Design of a Letterbox for Indian Post

A Product Design project II report by
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Approval sheet

The project entitled " *Design of a letterbox for Indian Post* " by *Siddharth Patil* (02613802) is approved as partial fulfillment for the *maters degree* in *industrial Design* at Industrial Design Center, Indian Institute of Technology, Bombay.

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External Examiner	……		

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Abstract

The project started as 'Indian post' wanted to redesign the letterbox.

The focus was kept majorly on maintenance free letterbox, which can have a new contemporary look, reflecting and suggesting a new age and competitive identity of 'Indian post'.

As the product acts as part of a complex system, the structure of the system plays an important role in design. The challenge was to create a very practical product that will get used in varied conditions and environments.

Introduction

1.1 About 'Indian Post' :

Indian post is a organization of Govt. of India which is the largest postal network in the world. providing postal services in every part of the country with over 1.5 lakh post offices.

The number of letterboxes in the country touches to a massive 6 lakh figure.

With the advancement of technology, the use of postal services is adversely affected. The newly developed options like mobile communication, SMS, emails, internet greetings, chatting etc are taking away the market share. Many aggressive and organized courier services in major cities are also competing with the post. The global changes like telephone infrastructure and reduced STD ISD tariff rates are also affecting the business

On other side postal dept is also coming with new options integrating the technology in their wide spread services. Some of them being

E-post : Using Internet and postal network as more effective combination for common people.

E-bill post : Bill-paying services with postal network.

Speed post tracking : Online tracking of the posted packet

India post is also coming with collaborations with different companies for offering better services like money transfer etc.

On one side there is increase in business communications but decrease in personal communications using postal services.

As a result, from last few years, the traffic of registered and unregistered mail is nearly constant or somewhat decreasing

1.2 History and concept of the letterbox

Somewhere in the mid-nineteenth century, the concept of letterbox started. Before that, people used to go to the post person to deliver the letters. As the demand for the letters and traffic kept increasing the concept of letterbox came into existence.

Earlier there used to be individual letterboxes for each house in some countries. The same boxes were used by the postman to collect and distribute the letters. Latter the concept vanished and idea of 'outgoing only' letterbox started.

Instead of people coming to the post office or postman going to each and every home to ask for letters an intermediate solution was applied. Placing a box at common places wherein people can come and post their letters. Once in a day the postman will go and collect all the letters from the letterboxes in the area.

1.3 A Letterbox :

The letterbox is a representative of the postal dept.

It will collect the letters from people on behalf of postal dept. and store them temporarily till the postman comes.

All this time, it will protect the letters from environment and others.

Only authorized people with a key are allowed to clear the letters.

The inlet :
Accepts the letter for storing
Ensures only one way traffic

The body:
Place to store the letters
Protects the letters from weather & Guards the letters

The door and lock :
Allows the letters to be taken out by authorized people only.

Data collection

Data collection is done in different areas.

Knowing the system :

What system is implemented for taking care of the collection of letters and how the things happen. The system that takes care of the letterboxes.

Product environment :

Actual function of the product and the conditions and environments the product is functioning in.

Problems :

What are the actual problems with the product? And what are the constraints in design?

Users :

People who interact with the letterboxes and nature of their interaction.

2.1 Indian letterboxes :

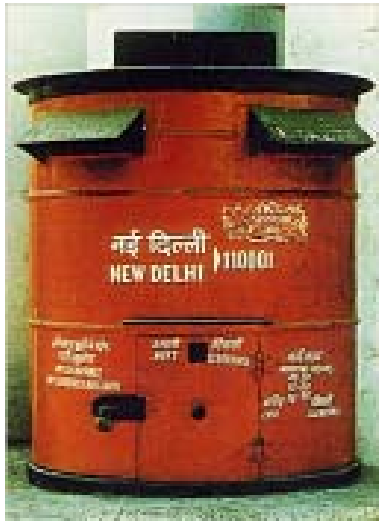
In India, British people started the public postal services as like today.
The letterboxes we see today are coming/derived from British letterboxes.
There are around 6 lakh letterboxes installed all over the country.
4-5 variations of the letterboxes exist.

The small boxes :

- Used majorly at the rural sides and where the traffic of letters is low
- Has volume around 1500 inch cube
- Many times hanged to the trees /walls without fixing anywhere
- Generally hanged in some common public place or in front of some shop, corner and depends on people for the security.

The medium sizes pillar box :

- The most identified and popular boxes.
- Bigger in sizes and normally used everywhere as standard letterbox.
- Has volume around 5000-inch cube
- Fixed on ground with structure and cement base



The twin box :

- Elliptical big boxes divided in to two parts inside
- Normally found at the central post offices or other big places like stations, stands etc.
- Divided in parts like city /outside mail
- Have large volumes

TV type boxes :

- Large square boxes
- Has a larger volume of around 7500 inch cube
- Installed where the traffic is more
- Installed with a pole and structure in cement block.

There are some variations of the letterboxes which comes in between elliptical single boxes and simple pillar-boxes like the shown below.

The larger no of boxes are the normal pillar and the square types.

