BMD Constructions Pty Ltd
Stage 2B Level 1 Inspection and Testing
Wyndham Harbour Development
GEOTABTF06373AB-DL
7 February 2014

When you think with a global mind problems get smaller
7 February 2014

BMD Constructions Pty Ltd
24-30 Camberwell Road
Hawthorn East VIC 3123

Attention: Nick Eddy

Dear Nick

RE: Stage 2B Level 1 Inspection and Testing
Wyndham Harbour Development

This letter presents our Level 1 Inspection and Testing (Level 1) report on the construction of engineered fill platforms for the proposed Stage 2B development as part of the Wyndham Harbour Project in Werribee South.

Should you have any questions regarding this report, please contact Sotir Stojcevski or the undersigned.

For and on behalf of Coffey Geotechnics Pty Ltd

[Signature]

Hans Mulder
Principal Geotechnical Engineer

Prepared by

[Signature]

Sotir Stojcevski
Associate Geotechnical Technician

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1 INTRODUCTION

This report presents the results of Level 1 Inspection and Testing (Level 1) undertaken by Coffey Geotechnics Pty Ltd (Coffey) during the construction of an engineered fill platform for a proposed 39 residential lots and associated structures as part of Wyndham Harbour Development in Werribee South.

Level 1 Inspection and Testing, as defined in AS3798-2007 "Guidelines on Earthworks for Commercial and Residential Development," provides for full time inspection of the construction of controlled fill and field and laboratory testing in accordance with AS1289 “Methods of Testing Soils for Engineering Purposes”. The Level 1 was undertaken predominantly by engineers and geotechnicians from Coffey during the period from 16 October to 13 December 2013.

The earthworks contractor for the project was Landforming to Perfection Pty Ltd (Landforming). Coffey Testing Pty Ltd (Coffey Testing) carried out the compaction control testing of the fill material as part of the Level 1 Inspection and Testing process. Coffey Testing has a NATA accredited soil testing laboratory situated in Abbotsford.

This report is applicable to engineered fill placed by Landforming under the proposed building platforms, the nature strips, batters and the roads to subgrade level only.

This report does not include trench backfill or any other fill that may be placed during this period or subsequent periods at or surrounding the monitored sites.

2 EARTHWORKS

The earthworks involved stripping of topsoil, subgrade preparation and the construction of engineered fill platforms including road subgrade for the proposed development.

The material used for the earthworks consisted of:

- Imported Fill - sourced from four dam construction sites located in Werribee South. The imported soils comprised mainly Deutgam Silt clays and some Basaltic clays. The soils sourced from these sites were assessed by Coffey prior to their import to the project and the findings of the assessments are summarised in the report under reference GEOTABTF06373AB-DF dated 13 November 2013.

- Stockpiled Fill - comprising silty clay stockpiled on site following the completion of the Stage 1 construction within the same project. Two stockpiles were present on site named as Borrow Pit Stockpile and Gate 2 Stockpile. The materials from both stockpiles were assessed during the earthworks of the Stage 1 on this project in 2012.

The placed fill thickness ranges from approximately 0.1m at various locations around the perimeter of the platforms and up to approximately 2.4m in the centre of the site. Average fill thickness was observed to be about 2.0m across the site comprising of 8 compacted layers. Based on the cross sections showing the surveyed fill thicknesses across the site and based on the number of layers placed during the earthworks, an average compacted thickness of 250mm per layer was achieved. The maximum compacted layer thickness appears to be 300mm based on the thickest fill platform measures to be 2.4m and comprising of 8 layers. Cross sections showing the fill thicknesses are presented in Figure 2.

Plant used for the earthworks comprised several tractors with towing scraper attachments, an excavator, a water truck and a pad foot roller of 20 tonne static weight.

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3 PROJECT SPECIFICATIONS

The earthworks were to be constructed in accordance with the specification prepared by Watsons, titled 'Wyndham Harbour, Duncans Road Werribee South, Stage 2B Residential Bulk Earthworks – Design Contours and Notes, Plan # 34914/2B, EW-RES', a copy of which is presented in Appendix B.

