PLANNING TO SHIFT THE PERIMETER FENCE AT STA 1+300 TO STA 1+950 TO MEET THE SIDE STRIPE STANDARDS AT JUWATA TARAKAN INTERNATIONAL AIRPORT

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ABSTRACT
The planning of shifting the perimeter fence at Juwata Tarakan International Airport aims to meet side stripe standards and keep people and animals out, protect vital objects such as navigation or power plants, as a boundary marker for areas under airport control, and protect employees and employees. This will directly or indirectly affect flight safety at Juwata Tarakan International Airport. This condition can realize optimal security at the perimeter of Juwata Tarakan International Airport, it is necessary to implement flight rules that have been determined so as to support safe, smooth, comfortable and efficient flight operations that take place at Juwata Tarakan International Airport.
In planning to shift the perimeter fence at Juwata Tarakan International Airport, not only changing the location but also calculating the budget plan and changing the existing foundation to a river stone foundation and displaying ground elevation data on the edge of the runway.
In planning to shift the perimeter fence, it was found that the volume of landfill was 181 m3 and the volume of river stone foundations was 491 m3 and the results of the calculation of the budget plan were found to be Rp. 1,170,000,000.00 (one billion one hundred and seventy million rupiah). In addition to the budget plan for planning the shifting of the perimeter fence, the maintenance that will be carried out to prevent it from being corrosive is to apply anti-corrosive paint regularly.
Keywords: Perimeter, Fence, Boundary Marker, Flight Operations, Corrosive

1. INTROdduction

Juwata Tarakan international airport itself has shortcomings in the form of physical barriers at the edge of runway 06. As regulated in PM 33 of 2015 in article 3 paragraph 2 which reads "Restricted security area as intended in paragraph (1) must be protected by physical barriers and always supervised, checked at certain time intervals, and provided with aviation security warning signs (sign boards).

The physical barrier in question can be a fence that has a minimum height of 2.44 meters and is equipped with barbed wire on top, and there are no gaps from bottom to top for people to enter. Meanwhile, Juwata Tarakan international airport itself has a point where the physical barrier is incomplete.

In this research, the budget plan and design of the physical barrier itself will be calculated so that it can meet the standards set out in PM 33 of 2015 or PM 167 of 2015.

In the research conducted by Amanda Nurma Hariyanti, Satiti Utami, Herman Susanto which was carried out in 2019 which raised the problem in the form of various disturbances, namely there are boundaries of land or areas under airport supervision. This limit is one that limits the aircraft movement area, as well as air navigation equipment facilities and other important installations from all obstacles that can endanger flight safety. By using the descriptive method of analysis to collect information about a systematic, actual and accurate description contained in the research object when the research was carried out. As well as getting results in the form of analytical data regarding securing the aviation perimeter at Adi Soemarmo-Surakarta International Airport.

Furthermore, the research was carried out by Bobby Fernanda in 2015 which raised the issue of having a fence gate to open and close it requires a lot of energy due to the heavy load, especially the fence gate in large residential housing by using the method of collecting planned equipment. In the design of the folding gate drive mechanism using a steel wire rope, the load when the fence opens and closes is 5.38 N, and the current released when opening and closing the fence is 4.5 A. In planning In the design of the folding gate drive mechanism using

a wire rope stell, there are two parts to the maintenance carried out, namely planned maintenance and unplanned maintenance and results in facilitating the process of opening and closing the door. fence with proper and efficient working mechanisms, as well as regular maintenance of the fence.

Furthermore, the research conducted by Dinda Fitria Nurjanah entitled Implementation of the Parimeter Security System and AVSEC Constraints is in carrying out security at Sentani Jayapura Airport. The purpose of this study is to review airport security facilities, namely the perimeter fence and to make observations regarding regulations and conditions in the field.

Currently, several domestic airlines that provide flight services to and from Juwata Tarakan International Airport include Lion Air, Batik Air, Citilink, MAF Indonesia, Pelita Air, Susi Air, WhiteSky, Smart Aviation, Cardig Air, Black Stone.