Earlier lettrboxes in UK 1857

UK 1866

2.2 World letterboxes :

All over the world the letterboxes are closely related to the society, as time advanced the changing culture and taste of people kept reflecting on the external appearances of the letterboxes. The concept remained more or less same.

At the start of the postal services, letterboxes were a matter of high society. the treatment given to the letterboxes was ornamental reflecting the 'value'. With time the service spread and the letterbox started becoming less glamorous objects.

As the technology advanced and other options started being available, the letterboxes started becoming more and more practical. The forms started becoming more rectangular compared to earlier cylindrical forms. The new materials and processes were used. Recently some letterboxes have started coming with new electronic display.

UK 1910

UK 1910

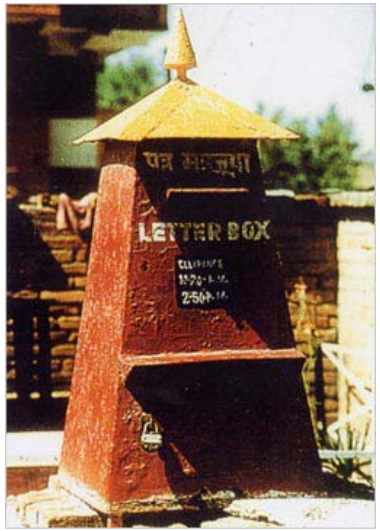
UK 1992

UK 1996

UK 1996

The indian letterboxes are derived from british boxes.

Different versions of letterboxes for departmental stores, stamp vending etc started coming.



Nepal

Germany

Brazil

Japan

France

The letterboxes reflect the picture of the society ,like economy,habits of people and the overall growth .
Letter boxes of each country are different and in some sense, represents the nation. They vary in terms of materials, colors, graphics and form.

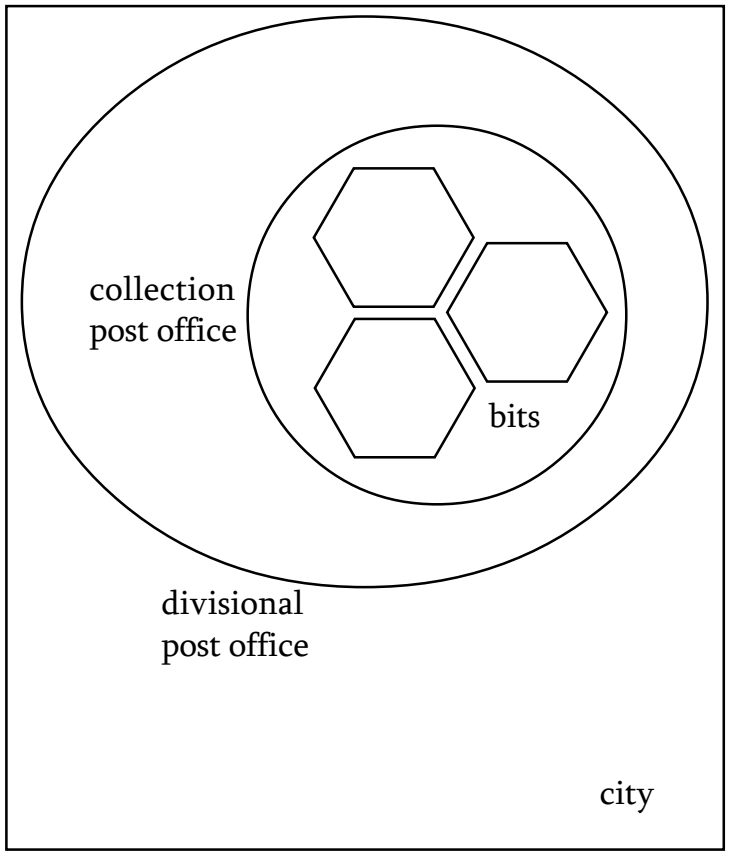
Pakistan

USA

Australia

Mexico

The letterboxes are designed according to habits of the people in the region. In USA the letterboxes are made to post the letters directly from the cars. The height and form is made specially considering the car drivers so that people can directly post letters without getting out.



