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PROJECT REPORT

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PROJECT:

BABY DIAPER MANUFACTURING UNIT

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PURPOSE OF THE DOCUMENT

This particular pre-feasibility is regarding BABY DIAPER MANUFACTURING UNIT

The objective of the pre-feasibility report is primarily to facilitate potential entrepreneurs in project identification for investment and in order to serve his objective; the document covers various aspects of the project concept development, start-up, marketing, finance and management.

[We can modify the project capacity and project cost as per your requirement. We can also prepare project report on any subject as per your requirement.]

PROJECT AT GLANCE

1	**Name of Proprietor/Director**	XXXXXXXX	
2	**Firm Name**	XXXXXXXX	
3	**Registered Address**	XXXXXXXX	
4	**Nature of Activity**	XXXXXXXX	
5	**Category of Applicant**	XXXXXXXX	
6	**Location of Unit**	XXXXXXXX	
7	**Cost of Project**	20.56	Rs. In Lakhs
8	**Means of Finance**		
i)	**Own Contribution**	2.06	Rs. In Lakhs
ii)	**Term Loan**	13.50	Rs. In Lakhs
iii)	**Working Capital**	5.00	Rs. In Lakhs
9	**Debt Service Coverage Ratio**	3.34	
10	**Break Even Point**	0.23	
11	**Power Requiremnet**	20	KW
12	**Employment**	10	Persons
13	**Major Raw Materials**	Polyethylene or cloth like film, tissue, hot melts, Hydrophobic & Hydrophilic non- woven, Elastics	

14 Details of Cost of Project & Means of Finance

Cost of Project

Particulars	Amount in Lacs
Land	Owned/Leased
Building & Civil Work	Owned/Leased
Plant & Machinery	13.50
Furniture & Fixture	0.50
Other Misc Assets	1.00
Working Capital Requirement	5.56
Total	**20.56**

Means of Finance

Particulars	Amount in Lacs
Own Contribution	2.06
Term Loan	13.50
Working capital Loan	5.00
Total	**20.56**

1. INTRODUCTION

Baby diapers are safely used every day by parents all over the world. Since these baby diapers were invented in the 1930s, they have constantly improved. Long gone is the days of plastic outer pants, ill-fitting terry cloth inners and constantly wet skin for babies and infants. Today's disposable diapers are light, compact, very absorbent, prevents leaks and easy to use.

- Baby diapers are comfortable to wear due to the softness, lightness and 'breathability' of the materials used.
- Keep the skin drier and, as a result, healthier. These benefits have been confirmed by independent medical experts in skin and infant health.
- Are better at reducing the transmission of infectious diseases as faecal containment is reduced so that there is less risk of the spread of bacteria.

The story of the diapers begins more than a century ago, but it became commercially viable in Europe and North America seven decades ago, in the late 1940s. Its evolution was hardly smooth, however, and the huge success it has become was hardly foreseen at the outset.

In nine decades of diapers the author Davis Dyer takes a long view of the product, and explains its development in four distinct periods:

1. Product Invention (before the 1930s), when numerous independent inventors sought better solutions to traditional diapering
2. Early Commercialization (1930s-1950s), when private corporations introduced diapers and slowly cultivated the market

3. Rapid Adoption (1960s-1980s), when demand exploded as diapers became affordable and widely available

4. Continuous Improvement (1990s-present), when the leading manufacturers are competing on a global basis to offer consumers a product undergoing constant innovation and improvement.

The main duty requirements of diapers are:

- The device should be comfortable for the baby
- It should be easy to place and remove on the baby
- It should have the capacity to absorb urine and semisolid stool
- It should be capable of being wrapped without spilling contents on removal
- It should be disposable and affordable
- It should be of such inert materials as will not affect baby's delicate skin

Types of Baby Diapers

- Teen baby diaper,
- Boy baby diaper,
- Baby napkin,
- Big baby diaper,
- New-born diaper,
- Paper diaper,
- Disposable baby diapers,
- Girl baby diaper and cotton baby diaper etc...

