

CONSTRUCTION MANAGEMENT PLAN FOR THE PROPOSED BAYSWATER MARITIME PRECINCT DEVELOPMENT 21 SIR PETER BLAKE PARADE, BAYSWATER FOR BAYSWATER MARINA HOLDINGS LTD

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Document Prepared By:

Airey Consultants Limited Level 8 19-21 Como Street Takapuna Auckland 0740

T (09) 486 4542 F (09) 489 5455 E michaell@aireys.co.nz W <u>aireys.co.nz</u>

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Quality Assurance Statement		
Bayswater Marina Holdings Ltd	Prepared by:	
	Ashley Watson	
Bayswater Maritime Precinct		
21 Sir Peter Blake Parade, Bayswater	Reviewed by:	
	Michael Lee	
Project Manager:	Approved for issue by:	
Michael Lee	Michael Lee	

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1 INTRODUCTION

Bayswater Maritime Precinct is a proposed development of Bayswater Marina, located in Bayswater, Auckland. The site is an operational marina and marina operations and services will be maintained for the duration of the construction works. Maintaining safe access to the marina piers is therefore a critical part of the overall project. An added complication is the fact that under the current marina berth leasehold licenses, 310 carparks are required to be provided for use by berth holders. This means that throughout the construction period, these carparks must be provided at all times.

This Construction Management Plan has been prepared in order to develop a high-level construction methodology for the project. It is intended that this document will be a live document that will continue to be developed as the design phases of the project progress; and will ultimately serve as the document that sets out the construction contractor's methodology.

The project involves a substantial scope of civil and structural engineering works which will need to be undertaken at the subdivision stage (prior to the release of titles), including:

- Demolition
- Bulk earthworks
- Stormwater, wastewater and water supply construction
- Utilities construction
- Pavement construction
- Hard and soft landscaping
- Piling for foundations
- Construction of retaining walls

2 DEMOLITION

The key consideration during the demolition phase of the development is maintaining not only safe access to the marina berths, but also maintaining utility services to the berths as well as temporary carparking. A proposed demolition methodology has been prepared and is summarised below.

2.1 Demolition Methodology

- i. The existing boat storage yard and buildings located in the northern part of the site will be removed. Additional metal will be spread over the yard area which will then be surfaced with chip-seal. Temporary signage will be installed to form a temporary carpark with 240 car spaces. The service connections to the buildings in the yard will be decommissioned.
- ii. The existing services that serve the marina berths will be relocated to suit the layout of the development. Provision will be made for providing temporary power and water supply while the relocation works are being undertaken. The existing public toilets and liveaboard marina facilities will also be removed. Provision will be made for providing temporary public toilets for the duration of the works. The marina offices (which are portable buildings) will be relocated prior to the commencement of works.
- iii. An area of the existing carpark will be provided with signage to create a temporary carpark with 70 car spaces. Boat ramp access will be maintained for the duration of the construction works.
- iv. A site compound will be constructed near the existing boat ramp and the temporary carpark. Signage and safety fencing will be installed to provide safe vehicle access to the two temporary carparks and pedestrian access from the carparks to the marina berths. Security fencing will be installed around the perimeter of the site (while maintaining public access to the perimeter footpath).
- v. Comprehensive demolition work will begin in the south precinct. This will involve removal of most trees (apart from the six existing Pohutukawas located southwest of the boatramp which will be retained, and the remaining Pohutukawas which will be temporarily relocated and stored within the site during the construction work, then replanted within the site), street lights and other surface features, as well as excavation of the existing pavement

layers. Excavated granular material from the existing pavements will be stockpiled for use as fill material under building foundations. Excavated topsoil from landscaping areas will be stockpiled for reuse in the proposed landscape areas. Sediment controls will be established prior to the excavation of topsoil.

vi. Bulk earthworks construction will then proceed as described in Section 3.

3 BULK EARTHWORKS & CIVIL WORKS

Bulk earthworks will be undertaken in three main cut to fill phases, with a final stage involving cut from stockpile. Some excavated material will be disposed of off-site, primarily in Stage 2. It is expected that no imported material will be required for bulk earthworks, however granular material will be required to be imported for the construction of pavement layers, building foundations, and pipe bedding and backfill.

Civil works will generally be undertaken once earthworks have been completed in a precinct, so the programme of works will be as follows:

- Stage 1 earthworks and civil works in South Precinct and Sir Peter Blake Parade
- Stage 2 earthworks and civil works in Central Precinct
- Stage 3 earthworks and civil works in North Precinct.

The proposed construction phases are documented on the construction management plans attached in Appendix A. The site compound and temporary carparks will progressively be relocated as works progress, as shown on the staging plans.

3.1 Earthworks Methodology

The proposed bulk earthworks methodology is generally the same for all phases as follows:

- i. Silt fences will be erected around the perimeter of the earthworks area first.
- ii. Excavation to form a sediment retention pond will be undertaken, with excavated material placed as fill.
- iii. Cut to fill earthworks will proceed with the cut and fill areas being selected in order to keep the majority of the earth-worked area falling towards the sediment retention pond at all times. Excess cut material will either be disposed of off-site or stockpiled for future phases as shown on the staging plans.

