

MP17033 Unity - Data Collection and Transformation Report

Date of Analysis: 18-Aug-2023



Introduction

This report provides a comprehensive analysis of the cost associated with different Equipment in the Unity FPSO Project. The analysis focuses on Piping, Special Piping, Structure, Valves and Bolts within the realms of SBM Scope and YARD Scope. The report includes an overview of all scopes and equipment involved, followed by detailed insights for each equipment. The report elucidates the total expenditure, alongside detailed cost breakdowns for each equipment category, metrics on cost per kilogram, and cost per supplier.

Overview of Scopes and Materials

This analysis of the Unity Project consists of two different scopes, including:

a. SBM Scope

- Piping
- Special Piping
- Valve
- Bolt

b. YARD Scope

- Piping
- Special Piping
- Structure
- Valve
- Bolt

Data Collection and Transformation: Enhanced Project Analysis Report

Overall Summary

The Unity Project FPSO stands as a key project for our company. It signifies deep operational and financial implications. Our in-depth analysis provides insights into the project's scope and complexities. Upon examining, the total material weight for the project is approximately 3737.910 metric tons. This includes various components from small fittings to major structural parts. The Material Take Off (MTO) shows an equipment cost of \$60268.567 thousands USD. Including all aspects of the Unity Project FPSO, the total financial implication is about \$1143953.07 thousands UDS (a sum of all purchased order). Manpower and time are crucial. We obtained approximately a total of 620673.63 hours for this project alone. As Unity project is at its end we had a good amount of data to work with. The project demands 607407 individual material pieces, highlighting its intricacy. About 146658.838 meters of material is needed, with 86614.6 meters sourced from the YARD.

Detailed Scope Analysis

As mentioned above, in our assessment, we've distinguished between two primary scopes: SBM and YARD Scope. Under the SBM scope, there's a total of 601921 pieces, markedly higher when compared to the YARD scope, which totals 5470 pieces. When considering weight, materials in the SBM scope amass to 5517.362 tons. On the other hand, YARD scope materials have a cumulative weight of 62.891 tons. These figures underline the material distribution and weight disparities between the two pivotal project sectors.

Material Types Breakdown

The weight distribution across various material types reveals key insights into the project's construction. Piping emerges as the dominant equipment, accounting for a notable 4256.720 tons. Following closely are the valves, which contribute 1208.149 tons, making them the second most weighty category in the project. Structural elements, pivotal to the project, register a total weight of 10416.9 tons. Not to be overlooked, special piping materials, a distinct category in our inventory, weigh 118.560 tons. Such a breakdown accentuates the emphasis of particular material types, echoing the project's functional requirements and design choices.

Understanding Surplus and Wastage

In the evaluation of the project's material management, we identify two essential components: surplus and wastage. The surplus primarily manifests in piping, where an additional 746 pieces are noted. These surplus materials represent an associated cost of \$294.931 thousands of dollars, highlighting the need for efficient utilization. Concurrently, we have identified wastage within structural equipments. Approximately 13010.2 tons of structural wastage have been observed. This insight emphasizes the significance of meticulous material planning and allocation to minimize waste and align with budgetary constraints.

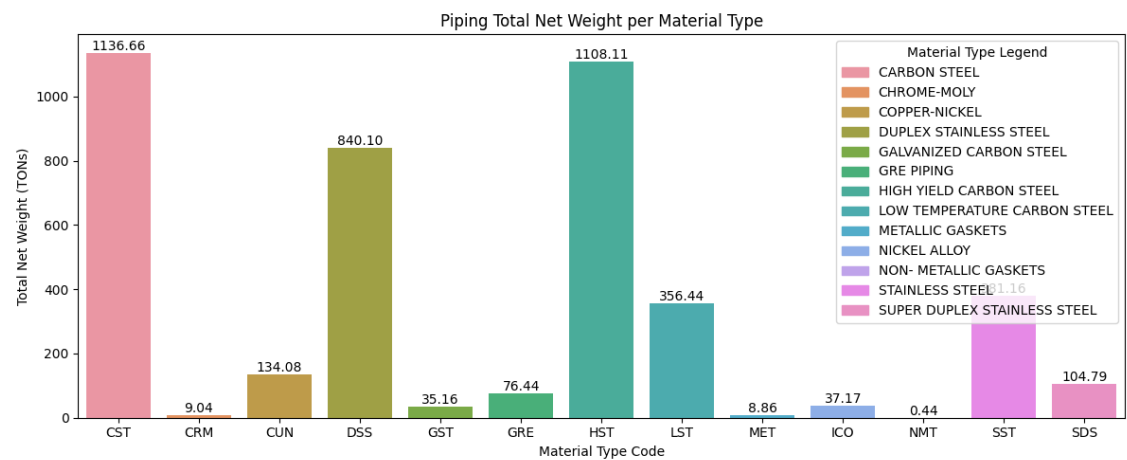
Purchase Order Metrics

The overall total pieces of piping, special piping and bolt equipments analyzed from the PO's placed in NADIA are 23576, and the total meters mainly from piping are 14323.