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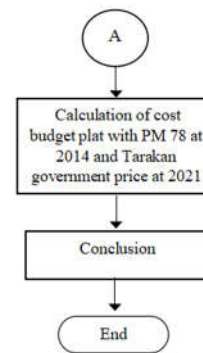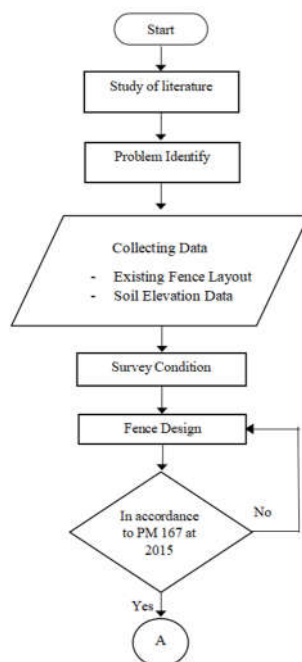
2. METHOD

Figure 1.1 Research Flow Diagram

2.1 Data collection

In implementing this planning, data is needed that can support this research activity. The supporting data used in this research is secondary data obtained from Juwata Tarakan International Airport. The required secondary data consists of field tests. The following are the data needed for this research:

1. Location layout

2. Data on existing guardrails

2.2 Desired Condition

The following are the desired conditions for planning to relocate the perimeter fence location at Juwata Tarakan International Airport, where the work area will be located on the edge of sta 1+300 to sta 1+950.

Figure 1.2 desired condition

2.3 Land Elevation

Station	mean sea level	Information
STA 1+300	4 m	Initial Benchmarks
STA 1+350	4 m	
STA 1+400	3 m	
STA 1+450	3.2 m	
STA 1+500	3 m	
STA 1+550	3.1 m	
STA 1+600	3 m	
STA 1+650	3.5 m	
STA 1+700	4 m	
STA 1+750	4 m	
STA 1+800	4 m	
STA 1+850	4 m	
STA 1+900	4 m	Final Benchmark

2.4 Fence Design Analysis

The fence design analysis here is carried out because the guardrail will be directly adjacent to sea water. Therefore, the foundation for the fence that will be built will be slightly different from the foundation for fences in general.
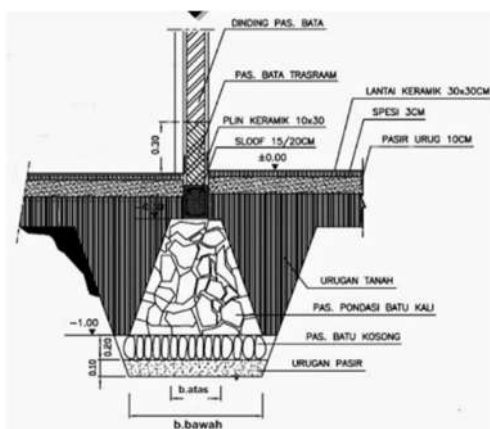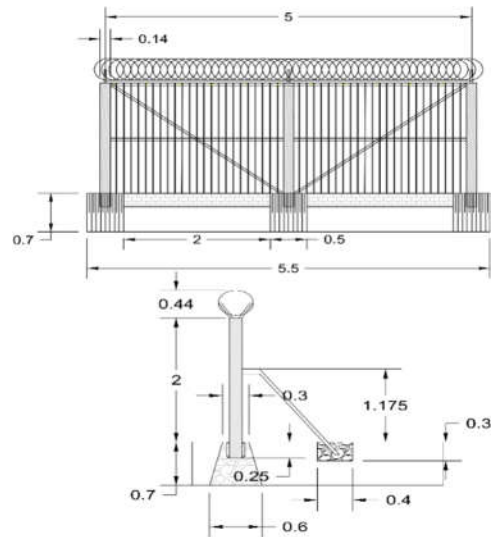

Figure 1.3 fence design

3. RESULT

Planning to move the location of the perimeter fence is necessary in order to improve aviation safety and security at Juwata Tarakan airport. By moving the location of this fence, it is hoped that it can prevent various types of life hazards.

