IN THE GENERAL DIVISION OF
THE HIGH COURT OF THE REPUBLIC OF SINGAPORE

[2023] SGHC 333

Suit No 173 of 2022

Between

Terrenus Energy SL2 Pte Ltd

… *Plaintiff*

And

Attika Interior + MEP Pte Ltd

… *Defendant*

JUDGMENT

[Building and Construction Law — Building and construction contracts — Lump sum contract]
[Building and Construction Law — Contractors' duties — Extension of time and liquidated damages]
[Building and Construction Law — Damages — Damages for defects]
[Building and Construction Law — Scope of works — Specifications]
[Contract — Remedies — Damages]
[Contract — Remedies — Remoteness of damage]

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v
Attika Interior + MEP Pte Ltd

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27 November 2023 Judgment reserved.

Kwek Mean Luck J:

Introduction

1 The plaintiff, Terrenus Energy SL2 Pte Ltd ("Terrenus"), entered into a contract (the "Contract") to employ the defendant, Attika Interior + MEP Pte Ltd ("Attika"), as the main contractor for the construction of a "Ground Mount Solar Generation Facility" (the "Solar Farm") and "Linkway Solar Generation Facility" (the "Linkway") at Changi Business Park (the "Project"). In HC/S 173/2022 ("S 173"), Terrenus claims against Attika for damages allegedly arising from three major defects, and for liquidated damages and general damages arising from delays. Attika in turn claims that it is entitled to an extension of time ("EOT") and counterclaims against Terrenus for payment of the balance of the Contract price.

Facts

2 Both Terrenus and Attika are companies incorporated in Singapore. On 5 April 2021, both parties entered into the Contract, with Terrenus as employer and Attika as the main contractor. The Contract comprises: (1) the Main Builder Agreement (the "MBA"); (2) Annexes A to N of the MBA; and (3) the Contract Drawings. SolarGy Pte Ltd ("SolarGy") was Terrenus's solar consultant, and PEC Civil Consultant Pte Ltd ("PEC") was Terrenus's civil and structural consultant for the Project. Neither SolarGy nor PEC were called to testify.

3 Annex A of the MBA sets out Attika's scope of works under the Contract (the "Works"). Attika was responsible for installing, testing, and commissioning the Solar Farm and Linkway. The Solar Farm consists of 71 solar arrays, totalling 35,509 solar panels. Terrenus was responsible for the supply of the solar panels, mounting structures, inverters, cables, containerized transformer and LV switchboard, as well as for the supply and installation of two containerised power grid 22kv substations (the "Substations"). The Substations were to be supplied and installed by Terrenus's subcontractor, Bulox Power Pte Ltd ("Bulox"). Each Substation energizes 50% of the Solar Farm.

4 Pursuant to cl 4.1.1 of the MBA, the lump sum price of the Works under the Contract was $5,100,000 (the "Contract Sum"). Annex F of the MBA, titled "Schedule of Payment", provides for the Contract Sum to be paid at three milestones, with the issuance of: (1) 40% of the Contract Sum based on monthly progress per item; (2) 20% of the Contract Sum upon the issuance of the Temporary Occupation Permit ("TOP") by the Building and Construction Authority ("BCA"); and (3) 40% of the Contract Sum on the issuance of the

Certificate of Statutory Completion ("CSC") by BCA. Annex L of the MBA, titled "Schedule of Prices", itemises the Works and the "Lumpsum Price" for each item of work.

5 Pursuant to cl 5.5.1 of the MBA, Attika was obliged to complete the Works expeditiously by the "Date of Completion". Pursuant to cl 5.6.1, Attika was also obliged to meet the requirements of "Partial Completion", defined in cl 1.3.12 as "the time for completion of part of the Works to commission and energize at least 70% of the [Solar Farm] on or before 30 June 2021, prior to the Date of Completion". The "Date of Completion" is defined in cl 1.3.5 as the "time or times for the completion of the Works or any phase or part of the Works set out in the Appendix subject to such extension or extensions of time (if any) as the Contractor may be allowed under the Agreement". The time as set out in the Appendix to the MBA was 31 July 2021. Clauses 5.5.5, 5.5.6, and 5.5.7 allowed Attika to submit formal requests for EOTs, and for Terrenus to allow or deny such requests. It is undisputed that Terrenus did not grant any EOTs, despite several requests from Attika.

6 Parties dispute the date that Partial Completion was achieved and the date that the Works were completed. This is relevant to Terrenus's claim for liquidated damages.

7 On 12 January 2022, TOP was issued by the BCA. On 3 February 2022, Terrenus terminated Attika's employment pursuant to cl 14.3 of the MBA, on a without default basis. On 6 July 2023, approval from the National Parks Board

("NParks") for CSC was obtained. On 13 July 2023, CSC was issued by the BCA.[1]

8 The parties engaged in several rounds of adjudication under the Building and Construction Industry Security of Payment Act 2004 (2020 Rev Ed) ("SOPA") during the course of the Contract.

9 Out of the Contract Sum, Terrenus has paid Attika $1,910,663.40. In May 2023, the parties agreed to fix the quantum of the Linkway. This resulted in an adjustment of the Contract Sum to $5,050,500. Accordingly, Attika's claim for the balance of the Contract Sum is for the amount of $3,139,836.60 (the "Balance Sum").

Issues Arising

10 Prior to trial, the parties agreed to narrow the issues and set out their positions in a Scott Schedule. The following main issues arise in S 173:

(a) whether there are substantial defects in the works delivered by Attika;

(b) when was Partial Completion achieved and when were the Works completed;

(c) whether Attika was entitled to EOTs and what was the Date of Completion (taking into account EOTs, if any);

(d) whether Attika is liable for liquidated damages under cl 17.1.2 of the MBA;

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[1] Agreed Statement of Facts (filed 19 July 2023).

(e) whether Attika is further liable for general damages due to Attika's delays under cl 17.1.4 of the MBA;

(f) whether Attika is entitled to claim for the Balance Sum pursuant to cl 14.3.2 of the MBA; and

(g) whether Attika is entitled to costs of S 173 on an indemnity basis due to Terrenus's breach of cl 21.1.1 of the MBA.

Whether Attika delivered works with substantial defects

11 The first main issue is whether Attika delivered works with substantial defects. This in turn raises three sub-issues, namely, whether Attika failed to:

(a) ensure that the solar panel mounting structure rods achieved an embedment depth of at least 500mm under the ground;

(b) provide for 700mm clearance between the bottom of the solar panel arrays and the ground; and

(c) comply with the requirements of cl 5.2.1 of Annex A Part III of the MBA, which relates to the removal of trees.

Whether Attika failed to embed PEG Rods to a minimum depth of 500mm

12 For context, the mounting structure for the solar panels includes a base bearing plate, a top bracket plate to which the corners of adjacent solar panels were affixed, and supporting rods ("PEG Rods") that were to be driven into the ground. Each solar panel stands on four PEG Rods. As the PEG Rods connect to one top bracket plate, adjacent solar panels share two PEG Rods. These mounting structures were supplied by Jurchen Technology GmbH ("Jurchen").

Parties' cases

13 The first substantial defect that Terrenus claims for is in relation to the embedment depth of the PEG Rods. Terrenus submits that Attika breached a contractual requirement for the installation of the PEG Rods by failing to embed all of them to a depth of at least 500mm below ground. Clause 2.2.3 of Annex A Part III states that "the Contractor shall install the mounting structures on the typical mounting structure details for PEG as specified on drawing no. 102A and manufacturer's installation manuals". It is undisputed that this refers to Drawing 102, which sets out a cross-section of the mounting structure. In relation to the PEG Rods, Drawing 102 provides for a "MINIMUM 500mm RAM UNDER GROUND". The manufacturer's installation manuals provide that the embedment depth is "to be in accordance with static calculation and soil conditions", and do not specify any particular minimum embedment depth. Jurchen provided a static calculation for the Project which sets out a ramming depth of 500mm across the Solar Farm, with the exception of certain specified locations which had to achieve a depth of 700mm.

14 Terrenus submits that so long as it is proven that there has been a departure from the contractual specifications, a defect will be made out.[2] Terrenus points out that even Attika's Mr Steven Tan ("Mr Tan"), the Managing Director of Attika, conceded that there was *some* non-compliance, such that it cannot be said that there was no breach.[3]

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2 Plaintiff's Closing Submissions dated 14 September 2023 at para 19.

3 Plaintiff's Closing Submissions dated 14 September 2023 at para 38; Plaintiff's Reply Submissions dated 29 September 2023 at para 4.

15 In order to prove the *extent* of non-compliance, Terrenus relies on: (a) an estimation by its structural expert, Mr David Satchell ("Mr Satchell"), of the total number of affected panels; (b) on-site photographs of six arrays taken by Mr Bong Eng Yueh ("Mr Bong"), the Deputy Head of Engineering, Project & Operations of the Terrenus Energy Group, at Mr Satchell's request; (c) several "MAJOR NONCONFORMITY, DEFECTS, REMEDIAL AND OUTSTANDING WORKS JOINT INSPECTION" reports dated between 20 January 2022 to 10 May 2022 (the "Joint Inspection Reports");[4] and the on-site photographs taken by Mr Bong for the Joint Inspection Reports.[5]

16 While Mr Satchell visited the Project site, he did not assess the actual number of non-compliant PEG Rods.[6] Instead, he utilised an estimate based on the fundamental assumption that the solar arrays rest on slanted ground, such that one end of an array is at a higher elevation than the other end, and that the solar panels are installed on a relatively flat gradient, rather than perpendicular to the sloping ground, following the slope. This assumption was reached by a combination of Mr Satchell's "observations on site" that the installation guide (which indicates that arrays on slopes are to be perpendicular to the sloping ground) "appears not to have been followed" and Mr Satchell's analysis of the data provided to him from the Joint Inspection Reports, which marked out non-compliant PEG Rods on the *perimeter* of the solar arrays.[7] Mr Satchell did not carry out a topographical survey, but instead *projected* a "ground slope profile

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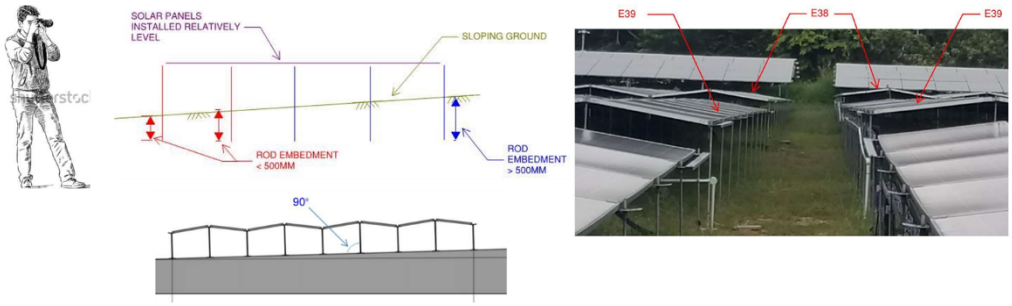
4 Affidavit of Evidence-in-Chief of Bong Eng Yueh dated 13 May 2023 at 2129–2270.

5 Plaintiff's Closing Submissions dated 14 September 2023 at para 25.

6 NE, 2 August 2023, at 21, lines 3–28.

7 1st Affidavit of Evidence-in-Chief of David Ian Satchell dated 16 May 2023 at 26-31; NE, 2 August 2023, at 16, lines 19–29.

across the array between the end points of the non-compliances".[8] From this assumption, Mr Satchell made an estimate of the non-compliant PEG Rods within a given area. Terrenus submits that Mr Satchell's estimation proves a trend of increasing non-compliance, and therefore that his estimates prove the extent of non-compliant PEG Rods.[9] Mr Satchell provided his analysis for 6 out of the 71 solar panel arrays and "extrapolated" his analysis to the remaining 65 arrays. There were about 35,509 solar panels installed in the Solar Farm, across 71 arrays, with each array consisting of about 500 solar panels. A visual representation of Mr Satchell's fundamental assumption is set out below.[10] It also contains a photograph of some of the solar arrays (numbered E38 and E39).



17 Although the claim is in respect of the embedment depth of the PEG Rods, Terrenus quantifies this claim with reference to the number of affected solar panels. This is because Terrenus submits that the appropriate method of rectification is a complete reinstallation of the entire affected solar panels. The Joint Inspection Reports also marked out solar panels as being non-compliant

8 1st Affidavit of Evidence-in-Chief of David Ian Satchell dated 16 May 2023 at 30.

9 Plaintiff's Closing Submissions dated 14 September 2023 at paras 26–34.

10 Exhibit P7 (filed 9 August 2023) at 11; Plaintiff's Closing Submissions dated 14 September 2023 at para 28.

so long as one of the four PEG Rods was insufficiently embedded.[11] In its Closing Submissions, Terrenus revised the number of solar panels that it claims are non-compliant. Terrenus accepts that Mr Satchell had conceded that the estimation for six arrays (where measurements were taken) could not be applied to the rest of the 65 arrays, and that it would therefore limit its claim. Terrenus continues to claim on the basis of Mr Satchell's estimated numbers for the six arrays for which he provided analysis. However, for the remaining 65 arrays which Mr Satchell initially said were non-compliant based only on his extrapolation, Terrenus claims only for the non-compliant panels recorded in the Joint Inspection Reports. The Joint Inspection Reports only marked out allegedly non-compliant solar panels based on PEG Rods at the perimeter of the solar arrays. On this revised basis, Terrenus claims for 1,578 panels or 4.4% of the panels (reduced from the original claim for 2,733 panels or 7.7% of the panels).[12]

18 As for the *consequences* of insufficient embedment, Mr Satchell was of the view that the 500mm embedment depth had to be strictly complied with. Terrenus does not contend that the insufficient embedment has any impact on the Solar Farm's power generation. Terrenus's case, in the lead up to and during the trial, was that the failure to embed the PEG Rods to a minimum depth of 500mm could result in the PEG Rods being pulled out and parts of the array being thrown up into the air "like a kite" at high windspeeds.[13]

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11 NE, 31 July 2023, at 23, lines 20–31.

12 Plaintiff's Closing Submissions dated 14 September 2023 at paras 42–43.

13 Annex A to HC/SUM 1565 of 2023 for leave to call Mr Sim as an expert witness; NE, 2 August 2023, at 13, lines 3–5.

19 In its Closing Submissions, Terrenus revised its position. It now accepts that Mr Satchell had clarified that the risk occasioned by insufficient embedment is more of a pull-out and structural failure in high winds rather than "actual kiting". Terrenus's revised position is that its case is not premised on showing that there is "actual kiting" but that there is a *risk* of pull-out or structural failure during a "design-level wind event", which Terrenus defines as "peak windspeeds that occur once in many years", rather than average daily windspeeds.[14] Terrenus relies on Mr Satchell's evidence that the applicable design-level windspeed is 20m/s, derived from the BS EN 1991-1-4 Eurocode (the "Eurocode") and the Singapore National Annex to the Eurocode.[15] Aside from this, Terrenus mainly focuses on undermining the evidence of the other structural experts. This is premised on Terrenus's submission that the burden is on Attika to prove the correct windspeed, and that the calculated minimum embedment depth by the other experts is unconservative.[16] Terrenus's case is that any deviation from the specified 500mm embedment depth causes the risk.

20 As for the damages for insufficient embedment, Terrenus submits that the measure of loss should be based on rectification, unless Attika can prove that the cost of cure is disproportionate.[17] Terrenus submits that the method of rectification should be complete reinstallation. Soil topping up is not an effective or practical method of rectification. The use of concrete ballasts is also not reasonable as it would limit re-deployability.[18] Terrenus concludes that the

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14 Plaintiff's Closing Submissions dated 14 September 2023 at paras 52 and 54–55.

15 2nd Affidavit of Evidence-in-Chief of David Ian Satchell dated 20 June 2023 at 7–8.

16 Plaintiff's Closing Submissions dated 14 September 2023 at paras 55–74.

17 Plaintiff's Closing Submissions dated 14 September 2023 at para 23.

18 Plaintiff's Closing Submissions dated 14 September 2023 at paras 86–90.

burden is on Attika to prove that damages based on complete reinstallation is unreasonable or disproportionate.[19]

21 Attika does not dispute that a failure to comply with the minimum embedment depth of 500mm constitutes a breach of contract, but submits that Terrenus has failed to prove the *extent* of non-compliance and that such non-compliance *results* in a structural risk to the solar panels.

22 First, Attika submits that the data underlying Terrenus's case and Mr Satchell's evidence is unreliable. Mr Satchell's expert evidence relies fully on the Joint Inspection Reports (above at [15]). The Joint Inspection Reports purport to be "joint inspections" on the basis that they were signed off by both Terrenus's Mr Bong, and SolarGy's Mr Albert Lim ("Mr Lim"). However, it became clear during cross-examination that these were not joint inspections but were all unilaterally conducted by Terrenus alone.[20] Mr Bong testified that Mr Lim was not physically present during the inspections, and Mr Bong was unsure how and whether Mr Lim verified the Joint Inspection Reports.[21]

23 Second, Attika submits that the Joint Inspection Reports are unsubstantiated and unreliable as to the alleged quantity of non-compliant PEG Rods for the following reasons:[22]

(a) Mr Bong admitted that the photographs exhibited in evidence to substantiate the Joint Inspection Reports included images of compliant

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19 Plaintiff's Closing Submissions dated 14 September 2023 at paras 92–93.

20 Defendant's Closing Submissions dated 14 September 2023 at paras 17–19.

21 NE, 28 July 2023, at 16, lines 1–20.

22 Defendant's Closing Submissions dated 14 September 2023 at paras 20–24.

PEG Rods.[23] Thus, the total number of photographs cannot be taken at face value as actual evidence of the extent of non-compliance.

(b) There are problems with the method of measurement. Many photographs fail to show the starting point of the measuring tape, as confirmed by Mr Bong.[24] As such, it is not apparent whether the PEG Rods depicted in those photos are actually non-compliant. Several photographs also show the measuring tape to be slanted. Mr Bong conceded that slanted measuring tapes would result in an inaccurate measurement of the PEG Rods. However, he then made the bare assertion that the difference would only be around 5–10mm.[25] Mr Bong further testified that even if a PEG Rod was measured to be non-compliant by just 1mm, it would still be marked as non-compliant, totally ignoring the 5–10mm margin of error in the taking of measurements.[26]

(c) Mr Bong's photos showing the alleged non-compliance also do not correspond with the markings in the Joint Inspection Reports. Terrenus is unable to link the photos adduced to any of the shaded markings on the Joint Inspection Reports. Mr Bong admitted that it is uncertain whether the photographs were even of those solar panels which were marked as non-compliant in the Joint Inspection Reports.[27] Terrenus was able to link a few of the photographs to various points on

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23 NE, 28 July 2023, at 78, lines 1–3.

24 NE, 28 July 2023, at 67, lines 6–28.

25 NE, 28 July 2023, at 68, lines 2–22.

26 NE, 28 July 2023, at 78, lines 6–25.

27 NE, 28 July 2023, at 65, lines 6–9.

> Mr Satchell's expert report. However, a comparison of the measurements taken by Mr Bong and by Mr Satchell from the same photographs shows that both arrived at different measurements.[28] Attika submits that the number of discrepancies for only six arrays shows that the Joint Inspection Reports cannot be regarded as reliable. Attika points out that Mr Bong conceded that photographs *could have* been taken for each instance of non-compliance.[29]

24 Third, Attika submits that there were too few data points taken for Mr Satchell to conclude that there was any slope profile across the solar arrays. For example, no data points within the shaded area were taken for array C28 in Exhibit P7 that was shaded in the shape of a chevron.[30] Further, Mr Satchell subsequently conceded that the slope profile that he had concluded for another array (A06) was not correct.[31] The slope profiles across all 71 arrays would be distinct from one another. There is no mathematical or logical basis to assume that just because there are purported slope profiles for the arrays inspected, it necessarily follows that the remaining arrays have similar slope profiles. It is not accurate to rely on the different lengths of the PEG Rods on the perimeter to determine a slope profile. It is unclear whether the different lengths were due to the way the PEG Rods were installed or due to the sloping condition of the ground.[32] Attika points out that no measurements of the ground slope were

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28 For example, A06 in the Affidavit of Evidence-in-Chief of Bong Eng Yueh dated 13 May 2023 at 2906, compared to Exhibit P1 (filed 9 August 2023) for Mr Satchell's measurement.

29 Defendant's Reply Submissions dated 28 September 2023 at paras 17 and 21; NE, 31 July 2023, at 26, line 19, to 27, line 3.

30 Exhibit P7 (filed 9 August 2023) at 16.

31 NE, 2 August 2023, at 53, lines 2–4.

32 Defendant's Closing Submissions dated 14 September 2023 at paras 28–34.

actually taken, and that Mr Satchell's estimation was based on no more than assumptions and conjecture.[33]

25 Fourth, Attika argues that Mr Satchell provided no basis for the "triangulation" method which he used to justify his estimation. He could not provide any academic or engineering literature to support its use. By using the "triangulation" method, even complaint PEG Rods were shaded as non-compliant in Mr Satchell's report.[34]

26 Attika submits that, in any event, such non-compliance did not create the structural risk alleged by Terrenus. Attika submits that, on the evidence, Terrenus's case at the highest would be that the minimum embedment required to negate the risk is 400mm,[35] but Terrenus has no evidence of the number of PEG Rods which need rectification. The burden remains on Terrenus to show that there *is* structural risk if the panels are not embedded to 500mm.[36]

27 In support of its position that the minimum embedment required is not 500mm as Terrenus contends, Attika first relies on an email dated 9 December 2021 from Jurchen (the "Jurchen Email"), the mounting structures supplier, to Attika, which states that the ramming depth of 500mm is a mere recommendation based on the assumption that the top 200mm of soil will be eroded over time. Effectively therefore, only a minimum ramming depth of 300mm is required to ensure stability of the mounting structures.[37] The Jurchen

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33 Defendant's Reply Submissions dated 28 September 2023 at paras 6–9.

34 Defendant's Closing Submissions dated 14 September 2023 at paras 35–37.

35 Defendant's Closing Submissions dated 14 September 2023 at paras 53.

36 Defendant's Reply Submissions dated 28 September 2023 at para 35.

37 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at 4663.

Email has a subject title which is specific to the Project and Jurchen has no other project in Singapore.

28 Second, Attika's structural expert, Mr Sim Kwai Meng ("Mr Sim"), had calculated that the minimum embedment depth for each PEG Rod is 400mm. According to Mr Sim, Jurchen's recommendation of 500mm as the minimum was a generalisation that was not based on actual pull-out test results, which show that the minimum depth required differed across the Solar Farm depending on location.[38] Mr Sim was unable to attend the Joint Conference of Structural Experts ("JCSE") at the trial. His written report was adopted by Mr Chua Chin Hiang ("Mr Chua"),[39] who served as Attika's structural expert during the JCSE. Mr Chua highlighted that Jurchen's design specification of 500mm was calculated assuming a windspeed of 20m/s. However, Mr Chua's view was that such a windspeed required an elevation of at least 10m, and that it would not be possible to reach a windspeed of 20m/s at a height of 2m above the ground. Mr Chua drew on three academic articles for his calculations. He testified that his *conservative* estimate of the windspeed at the Solar Farm, using a height calculation of around 2m for the solar panel structures (rather than their actual height of around 1.5m), was around 10m/s, for which an embedment depth of 360mm would suffice. Attika therefore submits that there is *no* structural risk for rods embedded to a depth of at least 360mm.[40] Attika highlights that Terrenus's focus on the design-level windspeed of 20m/s is misplaced, as that relates to *design parameters* rather than *actual structural risks*.[41] In addition,

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38 1st Affidavit of Evidence-in-Chief of Sim Kwai Meng dated 5 June 2023 at 7–10.

39 NE, 2 August 2023, at 10, lines 21–25.

40 Defendant's Closing Submissions dated 14 September 2023 at paras 56–64.

41 Defendant's Reply Submissions dated 28 September 2023 at paras 32–33.

Attika calls into question Mr Satchell's qualifications as an engineer,[42] and highlights Terrenus's failure to call the Project's structural engineering consultant, PEC, to give evidence on the risk of structural failure, given that PEC was statutorily obliged to ensure that the Project was structurally safe.[43]

29 Attika submits that damages should not be based on rectification costs and only nominal damages are recoverable as there is insufficient evidence of the extent of non-compliance and loss. Similarly, damages cannot be quantified on the basis of diminution in value due to insufficient evidence of loss.[44] Attika refers to *Ruxley Electronics and Construction Ltd v Forsyth* [1996] AC 344 for the principle that where it is not objectively reasonable to require rectification because the cost of cure is disproportionate to the loss, the claim for rectification will not be allowed. Attika submits that the Solar Farm has been operational and there has been no loss to the contractual objective of power generation. There are no real structural risks as Terrenus had no qualms about applying for TOP and CSC. Attika further contends that Terrenus has shown no intention to carry out rectifications.[45]

30 If damages are to be awarded, Attika highlights that Terrenus's own consultant, SolarGy, proposed an alternative method to complete reinstallation, being soil top up to counter the effects of soil erosion.[46] Mr Sim also suggested that a ballast consisting of well-compacted firm soil could resist wind uplift.

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42 Defendant's Closing Submissions dated 14 September 2023 at paras 41–46.

43 Defendant's Closing Submissions dated 14 September 2023 at paras 47–50.

44 Defendant's Closing Submissions dated 14 September 2023 at paras 65 and 84–86.

45 Defendant's Closing Submissions dated 14 September 2023 at paras 66–76.

46 Defendant's Reply Submissions dated 28 September 2023 at para 38; Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at 4737.

Another alternative would be localised concrete ballasts. Mr Chua's unchallenged evidence was that concrete ballasts would not affect re-deployability.

Decision

31 The minimum depth of 500mm is a specification of the Contract pursuant to cll 2.2.17 and 2.2.3 of Annex A Part III of the MBA read with Drawing 102. Attika was obliged to comply with this specification. This is not seriously contested by Attika. What is in dispute is whether the *extent* of non-compliance and the *consequence* of such non-compliance is that alleged by Terrenus, such that Terrenus is entitled to substantial damages, and whether the *measure* of damages based on the rectification costs of complete reinstallation of the solar panels is reasonable.

32 As a matter of first principles, the burden is on Terrenus as the claimant, to prove its case: (a) on the *extent* of non-compliance with the specification of 500mm embedment depth; (b) that the non-compliance *resulted in* the alleged structural risks such that Terrenus is entitled to *substantial* damages; and (c) that the measure of rectification costs it claims for as damages is reasonable. This is clear from s 103(1) of the Evidence Act 1893 (2020 Rev Ed) (the "EA"), which states that a party that seeks judgment as to any legal right, dependent on the existence of facts which the person asserts, must prove that those facts exist. In *Gimpex Ltd v Unity Holdings Business Ltd and others and another appeal* [2015] 2 SLR 686, the Court of Appeal took note of s 103 of the EA and held that a claimant who asserts that a contractual specification has not been complied with bears the legal burden throughout of proving three things: (a) what it was entitled to under the contract; (b) what was in fact delivered; and

(c) that what was delivered did not comply with what it was entitled to (at [64]). In *Ser Kim Koi v GTMS Construction Pte Ltd and others and another appeal* [2023] 1 SLR 1097, the Appellate Division of the High Court (the "Appellate Division") observed (at [201]) that the burden of proof is on party who alleges that works were not substantially completed because there are substantial defects in a project which remains unrectified, to prove first that there were defects which were substantial, and second, that these defects remain unrectified. In relation to Terrenus's claim for *substantial* damages, the Court of Appeal held in *Robertson Quay Investment v Steen Consultants Pte Ltd* [2008] 2 SLR(R) 623 ("*Robertson Quay*") (at [27]) that it is fundamental and trite that a claimant seeking substantial damages must prove their *loss*. The court cited *McGregor on Damages* (Sweet & Maxwell, 17th Ed, 2003) at para 8-001 which states that, to justify an award of substantial damages, a claimant must satisfy the court both as to the *fact of damage* and as to its *amount*. If they fail to satisfy the court on either, the action will fail, or they will be awarded at the most nominal damages for the infringed right. Damages are meant to be compensatory and cannot result in an unjustified windfall.

