Section D - Operational

1. Introduction

This section presents the preliminary studies on the operations to be carried out in **SUA05** area, destined to the operation and storage of Containerized Cargo in the Suape Port/PE.

2. Description of Activities

A port terminal of this type of cargo is generally a highly specialized environment, offering as services cargo handling and unloading of ships, storage and supporting services connected to containerized cargoes.

A first relevant distinction from the point of view of activities is that between "wet terminals" and "retro area terminals"[1]. The first are those in which ships effectively dock and perform loading and unloading operations, as well as providing storage services. The retro area terminals, on the other hand, only store and perform cargo services, not establishing any business relationship with the shipping companies, only with the cargo owners or their agents.

The figure below illustrates how these two types of installation relate to a container import process and the different path possibilities from an import container to the final destination (in exports flows occur in a similar way).

An imported container is always unloaded in a wet terminal, usually with the use of specialized terminal equipment. Once unloaded, there is a free minimum period (without additional storage charge) of 48 hours[2] for the shipping company to deliver the cargo to the cargo owner or bonded warehouse where storage will be carried out, in a primary or secondary zone. The possibilities are:

- Storage in the wet terminal itself;
- Transport from the wet terminal to a retro area terminal for storage;
- Transport from the wet terminal to a dry port or CLIA (Logistics and Industrial Customs Center) for storage;
- Direct customs clearance.

[1] Also called Bonded Dockside (TRA).
[2] Deadline defined by IN 248 of the Internal Revenue Service of Brazil.

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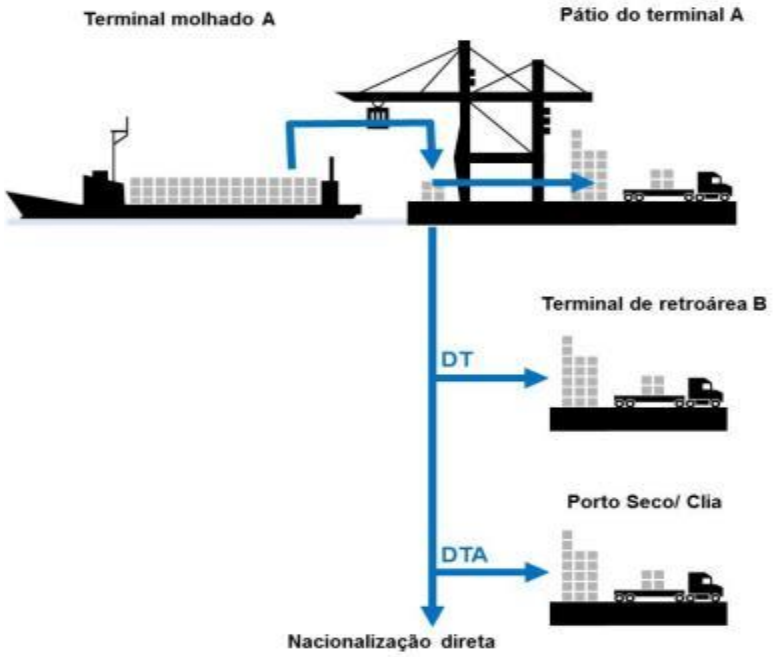

Figure 1 – Import container path
Source: EBP (2013)

The operational dynamics projected for **SUA05** area is the one of a "wet terminal", comprised by water and road reception and shipping of the goods and storage in the stockyard of the terminal. In the terminal specific ships called container ships that navigate routes pre-established by their owners will be operated, transporting various goods packaged in containers between the multiple destinations.

In the loading operation, the cargo leaves the storage facilities towards the dock via terminal tractors. At the dock, the container is transferred to the vessel by means of ship to shore cranes. In the unloading operation, the order of the operation is reversed. The flow chart below details the loading and unloading operations:

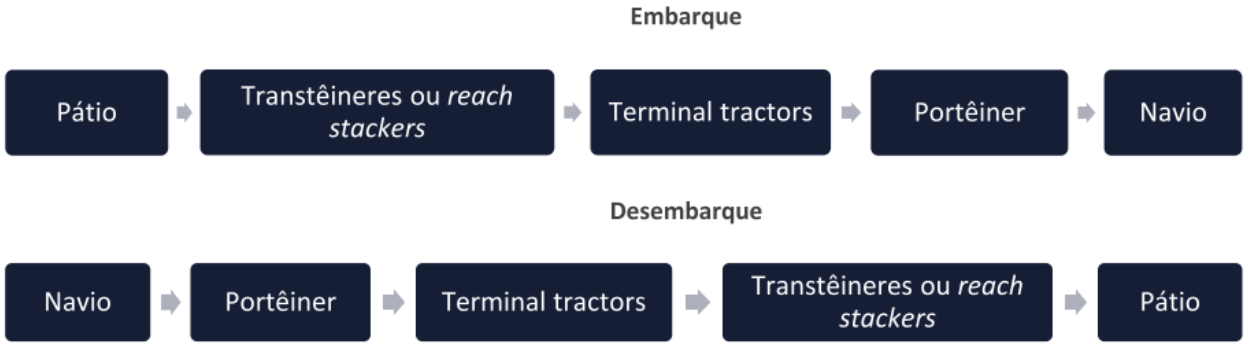

Figure 2 – Flowchart of the container operations
Source: Planos Mestres de Portos Organizados [Master Plans of Established Ports]

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In the Suape Port, currently the container ships mainly use two boarding structures: docks 2 and 3 with 660 meters in length and 14.4 meters of depth in the dock 2 and 11.6 meters in dock 3. It is emphasized that both are private, therefore, the new lessee of **SUA05** area must build a new dock. There is a smaller scale participation of dock 1, which is public.

In addition to the primary handling and storage activities, the following may also be carried out:

- Inspection support;
- Stuffing and unstuffing;
- Refrigeration;
- Repairs;
- Scanning;
- Positioning for fumigation;
- Cleaning; and
- Others.

3. Operational Performance

The operational performance in waterway terminals destined to the handling of containerized cargo can be measured by the following aspects:

- Average Consignment;
- Medium Board;
- Berth Occupancy Rate;
- Service Level; and
- Minimum Movement Required - MME.