- iv. The bulk earthworks for each precinct will not include the area on top of the reclamation bund or the existing footpath in this area. These will be retained during the main earthworks phases. A temporary batter will be formed down from the finished earthworks level to the existing surface.
- v. Upon completion of earthworks in a phase the earth-worked area will be stabilised, and civil works and structural works will commence.

3.2 Civil Works Methodology

The proposed civil works methodology is generally the same for all phases. Materials and plant will be stored in the site compound which will be progressively relocated as the works progress.

- i. Structural works associated with the perimeter pathway and retaining wall construction will begin concurrently with the commencement of civil works.
- ii. Construction of stormwater and wastewater drainage and utilities services will be undertaken first. This will include construction of stormwater treatment devices and outlets. Existing service pit covers and valves/hydrants etc will also be raised to suit the new proposed finished surface levels.
- iii. Construction of pavements will be generally be undertaken after the completion of services construction.
- iv. After the completion of pavement sealing the completed marina berth carparks will be opened up in order to facilitate removal of some of the temporary carparks.
- v. Final completion of the hard and soft landscaping (including pavements) near the structural works will be deferred until after the completion of the structural works. This is to avoid damage being caused to the landscaping by the construction plant for the buildings.

4 STRUCTURAL WORKS

The structural works involved in the project at the subdivision stage include:

- The perimeter retaining walls (refer to Section 6)
- Apartment buildings
- Temporary retaining walls to retain the terrace house excavations
- Minor landscaping retaining walls and other hard landscape features

The piling works for the apartment buildings will be undertaken by piling rigs (50 tonnes or more in weight). Excavations and piling for the retaining walls will be able to be undertaken by excavators fitted with auger attachments (15 – 25 tonnes in weight).

4.1 Structural Methodology

- Retaining wall construction for the perimeter pathway will commence immediately after the completion of the construction establishment phase. The construction operations will start from the South Park and will proceed in a clockwise direction around the perimeter of the site.
- ii. Structural works for buildings will not commence until bulk earthworks have been completed in a precinct.
- iii. The apartment basements will be excavated at the bulk earthworks stage and safe batters provided. Piling operations and construction of under-slab services will then commence from within the basement excavation. Dewatering of the basements will likely be required.
- iv. The terrace house foundations will also be excavated at the bulk earthworks stage and temporary timber pole retaining walls provided to support these excavations. Piling for these retaining walls will be undertaken from the finished earthworks level either by excavators with augur attachments, or by medium sized piling rigs (25 – 45 tonnes in weight).
- v. Construction of the multi-storey apartment buildings will be undertaken by mobile cranes or potentially tower cranes. If mobile cranes are used it is anticipated that the newly

constructed pavements will be suitable for supporting the cranes, although they will likely need to be repaired after being used as crane pads. If tower cranes are utilised to construct the apartment buildings it is likely that piled crane bases will need to be constructed. This will be confirmed by the crane contractor and geotechnical engineer during construction.

5 GEOTECHNICAL CONSIDERATIONS

Reference should be made to the Geotechnical Investigation Report prepared by KGA Geotechnical Group Ltd (ref K200265-1, dated 01/10/2020). The key geotechnical considerations from a construction point of view are discussed below.

5.1 Groundwater

KGA's groundwater investigations determined that the average groundwater level within the site is approximately RL1.0. However, near the existing reclamation bunds the groundwater level is expected to fluctuate with tidal variations. It should also be noted that the groundwater is anticipated to be saline and therefore structures and services constructed below RL1.0 should be designed to accommodate salinity equivalent to sea water in accordance with the relevant durability standards. The three apartment buildings have basement floor levels that are near to or below the groundwater level. In addition, some services trenches will be constructed below the groundwater level. Dewatering of these excavations will be required and it is recommended that the service trenches be backfilled during low tide when the groundwater level is at its lowest.

5.2 Differential Settlement

The underlying material present on the site has been subject to a substantial amount of historical consolidation/settlement. KGA undertook consolidation modelling and determined that the development may experience future consolidation of up to 65mm (assuming 1m fill depth). The site has also been designated as Moderately Reactive (Class M) in accordance with NZS3604 (SLS 500 year design characteristic surface movement of 44mm). If this consolidation were to occur it would be confined to the pavements and the landscaped areas, as the buildings will all be supported on pipes founded in bedrock. Therefore differential settlement between these features would be likely to occur. In order to reduce the impacts of differential settlement it is suggested that transition slabs (connected to the piled buildings and allowed to flex) are constructed, and that flexible joints are provided at all interfaces between inground pipes and pipes suspended beneath structural slabs.

5.3 Stabilised Upper Layer

The upper 1.5 - 2.0m of material present on the site is noticeably stiffer than the deeper fill material; and was most likely lime stabilised during the original reclamation works to form the marina and carpark. This material is anticipated to be suitable for use as engineered fill.