2.3 Letters collection system :

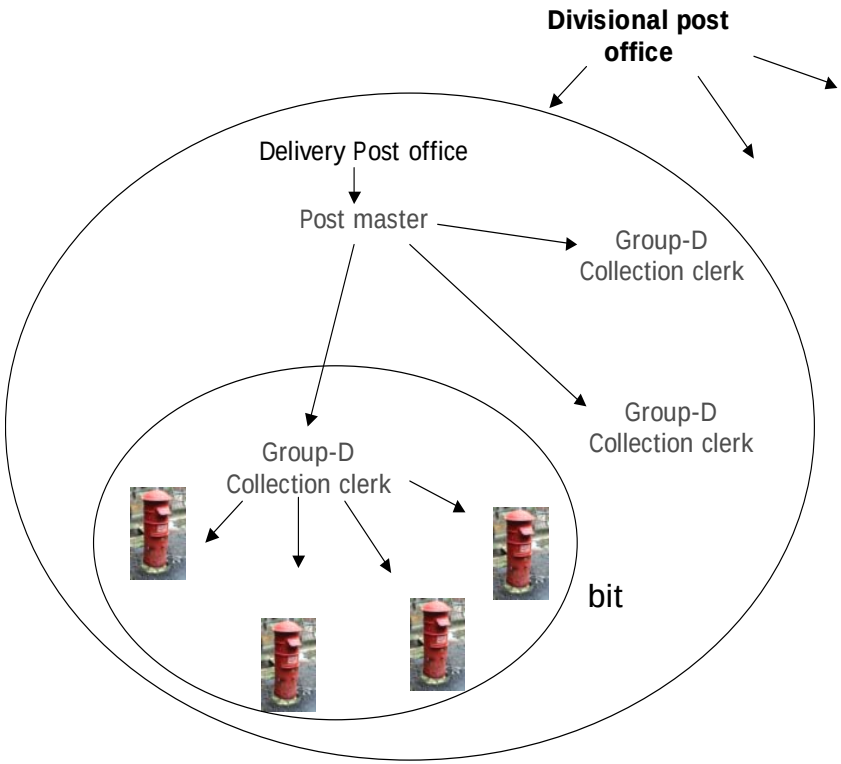
To understand the product better, the system in which the product works has to be understood.

The city area is divided in small parts and the collection process happens systematically. it is worked out to go well with local conditions and working efficiently from years.

The area is divided finally in small bits.

Each area post office is responsible to collect the letters from the letterboxes installed in its region.

The region under one post office is generally divided in to sub parts called bits. Every collection clerk goes for the collection once/ twice/thrice a day. Number of trips in a day are decided according to mail traffic and demand



The collection clerk goes to each and every letterbox and collects the letters.

Each collection clerk takes care about around 15-25 letterboxes.

For post offices covering a larger area, there will be more than one collection clerks going for collection in different bits at same time.

These collection clerks will come back to the post office and gather all the letters. Then the letters are piled together.

The post van will come at some particular time/s in a day.

All the mail received will be taken to the sorting office.

The routs of the van and number of visits in a day to single post office are calculated and decided according to the mail traffic.

Letterboxes are at the starting point of all this collection service.

2.4 System for taking care of letterboxes :

The following system is followed to take care of the letterboxes.

The city area is divided under different divisional post offices. Under each divisional post office there are many collection post offices. Senior superintendent at the divisional post office is the responsible person for the decisions about letterboxes.

There are around 6-7 divisional offices in whole Mumbai region.

There are some PRO's (public relation officers) associated with the divisional post office.

2.4.1 Installing a new letterbox

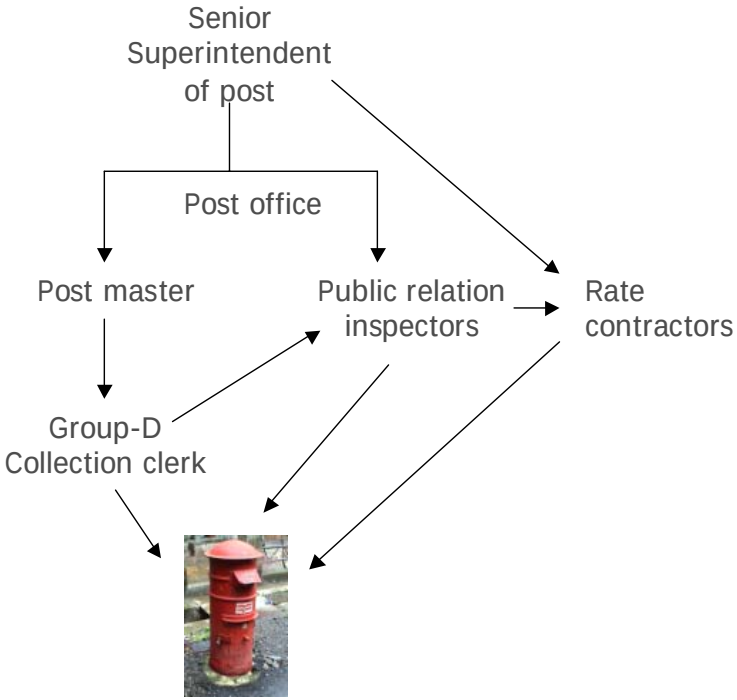
In case of demand from the people in some area, the request comes to the postmaster or directly to the senior superintendent. The senior superintendent asks for the enquiry of the matter.

The public relation officers associated with the divisional post office actually surveys the locations and analyses the possible traffic, need for the new box, if yes then what size and all other decision like places where the box can be installed etc.

The report is made and submitted to senior superintendent.

All decisions like exact location and other small things are decided by the public relation officers and the people in that area.

The divisional office asks higher-level offices for the letterboxes.



2.4.2 Repairing/reinstallation of the letterbox

The collection clerk reports the problems periodically to the postmaster or public relation officers. The PRO goes and inspects the condition of the letterboxes. If there is any problem then the respective steps are taken to repair the box.

Small problems like tags and locks missing are handled by the post office only.

Rate contractors

Post doesn't have any of the manufacturing or repairing facilities of its own. So all the manufacturing and repairing work is outsourced to the rate contractors.

The boxes are purchased in bulk.

For repair work there are rate contractors with yearly contracts with postal dept.