33 While the forgoing is trite law, it is necessary to highlight these principles as a preliminary matter, as Terrenus has strenuously sought to bolster its claim by pointing to the *lack* of contrary measurements or evidence from Attika to dispute aspects of Terrenus's case.[47] In light of the established legal position on the burden of proof, these submissions by Terrenus are, in my view, wholly misconceived. The burden is on Terrenus to prove its case.

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47 Plaintiff's Closing Submissions dated 14 September 2023 at paras 35, 40, and 41; Plaintiff's Reply Submissions dated 29 September 2023 at paras 3, 7, and 8; Plaintiff's Reply Submissions dated 17 October 2023 at paras 2–3.

34 I find that on the evidence, Terrenus has not discharged its burden of proving its claim for substantial damages for Attika's non-compliance with the requirement for the PEG Rods to be rammed to a minimum embedment depth of 500mm. This is for two connected but individually sufficient reasons. First, Terrenus has not proven the *extent* of non-compliance with the requirement and therefore cannot show the amount of any loss. Second, Terrenus has not proven that the non-compliance *resulted in* any structural risks and therefore cannot show that it has suffered any loss.

(1) Terrenus fails to establish extent of non-compliance

35 I find that Terrenus has not sufficiently proven the *extent* of the non-compliance with the specified minimum embedment depth of 500mm for the PEG Rods. Even if Terrenus did suffer loss (aside from infringement of rights) caused by the non-compliance, I find that Terrenus failed to establish the *amount* of such loss. There were numerous difficulties with Terrenus's evidence:

(a) first, I accept Attika's submission that it is clear on the evidence that the Joint Inspection Reports were not "joint inspections" at all and were in fact made by Terrenus acting alone. Mr Bong conceded this outright.[48] While this does not change the fact that the Joint Inspection Reports are still part of Mr Bong's own evidence, there is no basis for the veneer of impartiality that was put forward by presenting it as having been derived from "joint inspections". Terrenus also did not call Mr Lim or anybody from SolarGy to give supporting evidence;

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48 NE, 28 July 2023, at 16, lines 1–16, and 17, lines 27–30.

(b) second, Mr Bong accepted that not all of the 847 photographs relied on by Terrenus to show non-complaint PEG Rods and substantiate the Joint Inspection Reports, are actually non-compliant PEG Rods. Instead, *compliant* PEG Rods were also photographed;[49]

(c) third, although Terrenus relies on these 847 photographs to support its case that the marking of 971 affected solar panels in the Joint Inspection Reports is reliable, not a single photograph was matched to any PEG Rod for the solar panels that were marked as affected. Mr Bong accepted that it is unclear which photograph relates to which solar panel,[50] and that such matching *could have* been done for all 71 solar arrays, and that matching *ought to* have been done, so that there can be reliable evidence for the court.[51] It is notable that when Mr Bong re-surveyed six solar arrays on request of Mr Satchell, the number of solar panels marked as being affected by non-compliant PEG Rods was *reduced* from the number marked in the Joint Inspection Reports.[52] This further underscored the unreliability of Mr Bong's evidence in the Joint Inspection Reports. There is also no explanation as to why no photographs had been taken of the PEG Rods during the re-survey, to verify that the marked solar panels were indeed affected;[53]

(d) fourth, I accept Attika's submission that the method of measurement itself casts doubt on the accuracy of the measurements.

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49 NE, 28 July 2023, at 77, line 28, to 78, line 3; NE, 31 July 2023, at 24, lines 19–26.

50 NE, 28 July 2023, at 65, lines 6–9.

51 NE, 31 July 2023, at 26, line 2, to 27, line 3.

52 NE, 31 July 2023, at 21–23.

53 NE, 31 July 2023, at 23, lines 20–31.

The photographs do not show the starting point of the measurement but only a cropped image of the end of the measuring tape. It is hence unclear if the starting point is correctly placed to show insufficient embedment.[54] This is exacerbated by the cumulative effect of other methodological issues. Importantly, the photographs depict that some of the measurements had been taken in a slanted manner, rather than flush with the PEG Rod.[55] Even assuming that the measurements were taken from the correct starting point, the deviation would undoubtedly increase the measurement and give the impression of insufficient embedment. At trial, Mr Bong accepted that a slant affects the accuracy of the measurements but asserted that there would at most be a difference of 5–10mm.[56] However, there was no evidence or explanation to support this assertion and no evidence of how this would affect the total number of non-compliant PEG Rods, as the photographs depict instances of borderline non-compliance. Mr Bong further testified that he took into account this margin of error by beginning his measurement from the ground plate, rather than from the actual surface of the ground. Mr Bong reasoned that had he measured from the ground, the measurements would be greater and therefore show a greater extent of insufficient embedment, as "about 40%" of the ground plates were suspended above rather than sitting flat on the ground.[57] This did not in any way address the inaccuracies brought about by slanted measurements, which are wholly distinct from whether such leeway was

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54 Affidavit of Evidence-in-Chief of Bong Eng Yueh dated 13 May 2023 at 2309.

55 Affidavit of Evidence-in-Chief of Bong Eng Yueh dated 13 May 2023 at 2318.

56 NE, 28 July 2023, at 68, lines 2–23.

57 NE, 28 July 2023, at 69, line 5, to 70, line 12.

given. Moreover, there was no evidence adduced to support Mr Bong's claim that about 40% of the ground plates were suspended;[58] and

(e) for completeness, I reject Terrenus's submission that Attika bears the burden of showing the significance of Mr Bong's inaccurate measurements.[59] It is for Terrenus to prove the extent of the non-compliance to prove its claim.

36 For the forgoing reasons, I find that the "Joint Inspection" Reports are unreliable. This gravely undermines Attika's ability to discharge its burden of proving the *extent* of the non-compliance, as Attika relies upon the Joint Inspection Reports as proof of non-compliance in respect of 65 solar arrays (above at [17]). Furthermore, this flaw taints Mr Satchell's estimation, which Attika relies on to prove its case for the remaining six solar arrays.

37 In its Closing Submissions, Terrenus submits that a "sampling approach" suffices to discharge its burden of proving the extent of non-compliance and that there is no need for a photograph matched to every single defect. Terrenus submits that the latter would result in an "unreasonably onerous burden of proof" given that "there are tens of thousands of solar panels and legs". I observe that this might have been somewhat overstated given that Terrenus's case was initially that 2,733 solar panels were affected. In support of this submission, Terrenus relies on *Ramo Industries Pte Ltd v DLE Solutions Pte Ltd* [2020] SGHC 4 (at [170]) and *Millenia Pte Ltd (formerly known as Pontiac Marina Pte Ltd) v Dragages Singapore Pte Ltd (formerly known as Dragages et Travaux Publics (Singapore) Pte Ltd) and others (Arup Singapore*

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58 NE, 24 October 2023, at 1.

59 Plaintiff's Closing Submissions dated 14 September 2023 at para 50.

Pte Ltd, third party) [2019] 4 SLR 1075 ("*Millenia*").[60] However, the defects in those cases arose in relation to standardised, manufactured products. In contrast, the defects in this case are alleged to arise from installing solar panels on a flat gradient notwithstanding a slope profile (above at [16]) and Mr Satchell admitted that the type of slope, and *whether there is even a slope to begin with*, depends entirely on the specific location of each solar array.[61] Consequently, it is questionable whether Mr Satchell's estimation can even be properly regarded as an instance of the "sampling approach".

38 More fundamentally, the difficulty with Terrenus's case is not whether it is permissible to take a "sampling approach" here, but that *even if* I accept that Mr Satchell's estimation was based on such an approach, the samples relied on in the estimation itself were ridden with extensive measurement and identification problems. The issue is not, as Terrenus submits, whether it is necessary to have one photograph for every one defect.[62] The issue is that, even within what Terrenus claims to be a "sample", there is insufficient assurance that the measurements are sufficiently accurate for any extrapolation to even be made. I accept that what suffices as adequate proof of loss varies depending on the relevant factual matrix and that there is *potentially* some room to argue that less might be required *if* there are serious practical difficulties in providing precise evidence (as Terrenus alleges in this case). Nevertheless, if a claimant seeks to rely on a more flexible approach to proof, the law nevertheless requires that the claimant demonstrate that it has attempted its level best to prove its loss *and* that the available evidence is cogent (*Robertson Quay* at [27]–[31]). I find

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60 Plaintiff's Closing Submissions dated 14 September 2023 at paras 44–45.

61 NE, 2 August 2023, at 60, lines 19–21.

62 Plaintiff's Reply Submissions dated 17 October 2023 at para 6.

that Terrenus has failed to do so. Crucially, the fundamental assumption that Mr Satchell's estimate is based upon, that there is non-compliance within a given area because the solar arrays rest on sloping ground (above at [16]), was not supported by *any* other evidence such as a topological survey.[63] The foundational basis of Mr Satchell's estimate therefore rests on unstable ground.

39 As Mr Satchell's analysis and estimates are based predominantly on the data provided by Mr Bong, Mr Satchell's analysis and estimates are consequently also plagued by the same issues of unreliability and inaccuracy arising from Mr Bong's Joint Inspection Reports and photographs (above at [35]). Mr Satchell testified that he relied on the Joint Inspection Reports and that Terrenus did not provide him with any means to verify Mr Bong's data.[64] Where the basis or starting point for an expert report is shaky or flawed, the conclusion arrived at will be of little or no use to the court (*Khoo Bee Keong v Ang Chun Hong and another* [2005] SGHC 128 at [68] and *Turf Club Auto Emporium Pte Ltd and others v Yeo Boong Hua and others and another appeal* [2019] 1 SLR 214 at [12]). Indeed, this was exemplified when Mr Satchell revised his initial analysis and tendered a new estimate during the trial. This was because Mr Satchell had realised that the data in the Joint Inspection Reports had been "misleading", and the re-survey requested by Mr Satchell proved that his initial estimate had incorrectly identified compliant PEG Rods as being non-compliant.[65] Mr Satchell also considered his own evidence to be a "best estimate" rather than an "accurate measurement".[66]

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63 NE, 2 August 2023, at 32, lines 1–3.

64 NE, 2 August 2023, at 23, lines 8–12, at 24, lines 14–17, and 25, lines 13–23.

65 NE, 2 August 2023, at 36, line 11, to 39, line 27; Exhibit P7 (filed 9 August 2023) at 13.

66 NE, 2 August 2023, at 58, lines 15–18.

40 As alluded to, I also found difficulties with Mr Satchell's analysis. Expert opinion must be rational and coherent. Mr Satchell's fundamental assumption is that there is non-compliance within a given area between non-compliant data points because the solar arrays rest on sloping ground. His estimate is entirely and exclusively based on this assumption. However, there are critical flaws with Mr Satchell's hypothesis.

(a) There are data points (assuming that they are correct) which do not cohere with his hypothesis. For example, in respect of array A06, Mr Satchell accepted at trial that there is in fact not much of a slope, but he nevertheless marked the panels within the area as non-compliant. Mr Satchell was not able to satisfactorily explain why he did so.[67] Mr Satchell's estimate is thus internally inconsistent.

(b) Even within the six arrays where the re-survey was carried out, Mr Satchell was not able to rationalise how he decided upon the shape of the marked area of non-compliance. To illustrate, for array C28, Mr Satchell initially marked out an area in the shape of a triangle, with all panels within the marked area being estimated as being non-compliant. However, Mr Satchell subsequently revised this estimate by changing the marked area into the shape of a chevron.[68] This was because data point 15, which fell within the initial triangular area, was discovered to have in fact been sufficiently embedded. Mr Satchell addressed this by simply shifting the base of the triangle past data point 15, resulting in a

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67 Exhibit P7 (filed 9 August 2023) at 13; NE, 2 August 2023, at 49, line 11, to 50, line 27.

68 Exhibit P7 (filed 9 August 2023) at 16.

chevron shape.[69] In my view, this veered on being arbitrary. Mr Satchell's only explanation was to concede that the accuracy of the estimation would depend on the number of data points available.[70]

(c) Mr Satchell's extrapolation of his hypothesis to the other remaining solar arrays was wholly speculative. He admitted that he could not provide any assurance that all of the arrays were on sloped ground, and that the extrapolation was purely an assumption.[71] He accepted that the existence and type of slope profile depended on localised ground conditions, and he did not have any data points for the other arrays.[72] He accepted that he did not have any theoretical basis for assuming that there were slopes in the other arrays and, if so, what were the slope profiles, and that when he extrapolated his hypothesis to the other arrays, it was based on pure conjecture.[73]

(d) Despite his acknowledgement that he did not have any theoretical basis for his extrapolation to the other 65 arrays, Mr Satchell maintained in court that as an expert, he considered it reasonable to extrapolate just purely on the basis of the shading in the Joint Inspection Reports without any additional supporting data points.[74] Far from providing comfort, this steadfast willingness to maintain a position notwithstanding the acknowledged absence of any theoretical basis or

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69 NE, 2 August 2023, at 44, line 10, to 45, line 27.

70 NE, 2 August 2023, at 45, lines 16–17, at 49, lines 7–9, and 56, lines 19–20.

71 NE, 2 August 2023, at 29, lines 18–27, and 30, lines 1–17.

72 NE, 2 August 2023, at 60, lines 19–21.

73 NE, 2 August 2023, at 61, lines 3–17.

74 NE, 2 August 2023, at 62, lines 7–10.

> data supporting that position, called into serious question the impartiality and credibility of his assessment. A bare conclusory statement unsupported by any foundation or explanation has little evidential value.

41 Mr Satchell's estimation is plainly not "*the most cogent evidence of loss available in the given circumstances*" [emphasis in original] (*Robertson Quay* at [36]). I find that this further undermines Attika's ability to discharge its burden of proving the *extent* of the non-compliance, even in relation to the remaining six solar arrays.

42 Terrenus submits that because Mr Tan accepts that the photographs that Terrenus relies on shows *some* non-compliance, it is open to the court to make an adjustment to the quantities of non-compliance. Terrenus submits that this is preferable than to simply assume that there are zero non-compliances.[75] I accept that Attika has breached the Contract (above at [31]), as the degree of non-compliance was *non-zero*.[76] However, Terrenus provides no basis or framework whatsoever from which a sound and rational adjustment can be made, even after multiple rounds of written submissions.

43 I hence find that Terrenus has not sufficiently proven its case on the *extent* of non-compliance, even on its revised case (above at [17]). The narrowing of scope does not help Terrenus's case given the fundamental flaws in the evidence adduced. As Terrenus cannot establish with any certainty the amount of loss suffered as a matter of evidence, it is at best entitled only to

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75 Plaintiff's Closing Submissions dated 14 September 2023 at paras 48–49; Plaintiff's Reply Submissions dated 29 September 2023 at para 4.

76 Plaintiff's Reply Submissions dated 17 October 2023 at para 7.

nominal damages (*Biofuel Industries Pte Ltd v V8 Environmental Pte Ltd and another appeal* [2018] 2 SLR 199 ("*Biofuel*") at [44]).

(2) Terrenus has not established structural risks

44 I also find that Terrenus has not proven its case that the non-compliance with the minimum embedment depth of 500mm creates the alleged structural risks. This is fatal to Terrenus's claim for *substantial* damages. Even if Terrenus could prove the quantity of non-compliant PEG Rods, I find that Terrenus has not established that the non-compliance causes any loss.

45 In order to obtain substantial damages, it is not sufficient to prove only the fact of breach; the fact of damage and its amount must also be proven (*Biofuel* at [41]). Terrenus's case is not that the solar panels are structurally unsound or unstable. Terrenus's case prior to and during the trial was that the insufficient embedment created a risk of the PEG Rods being pulled out and parts of the array being thrown up into the air "like a kite" at high windspeeds. This underpinned its case that the only appropriate measure of damages was the cost of completely dismantling and re-installing the interconnected solar panels and mounting structures. As noted above (at [19]), Terrenus subsequently revised its case to focus on the *risk* of pull-out or structural failure during a "design-level wind event".[77] While the revision of Terrenus's case avoids the difficulty of proving "actual kiting", this belated revision raises several questions. First, it raises the question of whether Terrenus can show that the non-compliance creates the alleged structural risk. Second, it raises the question of whether the narrower structural risk justifies its claim for substantial damages

[77] Plaintiff's Closing Submissions dated 14 September 2023 at paras 51–54.

on the basis that the only appropriate measure of rectification is the removal and re-installation of the PEG Rods for the entirety of the affected solar panels.

46 In any event, I find that the evidence does not support Terrenus's case that the non-compliance with the 500mm embedment depth creates the alleged structural risk, even on the revised basis. In order for Terrenus to prove the fact of loss that entitles it to claim substantial damages, it must show that *any deviation* from the specified minimum embedment depth of 500mm *causes* the alleged loss (*ie*, the structural risk). This is because Terrenus did not adduce evidence of the actual degree of insufficient embedment for each non-compliant PEG Rod, but only adduced evidence of the estimated total number of non-compliant PEG Rods, regardless of the degree of insufficiency.

47 However, the evidence given by the structural experts during the JCSE shows that the structural risk alleged by Terrenus does not arise the moment there is any deviation from the specified minimum embedment depth of 500mm.

48 Before delving into the experts' evidence, it is useful to set out briefly the legal principles applicable to assessing the experts' evidence. In choosing between conflicting expert testimony, the court will have regard to their logic, common sense, coherence, as well as the objective evidence before the court (*Lee Hsien Loong v Review Publishing Co Ltd and another and another suit* [2007] 2 SLR(R) 453 at [105]; *Armstrong, Carol Ann (executrix of the estate of Peter Traynor, deceased, and on behalf of the dependents of Peter Traynor, deceased) v Quest Laboratories Pte Ltd and another and other appeals* [2020] 1 SLR 133 at [92]).

49 In Mr Satchell's expert report, he wholly adopts Jurchen's static calculations and therefore concludes that the minimum embedment depth is 500mm.[78] Mr Satchell opines that insufficient embedment less than 500mm in depth leads to loss of structural integrity and increased risk of structural failure in the event of a design-level wind event.[79] In Mr Sim's expert report, he opines that the stipulated minimum embedment depth of 500mm was a generalisation that was not based on the actual pull-out test results. Mr Sim therefore carried out his own calculations to verify the actual minimum embedment depth, based on the actual pull-out test results. Mr Sim calculated that the minimum embedment depth is 400mm rather than 500mm.[80] In Mr Satchell's second report, Mr Satchell reiterates his view "that non-compliance with [the contractual minimum embedment of 500mm] leads to risk of failure of the solar array structure due to wind uplift". Mr Satchell did not offer an alternative calculation, but provided criticism of Mr Sim's calculations, such as by pointing out that Mr Sim had failed to consider the fact that a designer has to design for a worse case uplift scenario.[81]

50 It was agreed between the structural experts that Jurchen designed the mounting structures with reference to the Eurocode, and that this was a valid approach to the *design* of the mounting structures. However, they differ in opinion on whether Jurchen's stipulated minimum depth of 500mm was calculated *based on* the actual results of the pull-out tests. Mr Sim observes that the pull-out tests had been conducted with a pre-determined ramming depth of

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78 1st Affidavit of Evidence-in-Chief of David Ian Satchell dated 16 May 2023 at 22.

79 1st Affidavit of Evidence-in-Chief of David Ian Satchell dated 16 May 2023 at 32 and 35–36.

80 1st Affidavit of Evidence-in-Chief of Sim Kwai Meng dated 5 June 2023 at 10.

81 2nd Affidavit of Evidence-in-Chief of David Ian Satchell dated 19 June 2023 at 11.

500mm, without any indication as to *how* this depth of 500mm was reached. Put simply, the pull-out tests conducted at the Solar Farm tested the resistance of PEG Rods rammed to a depth of 500mm, rather than testing the minimum embedment depth required to ensure that PEG Rods are sufficiently resistant.[82]

51 The experts agreed that Jurchen had used the design windspeed of 20m/s, and that this windspeed was based on the reference height of a building with a height of 10m. At the JCSE, the experts agreed that there was *no risk* of structural failure at windspeeds of 2.5m/s to 10m/s.[83] They further agreed that non-compliance with the Eurocode *does not* mean that a structural risk *necessarily* arises, as design codes incorporate a safety margin.[84]

52 As for the applicable windspeed, Mr Satchell adopted the figures used in Jurchen's static calculation.[85] Mr Chua, on the other hand, opined that the windspeed of 20m/s used for the design calculations required considerable elevation from the surface. The solar panels are about 1.5m in height. Mr Chua provided calculations based on three academic articles, that resulted in a windspeed of around 7.9m/s to 10m/s for the area of the Solar Farm. This took into consideration the fact that the solar panels were much closer to the ground than 10m high buildings (Mr Chua's calculations assumed a height of 2m) and was based on a classification of the Project site as having wind conditions between sub-urban and open terrain due to the presence of some low-rise buildings near Changi Business Park. Mr Chua testified that he took a more

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82 Experts' Joint Statement dated 1 July 2023 (Mr Satchell and Mr Sim) at 4, 9–10.

83 NE, 2 August 2023, at 100, lines 21–24, and 102, lines 28–30.

84 NE, 2 August 2023, at 94, lines 3–14.

85 NE, 2 August 2023, at 138, lines 1–5.

conservative position of 10m/s (instead of 7.9m/s) as the actual applicable windspeed at the Solar Farm. With the only variable being a change in windspeed from 20m/s to 10m/s from Mr Sim's original calculations, Mr Chua calculated the required minimum embedment depth at about 360mm.[86]

53 Terrenus questions Mr Chua's analysis. Terrenus submits that Mr Chua conceded that for the terrain of the Project (which is airport-like or flat) it was reasonable to design for the peak windspeed at a reference height of 12m experienced in an urban area as opposed to a reference height of 1m. Hence, Terrenus submits that Mr Chua's thesis of a windspeed of 10m/s, which Terrenus submits was predicated on a reference height of less than 2m rather than the established recommended reference height of 10m, is not supported even on Mr Chua's materials.[87] To properly contextualise this submission, it is necessary to set out the relevant extracts Terrenus relies upon, which was an exchange between Mr Chua and Mr Teo Wei Xian Kelvin (Zhang Weixian Kelvin) ("Mr Teo"), counsel for Terrenus, during the JCSE:[88]

> Mr Teo: So urban is less than suburban, right, the first sentence?
>
> Mr Chua: That's correct, yah.
>
> Mr Teo: Yah, but it goes on to say that:
>
> "Peak gust in the city may not be less than peak gust in the nearby airport. It is *somewhat conservative but reasonable to use measured or estimated peak gust speeds at an airport as the* ***designed wind speed for buildings*** *up to about 40 feet high*."

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86 Exhibit D3 (filed 10 August 2023) at 5; NE, 2 August 2023, at 113, lines 23–25, at 126, lines 3–17, at 160, lines 6–8, and 163, lines 11–14.

87 Plaintiff's Closing Submissions dated 14 September 2023 at paras 58–60.

88 NE, 2 August 2023, at 129–130.

> Mr Chua: Yah.
>
> Mr Teo: So I thought … please correct me if I'm wrong, but reading that sentence, what it's saying is that … *when you design for wind* ***in an airport***, you need to design it as if it is 40 feet high, is that what it's saying, which is 10 metres, right? …
>
> Mr Chua: 12 metres, yah, yah, correct.
>
> Mr Teo: 12 metres. So this is saying … it's reasonable when designing to use the peak wind speed at 12 metres when you are considering an airport, right? … Because the airport is flat, it's a runway, right? … So would you say that the arrays that we are talking about, are they closer to an airport runway …
>
> Mr Chua: It would be closer to the airport condition, yah.
>
> Mr Teo: Okay, thank you, so it's reasonable for us to assume that it is closer to the peak wind speed at 12 metres and not so much 1 metre, right, based on this article? … It's *reasonable for us to design to the peak wind speed at 12 metres as opposed to the speed at 1 metre*, would you agree with that?
>
> Mr Chua: *That's correct, yes, yah.*
>
> [emphasis added]

54 As seen from the above extract, the proposition that was put to Mr Chua was the inverse of the proposition set out in the academic article. The article states that it is reasonable to utilise the peak gust speeds experienced at an airport as the designed windspeed *for buildings up to about 12m* in a city or town. This is conservative for city designs because the windspeeds experienced in flat terrain are higher than that experienced in cities.[89] However, the proposition put by Mr Teo was that it is reasonable to utilise the peak windspeeds experienced at a height of 12m when designing *for structures in*

[89] Exhibit D2 (filed 10 August 2023) at 42 ("Wind on Buildings" at 4).

airport-like conditions. Although Mr Chua appeared to respond affirmatively to Mr Teo's question, I consider that Terrenus's reliance on the purported concession is flawed for two reasons. First, Mr Chua's evidence is that the reference height used was an elevation of 10m, not 2m. Mr Chua was calculating the windspeed.[90] The crux of Mr Chua's evidence is that a design windspeed of 20m/s would not realistically develop at the height of the solar panels.[91] Second, what Terrenus relies upon is *design* windspeeds for buildings in cities that are up to 12m in height. However, what is in issue was not the *design* parameters; rather, the issue is what a reasonable windspeed that would be experienced at the height of the solar panels would be. Mr Chua drew a distinction between *designing* for a peak windspeed that is experienced at a height of 12m, and whether there was *actual structural risk* to the panels for a windspeed that develops at a height of 2m. There was no inconsistency in his explanation. The key point is that while the *design* of a structure might ensure that it is impervious to a "design-level wind event" to a height of 10m, the question here is whether there is a risk of structural failure for a structure that is actually at a height of (less than) 2m.

55 Terrenus also submits that Mr Chua subsequently accepted that the *windspeed* would be somewhere higher than 10m/s, but that Mr Chua was not sure what it would be.[92] It is not entirely clear whether Mr Chua's purported

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90 NE, 2 August 2023, at 126, lines 3–4, at 131, lines 2–25, and 132, lines 6–7.

91 NE, 2 August 2023, at 132, lines 25–28, and 133, lines 22–25.

92 Plaintiff's Closing Submissions dated 14 September 2023 at para 66.

admission was in relation to the applicable windspeed or applicable reference height.[93] Mr Chua consistently testified that the applicable windspeed is 10m/s.[94]

56 Finally, Terrenus submits that Mr Chua incorrectly applied the windspeed formula from the academic articles. Terrenus accepts that it did not put this to Mr Chua at the trial and submits that this was because Terrenus's counsel and Mr Satchell did not have an adequate opportunity to check Mr Chua's calculations, as they were "given only minutes" to review the literature provided at the last minute by Attika.[95]

57 This submission did not fully accord with what actually transpired at trial. When Attika introduced the articles, I had queried Attika's counsel as to whether it would be too much material for Mr Satchell to go through during a stand down. Counsel for Attika agreed that the material would be initially limited to Exhibit D2.[96] Mr Chua's calculation was also based on the calculations in Mr Sim's report, with all parameters remaining the same, except for the reduced windspeed.[97] While counsel for Terrenus highlighted his concern that the academic articles had been adduced belatedly, and his specific concern that multiple parameters were changing, he also stated that if it was "just a wind speed change", Terrenus would "deal with it because it's just a one pointer."[98] Counsel then asked for 15 minutes to confer with Mr Satchell and discuss the academic articles and Mr Chua's calculations. I allowed this request.

