate design principles that focus on lightweight modular structures that reduce waste, focus on sustainability and coalesce modestly with the back drop of the Ku-ring-gai Chase National Park (O1). The house and studio proposed for 5 Portions Lovett bay have been designed with these principles in mind. Both structures will be constructed using a modular hardwood system that minimises waste material by utilising standard sheet widths for cladding. The proposed design relies predominantly on lightweight materials like corrugated iron roofing, sheet plywood, and hardwood timber in lengths manageable by one to two people to facilitate manual transport up hill (C2) to site storage. The design minimises the use of heavy materials, limiting the use of concrete for all but the essential features of building foundations and the slab floor of the studio and avoiding materials such as brick and roof tiles altogether.

There are a number of offshore building companies operating on Scotland Island and the western foreshores of Pittwater that are experienced with architectural builds in water access only locations (O2). Preliminary discussions have already been had with one of these companies that have a collaborative work history with the architects. These discussions have helped inform this construction management plan. By utilising a local offshore building company we can rely on the expertise of professionals accustomed to the terrain of the western foreshores (C2) and the logistics required to deliver water access only buildings to specification and budget (C5). In addition, local offshore building companies have access to and experience in operating their own boats and equipment essential for offshore building allowing them to effectively manage risks associated with weather (R1), the handling of goods and machinery in proximity to water (R2), emergency procedures involving water transport (R3), Environmental Risks (R4), natural hazards such as bites, stings and rough terrain (R5) and broader environmental threats such as bushfire and storms (R6). In addition, having builders capable of using boats addresses the isolated nature of the site allowing for the collection of time critical miscellaneous materials if they are missed during larger barge delivery ordering and material supply (C3).

One of the core factors influencing build timelines is the delivery of building materials to site. The Church Point Cargo Wharf will be used for the coordinated delivery of building materials and loading of barges (O3). Care will be taken to coordinate the delivery of materials for each phase of building prior to the commencement of each building phase. Utilising our family owned barge (O4) will reduce some of the additional costs usually associated with offshore building, and delivery days will be organised to coincide with a sufficient labour force to streamline the safe loading and unloading of materials (R2) at both Church Point Cargo wharf (O4) and the existing pontoon and flat waterfrontage of 5 Portions Lovett Bay (O5). Materials will be immediately transported manually up the hill to the construction material storage location identified in site plan LB4 2/2 (O6). This will ensure that disruptions for neighbours are minimised and that materials are available onsite when needed. Care will be taken in the lead up to scheduled delivery days to monitor weather conditions (R1) and adjust timing and plans as needed to take advantage of good weather windows as a precaution against unwanted exposure of building materials to the elements and safe handling conditions loading and unloading barges and transporting goods up hill (R2, C2). The lightweight modular design and associated materials (O1) have been considered to facilitate the transport of materials to site as much as possible and also reduce the waste produced during building. Waste will be temporarily stored onsite at the location identified in site plan LB4 2/2 and sorted into metals, timber, general waste, and special disposal (paint cans, polystyrene, etc.) for recycling or safe disposal. Waste will be removed on builder's recommendation as required during the course of the build and taken by boat to Church Point and then on to the appropriate recycling centre (Kimbriki or alternate depending on waste material) by ute. Waste storage as identified in site plan is out of view from neighbouring properties and the water and isn't considered to pose a slight on visual amenity during the proposed development.

The proposed building envelope for 5 portions Lovett Bay is on the same contour and adjacent to the house and workshop of 4 Portions Lovett Bay, also owned by the Leplastrier Lambert family. All amenities and services (electricity, water, kitchen, bathroom, shower, first aid supplies) at 4 Portions Lovett Bay are available for the building team at 5 Portions Lovett Bay (O7). Also available is a large established workshop, capable of supporting all which will be utilised for dressing and preparation of structural timber elements for build and prefabrication of modular elements, as needed, during initial construction phase (O8). Access to the amenities of 4 Portions Lovett Bay helps mitigate constraints C1, C2, C4, and C5 while similar amenities are installed at 5 Portions Lovett Bay, reducing the needs for (and costs associated with) temporary power, effluent, and kitchen support for the building team.

The site of the proposed construction at 5 Portions Lovett Bay does not require any demolition or waste removal prior to commencement. As a result, this provides a flexibility around the order of construction operations (O9) allowing for prioritisation of the installation of water tanks, and the ATWS effluent management system (detailed in the associated waste management report) prior to the construction of buildings and structures that might otherwise impede the installation and connection of these essential and bulky services. Tanks can be partially filled with water from 4 Portions Lovett Bay for interim stability, prior to installation of roofing and associated rainwater collection downpipes.

Prioritising the positioning and partial filling of water tanks in the early stages of construction ensures that the positioning of the tanks themselves will not be hindered by construction activities on the building envelope and that there will be a water supply available for building services and fire suppression prior to the timber construction and flame zone cladding phases (O8 mitigating C5 and R7). This flexibility mitigates some of the complexity that is often associated with remote construction in areas that don't have access to mains water or sewer systems (C4).

Proposed sequence and construction methodology

This section presents an overview of the proposed phases, sequence and construction methodology, which will be further refined at the construction certificate (CC) stage through consultation with a structural engineer, the builder, wastewater specialist, and electrical professionals.