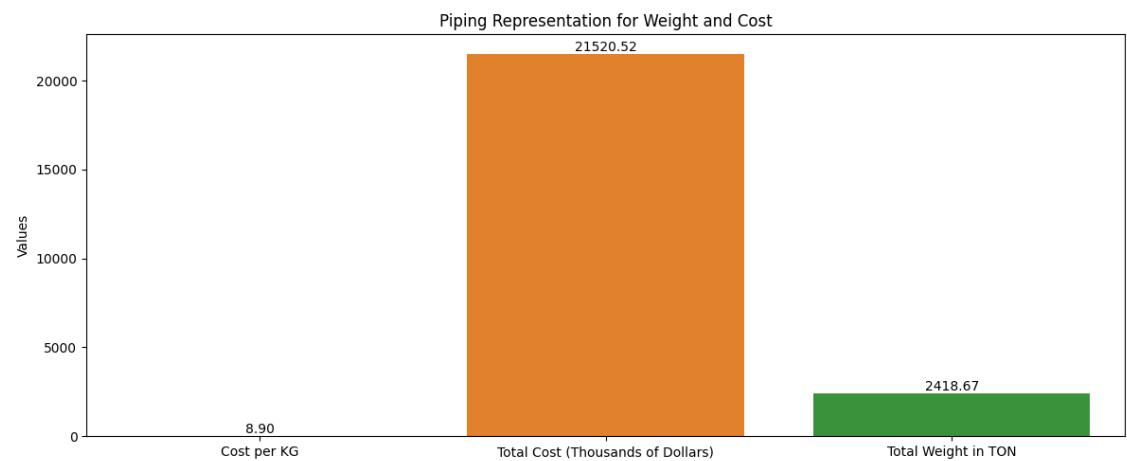
SBM SCOPE - Breakdown

Piping Specification - SBM Scope

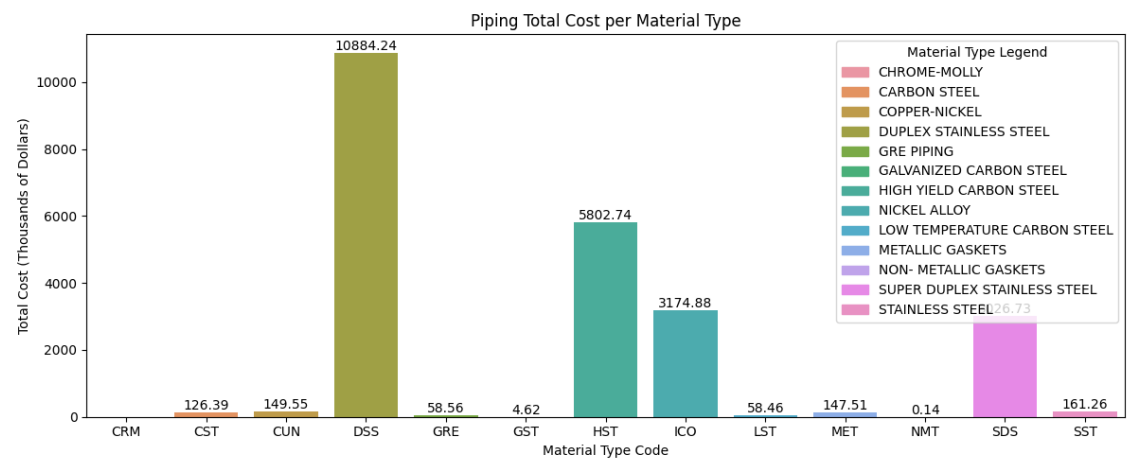
The cumulative weight of the piping stands at 4228.43 TONs, associated with a financial outlay of 21505.96 Thousand USD. The total number of piping pieces amounts to 99555, covering a material length of 59404.97 meters.



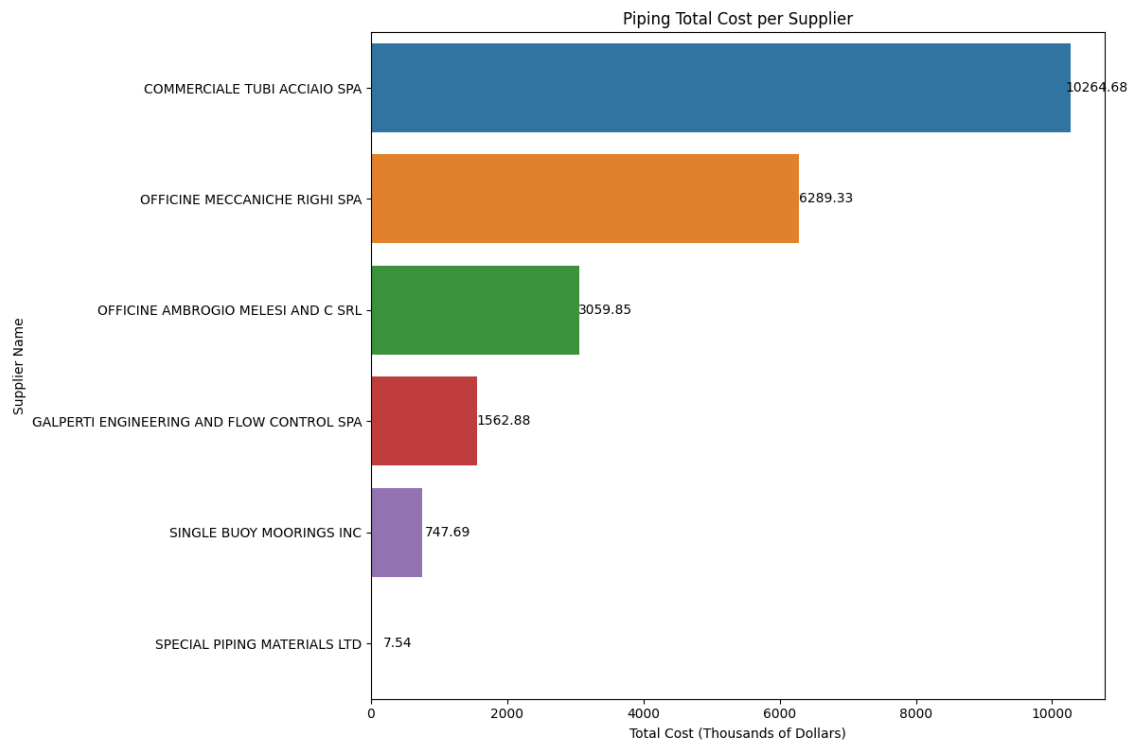
1 - Total Piping Weight per different Materials.