It is also noted in the specification that the contractor is required to satisfy the criteria specified in accordance with the Australian Standard AS 3798-2007 'Guidelines on earthworks for commercial and residential developments'.

In general, the project specification and/or AS 3798-2007 requires that the placed fill complies with the following:

- The fill soils beneath the buildings and pavements to be compacted to a dry density ratio of at least 95% Standard Compaction in accordance with AS1289-5.1.1
- The moisture ratio to be in the range of 85% to 115% of Standard Optimum Moisture Content (SOMC).
- The surface of the site to be stripped of all topsoil and organic matter.
- The stripped surface to be inspected and approved by the Level 1 Inspector.
- The testing frequency at this project was adopted as being Type 1 - Large scale operations (greater than 1500m²) in accordance with Table 8.1 of AS3798-2007. The frequency of field density tests was adopted to be at least 1 field density test per layer per material type per 2500m² or 1 test per material type per 500m², or minimum 3 tests per lot, whichever requires most tests.
- The fill to be placed in horizontal layers of no more than 200mm loose thickness. Based on the heavy machinery used for the placement and compaction of the material, and in accordance with Section 6.2.2, AS 3798:2007, we consider that a placement of loose layers up to 400mm thickness is appropriate for this project given that each layer does not exceed 300mm compacted thickness.
- The soils to be approved by the geotechnical and environmental engineers prior to placement. We are in receipt of Coffey Environments report ENVIABTF08206AG-R01a dated 21 January 2014.
- The imported soils to comply with the following:
  - Maximum particle size of 150mm;
  - Particles over 37.5mm diameter not to exceed 20% of the material;
  - Organic soils, topsoils, silts or soils containing organic matter, wood, plastics, metal or other deleterious materials are not acceptable.

4 LEVEL 1 INSPECTION AND TESTING

4.1 Subgrade Preparation

The grass and topsoil were stripped in each section prior to placement of any fill. The areas stripped of topsoil were assessed by the Coffey's Level 1 Inspector on site. Where areas with organic content or roots were observed, the contractor was instructed to further excavate the surface soils.

Based on volumes assessed by JAC Surveyors Pty Ltd and provided to us by the BMD, the following volumes of stripped materials were measured on this site:

- 4,688m³ of vegetation was stripped prior to the topsoil stripping.

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24,861 m³ of topsoil including the stripped material as well as stockpiled material from previous stages of development.

The volumes of the earthworks are presented in Appendix C.

4.2 Fill Material

4.2.1 Imported Fill

Imported fill comprised soils sourced from four local dam construction sites in Werribee South. Most of the imported fill comprised Deutgam Silt clays (sandy and silty clays). The fill source sites were arranged by Landforming. Prior to the Level 1 works, the source site soils were assessed and tested by Coffey to demonstrate the suitability of the soils for use on the site. The assessment of the soils was summarised in Coffey’s report reference GEOTABTF06373AB-DF dated 13 November 2013.

All imported material was required to meet environmental specification requirements prior to delivering on site. The environmental components of this project are covered in Coffey Environments report, reference ENVIABTF08206AG-R01a dated 21 January 2014.

Table 1 – Volume of imported fill per source

<table>
<thead>
<tr>
<th>Source Name</th>
<th>Fill Volume (solid)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Import Site 1 – Harrisons Road, Werribee South</td>
<td>10,500 m³</td>
</tr>
<tr>
<td>Import Site 2 – 247 Cunninghams Road, Werribee South</td>
<td>8,200 m³</td>
</tr>
<tr>
<td>Import Site 3 – 150 Cunninghams Road, Werribee South</td>
<td>8,188 m³</td>
</tr>
<tr>
<td>Import Site 4 – 747 Duncans Road, Werribee South</td>
<td>3,025 m³</td>
</tr>
<tr>
<td>Total imported volume from the four Import Sites</td>
<td>29,913 m³</td>
</tr>
</tbody>
</table>

Note: The volume of material is listed on BMD Spread sheet ‘Stage 2B Earthworks Summary: Daily Fill Volumes’ located in Appendix C.