5.4 Low Strength Underlying Materials

The low strength material underlying the stiff layer is anticipated to not be suitable for use as engineered fill and will need to be stabilised with lime and/or cement, or disposed of off-site. It should also be noted that the low strength material is unlikely to be suitable to support piling rigs or other large construction plant. A working platform will need to be constructed consisting of the following:

- A biaxial or triaxial polyester geogrid laid on the low strength material
- A non-woven geotextile separator cloth laid over the geogrid
- Approximately 800 1000mm thickness of granular material (GAP40 or GAP65) laid over the geotextile and compacted in layers not exceeding 250mm thick

6 CONSIDERATIONS FOR BERTH-HOLDERS

One of the key considerations for the construction of the project is the existing marina berths and the associated carparks and facilities. There are 419 marina berths and 310 carparks allocated for berth-holder use. Access to the berths is required to be maintained at all times as is access to the carparks. Temporary carparks will be required to be provided until the new berth-holder carparks have been constructed.

6.1 Carparks

The temporary carparks will be formed prior to the commencement of construction works, however due to the layout of the site and the proposed development, the temporary carparks will need to be relocated several times as the site development works progress. Safe pedestrian access from the temporary carparks to the marina piers will be retained at all times (with the exception of short disruptions to facilitate boardwalk construction, as described in Section 6.2). The preliminary methodology for the staging of the temporary carparks is detailed below.

6.1.1 Stage 1 – South Precinct

- The trailer boat yard will be cleared and metal spread over the area to form a stabilised area suitable for carparking for 240 cars.
- An additional 70 carparking spaces will be provided in the western part of the site, near Piers
 B and C. This area is currently an asphalt carpark and therefore minimal work will be
 required to prepare this for use as a temporary carpark.
- Access to the trailer boat yard and the other temporary carparks will be along Sir Peter Blake Parade and will be largely unchanged from existing conditions.

6.1.2 Stage 2 – Central Precinct

- By the time work commences in the bulk of the central precinct the earthworks and civil works in the south precinct will have been completed.
- A total of 140 carparks for berth holders will have been provided in the south precinct by this time.
- As works commence in the rest of the central precinct, the site compound will be relocated to the eastern corner of the trailer boat yard, as the number of carparks required there has decreased by 70.

- Access to the trailer boat yard carparks will be along Sir Peter Blake Parade.
- Access to the newly constructed carparks will also be along Sir Peter Blake Parade via the existing western entrance to the carparks.
- Traffic controls and signage will be provided to ensure the safety of berth-holders, as construction plant will be crossing Sir Peter Blake Parade from the central precinct works area to the site compound and material stockpile.

6.1.3 Stage 3 – North Precinct

- After earthworks and civil works are largely completed in the south and central precincts work will commence in the north precinct.
- By this point enough carparks will have been built that 240 carparks for berth-holders will be able to be located in the south and central precincts.
- The temporary carparks located in the trailer boat yard will be reduced to 70 and bulk earthworks and civil works will commence in the north precinct.
- The last temporary carpark will be removed upon completion of the carpark construction in the north precinct, following this the north park landscaping will be able to be completed to conclude the civil works construction.

6.2 Perimeter Pathway

A new public pathway will be constructed around most of the perimeter of the site, a total length of approximately 600m. The pathway will be supported by a gabion retaining wall with a maximum height of approximately 2.60m.

6.2.1 Pathway Construction Methodology

Due to the importance of the pathway in providing access to the marina piers, and maintaining public access around the perimeter of the site, it is proposed that construction of the pathway will begin immediately following site establishment and service relocation. Construction will commence from the southern end of the site, near the existing ferry terminal. This point is where the pathway starts to rise above existing levels; and is the start of the gabion retaining wall.

Bulk earthworks and civil works will be able to progress in the rest of the south precinct while the retaining wall construction is ongoing. The earth-worked surface will be raised up above the existing surface concurrently with the retaining wall construction.

In order to maintain access to the berths for berth-holders, efforts will be made to only close off short sections of the existing perimeter footpath at a time. Provisions for providing temporary gangways to some piers will be made as required.

6.3 Facilities

In addition to carparks, the other facilities provided for berth-holders include, toilets, showers and laundry facilities. There is also a marina office which will need to kept operational for safety and security reasons. The marina office is a portable building.

There are two existing toilet blocks on the site, these include shower and laundry facilities. The southern block is proposed to be demolished in Stage 1 of construction, while the northern block will be demolished in Stage 2. The marina office will be relocated in Stage 1 as well.

Prior to the demolition of the southern block marina office a temporary toilet, shower and laundry facility will be constructed in the northern part of the site, in the existing trailer-boat yard. The marina office will also be relocated to the trailer-boat yard. This facility will be retained for Stages 1

and 2 of the construction works. Both the berth-holder facilities and the marina office are proposed to be provided in the ground floor of the southern apartment building, and it is possible that this may be completed prior to the commencement of Stage 3. If this is not the case then provision will be made for relocating the temporary facilities from the trailer boat-yard to another location in the central or southern precinct until the new permanent facilities are completed.