2 - Piping overall Cost and Weight relation.



3 - Piping Total Cost representation per each material type.

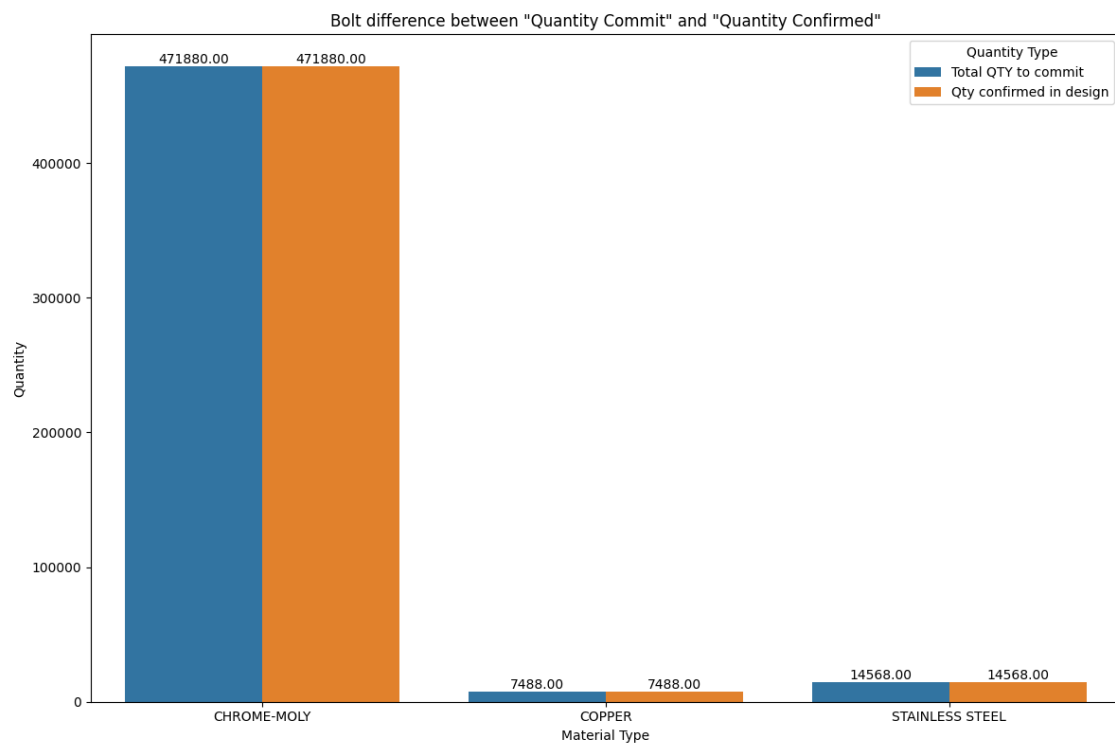


4 - Graphic representation of the Piping cost by different suppliers.

Bolt Specification - SBM Scope

The total count of bolts is approximately 493936 pieces.

The associated financial expenditure for bolts approximates to 112.26 Thousand USD.

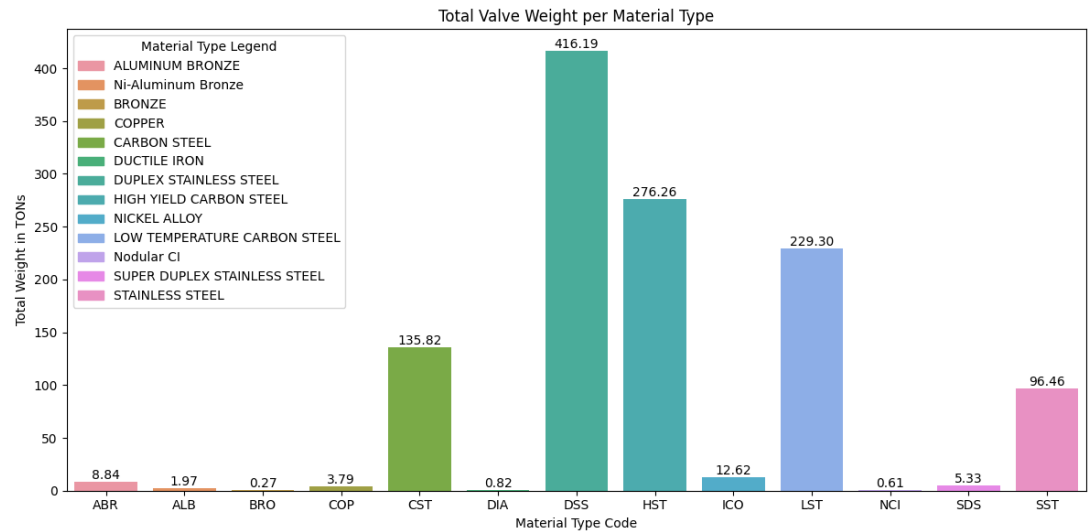


1 - Bolt quantity in design versus quantity committed.