Next, historical data are presented of the Suape Port for containerized cargo operations.

3.1. Average Consignment

This indicator is measured in units where the ship loads or unloads during its stay in the port. Under, there is the average consignment of the container ships that harbored at the Suape Port between the years 2012 and 2017.

SUAPE PORT (units/ship)	**2.012**	**2.013**	**2.014**	**2.015**	**2.016**	**2.017**
Docks 2 and 3	371	417	419	411	454	538
Dock 1	438	438	439	385	322	375

\Table 3 – Background of average consignment for Suape Port, period of 2012 -2017
Source: Own Development, data adapted from Antaq year book (2018)

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The average of this containerized cargo indicator is 435 containers per vessel at docks 2 and 3 and 399 containers per vessel at dock 1.

3.2. Medium Board

The Medium Board considers the volume of cargo operated in the berth per time period, usually measured in tons/hour. It is distinguished between Operational Medium Board (considering only the operating time) and General Medium Board (considering all the time docked).

The following table shows the productivity data for containerized cargo at Suape Port, divided into Operational and General, for the period from 2012 to 2017.

Medium Board (units/hour)						
Suape Port	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Containerized General Cargo						
OPERATIONAL Docks 2 and 3	27	30	30	44	50	48
GENERAL Docks 2 and 3	21	23	24	31	33	33
OPERATIONAL Dock 1	27	32	26	32	36	40
GENERAL Dock 1	22	25	20	22	21	24

Table 4 – Medium Board for Suape Port, period from 2012 - 2017
Source: Own Development, data adapted from Antaq year book (2018)

It should be noted that the operational average observed between 2012 and 2017 is 38 containers per hour at docks 2 and 3 and 32 containers per hour at dock 1. For the general average, the following data are available: 28 units per hour in docks 2 and 3 and 22 units per hour on dock 1.

It is observed that the Operational Medium Board is on average 39% higher than the General Medium Board on docks 2 and 3 and 44% higher on dock 1.

It is also noteworthy that while the Medium Boards at dock 1 registered more moderate increases, the general productivity at docks 2 and 3 increased by 57.1% between 2012 and 2017 and the operational productivity at 77.8% in the same period.

It is estimated that the average productivity at the new dock will reach the weighted average productivity level of 60 units/hour/berth (see Section C - Engineering).

According to this premise, and considering operations for 24 hours and 365 days a year, with a maximum occupancy of 50%, it reaches the nominal capacity of the dock for the future lessee of **840,000** TEUs, as shown in the following table.

Loading/Unloading System

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Operation Hours	h	
Operation Days	Day	
Effective rate of unloading	Unit/h/berth	
Number of Berths	Unit	
Maximum Occupancy of Berths	%	
Conversion Factor TEU/Unit		1.6
Loading/Unloading Annual Capacity	**TEUs**	**840,000**

Table 5 – Capacity of SUA05 dock
Source: Own Development, several data

3.3. Berth Occupancy Rate

As mentioned above, the project must build a new dock to operate the cargoes.

In the existing docks the following occupation between the years 2012 and 2017 was observed:

BERTHS OCCUPANCY RATE – DOCKS 4 AND 5		
	DOCKS 2 and 3	**DOCK 1**
2012	46.7%	6.2%
2013	40.1%	6.6%
2014	43.1%	8.2%
2015	56.1%	20.0%
2016	42.6%	41.0%
2017	49.7%	41.3%
AVERAGE	**46.4%**	**20.6%**

Table 6 – Occupancy rate of existing berths
Source: Own Development, data adapted from Antaq year book (2018)

The average calculated occupancy rate was 46.4% for docks 2 and 3 and 20.6% for dock 1.

3.4. Service level

The service level to the ship defines the relation of waiting time in relation to the time of service. According to UNCTAD[3], the ideal service level for any type of cargo is 30%. Larger levels may indicate ship demurrage, lower levels of idle infrastructure.

The service levels observed between 2012 and 2017 are as follows[4].

SUAPE PORT	**2.012**	**2.013**	**2.014**	**2.015**	**2.016**	**2.017**
Docks 2 and 3	52.2%	36.2%	42.0%	63.8%	44.0%	55.4%
Dock 1	70.6%	37.8%	40.5%	89.3%	32.2%	64.9%

Table 7 – Background of service level to PCC ships, period 2012 - 2017
Source: Own Development, data adapted from Antaq yearbook (2018)

Levels above 100% indicate that the waiting time of the ship is longer than the operating time. Note that the average waiting period was calculated at 48.9% at docks 2 and 3 and 55.9% at dock 1.

[3] Development and Improvement of Ports - United Nations Conference (1992)

[4] It was considered the average time to dock and the average time of operation

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3.5. Minimum Movement Required – MME

The operational performance measured by the amount of cargo handled by the waterway modal, called Minimum Movement Required - MME, aims to create incentive mechanisms for optimizing operations, using pre-defined metrics that must be performed by lessees.

The use of MME provides minimum guarantees of efficient use of the areas to the Public Authority, inducing lessee to operate at levels equal to or higher than those determined by the feasibility study.

The waterway movement metric brings with it assumptions of static capacity and inventory turnover, synthesizing these elements into a single, easily measurable indicator.

To define the MME to be applied in **SUA05** lease area, the macro demand projection is used in the three established scenarios: trend, optimistic and pessimistic for the whole period used in the analysis of the sizing, that is, from the year 2020 to 2044.

From the projected demand data in different scenarios, a variation band, called α factor (alpha), is calculated according to the methodology below:

- Step 1: Calculate the standard deviation of the demand sample universe for the three scenarios, in the analyzed period;
- Step 2: Calculate the simple arithmetic average of the values of the entire sample universe of the demand for the three scenarios, in the analyzed period;
- Step 3: Calculate the percentage of the standard deviation from "step 1" to the average of "step 2";
- Step 4: Apply the percentage of "step 3" on trend scenario (base), as a reducer. This will set the MME series for the agreement.