2. PRODUCT DISCRIPTION

2.1 PRODUCT USES

Diapers are personal hygiene products engineered to absorb and contain urine and faeces of a baby. They are placed and fastened around baby's legs and bottom to form a leak proof seal, preventing contamination of baby's clothes.

Size measurements:

- Standard: 360 mm(L.)×105mm (W.)× 16mm (Thickness) Max. 160 pieces/min
- Newborn baby: 320 mm(L.) ×105mm (W.)× 15mm (Thickness) Max. 150 pieces/min

2.2 RAW MATERIAL REQUIREMENT

Most baby diapers are made with the following basic components:

1) Polyethylene or cloth-like film: This is used as the back sheet that prevents the liquids from leaking out of the diaper. The back-sheet can also be given a cloth-like look, by adding a thin polypropylene non-woven sheet to the film, using either the hot melt process or the heat and pressure method.

2) Tissue: A special tissue paper that is different from the regular bathroom tissue and has a higher elasticity and wet strength is another important component of a diaper. The tissue essentially serves as a carrier for the pad (the pad is the absorbent core of the diaper) and helps reduce the pin holes created during the compression process carried out by continuous drum forming systems.

3) Hot Melts: They are used to glue the different components of the diaper, such as the pad and the elastics. They are made of a mixture of resins and oils. The hot melt adhesive is applied in molten form and when it cools down it provides the required bonding force to glue the materials.

4) Hydrophobic Non-woven: It is used as a top sheet for the leg cuffs; it prevents water from passing through. It is made of polypropylene resin without any added surface surfactants. The hydrophobic nonwoven prevents leakage out of diaper. By applying a surfactant to a restricted area, it is possible to make a roll of hydrophobic nonwoven only partially philic.

5) Hydrophilic Non-woven: It is the main top sheet, the top surface that is in contact with the baby's skin. It allows the liquids to flow into the diaper core. The difference between the two non-wovens (philic and phobic) is the surfactant treatment used in the process.

6) Elastics: Used to improve the fit of the diaper, usually made of polyurethane or polyester foam, synthetic rubber or Lycra (also known with the generic name Spandex).

They are used in cuffs, for the waist and the legs; they can also be used as lateral side panels and in tape construction.

7) Lateral Tapes: In premium diapers, Velcro type materials have been used to provide mechanical grip, it is also known as the "hook tape". In lower priced diapers, adhesive tapes made of polypropylene are used. Then there are new versions of elasticized Nonwoven Velcro Tapes.

8) Frontal Tapes: This is used to facilitate multiple repositioning of the lateral tape without tearing the back-sheet; it is made of polypropylene film and attached to the front of the diaper with adhesive. Its use has helped to reduce the thickness of the poly film without the risk of potential tears associated with the opening of the lateral tapes from the back-sheet.

9) Cellulose: Used in the construction of the pad, it gives integrity and absorbing capacity to the diaper. The capacity of normal cellulose pulp is around 10 cc of water per gram of pulp when the diaper is in "free swell".

10) Acquisition and Distribution Layer: Also known with its abbreviation ADL, it is a sub layer used between the top sheet and the absorbent core. Sometimes used in full length but mostly preferred as a patch near the target zone where urine is most likely to be deposited.

11) Sodium Poly-acrylate: Also known as super-absorbent or "SAP" (super absorbent polymer), Kimberly Clark used to call it SAM (super absorbent material). It is typically used in fine granular form (like table salt). It helps improve capacity for better retention in a disposable diaper, allowing the product to be thinner with improved performance and less usage of pine fluff pulp.