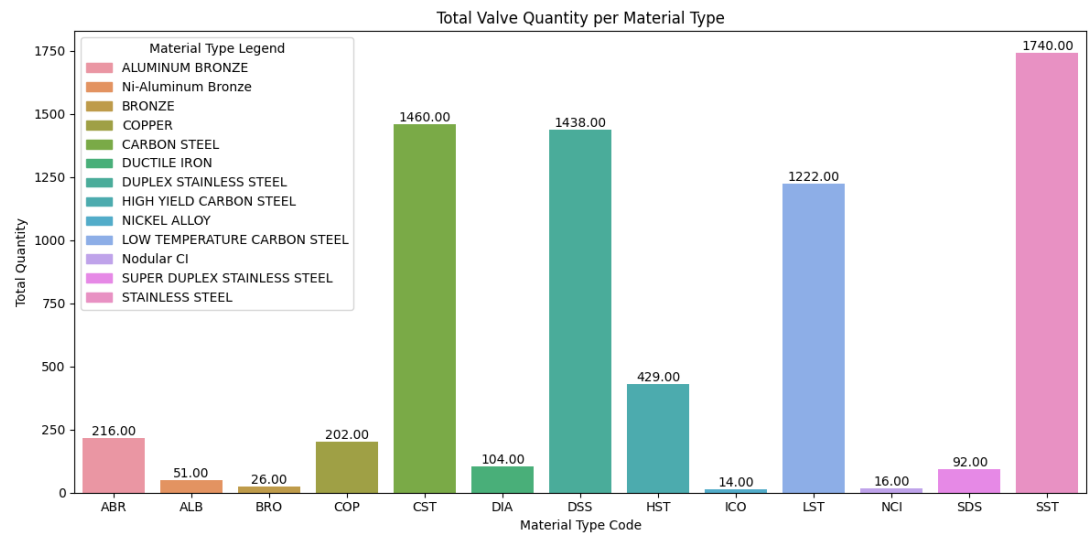
Valve Specifications - SBM Scope

The cumulative weight of valves stands at approximately 1188.28 TONs.

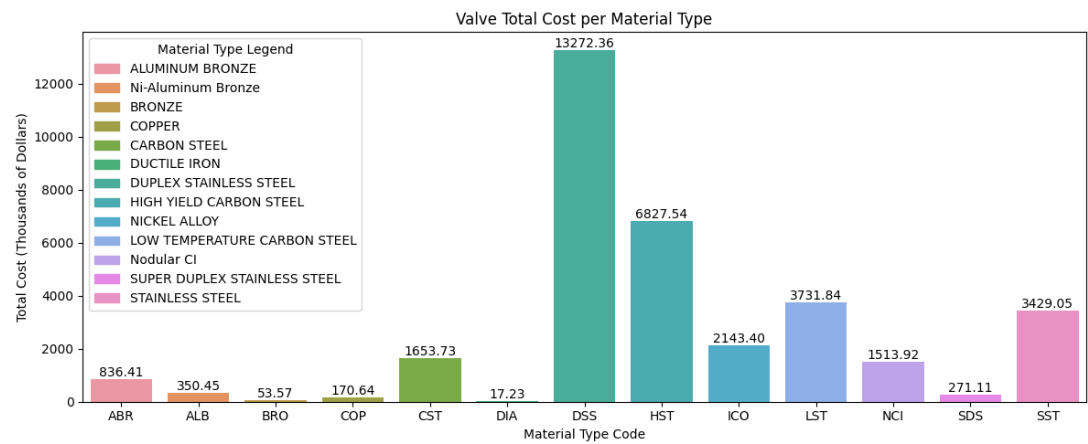
In terms of quantity, there are approximately 7073 valve units.



1 - Valve Weight distribution by the material type.



2 - Valve total pieces quantity per each material types.

