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MEMORANDUM

To:	Rob Holmlund (Humboldt Bay Harbor, Recreation, and Conservation District)
From:	Michael Jokerst and Ashley Knipe
Date:	March 27, 2024
Subject:	On-Site Workforce Quantity
Project:	Redwood Marine Multipurpose Terminal Replacement Project
Location:	Eureka, California
M&N Job No.:	212991-03
Cc:	Shane Phillips

Disclaimer: *This draft technical memorandum is a work-in-progress and is intended to be an internal document for use by the Humboldt Bay Offshore Wind Heavy Lift Marine Terminal Project team as a part of the conceptual design process and the ongoing permitting process. This memorandum is meant to be read as a part of a comprehensive packet of technical analyses. It is not written to be a standalone document and it is assumed that the reader has substantial project knowledge and context to understand the memorandum's content. All aspects of this memorandum are subject to change and may become less accurate over time. To better understand the project, please review the more comprehensive and up to date documents posted to the Humboldt Bay Harbor District's website at https://humboldtbay.org/humboldt-bay-offshore-wind-heavy-lift-marine-terminal-project-3.*

The purpose of this memorandum is to document Moffatt & Nichol's (M&N's) analysis method to determine the expected workforce size at the completed terminal. This memorandum is organized as follows:

1. Introduction
2. Methodology
3. Conclusion
4. Limitations
5. Next Phase Considerations
6. Reference Documents

1. INTRODUCTION

The proposed Redwood Marine Multi-Purpose Terminal includes two wharves and a wet storage tie-up pier to meet the operational needs of a heavy-lift marine terminal facility to support the offshore wind energy industry and other coastal-dependent industries.

Once operations begin at the terminal there will be an influx of workers to provide administration, fabrication, assembly, and other tasks. The quantity of workers coming on-site needs to be estimated as it has effects on design decisions such as utility demands, building sizes, and parking concerns.

The State of California (The State) commissioned a study to determine the estimated workforce needed to meet the goal of producing 25 Gigawatts of offshore wind power generation by 2045. The results of the study are presented in the *AB 525 Workforce Development Readiness Plan* Report (2023). This report presents the best information available regarding the expected workforce and was referenced to determine an estimated workforce at the subject terminal.

The findings of this memo are incorporated into the Terminal Permitted and Future Operations Memo (M&N, Jan 2024) as the basis of the workers on site for each type of operation.

2. METHODOLOGY

Projected workforce totals by type of operation and totals per year from Appendix J in the AB 525 Report were referenced for the analysis. There are multiple scenarios provided in which a “high” scenario represents the quantity of elements needed to meet the State’s goal of wind turbine devices (WTD) being manufactured, and “medium” scenario represents a realistic upper limit of what is achievable.

The “high” scenario considers the following:

- 3 ports for staging and integration (S&I)
- 1 turbine nacelle assembly facility
- 2 blade manufacturing facilities
- 1 tower manufacturing facility
- 2 foundation manufacturing facilities
- 2 subsea cable manufacturing facilities
- 1 mooring line manufacturing facility
- 1 anchor fabrication facility

The “medium” scenario envisions the following:

- 3 ports for staging and integration (S&I)
- 1 tower manufacturing facility
- 1 foundation manufacturing facility
- 1 subsea cable manufacturing facility
- 1 mooring line manufacturing facility
- 1 anchor fabrication facility

Blade and Tower Manufacturing: An assumption was made that there is a similar amount of workforce needed between tower and blade manufacturing activities. The “medium” scenario for “wind turbine supply workers” states 351 workers are expected for one tower manufacturing facility. It is assumed approximately 350 workers will be needed for blade manufacturing as well.

Foundation Assembly: Foundation component fabrication is assumed to occur offsite and only assembly of parts will occur on-site.

To determine assembly workforce the difference between the “high” and “medium” scenario is 1 foundation operation and 1 subsea cable operations. Between the years 2034 and 2036 there are between 234 and 295 workers, then in the following year the worker quantity increases to 529. It is assumed the 295 workers in the year 2036 represents the foundation only, and when the workers increases to 529 in later years it includes the subsea cable manufacturing as well. It can be concluded that 295 workers are needed for the total foundation operation. It is further assumed that the smaller scope of only assembly, rather than fabrication and assembly, will require 1/3 of the total estimated workers, or approximately 100 workers.

Staging and Integration: The staging and integration operation peak occurs in 2040 and is for all of California. If it is assumed the project will handle 40% of the S&I needed to meet California's target there will be an average of 266 workers on-site, or approximately 275.

3. CONCLUSION

The following four scenarios can be considered for the site:

1) The site only has staging and integration: 275 workers on site

2) The site will have staging and integration plus final assembly of the foundations on site: 375 workers

3) The site will have S&I, final assembly of the foundations, and 1 manufacturing area: 725 workers

4) The site will have S&I, and 2 manufacturing areas (blade or tower): 975 workers

4. LIMITATIONS

The workforce quantity is inferred from the AB525 report. While this report represents the best information available it would be better to confirm with specific operators, vendors, etc.

5. NEXT PHASE CONSIDERATIONS

At the start of the next phase of work, the following are critical steps in the continuation of the planning, analysis, and design work.

- Confirm which operations are most likely to occur on site. For example, if manufacturing is not realistic it would be better to eliminate considerations for this quantity of workers.
- Confirm if the quantity of workforce considered for the site will be sufficient to cover design demands for any future operations at the terminal that are not related to the offshore wind industry.
- Confirm worker assumptions with specific operators, vendors, etc.

6. REFERENCE DOCUMENTS

- AB 525 Worker Readiness Plan, California State Lands Commission, 6/16/2023 https://efiling.energy.ca.gov/GetDocument.aspx?tn=251090&DocumentContentId=86044
- Terminal Permitted and Future Operations Memo, M&N Jan 2024

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