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93 NE, 2 August 2023, at 134, lines 4–5.

94 NE, 2 August 2023, at 173, line 27, to 174, line 14.

95 Plaintiff's Reply Submissions dated 29 September 2023 at paras 34–37.

96 NE, 2 August 2023, at 107, lines 5-11.

97 NE, 2 August 2023, at 112, lines 1–12.

98 NE, 2 August 2023, at 113, lines 1–3.

The hearing was then stood down for 25 minutes, after which counsel for Terrenus informed the court that he was ready to proceed.[99] Given that Terrenus chose to proceed after standing down, and the alleged error in applying the formula was not put to Mr Chua, I do not consider it fair, in the circumstances, for Terrenus to raise this now.

58 However, I do note that Mr Chua accepted that there were potential issues affecting the accuracy of Mr Sim's calculations, which Mr Chua had used as the basis for his calculation of a minimum embedment depth of 360mm.[100]

59 In any event, Terrenus's own structural expert, Mr Satchell, agreed with Mr Chua that as a matter of principle, windspeeds would be reduced at lower heights. Mr Satchell was asked if he would intuitively agree with this or if he needed to study the paper. Mr Satchell did not ask for more time to study the paper and agreed with the proposition as a point of general principle.[101] While Mr Satchell did not completely accept that 10m/s would be the applicable windspeed, he did expressly confirm that it would be *less than* 20m/s, in light of the evidence and agreed principles. However, he was not able to come to a firm view on the precise windspeed.[102] Mr Satchell was able to provide a rough estimate that if the windspeed was dropped by 20%, consistent with the Hong Kong code, that would result in an approximate windspeed of 18m/s. This would mean that an embedment depth of around 400–450mm would be

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99 NE, 2 August 2023, at 114, lines 1–16.

100 NE, 2 August 2023, at 155, lines 1–9, and 166, lines 6–12.

101 NE, 2 August 2023, at 109, line 28, to 110, line 7, at 111, lines 26–30, and 174, lines 21–23.

102 NE, 2 August 2023, at 138, lines 6–12, and 177, lines 19–25.

adequate.[103] For avoidance of doubt, I accept Terrenus's submission that Mr Satchell should not be taken to have conceded that the correct applicable windspeed was 18m/s, as it was a ballpark figure.[104] Accordingly, it follows that I do not believe that Mr Satchell was conceding that the minimum embedment depth was 400–450mm. What Mr Satchell's evidence does demonstrate, however, is his agreement with the principle that windspeeds would be reduced at lower heights.

60 At this juncture, I reiterate that Terrenus's case is that a failure to strictly comply with the stipulated minimum embedment depth of 500mm *would* lead to the risk of pull-out or structural failure during a "design-level wind event". The evidence led at the JCSE thus critically undermines Terrenus's case. First, Mr Satchell's acceptance of the principle that windspeed is lower when closer to the ground and his acceptance that the windspeed is less than 20m/s, means that Mr Satchell effectively accepted that an embedment depth of *less* than 500mm *could suffice*. Therefore, even though the experts were unable to agree on the exact applicable windspeed, their consensus that it would be less than 20m/s means that any minute departure from the stipulated depth of 500mm, which was premised on a windspeed of 20m/s, *would not necessarily* lead to the alleged risk. Second, Mr Satchell's concession that non-compliance with a code would not necessarily create a risk of structural failure means that a departure from the stipulated depth of 500mm, which was premised on the Eurocode, *did not necessarily* create a risk of structural failure.

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103 NE, 2 August 2023, at 138, line 25, to 139, line 8.

104 Plaintiff's Reply Submissions dated 17 October 2023 at para 12.

61 In the light of this, it is not necessary for me to decide which expert's view is correct. I observe, however, that while Mr Satchell found Mr Chua's calculation based on a windspeed of 10m/s to be aggressive, Mr Satchell did not explain why this was the case, save that it was a significant drop from the *design* windspeed of 20m/s, which caused him some concern. While I fully appreciate that Mr Satchell may not have had enough time for a detailed critique or review of the materials, he was able to pose questions regarding the basis of Mr Chua's calculations and provide his estimated views given the agreed principles.[105]

62 The Jurchen Email also casts doubt on Terrenus's position. In that email, Jurchen's representative, Mr Nir Dekel ("Mr Dekel"), informed Attika that the minimum depth of 500mm was guidance provided on the assumption that the top 200mm of surface soil would be eroded during the project.[106] The relevant extract from their email correspondence is set out below:

> Email from Attika to Mr Dekel (9 December 2021):
>
> Hi Nir,
>
> During our meeting, I recalled you had informed me that the purpose of driving the mounting rods 500 mm depth into the ground is to cater to the change of weather conditions for the next 15 – 20 years and will eventually lose 250 mm of earth or soil. Therefore, from that time, you can still maintain a 250mm depth of the rod within the ground, which is still stable.
>
> May I know how this is correct?
>
> …
>
> Reply Email from Mr Dekel to Attika (9 December 2021):
>
> Hi Tan,
>
> *You are correct.*

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105 NE, 2 August 2023, at 115, line 9, to 120, line 30.

106 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at 4663–4664.

> The guidance of 500mm minimum foundation depth, ***regardless of the type of soil and the pullout loads***, *is due to the assumption that the top 200mm soil will be eroded during the project life.*
>
> [emphasis added]

63 As Attika submits, it appears from this exchange that Jurchen's position is that the minimum depth required for stability is 300mm rather than 500mm. In response, Terrenus submits that Mr Dekel had been misled into giving the comments on embedment depth. Terrenus then relies on a subsequent email dated 10 January 2022, which sets out the following exchange:[107]

> Email from Mr Bong to Mr Dekel (7 January 2022):
>
> Hi Nir,
>
> For your information, we have received copies of the email correspondence between you and Attika between 6 to 12 December 2021 […] from Attika in relation to guidance/advice concerning Jurchen's PEG system. Please note that Attika is using the same to justify, amongst other things, to the effect that their installation of your PEG system at SL2, although a significant portion is non-compliant with the approved design for the SL2 project, is within acceptable tolerances. In this regard, we attach a few photographs of the PEG installation at SL2 for your information.
>
> Please clarify:
>
> (a) whether your said guidance/advice to Attika apply specifically to the SL2 project, especially in light of Jurchen's Static Calculations for SL2 and the recommendations therein;
>
> (b) *whether the same supersedes your 2 emails* dated 11 August 2021 […] *to the effect that Attika should seek approval from the project consultant (SolarGy) and developer (Terrenus Energy)* should Attika have any proposal for an alternative installation specifications which are not in compliance with the approved design for the SL2 project; and
>
> (c) whether there were any qualifications and/or limitations to your said guidance/advice to Attika.

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107 Affidavit of Evidence-in-Chief of Yeo Ying Hao dated 14 May 2023 at 1004–1005.

> …
>
> Reply Email from Mr Dekel to Mr Bong (10 January 2022):
>
> Hi Bong,.
>
> My comment regarding this topic is the same as we've discussed [a] few weeks ago over the phone: Those recent discussions with Attika were aimed at making sure all their existing questions about the PEG are answered, since *other customers started contacting Attika regarding the PEG over the last ~2 months.* ***The advice I've given is generic PEG design and not project specific.*** *Actually I ignored the mentioning of 'SL2' in the emails title mainly, since I [thought] this project is completed I was not aware of the open issues between Terrenus and Attika.*
>
> I haven't seen most of the photos you've just sent. The ones showing a pile of soil is clearly unacceptable and cannot achieve the long terms foundation stability required over the project life. I am surprised and very disappointed Attika sent only the photos showing the concrete and not the ones showing the soil, and still communicating to Terrenus I approved the design for SL2…. This is clearly unacceptable.
>
> In my answer to their recent question (about the slopes) *I've clarified this to Attika that my advice is generic, and any project specific design must consider both the local conditions and the customer's design* (in this case Terrenus and SolarGy.
>
> …
>
> [emphasis added]

64 Terrenus submits that in the above exchange, Mr Dekel qualified his earlier advice to Attika in the Jurchen Email by saying that the advice was generic and "not project specific". Terrenus focuses on this in support of its case that Mr Dekel walked back on his earlier advice that 300mm was effectively sufficient.[108]

65 However, despite Terrenus specifically asking Mr Dekel if such advice supersedes its earlier emails to the effect that Attika should seek approval from

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108 Plaintiff's Reply Submissions dated 29 September 2023 at paras 26–29.

SolarGy and Terrenus should Attika have any proposal for alternative installation specifications which are not in compliance, Mr Dekel did not specifically respond. Notably, Mr Dekel did not expressly take back his earlier statement to Attika communicating that the minimum embedment depth of 500mm was guidance applicable "*regardless of the type of soil and the pullout loads*" and that the effective requirement was for an embedment depth of 300mm (ignoring projected soil erosion).

66 In my view, Mr Dekel's statement was, on its face, applicable to the Project. Indeed, the context of the Jurchen Email shows that Mr Dekel's response was situated within a discussion specifically on the Project. In an earlier email dated 7 December 2021 in the same chain, Attika asked Mr Dekel to confirm if soil topping up was an acceptable solution if the PEG Rods were unable to penetrate 500mm into the ground. In response, Mr Dekel himself questioned Attika specifically on the "soil at Changi Business Park".[109] This email exchange was sent two days prior to the Jurchen Email and was the most recent exchange. This made it improbable that the advice rendered was generic and "not project specific". The fact that the guidance depth of 500mm was applicable regardless of the type of soil or pull-out loads also appears to be consistent with Mr Sim's observation the pull-out tests had been conducted with a pre-determined ramming depth of 500mm (above at [49]).

67 Hence, on the face of the emails, it appears that Jurchen did not actually take back its earlier stated position in the Jurchen Email. At the very least, there are doubts about whether Jurchen did so. Neither party disputed that Mr Dekel

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109 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at 4666–4667; Plaintiff's Reply Submissions dated 29 September 2023 at para 25.

made the statements and sent the emails. Neither party called Mr Dekel to clarify. In the absence of such clarification, there is *prima facie* evidence from Jurchen, the supplier of the PEG Rods, that casts doubt on whether a failure to strictly comply with the stipulated 500mm embedment depth would necessarily create the alleged structural risks. This is significant as Terrenus's submissions focus on undermining the evidence of the other structural experts, and its positive case relies mainly upon Jurchen's static calculations.

68 Contrary to Terrenus's submission, the burden of proof does not lie on Attika. The burden remains on Terrenus to show both the *fact of damage* and its *amount*. Taking into consideration the overall evidence, I find that Terrenus has not proven that a failure to strictly comply with the stipulated embedment depth of 500mm would result in the alleged structural risk. Terrenus therefore fails to prove that it suffered any loss for which it is entitled to *substantial* damages. Terrenus is therefore entitled only to nominal damages (*Biofuel* at [44]).

69 I observe in passing, that the loss which Terrenus claims to suffer is an uncertain and unquantified increased *risk* of structural failure upon the occurrence of what both the parties and the experts regarded as an *unlikely event*, rather than actual structural failure or instability, or even an imminent risk. This raises several interesting questions, such as whether a speculative future loss suffices as loss for the purposes of claiming substantial damages for breach of contract, whether a claim for increased risk of a potential future loss is too remote to be recoverable, and whether the probability of a risk eventuating (if quantifiable) should interact with the quantum of damages awarded so as to avoid overcompensation. The parties also did not provide submissions on these issues. Given my findings above, I need not address these questions.

(3) Appropriate method of rectification

70 As Terrenus has not proven its case on the extent of non-compliance nor its case that any non-compliance with the 500mm embedment depth would result in the alleged structural risk, the issue of the appropriate measure of rectification, assuming that rectification is the appropriate basis of damages, does not arise for my consideration. I observe that while there theoretically could be diminution in value, such a claim is similarly impossible to advance given that Terrenus has not sufficiently proven the extent of non-compliance, even in a broad fashion using reliable methods, such that the court can assess any diminution in value. Nor has Terrenus provided any submissions or evidence of what such diminution in value should be.

(4) Conclusion

71 In the circumstances, while I find that Attika is in breach for *some* failure to comply with the contractual requirement of a minimum embedment depth of 500mm for PEG Rods, Terrenus has failed to prove its case on the *extent* of non-compliance and failed to show that the breach *resulted in* any loss that justifies substantial damages. I hence award Terrenus only nominal damages in respect of such breach, fixed at $1,500.

72 For completeness, Attika submitted that Mr Satchell is unqualified to carry out evaluations and provide engineering advice in this jurisdiction. As I have found that Terrenus has not proven its case, even with the assistance of Mr Satchell's testimony, I do not consider it necessary to delve into this sub-issue.

Whether Attika failed to ensure an above ground clearance of 700mm

Parties' cases

73 The second substantial defect that Terrenus claims for is in relation to the ground clearance of the solar panels. This too relates to the embedment of the PEG Rods, with insufficient ground clearance being a result of over embedment. Terrenus submits that Attika breached a contractual requirement that there must be a minimum clearance of 700mm between the ground and the bottom of the solar panel array. Terrenus submits that Drawing 102 clearly shows a minimum clearance requirement of 700mm. I note that unlike the case for embedment depth, which states that 500mm is the "minimum" (above at [13]), Drawing 102 does not describe the clearance height as a minimum. There is also no equivalent to cl 2.2.17 of Annex A Part III of the MBA (above at [31]) that expressly obliges Attika to ensure that the clearance height is achieved.

74 Terrenus submits that it has suffered loss in the form of increased operation and maintenance costs. Terrenus submits that the 700mm clearance was to allow, amongst other things, for ease of grass cutting, using a "Raymo robot". According to Terrenus, this robot has a height of 510mm and is the only robot with a good capacity to cut the amount of grass in question. It is the only robot recommended on Jurchen's website. Terrenus submits that as a result of insufficient ground clearance, the Raymo robot might snag on cables dangling from the solar panels. Therefore, Terrenus has had to resort to the more inefficient use of manual grasscutters.[110] Terrenus submits that it is not obliged

[110] Plaintiff's Closing Submissions dated 14 September 2023 at paras 94–100.

to "trial other shorter robots which may not work as well in the conditions of the Project".[111]

75 Terrenus initially brought its case, on the *extent* of non-compliance, on the basis of Mr Satchell's estimation that approximately 9% (3,292) of the solar panels have insufficient ground clearance.[112] As with the estimate of insufficient embedment, Mr Satchell's estimate also depended on Mr Bong's Joint Inspection Reports and the same fundamental assumption of sloping ground (above at [16]).[113] Similarly, Terrenus's claim was revised downwards after the trial, in its Closing Submissions, on the basis of the same concessions (above at [17]). On this revised basis, Terrenus claims for 1,492 panels or 4.2% of the panels (reduced from the original claim for 3,292 panels or 9.3% of the panels). As before, Terrenus points out that Attika's Mr Tan had conceded that there was *some* non-compliance,[114] and that Attika did not produce measurements to contradict Terrenus's evidence.[115]

76 As for the *consequences* of insufficient clearance, Terrenus frames its loss as increased operation and maintenance costs. However, Terrenus does not claim for the actual increase in operation and maintenance costs between the Raymo robot and manual grass cutting, but claims for substantial damages for cost of cure based on the complete reinstallation of all the affected solar

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111 Plaintiff's Closing Submissions dated 14 September 2023 at para 101.

112 1st Affidavit of Evidence-in-Chief of David Ian Satchell dated 16 May 2023 at 50.

113 1st Affidavit of Evidence-in-Chief of David Ian Satchell dated 16 May 2023 at 42–43.

114 NE, 8 August 2023, at 92, line 18.

115 Plaintiff's Closing Submissions dated 14 September 2023 at paras 42–43, and 102–107.

panels.[116] To meet Attika's submission on remoteness, Terrenus submits that the grass cutting costs *show* that it has suffered loss as a result of the breach, but simultaneously submits that "its claim is not in fact for the cost of grass cutting but the cost of rectification".[117]

77 Attika does not dispute that the 700mm ground clearance was a requirement of the Contract.[118] However, Attika submits it was nothing more than a minor requirement.[119] As with Terrenus's case on insufficient embedment, Attika submits that Terrenus cannot prove the *extent* of non-compliant solar panels because the evidence Terrenus relies upon is plagued with the same issues of unreliability and inaccuracy (above at [22]–[25]).

78 Attika also submits that Terrenus cannot prove that it is entitled to *substantial* damages.

79 First, Attika submits that Terrenus's case on the necessity of using the Raymo robot is contradictory. Mr Charles Wong ("Mr Wong"), the Chief Executive Officer of the "Terrenus Energy" group, testified that Terrenus would use the Raymo robots for the *entire* Solar Farm. However, Terrenus's website states that it intends "[t]o fully utilize every inch of space allocated for the project suitable crops will be planted below the solar arrays". It is undisputed that some crops have been planted at the Solar Farm. Attika submits that, with

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116 Plaintiff's Closing Submissions dated 14 September 2023 at paras 108–113.

117 Plaintiff's Reply Submissions dated 29 September 2023 at paras 61–63.

118 NE, 24 October 2023, at 3, lines 1–3.

119 Defendant's Closing Submissions dated 14 September 2023 at para 87.

crops planted "*below* the solar arrays" [emphasis added], there would be no grass to be cut below the arrays.[120]

80 Second, Attika submits that the Raymo robot's height of 510mm means that, on Terrenus's own design, the cable trays placed under every solar array at a height of 450mm above the ground would obstruct the Raymo robot's path. In other words, the Raymo robots could never have been used in any event.[121]

81 Third, Attika submits that the loss represented by the alleged inability to use the Raymo robots must fail for being too remote, as there is no evidence that Terrenus ever informed Attika that Raymo robots or any other grass cutting robot would be used for the maintenance of the Solar Farm.[122]

82 Fourth, Attika highlights that Mr Tan gave unchallenged evidence that there are other types of grass cutting robots lower in height than the Raymo robot.[123] Attika challenges Mr Bong's claim that Terrenus had tested one other type of robot but found it to be unsuitable as a bare statement. In any case, Attika submits that there was no reason why Terrenus could not have tested the suitability of other robots as well.[124] Attika submits that it is implausible that only one type of robot exists that is suitable for the Project. Therefore, Terrenus has breached its duty to mitigate.[125]

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120 Defendant's Closing Submissions dated 14 September 2023 at paras 95–97.

121 Defendant's Closing Submissions dated 14 September 2023 at para 98; Defendant's Reply Submissions dated 28 September 2023 at para 47.

122 Defendant's Closing Submissions dated 14 September 2023 at para 99.

123 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at para 230(c) and pp 4631–4646.

124 Defendant's Closing Submissions dated 14 September 2023 at para 100.

125 Defendant's Reply Submissions dated 28 September 2023 at paras 45–48.

83 Fifth, Attika submits that Mr Bong gave evidence that Terrenus had in fact already placed a purchase order for Raymo robots. This shows the falsity of Terrenus's claim that it is unable to use Raymo robots and that the insufficient clearance had caused it to use manual cutting for the entire Solar Farm.[126]

Decision

84 The dispute between the parties goes towards the extent of the non-compliance and the effect of the breach. I reiterate that the burden remains on Terrenus to discharge its burden of proof (above at [32]). I find that Terrenus has not met this burden as it failed to show the extent of non-compliance and that it suffered any loss that would entitle it to substantial damages.

85 First, there are severe problems with the Terrenus's evidence on the *extent* of non-compliance. The evidence that Terrenus relies on to prove extent is Mr Satchell's estimate and Mr Bong's Joint Inspection Reports.[127] As I have explained, both are fundamentally flawed (above at [35] and [38]–[40]). Briefly, the Joint Inspection Reports are of dubious reliability, and Mr Bong's photographs reveal severe methodological issues. Even if Mr Satchell's estimation was based on a permissible approach, the absence of basis for Mr Satchell's fundamental assumption of sloping ground means that his estimate is of little or no use. Mr Bong candidly accepted that there was no certainty about the exact quantity of affected solar panels.[128] I find that Terrenus has not proven the extent of non-compliance with the 700mm ground clearance requirement.

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126 Defendant's Closing Submissions dated 14 September 2023 at para 101.

127 Plaintiff's Closing Submissions dated 14 September 2023 at para 103.

128 NE, 27 July 2023, at 119, lines 27–31.

86 Second, I find that Terrenus has not proven that the insufficient clearance caused it to suffer loss that would entitle it to substantial damages:

(a) first, it is unclear whether the non-compliance caused *any* loss to Terrenus. Terrenus frames its loss as increased operation and maintenance costs but complains *exclusively* of the alleged inability to use the Raymo robot. While I do not place great weight on the marketing materials on Terrenus's website, I accept Attika's point that Terrenus cannot maintain the claim that the Raymo robots were to be used for the entire Solar Farm. Mr Wong did not dispute that parts of the Solar Farm are being used for farming, although he asserted that this would be "very close" but not "underneath" the panels.[129] Mr Bong also testified that Terrenus had in fact nevertheless purchased the Raymo robot, which was already being used at the Solar Farm.[130] It is therefore clear that any non-compliance did not *prevent* Terrenus from using the Raymo robot entirely. Terrenus appears to have realised the difficulty in its submission, as it reframed its submission as an inability to deploy the Raymo robot only at certain areas.[131] There is, however, no evidence of the extent to which the Raymo robot was obstructed. In any event, Mr Bong testified that Terrenus was only "just recently" able to contact a distributor for the Raymo robot.[132] Terrenus therefore cannot claim that it suffered any loss from the *inability* to use the Raymo robot prior to

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129 NE, 25 July 2023, at 40, lines 10–13.

130 NE, 28 July 2023, at 124, lines 7–9, and 125, lines 1–4.

131 Plaintiff's Reply Submissions dated 29 September 2023 at para 60.

132 NE, 28 July 2023, at 124, lines 11–18.

this point, as Terrenus had not in any event been able to procure it until recently;

(b) second, the loss is, in any event, too remote. There is no mention of the use of robots or the Raymo robots in the Contract, and there is no evidence that Attika was ever aware that Terrenus had planned to use such a robot or any particular grass-cutting robot. The alleged loss, being a specific inability to use the Raymo robot, falls under the second limb of *Hadley v Baxendale* (1854) 9 Exch 341 ("*Hadley v Baxendale*") which requires Terrenus to prove special knowledge. Terrenus cannot avoid this principle by attempting to reframe its alleged loss at a higher degree of generality as an increase in operations and maintenance costs; and

(c) third, even if causation and remoteness were satisfied, Terrenus would have failed to discharge its duty to mitigate. Mr Bong admits that there is no evidence that Terrenus is unable to use robots shorter than the Raymo robot.[133] Mr Bong could only provide a bare assertion that despite the fact that Terrenus was aware of robots that are shorter than 510mm, all other robots were unsuitable for use at a solar farm.[134] There is no evidence back up this bare claim. Terrenus's submission that it is not obliged to trial other suitably sized robots is antithetical to the duty to mitigate its loss.

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133 NE, 28 July 2023, at 119, lines 3–4.

134 NE, 28 July 2023, at 118, lines 26–32.

For completeness, it is undisputed that the clearance height poses no structural issues,[135] and Terrenus did not make submissions based on the cost differential of manual grass cutting. I therefore do not need to consider whether Terrenus's case on complete reinstallation is the appropriate measure of rectification, or whether it is wholly disproportionate to the unquantified additional cost of manually cutting grass at a limited section of the Solar Farm.

87 I therefore find that Terrenus has not proven its case on the extent of non-compliance and effect of the breach, so as to support its claim for substantial damages. In the circumstances, I find that Terrenus is only entitled to nominal damages (*Biofuel* at [44]) for the non-compliance with the clearance height of 700mm, fixed at $1,500.

Whether Attika failed to remove "root balls"

88 Clause 5.2.1 of Annex A Part III of the MBA ("Clause 5.2.1") provides that:

> [Attika] shall excavate, dismantle in sections, hoist, transport, and dispose the trees (inclusive of the root ball) as specified on the Annex I.

Annex I identifies 265 different trees for removal. Annex L states the Lumpsum Price of Tree Removal as $420,000. After variations, Attika was to remove 266 trees. Clause 5.2.2 of Annex A Part III of the MBA provides that:

> [Attika] shall engage the contractor with relevant registration with NParks to carry out tree felling works and shall be supervised by the NParks certified arborist and all associated works shall follow arborist's recommendations.

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135 NE, 28 July 2023, at 117, lines 5–9.

89 Attika engaged ISO Landscape Pte Ltd to carry out the tree removal works. Mr Jeevanantham Santhakumar ("Mr Santhakumar") was appointed as the certified arborist. ISO Landscape Pte Ltd carried out the tree removal works from 8 May 2021. Mr Santhakumar directed that the trees were to be removed by first felling the trees, followed by either grubbing or grinding the roots to a depth of 150–200mm below ground level.[136] The process known as grubbing essentially involves the use of an excavator to extract an entire mass of soil and debris.[137] Grinding involves using a special grinding machine to remove the roots.

Parties' cases

90 The third substantial defect that Terrenus claims for is in relation to Attika's alleged failure to remove all "root balls" from the Solar Farm in accordance with Clause 5.2.1. Much of the dispute centres around the meaning of the term "root ball" in Clause 5.2.1.

91 Terrenus's case prior to and during the trial was that Clause 5.2.1 required Attika to actually remove the *entire* mass of roots for each tree through *grubbing*.[138] In its Closing Submissions, Terrenus revised its case to submit in the alternative that Clause 5.2.1 requires at least the removal of all non-root subterranean portions of the tree and part of the mass of roots to a depth of 150–200mm under the surface, which may be done by *grinding*.[139]

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136 Affidavit of Evidence-in-Chief of Jeevanantham Santhakumar dated 8 May 2023 at paras 6–9 and pp 502 and 505.

137 NE, 1 August 2023, at 17, lines 28–30.

138 Statement of Claim at paras 78–86; Revised Scott Schedule dated 31 July 2023 at 8–11.

139 Plaintiff's Closing Submissions dated 14 September 2023 at paras 114–118.

92 After Attika's employment was terminated, Terrenus engaged an arborist, Mr Marimuthu Puddan ("Mr Puddan"), to survey the 266 tree locations. Mr Puddan was instructed to prepare a "Root Ball Survey Report".[140] His evidence is that he found 178 "root balls" at the 266 tree locations.[141] Terrenus's primary position was that these 178 "root balls" had to be totally removed by way of grubbing, as any remnants would otherwise decompose over the life span of the Project and thereby soften. Terrenus submits that this will cause instability to any nearby fences or mounting structures.[142] On Terrenus's alternative case, Terrenus adopts Mr Santhakumar's position that Clause 5.2.1 requires roots to be removed to a depth of 150–200mm.[143] Terrenus submits that as Mr Puddan only dug about 50–100mm to find the "root balls", there are 178 "root balls" which were not grubbed or grinded to a depth of 150–200mm.[144] At the minimum, Terrenus submits that 43 stumps had to be removed as Attika's expert arborist, Mr Goh Mia Chun ("Mr Goh"), had said this in his report.[145]

93 Terrenus claims for diminution in value for each tree that was not sufficiently removed in accordance with Clause 5.2.1. Terrenus quantifies this at $500 per "root ball", based on Mr Goh's estimation.[146] Alternatively,

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140 Affidavit of Evidence-in-Chief of Marimuthu Puddan dated 13 May 2023 at para 6.