12) Top Sheet surface add-on lotions: In order to create novelties for product differentiation, several topical lotions are added to the nonwoven top sheet, among others: Aloe Vera, Vitamin E, Petrolatum, Almond Oil, Vitamin D, Oat Extract, Jojoba, etc. There is another trend to use antibacterial lotions (such as tertiary ammonia or silver salt compounds). However, many paediatricians are against its use for obvious reasons.

13) Decorated Films and wetness indicators: For even greater product differentiation, some diapers use decorated films underneath the cloth-like back-sheet. Some use as many as nine inks with all kinds of well-known characters such as Disney, Sesame Street, Soccer teams, etc. Another gimmick they use is a wetness indicator. This is typically used for adult products but some baby diapers also use it.

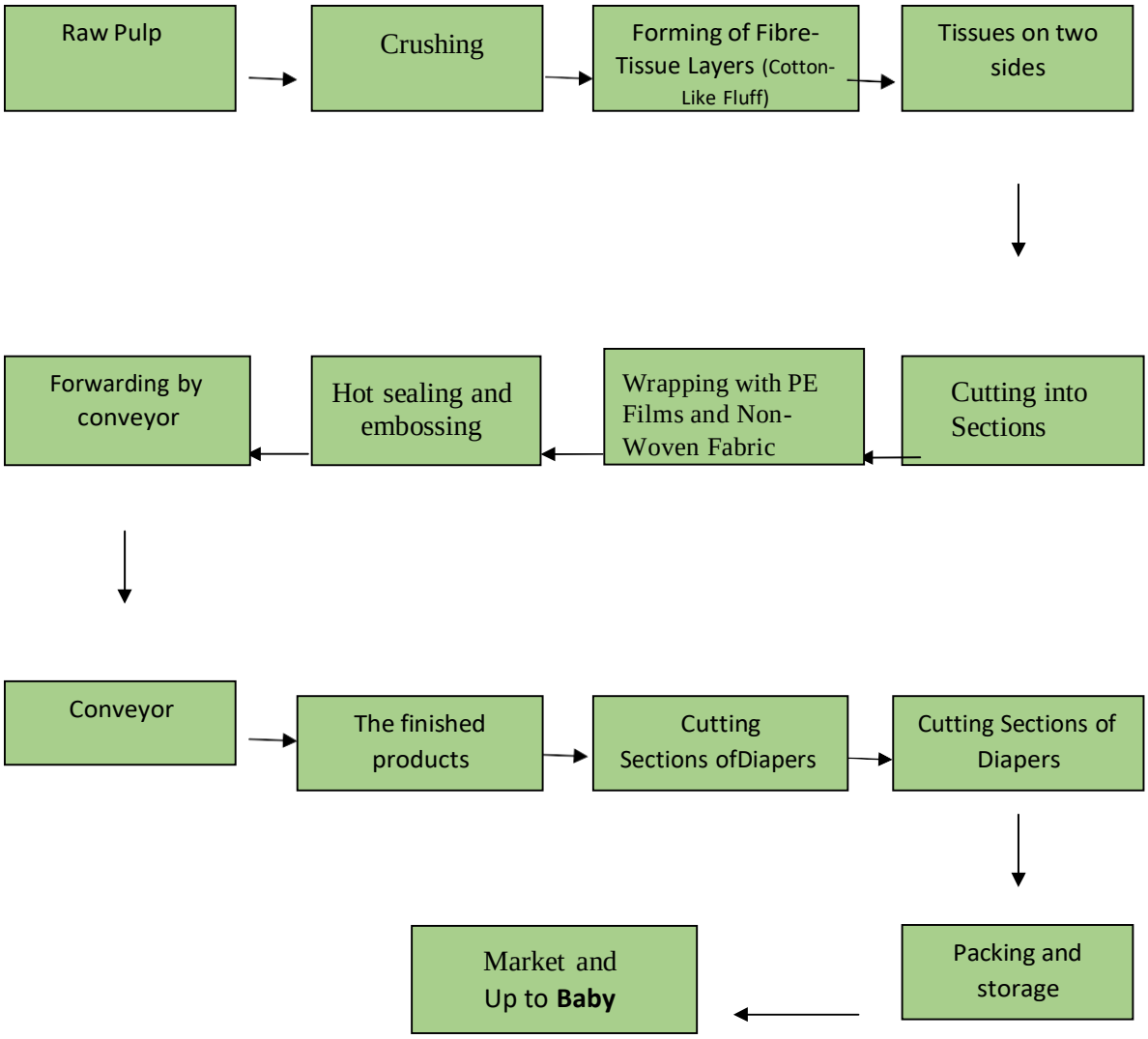
2.3 MANUFACTURING PROCESS

The manufacturing process of the Diapers is simple and amenable to line production. It consists of continues operation in which the filler paper is ground by a hammer mill to produce a fluffed pulp which is then supported by a tissue paper. Next a non-woven fabric is placed and adhesive is applied to bond the materials. The diaper is cut to the proper dimension, and the fastener and release tapes are attached at designated points. Thus, the process is:

Sheets of rolled wood pulp are continuously and automatically fed to the pulp crusher, which crushes the supplied pulp into cotton-like fluff.

- The fluffed pulp is then molded into strips.
- Two absorbent layers of cotton are placed on two sides of the molded strip.
- The entire strip is then cut into required lengths.
- The Waterproof polyethylene film is laid on the sides of the absorbent layers.
- The entire strip is then wrapped by a non-woven fabric, which holds the individual strip together.
- The strip is then processed by hot sealing and embossed with favorite figures.
- The diapers, which are still joined together by the train diaper are forwarded by a conveyer and thereafter cut into separate pieces.
- Each diaper is then placed into individual bags and arrayed in good order for packing.

Baby Diaper Manufacturing Process:



3. PROJECT COMPONENTS

3.1 Land /Civil Work

An area of almost 3,000-4,000 square feet would be required to set up the Baby Diaper Manufacturing Unit. This space would be required for raw materials storage, production, packaging, storage of finished goods, waste treatment, and administrative work.