7 PUBLIC FACILITIES

Existing public facilities in the vicinity of the site include:

- Auckland Transport ferry terminal (within the site)
- Auckland Transport park and ride car parks (adjacent to the site)
- Auckland Transport bus stop (within the site)
- Boat Ramp (within the site)
- Walkway around the perimeter of the site

7.1 Ferry Terminal

The ferry terminal is located in temporary structures at the southern tip of the Bayswater Marina site. Ferry patronage is approximately 5000 passengers per day. Ferry passengers generally arrive by bus, private vehicle, or walking. In all cases the pedestrian route to the ferry is through the existing car park, past the boat ramp and along the path on the south eastern edge of the site.

Pedestrian access to the ferry terminal will be maintained for the duration of the construction works. The path on the south eastern edge of the site (refer Figure 1) will be redeveloped as part of Stage 1 the project, and a temporary diversion will be provided while these works are undertaken. A delineated pedestrian route separated from construction traffic will be provided for the duration of the construction works. The pedestrian route will be adjusted to suit each stage of construction works.



Figure 1 – Looking south to ferry terminal from the boat ramp

7.2 Park and Ride Car Parks

The existing park and ride car parks are located in the Auckland Council land immediately east of the site. Access to the car parks will be impacted by the Stage 1 construction works on Sir Peter Blake Parade. It is anticipated that the road will be reduced to a single lane with stop-go traffic control while these works are undertaken. Following the completion of the works on Sir Peter Blake Parade access to the car parks will be unimpdeded for the remainder of the construction period. Pedestrian access from the park and ride car parks to the ferry terminal is described in Section 7.1.



Figure 2 - Looking south at park and ride car parks from Sir Peter Blake Parade

7.3 Bus Stop

The existing bus stop is located north of the boat ramp, within the site. We understand that Auckland Transport is currently engaged with designing a new car park and bus stop facility that will be located on the Auckland Council land east of the site, however we are not aware of any firm timing for this work. Therefore it is proposed to retain the existing bus stop location for the duration of the construction works. The bus route through the site will generally be maintained for Stages 1 and 2-A of construction but will be adjusted for Stages 2-B and 3 to run further west along the newly constructed Link Street and east along the newly constructed Cross Street. As described in Section 7.1, safe pedestrian access from the bus stop to the ferry terminal will be maintained for the duration of the construction works. The existing pavement at the bus stop location will be removed and reconstructed during Stage 1 of construction, this work will be staged so as not to impede bus or pedestrian access. Temporary relocation of the bus stop by up to 30m is anticipated to facilitate this work.



Figure 3 - Looking northeast to bus stop with boat ramp in foreground.

7.4 Boat Ramp

The boat ramp is popular, particularly in the summer months, and is provided with a substantial number of trailer parks. The boat ramp is proposed to be retained as part of the development and the existing trailer parks and to be replaced with new parks. The existing trailer parks will be retained for Stages 1 and 2-A, although the pavement around the boat ramp will be reconstructed to suit the development. These works will be staged so as to maintain access to the boat ramp at all times. At the commencement of Stage 2-B, the existing trailer parks will be removed, but by this point new trailer parks will have been constructed along Sir Peter Blake Parade and these will be able to be utilised going forward.

7.5 Waterfront Path

The pathway around the perimeter of the site provides access to the marina berths, and also provides a route for the public to walk around the waterfront. The existing path is proposed to be replaced with a new, wider pathway as part of the development. In order to facilitate construction of the new pathway (which is situated at a higher elevation), temporary diversions of the existing path will be provided. It is anticipated that works on the pathway will be undertaken in all construction stages, beginning adjacent to the boat ramp and moving around the perimeter of the site in a clockwise direction.