The rate contractor's work includes installing the boxes, repainting the boxes, repairing and reconditioning/maintenance of the boxes.

2.5 The people using the letterboxes

People who use these letterboxes for posting their letters are from varied backgrounds. They range from illiterate farmers, housewives, office going people, clerks etc.

Earlier letters used to be a major communication media for personal communication. After the revolution in communication industry, personal communication is overtaken by business communication.

People are used to the same kind of boxes from years. Normally the people who use letterboxes regularly, deal with only one particular box, which is in their way or near the home. So they are usually aware of the clearance timings. People are reluctant to use letterboxes if they have more important letters. They prefer speed post or courier services or register post as a better option. Some people go to the post offices to post the normal letters which they feel are important.

Some people are aware of the problems with letterboxes like missing locks, loose doors, possibility of getting wet etc. but still they for normal communication they relay on the letterboxes.

People see postal department as 'different' from normal government departments. Over all people have a friendly, cooperative and almost reliable image about the postal services.

2.6 The 'collection clerk'

The collection clerk is a group-d clerk in the post office. Other than going for collection of the letters, at other time he works in the post office.

He is the person who interacts with the letterboxes more than anyone else.

Depending on how many times the van comes to the post office and the letter traffic in the area, he goes for collection either once, twice or thrice in a day.

Normally he goes for the collection walking / bicycle. Sometimes they use public transport as a medium for travel. He carries a cloth sack with him for collecting the letters. The letters are directly put into the sack from the letterbox.
He carries with him the bunch of keys for all the letterboxes in the area allotted to him.

He also carries the metal tags. These tags have the timings painted on it for the next clearance. When he collects the letters from the letterbox, he replaces the next clearance tag in the door

2.7 The interaction with letterbox

For each letterbox he has to go through a sequence of actions :

1. Reaches to the letterbox
2. Keeps the bag on ground
   -Many times the ground is not clean/ may be wet/ may be water collected near the box.
   -Sometimes he keeps the bag on top of the box in this condition.
3. Takes out the keys
4. Opens the lock
5. Opens the door
6. Keeps the lock in the place or on ground
7. Collects the letters and keeps them in bag
   - This process repeats several times as the letters are scattered inside the box.
8. Takes out the old tag and puts new one at place
9. Closes the door
10. Puts lock in place and locks the door
11. Picks the bag .

The entire process gets complex during rains when he has to hold an umbrella in one hand. Then the actions are to be done with only one hand as one hand is all the time engaged.

In case of the TV type letterboxes, the process is somewhat simple but these boxes are not used much.

The interaction with letterbox

Image 1

Image 2

Image 3

Image 4

Image 5

Image 6

Images 1,2 and 4 :
The complex positions of postman while interacting with the letterboxes.

Image 3 :
postman carrying the metal tags.

Images 5 and 6 :
The situation becomes more complex in rainy seasons

Observations and insights

Observations and insights

1. Observation :

The sheet metal construction along with the painting does not withstand with the environment. It starts rusting and damaging the letters.

Description :

1. The sheet metal gets rusted and water enters in the LB. Water gets collected and further deteriorates the metal faces that are badly painted. The box starts deteriorating and the letters starts getting wet and spoiled eventually.

2. Maintenance and painting works are done at the letterbox place. The treatment is not proper. Just a patch up kind of work is done which is not sufficient to sustain environmental attacks.

Ideas :

1. Materials like FRP can be used instead of the metal, which have higher environmental resistance. Also SS can be considered to avoid rusting.

2. Design should consider the repair and reworking conditions also.

The sheet metal construction doesnot withstand with the environment.

Few months after installation the boxes start looking rusty

2. Observation :

Current structures can be used to install the letterboxes as installation takes lot of efforts and money.

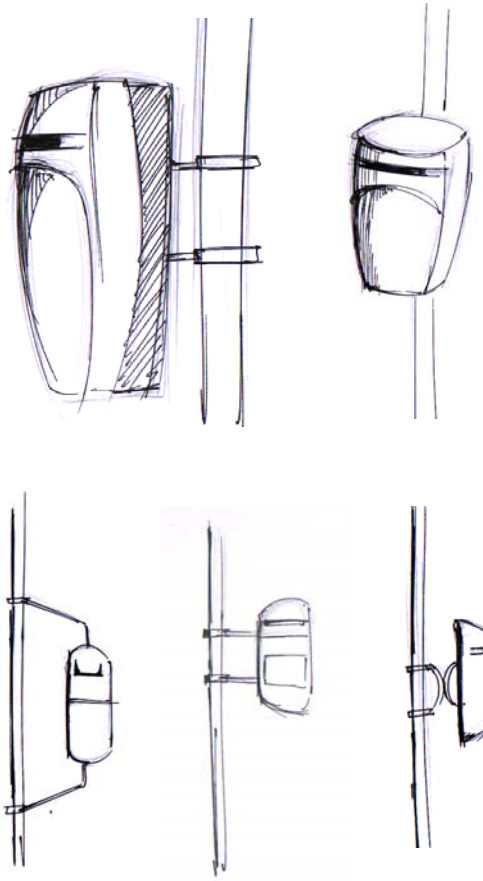
Description :

Current structures like electric poles, telephone poles can be used for installing new letterboxes. It will also benefit, as this will automatically give the night visibility or a better lighting condition for the letterboxes.
Installation of boxes will become more easier and less time consuming job.
These structures can be found at every village and normally are very common structures everywhere.
Many villages have flag poles etc.
(Light and water bills are accepted in post offices.)