For **SUA05** lease area, the variation band α (alpha) is reached in the amount of 55.98%, according to data shown in the table below.

SCENARIO	**2020**	**2025**	**2030**	**2035**	**2044**
Trend	493.055	536.939	585.670	668.881	828.569
Pessimist	490.178	528.539	570.675	644.996	783.739
Optimist	618.117	1.042.704	1.529.785	1.869.038	2.060.068
Average	**926.942**				
Standard Deviation	**518.884**				
α (alpha)	**55,98%**				

Table 8**:** variation band α (alpha) for **SUA05** area

Source: Own Development

Due to the high volatility presented by the projection demand, focusing on the optimistic scenario, it was decided to adopt a limit for the alpha variable, based on the methodology set forth in Technical Note No. 17/2017-GPP of ANTAQ, which defines the limit of **25%** variation for establishment of Minimum Movement Required - MME.

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After identifying the reducer that will define the MME, the same applies to the series of projection of micro demand for port lease. According to the assumptions adopted, the MME for **SUA05** lease area is shown in the table below.

Year	Micro Demand (Trend)	MME α (alpha) 25%
2020	0	0
2021	0	0
2022	0	0
2023	101.785	76.339
2024	173.148	129.861
2025	227.028	170.271
2026	270.035	202.527
2027	305.693	229.270
2028	311.039	233.279
2029	316.501	237.376
2030	321.965	241.474
2031	330.941	248.206
2032	340.141	255.106
2033	349.131	261.848
2034	358.359	268.769
2035	367.710	275.782
2036	377.246	282.934
2037	386.790	290.092
2038	396.367	297.275
2039	405.812	304.359
2040	415.515	311.637
2041	425.303	318.977
2042	435.310	326.483
2043	445.549	334.162
2044	455.496	341.622

Table 9: Minimum Movement Required – MME for **SUA05** lease area

Source: Own Development

4. Operating Costs and Expenses

In this subsection, the terminal's costs and expenses projections are discussed over the agreement horizon. The cost structure is divided into fixed costs and variable costs. From this division the following categorization was delimited:

Fixed Costs:

- Own workforce;
- Utilities;
- Maintenance;
- General and Administrative;
- Environmental Costs;

- Fees and other contributions.

Variable costs:

- Outsourced labor;
- Utilities;
- Port Fees.

Then, the cost groups considered in the study are presented, containing the assumptions adopted in terms of unit and quantitative costs.

4.1. Fixed Costs

4.1.1. Labor

For the purpose of sizing the fixed workforce, a team of 584 employees was established in the **SUA05** lease area.

To estimate the administrative workforce it was assumed that the size of the team is correlated with the size of the enterprise, as measured by the estimate of its revenues.

It is important to note that the level of evolution of the size of the teams occurs gradually, which means that the growth of the management team does not continuously follow the revenue curve. Differently, the evolution of the administrative team takes place in intervals of revenue growth, which allows dividing it into revenue levels, according to the table below.

	Annual Revenue						
Team	**< 3.800**	**<18.000**	**<30.000**	**<45.000**	**<60.000**	**<160.000**	**> 160.000**
General Director	0	0	1	1	1	1	1
Senior Manager	1	1	2	2	3	4	6
Manager	3	2	3	3	4	6	10
Administrative 1	1	1	1	3	4	8	15
Administrative 2	0	3	2	3	3	6	10
Total	**5**	**7**	**9**	**12**	**15**	**25**	**42**

Table 10: Levels of the administrative teams (revenue x 1.000)
Source: Own Development

According to the classification of the above table, **SUA05** terminal fits the revenue level of over BRL 160 million/year with an administrative team of 42 people.

Unlike the management team, the number of employees in the operational sector required for a terminal varies depending on the amount of cargo handled, not the revenue generated. To estimate the labor composition, the productivity/employee ratio was applied, with data collected in five container terminals.

This index evaluates the relationship between the historical movement of the terminal and the number of employees in the operating sector, as detailed in the table below:

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Terminal	**Movement/TEU**	**Operational Employees**	**Productivity TEU/Employee**
1	187.631	247	760
2	67.600	243	278
3	547.679	531	1.031
4	302.354	431	702
5	1.186.424	1.546	767
Average	**458.338**	**600**	**764**

Table 11: Productivity/employee in five port terminals
Source: Database EPL, research 2016

The average observed at these 5 terminals is **764** TEUs/year/employee. Applying this value on the expected movement in the terminal, there are 542 operational employees required for the **SUA05** area.

The salary values were defined using references from the SICRO (PE), SINAPI (PE) and SINE (National) systems. For the charges, a specific terminal composition was used, calculated in SICRO and SINAPI. The amounts, salary and fees are detailed in the following table:

Team	Quantity	Average Salary (BRL/month)	Charges	Total Cost (BRL/year)
Administrative				
Director	1	27,033	95.20%	633,217
Senior Manager	6	11,946	95.20%	1,678,970
Medium Level Manager	10	9,102	95.20%	2,132,020
Administrative Support Team (n 1)	15	3,270	95.20%	1,149,063
Administrative Support Team (n 2)	10	1,756	95.20%	411,269
Maintenance				
Supervisors	7	4.361	95.20%	715,051
Maintenance Technicians	35	2.391	95.20%	1,960,319
Operations				
Operations Supervisor	20	4.361	95.20%	2,043,004
Equipment Operators	50	4.961	95.20%	5,810,112
Receipts & Deliveries	215	1.714	95.20%	8,631,273
Yard and Warehouses Assistants	215	1.788	95.20%	9,003,798
Total	**584**			**34,168,097**

Table 12 – Own Workforce of **SUA05** Area
Source: Own Development

Annex D-1 presents the breakdown of the unit and quantitative values.

4.1.2. Utilities

In this category there are the fixed costs and expenses of the administrative and support areas, such as: electricity, water/sewage and communication.

The fixed expenses with electricity are generated by the consumption of support, lighting, energy for non-operational and administrative uses.