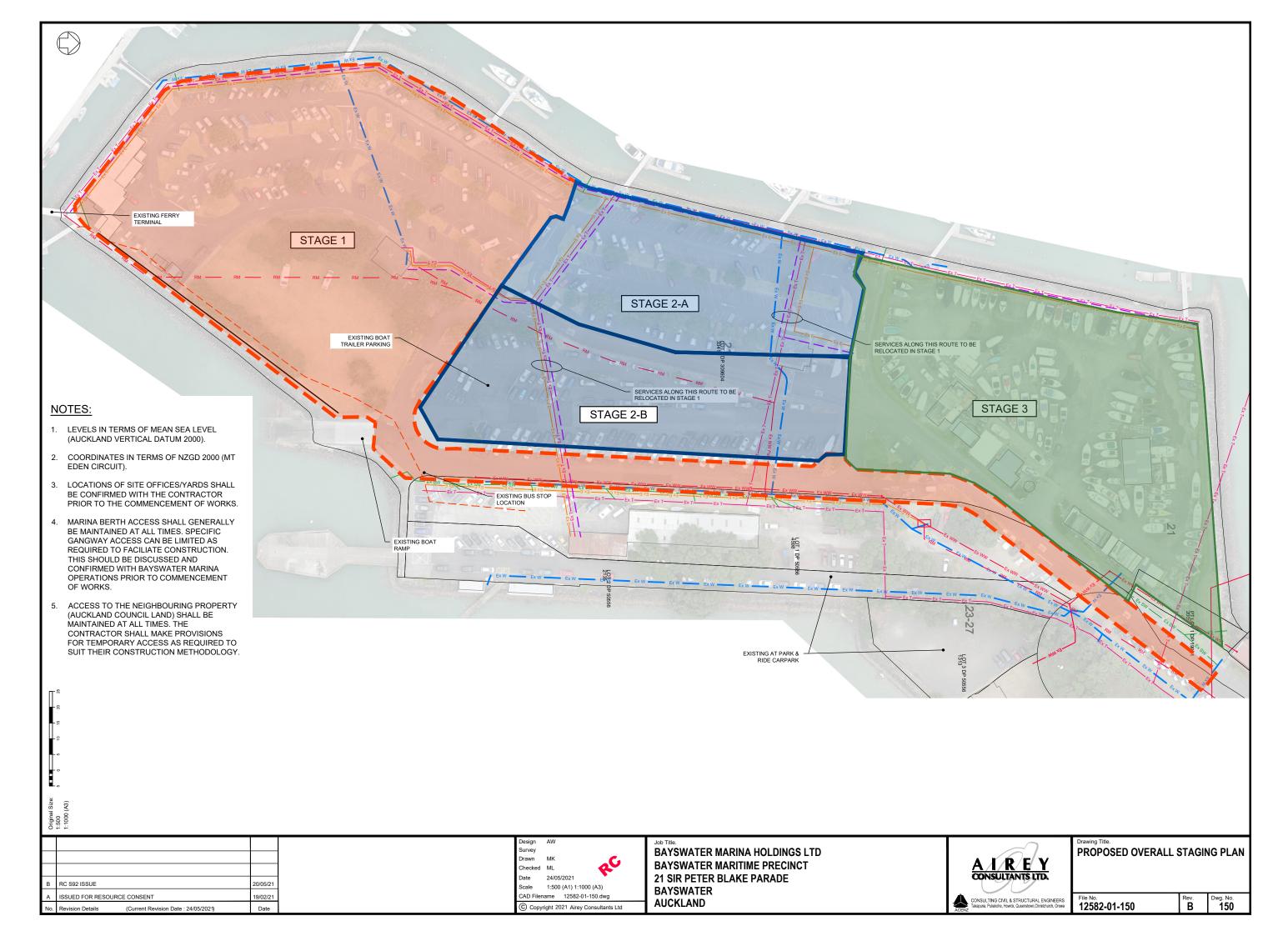
8 TERRACE HOUSE CONSTRUCTION

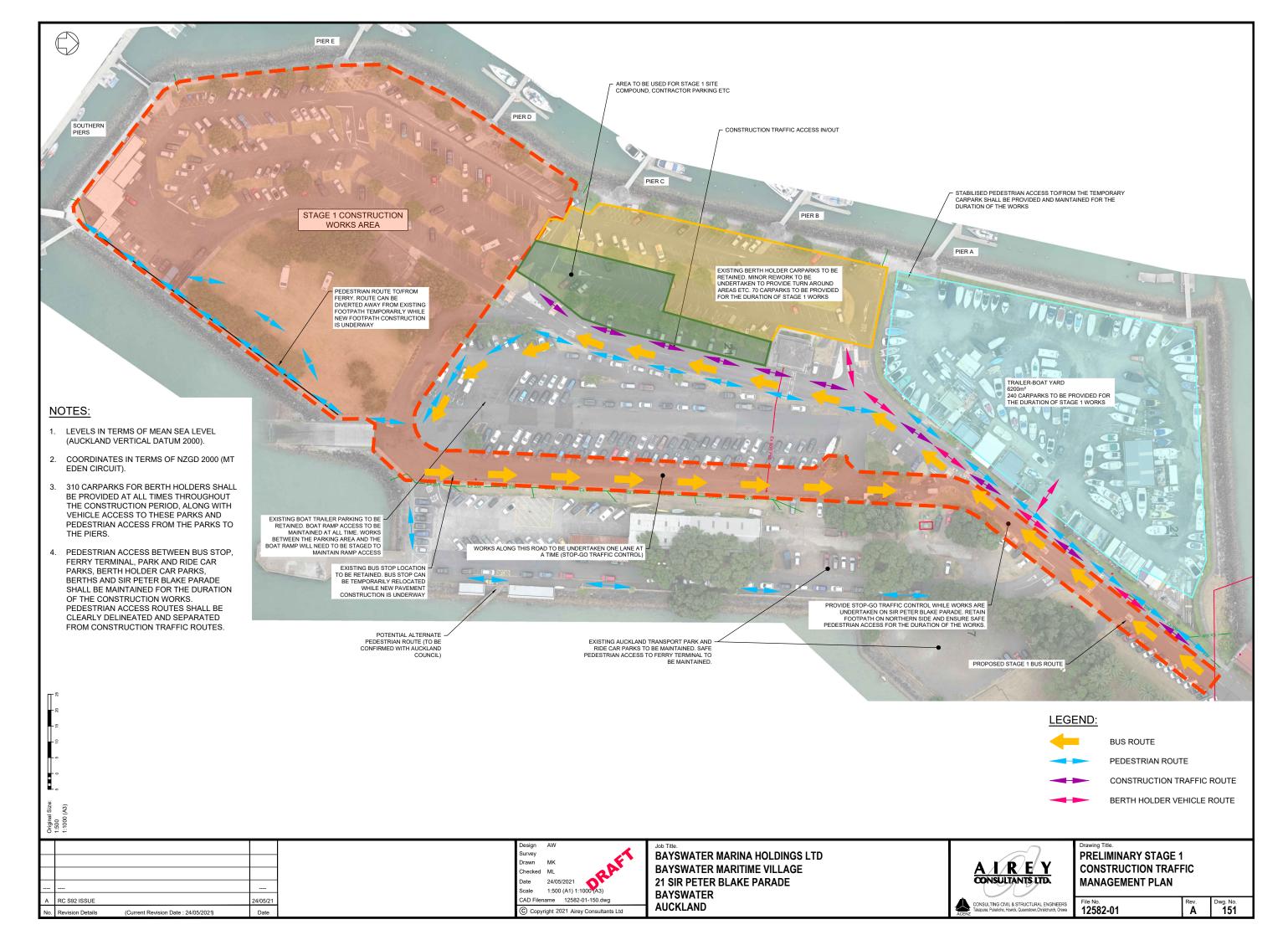
The terrace houses are anticipated to be sold individually with strict time limits to ensure building commences in a timely manner. It is anticipated that some houses will commence construction before the civil works construction is complete. Provision shall be made for tradespeople involved with terrace house construction to be able to park in the main contractor site compounds while civil works construction is ongoing.