We have not considered the cost of Land purchase & Building Civil work in the project. It is assumed that land & building will be on rent & approx. rental of the same will be Rs. 30,000 – 40,000 per month.

3.2 Plant & Machinery

The manufacturing process of baby diaper is a line production. The unit comprises a paper pulp crushing machine, forming/ wrapping machine, glue spreading machine and the conveyer systems, plus counter, control box, and alignment machine.

A fluff pulp mill positioned at the right hand end of the machine and normally counter/stacker at the left hand end to count the diapers and align them before they are pushed into the manually held bag or into the automatic packaging machine.

Pulp feeding frame: The electrically controlled lifter, the feeding is easily operated

Pulp grinder: Grinding system with the reject fiber collecting device, which can reduce the production cost.

Pad wrapping system: Pliable but strong wrapping and forming device made from the stainless steel with special specification and designs.

Hot melt adhesive rolling system: The special applying adhesive device.

Pad conveyor: Convey the pads in 2.5M row, which is convenient for packing inspection

Drive system: Solid spiral and helical gears of different specification to match with vari-speed gear shift allowing for reduction of the pulp mat to the proper thickness at the desired weight.

Packing facilities: If wish to pack the product into a plastic bag, use a pedal-controlled manual packing machine, or the continuous heat-sealing machine. If one wishes to pack the product into a paper bag, use a box packing machine and carton packing machine for higher efficiency.

The technology and plant machineries are easily available worldwide. The machines are purchased on the turnkey basis from one company with technology tie up, with all other facilities like training of operators, maintenance provision and also on sharing basis.

Baby Diaper Machine

All high speed disposables machines are custom built to suit exact requirements. They vary greatly in price based on the following main parameters:

Machine speed

Product features

Product quality

Machine reliability/efficiency

The following tables give costs of typical baby diaper and sanitary napkin machines. These should be treated only as guidelines since there are many different manufacturers in Americas, Asia and Europe that offer different levels of machinery and after sales support.