4.2.2 Stockpile Fill

Fill material was also sourced from two stockpiles on site. The stockpile soils comprised predominantly silty clay material from the remaining imported material from the western suburbs of Melbourne following the completion of the earthworks on Stage 1, and partly from the underground service installation in Stage 1. The stockpile material contained occasional boulders and rubble which were removed with an excavator with a shaker bucket attachment prior and during the placement on the site.

- Borrow Pit Stockpile - During the earthworks phase of the Stage 1 development, clay material was sourced from a number of sources including material from a borrow pit located towards the north of the Wyndham Harbour site. This material was sampled and validated as part of the 2012 assessment works during the development of the Stage 1. Some 6,076 m³ of surplus material remained, located in a stockpile named Borrow Pit Stockpile, was used during the filling of Stage 2B.
• Gate 2 Stockpile - During the Stage 2B filling works 12,875 m³ of previously validated material, originating from Stage 1, was transferred within the site for use in Stage 2B. This material from Stage 1 consisted of surplus material from construction works in Stage 1, such as trenching soils from stormwater pipe installation. This material had previously been imported to Stage 1 and validated as part of the earlier assessment works. This material was stockpiled and referenced as Gate 2 Stockpile.

<table>
<thead>
<tr>
<th>Source Name</th>
<th>Fill Volume (solid)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Borrow Pit Stockpile</td>
<td>6,076 m³</td>
</tr>
<tr>
<td>Gate 2 Stockpile</td>
<td>12,875 m³</td>
</tr>
<tr>
<td>Total volume from stockpiled material</td>
<td>18,951 m³</td>
</tr>
</tbody>
</table>

*Note: The volume of material is listed on BMD Spread sheet ‘Stage 2B Earthworks Summary: Daily Fill Volumes’ located in Appendix C.*

4.3 Fill Placement

Following stripping of the vegetation and the topsoil, acceptable fill materials were placed either by trucks or by scraper scoops pulled by tractors. These materials were then spread by a tractor towing scraper attachments to form a loose layer thickness of approximately 300 to 400mm. Compaction was undertaken using a CAT pad foot roller of 20 tonne static weight. Following the compaction of the layers, the compacted thickness of each layer was observed to vary from about 250mm to 300mm. Based on the surveyed subgrade and finished surface levels shown on the cross sections in Figure 2, the following is applicable for the fill platforms:

- A maximum fill thickness of about 2.4m is achieved in the middle of the engineered fill platform shown on Figure 1 where cross sections BB’ and DD’ intersect. The fill thickness at this location can be seen on Figure 2. A total of 8 layers were placed and compacted in this location which results in maximum compacted layer thickness of 300mm as per the specified criteria in Section 3 of this report.

- An average fill thickness across the engineered fill platforms measures about 2m as shown in Figure 2. Based on the 8 layers observed to be placed and compacted during the construction of the fill platforms, the average compacted fill thickness in these areas results to about 250mm.

- The sections of the roads shown on the cross sections BB’ and DD’ in Figure 2 show that fill of about 1.5m to 1.9m was placed under the finished surface level of the roads subgrades. Based on the 7 fill layers observed to be placed and compacted in these areas, the average compacted fill thickness under the roads varies between 220mm and 270mm.

Oversize materials (boulders and cobbles) were occasionally observed in the imported and stockpile soils. When this occurred, the oversize material was removed from the building platforms. The removal of the oversize material was done by sorting the placed fill with a shaker bucket attached to an excavator arm. Following removal of the oversize material the soils were assessed by the Coffey personnel on site and contractor advised if further sorting or cleaning was needed prior to compaction.
On some occasions, if oversize material was observed following compaction, the oversize rocks would identified for removal from the site accordingly.