Site preparation and screen planting

Prepare the pontoon, waterfront landing for delivery of construction materials and builders access. Demarcation of the construction and waste material storage areas as identified in LB4 2/2 - site plan. Arrange for temporary fencing and sediment barriers where necessary to ensure site safety and minimise offsite sediment transport associated with the minor earthworks. Coordinate with electrical professional to engage AusGrid for site connection to mains power including a *Temporary Builders service connection*. Conduct stabilisation measures for terrace retaining walls (if required and as directed by structural engineer). Mark out building footprint, footing locations, and channels for utilities (power, potable water, effluent management, storm water). Condition soil for proposed screen planting and plant screening citrus trees as indicated in drawing LB4 2/2.

Delivery of Water tanks and pipe for utilities connection

Coordinate the delivery of materials and equipment needed for utilities connection and water tanks for barge transport from Church Point Cargo wharf to 5 Portions' pontoon and waterfront with enough time prior to requirement on site to take advantage of good weather windows. Transport materials up hill to construction materials storage. Tanks can be rolled up hill with a team of six people with ropes and stored on terrace in close proximity to final location.

Excavation for utilities and water tank installation

Excavate trenches for water management, effluent management, and electricity connections as per effluent management system design, energy professional instruction and relevant guidelines. Excavation will be carried out manually or using small machinery that can be brought up the right of passage, as there is no access for large equipment. Coordinate with AusGrid for the installation and connection to the grid. Coordinate with plumbers the installation and connections for effluent management system, site drainage, and rainwater collection and stormwater overflow. Ensure proper backfilling and compaction of trenches after installation of services.

Prepare tank stand footings; install tank stands and position tanks. Once the tanks are in their final positions, the plumber will connect them to the previously laid pipes and temporarily cap. Tanks can then be partially filled with water from 4 Portions Lovett Bay, for additional stability and water access for building activities and emergency fire suppression at 5 portions Lovett Bay.

Foundation and slab construction

Coordinate the delivery of materials and equipment needed for foundation and slab construction for barge transport to 5 Portions' pontoon and then up to site taking advantage of good weather windows.

Excavation for the foundations will be carried out manually or using small machinery that can be brought up the right of passage. Pad footings or concrete piers will be installed to support the structure, as specified by the structural engineer and detailed in the construction certificate. The same equipment will also be used to level and compact the ground in preparation for the studio concrete slab as well as establish perimeter drainage. Temporary low formwork may be required for concrete slab construction of studio ground floor taking into account the location of in situ services. Bagged cement will be transported over by barge and taken up the hill for storage with other materials for first stage of building and mixed on site as needed for pouring the foundations and reinforced concrete slab.

Studio construction

Coordinate the delivery of materials and equipment needed for studio and dwelling construction for barge transport to 5 Portions' pontoon and then up to site taking advantage of good weather windows.

Construction of the studio will begin with the erection of hardwood timber framed stud walls for the ground floor, fixed to the reinforced concrete slab on threaded stainless steel roads. Then cross bracing for the floor will be installed – details to follow at the CC stage. Temporary flooring would be installed over the floor joists.
Installation of ceiling/floor joists for top floor would be installed and covered with temporary flooring to enable safe working on the top floor. Spiral staircase would be installed to give access to top floor. Construction of the top floor

stud walls and roof frame would then follow. Hardwood roof structure, insulation and cladding to follow as specified in the BASIX, plumbing from gutters to water storage would also be fitted. Window and door jams would then be constructed and installed followed by the external cladding and installation of encased flame zone Rollashield Shutters. Location of internal services, insulation and internal cladding would then be carried out before final fit-out and finishes as required.

Dwelling construction

Coordinate the delivery of any additional materials and equipment needed for construction of dwelling for barge transport to 5 Portions' pontoon and then up to site taking advantage of good weather windows.

Construction of the dwelling will begin with the central hardwood post and beam structure and roof to take the double story for the main living area. This will be carried out to engineer's specification and detailed in the CC stage. Roofing, insulation and cladding will be carried out to BASIX and fire specification.

Timber floor bearers will then be fixed to footings and a temporary ply floor will be installed to support construction. Construction of internal stair structure and upper floor timber flooring will follow. Stud walls of the main house will then be constructed, including door jambs, window reveals and the installation of doors and windows, working outwards from the central room. This structure will support the subsequent installation of the roof, insulation and cladding for the east and west wings of the house. Connection of gutters to water storage and stormwater runoff would then be made.

Services installation will be at the builder's discretion before internal wall linings. The preparation and fitting of External cladding will precede insulation and internal wall finishes. Once external cladding is completed then the installation of the encased flame zone shutters can be carried out. Final fit out of kitchen, wet areas and final floor finish, installation of white goods, and any other fit out as directed by builder to complete the dwelling.

Final Landscaping and builders exit

Any final landscaping, removal of waste, and dismantling of any scaffolding and temporary fencing would constitute the last stage of the development before the building team leave site.

Conclusion

By carefully managing the constraints, monitoring the risks, and leveraging the opportunities outlined above, the construction of a dwelling and studio at 5 Portions Lovett Bay can be carried out effectively, efficiency and safely. Further detail can be provided on request.