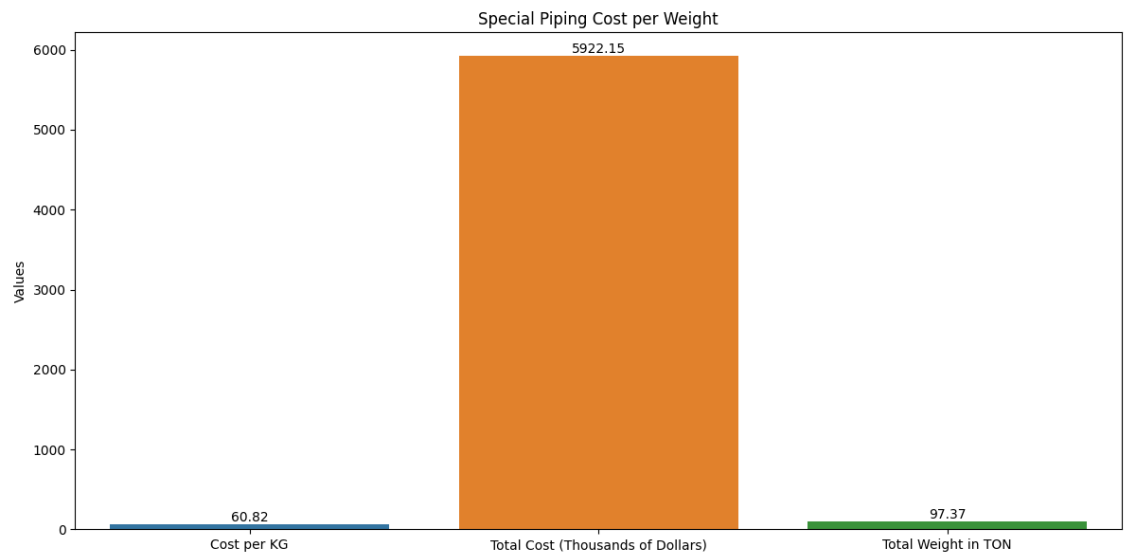


3 - Valve overall cost per each material types.

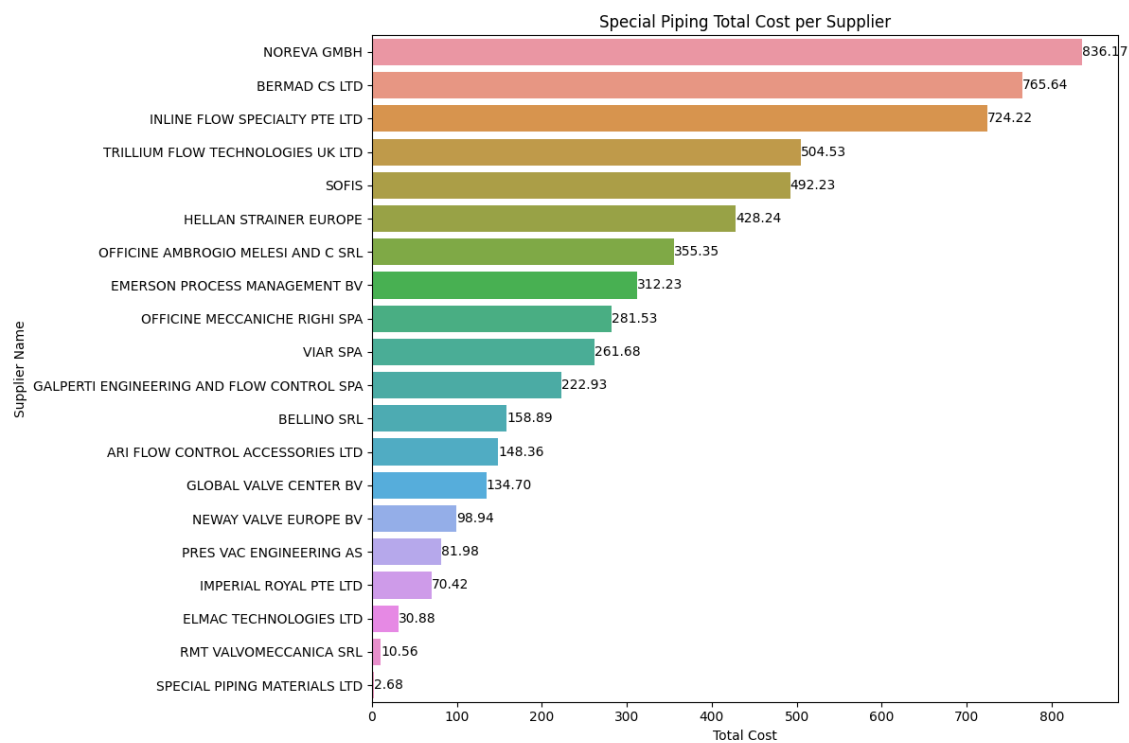
Special Piping Specifications - SBM Scope

The Special Piping segment boasts a cumulative weight of approximately 100.65 TONs.

The quantity of Special Piping units amounts to 1357, with an estimated expenditure of 5922.15 thousands of dollars.



1 - Cost and Weight relation of the Special Piping equipments.

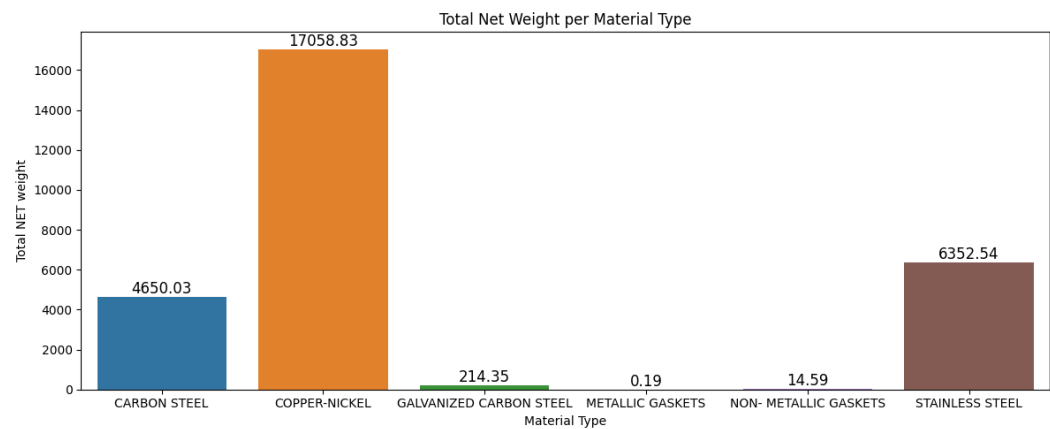


2 - Overall Special Piping cost per different suppliers.