One water truck was available for moisture conditioning the materials during and prior to placement.

4.4 Results of Compaction Testing

In accordance with the earthworks specifications, field density testing was carried out in the compacted fill layers.

The locations of the field density tests were selected by Coffey's Level 1 personnel and testing was conducted by Coffey Testing on-site and in their NATA accredited laboratory at Abbotsford. The location of each density test was recorded by the Level 1 Inspector. The layers were identified by layer number. The approximate locations of the density tests are shown on Figures 3/0 to 3/8.

The frequency of the field density testing was in accordance with the specification as discussed in section 3 of this report, i.e. at least 1 field density test per layer per material type per 2500m² or 1 test per material type per 500m³.

Testing of the fill comprised a total of 139 field density tests (including failed tests), taken in the fill using a nuclear moisture-density gauge in accordance with Australian Standard AS 1289-5.8.1, together with 139 rapid Hill Compaction tests in accordance with AS 1289-5.7.1. Where field density testing indicated that the engineered fill did not comply with the dry density ratio or moisture specification requirement, the area was generally re-worked and re-tested.

Of the 139 field density tests completed within the project, a total of 26 tests did not meet the specified density and/or moisture content requirement. These areas were subsequently re-worked and re-tested.

There was one exception as follows:

- Test #92 which was in layer 5 of the stockpile fill met the density requirement with 95.5% density ratio and obtained non-compliant moisture ratio result of 116%. Given the marginal degree of non-compliance, this result was considered unlikely to impact on the performance of the completed fill platform and as such accepted by Coffey's Level 1 Inspector.

The results of the compaction control testing are presented in Appendix A and a summary of these is presented in a spreadsheet form in Figure 4.

From the earthworks volumes summary provided by BMD (Appendix C), it is understood that a total of 48,864m³ of soil (solid volume) has been placed. Therefore, based on the target frequency 1 test per 500m³, a total of 98 passing tests would be required. It is noted that 113 passed tests were executed in the fill which is compliant with the AS3798-2007 target frequency.

4.5 Daily Records

Coffey's Level 1 Inspector was on site full time during the construction of the engineered fill for which a daily record of activities have been maintained and kept in our files.

5 STATEMENT OF COMPLIANCE

Coffey personnel have provided Level 1 Inspection and Testing services during the construction of the engineered fill for the building platform and road subgrade at the site. An experienced geotechnician or engineer from Coffey was on site on a full time basis during fill placement and observed the construction techniques adopted.
Based on observations made by Coffey personnel and the results of field and laboratory tests, we consider that the engineered fill for the building platforms and the road subgrades placed between the stripped surface and final capping layer surface (as shown on the cross sections in Figure 2), as far as we have been able to determine, have been placed in general accordance with the intent of the specification.
Important information about your Coffey Report

As a client of Coffey you should know that site subsurface conditions cause more construction problems than any other factor. These notes have been prepared by Coffey to help you interpret and understand the limitations of your report.

Your report is based on project specific criteria

Your report has been developed on the basis of your unique project specific requirements as understood by Coffey and applies only to the site investigated. Project criteria typically include the general nature of the project; its size and configuration; the location of any structures on the site; other site improvements; the presence of underground utilities; and the additional risk imposed by scope-of-service limitations imposed by the client. Your report should not be used if there are any changes to the project without first asking Coffey to assess how factors that changed subsequent to the date of the report affect the report’s recommendations. Coffey cannot accept responsibility for problems that may occur due to changed factors if they are not consulted.

Subsurface conditions can change

Subsurface conditions are created by natural processes and the activity of man. For example, water levels can vary with time, fill may be placed on a site and pollutants may migrate with time. Because a report is based on conditions which existed at the time of subsurface exploration, decisions should not be based on a report whose adequacy may have been affected by time. Consult Coffey to be advised how time may have impacted on the project.