Condition of Juwata Airport Perimeter Fence		
PM 167 of 2015	yes	no
In the form of a wall / fence	✓	
The height is sufficient and not easy to climb		✓
Gap from bottom to top	✓	
Provision of trails in drains	✓	
Lighting is available		✓
Perimeter maintenance available	✓	
Inspection roads are available		✓
There is an emergency exit		✓

3.1 Job volume

The volume of each job must be known to make it easier to plan the cost budget, along with calculating the volume of work :

1. Foundation Volume m³

Long	= 50 cm (0,5 m)
Top width	= 30 cm (0,3 m)
Bottom width	= 60 cm (0,6 m)
Tall	= 70 cm (0,7 m)
Volume	= ½ (0,3 + 0,6) 0,7.0,5
	= 0,54 m³ x number of poles (260)
	= 140,4 m³
	= 140,4 m³ + volume sloof (40,6 m³)
	= 181 m³

2. Landfill Volume

   a.
Thick	: 1 m
Wide	: 0.7 m
Long	: 50 m
Volume	= 50 x 0.7 x 1 = 35 m³

   b.
Thick	: 0.8 m
Wide	: 0.7 m
Long	: 50 m
Volume	= 50 x 0.7 x 0.8 = 28 m³

   c.
Thick	: 1 m
Wide	: 0.7 m
Long	: 50 m
Volume	= 50 x 0.7 x 1 = 35 m³

   d.
Thick	: 0.9 m
Wide	: 0.7 m
Long	: 50 m
Volume	= 50 x 0.7 x 0.9 = 31,5 m³

   e.
Thick	: 1 m
Wide	: 0.7 m
Long	: 50 m
Volume	= 50 x 0.7 x 1 = 35 m³

   f.
Thick	: 0.5 m
Wide	: 0.7 m
Long	: 50 m
Volume	= 50 x 0.7 x 0.5 = 17.5 m³

Fence posts will be installed every 2.5 m, then within 50 meters 20 fence posts will be installed.

Pole required = 260 Bh

3.2 Unit price analysis

Analysis of the unit price of work which is commonly called AHSP aims to facilitate the preparation of RAB.

No.	Harga Satuan Tenaga			
	Tenaga	Satuan	Harga	
1	Mandor	OH	Rp	160.000,00
2	Tukang	OH	Rp	145.000,00
3	Pekerja	OH	Rp	120.000,00
4	Operator	OH	Rp	150.000,00
5	Juru Ukur	OH	Rp	200.000,00
6	Tukang Las	OH	Rp	95.192,00

No.	Harga Satuan Bahan			
	Bahan	Satuan	Harga	
1	Tiang pipa BRC d = 1,5 in t 1,20 m	Bh	Rp	194.005,00
2	Pagar BRC 1,20 x 2 40 m	Bh	Rp	339.505,00
3	Kawat duri	Roll	Rp	101.505,00
4	Semen 50 kg	Zak	Rp	85.005,00
5	Paku sekrup	Bh	Rp	100,00
6	Batu kali	M3	Rp	441.305,00
7	Tanah urug pilihan	M3	Rp	97.005,00
8	Pasir pasang	M3	Rp	194.005,00
9	Semen PC (Kg)	Kg	Rp	1.505,00
10	Angkur	Bh	Rp	8.815,00

No.	Harga Satuan Alat		
	Alat	Satuan	Harga
1	Excavator	Rp/jam	Rp 494.478,00
2	Grader	Rp/jam	Rp 669.460,00
3	Dump truck 6-8 m3	Rp/jam	Rp 365.973,00
4	Loader	Rp/jam	Rp 331.636,00
5	Topi pelindung (safety helmet)	Bh	Rp 100.000,00
6	Rompi keselamatan	Bh	Rp 100.000,00

3.3 Budget plan

From the previous price analysis, the cost budget plan can be determined as follows:

S curve

In planning the shift of the fence at Tarakan's Juwata Airport, an s curve is needed in order to arrange the flowchart of work to be carried out first. The S curve is a graph that depicts the cumulative work or project. From the budget design data (RAB) we can make an S curve.