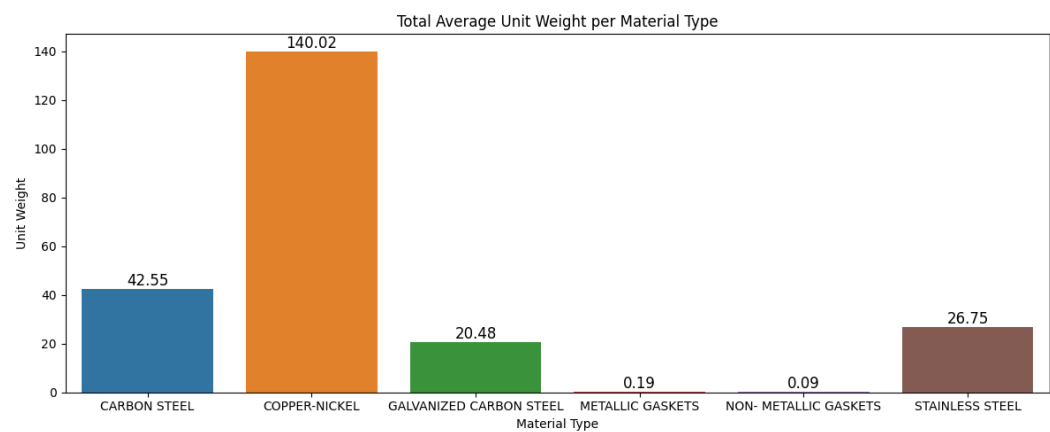
YARD SCOPE - Breakdown

Piping Specification - YARD Scope

The piping under the YARD SCOPE accounts for a total weight of 28290.53 tons, comprising 648.0 individual pieces and spanning 639 meters in materials.



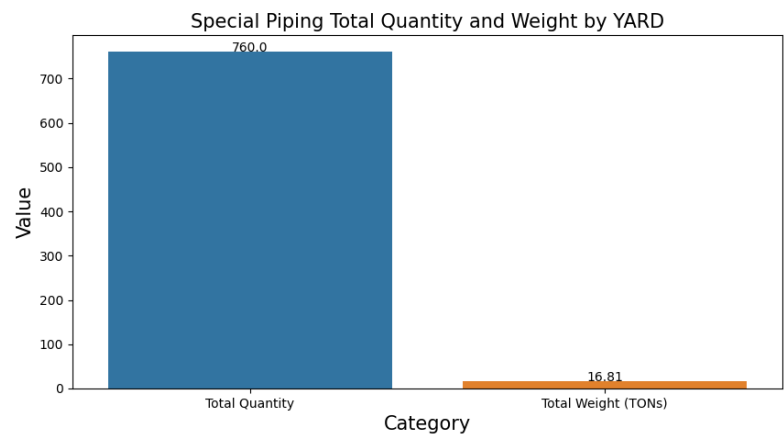
1 - YARD Piping total weight by different material types.



2 - YARD Piping average weight per material types.

Special Piping Specifications - YARD Scope

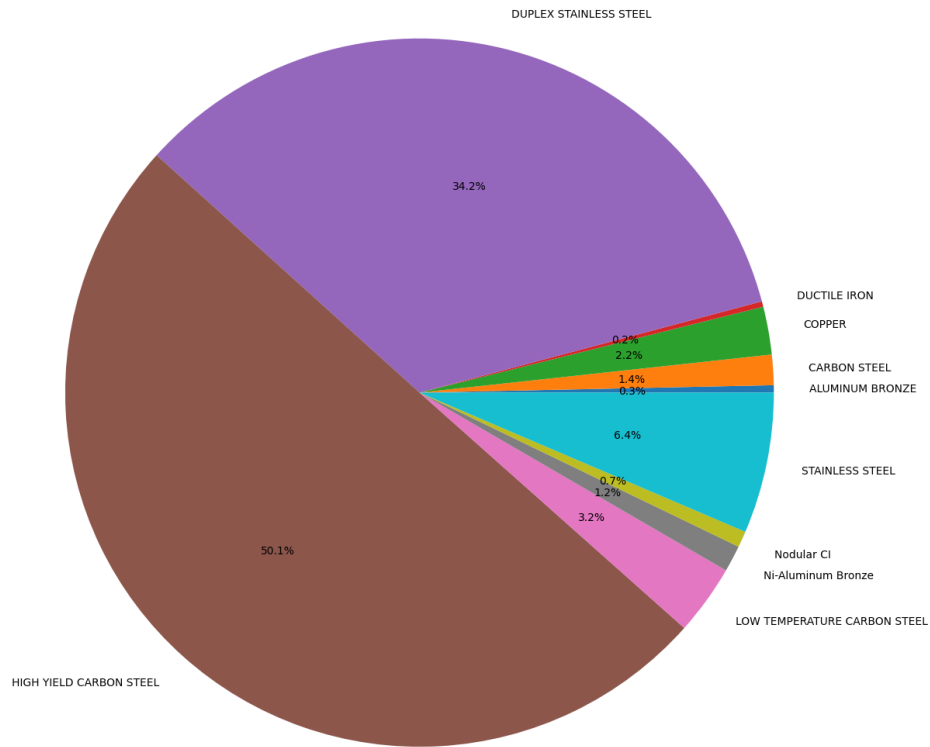
Within the YARD scope, special piping has a total weight of 16809.40 tons and consists of 760 individual pieces.