Ideas :

1. Fitted on the pole completely.

2. Supported / locked to the pole partially.



For night visibility and reducing cost of installation, the letterboxes can be installed on electric poles.

3. Observation:

Locks missing. The LB's without locks.
Rusted locks. Non-functioning locks

Description:

In 20 LB's around 6-7 were without locks. The reason may be theft, mischief or rusted locks broken by the post people themselves.
New locks take time to come from the dept.
Even maintenance people come late to repair the inbuilt locks.
A simple problem like children inserting some sticks in the locks can create problems takes time to get solved. As a result the letterboxes get closed for days and then there is no option other than breaking the locks for taking out the letters.

Ideas:

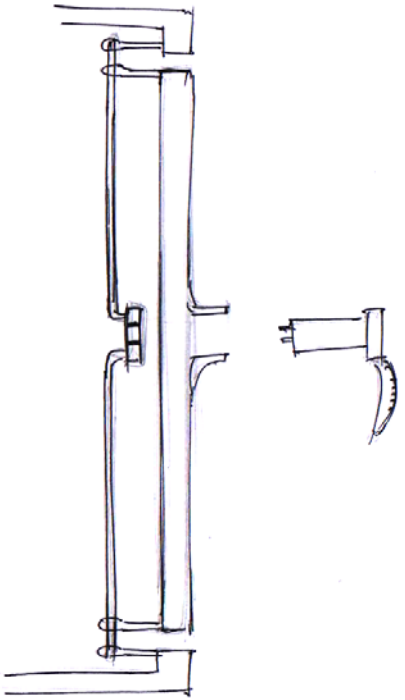
1. Removing the lock system entirely.(applying handle and key type thing.)

2. The lock can be mad as a part of the door. The separate lock is more inviting for the mis chiefs to happen. Also the lock can be covered with some plastic cap etc. to avoid the attention.

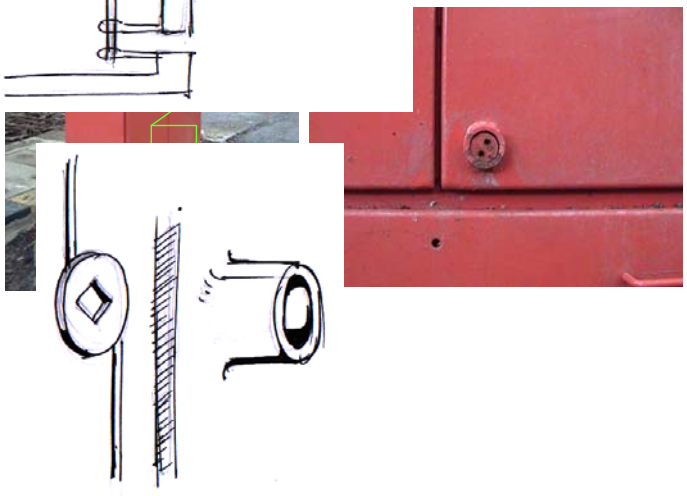
3. Fitting a lock in such a way that the lock gets easily removable in case of non-functioning. Installing a new lock should also be easy.
Nonexistence of lock should not crate any problem for letterbox function. (breaking a lock can create hole in the front door.)

4. While closing door, it can get locked as well, in case of forgetting to lock the door by post man.

The locking mechanisms used in electric junction boxes can be adapted for letterboxes also.
The advantage being,
- No seperate key for each box.
- No problems from key loss.
- sturdy locks



The bunch of the keys carried by the postman



4. Observation:

A postman looking after 15-20 letterboxes has to carry 15-20 different keys with him.

Description:

Currently there are different locks for different boxes. The locks are identical and so the keys. Post people by habit remember the keys in short time. When another person goes for the collection, he faces trouble. The person has to carry a whole bunch of keys with him.

Also the entire operation (interaction with box) can be made more comfortable.

Ideas :

1. For all letterboxes, in one region the locks can have same key. There are vendors available in the market that can supply these locks.
2. The idea of locks can be avoided and something like ‘combining handle and key’ can be implemented.
3. Something like an ‘Allen key’ can be used to open the door, instead of lock.
4. Something like a special tool integrated with handle that is common for all the boxes.

5. Observation :

The sheet metal boxes manufacturing contractors do not have any concern for the functional requirements.
Due to very small defects in manufacturing the functioning can get hampered completely.
The TV type box is an example.

Description :

The workmanship and quality of work is difficult to control because of the system faults.
The quality checking work doesn't happen properly in the system.
The TV type letterboxes can serve better but due to low quality standards in manufacturing these letterboxes are not working properly.
The water in heavy rains gets in the area between door and box.
The water gets trapped and flows down the vertical edges and because of the manufacturing defects, reaches the bottom of the box.