141 Affidavit of Evidence-in-Chief of Marimuthu Puddan dated 13 May 2023 at para 9.

142 Plaintiff's Closing Submissions dated 14 September 2023 at para 124.

143 Plaintiff's Closing Submissions dated 14 September 2023 at para 117.

144 Plaintiff's Closing Submissions dated 14 September 2023 at paras 122–123.

145 Plaintiff's Reply Submissions dated 17 October 2023 at para 28; Affidavit of Evidence-in-Chief of Goh Mia Chun dated 24 April 2023 at 25.

146 Plaintiff's Closing Submissions dated 14 September 2023 at para 130; Affidavit of Evidence-in-Chief of Goh Mia Chun dated 24 April 2023 at 8.

Terrenus relies on the evidence of its quantum expert, Mr See Choo Lip ("Mr See"), that the removal would cost about $152 per "root ball" on average.[147]

94 Attika submits that there is no contractual provision mandating the removal of tree roots by way of grubbing or providing for any specified method of removal. Attika highlights that cl 5.2.2 of Annex A Part III of the MBA leaves this to the determination of the certified arborist, Mr Santhakumar, who directed the use of grubbing and grinding. Both Mr Santhakumar and Mr Goh gave evidence that the term "root ball" is only applicable where there is *transplanting* of trees, and does not apply to the removal of roots. The phrase "root ball" therefore does not have any particular meaning under Clause 5.2.1.[148] Attika submits that Terrenus's claim that decomposition will cause instability is unsupported by evidence. Mr Santhakumar opined that "root balls" that are grinded will not interfere or cause damage to the structures. Both Mr Santhakumar and Mr Goh opined that because decomposition will occur slowly over several years, it is unlikely to affect the mounting structures or fencing.[149]

95 Attika accepts it will be in breach if the roots have not been grinded to at least 150mm below the ground surface. However, Attika does not accept that the 178 "root balls" identified by Mr Puddan require further grinding.[150] Attika relies on Mr Santhakumar's positive evidence that the roots were grinded to at

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147 Plaintiff's Closing Submissions dated 14 September 2023 at para 132; Affidavit of Evidence-in-Chief of See Choo Lip dated 25 May 2023 at para 92.

148 Defendant's Closing Submissions dated 14 September 2023 at paras 108–111.

149 Defendant's Closing Submissions dated 14 September 2023 at para 113; NE, 1 August 2023, at 56, lines 18–21; NE, 3 August 2023, at 41, lines 4–14.

150 Defendant's Closing Submissions dated 14 September 2023 at para 116.

least 150mm.[151] In contrast, the photographs that Mr Puddan took for the "Root Ball Survey Report" do not show the exact depth to which the "root balls" were grinded. Attika highlights that Terrenus's counsel sought to make this point to Mr Goh during the trial.[152] Attika therefore submits that Mr Puddan's evidence does not show that 178 "root balls" were insufficiently grinded, as the roots that were sufficiently grinded below the depth of 150mm could have been exposed if Mr Puddan had excavated below that depth.[153] Attika emphasises that Terrenus's original position had been that the entire mass of roots for each tree had to be removed through grubbing, and that this was the basis on which Mr Puddan prepared the "Root Ball Survey Report". Mr Puddan had been instructed to search for "root balls" and not to determine if roots had been grinded to at least 150mm below the surface.[154]

96 Furthermore, Attika highlights that Mr Goh also testified that he was unable to ascertain the location of the "root balls" at the Project site even with the assistance of representatives from both parties.[155] Both Mr Santhakumar and Mr Goh stated that there were only around five or six stumps above ground that needed to be grinded.[156] While Mr Puddan said that there were 14 stumps that were above ground, Attika submits that Mr Goh and Mr Santhakumar's evidence should be preferred as their evidence was based on their observations on site, whereas Mr Puddan's evidence on the number of above ground stumps

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151 Defendant's Closing Submissions dated 14 September 2023 at para 121.

152 Defendant's Closing Submissions dated 14 September 2023 at para 119; NE, 1 August 2023, at 64, line 27, to 65, line 1.

153 Defendant's Closing Submissions dated 14 September 2023 at paras 117–120.

154 Defendant's Reply Submissions dated 28 September 2023 at para 60.

155 NE, 1 August 2023, at 7, lines 3–15.

156 NE, 1 August 2023, at 8, line 13; NE, 3 August 2023, at 27, line 32.

was based on his perusal of the photographs, which may not be accurate.[157] Similarly, Attika submits that Mr Goh's opinion that 43 stumps had to be removed must be rejected, as it was based only on Mr Puddan's photographs. Mr Goh's evidence was that he only found six stumps above the ground.[158]

97 Attika therefore submits that Terrenus had failed to prove that Attika has breached Clause 5.2.1 or the extent to which roots have not been grinded to the depth of at least 150mm.[159] Attika submits that if a value has to be attributed for insufficient root removal, the rate of $30 per remnant root should be applied, as this rate was set out by Terrenus' own witness, Mr Zhang Yin ("Mr Zhang"), the Head of Engineering, Project & Operations of the Terrenus Energy Group.

Decision

98 There are two sub-issues. First, whether Clause 5.2.1 obliged Attika to remove the entire subterranean mass of roots by the process known as grubbing, such that Attika was in breach for failing to do so. Second, whether Attika had failed to comply with the requirements of Clause 5.2.1, and if so, to what extent.

(1) Clause 5.2.1 does not require grubbing

99 I find that Terrenus has not proven its case that Attika was contractually obliged under Clause 5.2.1 to completely excavate the entire mass of roots for each tree at the Solar Farm, whether described as "root balls", "stumps", or "root remnants". It was sufficient for Attika to grind any roots to a depth of 150–200mm under the surface.

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157 Defendant's Closing Submissions dated 14 September 2023 at paras 124–128.

158 Defendant's Closing Submissions dated 14 September 2023 at para 129.

159 Defendant's Closing Submissions dated 14 September 2023 at paras 133–134.

100 Although the interpretation of Clause 5.2.1 is a question of law, I consider it helpful to have regard to the opinions of the arborists, as cl 5.2.2 of Annex A Part III of the MBA required the tree removal works to be carried out under the supervision and following the recommendations of an arborist. Terrenus did not put forth an expert arborist. While Terrenus called Mr Puddan to testify, Mr Puddan did so strictly in his capacity as a factual witness and not as an expert.

101 The expert evidence is that the term "root ball", which is referred to in Clause 5.2.1, is understood by arborists to refer to a clump of roots and soil, usually in the shape of a ball, which occurs when young trees are transplanted. The term root ball is used in transplanting and not tree removal.[160] Clause 5.2.1, however, relates to tree removal and not transplanting.

102 Mr Goh, Attika's expert arborist, provided a technical definition of "root ball" based on the International Society of Arboriculture, Glossary of Arboricultural Terms 2020. This defines a "root ball" as "soil containing all or a portion of the roots that are removed with a plant when it is planted or transplanted."[161] Mr Goh testified that the industry understanding of the term "root ball" is that it refers to a clump of soil and roots of a young sapling, usually in a bag or container, in the nursery or when transplanting. Once transplanted, there is no longer a root ball. The root system of a mature tree cannot be described as a "root ball".[162] When asked about Clause 5.2.1 and what the removal of a "root ball" would entail, Mr Goh opined that it simply refers to the

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160 NE, 1 August 2023, at 41, lines 2–5; NE, 3 August 2023, at 39, lines 28–31.

161 Affidavit of Evidence-in-Chief of Goh Mia Chun dated 24 April 2023 at 5.

162 NE, 1 August 2023, at 41, lines 2–24, and 42, lines 10–14.

removal of some part of the tree that is under the surface of the ground, and that what precisely needed to be done was generally a matter of agreement and for the client to specify in the contract, in terms of what needed to be removed and to what depth.[163]

103 Mr Santhakumar noted that grubbing was not a requirement of the Contract.[164] His evidence is that grinding was sufficient to satisfy Attika's obligations under Clause 5.2.1 as it removed the tree. This is significant as Mr Santhakumar was the certified arborist who supervised the tree removal works and the use of grinding was his recommendation. In his view, grinding was an established industry practice, and would avoid the risk of soil erosion caused by grubbing.[165] Mr Santhakumar also testified that the term "root ball" did not apply to tree removal, but to tree transplanting, and refers to roots with some soil.[166]

104 In my view, the effect of Mr Goh and Mr Santhakumar's unchallenged evidence is that Clause 5.2.1 *does not* mandate that Attika must remove *all* roots that are under the surface of the ground. Clause 5.2.1 did not specifically require that tree removal could only proceed by way of grubbing of roots. A certified arborist required by cl 5.2.2 would understand that Clause 5.2.1 includes the disposal of the trees, but that it does not specify how, or how much, of the subterranean roots must be removed.

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163 NE, 1 August 2023, at 42, lines 5–7, and 48, lines 14–31.

164 NE, 3 August 2023, at 42, line 8.

165 Affidavit of Evidence-in-Chief of Jeevanantham Santhakumar dated 8 May 2023 at paras 8–9.

166 NE, 3 August 2023, at 39, lines 28–31.

105 Mr Santhakumar, the certified arborist, considered that trees would be removed if the roots were grinded to a depth of around 150–200mm below the surface of the ground. Terrenus contends that this is insufficient, as decomposition could affect the stability of nearby structures. However, the unchallenged evidence of Mr Goh is that while there is a possibility that the soil will soften due to the decomposition of the roots, this would not affect the solar panels as they were only 1m tall. Mr Goh's assessment, based on his experience, is that the tilt from the soil softening is likely to be no more than 1 degree over 16–20 years and that the soil should be stable enough to hold up the PEG Rods. It is not possible for what he considered to be a "tiny" structure to collapse during that period because of the decomposition.[167]

106 I hence find that Terrenus has not proven that Attika is required to *totally* remove all the roots that are below ground. It suffices for Attika to grind the roots to around 150–200mm beneath the surface of the ground.

(2) Six root stumps have been insufficiently grinded

107 I next consider the extent to which this has been done. I reiterate that Terrenus bears the burden of proving the extent of non-compliance (above at [32]). Mr Puddan's "Root Ball Survey Report" identified 178 "root balls" at the Project site. Mr Puddan testified that in excavating the ground in search of "root balls", he dug around 50–100mm into the ground.[168] Terrenus relies on this to support its alternative position that there are 178 "root balls" which were not grubbed or grinded to a depth of 150–200mm.[169]

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167 NE, 1 August 2023, at 75, lines 10–21.

168 NE, 31 July 2023, at 116, lines 8–9.

169 Plaintiff's Closing Submissions dated 14 September 2023 at paras 122–123.

108 However, I find that Mr Puddan's evidence was unreliable in this aspect. First, Mr Puddan testified that he did not dig for all the locations,[170] nor did he state how many locations he did not dig at. The "Root Ball Survey Report" did not identify which locations required digging, and to what depth. Second, I agree with Attika's submission that Mr Puddan had carried out his survey on the basis of Terrenus's original position, that all the "root balls" must be completely removed through *grubbing*. His instructions from Terrenus had been to determine if there were any existing "root balls", and not whether roots had been grinded to 150–200mm below ground.[171] This is also clear from the recommendations and summary of his "Root Ball Survey Report". He states there that it is essential to completely remove the "root balls" and that based on his survey, 178 root balls are still intact and "un-grubbed". His recommendation was "to remove all the existing rootballs completely (grubbing) from the site".[172] It is clear that Mr Puddan did not survey if the roots had been grinded to below 150–200mm. Nor did he set out in the "Root Ball Survey Report" how many of the 178 "root balls" identified were grinded to below 150–200mm. Terrenus's Mr Zhang testified that he could not tell the depth of excavation based only on Mr Puddan's photographs.[173]

109 On the other hand, Mr Santhakumar, who supervised the tree removal works, testified that all the roots had been grinded to at least 150–200mm, except for around five or six.[174] Mr Santhakumar also claimed to have witnessed

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170 NE, 31 July 2023, at 111, lines 9–10.

171 Affidavit of Evidence-in-Chief of Marimuthu Puddan dated 13 May 2023 at para 7.

172 Affidavit of Evidence-in-Chief of Marimuthu Puddan dated 13 May 2023 at 60–61.

173 NE, 27 July 2023, at 76, lines 23–32.

174 NE, 3 August 2023, at 38, line 8.

Mr Puddan's workers carrying out the "root ball" survey. On Mr Santhakumar's estimate, Mr Puddan's excavation went to a depth *below* 150mm.[175] However, Mr Santhakumar also admitted that he did not check each tree individually as they were being removed.[176]

110 Mr Goh, Attika's expert arborist, gave evidence in his report that there were 43 tree stumps that are above or on ground level or near fences, and that in his view, these should be removed, along with the live trees.[177] I accept Attika's submission that this opinion cannot be relied on because Mr Goh acknowledged that this count was based *only* on his perusal of Mr Puddan's photographs.[178] I have found Mr Puddan's report to be unreliable. I prefer Mr Goh's testimony, where he said that he had personally found six stumps that were above the surface of the ground during his onsite inspection.[179] This is similar to Mr Santhakumar's evidence that five or six roots had not been sufficiently grinded. Mr Goh also testified that although he did not check all 266 locations, he generally found it difficult to locate the tree roots.[180]

111 Finally, Terrenus submits that Attika's Mr Tan had accepted that there are 43 "root balls" to be removed, albeit by way of grinding down to a depth of 150–200mm.[181] After considering Mr Tan's testimony, I do not consider it safe to regard what Mr Tan said as a concession. When he was referred to Mr Goh's

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175 NE, 3 August 2023, at 48, line 8, to 49, line 31.

176 NE, 3 August 2023, at 23, lines 5–29.

177 Affidavit of Evidence-in-Chief of Goh Mia Chun dated 24 April 2023 at 25.

178 NE, 1 August 2023, at 7, lines 22–24.

179 NE, 1 August 2023, at 8 line 13.

180 NE, 1 August 2023, at 6, line 20, to 7, line 15.

181 Plaintiff's Closing Submissions dated 14 September 2023 at para 118.

report and asked if he accepted that there are 43 root stumps that still needs to be removed, he replied that he "would accept that it needs to grind it down 150 to 200mm [*sic*]".[182] This appears to be an acknowledgement of the methodology of grinding, rather than an acknowledgement that there are 43 roots to be removed.

112 Terrenus bears the burden of proving the extent to which Attika failed to grind roots to the depth of at least 150mm. Examining the evidence as a whole, I find on balance that the number of roots that were not grinded to a depth of at least 150mm, based on the evidence of Mr Santhakumar and Mr Goh, is around six. I hence find that there are six roots that were insufficiently grinded.

(3) Diminution in value

113 Accordingly, I find that there should be a diminution in value for the six roots. Terrenus relies on Mr Goh's estimate of $500 per "root ball" or alternatively on the unchallenged evidence of its quantum expert, Mr See, who testified that the average removal cost based on four quotations is $152 per "root ball". Attika relies on the evidence of Mr Zhang, who testified that Terrenus received a quotation for the removal of "root balls" at $30 per "root ball".[183]

114 I found that amongst the figures given, Mr See's figures were the most reliable. Mr Goh did not explain the basis for his figure. Mr Zhang's figure was based on single quotation. In contrast, Mr See's figure is based an average of

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182 NE, 10 August 2023, at 77, lines 9–18; see also NE, 8 August 2023, at 12, lines 25–29.

183 NE, 27 July 2023, at 80, lines 25–28.

four quotations. He was presented by Terrenus as its quantum expert, and Attika chose not to cross-examine him. His evidence was thus unchallenged by Attika. I consequently award Terrenus damages in the form of diminution in value of $912 (6 x $152) for the insufficient grinding of six roots. This is an insignificant amount compared to the value of the tree removal works, which was $420,000 under the Contract. Attika is also to remove the four live trees identified, as undertaken by Attika during the hearing.

Summary of Defects

115 In summary, I find that Terrenus has in substance failed to make out its case that Attika delivered works with substantial defects:

(a) first, although Terrenus has established that a *non-zero* amount of PEG Rods were non-compliant with the contractually stipulated minimum embedment depth of 500mm, Terrenus failed to discharge its burden of proving both: (i) the *extent* of such non-compliance; and (ii) that the non-compliance *caused* any increased structural risks. Terrenus is awarded only nominal damages of $1,500;

(b) second, although Terrenus has established that a *non-zero* amount of solar panels were non-compliant with the designed clearance height of 700mm, Terrenus failed to discharge its burden of proving both: (i) the *extent* of such non-compliance; and (ii) that the non-compliance *caused* any loss in respect of which Terrenus can claim substantial damages. Terrenus is awarded only nominal damages of $1,500; and

(c) third, Terrenus has failed to establish that Clause 5.2.1 required Attika to remove all roots by grubbing and has only established that six

roots have been insufficiently grinded to a depth of at least 150mm. Terrenus is awarded damages for diminution in value of $912.

When was Partial Completion achieved and when were the Works completed

116 The second main issue is when Partial Completion was achieved and when were Attika's Works completed. The MBA sets out two material dates. The first date is for "Partial Completion" (the "Date of Partial Completion"). This was set at 30 June 2021, pursuant to cl 5.6.1 of the MBA read with cl 1.3.12, which provide:

> 1.3.12. "Partial Completion" means the time for *completion* of part of the Works to *commission and energize at least 70% of the [Solar Farm]* on or before *30 June 2021*, prior to the Date of Completion.
>
> 5.6.1. In addition to Clause 5.5 above, [Attika] shall also meet the requirements for Partial Completion.
>
> [emphasis added]

117 The second date is the "Date of Completion". As stated at the outset, this was stipulated in the Appendix to the MBA as 31 July 2021 (above at [5]). Pursuant to cl 5.5.1, Attika was obliged to complete the Works expeditiously by the Date of Completion. As set out in cl 1.3.5, this Date of Completion was *subject to* such EOTs as Attika may be allowed under the Contract. Clauses 5.5.4, 17.1.1, and 17.1.3 provide:

> 5.5.4. [Attika] shall submit a formal request for an extension of time in writing addressed to [Terrenus] specifying the additional time required, the reason for the request and other supporting documents to substantiate the request.
>
> …
>
> 17.1.1. The Parties hereby agree if [Attika] fail[s] to achieve *completion* within the time prescribed by Clause 5.5.1

> and/or Clause 5.6.1 hereof, *or such extended time as may be allowed under the Clause 5.5.4* hereof, then [Attika] shall pay to [Terrenus] the amount specified hereunder and shall be construed as a reasonable estimate of losses/damages suffered by [Terrenus].
>
> …
>
> 17.1.3. For the avoidance of doubt, if [Attika] shall have failed to complete the Works or any phase or part of the Works by the date of Partial Completion and/or Date of Completion, [Terrenus's] right to liquidated damages shall not be affected thereby but, subject to compliance by [Attika] with Clause 5.5.3, the Employer Rep shall grant an extension of time pursuant to Clause 5.5.4. Such extension of time shall be added to the Revised Date of Completion of the Works (or of the relevant phase or part).
>
> [emphasis added]

The Date of Partial Completion and Date of Completion are therefore relevant to the fourth main issue, which is Attika's liability for liquidated damages under cl 17. If Attika did not complete its Works by the Date of Partial Completion or Date of Completion, Attika will be liable for liquidated damages. Two sub-issues arise:

(a) first, when was Partial Completion achieved; and

(b) second, when did Attika "complete the Works".

When was Partial Completion achieved

Parties' cases

118 Terrenus submits that "commission and energize" under cl 1.3.12 of the MBA requires the Project to be connected to the national electric grid and *for*

electricity to be sold.[184] Terrenus submits that it cannot be disputed that the relevant documents are the Commissioning of Photo-voltaic Systems ("COPS") documents issued for the Substations, as Attika's Mr Tan conceded that the COPS documents show when commissioning took place.[185] The COPS documents certify that the Photovoltaic (PV) System and Installation have been inspected and tested in accordance with "SS CP5". SS CP5 is the previous iteration of SS 638:2018 ("SS 638"). Compliance with SS 638:2018, which is the "Code of practice for electrical installations", is contractually required pursuant to cl 1.2.3 of Annex A Part VI of the MBA.

119 There are two sets of COPS documents. In both sets, the COPS for Substation 2 was dated 23 November 2021. However, in respect of Substation 1, one of the COPS documents is dated 17 November 2021, whereas the other is dated 25 November 2021.[186] While all four COPS documents are signed by the Licensed Electrical Workers ("LEWs"), the COPS for Substation 1 dated 17 November 2021 is signed by an officer from SP PowerGrid Ltd ("SPPG").[187]

120 Terrenus submits that the COPS dated 17 November 2021 is not the correct document, as that document predates the power quality management test ("PQ Test"). Compliance with para 712.55L of the SS 638 / SS CP5 requires the PQ Test to be carried out to detect and "avoid adverse effects to the public supply system and to other installations".[188] Mr Bong testified that the LEWs had signed the COPS for Substation 1 on 17 November 2021 by mistake as they

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184 Plaintiff's Closing Submissions dated 14 September 2023 at para 133.

185 Plaintiff's Closing Submissions dated 14 September 2023 at para 135.

186 Affidavit of Evidence-in-Chief of Bong Eng Yueh dated 13 May 2023 at 283–284.

187 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at 7719.

188 2PCB at 148 (712.551L).

had forgotten about the requirement for the PQ Test. The SPPG officer had also been asked to sign the COPS when it was unnecessary. The LEWs realised their mistake after the PQ Test had been completed, and thereafter issued the correct COPS for Substation 1 on 25 November 2021.[189] Terrenus thus submits that Partial Completion was achieved on 25 November 2021, being the latest of the two dates that the Substations were commissioned and energised. Terrenus does not pursue damages beyond 25 November 2021.

121 Attika submits that "energize" under cl 1.3.12 of the MBA refers to the energisation of the Solar Farm and not the supply and sale of electricity to SPPG for the national grid. The tests mentioned in the MBA in respect of commissioning are localised tests. They make no mention of SPPG. Consequently, Attika submits that the commissioning culminated in the issuance of the Statement of Turn-On of Electricity ("SOTO") for Substation 2 on 15 November 2021 and for Substation 1 on 17 November 2021.[190] Partial Completion was therefore achieved on 17 November 2021. Furthermore, Attika contends that Mr Tan did not concede that the commissioning for Substation 2 took place on 23 November 2021 or concede that the COPS were the relevant documents. He only confirmed the words stated in the COPS. Attika also says that Terrenus did not introduce evidence on the operation of para 712.55L of SS 638 during the trial nor put it to any of Attika's witnesses and Terrenus should not be allowed to now submit on it.

122 Attika submits that if the COPS documents were to be used, then the COPS for Substation 1 dated 17 November 2021 should be used instead of the

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189 NE, 31 July 2023, at 5.

190 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at 1063 and 1065.

COPS for Substation 1 date 25 November 2021. The latest date that Partial Completion would have been achieved would then be 23 November 2021, being the date of the COPS for Substation 2.[191]

Decision

123 Clause 1.3.12 of the MBA requires the Works to be sufficiently completed by 30 June 2021 so as to "commission and energize" at least 70% of the Solar Farm. Each Substation energises 50% of the Solar Farm. Both Substations must therefore be commissioned and energised to reach at least 70% of the Solar Farm and for Partial Completion to be achieved.[192]

124 I agree with Attika that the plain words of the relevant clauses of the MBA do not require power to the *sold* to SPPG, before the Works are regarded as commissioned and energised.

125 At the same time, cl 1.2.3 of Annex A Part VI of the MBA states that Attika shall "test" and perform "commissioning" according to the requirements set out by Terrenus's consultant. Further, that the scope of works shall comply with SS 638. The COPS document requires SPPG and the LEW to certify that the Substations have been "inspected and tested by me in accordance [with the] SS CP5 and relevant Singapore Regulations". Attika did not dispute that SS 638 is the replacement code for SS CP5.

126 It is thus apparent on the face of the COPS documents that the testing of the PV system is for compliance with SS CP5 / SS 638. It is hence part of what

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191 Defendant's Closing Submissions dated 14 September 2023 at para 143.

192 NE, 25 July 2023, at 59, lines 13–21; NE, 24 October 2023, at 14–16.

Attika is required to test and commission under cl 1.2.3 of Annex A Part VI of the MBA. Attika objects that Terrenus did not introduce or put para 712.55L of SS 638 to any of Attika's witnesses. This was not necessary. The MBA and the COPS documents were adduced, and they are clear on their face that the COPS is part of the testing and commissioning requirements that Attika must undertake under the MBA. The COPS documents and SS CP5 / SS 638 were shown to Mr Tan and it was put to him that they show when the Substations were commissioned.[193]

127 I find that the COPS documents show the date that commissioning was achieved. Consequently, the sole remaining issue is which of the COPS documents for Substation 1 should be accepted as the accurate date.

128 Attika relies on the COPS for Substation 1 that was signed off on 17 November 2021. This was a hardcopy document that was physically signed by both the SPPG officer and the LEWs.[194] Terrenus relies on the COPS signed on 25 November 2021. As mentioned, this COPS document was not signed off by a SPPG officer. Mr Bong's testimony that the LEW had made a mistake and that the SPPG officer was not required to sign the COPS was a bare assertion; he was not in a position to speak for them, and they were not called to testify. There is no reliable evidence refuting that they signed off on the COPS for Substation 1 on 17 November 2021.

129 I hence regard the COPS document signed on 17 November 2021 as the accurate reflection of when Substation 1 was commissioned and energised.

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193 NE, 7 August 2023, at 52, lines 18-32, and 55–57; NE, 10 August 2023, at 37.

194 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at 1073.

Since both parties accept that the COPS for SS2 was signed on 23 November 2021, this was the date when at least 70% of the Solar Farm was commissioned and energised. I hence find that Partial Completion was achieved on 23 November 2021. As both Substations were commissioned and energised, the entire Solar Farm was also commissioned and energised on this date.

When did Attika complete the Works

Parties' cases

130 Terrenus's case is that Attika had not completed its Works because of the three substantial defects that it claims for, being Attika's failure to (a) ensure that the PEG Rods achieved a minimum embedment depth of 500mm; (b) provide for 700mm ground clearance for the solar panels; and (c) comply with the requirements of Clause 5.2.1.[195]

131 Attika submits that in the absence of a contractual definition for completion, reference should be made to the common law doctrine of substantial completion (or substantial performance). If the Works meet the objective of the contract and can be usefully occupied for their intended purpose, then they can be considered as completed, notwithstanding minor outstanding works and defects.

Decision

132 As set out above, I have found that the Solar Farm was energised and commissioned by 23 November 2021 (above at [129]). I have also found that Terrenus has failed to prove its case that any of the three defects it claims for

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195 Plaintiff's Closing Submissions dated 14 September 2023 at paras 9(b) and 151.

were substantial (above at [71], [87], and [114]). Terrenus repeatedly confirmed that aside from the three supposedly substantial defects, Attika's Works were completed.[196] As Terrenus has not proven that there were substantial defects, such that Attika's Works could not be considered completed, I therefore find that Attika completed its Works on 23 November 2021.