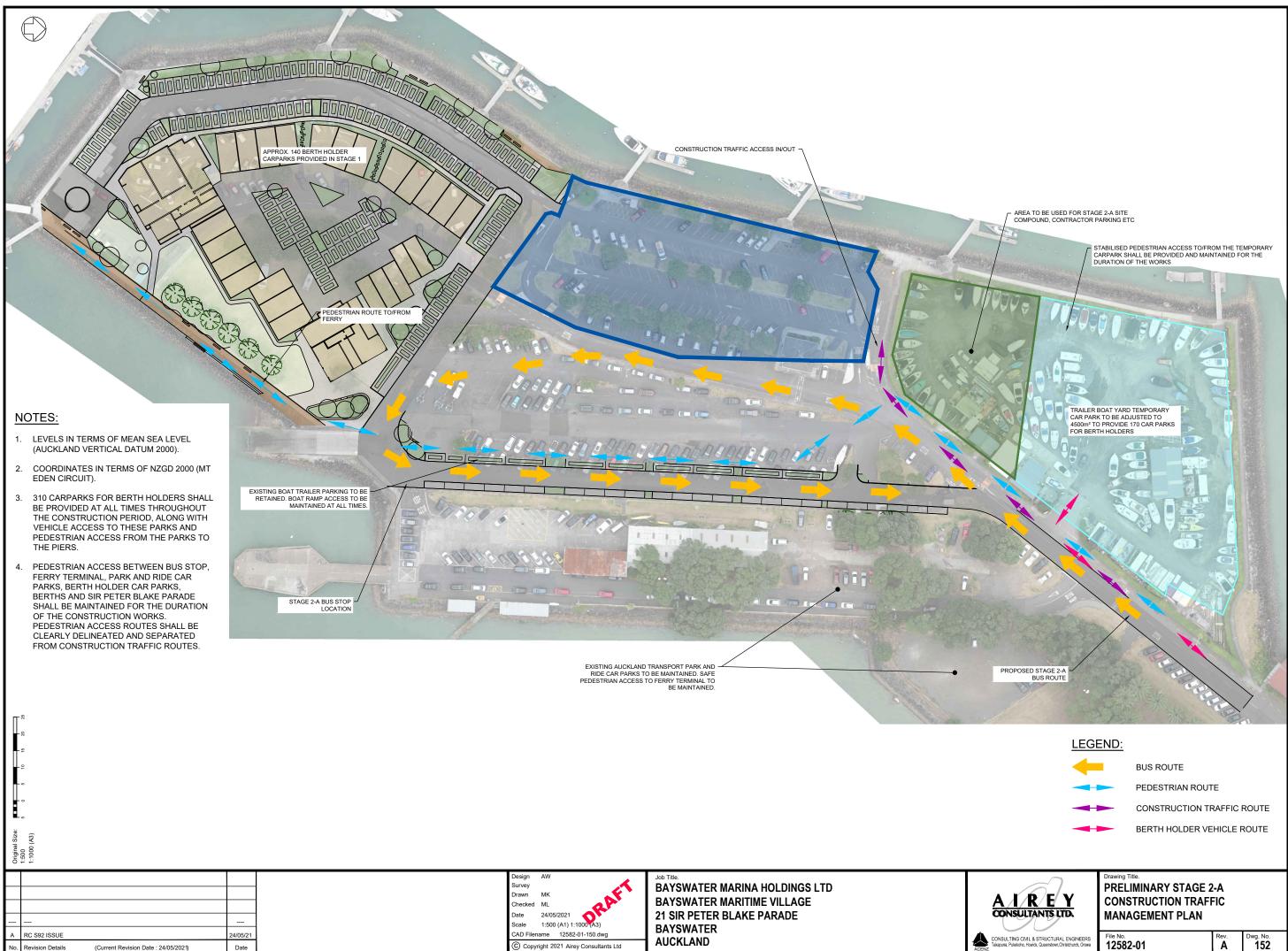
Following the completion of civil works construction parking for tradespeople will be limited to the new visitor car parks constructed on Sir Peter Blake Parade (within the site). If these car parks are fully occupied then tradespeople will be required to park in the public parking on Sir Peter Blake Parade (north of the site) adjacent to Marine Parade Reserve. It will be clearly noted in sales and purchase agreements that tradespeople are not permitted to use the park and ride and berth holder parking.