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For electricity expenses, the unit values provided by Companhia Energética de Pernambuco (CELPE) for commercial, industrial, services, Public Authority and other activities were used. The average tariff per kWh is composed of active consumption, surplus reactive consumption, peak active consumption, intermediate active consumption and off-peak active consumption, and it is **BRL 0.769782/kWh**.

Water and sewage expenses are calculated based on the use of 100 liters per employee per day, according to the parameters of PAP, applying the current tariff provided by Companhia Pernambucana de Saneamento (COMPESA). The current unit value of water for the commercial sector is **BRL 11.72/m³**.

Due to the absence of a sewage network in the port complex of Suape, it was assumed that lessee will pay 50% of this unit value for the collection of sewage, resulting in expenses for water and sewage of **BRL 17.58/m³**.

The communication category includes expenses with telephony, internet, correspondence and advertising. The definition of the value was established by adjusting the amount foreseen in the Port Lease Program updated by IPC-A index at 33.12% (from July/2013 to February/2018), estimated at **BRL 13,312.00/month**.

Utilities	Cost/Year (BRL)
Electricity	1,028,000
Water	375,000
Communication	160,000
Total	**1,563,000**

Table 13 – Costs with utilities of **SUA05** area
Source: Own Development

Annex D-1 presents the breakdown of the unit and quantitative values.

4.1.3.Maintenance

The maintenance costs were divided into maintenance of civil works and equipment in the terminal. The premise used in this case is to apply a maintenance fee for new goods that adequately reflects the disbursement necessary to maintain the goods in a suitable condition of conservation for the performance of terminal operations.

In the case of **SUA05** lease area, considering that it is a greenfield without existing facilities, it is estimated that the disbursement of 0.5% of the value of the civil works annually in maintenance of these assets will be sufficient to maintain the condition of these assets at an appropriate level.

For the equipment a rate of 1% on the value of the equipment is estimated, spent annually in maintenance. The assumptions used are the same as the premise adopted in the Port Lease Program - PAP.

As of the definition of asset value, the rates mentioned above were applied, reaching the annual maintenance values. The following table shows the composition of assets in **SUA05** area classified in civil works and equipment.

Maintenance	Calculation Base (BRL)	Cost/Year (BRL)
0.5% of Works	425,480	2,128,000

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1% of Equipment	350,277	3,503,000
Total	**775,757**	**5,631,000**

Table 14 – Projection of costs of maintenance for the project of **SUA05** Area
Source: Own Development

Annex D-1 presents the breakdown of the unit and quantitative values.

4.1.4.General and Administrative

This group of costs covers the categories cleaning, accounting, legal and consultants, insurance, security, vehicles, fuel and others.

To determine the appropriate cleaning amount for **SUA05** lease area the following were applied:

- Salary and charges of SICRO (PE) system for ten employees;
- Overall value of BRL 1,000.00 per month for the acquisition of cleaning materials.

Based on the assumptions adopted, the annual value of **BRL 348,000.00** for cleaning services (rounded) is reached.

For the outsourced accounting, legal and consulting services, the assumptions and values of PAP were adopted, updating the original value of BRL 100,000.00/year by IPC-A index of 33.12% (from July/2013 to February/2018), resulting in the total amount of **BRL 134,000.00** per year (rounded).

The insurance applicable to the development to be installed in **SUA05** lease area are:

Stage	Insurance	Calculation Base
During the construction	Engineering risk insurance	Capex of Construction
	Work's civil liability insurance	Capex of Construction
During the operation	Multi-risk insurance	Total Capex
	Agreement's activities civil liability insurance	Value of the agreement
	Work accidents insurance	Opex of labor
	Agreement performance bond insurance (during the grant)	Value of the agreement

Table 15: Insurance applicable to **SUA05** lease area
Source: Own Development

Using the assumptions adopted in the Port Lease Program - PAP, the amount of **BRL 4,860,000.00** per year is reached. Annex D-1 presents the breakdown of the unit and quantitative values.

The item security refers to the labor of security guards and the expenses with cameras, systems and equipment. It is estimated a total of 16 guards, with salaries and charges referenced in SICRO (PE), and safety equipment. Together, the annual value of **BRL 696,000.00** (rounded) is reached.

For the category of vehicles and fuels, it is considered only light vehicles that circulate inside the port or are used for external meetings and purchase of inputs. Six vehicles with six drivers were estimated, with salaries and charges referenced in SICRO (PE). In addition, expenses with fuel, fluids, insurance and IPVA

[vehicle tax] were considered. From these premises, the annual rounded value of **BRL 315,000.00** is reached.

In the item others, expenses are grouped less representatives, such as: food, IT and supplies. For these expenses, a rate of 10% of the total value of the general and administrative category was adopted to define the group "others", totaling **BRL 636,000.00** per year.

The annual values adopted are presented below.

General and Administrative	Cost/Year (BRL)
Cleaning	348,000
Accounting/Legal/Consulting	134,000
Insurance	4,860,000
Security	696,000
Vehicles/Fuel	315,000
Others	636,000
Total	**6,989,000**

Table 16 – General and administrative costs projected for **SUA05** area
Source: Own Development

Annex D-1 presents the breakdown of the unit and quantitative values.

4.1.5.Environmental Costs

The environmental cost is comprised of environmental licensing, studies and programs, and should monetarily represent the preliminary diagnoses for licensing and operation of the port terminal to be implemented.

The preliminary diagnosis on environmental issues for **SUA05** area can be found in Section F - Environment, as well as the assumptions and cost values for the project.

4.1.6.Fees and other contributions

Considering the expiration of Law 13.467 of July 13th, 2017, which establishes the end of the compulsory union contribution, no payments were made to unions in the modeling of the feasibility study.

The Plenary of the Federal Supreme Court (STF) in a recent decision recognized the constitutionality of the collection of the Urban Land and Territorial Tax (IPTU) from public land granted to private companies or mixed investment companies.

Thus, the value of IPTU was appropriated in the financial model of the denominated **SUA05** area as pre-operational expenses in the implementation phase, considering the period in which the terminal is under construction. For the remainder of the contractual term IPTU was registered as a fixed operating expense.

The estimated value for IPTU of the denominated **SUA05** area totals the annual amount of **BRL 827,281.65**, applicable to the base date of the feasibility study.