3.4 Perimeter Fence Maintenance

In planning the shift of the perimeter fence, the fence will be coated with anti-rust paint, which aims to make the perimeter fence resistant to sea water content around the perimeter fence. Based on the field survey, the anti-rust paint that will be used is anti-corrosive paint which must have the following specifications:
1. Contains primer paint and top coat

No.	Komponen	Koefisien	Satuan	Harga Satuan	Jumlah Harga
A	Tenaga				
1	Mandor	1,0050	OH	Rp 160.000,00	Rp 160.800,00
2	Pekerja	2,1000	OH	Rp 120.000,00	Rp 252.000,00
	Jumlah Harga Tenaga				Rp 412.800,00
B	Bahan				
1	Seng Plat BJLS 30 Lebar 50	1,000	M	Rp 43.100,00	Rp 43.100,00
2	Paku Seng	0,6000	Kg	Rp 27.200,00	Rp 6.320,00
3	Dolken Kayu Galam Diameter 8-10 cm, panjang 300 cm	1,000	Batang	Rp 32.500,00	Rp 32.500,00
4	Jendela Nako	1,000	M2	Rp 67.900,00	Rp 67,900
5	Kusen Alluminium SF 4"	1,000	M2	Rp 206.600,00	Rp 206.600,00
6	Kayu Kelas I	0,0350	M3	Rp 4.607.500,00	Rp 161.262,00
7	Kaca Bening 3mm	0,0800	M2	Rp 122.400,00	Rp 9.792,00
8	Paku Biasa	0,6000	Kg	Rp 21.300,00	Rp 12.780,00
9	Gypsumboard 1200 x 2400 x 9 mm	0,6000	M2	Rp 80.900,00	Rp 48.540,00
	Jumlah Harga Bahan				Rp 588.794,00
C	Peralatan				
	Jumlah Harga Peralatan				Rp 0,00
D	Jumlah Harga Tenaga,Bahan,Dan Peralatan (A+B+C)				Rp 1.001.594,00
E	Overhead dan profit 15 % x D				Rp 150.239,00
F	Harga satuan pekerjaan (D+E)				Rp 1.151.833,00

No.	Komponen	Koefisien	Satuan	Harga Satuan	Jumlah Harga
A	Tenaga				
1	Mandor	0,1000	OH	Rp 160.000,00	Rp 16.000,00
2	Pekerja	0,4000	OH	Rp 120.000,00	Rp 48.000,00
	Jumlah Harga Tenaga				Rp 64.000,00
B	Bahan				
1	Kayu kelas I	0.0350	M3	Rp 4.607.500,00	Rp 161.262,00
2	Seng Plat BJLS 30 Lebar 50	1,4000	M	Rp 43.100,00	Rp 60.340,00
3	Paku biasa	0,6000	Kg	Rp 21.300,00	Rp 12.780,00
4	Cat dasar kayu	1,5000	Kg	Rp 51.400,00	Rp 77.100,00
	Jumlah Harga Bahan				Rp 311.472,00
C	Peralatan				
	Jumlah Harga Peralatan				Rp 0,00
D	Jumlah Harga Tenaga,Bahan,Dan Peralatan (A+B+C)				Rp 375.472,00
E	Overhead dan profit 15 % x D				Rp 37.547,00
F	Harga satuan pekerjaan (D+E)				Rp 413.019,00

2. Resistant to weather
3. Has solvent based content.
Apart from being able to protect against corrosive paint, this paint can also speed up work because no primer is needed

4. CONCLUSION

4.1 Conclusion

The conclusions that can be given regarding the planning for shifting the perimeter fence at Juwata Tarakan International Airport are as follows:

1. The size of the perimeter fence to be built is 650 m long and 2.44 m high and uses river stone foundations.

2. The budget plan required is Rp. 1,170,000,000.00 (one billion one hundred and seventy million rupiah).

3. The treatment needed to make the perimeter fence more resistant to seawater is to use anti-corrosive paint

4.2 Suggestion

Suggestions that can be given for planning a shift in the perimeter fence at Juwata Tarakan International Airport are as follows:

1. The need for routine weekly inspections in order to monitor the condition of the fence on a regular basis

2. It is recommended to choose quality materials so that the fence lasts longer and repaint it regularly so that the fence does not rust easily.

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