9 APPENDICES

- Preliminary Construction Staging Plan
- Preliminary Construction Traffic Management Plans

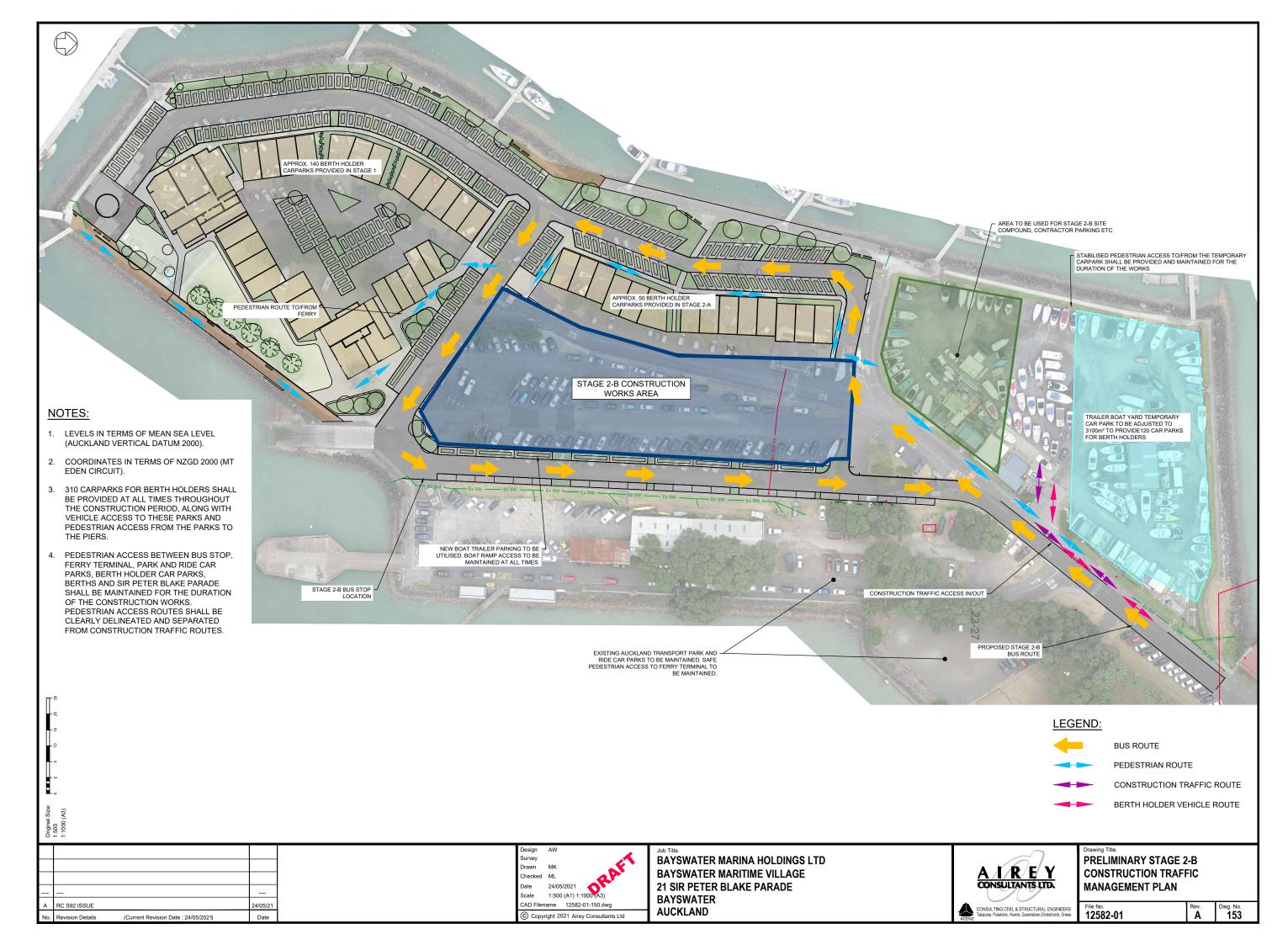






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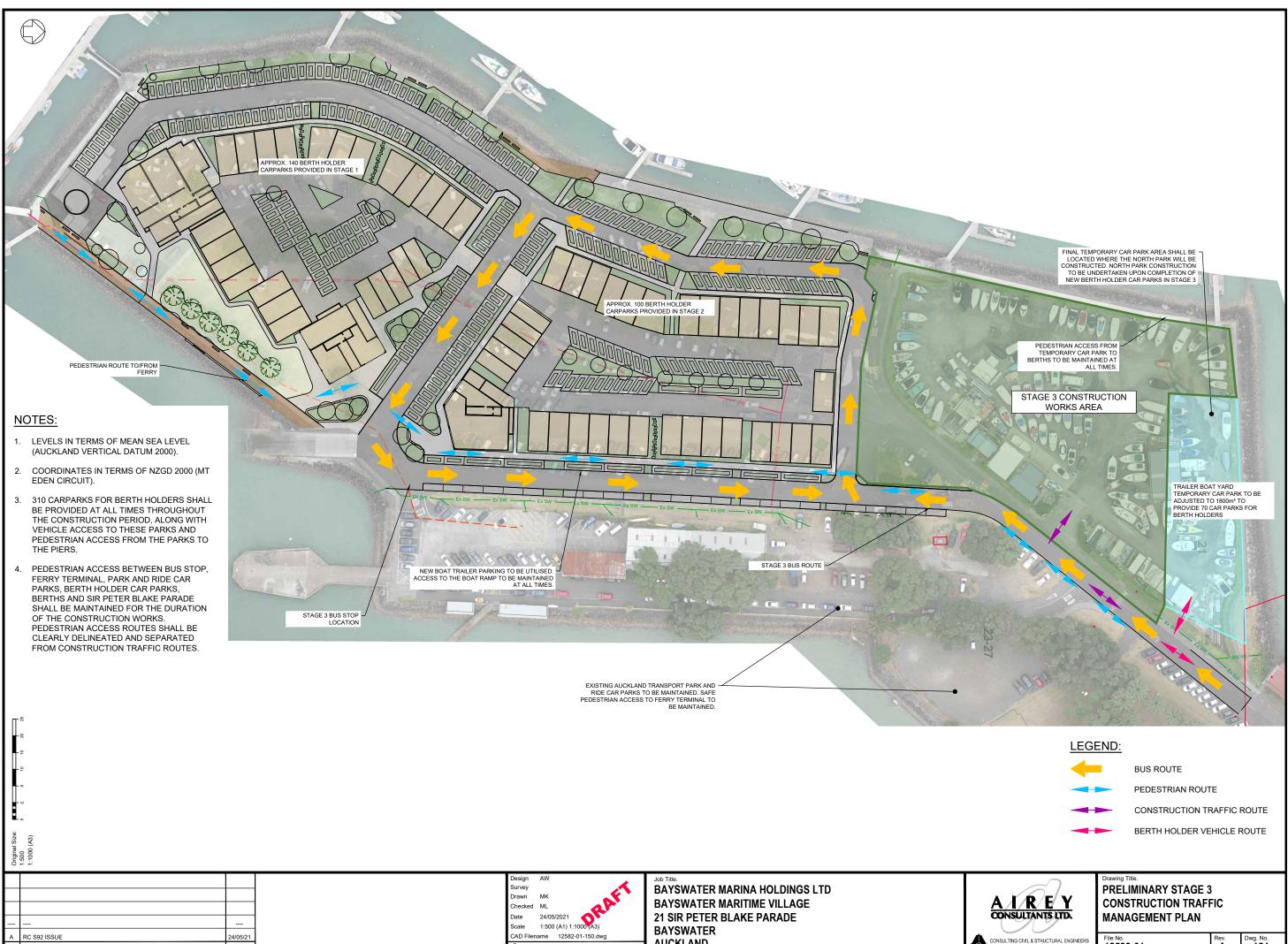


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NOTES:	
1. LEVELS IN TERMS OF MEAN SEA LEVEL (AUCKLAND VERTICAL DATUM 2000).	
2. COORDINATES IN TERMS OF NZGD 2000 (MT EDEN CIRCUIT).	
3. 310 CARPARKS FOR BERTH HOLDERS SHALL BE PROVIDED AT ALL TIMES THROUGHOUT THE CONSTRUCTION PERIOD, ALONG WITH VEHICLE ACCESS TO THESE PARKS AND PEDESTRIAN ACCESS FROM THE PARKS TO THE PIERS.	
4. PEDESTRIAN ACCESS BETWEEN BUS STOP, FERRY TERMINAL, PARK AND RIDE CAR PARKS, BERTH HOLDER CAR PARKS, BERTHS AND SIR PETER BLAKE PARADE SHALL BE MAINTAINED FOR THE DURATION OF THE CONSTRUCTION WORKS. PEDESTRIAN ACCESS ROUTES SHALL BE CLEARLY DELINEATED AND SEPARATED FROM CONSTRUCTION TRAFFIC ROUTES.	STAGE 3 BUS STOP LOCATION
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