6.3 Miscellaneous Assets

The miscellaneous assets include Testing devices, Spare parts, Generator, safety equipment, instrument chart and accessories, cleaning materials of the plants, computer, printer, furniture, and other electrical equipments.

4. LICENSE AND APPROVALS

To start the baby Diaper manufacturing process the different licenses and registrations from the different authorities regarding the area and machineries must be obtained initially. These laws vary from one state to the other. Besides them, the other certificates that must be obtained are:

1. MSME Udyam Online registration
2. The GST (Goods and Service Tax) certification.
3. A “No-objection Certificate” from the State Pollution Control Board.
4. A “No-objection Certificate” from the Fire Board.
5. Trademark (Choice of brand name-optional)

PROJECTED BALANCE SHEET **(in Lacs)**

PARTICULARS	1st year	2nd year	3rd year	4th year	5th year
Liabilities					
Capital					
Opening Balance		3.67	6.27	10.14	13.83
Add:- Own Capital	2.06				
Add:- Retained Profit	4.11	6.10	8.88	12.19	14.05
Less:- Drawings	2.50	3.50	5.00	8.50	10.00
Closing Balance	**3.67**	**6.27**	**10.14**	**13.83**	**17.88**
Term Loan	12.00	9.00	6.00	3.00	-
Working Capital Limit	5.00	5.00	5.00	5.00	5.00
Sundry Creditors	1.94	2.38	2.86	3.38	3.95
Provisions & Other Liabilities	1.50	2.00	2.40	2.64	2.90
TOTAL :	**24.11**	**24.65**	**26.41**	**27.85**	**29.73**
Assets					
Fixed Assets (Gross)	15.00	15.00	15.00	15.00	15.00
Gross Depriciation	2.23	4.12	5.73	7.10	8.27
Net Fixed Assets	**12.78**	**10.88**	**9.27**	**7.90**	**6.73**
Current Assets					
Sundry Debtors	3.13	3.95	4.75	5.61	6.55
Stock in Hand	4.65	5.65	6.76	7.91	9.20
Cash and Bank	1.55	1.67	2.64	2.43	3.75
Loans & Advances	2.00	2.50	3.00	4.00	3.50
TOTAL :	**24.11**	**24.65**	**26.41**	**27.85**	**29.73**

PROJECTED PROFITABILITY STATEMENT **(in Lacs)**

PARTICULARS	1st year	2nd year	3rd year	4th year	5th year
Capacity Utilisation %	**30%**	**35%**	**40%**	**45%**	**50%**
SALES					
Gross Sale					
BABY DIAPER	93.96	118.50	142.40	168.26	196.44
Total	**93.96**	**118.50**	**142.40**	**168.26**	**196.44**
COST OF SALES					
Raw Material Consumed	58.32	71.52	85.88	101.48	118.37
Electricity Expenses	1.01	1.35	1.55	1.74	1.93
Depreciation	2.23	1.89	1.61	1.37	1.17
Wages & labour	8.40	10.08	12.10	14.52	17.42
Repair & maintenance	1.88	2.37	2.85	3.37	3.93
Consumables	5.64	7.11	8.54	10.10	9.82
Packaging cost	3.76	3.56	4.27	3.37	4.91
Cost of Production	81.23	97.88	116.80	135.93	157.55
Add: Opening Stock	-	2.71	3.26	3.89	4.53
Less: Closing Stock	2.71	3.26	3.89	4.53	5.25
Cost of Sales	78.52	97.32	116.17	135.29	156.83
GROSS PROFIT	**15.44**	**21.18**	**26.23**	**32.97**	**39.62**
GROSS PROFIT RATIO	**16.43%**	**17.87%**	**18.42%**	**19.59%**	**20.17%**
Salary to Staff	3.24	3.89	4.67	5.83	7.58
Interest on Term Loan	1.33	1.17	0.84	0.51	0.18
Interest on working Capital	0.55	0.55	0.55	0.55	0.55
Rent	4.80	5.04	5.29	5.56	6.11
Selling & Administration Expenses	1.41	4.15	4.98	5.89	7.86
TOTAL	**11.33**	**14.79**	**16.33**	**18.34**	**22.28**
NET PROFIT	**4.11**	**6.38**	**9.90**	**14.63**	**17.33**
Taxation	-	0.29	1.02	2.45	3.29
PROFIT (After Tax)	4.11	6.10	8.88	12.19	14.05
NET PROFIT RATIO	**4.38%**	**5.14%**	**6.24%**	**7.24%**	**7.15%**