Whether Attika is entitled to extensions of time

133 The third main issue is whether Attika is entitled to EOTs, and if so, how many days of EOT. As stated at the outset, Terrenus did not grant any EOTs pursuant to cl 5.5.5 of the MBA, despite several requests from Attika under cl 5.5.4. The parties agree that in S 173, Attika's entitlement to EOT arises from cl 5.5.7, which provides that:

> 5.5.7. In the case of delay on the part of the Employer, the Contractor, to the extent that such delay results in the extension of the Contractor's Works beyond the Date of Completion of this Agreement, shall be entitled to an extension of time for only the extended time attributed to the delay caused by the Employer.

134 Terrenus called Mr Sezgin Ozbilgin ("Mr Ozbilgin") as its delay expert while Attika called Mr Chan Fook Thim ("Mr Chan") as its delay expert. During the Joint Conference of Delay Experts at the trial, both experts provided their assessment of whether there was critical delay at four time periods, which are referred to as "Windows".

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196 NE, 25 July 2023, at 65, lines 31–32, and 99, lines 4–8; NE, 26 July 2023, at 88, lines 16–19; NE, 27 July 2023, at 44, lines 9–11 and 21–22; NE, 7 August 2023, at 73, lines 14–17; NE, 10 August 2023, at 113, lines 13–30.

Window 1: Delay in procuring NParks's approval

135 The first Window is from 14 April 2021 to 3 May 2021. Both Mr Ozbilgin and Terrenus accept that the critical path during this Window runs through NParks's approval for tree removal works.[197] NParks's approval for tree removal was obtained on 3 May 2021.

Parties' cases

136 Terrenus submits that pursuant to cl 15 of the MBA, Attika bears the risk of any delays in obtaining approvals from the public authorities, which includes NParks. Clause 15 provides:

> 15.1.1. [Attika] shall ensure that the Works to be performed under the Agreement are performed in full compliance with all relevant legislation and all subsidiary legislation made thereunder.
>
> 15.1.2. [Attika] shall be wholly responsible for compliance with the requirements of any law, regulation, by-law, or public authority as stipulated in Clause 15.1.1.

Terrenus thus submits that as NParks is a public authority and Attika must be "wholly responsible", delays by NParks are *prima facie* at Attika's risk.[198]

137 Annex B of the MBA is titled "Schedule Division of Work" and sets out who is the "Responsible Party" for each item of the Works, being either Terrenus, Attika, or "Other/Consultant". Item 4 in Part B of Annex B identifies "Other/Consultant" as the party responsible for "Submission and approval to technical agencies and SPPG" ("Item B4"). The relevant consultant is PEC.

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197 Plaintiff's Closing Submissions dated 14 September 2023 at para 155 (Window 1); NE, 27 July 2023, at 24, lines 25–26.

198 Plaintiff's Closing Submissions dated 14 September 2023 at para 164.

Terrenus submits that Annex B does not apply to NParks, as Attika has not shown that NParks is a "technical agency".[199]

138 In any event, Terrenus submits that the period of delay should only be from 15 April 2021 to 3 May 2021 (18 days), with 15 April 2021 being the date Attika planned to start, and 3 May 2021 being the actual date of NParks's approval.[200] Essentially, Attika should have started immediately on approval.

139 Attika submits that it was not responsible for procuring NParks's approval. No provision in the MBA required Attika to apply for such approval. The application was in fact made by PEC on 24 February 2021, prior to the parties' entry into the Contract. It is illogical for the risk to fall on Attika for any late or defective submission by PEC. Item B4 allocates responsibility to PEC, and cl 15 of the MBA only requires that *works carried out* by Attika comply with the requirements of public authorities. Clause 15 is therefore irrelevant to who bears responsibility for delays in approval by public authorities. Following the responsibility matrix in Item B4, Terrenus undertook the risk of any late submission to or approval by a public authority.[201]

140 Attika submits that the delay was from 14 April 2021 to 3 May 2021 (19 days). Works were planned to start on 15 April 2021. It can only be reasonable to start on the day following NParks's approval. Attika would need to inform the tree removal subcontractor and organise resources. As Terrenus's Mr Zhang

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199 Plaintiff's Reply Submissions dated 29 September 2023 at para 80.

200 Plaintiff's Closing Submissions dated 14 September 2023 at para 165.

201 Defendant's Closing Submissions dated 14 September 2023 at paras 182–186.

had accepted that a day to mobilise after receipt of NParks's approval is reasonable, Attika should be entitled to 19 days of EOT in Window 1.[202]

Decision

141 Two sub-issues arise. First, whether Attika bears the risk of NParks's delay in granting approval. Second, if Attika is entitled to EOT, whether the number of days of EOT should include a day for Attika to mobilise its sub-contractors after NParks's approval had been obtained.

142 On the first sub-issue, I find no merit to Terrenus's submission that Attika bears the risk of delay in obtaining NParks's approval to start tree removal works. Clause 15 of the MBA only requires that the works carried out by Attika comply with the requirements of public authorities. It does not state that Attika bears the risk of delay in obtaining approvals by the authorities. Item B4 clearly provides that Terrenus's consultant, PEC, is responsible for "submission *and approval*" [emphasis added]. Factually, PEC made the application to NParks before the MBA was even concluded.[203] I also reject Terrenus's submission that Attika has not proven that NParks is a "technical agency". The undisputed evidence is that NParks did impose requirements and it is one of the agencies from whom approval for CSC must be obtained. In my view, it is clear that NParks is a "technical agency" within the meaning of Item B4. Following from this, it is Terrenus (through its consultant PEC) and not Attika, that bears the risk of any late submission or delayed approval from NParks.

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202 Defendant's Closing Submissions dated 14 September 2023 at paras 187–190.

203 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at paras 442–443; ACB at 1599.

143 In respect of the second sub-issue, Terrenus's Mr Zhang had testified that it would be reasonable for Attika to start work one day after NPark's approval.[204] I am of the same view. One day is a reasonable amount of time to mobilize resources and organise the work. I therefore find that the delay in NParks's approval for removal of trees was 19 days. As this is attributable to Terrenus, Attika is entitled to an EOT of 19 days.

Mr Ozbilgin's analytical approach to Windows 2 to 4

144 As Mr Ozbilgin applied the same analytical approach to Windows 2 to 4, I will provide my general assessment of his approach here. Mr Ozbilgin's analysis draws on his assessment of the percentage of works that should have been completed by Attika at certain dates, based on a linear distribution of planned progress derived from the Master Programme ("MP"). If the actual activity does not match this linear progression, he considers there to be a delay. He calculates the number of days of delay from the date given in the MP for completing that activity and considers the activity with the *greater number of delay days* as the critical path delay event.

145 Attika makes several criticisms of Mr Ozbilgin's analysis.

146 First, it submits that Mr Ozbilgin's approach is flawed as he relies on SolarGy's progress reports and a spreadsheet titled "SL2_Estimation of Site Progress (before Turn On)_R2" ("SL2 Estimation"). The information in SolarGy's progress reports and the blue-coloured parts of the SL2 Estimation were allegedly obtained from SolarGy. Since nobody from SolarGy was called by Terrenus to testify as a witness, Mr Ozbilgin's analysis is based on

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[204] NE, 27 July 2023, at 24, lines 28–32.

inadmissible hearsay. The SL2 Estimation is also inaccurate in so far as it "prorate(s) progress data" in order to hypothesise Attika's progress for certain activities. The sources of Mr Ozbilgin's analysis are hence inadmissible and inaccurate.[205] Terrenus's response is that Mr Ozbilgin only relied on the SL2 Estimation on three occasions. They do not affect the core of his evidence.[206]

147 Second, Attika submits that Mr Ozbilgin's analysis, which is premised on a linear progression of work is flawed, for several reasons.[207]

(a) First, there is no evidence that the progress of works within the MP are to be linearly distributed at a uniform rate of progress per day.

(b) Second, Mr Ozbilgin posits that Attika had applied the "default setting" of linear progress in the MP. This is a baseless assumption because he admitted that he had never seen the native file of the MP. In any event, any such default setting would have just been a *programming* setting. There is no basis for it to be applied in assessing *actual* critical delay for a project. The MP only set out *planned* start and finish dates for the various work activities. Attika had the discretion to speed up or pace it works as necessary according to the actual site conditions.

(c) Third, theoretical percentages within the linear distribution cannot be used to measure actual delay, since the progress of works does not necessarily track a linear progression. Mr Chan opined that Mr Ozbilgin had wrongly assumed that there must only be equal and

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205 Defendant's Closing Submissions dated 14 September 2023 at paras 168–174.

206 Plaintiff's Reply Submissions dated 29 September 2023 at para 74.

207 Defendant's Closing Submissions dated 14 September 2023 at paras 176–179.

> uniform progress throughout the whole duration of the planned period, when this is not the case in reality. Progress can intensify and accelerate.[208] A contractor may catch up on his works within the planned period, thus leading to no critical delay if the end date is accomplished. Mr Chan's approach was to compare the planned start and planned finish. He did not consider it appropriate to compare percentages. He cited the Society of Construction Law Delay and Disruption Protocol ("SCL Protocol"), which both experts agreed should be referenced. This states that the incidence and extent of critical delay in each window is "determined by comparing key dates along contemporaneous or actual critical path against corresponding planned dates in the baseline".[209] There is no reference to any theoretical *linearly* distributed percentage of progress within the period given for a particular activity.

148 I find Mr Ozbilgin's analysis to be far less logical and cogent compared to Mr Chan's. First, there is no logical basis for Mr Ozbilgin's approach to determining when there is delay. Mr Ozbilgin's analysis presumes that works progress according to a linear distribution, in terms of percentages, derived from Attika's MP. I agree with Mr Chan that Mr Ozbilgin has provided no basis for this approach. Indeed, Terrenus *concedes* that Mr Ozbilgin's critical path and delaying events *wrongly assume* a linear distribution of planning progress and that it is based on a programming perspective.[210] Mr Ozbilgin's analysis assumed a strong logic linkage between certain work events. He stated that the software that Attika used to produce the MP *could* contain such logic linkage

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208 Joint Expert Statement No 2 dated 19 May 2023 (Mr Ozbilgin and Mr Chan) at 4–5.

209 Joint Expert Statement No 2 dated 19 May 2023 (Mr Ozbilgin and Mr Chan) at 39.

210 Plaintiff's Reply Submissions dated 29 September 2023 at para 75.

and that Attika must have included it in the MP. However, he also accepted that he had not actually seen this, since he only had access to the hardcopy of the MP and not the software.[211]

149 Second, I do not find a logical basis for Mr Ozbilgin's approach to determining when there would be a critical path delay event. Mr Ozbilgin considers the event with the greatest number of delay days as the critical path event. This would mean that as between two selected activities, the earlier scheduled activity would *invariably* be deemed the critical path event, since the earlier scheduled activity would naturally accumulate more delay days than a later scheduled activity.[212] However, this does not actually inquire into which activity *caused critical delay*. It fails to consider if the earlier scheduled item could not have started on time due to reasons that are not attributable to the contractor, or if there were other activities which caused the critical delay. It does not consider if work progressed sufficiently to catch up on the earlier activity. I therefore find that Mr Ozbilgin's evidence has little probative value.

150 Terrenus submitted that Mr Ozbilgin's approach of using the greatest number of delay days as the critical path event is justified by Mr Chan's definition of critical path, as the "longest sequence of activities through a project network, from start to finish, the sum of whose duration determines the overall project duration, is one of the critical paths of the project network".[213] However, this merely references the "longest sequence of activities through a project network". This in and of itself *does not* mean that critical delay is to be assessed

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211 NE, 4 August 2023, at 172, lines 21–23.

212 NE, 4 August 2023, at 141, lines 14–18.

213 Plaintiff's Reply Submissions dated 17 October 2023 at para 36.

simply on the basis of an earlier scheduled activity that gives a greater number of delay days on a programming perspective. Moreover, Mr Chan had provided an explanation of why Mr Ozbilgin's analysis was wrong, and this line was never put to Mr Chan for his views. Similarly, I find Terrenus's reliance on a line at para 13.1 of the SCL Protocol to be misplaced. This states that an employer's delay should not result in an EOT unless it is "predicted to delay the activities on the longest path to completion".[214] This, in and of itself, does not support Mr Ozbilgin's approach. This line was also never put to Mr Chan.

151 As I will elaborate below, these flaws in Mr Ozbilgin's analysis affects the probative value of his evidence for Windows 2 to 4 and consequently undermines Terrenus's case. The evidence relevant to these Windows also highlight the flaws with Mr Ozbilgin's analysis. For completeness, Attika submits that as Mr Ozbilgin had previously been hired by Terrenus when the Project was ongoing, and had admitted to this during cross-examination,[215] he is biased and his evidence should not be relied on. Terrenus denied the allegation of bias but did not deny that Mr Ozbilgin had been hired while the Project was ongoing. There are authorities that state that greater scrutiny should be accorded to the evidence of an expert who was previously engaged by one of the parties, and that the weight of such evidence should be limited: *Vita Health Laboratories Pte Ltd and others v Pang Seng Meng* [2004] 4 SLR(R) 162 (at [85]) and *Kaufman, Gregory Laurence and others v Datacraft Asia Ltd and another* [2005] SGHC 174 (at [33]). Nevertheless, I state that I arrived at my

214 Plaintiff's Reply Submissions dated 17 October 2023 at para 36.

215 NE, 26 July 2023, at 103, lines 6–12.

assessment on the lack of logic and coherence in Mr Ozbilgin's analysis, even without applying any greater standard of scrutiny.

Window 2: Delay in delivery of solar panels for Ground Mount facility

152 Window 2 covers the period from 10 May 2021 to 21 June 2021. The PEG mounting structures for the solar arrays have to be installed before solar panels may be mounted. Mr Chan opined that the *delivery* of solar panels by Terrenus was on the critical path during this window. Mr Ozbilgin's view was that it was the *installation* of the PEG mounting structures by Attika that was on the critical path.

153 A delivery schedule provided to Attika as part of the tender documents stated that delivery of the solar panels to the Port of Singapore would commence on 7 May 2021. It is common ground that the solar panels were actually delivered to the Project site from 19 June 2021 onwards.[216]

Parties' cases

154 Terrenus accepts that it is responsible for the supply of solar panels but highlights that there is no contractual obligation for it to provide solar panels any earlier than 19 June 2021.[217] Terrenus submits that it had intentionally pushed back the delivery of the solar panels to the Project site as it had observed that the installation of the PEG mounting structures had been going slowly, and it did not want solar panels to be at risk of loss or damage.[218]

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216 NE, 31 July 2021, at 42, lines 22–28.

217 Plaintiff's Reply Submissions dated 29 September 2023 at para 81.

218 Plaintiff's Closing Submissions dated 14 September 2023 at para 173.

155 Mr Ozbilgin opined that what was planned by Attika was for a work front of substantial number (13%) of PEG mounting structures to be installed *before* the solar panels were installed. Without this buffer, the available PEG mounting structures would quickly run out. Mr Ozbilgin formed this opinion from his linear distribution of work analysis. Up to 30 May 2021, there were no complete mounting structures ready for installation of solar panels. The data showed that the mounting plates for the PEG structures were installed first, and the top and base plates installed later, and that the installation of solar panels only started in the week of 28 June 2021, when the solar panels had been delivered on 19 June 2021. Terrenus submits that this shows that Attika was in no position to install the solar panels even if they had been delivered earlier. The delivery of the solar panels was hence not on the critical path.

156 Attika highlights that under the delivery schedule provided by Terrenus as part of the tender documents, Terrenus represented that the solar panels would be delivered to the Port of Singapore in five batches from 7 May 2021 to 31 May 2021.[219] This led Attika to plan in the MP for installation to commence on 10 May 2021. Instead, the solar panels were delivered to Singapore in three batches, with the first batch shipped around 16 June 2021, and Attika receiving it on site only around 19 June 2021. As the delivery of solar panels had been delayed, Attika could only install PEG mounting structures in limited areas prior to the delivery of solar panels. This is because the installation of *all* the PEG mounting structures *before* affixing solar panels would obstruct the carriage of solar panels to their mounts. When the solar panels are delivered, they would be hoisted onto site in their containers by mobile cranes. Excavators would then be used to carry the stacks of solar panels to their mounting structures. If PEG Rods

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219 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at 6184.

are already installed this would hinder access and carriage of the panels to the PEG mounting structures.[220]

157 Attika submits that it was the delay in delivery of the solar panels that caused critical delay. Prior to the delivery of the solar panels, Attika had installed a substantial number of PEG mounting structures, and was more than ready to receive the undelivered solar panels. After receiving the first batch of solar panels on 19 June 2021, Attika was able to commence installation on 21 June 2021. Attika submits that Terrenus's claim that delivery had been slowed to match Attika's slow installation of PEG mounting structures is disingenuous. In fact, Terrenus informed Attika as early as 23 May 2021 that the delivery of solar panels to the Port of Singapore would be delayed from 7 May 2021 to 17 June 2021.[221] Terrenus did not indicate that this was on account of Attika's slow work, and there is no evidence that Terrenus ever complained about the alleged slow progress in the installation of PEG mounting structures. It was Attika that had to pace its works to align with the delayed delivery of solar panels.

158 Attika submits that there is no basis for Mr Ozbilgin's assumption that there had to be a 13% work front requirement for PEG mounting structure installation throughout the period. Mr Chan observed that this assumption was not contemplated by parties when the MP was submitted and is not based on the planned sequence of works. It has no bearing on actual delays. Terrenus's reliance on the progression of the installation of the base and top plates of the PEG mounting structures is also flawed. Mr Tan testified that these plates were very simple to install. They were mostly done concurrently with the installation

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220 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at paras 492–495.

221 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at 6050, 6073, and 6206.

of the solar panels. There was no need for them to be installed beforehand, to await the installation of solar panels. His testimony is consistent with Attika's progress report, which showed that once the solar panels were delivered, the base and top plates were almost immediately installed.

159 Attika submits that Terrenus's delayed delivery of the solar panels is more critical than any delay in PEG mounting structure installation works. This was because installation of PEG mounting structures had always been well ahead of the solar panel installation works. Mr Chan's expert evidence comparing the progress of installation for PEG mounting structures (blue) and solar panel installation (red) demonstrates this.[222]

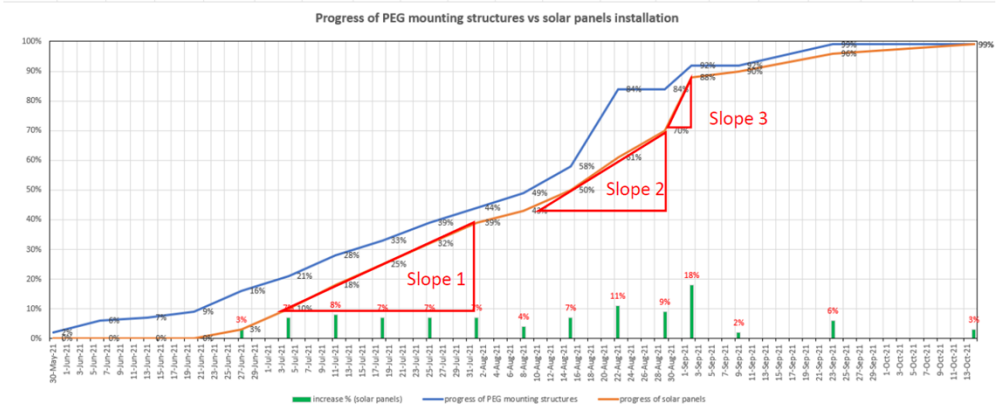

Fig. 3.2 – Rate of solar panel installation continue to increase without being restrained by the purported work front availability of 13% between PEG mounting structures and solar panel installation (comparing slopes 2 and 3 against slope 1) which diminish gradually

As of	27-Jun-21	4-Jul-21	11-Jul-21	18-Jul-21	25-Jul-21	1-Aug-21	8-Aug-21	15-Aug-21	22-Aug-21	29-Aug-21	2-Sep-21	9-Sep-21	23-Sep-21
progress of PEG mounting structures	16%	21%	28%	33%	39%	44%	49%	58%	84%	84%	92%	92%	99%
progress of solar panels	3%	10%	18%	25%	32%	39%	43%	50%	61%	70%	88%	90%	96%
Diff in % of progress (workfront)	13%	11%	10%	8%	7%	5%	6%	8%	23%	14%	4%	2%	3%
increase % (PEG mounting structures)	8%	5%	7%	5%	6%	5%	5%	9%	26%	0%	8%	0%	7%
increase % (solar panels)	3%	7%	8%	7%	7%	7%	4%	7%	11%	9%	18%	2%	6%

Fig. 3.3 – Continuous increase in rate of solar panel installation unaffected by the diminishing available work front post 1 August 2021

222 Joint Expert Statement No 2 dated 19 May 2023 (Mr Ozbilgin and Mr Chan) at 63.

160 Attika submits that the actual amount of delay caused by Terrenus's delayed delivery of solar panels was 40 days, *ie*, from 10 May 2021 (the planned start date of solar panel installation) to 19 June 2021 (the actual date of delivery of the solar panels). The critical delay attributable to this delaying event is 21 days (*ie*, 40 days less 19 days), after factoring in the delay of 19 days caused by the late procurement of NParks's approval in Window 1.[223]

Decision

161 I first consider Terrenus's submission that it intentionally delayed the delivery of the solar panels because Attika was late in installing the PEG mounting structures and Terrenus did not want to risk damaging the solar panels by delivering them before they were ready for installation.

162 Terrenus emphasises that it was not under any contractual obligation to deliver solar panels on 10 May 2021 or before the PEG mounting structures were installed in the week of 24 to 30 May 2021. In my view, this does not assist Terrenus. Clause 5.5.7 of the MBA states that Attika is entitled to EOTs for extended time "*attributed to* the delay caused by [Terrenus]" [emphasis added]. Hence, the issue is not whether there was a contractual breach, but whether the delay was *attributable to* Terrenus's delay in the delivery of the solar panels.

163 The evidence does not bear out Terrenus's submission that it delayed the solar panel delivery because Attika was slow in installing the PEG mounting structures. By 4 June 2021, prior to the delivery of the first batch of solar panels, Attika had already installed over 1,300 PEG Rods in Plot A and B of the Solar

223 Defendant's Closing Submissions dated 14 September 2023 at paras 191–203.

Farm.[224] This supports Attika's case that it was waiting for the solar panels to arrive. Mr Bong's assertion that Attika would not have been able to install even more PEG Rods between 4 June 2021 and 19 June 2021 was not credible. On his own account, no PEG Rods had been installed on 23 May 2021, meaning that Attika had installed over 1,300 PEG Rods in a shorter amount of time.[225] There is also no contemporaneous evidence that Terrenus had slowed down delivery of the solar panels on account of Attika's slow progress, as Terrenus did not inform Attika of this when it provided the updated delivery schedule.[226] Mr Bong also admits that Terrenus has *no evidence* of: (1) any of its purported communications with the solar panel supplier instructing them to delay delivery; (2) complaints that Attika's PEG Rods installation progress was slow; or (3) any indication that Attika was informed that the delivery would be delayed due to their slow progress.[227]

164 I next consider whether the delay of solar panel delivery panels by Terrenus, or the installation of the PEG mounting structures by Attika, was on the critical path during Window 2. The general difficulties that I have identified above with Mr Ozbilgin's analysis surfaces here. Mr Ozbilgin assumed that there was delay in PEG mounting structure installation because of his assumption that there *had* to be a 13% work front. However, there is no basis for such an assumption. The flaws with this assumption are starkly brought out by Mr Chan's analysis. He provided unchallenged analysis that at every stage from 27 June 2021 to 23 September 2021, the percentage of PEG mounting

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224 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at 732, 740 and 750; NE, 31 July 2023, at 43, lines 19–32, to 44, lines 1–7.

225 NE, 31 July 2023, at 44, lines 13–27, and 48, lines 28–31.

226 Exhibit D1 (filed 10 August 2023).

227 NE, 31 July 2023, at 46, lines 25–30, and 49, lines 5–12.

structure progress was ahead of the percentage of solar panel installation progress (above at [159]).[228] Mr Bong conceded that so long as the PEG Rods were installed, solar panel installation would not be held up.[229] This shows that the installation of the PEG mounting structures was *not* causing delay to the solar panel installation. Instead, the progress of the PEG mounting structures was affected by the delivery of the solar panels. I accept Mr Tan's evidence that not all of the PEG Rods could be installed before the solar panels were delivered, as it might obstruct the ability to deliver solar panels.[230]

165 On the whole, I find Mr Chan's evidence on this Window to be much more logical and coherent, and based on a more objective assessment of what actually transpired on the ground. Following from the above, I accept Mr Chan's evidence that it was Terrenus's delivery of the solar panels that was on the critical path, and Attika's submission that this led to a further 21 days of delay attributable to Terrenus. Attika is entitled to 21 days of EOT.

Window 3: Delay by Bulox in installation of the mobile substations

166 Window 3 covers the period from 12 July 2021 to 25 August 2021. Mr Chan opined that the critical path in Window 3 lay in the delay caused by Terrenus's subcontractor, Bulox, taking longer than planned to complete the installation of the Substations. Mr Ozbilgin opined that the greater number of delay days came from the installation of the inverters by Attika, and that this instead was on the critical path.

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228 Joint Expert Statement No 2 dated 19 May 2023 (Mr Ozbilgin and Mr Chan) at 63.

229 NE, 31 July 2023, at 37, lines 13–20.

230 NE, 10 August 2023, at 13, lines 16–22, at 14, lines 21–31, and 18, lines 21–26.

Parties' cases

167 Terrenus submits that the key dispute is whether Attika can prove that the Substation works were on the critical path and that the delay was caused by Bulox's slow installation of the Substations. Terrenus relies on what it considers to be a concession from Mr Chan during trial, where Mr Chan allegedly said that he was unable to tell whether the delay in the Substation works or inverter works were more critical, as he agreed that both were equally causative.[231] Terrenus then disagrees that both works were equally causative and submits that it was the slow installation of the inverters that was on the critical path. Attika only completed the mock-up for the inverter extension rack around 23 August 2021, instead of on 3 May 2021.[232] Terrenus also submits that any delay to the installation of the Substations was contributed to by Attika's refusal to "facilitate" Bulox's installation of the Substations despite demands from Terrenus. Terrenus submits that Attika was obliged to facilitate pursuant to cll 3.1.2 and 3.1.3 of Annex A Part III of the MBA.[233]

168 Terrenus submits that if I find that the critical path ran through the Substation installation works, then there should not be any EOT for the period of 30 July 2021 to 5 August 2021 as there was a COVID-19 stop work order in relation to Substation 1 (the "COVID Stop Work Order").[234] Evidence of this had been adduced by Attika's Mr Tan.[235] Mr Ozbilgin did not deal with this

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231 NE, 4 August 2023, at 160, line 11, to 161, line 6.

232 Plaintiff's Closing Submissions dated 14 September 2023 at paras 184–192.

233 Plaintiff's Reply Submissions dated 29 September 2023 at para 89(b)–(c).

234 Plaintiff's Reply Submissions dated 29 September 2023 at para 89(a).

235 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at 6567.

because his analysis was that the inverters were on the critical path, not the Substation works.

169 Attika submits that under the Contract, Bulox is responsible for the placement and installation of the Substations, not Attika. For its part, Attika had completed its structural works for both Substations and handed them over to Terrenus on 7 July 2021 and 12 July 2021 respectively. Bulox only completed the installation of both substations on 25 August 2021.[236] This period of 44 days far exceeded the 3 days that Attika had planned for the Substations' installation in the MP. Attika had anticipated that the installation of the Substations would be "plug and play", and Terrenus did not object or comment on the allocation of 3 days in the MP.[237] As Terrenus's sub-contractor, Bulox's delays were attributable to Terrenus.