Ideas:

1. The manufacturing methods can be changed and more accurate methods like CNC cutting etc can be implemented to avoid the errors.
2. The design can come with some checking list or standard document description that will help the people in the system about controlling quality in critical areas.

A very small manufacturing defect can spoil the utility of the product.

a small error in joining results in leakage of water and hampers the functionality.

6. Observation:

The maintenance work is done at the LB location only as the box cannot be removed once it gets fixed in the cement base. The quality of maintenance is inferior therefore.

Description:

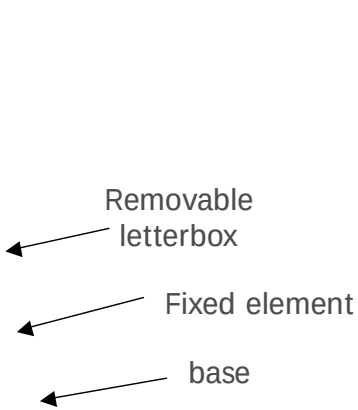
The fixed box is treated with some patching kind of work. No welding, re welding or machine work is possible, as the location is fixed. Also the checking of the maintenance quality is difficult, as inspector has to go every box location for checking. (Same for painting.) The options of the maintenance reduces when it comes to the ' on the spot' treatments.

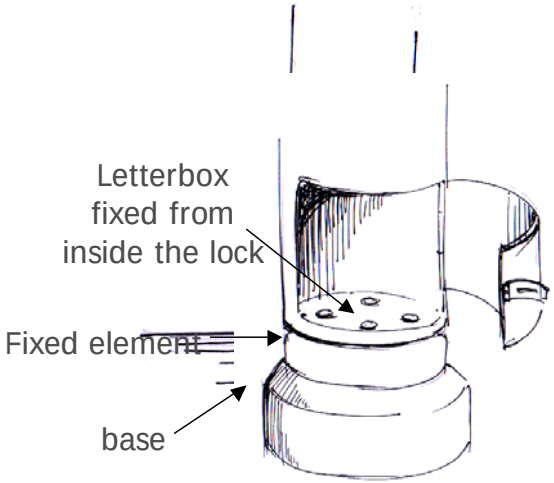
Also painting etc. cannot be done systematically (due to open environment the quality of painting also suffers)

Ideas:

1. The changed design can have considerations of repairs also. In case of plastics, some solu tions etc. (changing parts..)
2. The letterbox is not permanently fixed to the ground. In case of repair it can be moved to a repair shop where it can be easily treated in better conditions.
3. The quality of repair work can be checked by the inspector at the repair station only as all LB's are together. He doesn't need to go to each and every LB location to check it.
4. Partly fixed and partly detachable letterboxes can be made.
5. Fixing can be inside the box so no one can take it out without having the keys.

The maintenance work, being done at the location, causes inferior quality and touchup kind of work.





Removable and modular letterboxes can possiblely address this problem

7. Observations:

Structures placed at public places are prone to theft and vandalism.

Description:

Structures at the public places are prone to theft. Structures like electric boxes, telephone exchange boxes, advertising boards/ banners, tree surroundings protectors are all normally attacked by the lifters/ slum people. Wherever possible the parts of these structures are broken and sold to scrap dealers.

Ideas:

1. There can be minimum no. of parts with firmly fitted to each other. The structures should be firmly fixed to the ground/ support. (ref. small hanging LB's)

2. Material usage can be some non-recyclable materials like POP, cement blocks, cement casting, plastics, FRP. If the material doesn't have any scrap value chances of theft are lesser.

3. The overall look of the box should be solid and integrated.
   May be a sophisticated polished look will keep the lifters away.

4. The parts should not have any usable shapes like bucket shape etc.

The structures placed in public places are prone to vandalism/theft.
Pasting posters, spoiling surfaces and colors is noramlly observed.
The electrical boxes covers and many other structures are found missing.

8. Observation :

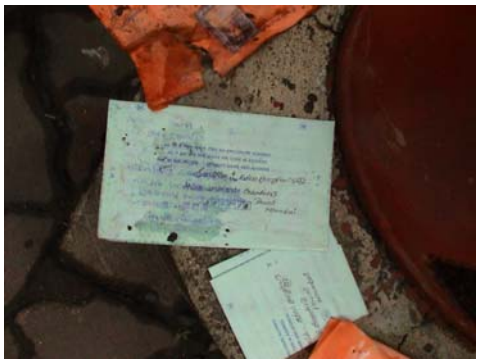
Many times the surfaces are such that they collect water, when water goes inside due to improper maintenance of the box; these surfaces also start collecting water.

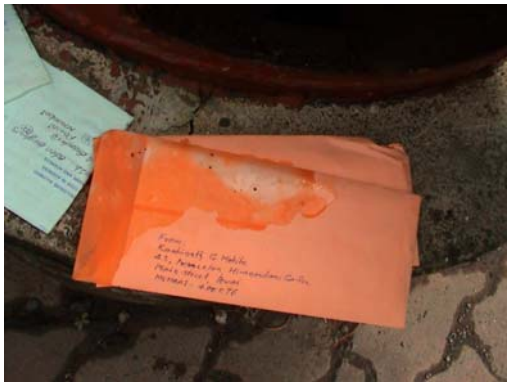
Description :

1. The collected water damages the letters directly.
2. Makes the inside area humid and indirectly wets the letters.
   Many times the letters are seen with spread writings.
3. Further deteriorations of the metals leads to holes in the letterbox.