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4.1.7.Reimbursement for the development of EVTEA

The methodology for pricing port studies, validated with TCU, defined in Technical Note No. 72/2015/DOUP/SPP/SEP/PR, establishes a limit value for EVTEAs elaborated under the Ordinance No. 38 of the Port Lease Program - PAP, priced in March 2013, which serves as the basis for establishing the effective value of EVTEA reimbursement. On the limit value, defined in BRL 325,185.37 (03/2013), the IPCA was updated by the date of this EVTEA, that is, February 2018, amounting to **BRL 438,005.05**.

The original study of 2012 was updated within the scope of Electronic Auction No. 014/2017, which aimed at hiring a specialized company to update EVTEA, in the final overall amount of **BRL 329,000.00**, with a base date of May 2017.

This value was updated to the base date of the present study, ie February 2018, using the IPC-A index accumulated at 2.13% for the period, reaching **BRL 336,002.11**.

However, considering the need for updating and incorporation of TCU determinations and supervening standards, a new evaluation was made on the portion of the study actually used, in the manner established by Ordinance No. 38 of the Port Lease Program - PAP. According to the results obtained, the percentage used in the updated study is **28.64%.** Applying this percentage to the value of the updated study the amount of **BRL 96,231.00** is reached.

In addition, the reimbursement of the Planning and Logistics Company - EPL was increased due to the services provided in the update of the study, in the total amount of **BRL 288,530.39**, according to the internal pricing method, which considered the sum of efforts allocated in the elaboration of services.

Therefore, the total remuneration due for the feasibility study of **SUA05** area amounts to **BRL 384,761.39**.

It should be noted that the amount of reimbursement on the study is being considered in the economic-financial equation of the project, as contribution in the first year of the agreement.

It is also worth noting that the value of the bidding public notice, containing the base date of 02/2018, should be updated by IPC-A in accordance with the Public Notice rules.

4.1.8.Auction Cost

In the case of **SUA05** terminal, following the guideline of the Granting Authority, the premise of the auction is adopted at B3 S.A.

As a reference value, the remuneration of B3 S.A. was used for terminals PAR01, PAR12 and IQI18, to be auctioned in July 2018, in the amount of **BRL 247,854.93 per terminal**, according to auction Public Notices 01/2018, 02/2018 and 03/2018 of ANTAQ. It should be noted that the payment of the value is being considered in the economic-financial equation of the project, with contribution in the first year of the agreement.

It is also worth noting that the value drawn for the financial economic equation is an estimate, and may be altered after knowing the actual value related to the costs of the auction.

4.2. Variable Costs

4.2.1. Outsourced Workforce (OGMO)

Outsourced operational workforce at port terminals in established ports is usually performed by the Workforce Management Body (OGMO). However, in this case, according to the information of the agency, there will be hiring of labor of stevedoring and foremanship direct by the terminal, thus exempting the obligatory use.

4.2.2. Utilities

This group of costs refers to the use of electric energy and fuel/lubricant in operations.

In order to define these costs incurred with variable utilities, the previous values for the same activity were calculated, being this value converted for specific consumption in kWh/TEU, obtaining the cost of **BRL 9.32/TEU** of Containerized Cargo.

4.2.3. Port Fees

Regarding the port fees applicable to the enterprise, it should be noted that the Table in force on the base date of the present study, which is February 2018, corresponds to the Table approved by Resolution No. 5.944 of February 23rd, 2018 and published in DOU of 02/26/2018.

The following port fee applies to the terminal in question:

- **Table III** - For the use of the infrastructure made available for the transfer of goods from vessels to warehousing facilities, of any use, located in the Port Area, or in the reverse direction; equivalent to the value of:

  - **BRL 4.27 per full container (unit);**
  - **BRL 2.08 per empty container (unit)**.

4.2.4. Taxes

The taxes applicable to the enterprise can be subdivided into two groups:

- Taxes on invoicing: PIS [program of social integration], COFINS [contribution to social security financing] and ISS [service tax];
- Income taxes: IRPJ [company income tax] and CSLL [social contribution on net income].

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In order to carry out the tax calculation, the most advantageous tax method was optimized for the enterprise, adopting the one that produces the highest net profit (profit) year by year. In the process of tax optimization, the following assumptions were considered:

Tax Rates	**Taxable Income**	**Assumed Profit**
PIS (without revenue)	1.65%	0.65%
COFINS (without revenue)	7.60%	3.00%
ISS (without revenue)	5.00%	5.00%
CSLL (without profit)	9.00%	9.00%
IR [Income Tax] (without profit)	15.00% + 10.00%	15.00% + 10.00%
IR below BRL 240k	15.00%	15.00%
Method of Assumed Profit		
Qualification criteria:	Smaller, equal or greater	Equal or greater
Gross Revenues >	78,000,000	78,000,000
Tax Incentives:	**Rate**	**Applicable on:**
PIS/COFINS Credits	9.25%	Utilities
REIDI/REPORTO	Applicable	
SUDENE	Applicable in Taxable Income on the first 10 years	

Table 17: Summary of tax assumptions for **SUA05** area
Source: Own Development

Also regarding taxes, the following information should be highlighted:

- The conditions for recovery of up to 30% of losses in previous periods were considered.
- PIS/COFINS credits were considered when using the real profit method.
- Tax incentives for asset acquisition (REIDI and REPORTO) were considered.
- In the first ten years, the tax benefit of the Northeast Development Superintendence (SUDENE) was considered in the taxable income method, reducing IR value by 75%.