170 Attika submits that Bulox's delayed installation of the Substations caused critical delay to the completion of the Project. Until Bulox had completed its works, SPPG could not be asked to inspect and take over the Substations for energisation of the Solar Farm. Terrenus admitted that the Substation works were critical as without them, even if the solar panels/PV system were installed and ready for use, the Solar Farm cannot be energised.[238] As Bulox only completed installation on 25 August 2021, SPPG could only carry out a handover inspection of the Substations on 26 August 2021. The contemporaneous evidence recorded that SPPG required all Substation works to be completed, with photographs sent to them, before an official handover

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236 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at para 525.

237 NE, 31 July 2023, at 58, lines 10–13.

238 NE, 31 July 2023, at 58, lines 10–30.

would be arranged,[239] and that Bulox had been "asked to speed up the works" with Terrenus to update SPPG on the Substations' handover date.[240] When SPPG requested for photographic updates of the Substations on 29 July 2021 before it would arrange for the next inspection, Terrenus took until 22 August 2021 to respond.[241]

171 In relation to Terrenus's submission that any EOT allowed on the basis of the Substation works should take into account the six day period of the COVID Stop Work Order, Attika submits that Terrenus's witness, Mr Bong, had himself denied that Attika could rely on it since it was in relation to Substation 1 and not site wide works.[242] There is no evidence from Terrenus of how this would affect the calculation of EOT. Further, it was not put to the delay experts that the six days ought to be deducted, and none of the experts had opined that this should account for six days.

172 Attika submits that the inverter installation works were not on the critical path. Mr Ozbilgin wrongly assumed that they became critical when the planned 26% of PEG mounting structures and 16% of solar panels (based on his linear distribution analysis) were not achieved. However, there is no actual requirement to install a certain percentage of such works before the start of inverter installation works. Mr Ozbilgin's analysis is based on delay from a *planning* perspective. He read into the MP logic links which were non-existent. Just because the inverters were *planned* to be installed before the cables are laid

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239 Affidavit of Evidence-in-Chief of Bong Eng Yueh dated 13 May 2023 at 1173.

240 Affidavit of Evidence-in-Chief of Bong Eng Yueh dated 13 May 2023 at 1176.

241 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at 7535.

242 Affidavit of Evidence-in-Chief of Bong Eng Yueh dated 13 May 2023 at para 134.

and *planned* to be fully completed before cable termination commences, does not mean that a deviation from this planned sequence would lead to *actual* delay. The carrying out of inverter works later than planned was not critical as there was no actual critical dependency of the other works on it. Attika could start cable laying even before the installation of inverters and do cable termination before all inverters were installed, based on Terrenus's own evidence. Therefore, the inverter installation works were not critical as they were a standalone activity, which required minimal effort on Attika's part to install, especially in light of their small quantity (*ie*, only 71 inverters). Attika's Mr Tan testified that the installation of one inverter would take at most 30 minutes, while Terrenus's Mr Zhang testified that it would take less than half a day to install one inverter.

173 Attika submits that the actual delay caused by Bulox's installation of the Substations is 41 days (*ie*, 44 days less 3 days). This is derived from Bulox taking 44 days for the installation of the Substations, exceeding the planned duration of 3 days. The cumulative critical delay at the end of Window 3 is 63 days. Taking into account the cumulative critical delay of 40 days at the end of Window 2, the critical delay attributable to Bulox's installation of Substations in Window 3 is 23 days.

Decision

174 The problems that I highlighted above with Mr Ozbilgin's overall analytical method undermines Terrenus's case on Window 3. As before, Mr Ozbilgin assumes a certain percentage of work front for the installation of PEG mounting structures and solar panels before Attika could have started on inverter installation, and that inverter installation became critical when these

percentages were not met.[243] There is, however, no basis for assuming that these percentages are relevant. There is no actual requirement to meet such percentages and they do not correlate to the actual state of progress on site.

175 The evidence for this Window accentuates the difficulties with Mr Ozbilgin's analysis. Mr Ozbilgin's opinion is not based on delays in the installation of the inverters, but more specifically the delay in the *mock-up* for the inverter *racking*, which was not completed until 23 August 2021.[244] Attika's position is that the inverters were installed on 9 July 2021.[245] Mr Tan's evidence is that the mock-up that Mr Ozbilgin focuses on, was a mock-up for the roof extension for the inverter racks, which had no effect on inverter *installation*. This was a variation requested by Terrenus. It was not on the critical path as it did not affect energisation or any other works.[246] Mr Tan's evidence on this was not challenged. Indeed, Mr Bong confirmed that it was Terrenus's consultant who had requested a variation to the inverter rack design and that this pertained to the roof.[247] This substantially undermines Mr Ozbilgin's analysis. On the evidence, I find that the inverter works were not on the critical path.

176 On the other hand, there *is* evidence that the installation of the Substations was on the critical path. It is undisputed that SPPG would not carry out a handover inspection of the Substations until the works for them were

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243 Affidavit of Evidence-in-Chief of Sezgin Ozbilgin dated 28 April 2023 at 138–139 (paras 7.6.20–7.6.21).

244 Affidavit of Evidence-in-Chief of Sezgin Ozbilgin dated 28 April 2023 at 141 and 144 (paras 7.6.27 and 7.6.38).

245 NE, 10 August 2023, at 79, lines 9–11; ACB at 1072 at [3] of Claimant's position.

246 NE, 10 August 2023, at 78, lines 11–14, at 79, lines 9–21, at 85, lines 22–29, at 89, lines 10–27, and 90, lines 13–15.

247 NE, 31 July 2023, at 52, line 13, to 53, line 22, and 56, line 13, to 57, line 18.

completed. Uncontroverted contemporaneous evidence indicates that the SPPG officers considered the installation of the Substations to be the most important, as there could be no handover to them without resolving the installation of the Substations, failing which there could not be any energisation.[248] Bulox only completed installation of Substation 1 on 25 August 2021, and both Substations were thereafter immediately handed over to SPPG on 26 August 2021.[249]

177 While Terrenus referenced Mr Chan's alleged "concession", a closer examination of Mr Chan's testimony does not reveal this to be a concession *per se*. He had simply stated that he would find it difficult to explain the rationale of why an event is on the critical path, without knowing or taking into account what actually transpired for the downstream activities.[250] Given that the assessment of critical path delay is ultimately related to what affected the achievement of the overall timelines for the Project, this is uncontroversial.

178 Finally, I reject Terrenus's submission that Attika contributed to the delay in Bulox's installation of the Substations. Terrenus asserts that Attika had breached its duty by refusing to "facilitate" Bulox's installation of the Substations, relying on cll 3.1.2 and 3.1.3 of Annex A Part III of the MBA. However, in my view, the Contract is clear. Clause 3.1.1 of Annex A Part III explicitly states that the supply and installation of the Substations are the responsibility of Bulox as Terrenus's sub-contractor. There is nothing in the Contract that obliges Attika to actively carry out the installation works for the Substations. An obligation to "facilitate" does not extend to a positive obligation

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248 NE, 31 July 2023, at 76, line 30, to 77, line 1.

249 NE, 31 July 2023, at 64, lines 27–30, and 65, lines 8–11.

250 NE, 4 August 2023, at 160, lines 5–10.

to actually carry out works that are within Bulox's job scope. Mr Bong also conceded that hoisting, installation, and the internal installation of electrical items for the Substations had to be done by Bulox.[251] Mr Tan had also explained that Attika had done its part to "facilitate" by providing power supplies, temporary toilets, and lighting for Bulox's work. In my view, Attika was entitled to reject requests to do works that were within Bulox's work scope (*eg*, ground-levelling works and supplying a plate for hoisting).[252] Furthermore, Mr Bong testified that Attika's works were completed before Bulox's.[253] I hence find that Attika did not contribute to Bulox's delay in the installation of the Substations.

179 Assessing the evidence on the whole, I find that there was critical delay in Bulox's installation of the Substations, which is attributable to Terrenus. This delay is for 23 days, after taking into account the cumulative critical delay at the end of Window 2, which is 40 days. I find that there is no evidential basis to deduct six days from this on the basis of the COVID Stop Work Order. While this order appears to be in relation to Substation 1, no evidence was led from any factual or expert witness on how this may have affected the progress of Bulox's Substation installation works. Neither was it put to Mr Chan that there should be a deduction from his calculations because of this. I hence find that Attika is entitled to an EOT for 23 days in Window 3.

Window 4: Delay in handover of substations to SPPG

180 Window 4 is from 26 August 2021 to 11 November 2021.

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251 NE, 31 July 2023, at 59, lines 26–32, and 68, lines 22–23.

252 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at paras 537–539; NE, 10 August 2023, at 21, lines 1–9.

253 NE, 31 July 2023, at 66, lines 23–26.

Parties' cases

181 Attika's case is that the delays by Bulox on the Substation works continued after the SPPG handover inspection on 26 August 2021, as Bulox was required to carry out rectification works, and this was on the critical path.

182 Attika submits that Mr Ozbilgin acknowledges that most of Attika's Works were completed by around the end of September 2021.[254] In contrast, SPPG required Bulox to carry out rectification works before SPPG would take over and schedule energisation. In a WhatsApp conversation with Mr Bong on 21 September 2021, an SPPG officer commented that SPPG was "not confident that Bulox will follow up" and that SPPG "[w]ill want all these rectified before I issue the take [over]". The SPPG officer further added that "Maincon issue I can close one eyes [*sic*]", referring to Attika, and that he was "more concern[ed] with Bulox".[255]

183 Attika disagrees that its testing and commissioning held up completion, as this is naturally the last activity carried out after all other Works have been completed. Once Bulox completed its rectifications, the Solar Farm was energised on 17 November 2021. In addition, Attika had carried out a series of testing and commissioning activities, while Bulox was in the midst of carrying out its rectification works.

184 Attika also disagrees that it contributed to Bulox's delays. Terrenus submits that both Bulox and Attika were resolving comments by SPPG in the

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254 Affidavit of Evidence-in-Chief of Sezgin Ozbilgin dated 28 April 2023 at 154 (para 7.7.2).

255 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at 7698–7699 and 7701–7702.

period between 26 August 2021 to 23 September 2021. However, Attika refers to Mr Bong's evidence, which focuses only on two "major" outstanding items in Terrenus's email of 26 August 2021 to Bulox and Attika.[256] The first item is that SPPG did not allow earth pits inside the cable chamber. Mr Bong conceded that this was a design defect by Terrenus's consultants, for which Terrenus subsequently had to instruct Attika to correct by relocating the earth pits. These were found to be variations which Attika completed and successfully claimed for in SOPA adjudication. The second item is that there were mistakes in Bulox's endorsement of the distribution box within SPPG's substation. It is undisputed that this falls within Bulox's scope of works.[257] These events are thus attributable to Terrenus and entitle Attika to an EOT.

185 Attika submits that the delay caused was 77 days, from 26 August 2021 (the date when Bulox was informed of SPPG's comments) to 11 November 2021 (the date when Bulox completed its last item of rectification). The critical delay caused by this is 77 days.

186 Terrenus disagrees that the issues with SPPG were on the critical path. It submits that the site-wide works were far from completed during this period. As of the 2nd week of September 2021, Attika had only completed 77% of the solar panel installation. Mr Ozbilgin opined that it was the cable termination at the inverters, followed by testing and commissioning of site-wide works, that were in delay. Since Partial Completion was achieved only on 23 or 25 November 2021, Terrenus submits that it follows that it was the testing and

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256 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at 7651.

257 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at 7651; NE, 31 July 2023, at 74, line 28, to 75, line 9.

commissioning works, which ended after the Substation works were completed, that caused critical delay during this window.

187 Terrenus submits that even if the critical path ran through the Substation works during Window 4, Attika is not entitled to EOT. This is because, from 26 August 2021 to 23 September 2021, both Attika and Bulox worked to resolve SPPG's comments. From 23 September 2021 to 2 November 2021, works were carried out by SPPG on the Substations. Terrenus submits that Attika "bore the risk" of SPPG's delays. Terrenus makes two alternative legal submissions in support of this. In its Closing Submissions, Terrenus submits that pursuant to cl 15 of the MBA, Attika "bore the risk" of delay caused by SPPG's works, as SPPG's requirements are "essentially akin to the requirements of a statutory authority, as it is the gatekeeper for connection to the power grid of Singapore".[258] In its reply submissions, Terrenus submits that "Terrenus should not be blamed" because Attika ought to have known and should have planned for delays by SPPG. Attika had agreed to the date of Partial Completion without negotiating for such risk to be allocated to Terrenus.[259]

Decision

188 In my judgment, SPPG's comments in the WhatsApp chat with Mr Bong indicate that as far as SPPG was concerned, the Substations' issues were of greater concern than those of the main contractor, Attika. These views are particularly relevant given that SPPG was the entity that had to be satisfied before there could be any handover of the Substations. I find that on the whole,

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258 Plaintiff's Closing Submissions dated 14 September 2023 at para 201.

259 Plaintiff's Reply Submissions dated 29 September 2023 at para 91.

the evidence supports Mr Chan's opinion that the Substation works were on the critical path.

189 I reject Terrenus's submission that Attika contributed to the delay during 26 August 2021 to 23 September 2021. I agree with Attika that, on the evidence, the two major items that Mr Bong referred to during this period were within Bulox's scope of works and not Attika's. This was conceded by Mr Bong.[260]

190 In contrast, I did not find that Attika's site-wide works were on the critical path. First, as I have set out above, there are substantial flaws with Mr Ozbilgin's method of analysis. It unjustifiably assumes a linear progression of work and determines delay on that basis. This invariably selects the earlier scheduled work item in the MP as the more potent delay event, simply on the basis that it accumulated more total delay days. This lacks logical foundation. Moreover, on the evidence, most of Attika's Works had been completed by around the end of September 2021. This was acknowledged by Mr Ozbilgin.[261] He states that there were outstanding site-wide works and then lists a series of tests that were carried out between September to November 2021. There is, however, no evidence that such testing held back the energisation of the Solar Farm. I also accept Attika's submission that on the evidence, some of the tests referred to by Terrenus, such as the PQ Test, could only be carried out after the Substations' defects had been rectified by Bulox. Bulox's rectification works therefore fell on the critical path and caused the delay.

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260 NE, 31 July 2023, at 74, lines 12–23, and 75, lines 14–23.

261 Affidavit of Evidence-in-Chief of Sezgin Ozbilgin dated 28 April 2023 at 154 (para 7.7.2).

191 On a plain reading of cl 5.5.7 of the MBA, Attika is entitled to EOT so long as there is delay "attributed to" Terrenus. On the evidence, there are no concurrent delays. The sole critical delay is in relation to the resolution of the Substation issues identified by SPPG, which were the responsibility of Bulox and are hence attributable to Terrenus.

192 Terrenus submits that Attika is not entitled to EOT for such delay by virtue of cl 15 of MBA. In my view, this submission is without merit. First, cl 15 only requires Attika to comply with the requirements of public authorities in carrying out *Attika's work*. I have found that it is clear from SPPG's comments that, in their view, Bulox was the party that needed to rectify. The installation of the Substations were also indisputably part of Bulox's scope of work, as were the rectification of the defects in relation to the Substations. The rectification works were not part of Attika's Works. Any facilitation provided by Attika and the variation works it had to carry out, did not change the fact that the rectification was Bulox's responsibility. Second, cl 15 relates to requirements imposed by *public authorities*. SPPG is a private company, not a public authority. As a point of reference, the parties found it necessary to specifically name SPPG in addition to "technical agencies", when clarifying the responsibilities for submission and approval under Item B4. This reinforces my view that the parties' did not regard SPPG as a public authority under cl 15.

193 I also reject Terrenus's alternative submission that Attika bears the risk of SPPG's delays because Attika should have planned for it and Attika failed to negotiate for this risk to be allocated to Terrenus. In my view, this submission somewhat contradicts Terrenus's initial submission above, which is premised on there being a negotiated allocation of risk to Attika pursuant to cl 15 of the MBA. In any event, I also find no merit to this alternative submission. The

installation of the Substations is part of Bulox's work scope under the Contract. It is clear that SPPG looked to Bulox to rectify the defects identified and prepare the Substations for handover. There is no basis for submitting that Attika should have planned for SPPG's delays in this workstream.

194 Accordingly, I find that Attika is entitled to EOT for 77 days in Window 4, for the delays caused by Bulox's rectification works on the Substations from 26 August 2021 (the date when Bulox was informed of SPPG's comments) to 11 November 2021 (the date when Bulox completed its last item of rectification).

Delay due to adverse weather conditions

195 Attika's case for EOT due to adverse weather conditions arises only if I find in favour of Mr Ozbilgin's critical path, as he allowed for seven days of delay caused by excessive rainfall. As I have rejected Mr Ozbilgin's analysis, this aspect of Attika's case for EOT does not arise.

Summary of EOT

196 In summary, following from the above findings on delay, I find that Attika would have been entitled to EOT for a total of 140 days (19 + 21 + 23+ 77).

Whether Attika is liable for liquidated damages

197 The fourth main issue is whether Attika is liable for liquidated damages. Terrenus claims for liquidated damages pursuant to cl 17.1.2 of the MBA.[262] Clause 17.1.2 provides that:

> 17.1.2 [Attika] shall pay [Terrenus] 0.1 % of Contract Sum per day for each day of delay as liquidated damages. For the avoidance of doubt, the total liquidated damages payable to [Terrenus] if any, shall be limited to the amount of not more than Contract Sum.

198 The liquidated damages rate pursuant to cl 17.1.2 of the MBA is $5,100 per day of delay, as the Contract Sum was $5,100,000. As I have found above, Attika achieved Partial Completion on 23 November 2021 (above at [129]) when it was supposed to have achieved this on or before 30 June 2021. Attika would have been in delay up till 22 November 2021, for 146 days. After taking into account 140 days of EOT, Attika was in delay for six days from the Date of Partial Completion. As Attika's Works were completed on 23 November 2021 (above at [132]), Attika was not in delay in respect of the Date of Completion (which was supposed to be on 31 July 2021), taking into account the EOT. On this basis, Terrenus is entitled to six days of liquidated damages, in the amount of $30,600.

The Renewable Energy Purchase Agreement

199 It is necessary to provide some context to understand the parties' submissions on damages for delays. Terrenus claims that it had entered into a Renewable Energy Purchase Agreement dated 20 November 2020 (the "REPA") with Malkoha Pte Ltd, a subsidiary of Meta Platforms, Inc. (formerly

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262 Plaintiff's Closing Submissions dated 14 September 2023 at para 208.

Facebook, Inc.). For convenience, I shall refer to the REPA counterparty simply as "Meta". Although Terrenus referred to the REPA as a "power purchase agreement" in its pleadings,[263] it transpired that the REPA was *not* an agreement for the sale of power to Meta but was instead "purely a financial transaction" to hedge against energy price fluctuations. Put simply, the REPA sets out a fixed price for power. If the market price goes above the fixed price, Terrenus must pay Meta the difference. If the market price goes below the fixed price, Meta must pay Terrenus the difference.[264] Terrenus did not call Meta to testify.

200 For the purposes of S 173, Terrenus highlights that cl 3.4 of the REPA required Terrenus to achieve the "Declared Commercial Operation Date" by the "Expected Commercial Operation Date" of 30 June 2021. The "Declared Commercial Operation Date" requires the Solar Farm to have a total "Nameplate Capacity" at least equal to the "Guaranteed Capacity".[265] The "Guaranteed Capacity" of the Solar Farm is 18 MWp.[266] Pursuant to cl 3.5 of the REPA, Terrenus is liable for "Daily Delay Damages" of $9,000 per day of delay from the "Expected Commercial Operation Date" of 30 June 2021.[267]

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263 Statement of Claim filed on 10 May 2022 at para 109.

264 Affidavit of Evidence-in-Chief of Yeo Ying Hao dated 14 May 2023 at paras 36–48.

265 Affidavit of Evidence-in-Chief of Charles Wong Kwok Leong dated 13 May 2023 at 23 and 33–34.

266 Affidavit of Evidence-in-Chief of Charles Wong Kwok Leong dated 13 May 2023 at 26.

267 Affidavit of Evidence-in-Chief of Charles Wong Kwok Leong dated 13 May 2023 at 23 and 34.

Parties' cases

201 Attika submits that the liquidated damages amount of $5,100 per day set out in cl 17.1.2 of the MBA bears no relation to any genuine pre-estimate of loss that Terrenus may suffer. First, Terrenus could not have suffered any losses on Partial Completion. This is because Terrenus could not have sold any power to Meta under the REPA until the Solar Farm was able to generate the required "Nameplate Capacity" of at least 18 MWp, which is more than 70% of the capacity of the Solar Farm (19.17486 MWp). Second, the same rate of $5,100 per day for any delay to Partial Completion continues to be applicable for delays to completion, even though the implications of these two events have varying gravity. Attika submits that this therefore raises a rebuttable presumption that the liquidated damages clause is a penalty, citing *Denka Advantech Pte Ltd and another v Seraya Energy Pte Ltd and another and other appeals* [2021] 1 SLR 631 ("*Denka*") at [66], which refers to *Dunlop Pneumatic Tyre Co Ltd v New Garage and Motor Co Ltd* [1915] AC 79 at 87–88 (the "Single Lump Sum Test": see *Denka* at [303]).[268]

202 Terrenus submits that the liquidated damages rate of $5,100 per day is not a penalty because it cannot be said to be so extravagant or unconscionable in comparison with the greatest loss that could conceivably be proved to have followed from the breach (the "Greatest Loss Test": see *Denka* at [305]), being the Daily Delay Damages payable to Meta under the REPA, and loss of power sales. The Daily Delay Damages were at the rate of $9,000 per day from 30 June 2021, and therefore the loss suffered by Terrenus under the REPA exceeded the rate of liquidated damages under cl 17.1.2 of the MBA. This is even without

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[268] Defendant's Closing Submissions dated 14 September 2023 at paras 246–249 and 282–283.

accounting for loss caused to Terrenus due to the lost income from not being able to sell to the national grid.[269] Terrenus submits that the Single Lump Sum Test is but a factor, and the principle of overarching importance is the Greatest Loss Test (citing *Denka* at [305]).[270]

Decision

203 It is for Attika as the party being sued to show that cl 17.1.2 of the MBA is a penalty. The question to be considered is not whether there are possible circumstances where a lesser loss would be suffered, but whether Attika can show that the sum is so extravagant, having regard to the range of damages which Terrenus as the innocent party was likely to suffer, that cl 17.1.2 could not constitute a genuine estimate of the damages (*CLAAS Medical Centre Pte Ltd v Ng Boon Ching* [2010] 2 SLR 386 ("*CLAAS Medical*") at [63] and [67]). A clause is not a penalty "simply because it results in overpayment in particular circumstances and the parties are allowed a generous margin to determine the agreed damages to be payable upon breach" (*CIFG Special Assets Capital 1 Ltd v Polimet Pte Ltd and others (Chris Chia Woon Liat and another, third parties)* [2017] SGHC 22 at [125]). The assessment of the genuineness of a liquidated damages clause is a question of construction that must be decided at the time the contract was entered into, and not as at the time of breach (*Denka* at [281]).

204 I reject Attika's submission that Terrenus could not have suffered any loss on Partial Completion. Mr Yeo Ying Hao ("Mr Yeo"), legal counsel of Terrenus, conceded that losses arising from the REPA would only be possible

269 Plaintiff's Closing Submissions dated 14 September 2023 at paras 211–215.

270 Plaintiff's Reply Submissions dated 17 October 2023 at para 38.

if Terrenus had been able to achieve 100% energisation.[271] However, cl 17.1.2 of the MBA is not limited to losses suffered under the REPA. The REPA does not involve actual sale of power. I accept Mr Yeo's evidence that power could have been sold to the national grid.[272] In any event, liquidated damages are payable even without proof of loss.

205 I also reject Attika's submission that the Single Lump Sum Test is applicable. On the facts, it was not possible to achieve Partial Completion without also achieving completion. As each Substation only enabled the generation of 50% of the capacity of the Solar Farm, both Substations had to be commissioned and energised to reach at least 70% of the capacity of the Solar Farm and for Partial Completion to be achieved. At the same time, this would achieve completion as it would enable the generation of 100% of the capacity of the Solar Farm (above at [123]). As acknowledged by counsel for Attika, the separation of these two events was not practically or theoretically possible at the time of entering into the Contract.[273] Hence, Partial Completion and completion did not constitute two events of varying gravity such as to raise a rebuttable presumption that cl 17.1.2 of the MBA was penal under the Single Lump Sum Test.

206 Accordingly, the onus is still on Attika to show that cl 17.1.2 of the MBA violates the Greatest Loss Test. Attika must show that the amount of liquidated damages is so extravagant, having regard to the greatest loss which Terrenus *could have reasonably been anticipated to suffer at the time of contracting*, such

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271 NE, 26 July 2023, at 18, lines 18–20.

272 NE, 26 July 2023, at 18, lines 1–6, and 25, lines 18–20.

273 NE, 24 October 2023, at 14–16.

that it could not constitute a genuine pre-estimate of damages (*Denka* at [281]). For this reason, I reach my conclusion not because of the Daily Delay Damages allegedly payable to Meta (which I discuss below at [222]–[223]), but because Attika did not provide *any* evidence that this is so. As I have found that the presumption of the Single Lump Sum Test has not been raised, in the absence of a positive case from Attika on the Greatest Loss Test, I reject Attika's contention. I hence find that cl 17.1.2 is *not* a penalty. Terrenus is thus entitled to six days of liquidated damages under cl 17.1.2, in the amount of $30,600.

Whether Attika is further liable for general damages due to delay

207 The fifth main issue is whether Attika is further liable for general damages due to delay, in the sense of actual loss or actual damage, pursuant to cl 17.1.4 of the MBA. This states:

> 17.1.4. If [Terrenus] suffers other losses and damages which cannot be covered by such liquidated damages, such losses and damages incurred by [Terrenus] shall be deemed as its losses and damages resulting from [Attika's] default and shall be reimbursed by [Attika] to [Terrenus].

208 This raises the following sub-issues:

(a) whether cl 17.1.4 of the MBA only applies to non-delay damages and claims on a reimbursement basis;

(b) whether Attika is liable for Terrenus's liability for Daily Delay Damages payable to Meta under the REPA; and

(c) whether Attika is liable for Terrenus's lost income under the REPA.

Whether cl 17.1.4 of the MBA only applies to non-delay damages

209 Terrenus accepts that it cannot double-claim both liquidated damages and general damages.[274] However, Terrenus submits that the natural reading of cl 17.1.4 of the MBA is that it entitles Terrenus to recover loss which cannot be covered by liquidated damages under cl 17.1.2. It is even contained in the same clause under the heading "Liquidated Damages". It was held in *Crescendas Bionics Pte Ltd v Jurong Primewide Pte Ltd* [2021] SGHC 189 ("*Crescendas (HC)*") at [57] to [59] that general damages and liquidated damages are underpinned by different considerations, and there is no reason to cap the general damages recoverable to the amount of liquidated damages. The Appellate Division also agreed in *Crescendas Bionics Pte Ltd v Jurong Primewide Pte Ltd and other appeals* [2023] 1 SLR 536 ("*Crescendas (AD)*") at [34] that a liquidated damages clause should not restrict the quantum which the employer may claim in general damages.