Ideas :

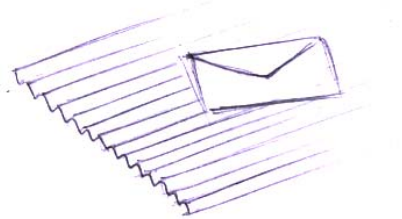
1. Surface of collecting the letters and bottom surface can be different so as to avoid the direct damage to the letters.
2. In case of water entering in the LB, some arrangement can be done to remove the water outside. Some holes at bottoms, or some groove can move the water out.
   All surfaces can be made more curvy / sloppy so as water will not stay.
3. The detailing has to be done carefully.





The surfaces are such that they collect water.
This causes fast rusting of the box and spoiling of letters.

some efforts are made by post-men to seperate the letters from water collecting surfaces.



9. Observation:

Maintenance and fitting / installing people are not aware of design specifications and installation precautions.

Description:

People in the system are not sensitive to the design problems and issues and they use their own methods to solve the problems.

The problems like, letterboxes fitted in tilted position, holes made at the bottom of the LB's to drive the water out, fitting the boxes on some other customized platforms do arise.

Ideas :

1. Clear guidelines about the design specifications can be given with the letterbox.
2. Design itself can be made such that customized installing etc. is not possible or doesn't make any difference (the designed method can only be followed for installation.)

Making holes at the bottom to remove water, Installing the boxes inclined are done by the people to avoid problems.

Non standard installations methods causes problems for the boxes.
the water gets collected between box and slab which causes fast rusting.

10. Observation:

The access to inside of the box is limited. Postman can collect the letters easily if the access can be increased. postman is reluctant to clean the letterboxes from inside (bottom) as it is not comfortable.

Description:

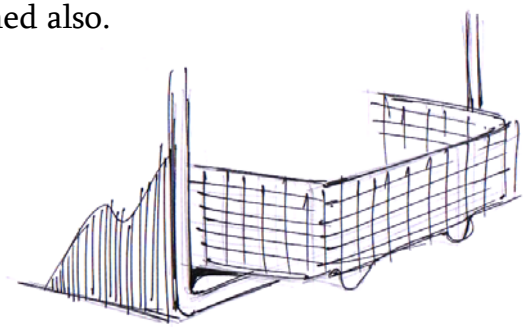
The access to the box is limited and doesn't allow the postman to collect the letters comfortably. Postman is not keen to clean the bottom of the LB's also for same reason. The surface is not reachable and cannot be accessed easily. Post men just collects the letters and leaves the bottom as it is.

Ideas :

1. The bottom surface can be taken out and letters can be collected from it (like a tray) then the cleaning of the LB bottom can be more easily.
2. The box can open more so as to make the bottom completely accessible.

A limited access to inside in case of pillar boxes doesn't allow comfortable interaction.

If the surface becomes movable like a tray the bottom face can be easily cleaned also.



11. Observation :

The slot size is normally bigger.
People with destructive tendencies put waste stuff in the boxes.

Description :

Many times kids etc. put stuff inside the LB through the big slots. The stuff may be wooden pieces, pebbles, empty packets, bottles, and in festival season firecrackers too.

1. People have destructive tendencies.

2. The design can be modified to avoid these problems.

Ideas :

1. The slot size can be reduced to accommodate only letters.

2. Destructive tendencies of the people should not be overlooked in design.

3. The materials used in the box should sustain the destructive actions by the people. (Fire resistant plastic in case of plastics)

Destructive tendencies of people results in lot of foreign articles in the letterboxes. At the time of festive seasons crackers are fired in the box.

12. Observation:

The letters are 'scattered' inside the letterbox.

Description:

Many letterboxes are cylindrical in cross section. Which doesn't go with the rectangular letters. The letterbox sizes are big.
The letters fall from the height and gets scattered on the bottom face, rest against the walls inclined. Sometimes can get folded inside the box.
Postman collects them as it is and keeps them in bag. No piling etc is done.
The box and bag can be changed to carry the letters more systematically in pile etc.

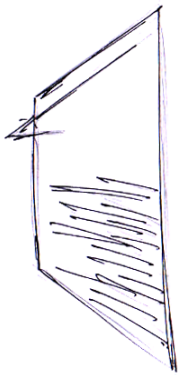
Ideas :

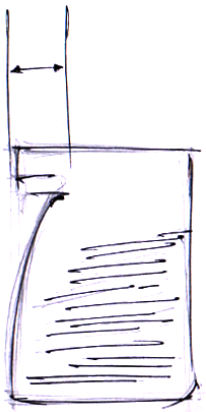
1. The box dimensions and shape can be made such that the letters will form a pile inside the box.

2. Putting the letters in box, can be done by some different style or mechanism, to ensure the letters storage is safe and systematic (entirely diff posting method).