Interpretation of factual data

Site assessment identifies actual subsurface conditions only at those points where samples are taken and when they are taken. Data derived from literature and external data source review, sampling and subsequent laboratory testing are interpreted by geologists, engineers or scientists to provide an opinion about overall site conditions, their likely impact on the proposed development and recommended actions. Actual conditions may differ from those inferred to exist, because no professional, no matter how qualified, can reveal what is hidden by earth, rock and time. The actual interface between materials may be far more gradual or abrupt than assumed based on the facts obtained. Nothing can be done to change the actual site conditions which exist, but steps can be taken to reduce the impact of unexpected conditions. For this reason, owners should retain the services of Coffey through the development stage, to identify variances, conduct additional tests if required, and recommend solutions to problems encountered on site.

Your report will only give preliminary recommendations

Your report is based on the assumption that the site conditions as revealed through selective point sampling are indicative of actual conditions throughout an area. This assumption cannot be substantiated until project implementation has commenced and therefore your report recommendations can only be regarded as preliminary. Only Coffey, who prepared the report, is fully familiar with the background information needed to assess whether or not the report’s recommendations are valid and whether or not changes should be considered as the project develops. If another party undertakes the implementation of the recommendations of this report there is a risk that the report will be misinterpreted and Coffey cannot be held responsible for such misinterpretation.

Your report is prepared for specific purposes and persons

To avoid misuse of the information contained in your report it is recommended that you confer with Coffey before passing your report on to another party who may not be familiar with the background and the purpose of the report. Your report should not be applied to any project other than that originally specified at the time the report was issued.
Important information about your Coffey Report

Interpretation by other design professionals
Costly problems can occur when other design professionals develop their plans based on misinterpretations of a report. To help avoid misinterpretations, retain Coffey to work with other project design professionals who are affected by the report. Have Coffey explain the report implications to design professionals affected by them and then review plans and specifications produced to see how they incorporate the report findings.

Data should not be separated from the report*
The report as a whole presents the findings of the site assessment and the report should not be copied in part or altered in any way.

Logs, figures, drawings, etc. are customarily included in our reports and are developed by scientists, engineers or geologists based on their interpretation of field logs (assembled by field personnel) and laboratory evaluation of field samples. These logs etc. should not under any circumstances be redrawn for inclusion in other documents or separated from the report in any way.

Geoenvironmental concerns are not at issue
Your report is not likely to relate any findings, conclusions, or recommendations about the potential for hazardous materials existing at the site unless specifically required to do so by the client. Specialist equipment, techniques, and personnel are used to perform a geoenvironmental assessment. Contamination can create major health, safety and environmental risks. If you have no information about the potential for your site to be contaminated or create an environmental hazard, you are advised to contact Coffey for information relating to geoenvironmental issues.

Rely on Coffey for additional assistance
Coffey is familiar with a variety of techniques and approaches that can be used to help reduce risks for all parties to a project, from design to construction. It is common that not all approaches will be necessarily dealt with in your site assessment report due to concepts proposed at that time. As the project progresses through design towards construction, speak with Coffey to develop alternative approaches to problems that may be of genuine benefit both in time and cost.

Responsibility
Reporting relies on interpretation of factual information based on judgement and opinion and has a level of uncertainty attached to it, which is far less exact than the design disciplines. This has often resulted in claims being lodged against consultants, which are unfounded. To help prevent this problem, a number of clauses have been developed for use in contracts, reports and other documents. Responsibility clauses do not transfer appropriate liabilities from Coffey to other parties but are included to identify where Coffey's responsibilities begin and end. Their use is intended to help all parties involved to recognise their individual responsibilities. Read all documents from Coffey closely and do not hesitate to ask any questions you may have.

* For further information on this aspect reference should be made to “Guidelines for the Provision of Geotechnical Information in Construction Contracts” published by the Institution of Engineers Australia, National headquarters, Canberra, 1987.