PROJECTED CASH FLOW STATEMENT **(in Lacs)**

PARTICULARS	1st year	2nd year	3rd year	4th year	5th year
SOURCES OF FUND					
Own Margin	2.06				
Net Profit	4.11	6.38	9.90	14.63	17.33
Depriciation & Exp. W/off	2.23	1.89	1.61	1.37	1.17
Increase in Cash Credit	5.00	-	-	-	-
Increase In Term Loan	13.50	-	-	-	-
Increase in Creditors	1.94	0.44	0.48	0.52	0.56
Increase in Provisions & Other liabilities	1.50	0.50	0.40	0.24	0.26
TOTAL :	**30.34**	**9.22**	**12.39**	**16.76**	**19.33**
APPLICATION OF FUND					
Increase in Fixed Assets	15.00				
Increase in Stock	4.65	0.99	1.11	1.16	1.28
Increase in Debtors	3.13	0.82	0.80	0.86	0.94
Repayment of Term Loan	1.50	3.00	3.00	3.00	3.00
Increase in Loans & Advances	2.00	0.50	0.50	1.00	0.50
Drawings	2.50	3.50	5.00	8.50	10.00
Taxation	-	0.29	1.02	2.45	3.29
TOTAL :	**28.78**	**9.10**	**11.42**	**16.96**	**18.01**
Opening Cash & Bank Balance	-	1.55	1.67	2.64	2.43
Add : Surplus	1.55	0.12	0.96	-0.20	1.32
Closing Cash & Bank Balance	**1.55**	**1.67**	**2.64**	**2.43**	**3.75**

CALCULATION OF D.S.C.R

PARTICULARS	1st year	2nd year	3rd year	4th year	5th year
CASH ACCRUALS	6.34	7.99	10.49	13.56	15.21
Interest on Term Loan	1.33	1.17	0.84	0.51	0.18
Total	7.67	9.16	11.33	14.07	15.39
REPAYMENT					
Instalment of Term Loan	1.50	3.00	3.00	3.00	3.00
Interest on Term Loan	1.33	1.17	0.84	0.51	0.18
Total	2.83	4.17	3.84	3.51	3.18
DEBT SERVICE COVERAGE RATIO	**2.71**	**2.20**	**2.95**	**4.01**	**4.84**
AVERAGE D.S.C.R.					**3.34**