210 Attika submits that on a plain reading, cl 17.1.4 of the MBA clearly confines Terrenus's claims only to "*other* losses and damages which cannot be covered by such liquidated damages". Clause 17.1.4 must be read with cl 17.1.1, which provides that liquidated damages are in respect of delays. The phrase "other losses and damages" must therefore refer to those that do not stem from Attika's *delay* as these losses and damages would then not "be covered by such liquidated damages". According to Attika, such a reading is consistent with the well-established principle that a liquidated damages clause is exhaustive as to the compensation for delay damages. A party cannot claim general damages in addition to liquidated damages nor elect to abandon the liquidated damages

274 Plaintiff's Reply Submissions dated 29 September 2023 at para 100.

clause to pursue its claim of general damages, citing *Chan Ah Beng v Liang and Sons Holdings (S) Pte Ltd* [2012] 3 SLR 1088 ("*Chan Ah Beng*") at [54]–[55]. Terrenus's claims for Daily Delay Damages payable to Meta under the REPA and any alleged loss of income from the REPA are all losses that all clearly stem from alleged *delay*.[275]

211 Attika submits that Terrenus's interpretation of cl 17.1.4 of the MBA renders the stipulation of liquidated damages in cll 17.1.1 and 17.1.2 otiose. Terrenus is essentially seeking to interpret the phrase "*other* losses and damages" in cl 17.1.4 as "*additional* losses and damages". However, the word "other" has a different meaning from "additional". It refers to a different *type* of damage. Whereas "additional" refers to more of the *same type* of damage. Further, since the terms of the Contract were drafted by Terrenus, Attika submits that the *contra proferentem* rule should apply.[276]

Decision

212 Terrenus relies on *Crescendas (HC)* for the proposition that general damages should not be capped at the amount of liquidated damages. However, the proposition there was made in a very different context, namely, in a situation where the liquidated damages clause had been rendered *inoperative* as time had been set at large (*Crescendas (AD)* at [34]). *Crescendas (HC)* therefore does not stand for the proposition that general damages can always be claimed *in addition to* liquidated damages. It simply clarifies the trite position that general damages can be claimed as of right even if a liquidated damages clause is

275 Defendant's Closing Submissions dated 14 September 2023 at paras 250–252.

276 Defendant's Closing Submissions dated 14 September 2023 at paras 254–256.

inoperative or struck down as a penalty, subject to the usual requirements of proof of loss, causation, remoteness, and mitigation.

213 The leading authority is the Court of Appeal's decision in *Chan Ah Beng*, which held (at [55]):

> It is an established principle of law that *an innocent party cannot claim unliquidated damages in addition to the liquidated damages which were designed to deal with the loss that has occurred* … However, the courts will allow unliquidated damages to be claimed in addition to liquidated damages if the damages which is the subject matter of the former claim arises wholly or partially from some other breach that does not fall within the ambit of the liquidated damages provision …
>
> [emphasis added]

In *Chan Ah Beng*, the respondent purchaser claimed against the appellant vendor for specific performance of the sale transaction, because the appellant failed to complete the sale by the contracted date of completion after the respondent exercised the option to purchase. At first instance, the respondent succeeded at obtaining *both* general damages *and* liquidated damages. General damages were awarded for rent in respect of the property between the contracted date of completion and the actual date of completion. Liquidated damages were also awarded, in the form of interest, as the contract provided that should the appellant fail to complete the sale by the contracted date, the appellant "must pay interest (*as liquidated damages*) commencing on the day following the date fixed for completion up to and including the day of actual completion" [emphasis added]. After setting out the applicable principles and examining the ambit of the liquidated damages provision (at [56]), the Court of Appeal held that because the liquidated damages clause was intended to encompass rent, awarding *both* rent in the form of damages and interest would amount to impermissible double recovery (at [63]).

214 In this case, the liquidated damages referred to in cl 17.1.2 of the MBA, when read with cl 17.1.1 (above at [117]), are specified to be for Attika's failure to achieve timely completion by the Date of Partial Completion and/or Date of Completion (after taking into account EOTs). In other words, damages arising from *delay*. All damages arising from delay would therefore fall within the ambit of the liquidated damages provision in cl 17.1.2. In my view, the interpretation of cl 17.1.4 propounded by Terrenus would allow it to claim unliquidated damages *in addition to* liquidated damages, which were already designed to deal with the loss incurred from delay. This directly contravenes the principle set out in *Chan Ah Beng*.

215 In addition, a plain reading of cl 17.1.4 of the MBA *does not apply to* claims for losses and damages arising from *delay*. Clause 17.1.4 specifically refers to "*other* losses and damages" which *cannot* be covered "by such liquidated damages". It does not refer to "additional" losses and damages from delay. Since damages from delay *would* already be covered by cl 17.1.2, it cannot be considered to be "other" losses and damages.

216 Although Mr Wong gave evidence as to the alleged circumstances surrounding the inclusion of cl 17.1.4 of the MBA, both parties agreed that the true construction of cl 17.1.4 depends entirely on the four corners of the MBA. The parties therefore did not make submissions on the effect of cl 2.1.1, which was an entire agreement clause.[277]

217 For the above reasons, I find that Terrenus's claim for general damages arising from delay pursuant to cl 17.1.4 of the MBA fails. It is hence

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277 NE, 24 October 2023, at 16–17.

unnecessary to examine if cl 17.1.4 of the MBA is limited only to claims on a reimbursement basis. I will nevertheless for completeness, briefly provide my observations on the particulars of Terrenus's claim for general damages.

Whether Attika is liable for Terrenus's liability to pay Daily Delay Damages to Meta under the REPA

218 Under the REPA, Terrenus is liable to pay Daily Delay Damages at a rate of $9,000 per day to Meta if it does not achieve the "Declared Commercial Operation Date" by the "Expected Commercial Operation Date" of 30 June 2021 (above at [200]). Terrenus submits that its potential liability to Meta for delay from 1 July 2021 (the date the Daily Delay Damages will start to accrue) to 25 November 2021 (the date that Terrenus submits that completion was achieved) is therefore $1,248,300 (Terrenus includes a 30% discount for the month of July 2021).[278] Terrenus claims that it has been negotiating a settlement with Meta to fix their liability at the sum of $783,000, although these negotiations have not concluded in any formally executed agreement. Terrenus submits that any Daily Delay Damages payable to Meta would have been within the reasonable contemplation of Attika, as Attika must be taken to have known as the main contractor of a power farm that the commercial purpose of the Project was to sell energy *to someone*. Therefore, Terrenus submits that liquidated damages owed by Terrenus to such an energy purchaser arising from a delay in completion would fall within the first limb of *Hadley v Baxendale*. Terrenus submits that a claim for damages for Daily Delay Damages payable to Meta is not too remote.[279] Terrenus submits that Attika's Mr Tan was aware of the existence of the REPA, as Mr Wong had shared with Mr Tan that Terrenus

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278 Affidavit of Evidence-in-Chief of Yeo Ying Hao dated 14 May 2023 at 48.

279 Plaintiff's Closing Submissions dated 14 September 2023 at paras 218–220.

had signed an agreement with Meta. Terrenus claims that Mr Tan also appeared to accept at trial that there would be problems if the completion dates in the Contract were not met.[280] Terrenus submits that it is entitled to claim damages in the sum of $783,000 as their liability to Meta under the REPA "crystallised" the moment Terrenus breached the REPA. Terrenus is not required to show that any settlement had actually been executed or show that Meta has commenced legal proceedings in respect of the Daily Delay Damages under the REPA.[281]

219 Attika submits that Terrenus's claim must fail for lack of causation and remoteness. Under the rule in *Hadley v Baxendale*, the recovery of special damages requires that the special circumstances were within the reasonable contemplation of both parties at the time of the MBA. There is no evidence that, at the time of entering the Contract on 5 April 2021, Attika was even aware of the existence of the REPA, much less of its terms. Mr Wong also admitted that Attika would (at best) only know that there was an agreement to sell power, but not that Terrenus could incur liquidated damages under the REPA.[282]

Observations

220 As Terrenus's claim for Daily Delay Damages (in the sum of $783,000) is a loss arising from *delay*, my findings on cl 17.1.4 of the MBA are fatal to this claim. Even if I had accepted that Terrenus could bring a claim for general damages arising from delay pursuant to cl 17.1.4 of the MBA, I would have found that Terrenus has not proven its case for this claim.

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280 Plaintiff's Closing Submissions dated 14 September 2023 at paras 221–223.

281 Plaintiff's Closing Submissions dated 14 September 2023 at paras 225–229.

282 NE, 24 July 2023, at 55, line 15, to 56, line 17.

221 First, Terrenus fails to prove causation. Terrenus must show that Attika was the sole cause of Terrenus's liability to Meta for Daily Delay Damages (*CAA Technologies Pte Ltd v Newcon Builders Pte Ltd* [2017] 2 SLR 940 at [83]–[86]). No evidence of this was led. Without establishing causation, Terrenus fails to discharge its burden of proof. Moreover, it is clear that Terrenus *cannot* show causation for the period between 1 July 2021 (the day after the original Date of Partial Completion before taking into account EOTs) to 31 July 2021 (the original Date of Completion before taking into account EOTs) since Terrenus would have been in breach of the REPA even if 70% of the Solar Farm's capacity had hypothetically been achieved on 30 June 2021 (the Expected Commercial Operation Date under the REPA). Terrenus had contracted with Attika for 70% capacity to be achieved on 30 June 2021, which would only have (hypothetically) generated approximately 13.4 MWp. This would not avoid a breach under REPA, as Terrenus was required to achieve the Nameplate Capacity of at least 18 MWp under the REPA (above at [200]). Terrenus acknowledges this by including a theorised 30% discount on Daily Delay Damages for the month of July. However, there is no logical or evidential basis for the arbitrary adjustment. Furthermore, Attika cannot be liable for the 140 days for which I have found that it is entitled to EOT (above at [196]), as there would have been no breach for which damages could be claimed during this period. Terrenus expressly accepts that this must be the case.[283] In addition, there is some evidence that Meta granted Terrenus an EOT under the REPA, which would reduce Terrenus's exposure to Daily Delay Damages.[284]

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283 Plaintiff's Reply Submissions dated 29 September 2023 at para 108.

284 NE, 24 July 2023, at 9, lines 12–25, and 17.

222 Second, Terrenus's claim fails for remoteness. Terrenus has not satisfied the first limb of *Hadley v Baxendale*. It has not shown that the Daily Delay Damages were within Attika's reasonable contemplation. Unlike the typical construction situation with several tiers of *construction* contracts where liquidated damages are owed by an upstream contractor to another upstream contractor or to the developer or employer, Meta and the REPA are in a wholly different position. Meta is the purchaser of a service provided by Terrenus and is the counterparty to what was essentially a financial arrangement for price hedging (above at [199]). Indeed, at trial, counsel for Terrenus sought to make the point that typical construction contracts and the REPA are wholly different creatures.[285] The unusual nature of the REPA calls into question whether it could even be within the reasonable contemplation of Attika that Daily Delay Damages would be owed by Terrenus to Meta in such a situation.

223 Third, Terrenus's claim also fails on the second limb of *Hadley v Baxendale*. Terrenus's case is evidentially weak. All that it relies on is the fact that Attika's Mr Tan allegedly congratulated Terrenus's Mr Wong on winning the Meta contract over a meal. There is no evidence that Mr Tan was shown the REPA, was aware of its terms, or was aware that Terrenus would be liable to Meta for Daily Delay Damages and under what conditions. There is no indication that Mr Tan even knew that the agreement with Meta was actually a price hedging arrangement. Mr Wong specifically admitted that: (1) his claim that Mr Tan was aware of the REPA actually related to the time period *after* both parties had entered into the Contract, when Works were already

[285] NE, 10 August 2023, at 44, lines 5–14.

underway;[286] (2) Mr Tan was never given a copy of the REPA;[287] and (3) he did not inform Mr Tan about the Daily Delay Damages payable by Terrenus to Meta under the REPA.[288] These admissions corroborate Mr Tan's testimony, which is that he only congratulated Mr Wong over a meal but did not know or discuss any of the details of Terrenus's contract with Meta.[289]

224 Terrenus submits that Mr Tan had admitted at trial that he knew that Mr Wong would face problems if the REPA timelines were not met. However, that was not Mr Tan's testimony.[290] Counsel for Terrenus had asked Mr Tan if he remembered Mr Wong's testimony in court about the importance of the timelines. Mr Tan testified that he *recalled* Mr Wong saying that "We will cry". Counsel for Terrenus then asked Mr Tan if he agreed that what Mr Wong was saying was that there was going to be a big problem if the timelines are not there. Mr Tan simply replied "that's what he say". Mr Tan's answer was not an admission and was clearly about his recollection of what Mr Wong had testified at trial. It was *not* about what Mr Tan himself understood would happen to Terrenus under the REPA.

Whether Attika is liable for Terrenus's lost income under the REPA

225 Terrenus also claims for the lost income from the "sale of power" it would have made to Meta under REPA, at a price of $134 per MWh, for the period from 1 July 2021 to 25 November 2021. The total sum claimed is

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286 NE, 24 July 2023, at 49, line 4, to 50, line 8.

287 NE, 24 July 2023, at 50, lines 1–4, and 54, lines 29–31.

288 NE, 24 July 2023, at 56, lines 4–6.

289 NE, 7 August 2023, at 33, lines 18–23; NE, 10 August 2023, at 42, lines 24–26.

290 NE, 10 August 2023, at 41, lines 7–19.

$1,245,401.17. Attika submits that on the terms of the REPA, it is clear that Terrenus could not have earned income from Meta even if Partial Completion was achieved on 30 June 2021 Terrenus was required to achieve the Nameplate Capacity of at least 18 MWp. There is no evidence that Terrenus has satisfied any of the other pre-conditions under the REPA.

Observations

226 As Terrenus's claim for lost income under the REPA is a loss arising from *delay*, my findings on cl 17.1.4 of the MBA are fatal to this claim. Even if I had accepted that Terrenus could bring a claim for general damages arising from delay pursuant to cl 17.1.4 of the MBA, I would have found that Terrenus has not proven its case for this claim. It is wholly unmeritorious.

227 First, Terrenus fails to prove causation. It has not shown that it could have received such income under the REPA. The *only* basis for the claim is Mr Yeo's belief that "[i]t was very likely, in [his] view, that [Terrenus] could have reached a commercial agreement with Meta to treat 30 June 2021 as a Commercial Operation Date for 70% of [the Project], and as being fully operational and producing and selling energy at or above the Guaranteed Capacity under the REPA from 31 July 2021. Meta and [Terrenus] would have addressed the shortage of 30% through commercial discussions".[291] This bald assertion of a wholly speculative "commercial agreement" is entirely baseless. Mr Yeo agreed that his confidence was entirely speculative.[292] I agree with Attika that on the face of the REPA, there is no indication that Meta would have agreed to pay Terrenus any money when Terrenus failed to meet the Nameplate

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291 Affidavit of Evidence-in-Chief of Yeo Ying Hao dated 14 May 2023 at para 50(g).

292 NE, 26 July 2023, at 22, lines 1–8.

Capacity of 18 MWp. Furthermore, one of the requirements of achieving "Commercial Operation" is that all Daily Delay Damages have been paid.[293] Mr Yeo's own evidence is that no Daily Delay Damages have been paid at all; the alleged settlement has not even been finalised.[294]

228 Second, Attika cannot be liable for the 140 days for which I have found that it is entitled to EOT (above at [221]).

229 Third, Terrenus has no evidence of the quantum of loss. Mr Yeo's claim of $1,245,401.17 is based entirely on a simulation report done by SolarGy. Mr Yeo adduced it but is not qualified to explain it. The report was done by SolarGy, but Terrenus did not call SolarGy to explain the report, though they would be best placed to do so. It is inadmissible. Mr Yeo also referred to a one-page report which he said was produced by Mr Zhang, but the report was not adduced by Mr Zhang nor did Mr Zhang testify on it.

Whether Attika is entitled to claim for the Balance Sum pursuant to cl 14.3.2

230 The sixth main issue is whether Attika is entitled to claim for the Balance Sum pursuant to cl 14.3.2 of the MBA. Clause 14.3 is titled "Termination Without Default" and deals with the consequences of Terrenus terminating Attika's employment on a without default basis. Clause 14.3.2 provides:

> 14.3.2. In the event of a Notice of Termination under Clause 14.3.1, the Employer Rep *shall* certify payment to [Attika]:

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293 Affidavit of Evidence-in-Chief of Charles Wong Kwok Leong dated 13 May 2023 at 21.

294 NE, 26 July 2023, at 4–11.

> (a) for *all work executed* prior to the date of termination *as set out in the Agreement* including the amounts payable in respect of any other items shown and separately priced in the Agreement, including those for construction equipment *in so far as the work comprised therein has been carried out or performed*, and *a proper proportion of any such items* which have been partially carried out or performed;
>
> (b) …
>
> The Employer Rep *shall expeditiously certify the amounts payable to [Attika] under this Clause*, and [Attika] shall provide all reasonable assistance to the Employer Rep. In the event that [Attika] does not submit the necessary information required, the Employer Rep shall make his certification on the information available. *The amount certified shall be paid by [Terrenus] less any sums previously paid or due to or recoverable by [Terrenus] from [Attika].*

[emphasis added]

231 This raises the following sub-issues:

(a) whether the words "as set out in the Agreement" in cl 14.3.2 of the MBA refer only to the execution of Attika's Works, or includes the need to apply Annex F;

(b) if the words "as set out in the Agreement" includes the need to apply Annex F, whether there is an implied term that Terrenus would be diligent in taking reasonable steps to procure the issuance of CSC; and

(c) whether and what Attika is entitled to claim under cl 14.3.2.

232 To recapitulate, Annex F of the MBA, titled "Schedule of Payment", provides for the Contract Sum to be paid in percentages based on monthly progress (40%), and upon issuance of the TOP (20%) and CSC (40%). TOP was issued on 12 January 2022, and CSC was issued on 13 July 2023.

Whether Annex F applies

The meaning of "as set out in the Agreement" in cl 14.3.2

233 Terrenus submits that cl 14.3.2 of the MBA is *in pari materia* with cl 31.4 of the Public Sector Standard Conditions of Contract for Construction Works 2014 Ed ("PSSCOC"), save that the PSSCOC provides that payment is to be certified by the "Superintending Officer" "for all work executed prior to termination *at the Rates for the Works* as set out in the Contract" [emphasis added]. According to Terrenus, the parties deleted the phrase "at the Rates for the Works" whilst leaving "as set out in the Agreement" because there are no rates in the Contract. Terrenus submits that the natural inference is that the parties wished that the payment mechanism under the Contract, which was "payment by milestones" contained in Annex F, would continue to apply. The contractual definition of "Agreement" in cl 1.3.2 includes "Annexes". Hence, the phrase "as set out in the Agreement" in cl 14.3.2 includes Annex F. Under Annex F, Attika is only entitled to be paid 40% of the Contract Sum on the issuance of CSC. Terrenus's case is essentially that because Attika's employment was terminated (on a without default basis) *before* the issuance of CSC, Attika is wholly disentitled from claiming the Balance Sum.[295] Terrenus submits that cl 14.3.2 provides exhaustively for the sums that Attika may recover, and that considerations of fairness or inadequacy of compensation are not relevant to interpretation, citing *TT International Ltd v Ho Lee Construction Pte Ltd* [2017] SGHC 62 ("*TT International*").[296]

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295 Plaintiff's Reply Submissions dated 29 September 2023 at para 130(c).

296 Plaintiff's Reply Submissions dated 29 September 2023 at paras 118–119.

234 Attika submits that the words "as set out in the agreement" simply refer to Attika's Works as set out under the Contract. Reading cl 14.3.2(a) of the MBA holistically, including the subsequent reference to "*including* amounts payable in respect of any other items shown and separately priced in the Agreement" [emphasis added], make it clear that the reference to "as set out in the Agreement" is to the Works. There is no express reference to Annex F in cl 14.3.2. The phrase "as set out in the Agreement" does not incorporate Annex F nor mean that Annex F applies. Mr Yeo denied that this phrase incorporates Annex F.[297] Attika's submissions on the implied term that Terrenus must be diligent in taking reasonable steps to procure the issuance of the CSC, and that Terrenus had breached its duty to do so, arise only if Annex F applies *and* Terrenus's characterisation of the issuance of the CSC as a "condition precedent" is correct.

Decision

235 On a plain reading of cl 14.3.2 of the MBA, it is clear that the words "as set out in the Agreement" are inserted with reference to the phrase "works executed", as seen below:

> … the Employer Rep shall certify payment to [Attika]: … ***for all work executed*** prior to the date of termination ***as set out in the Agreement*** …
>
> [emphasis added]

This is made even clearer by the rest of cl 14.3.2, which goes on to refer to work items, stating that this shall include "the amounts payable in respect of any other items shown and separately priced in the Agreement".

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297 NE, 25 July 2023, at 91, lines 3–8.

236 In my view, contrary to Terrenus's submissions, the phrase "as set out in the Agreement" *does not* include Annex F of the MBA. That the contractual definition of "Agreement" includes the "Annexes" does not assist Terrenus, given the specific language of cl 14.3.2. Neither is there a natural inference, on the plain language of the clause, that parties wished for Annex F to continue to apply if Attika's employment was terminated on a without default basis. There is no reference to Annex F, to the use of payment mechanisms, or to payment milestones in cl 14.3.2. Clause 14.3.2 simply states that the Employer Rep must certify payment for all works executed (prior to termination) as set out in the Contract. In other words, it states that payment is only for work that falls within the scope of the Contract.

237 Terrenus describes Annex F of the MBA and payment upon issuance of the CSC as a "condition precedent" to payment. This interpretation is completely unsupported. There is no indication that Annex F, which is simply titled "Schedule of Payment", is intended to be some form of risk allocation mechanism. It is undisputed that it is Terrenus and its consultants that make (and made) the application for CSC.[298] Terrenus's submission is, in effect, that Terrenus can decide to deny Attika up to 60% of the Contract Sum *at will*, given that cl 14.3.1 grants Terrenus the right to terminate Attika's employment *on a without default basis*. Even Terrenus's witnesses did not stand by such an interpretation.[299] In my view, unless the true construction of the contract shows otherwise, the court will generally lean against an interpretation of a contract which would deprive the contractor of any payment at all simply because there

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298 NE, 25 July 2023, at 98, line 23, and 101, lines 2–24; NE, 26 July 2023, at 114, lines 11–18; NE, 28 July 2023, at 57, lines 8–22, and 60, lines 10–21.

299 NE, 25 July 2023, at 99, lines 26–31, and 101, lines 21–26.

are some defects or omissions (*Hoenig v Isaacs* [1952] 2 All ER 176). *TT International* does not support Terrenus's case. First, *TT International* concerns the interpretation of an entirely separate contract, the PSSCOC. Second, the issue in *TT International* was whether a contractor could claim for *loss of profits* for *uncompleted work* upon termination on the without default basis. The terms of the contract in that case provided that the Superintending Officer was also to certify for "Loss and Expense" suffered by the contractor as a result of the termination, and "Loss and Expense" was contractually defined to *include* loss of profits (at [27]–[28]). It was in this context that the court held that the termination for convenience clause provides exhaustively for the sums recoverable by the contractor.

238 I hence find that Terrenus is not entitled to object to Attika's claim under cl 14.3.2 of the MBA by asserting that it incorporates Annex F and that Attika's employment was terminated prior to the issuance of CSC.

Whether there is an implied term that Terrenus would be diligent in taking reasonable steps to procure the issuance of the CSC

239 In view of my finding above that cl 14.3.2 of the MBA does not include a requirement to apply Annex F, the issue of whether there is an implied term that Terrenus would be diligent in taking reasonable steps to procure the issuance of the CSC does not arise.

Whether Attika is entitled to the Balance Sum under cl 14.3.2

240 Attika highlights that the Contract is a lump sum contract and that the Balance Sum is $3,139,836.60 (above at [9]). Attika submits that it is simply claiming for what it is owed under the Contract for having completed the Works.

Parties' cases

241 Terrenus submits that Attika lacks evidence to prove that it is entitled to claim for the Balance Sum under cl 14.3.2 of the MBA. Additionally, as the parties have agreed to submit certain claims for Neutral Evaluation ("NE"), the total amount payable under cl 14.3.2 cannot be determined by the court, as it will have to take into account set-offs by Terrenus.[300]

242 In particular, Terrenus contends that Attika's Mr Tan had conceded that Attika would need to: (1) meet the requirements of the authorities to obtain CSC as part of Attika's Works; and (2) carry out three years' worth of inspection and maintenance post-completion (the "Inspection & Maintenance Claim"). Terrenus submits that any sum payable under cl 14.3.2 must include deductions for these items, and Attika has failed to produce any evidence of what their value would be.[301] Terrenus highlights that cl 14.3.2 requires the certification to account for "a proper proportion of any such items which have been partially carried out or performed" and that which is "due to or recoverable by [Terrenus] from [Attika]".[302]

243 Aside from these two items, Terrenus submits that Attika does not have any evidence of the *actual value* of the Works carried out as of the date of termination, 3 February 2022, as required under cl 14.3.2 of the MBA, which pertains to certification of "all work executed prior to the date of termination". Terrenus submits that Attika cannot simply claim for the Balance Sum by taking

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300 Plaintiff's Closing Submissions dated 14 September 2023 at para 10; Plaintiff's Reply Submissions dated 17 October 2023 at para 41.

301 Plaintiff's Closing Submissions dated 14 September 2023 at paras 234–239.

302 Plaintiff's Reply Submissions dated 29 September 2023 at paras 136 and 139(b).

the (adjusted) Contract Sum and deducting sums already paid, without adducing valuation evidence of what *would have been* certified under cl 14.3.2 by the Employer Rep.[303] In essence, Terrenus's case is that if Annex F does not apply, Attika cannot rely on any valuation, including valuations carried out by SOPA adjudicators in the prior SOPA adjudication proceedings, as these are based on the "payment milestones" in Annex F. Attika must do a quantification from scratch. Terrenus submits that Attika could not have discharged its burden of proof, as no quantum expert evidence had been given due to Attika's own tactical decision to dismiss its expert and decline to cross-examine Terrenus's quantum expert.[304]

244 In response, Attika submits that Terrenus did not plead any specific claim for abatement of the Contract Sum based on either: (1) failure to complete Works required to obtain CSC; or (2) three years' worth of inspection and maintenance post-completion not having been carried out. Terrenus's case, as repeatedly confirmed and as understood by both parties, including during the Pre-Trial Conferences and during the course of the trial itself, is simply that while Attika had completed the Works, there were three allegedly substantial defects. The burden is on Terrenus to make out any claims for deductions, which does not change Attika's entitlement to the Balance Sum as the unpaid balance of the lump sum Contract Sum.[305]

245 Attika submits that, in any case, the Contract Sum is also an *aggregate* lump sum price of the individually priced contract works. The three years of

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303 Plaintiff's Reply Submissions dated 29 September 2023 at para 135.