Section D - Operational

Annex D -1 (1/4)

Sumário Desp. Oper. (SUA05)

Movimentação Base 414.000 TEU

Salários de equipe	Equipe	Salário médio (R$/mês)	Custos Sociais	Total Custo (R$/ano)	Notas
Administrativo					
Diretor Geral	1	27.033	95,20%	633.217	
Gerente Senior	6	11.946	95,20%	1.678.970	
Gerente de Nível Médio	10	9.102	95,20%	2.132.020	
Equipe de Suporte Administrativo (n 1)	15	3.270	95,20%	1.149.063	
Equipe de Suporte Administrativo (n 2)	10	1.756	95,20%	411.269	
Manutenção			95,20%		
Supervisores	7	4.361	95,20%	715.051	
Técnicos de Manutenção	35	2.391	95,20%	1.960.319	
Operações			95,20%		
Supervisor de Operações	20	4.361	95,20%	2.043.004	
Operadores de Equipamentos	50	4.961	95,20%	5.810.112	
Recebimentos & Entregas	215	1.714	95,20%	8.631.273	
Assistentes de Pátio e Armazéns	215	1.788	95,20%	9.003.798	
Total	584			34.168.097	
Sub-total Equipe de Admin				6.004.539	
Sub-total- Equipe de Manutenção / Operação				28.163.558	

Manutenção	Base de cálculo	%				
Equipamentos - manutenção e peças	350.277	1,00%				
Manutenção Infra - civil/estrutural	425.480	0,50%				0
	-	-	-	-		

Eletricidade - uso

Custo unitário 0,769782 R$/kWh Fonte: CELPE

Equipe	pessoas	horas/dia	dias/ano	consumo (kW/pessoa)	custo (R$/ano)	Notas
Admin	42	12	252	2,625	256.642	
Manutenção	42	16	252	1,313	171.095	
Operações	500	16	365	0,063	140.485	
Total - Equipe	584				569.000	arrendodado para 000 mais próximo

Notas sobre uso de eletricidade

Admin	100W iluminação; 1500W ar condicionado; 500W computadores e outros; 25% área comum
Manutenção	100W iluminação; 1500W ar condicionado; 500W computadores e outros; 25% área comum; fator de redução 50% para manutenção/operação
Operações	100W iluminação; sem ar condicionado; 25% área comum; 50% fator de redução para manutenção/operação

Iluminação

Watt =	lux * m2 / eficiência luminosa
Eficiência luminosa (lm/w)	vários tipos de fonte de luz
Lâmpadas Fluorescentes	faixa de 45 - 75 lm/W
Lâmpada de vapor de sódio	faixa de 85 - 150 lm/W

Tipo de área	tamanho (m2)	eficiência luminosa (lm/W)	iluminação (lux)	hora/dia	dias/ano	consumo (kW)	custo (R$/ano)	Notas
Armazém Coberto	8.192	50,00	200	10	365	32,77	92.068	-
Aberto (área de pátio/tanque)	233.996	100,00	50	10	365	117,00	328.730	-
Aberto (berço)	26.779	100,00	50	10	365	13,39	37.621	-
Total (iluminação)							459.000	arrendodado para 000 mais próximo
Notas	iluminação de área aberta: uso de 50 lux em média; indicação: estacionamento: 20 lux; portões: 75 lux; cercas: 10 lux							

Combustível

Custo unitário do Diesel - R$/litro

Água

Utilização Escritório	100	litros/pessoa/dia
Tarifa (Fonte: COMPESA)	17,58	R$/m3
1 m3=	1.000	litros
Custo	1,76	R$/emp/dia

Outros custos gerais&adm

Veículos	6	veículos a	4.553	R$ por mês	-
Segurança	1	Unidade	695.462	R$ por ano	-
Serviço de Limpeza	1	Unidade	347.347	R$ por ano	-
Outros G&A(suprimentos, TI, alimentação)	10%	Equipe	635.300	R$ por ano	-

Pagamento para Autoridade Portuária 2,29 R$/TEU Fonte: SUAPE, Tarifas Portuárias, Tabela III

Aplicável a 414.000 TEU

Section D - Operational

Annex D -1 (2/4)

Sumário de Estimativas de Desp.Oper.

Fator de arredondamento -

Categoria de custo	Tipo de despesa	Custo unitário	Unidades de medida	Número de Unidades	Custo (R$)	Fatores de ajuste para níveis de movimentação 207.000	310.500	414.000	517.500
Mão de obra									
Administrativo	Fix	6.004.539	R$	1	6.005.000	60%	80%	100%	110%
Operações / Manutenção / Ambiental	Fix	28.163.558	R$	1	28.164.000	60%	80%	100%	110%
OGMO	Var	-	R$/ton	414.000	-	100%	100%	100%	100%
Utilidades									
Eletricidade - escritórios	Fix	569.000	R$/ano	1	569.000	60%	80%	100%	110%
Eletricidade - iluminação	Fix	459.000	R$/ano	1	459.000	100%	100%	100%	100%
Eletricidade - equipamento	Var	7,99	R$/TEU	414.000	3.308.000	100%	100%	100%	100%
Água	Fix	1,76	R$/dia/emp	584	375.000	60%	80%	100%	110%
Comunicações	Fix	13.312	R$/mês	12	160.000	60%	80%	100%	110%
Combustível & Lubrificante	Var	1,33	R$/TEU	414.000	551.000	100%	100%	100%	100%
Manutenção					-				
Equipamentos - manutenção e peças	Fix	3.502.767	R$/ano	1	3.503.000	80%	90%	100%	100%
Manutenção Infra - civil/estrutural	Fix	2.127.402	R$/ano	1	2.128.000	100%	100%	100%	100%
-		-	-	-	-	80%	90%	100%	100%
Geral e Admin					-				
Limpeza	Fix	347.347	R$/ano	1	348.000	70%	90%	100%	100%
Contabilidade, Jurídico e Consultores	Fix	133.120	R$/ano	1	134.000	70%	90%	100%	100%
Seguros	Fix	4.860.000	R$/ano	1	4.860.000	100%	100%	100%	100%
Segurança	Fix	695.462	R$/ano	1	696.000	100%	100%	100%	100%
Veículos, combustíveis	Fix	26.225	R$/mês	12	315.000	70%	90%	100%	100%
Outros G&A(suprimentos, TI, alimentação)	Fix	635.300	R$	1	636.000	60%	80%	100%	110%
Taxas e outras Contribuições	Fix				-				
IPTU	Fix	827.282	R$/ano	1	828.000	100%	100%	100%	100%
Contribuição p/ Sindicatos	Fix	-	R$/mês	12	-	100%	100%	100%	100%
Pagamento para Autoridade Portuária	Var	2,29	R$/TEU	414.000	949.000	100%	100%	100%	100%
Subtotal					53.988.000				
Contingência		5%			2.651.950				
Total (R$/ano)					56.639.950				