1 - YARD Special Piping total Pieces and Weight.

Valve Details - YARD Scope

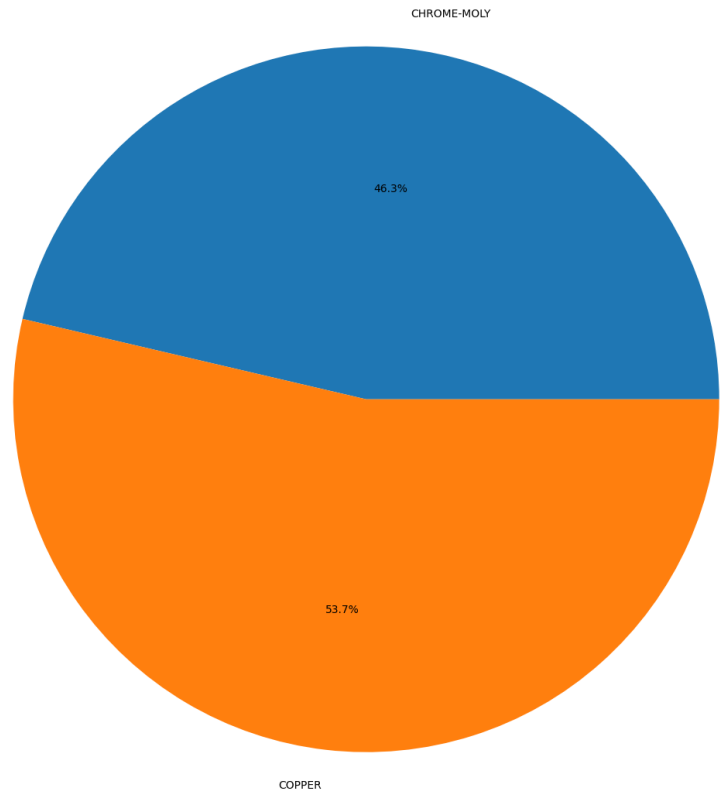
For this scope we counted a total Valve Weight of approximately 7374.00 TON's.



1 - YARD Valve weight distribution per material types.

Bolt Details - YARD Scope

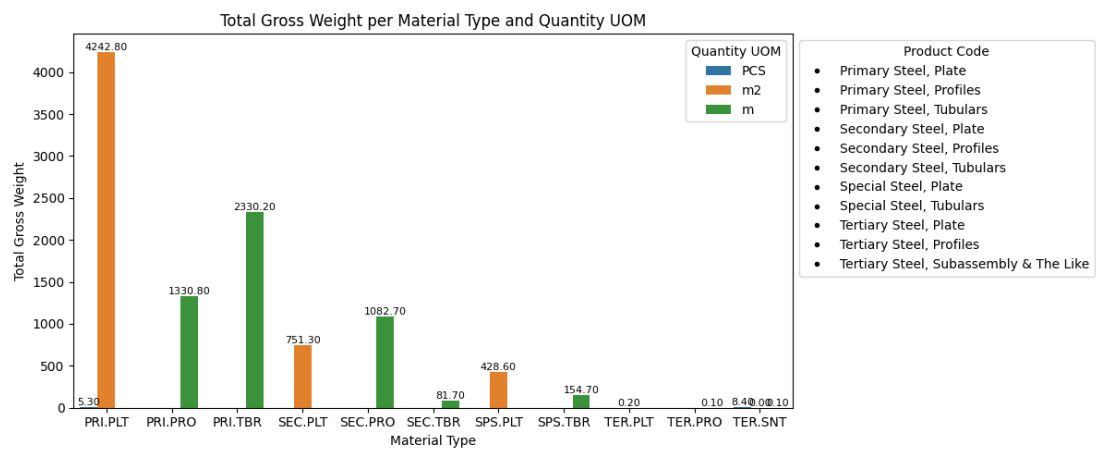
For the Bolt segment within the YARD scope we have a total of 3936 pieces