304 Plaintiff's Reply Submissions dated 29 September 2023 at paras 126–141.

305 Defendant's Reply Submissions dated 28 September 2023 at paras 91.

inspection and maintenance were separately itemized and *not priced*. Clause 9.2.2 of the MBA and Note (c) to Annex L also make clear that Terrenus is entitled to engage other contractors to carry out regular inspection and maintenance after the "Defect Liability Period". The Contract does not provide for any sum to be recoverable should Terrenus exercise this right. Attika's entitlement to the full Contract Sum was regardless of whether Terrenus hired another contractor to carry out the inspection and maintenance post-completion.[306]

246 Attika emphasises that Terrenus hangs its entire case on non-completion on the three allegedly substantial defects. Despite having its own quantum expert, Mr See, who had access to all the relevant documents and the opportunity to take measurements at the Solar Farm, Terrenus did not advance any alternative quantum to challenge Attika's evidence of the value of work done. According to Attika, Terrenus cannot now assert that Attika has no evidence of the value of the Work when the value is unchallenged and Terrenus had itself conceded in the Scott Schedule dated 4 July 2021 that "it is prepared to abide by the value of the contract Works as determined in [prior SOPA adjudications] … the value of the contract Works is $4,776,658.50 (at the [Solar Farm]) and when $159,500 (agreed value of Linkway works) is added, the total value of the Works is $4,936,158.50."[307]

247 As for Terrenus's submission that there are claims to be dealt with in NE, Attika submits that those matters cannot be considered by this court and that it does not prevent me from deciding on the amounts that Attika is entitled

306 Defendant's Reply Submissions dated 28 September 2023 at paras 92.

307 Revised Scott Schedule dated 31 July 2023 at 29–30.

to under cl 14.3.2 of the MBA, based on the claims before me. Should Terrenus succeed in its claims in the NE, it can separately recover those amounts from Attika at the appropriate juncture.[308]

Decision

248 There are two broad issues for my determination. First, what is the value of the "works executed prior to the date of termination" by Attika. Second, what is the effect of the agreement to submit claims to NE and whether deductions are to be made from any recoverable sum pursuant to cl 14.3.2 of the MBA.

(1) Certification under cl 14.3.2 and Annex F

249 Before addressing these two issues, I set out my findings in relation to the certification mechanism under cl 14.3.2 of the MBA, as well as the true import of Annex F.

250 Terrenus submits that Attika cannot rely on the Contract Sum and must show what Terrenus's Employer Rep *would have* certified under cl 14.3.2 of the MBA. This is why Terrenus submits that Attika's claim must fail on burden of proof, as Attika has not adduced carried out a valuation exercise.

251 Under cl 14.3.2 of the MBA (above at [230]), Terrenus's Employer Rep is mandatorily obliged ("shall") to certify payment in respect of "all works executed" and this must be done "expeditiously". This places an obligation on Terrenus (*via* its representative) to make such certification expeditiously and to thereafter make payment on the amounts certified. I find that Terrenus had breached this obligation. Terrenus's Mr Yeo testified that it was Terrenus that

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308 Defendant's Reply Submissions dated 28 September 2023 at para 95.

had unilaterally decided to withhold certification, without any agreement with Attika.[309] Terrenus apparently reached a considered decision internally to withhold certification on the basis that it would be "meaningless", whilst it continued to inform Attika that certification was ongoing and was due to be completed by January 2023.[310] Mr Yeo accepted that Terrenus breached cl 14.3.2 of the MBA by failing to certify at all.[311]

252 In view of the above, I find that Attika is not required to prove what Terrenus's Employer Rep would have certified under cl 14.3.2 of the MBA. This was Terrenus's obligation to provide.

253 As for Annex F, Terrenus submits that Attika cannot rely on any prior valuation in the SOPA adjudication proceedings because these were based on the "payment milestones" in Annex F, which no longer apply.

254 I have already held that cl 14.3.2 of the MBA does not incorporate Annex F (above at [238]). In my view, Attika is correct in pointing out that Annex F only goes towards the *timing* of the payments and not the *valuation* of works.[312] Annex F is simply titled "Schedule of Payment". The value of the Works is based on: (1) cl 4.1.1, which establishes Attika's entitlement to be paid the Contract Sum as consideration for the completion of the Works; read with (2) Annex L, the "Schedule of Prices", which itemises the Works and the "Lumpsum Price" for each item, the sum total of which is the Contract Sum (above at [4]). These apply regardless of whether Annex F applies. As cl 14.3.2

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309 NE, 25 July 2023, at 129, lines 12–27.

310 NE, 25 July 2023, at 130, lines 14–19, at 134, lines 6, to 135, line 15.

311 NE, 25 July 2023, at 139, line 22, to 140, line 2.

312 Defendant's Reply Submissions dated 17 October 2023 at para 32.

is the applicable clause upon termination on a without default basis, the timing set out in Annex F no longer applies, and Attika is entitled to payment after the expeditious certification by Terrenus's Employer Rep. In any event, Mr Tan's evidence that the SOPA adjudications had determined the actual valuation of the Works carried out by November 2022 went entirely unchallenged.[313] Terrenus confirmed that such valuation had been carried out.[314]

255 In my view, Terrenus's submission that Attika must carry out a valuation "from scratch" is misguided. The nature of Attika's claim for the Balance Sum is an action for a fixed sum (or action for an agreed sum) under a lump sum contract, rather than a claim for breach of contract that sounds in damages. Attika is claiming for what it is entitled to under Terrenus's primary obligation to pay the Contract Sum, rather than Terrenus's secondary obligation to compensate for damages from breach. Attika therefore need not *prove* the valuation of the Works, as the valuation was already fixed between the parties. The real question is therefore whether Attika has shown that the Works were substantially completed such that it is entitled to be paid the Contract Sum.

(2) Value of the Works completed by Attika

256 I have found that Attika completed its Works on 23 November 2021. Attika did not fail to meet the Date of Completion (after accounting for EOTs). Terrenus failed to prove its case that any of the three defects it claims for were substantial (above at [71], [87], [114], and [132]). I reiterate that Terrenus repeatedly confirmed that Attika's Works were completed, aside from the three

313 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at paras 67 and 69–82.

314 NE, 24 October 2023, at 20–24.

supposedly substantial defects.[315] Terrenus did not submit that works were not done by Attika after the Works were completed and until the date Attika's employment was terminated. Terrenus's Mr Yeo accepted that by the time of termination, all the Works had been completed and that Attika was entitled to be paid the Contract Sum, albeit subject to deductions for defects.[316]

257 As Attika's Works were completed, I find that Attika is entitled to the Contract Sum (above at [254]–[255]). I accept that the starting point for the quantum of Attika's claim is the Balance Sum, in the amount of $3,139,836.60, which accounts for the previously paid sum of $1,910,663.40 (being the sum of $526,900 paid prior to SOPA adjudications plus the adjudicated sum of $1,383,763.40 for the original Works that was subsequently paid), from the (adjusted) Contract Sum of $5,050,500.

(3) What is the recoverable sum

258 The next question is whether Terrenus is entitled to reduce the amount owed to Attika based on the agreement to submit claims to NE and cl 14.3.2 of the MBA. Terrenus's case is based on the proviso to cl 14.3.2 that the certification for "all work executed prior to the date of termination" must take into account "a proper proportion of any such items which have been partially carried out or performed" (the "Proviso"). There are three groups of items which merit further consideration to assess if they provide a basis for Terrenus's claimed deductions based on the Proviso.

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315 NE, 25 July 2023, at 65, lines 31–32, and 99, lines 4–8; NE, 26 July 2023, at 88, lines 16–19; NE, 27 July 2023, at 44, lines 9–11 and 21–22; NE, 7 August 2023, at 73, lines 14–17; NE, 10 August 2023, at 113, lines 13–30.

316 NE, 25 July 2023, at 99, lines 4–8 and 26–31.

259 First, Terrenus contends that Attika failed to meet the requirements of the authorities to obtain CSC, which it was obliged to do, and that there ought to be deductions for this. Counsel for Terrenus confirmed that this refers to directions issued by NParks pursuant to Terrenus's CSC application, where NParks required the planting of cow grass at parts of the Solar Farm before approval for CSC could be obtained (the "Cow Grass Claim").[317] I note that Terrenus had accepted that the Cow Grass Claim was not pleaded.[318] Near the close of trial, Terrenus applied to amend its Reply and Defence to Counterclaim to include this allegation, but ultimately withdrew the application.[319]

260 Second, Terrenus contends that there ought to be deductions for the Inspection & Maintenance Claim. It is undisputed that Attika cannot carry out post-completion inspections and maintenance as its employment has been terminated.

261 The third group comprises the claims to be sent for NE. On the first day of trial, Terrenus provided a list of the claims that parties had agreed to send for NE. These relate to: (a) non-compliance with the requirement of a 1.5m gap between the solar arrays; (b) fencing using concrete stumps; (c) damaged solar panels; (d) ponding; (e) general loss and damage or alternatively diminution in value for the rest of the non-compliance and defects; (f) back-charges BC-1 and BC-8 in relation to VO-1 brought by Attika; (g) BC-2, BC-3, BC-4 and BC-21; and (h) unrecovered legal costs for SOPA adjudication.

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317 NE, 24 October 2023, at 29, lines 14–19.

318 NE, 1 August 2023, at 129, lines 27–29; NE, 10 August 2023, at 100, line 25, to 101, line 3.

319 HC/SUM 2380/2023; NE, 10 August 2023, at 102, line 32.

262 The question that arises is whether there should be any deductions for the above three groups, arising from the Proviso. I make three points about this.

263 First, any deductions to be made under the Proviso must necessarily be sums that are related to the works certified under cl 14.3.2 of the MBA (*ie*, Attika's Works), and not any other general claims that Terrenus may have or might try to bring against Attika. This is in view of how cl 14.3.2 is structured. It begins by stating that Terrenus's Employer Rep shall certify works "executed prior to the date of termination". It then allows for the Employer Rep to take into account a "proper proportion of any such items which have been partially carried out or performed". This, again, is related to the works certified. It next states at cl 14.3.2(b) that the certification for payment includes the cost of materials reasonably ordered for the works (above at [230]). The sums "due to or recoverable by [Terrenus] from [Attika]" at the end of cl 14.3.2 must necessarily also mean such sums that are recoverable in relation to the works certified or materials reasonably ordered for the works, and not otherwise. I thus reject Terrenus's submission that the Proviso should be read widely to include anything that is generally recoverable by Terrenus, without some relation to works executed prior to termination. Such a wide reading of the Proviso will render the earlier parts of the clause, which allow for a proper proportion of works partially carried out, redundant. Terrenus also submits that a final accounting exercise must necessarily include any other claims by Terrenus, but there is no language of final accounting in cl 14.3.2.

264 Following from the above analysis, certain items under the third group of claims that Terrenus is bringing to NE should not be deducted under cl 14.3.2 of the MBA. This thus excludes the back-charges BC-1 and BC-8, which are in relation to the claim for a variation order brought by Attika, which are not under

the scope of Attika's Works under the Contract. It must also exclude the unrecovered legal costs for SOPA adjudication, which is also unrelated to the Works. In the same vein, the Inspection & Maintenance Claim and the Cow Grass Claim do not relate to works executed prior to the termination of Attika, and do not fall under the Proviso. This is without prejudice to Terrenus's ability to bring a claim against Attika in respect of the above items.

265 Second, there are items which the court has been made aware of, but for which Terrenus has not provided any particulars on their value. This includes Terrenus's claims in the NE relating to other non-compliances or in relation to BC-2, BC-3, BC-4 and BC-21, as well as Terrenus's claim for non-compliance with the requirement of a 1.5m gap between the solar arrays, for which damages are to be assessed. As summarised (above at [241]–[242]), it is Terrenus's own submission that there is no evidence of the value of the Inspection & Maintenance Claim and the Cow Grass Claim. The post-completion inspection and maintenance is listed under Section 3 of Annex L of the MBA. Unlike the items in Sections 1 and 2 of Annex L, there is *no pricing* for this, and therefore no apparent value for the Inspection & Maintenance Claim. The Cow Grass Claim was not properly put in issue and is not under any part of Annex L of the MBA. Again, there was no evidence led on the price of this item of work. Given the lack of particulars on the value of the work for these items, I make no provision for them in terms of any deductions pursuant to the Proviso. This is without prejudice to Terrenus's ability to bring a claim in respect of these items in NE.

266 Third, in my view, the phrase "less any sum … recoverable" does not mean *only* such sums that Terrenus is able to establish its entitlement to, which is Attika's submission. The establishment of Terrenus's entitlement would

entail a detailed examination of the merits of Terrenus's claims. However, this is not what the clause states. Given that this clause pertains to *expeditious* certification, delaying certification until such entitlement can be established runs contrary to the envisioned time frame of the clause. This could involve further delay, contrary to the plain intent of cl 14.3.2 of the MBA, which emphasises expeditious certification followed by payment. Indeed, the clause does not stipulate any form of adjudicatory mechanism or forum for the determination of a party's entitlement to the sums. I therefore do not accept Attika's submission that the clause is limited only to sums Terrenus has proven are recoverable.

267 Following from this, I find that the sum due to Attika should account for deductions of the following claims that will be brought to NE: (a) fencing using concrete stumps (replacement cost of US$69,072.90)[320] (while Terrenus's mentioned a possible diminution in value of $650,000 for this, this quantum has not been adduced in the evidence of Terrenus's witnesses, compared to the replacement cost);[321] (b) damaged solar panels (US$16,848);[322] and (c) ponding ($49,861).[323]

268 Consequently, in light of the Proviso and what has been presented by Terrenus, I find that the payment of the Balance Sum pursuant to cl 14.3.2 of the MBA, should include a deduction for the sum of the identified quantum in these claims, which is the sum total of $49,861 and US$85,920.90. This

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320 Affidavit of Evidence-in-Chief of Bong Eng Yueh dated 13 May 2023 at 3202.

321 Scott Schedule for Plaintiff's Claims dated 5 July 2023 at 21.

322 Scott Schedule for Plaintiff's Claims dated 5 July 2023 at 34.

323 Affidavit of Evidence-in-Chief of Bong Eng Yueh dated 13 May 2023 at paras 167–169.

deduction *does not* purport to determine which party is entitled to the deducted sums and is without prejudice to Attika's recovery of such sums from Terrenus at NE.

Whether Attika is entitled to costs on an indemnity basis due to Terrenus's breach of cl 21.1.1

269 The seventh main issue relates to Attika's claim for costs on an indemnity basis.

Parties' cases

270 Attika submits that cl 21.1.1 of the MBA provides that before filing a suit in court, all disputes are to first be referred to the Singapore Mediation Centre ("SMC") for resolution, and further that parties may notify each other in writing within twenty-one days stating their intention to submit the matter to mediation. Terrenus failed to abide by this clause. It filed S 173 without submitting the dispute to mediation despite counsel for Attika's holding response that it was taking instructions. Terrenus filed S 173 just 13 days after its first letter dated 17 March 2022. Terrenus did not give Attika the 21 days required under the Contract. Attika accepts that the Parties did attend a mediation session after the commencement of the proceedings. However, as cl 21.1.1 was for parties to mediate in good faith, having a mediation *after* S 173 was already filed did not fulfil the intended purpose of the clause. Attika submits that the court should consequently exercise its discretion to award costs on an indemnity basis, citing *Airtrust (Hong Kong) Ltd v PH Hydraulics & Engineering Pte Ltd* [2016] 5 SLR 103 (at [18]).

271 Terrenus submits that there is no dispute that at the time when Terrenus wrote to Attika on 17 February 2022 to give notice of intention to mediate, the

parties were already in serious dispute and had engaged in a number of SOPA adjudications. Attika dragged its feet on mediation and refused to even confirm that it wished to mediate. 14 days later, Terrenus proceeded to commence this Suit on 3 March 2022. There is no dispute that a mediation subsequently took place thereafter and was unsuccessful. Thus, Terrenus submits that Attika cannot point to any real loss or prejudice. Clause 21.1.1 is unclear as to whether the parties *must* wait for 21 days after a notice of intention to mediate is given, before commencing a suit. In any event, a departure from the usual standard for costs by ordering indemnity costs is the exception rather than the norm. It must be justified by a "high degree of unreasonableness" which causes prejudice. The factual context does not amount to a high degree of unreasonableness and Attika cannot point to any prejudice, even if Terrenus breached cl 21.1.1.

Decision

272 Clause 21.1.1 of the MBA requires parties to first submit any dispute to SMC for amicable resolution prior to commencing litigation in the courts. Terrenus *is* in breach of this clause by filing S 173 without first submitting this dispute to the SMC for resolution. I do not condone such a breach. Nevertheless, this alone does not mean that Attika is entitled to costs on an indemnity basis. In this case, parties did subsequently proceed to mediation, which was unsuccessful. Attika submits that the fact that Terrenus had already filed S 173, meant that Terrenus did not mediate in good faith. However, Attika does not have any other evidence to suggest that Terrenus lacked good faith when mediating. Attika has not, for example, highlighted anything else from Terrenus' conduct in the lead up to the mediation or during the mediation, that suggests a lack of good faith. I find that the filing of S 173 alone does not substantiate Attika's submission. There have been instances of successful

mediation after litigation has commenced or after the trial has been concluded and the matter is pending appeal. At the same time, the fact that a mediation did not succeed does not necessarily lead to the conclusion that one party acted in bad faith. I thus find that Attika has not shown what prejudice it suffered, simply because Terrenus filed S 173 before later proceeding to mediation. Neither has Attika shown what prejudice it suffered, by Terrenus waiting for only about 13 days rather than the full 21 days for Attika to respond. I find that Attika has not provided evidence of conduct that rises to the threshold of warranting an award for indemnity costs. Nevertheless, I will take into consideration submissions on this factor when exercising my discretion on costs.

Conclusion

273 I set out in the table below, a summary of the claims allowed:

Terrenus's claims	**Findings**
Non-compliance with the minimum embedment depth of 500mm for PEG Rods	Nominal damages of $1,500
Non-compliance with ground clearance of 700mm for solar panels	Nominal damages of $1,500
Failure to comply with Clause 5.2.1	Damages at $912
Liquidated damages for delay (cl 17.1.2)	$30,600 (six days of delay)
Total	$34,512
Attika's counterclaim	**Findings**
Balance Sum (cl 14.3.2)	S$3,139,836.60 – (S$49,861 + US$85,920.90)

	= S$3,020,902.7 – US$16,848

Pre-judgment interest

274 Attika pleaded for pre-judgment interest at the rate of 5.33% per annum from the due date of the sums due until the date of full payment, pursuant to s 8 of SOPA. Section 8(1) of SOPA sets out how to determine the due date for payment of a progress payment, while s 8(5) provides for the applicable interest rates on the unpaid amount of the progress payment.

275 Section 5 of SOPA provides that any person who has carried out any construction work, or supplied any goods or services, under a contract is entitled to a "progress payment". Section 2 of SOPA defines "progress payment" as a payment to which a person is entitled for the carrying out of construction work, or the supply of goods or services, under a contract, and includes a single or one-off payment (including a final payment) or a payment that is based on an event or a date (including a final payment). Attika submits that its claim for the Balance Sum pursuant to cl 14.3.2 of the MBA fall within the definition of "progress payment" under SOPA and that s 8 of SOPA is thus applicable here. Terrenus accepts that s 8 of SOPA is of general application and is not dependent on Attika's entitlement to serve a payment claim under s 10 of SOPA.[324]

276 Attika relies on s 8 of SOPA in respect of two sums: (a) the sum of $1,020,000 which is payable upon issuance of TOP (20% of the Contract Sum) for which Attika submits interest runs from the date of TOP issuance (12 January 2022); and (b) the remainder of the Balance Sum due (excluding

[324] Plaintiff's Further Submission on Interest Rate and Dates dated 9 November 2023 at paras 8 and 10.

$1,020,000), pursuant to cl 14.3.2 of the MBA, for which Attika submits interest runs from 2 March 2022.[325]

277 While Attika pleaded that it is entitled to payment of 20% of the Contract Sum on issuance of TOP pursuant to Annex F of the MBA,[326] it did not ultimately advance its claim for the Balance Sum on the basis of Annex F, but on the basis of cl 14.3.2. In its calculations for what is due under cl 14.3.2, Attika did not break down the Balance Sum due into the sum of $1,020,000 due from the Annex F milestone for issuance of TOP being met, and the remainder of the Balance Sum. Instead, it sought the undifferentiated sum of $3,139,836.60. In its submissions on the interpretation of cl 14.3.2, Attika has submitted that the words "as set out in the agreement" under cl 14.3.2 refers only to the scope of Works under the Contract and not to Annex F, a submission which I agreed with (above at [236]). Attika's Mr Tan had also stated that payment to Attika under cl 14.3.2 is "not dependent on the issuance of TOP or CSC".[327] In light of how Attika has conducted its case, as documented in its submissions and affidavits, I do not consider it fair to now treat interest on the sum of $1,020,000 as being due from the date of TOP issuance. I will instead consider the treatment of interest on the Balance Sum as a whole.

278 For the remainder of the Balance Sum that is due under cl 14.3.2 of the MBA, Attika submitted that under s 8(1) of SOPA, interest should run from 2 March 2022, *ie*, the date of the writ. Section 8(1) of SOPA provides that the progress payment shall become due and payable from the date specified in the

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325 Defendant's Submissions on Interest dated 1 November 2023 at paras 1 and 8.

326 Defence and Counterclaim at para 111 and 114.

327 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at para 100.

contract or determined accordance with the terms of the contract. While cl 14.3.2 did not specify a date, it did set out a process whereby Terrenus's Employer Rep was obligated to expeditiously certify payment to Attika after its termination of Attika's employment on 3 February 2022. Attika submits that if Terrenus had complied with this obligation, payment of the Balance Sum would have been due shortly after termination and certainly by the date of the writ on 2 March 2022.

279 Terrenus submits that since cl 14.3.2 of the MBA does not provide for a date for payment to be made, and only provides that certification should be done expeditiously, s 8(2)(a) of the SOPA applies, with interest running from 14 days after the relevant tax invoice is submitted by Attika. Since no tax invoice has been submitted for a cl 14.3.2 claim, pre-judgment interest does not run under s 8 of SOPA.

280 Examining cl 14.3.2 of the MBA, I find that it does not provide for a specific date for payment, nor does it contain terms that would allow for the determination of the due date of payment. Attika relies on the fact that cl 14.3.2 places an obligation on Terrenus to "expeditiously certify the amounts payable". However, this only speaks to the need for expeditious certification. There is nothing in cl 14.3.2 which deals with the due date for payment, after expeditious certification has been carried out. Under s 8(2) of SOPA, where a construction contract does not provide for the date on which a progress payment becomes due and payable, the progress payment is due 14 days after the tax invoice for that payment is submitted. However, there is no evidence of such invoice being submitted here. In view of this, I find that Attika is not entitled to rely on s 8(2) of SOPA for its claim on pre-judgment interest.

281 Nevertheless, s 12(1) of the Civil Law Act 1909 (2020 Rev Ed) provides that the court has the discretion to order pre-judgment interest. Terrenus submits that in this circumstance, the date for pre-judgment interest for Attika's claim for the Balance Sum pursuant to cl 14.3.2 of the MBA should start from 18 July 2023. This is the date when Attika filed its Opening Statement, which Terrenus submits is the date when the cl 14.3.2 claim was first bought. Terrenus submits that, while it was prepared not to object to the late introduction of the cl 14.3.2 claim by Attika, it would not be fair to allow Attika to both bring a claim late in the day and allow interest to run long before that date. In response, Attika reiterates its position that 2 March 2022 should be the relevant date, on the basis of the need for expeditious certification under cl 14.3.2. In *Robertson Quay*, the Court of Appeal approved (at [100]) that "in principle interest should commence to run from the moment the cause of action does accrue in respect of loss which also then accrues". In *Grains and Industrial Products Trading Pte Ltd v Bank of India and another* [2016] 3 SLR 1308 ("*Grains*") the Court of Appeal held (at [138]) that "claimants who have been out of pocket without basis should be able to recover interest on money that is found to have been owed to them from the date of their entitlement until the date it is paid".

282 I agree with Attika that, following the principles set out in *Robertson Quay* and *Grains*, pre-judgment interest generally commences from when the loss accrues or when the entitlement to be paid arises, rather than when the claim was brought. I also accept Attika's submission that as cl 14.3.2 of the MBA obliges Terrenus to certify expeditiously, it would be fair to consider this to notionally have been carried out by about a month after termination, around 2 March 2022. As I have highlighted above, however, there is a difference between certification and payment following certification. I consider that it is fair to allow for a month for payment to be made after certification, *ie*, around

2 April 2022. I therefore hold that Attika is entitled to pre-judgment interest on the Balance Sum from 2 April 2022 to the date of this Judgment.

283 In terms of the applicable interest rate, Attika refers to a redacted letter from a bank which it submits shows an interest rate of 5.27% that Attika incurred for its loan facility. However, this redacted letter does not say who the letter is addressed to. Neither did Attika state that any of its witnesses had adduced this letter into evidence or explained what this letter refers to. It was held in *Grains* (at [137]), that pre-judgment interest compensates for the time value of money the use of which was lost between the date the cause of action arose and the date of judgment. Hence, I consider that in principle, Attika is entitled to interest on the basis that payment would have reduced or obviated its need to borrow from financial institutions. However, I do not find sufficient evidential basis to adopt Attika's submitted rate of 5.27%. Terrenus submits that if this was the basis for considering the applicable interest rate, the mean interest rate from the evidence adduced by Attika's Mr Tan is 3.1%.[328] Given that this is based on evidence from Attika, I hold that the applicable interest rate for the pre-judgment interest on the Balance Sum due under cl 14.3.2 is 3.1%.

284 I turn next to the interest on the sums awarded to Terrenus. While Attika submits that Terrenus should not be entitled to pre-judgment interest on the basis that Terrenus had held on to the Balance Sum and hence enjoyed the time value of using these excess funds, I have dealt with this by the award of pre-judgment interest on the Balance Sum in favour of Attika.

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328 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at 2991–2992.

285 Terrenus submits that the applicable date for interest to run for its claims should be 2 March 2022, *ie*, the date of the writ. Attika submits that it should be 11 March 2022, as the 21-day notice period in cl 21.1.1 of the MBA would have ended on 10 March 2022. I have dealt with and dismissed Attika's claim for indemnity costs above. Attika's claims for remedies in relation to this breach, should be and are dealt with under that claim. I therefore do not consider 11 March 2022 to be a relevant date. Following from the above, I order that pre-judgment interest on the nominal damages, diminution in value and liquidated damages due to Terrenus, is to run from 2 March 2022 till the date of this Judgment.

286 There is no evidence from Terrenus that payment would have reduced or obviated its need to borrow from financial institutions, such that a lending rate would be appropriate. Neither is there evidence to support its submission that 5.33% is the appropriate rate for compensation. The lack of evidence from Terrenus is clear from its submission pointing to "actual lending rates which presumably would be available in published financial reports".[329] At the same time, there is evidence from Attika that the average fixed deposit rate for its deposits between 2020 to 2021 was about 0.18%.[330] It is entirely possible that such a fixed deposit rate would have also been open to Terrenus. I hence fix the pre-judgment interest rate for the sums due to Terrenus at 0.18%.

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329 Plaintiff's Further Submission on Interest Rate and Dates dated 9 November 2023 at para 27.

330 Affidavit of Evidence-in-Chief of Tan Buan Joo dated 11 May 2023 at 2990.

287 Unless parties agree on costs, they are to put in their submissions on costs, limited to ten pages, within 3 weeks of this Judgment.

Kwek Mean Luck
Judge of the High Court

Teo Wei Xian Kelvin (Zhang Weixian Kelvin) and Zhao Junning (Drew & Napier LLC) for the plaintiff;
Lee Peng Khoon Edwin, Amanda Koh Jia Yi, Raheja Binte Jamaludin, and Smrithi Sadasivam (Eldan Law LLP) for the defendant.