Nota: Todos os números de custo foram arredondados para milhar mais próximo

Custo a diferentes níveis de movimentação		Movimentação			
Categoria de custo	Tipo de despesa	207.000	310.500	414.000	517.500
Mão de obra					
Administrativo	Fix	3.603.000	4.804.000	6.005.000	6.605.500
Operações / Manutenção / Ambiental	Fix	16.898.400	22.531.200	28.164.000	30.980.400
OGMO	Var	-	-	-	-
Utilidades		-	-	-	-
Eletricidade - escritórios	Fix	341.400	455.200	569.000	625.900
Eletricidade - iluminação	Fix	459.000	459.000	459.000	459.000
Eletricidade - equipamento	Var	1.653.930	2.480.895	3.307.860	4.134.825
Água	Fix	225.000	300.000	375.000	412.500
Comunicações	Fix	96.000	128.000	160.000	176.000
Combustível & Lubrificante	Var	275.310	412.965	550.620	688.275
Manutenção		-	-	-	-
Equipamentos - manutenção e peças	Fix	2.802.400	3.152.700	3.503.000	3.503.000
Manutenção Infra - civil/estrutural	Fix	2.128.000	2.128.000	2.128.000	2.128.000
-		-	-	-	-
Geral e Admin		-	-	-	-
Limpeza	Fix	243.600	313.200	348.000	348.000
Contabilidade, Jurídico e Consultores	Fix	93.800	120.600	134.000	134.000
Seguros	Fix	4.860.000	4.860.000	4.860.000	4.860.000
Segurança	Fix	696.000	696.000	696.000	696.000
Veículos, combustíveis	Fix	220.500	283.500	315.000	315.000
Outros G&A(suprimentos, TI, alimentação)	Fix	381.600	508.800	636.000	699.600
Taxas e outras Contribuições	Fix	-	-	-	-
IPTU	Fix	828.000	828.000	828.000	828.000
Contribuição p/ Sindicatos	Fix	-	-	-	-
Pagamento para Autoridade Portuária	Var	474.030	711.045	948.060	1.185.075
Subtotal		36.279.970	45.173.105	53.986.540	58.779.075
Contingência		5%	5%	5%	5%
Total (R$/ano)		38.070.267	47.396.208	56.638.464	61.658.775
Custo unitário		183,91	152,64	136,81	119,15

rias de custo fixo	Crédito de PIS/COFINS (1=sim, 0=não)	Custo Fixo (R$ k)			
Mão de obra (Admin, O&M, Ambiental)	0	21.526	28.702	35.877	39.465
Utilidades - Eletricidade, Água, Comunicações	1	1.177	1.409	1.641	1.757
Manutenção - Equip / Infra	0	5.177	5.545	5.913	5.913
Geral e Admin	0	6.820	7.121	7.338	7.405
#N/D	0	869	869	869	869

rias de Custos Variáveis	Crédito de PIS/COFINS (1=sim, 0=não)	Custo unitário	Custo unitário	Custo unitário	Custo unitário
Mão de obra - OGMO	0	-	-	-	-
Utilidades - Eletricidade, Água, Combustíveis e Lubrif	1	9,79	9,79	9,79	9,79
Pagamento para Autoridade Portuária	0	2,29	2,29	2,29	2,29

Section D - Operational

Section D - Operational

Annex D -1 (3/4)

Sumário de Custos de Seguros e Garantias

Operação	4.860,0	k R$/ano
Implantação (Garantia de Execução)	1.380,0	k R$/ano

SEGUROS E GARANTIAS		
Total Capex / Valor Ativos Existentes	775.757	k R$
Capex/Valor Ativos Existentes	425.480	k R$
Equipamentos/Valor Ativos Existentes	350.277	k R$
Valor do Contrato	5.495.881	k R$
OPEX - MÃO DE OBRA	34.169	k R$
Capex/Valor Ativos Existentes Públicos	525.277	k R$

ANTES DA OPERAÇÃO

Seguro Risco de engenharia - obras civis em construção, instalação e montagem

Valor assegurado - Capex de construção	50%
Alíquota	0,50%
Periodicidade	anualmente durante a construção

Seguro Responsabilidade Civil Geral e Cruzada das atividades das obras

Valor assegurado - Capex de construção	50%
Alíquota	0,50%
Periodicidade	anualmente durante a construção

DURANTE A OPERAÇÃO

Seguro riscos nomeados/multirriscos

Valor assegurado - Capex total	50%
Alíquota	0,50%
Custo	1.939,39 k R$
Periodicidade	anualmente durante o período da operação

Seguro responsabilidade civil das atividades do contrato

Valor assegurado - valor do contrato	5%
Alíquota	0,50%
Custo	1.373,97 k R$
Periodicidade	anualmente durante o período da operação

Seguro para acidentes de trabalho relativo a colaboradores e empregadores

Valor assegurado - Opex de mão de obra	100%
Alíquota	0,50%
Custo	170,85 k R$
Periodicidade	anualmente durante o período da operação

GARANTIAS

Garantia de execução do contrato (durante concessão)

Valor assegurado - valor do contrato	5%
Alíquota	0,50%
Custo	1.373,97 k R$
Periodicidade	anualmente durante o período da concessão

Section D - Operational

Annex D -1 (4/4)

Previsão de Gastos Operacionais	Ano 1	Ano 2	Ano 3	Ano 4	Ano 5	Ano 6	Ano 7	Ano 8	Ano 9	Ano 10	Ano 11	Ano 12	Ano 13	Ano 14	Ano 15	Ano 16
Entrada para as Demonstrações Financeiras (DemFin)	2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Despesas Operacionais Fixas + Custos Ambientais	0	0	0	36.371	36.398	44.376	44.376	44.409	44.402	52.243	52.270	52.270	52.329	53.555	54.484	53.993
Despesas Operacionais Variáveis	0	0	0	1.229	2.091	2.742	3.261	3.692	3.756	3.822	3.888	3.996	4.108	4.216	4.328	4.440
Pagamento para Orgãos Governamentais + Estudos + Leilão	3.093	2.511	2.511	5.335	7.314	8.809	10.002	10.991	11.139	11.291	11.442	11.691	11.947	12.196	12.452	12.711