REPAYMENT SCHEDULE OF TERM LOAN							
					Interest		11.00%
Year	**Particulars**	**Amount**	**Addition**	**Total**	**Interest**	**Repayment**	**Closing Balance**
1st	Opening Balance	-					
	1st month		13.50	13.50	-	-	13.50
	2nd month	13.50	-	13.50	0.12	-	13.50
	3rd month	13.50	-	13.50	0.12	-	13.50
	4th month	13.50		13.50	0.12	-	13.50
	5th month	13.50	-	13.50	0.12	-	13.50
	6th month	13.50	-	13.50	0.12	-	13.50
	7th month	13.50	-	13.50	0.12	0.25	13.25
	8th month	13.25	-	13.25	0.12	0.25	13.00
	9th month	13.00	-	13.00	0.12	0.25	12.75
	10th month	12.75	-	12.75	0.12	0.25	12.50
	11th month	12.50	-	12.50	0.11	0.25	12.25
	12th month	12.25	-	12.25	0.11	0.25	12.00
					1.33	1.50	
2nd	Opening Balance						
	1st month	12.00	-	12.00	0.11	0.25	11.75
	2nd month	11.75	-	11.75	0.11	0.25	11.50
	3rd month	11.50	-	11.50	0.11	0.25	11.25
	4th month	11.25	-	11.25	0.10	0.25	11.00
	5th month	11.00	-	11.00	0.10	0.25	10.75
	6th month	10.75	-	10.75	0.10	0.25	10.50
	7th month	10.50	-	10.50	0.10	0.25	10.25
	8th month	10.25	-	10.25	0.09	0.25	10.00
	9th month	10.00	-	10.00	0.09	0.25	9.75
	10th month	9.75	-	9.75	0.09	0.25	9.50
	11th month	9.50	-	9.50	0.09	0.25	9.25
	12th month	9.25	-	9.25	0.08	0.25	9.00
					1.17	**3.00**	
3rd	Opening Balance						
	1st month	9.00	-	9.00	0.08	0.25	8.75
	2nd month	8.75	-	8.75	0.08	0.25	8.50
	3rd month	8.50	-	8.50	0.08	0.25	8.25
	4th month	8.25	-	8.25	0.08	0.25	8.00
	5th month	8.00	-	8.00	0.07	0.25	7.75
	6th month	7.75	-	7.75	0.07	0.25	7.50
	7th month	7.50	-	7.50	0.07	0.25	7.25
	8th month	7.25	-	7.25	0.07	0.25	7.00
	9th month	7.00	-	7.00	0.06	0.25	6.75
	10th month	6.75	-	6.75	0.06	0.25	6.50
	11th month	6.50	-	6.50	0.06	0.25	6.25
	12th month	6.25	-	6.25	0.06	0.25	6.00
					0.84	**3.00**	

4th	1st month	6.00	-	6.00	0.06	0.25	5.75
	2nd month	5.75	-	5.75	0.05	0.25	5.50
	3rd month	5.50	-	5.50	0.05	0.25	5.25
	4th month	5.25	-	5.25	0.05	0.25	5.00
	5th month	5.00	-	5.00	0.05	0.25	4.75
	6th month	4.75	-	4.75	0.04	0.25	4.50
	7th month	4.50	-	4.50	0.04	0.25	4.25
	8th month	4.25	-	4.25	0.04	0.25	4.00
	9th month	4.00	-	4.00	0.04	0.25	3.75
	10th month	3.75	-	3.75	0.03	0.25	3.50
	11th month	3.50	-	3.50	0.03	0.25	3.25
	12th month	3.25	-	3.25	0.03	0.25	3.00
					0.51	**3.00**	
5th	Opening Balance						
	1st month	3.00	-	3.00	0.03	0.25	2.75
	2nd month	2.75	-	2.75	0.03	0.25	2.50
	3rd month	2.50	-	2.50	0.02	0.25	2.25
	4th month	2.25	-	2.25	0.02	0.25	2.00
	5th month	2.00	-	2.00	0.02	0.25	1.75
	6th month	1.75	-	1.75	0.02	0.25	1.50
	7th month	1.50	-	1.50	0.01	0.25	1.25
	8th month	1.25	-	1.25	0.01	0.25	1.00
	9th month	1.00	-	1.00	0.01	0.25	0.75
	10th month	0.75	-	0.75	0.01	0.25	0.50
	11th month	0.50	-	0.50	0.00	0.25	0.25
	12th month	0.25	-	0.25	0.00	0.25	-
					0.18	**3.00**	

DOOR TO DOOR	60	MONTHS
MORATORIUM PERIOD	6	MONTHS
REPAYMENT PERIOD	54	MONTHS

DISCLAIMER

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