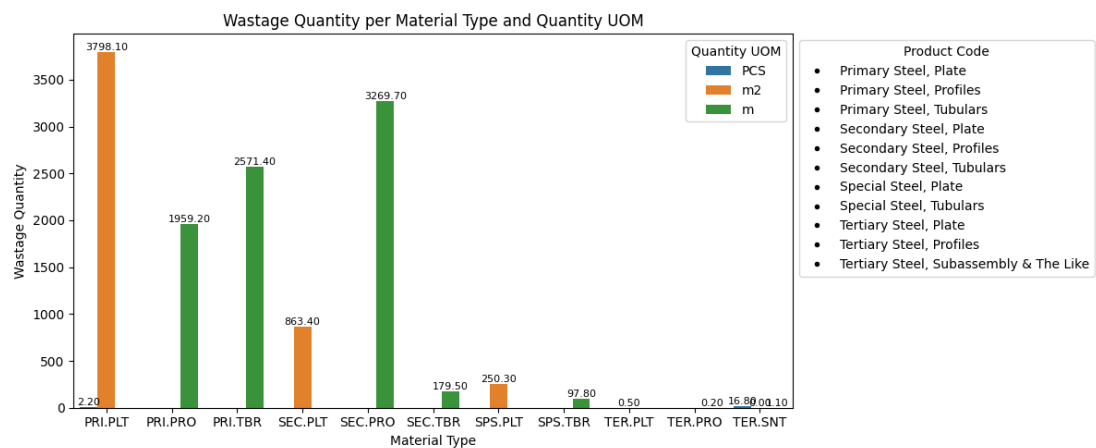
1 - YARD Bolt pieces quantity by material type.

Structure Specifications - YARD Scope

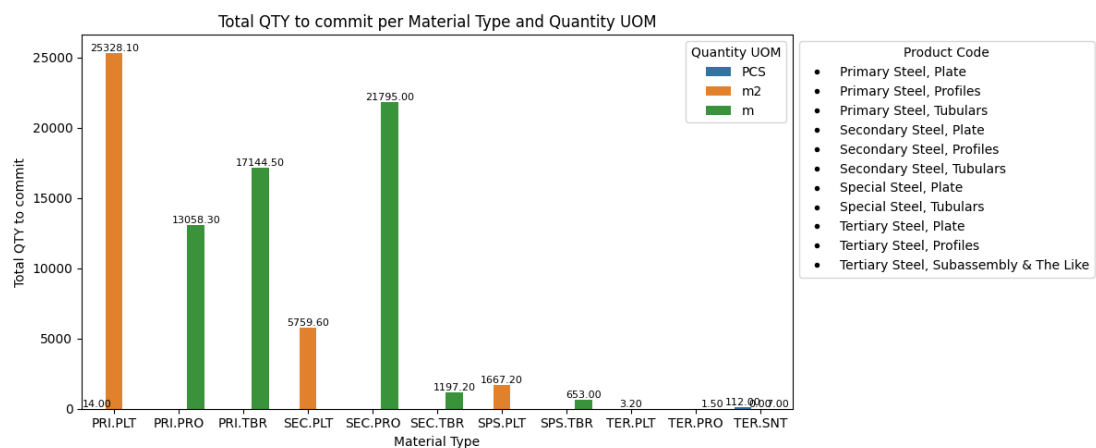
The Structural components in the YARD scope amass a total weight of approximately 10416.90 TONs. This equates to about 126 individual pieces, spanning an area of 53856.50 meters and covering a surface area of 32758.10 square meters.



1 - YARD Structural Gross Weight graphic representation.



2 - Structural Wastage quantity graphic representation.



3 - Total YARD Structural quantity committed per material types.

Conclusion

In-Depth Reflection on Unity Project FPSO Materials Analysis

The Unity Project FPSO stands as a monumental endeavor for our organization, resonating with profound operational and fiscal connotations. After a meticulous review, we discerned that the project encapsulated an impressive weight of approximately 3737.910 metric tons, which sprawls across myriad equipment ranging from the nuances of small fittings to the grandeur of major structural components.

Financially, the equipment costs as revealed by the MTO equate to roughly \$60268.567 thousand USD. However, in its entirety, the Unity Project FPSO attracts a colossal financial commitment of about \$1143953.07 thousand USD. This mirrors not just the tangible assets but also our dedication in terms of manpower--reflected by an investment of around 620673.63 hours.

The granularity of the project's composition is further illustrated by the sheer number of individual pieces required--607407 to be precise, which underscores its intricate nature. The span of materials expands to about 146658.838 meters, with a significant chunk, approximately 86614.6 meters, being procured from the YARD.

Diving deeper, a comparative lens between the SBM and YARD scopes showcases disparities in piece count and weight, but both remain paramount to the project's success. Under the SBM scope, there are a total of 601921 pieces and 5517.362 tons, as opposed to the YARD scope with 5470 pieces and 62.891 tons.

The weight distribution across different material classes elucidates the project's architectural philosophy. With piping taking precedence in weight at 4256.720 tons, followed by valves at 1208.149 tons and structural elements at 10416.9 tons, it's evident where our primary engineering focus lies. The specialized category of piping materials, though niche, plays a pivotal role with its contribution of 118.560 tons.

Yet, no endeavor is without its challenges. The presence of a surplus in piping, equivalent to 746 additional pieces, and the associated cost of \$294.931 thousand dollars stresses the essence of refined material management. Moreover, the noted wastage, especially in structural equipment, which amounts to 13010.2 tons, calls attention to the imperativeness of optimizing planning processes to curb wastage and uphold fiscal discipline.

Lastly, a snapshot of the purchase orders placed in NADIA underscores the breadth of our procurement efforts with 23576 pieces of piping, special piping, and bolt equipment and an expanse of 14323 meters from piping.

In summation, the Unity Project FPSO is not just an engineering marvel but a testament to our capabilities, challenges, and commitment to excellence. As we reflect on its journey, we're reminded of the importance of data-driven insights, strategic material management, and the balance between design intricacy and practical implementation. The learnings derived will indubitably guide our future endeavors.