Previsão de Desp.Oper. (SUA05)

Previsão em kR$. Todos os valores em termos Real

			Ano 1	Ano 2	Ano 3	Ano 4	Ano 5	Ano 6	Ano 7	Ano 8	Ano 9	Ano 10	Ano 11	Ano 12	Ano 13	Ano 14	Ano 15	Ano 16
			2020	2021	2022	2023	2024	2025	2026	2027	2028	2029	2030	2031	2032	2033	2034	2035
Ano de Operação (1=sim, 0=não)			0	0	0	1	1	1	1	1	1	1	1	1	1	1	1	1
Volume de Carga (k Tons)			-	-	-	102	173	227	270	306	311	317	322	331	340	349	358	368
Grupo de custo (para custo fixo - função degrau)			4	4	4	4	4	5	5	5	5	6	6	6	6	6	6	6
Pagamento para Órgãos Governamentais																		
Pgto Fixo Anual			2.511	2.511	2.511	2.511	2.511	2.511	2.511	2.511	2.511	2.511	2.511	2.511	2.511	2.511	2.511	2.511
Pagamento dos Leilões + Estudos			581	0	0	2.823	4.803	6.298	7.491	8.480	8.628	8.780	8.931	9.180	9.435	9.685	9.941	10.200
Total Pagamento para Órgãos Governamentais			3.093	2.511	2.511	5.335	7.314	8.809	10.002	10.991	11.139	11.291	11.442	11.691	11.947	12.196	12.452	12.711
Despesas Operacionais Fixas	**Crédito de PIS/COFINS (1=sim, 0=não)**																	
FO1 Mão de obra (Admin, O&M, Ambiental)	**0**		0	0	0	21.526	21.526	28.702	28.702	28.702	28.702	35.877	35.877	35.877	35.877	35.877	35.877	35.877
FO2 Utilidades - Eletricidade, Água, Comunicações	**1**		0	0	0	1.177	1.177	1.409	1.409	1.409	1.409	1.641	1.641	1.641	1.641	1.641	1.641	1.641
FO3 Manutenção - Equip / Infra	**0**		0	0	0	5.240	5.240	5.509	5.509	5.509	5.509	5.779	5.779	5.779	5.779	6.654	7.529	7.529
FO4 Geral e Admin	**0**		0	0	0	6.820	6.820	7.121	7.121	7.121	7.121	7.338	7.338	7.338	7.338	7.776	7.776	7.338
FO5 Taxas (IPTU, Sindicatos)	**0**		0	0	0	869	869	869	869	869	869	869	869	869	869	869	869	869
Total Despesas Operacionais Fixas			0	0	0	35.634	35.634	43.611	43.611	43.611	43.611	51.505	51.505	51.505	51.505	52.818	53.693	53.255
Despesas Operacionais Variáveis	**Crédito de PIS/COFINS (1=sim, 0=não)**																	
VO1 Mão de obra - OGMO	**0**		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
VO2 Utilidades - Eletricidade, Água, Combustíveis e Lubrific	**1**		0	0	0	996	1.694	2.222	2.643	2.992	3.044	3.097	3.151	3.239	3.329	3.417	3.507	3.598
VO3 Pagamento para Autoridade Portuária	**0**		0	0	0	233	397	520	618	700	712	725	737	758	779	800	821	842
Total de Despesas Operacionais Variáveis			0	0	0	1.229	2.091	2.742	3.261	3.692	3.756	3.822	3.888	3.996	4.108	4.216	4.328	4.440
Créditos Tributários PIS / COFINS gerados c/ Desp.Oper.																		
Despesas Operacionais Fixas			0	0	0	1.177	1.177	1.409	1.409	1.409	1.409	1.641	1.641	1.641	1.641	1.641	1.641	1.641
Despesas Operacionais Variáveis			0	0	0	996	1.694	2.222	2.643	2.992	3.044	3.097	3.151	3.239	3.329	3.417	3.507	3.598
D&A	**0**		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
	Taxa		*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*
Total de Crédito Tributário de PIS/COFINS a partir da Desp.Oper.			**0**	**0**	**0**	**201**	**266**	**336**	**375**	**407**	**412**	**438**	**443**	**451**	**460**	**468**	**476**	**485**
Investimento																		
Desp. Garantia, Seguros &Impostos durante construção			2.305	2.305	2.305	-	-	-	-	-	-	-	-	-	-	-	-	-
Custos Ambientais dur. Construção (k R$)			2.873	325	384	-	-	-	-	-	-	-	-	-	-	-	-	-
Desp. Oper:																		
Custos Ambientais dur. Operação (k R$)			-	-	-	738	764	764	764	797	791	738	764	764	824	738	791	738
Créditos Tributários PIS / COFINS gerados c/ Desp.Oper.																		
D&A			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
D&A - Investimentos sem REIDI/REPORTO			0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
			9,25%	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*	*9,25%*
Total de Crédito Tributário de PIS/COFINS a partir da Desp.Oper.			**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**	**0**

Manutenção	%	Infrapriv = 1; pub=2Equippriv = 3; pub=4																
Novos																		
3 Equipamentos - manutenção e peças	1,00%	0	89.792	179.584	269.376	269.376	269.376	269.376	269.376	269.376	269.376	269.376	269.376	269.376	269.376	356.876	444.376	444.376
1 Manutenção Infra - civil/estrutural	0,50%	0	205.668	411.336	617.004	617.004	617.004	617.004	617.004	617.004	617.004	617.004	617.004	617.004	617.004	617.004	617.004	617.004
Total			-	-	-	5.240	5.240	5.509	5.509	5.509	5.509	5.779	5.779	5.779	5.779	6.654	7.529	7.529