3. The bag can be reconsidered to suit the changed new process of collecting letters, from the boxes.

The scattered letters inside the boxes





The letters can be made to pile systematicaly inside the box

13. Observations:

A writing platform can be provided at the top surface, so that people who forget to write something can use it.

Description:

People can use the upper flat surface of the box as a writing platform/ support.
Generally people can feel a need to write/correct the address or add to the content in the letters just before posting the letter finally.

Ideas :

1. The upper surface can act as a writing platform

2. There can be some plate etc that can be opened to form a support.

Design scope

4.1 Design Considerations

Presently there are three sizes of letterboxes.
For the convenience of the postal dept. the number of box sizes have been reduced to two.
The smaller one is in between the earlier smallest and the medium size letterbox and the larger one is slightly greater than medium sized.
The smaller one can be fixed on walls, base structure or pole mounting. Which can be fixed easily at the villages, the places where possibility of installing cement structure is less as well as unavailable.
The information to be displayed is

1. The next clearance timings: the collection timing of the letters in a day and closing day.
2. The responsible post office contact and a reference no of the box.

Better materials can be found rather than sticking to the existing sheet metal construction. Combination of different materials can be used to achieve better design.

Contemporary manufacturing processes like CNC sheet metal cutting, punching and bending can be used to come with high quality letterboxes.

New materials and processes can be considered like environmental resistant plastics using rotomolding or FRP-resin transfer molding for manufacturing.

4.2 Considerations for the form :

Should reflect the new and advanced image of postal dept.
Should have a different unique identity
- Capable of creating a strong identity which will result in a strong associations with letterbox.

Should go with the environment.
Can have commonality between previous letterboxes.
- Association of the letterbox image in people's mind.

Simplistic form which will avoid the 'tiredness of visual perception'

The characteristics association letterbox can have:
- Alert, alive, capable
- Care taking, responsible, senses of security, smart
- Happy and welcoming, something which people can associate the good feelings of letters with (good looking)
- Modern and smart looks
- A government or authority suggesting

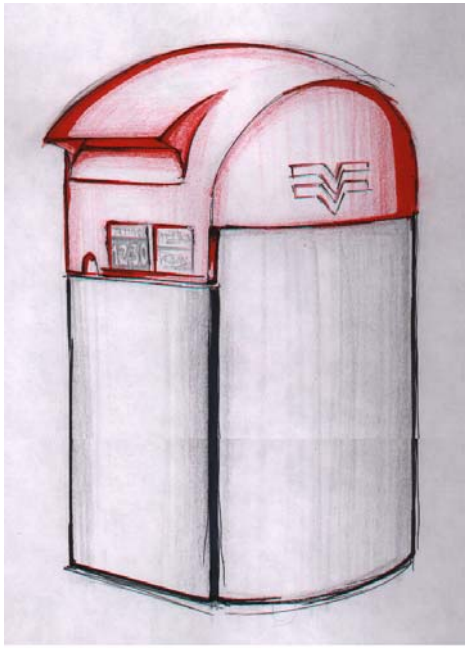
4.3 Product Brief :

1. Letter boxes should be in two sizes
   - Smaller sized can be fitted on walls/ poles or placed on pedestals.
   - Large boxes installed at 15 inch clearance from the ground.
2. The letterbox
   - should have a strong identity .
   - should reflect a modern new image for postal dept.
3. Materials and manufacturing
   -Using contemporary mfg processes and materials to make the letterbox weatherproof.
4. More comfortable letter collection process .
   - Guiding of letters in the bag should be easier.
   - Interaction with the box in rains should be comfortable.
5. The letterbox should display following information :
   - Next clearance timing.
   - Post office authority
   - Contact number.
   - Reference no. of the box.
   - pin code number of region.

Concepts

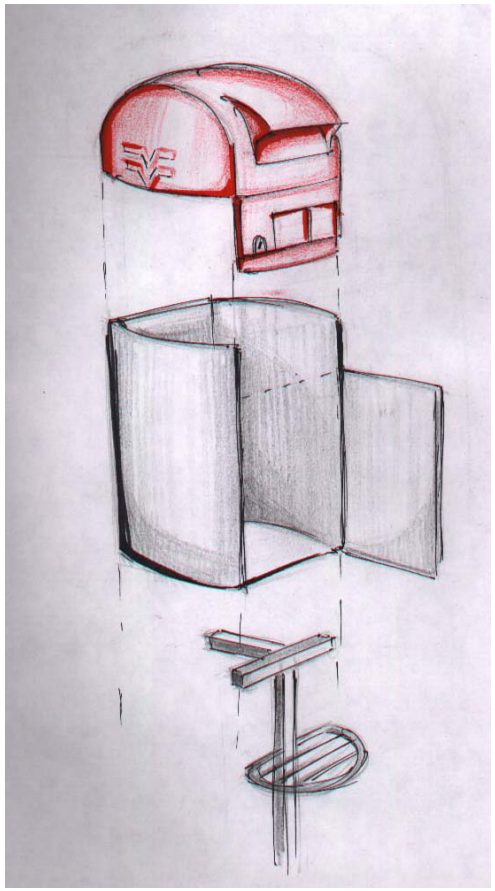
5.1 Preliminery concept generation

Idea A



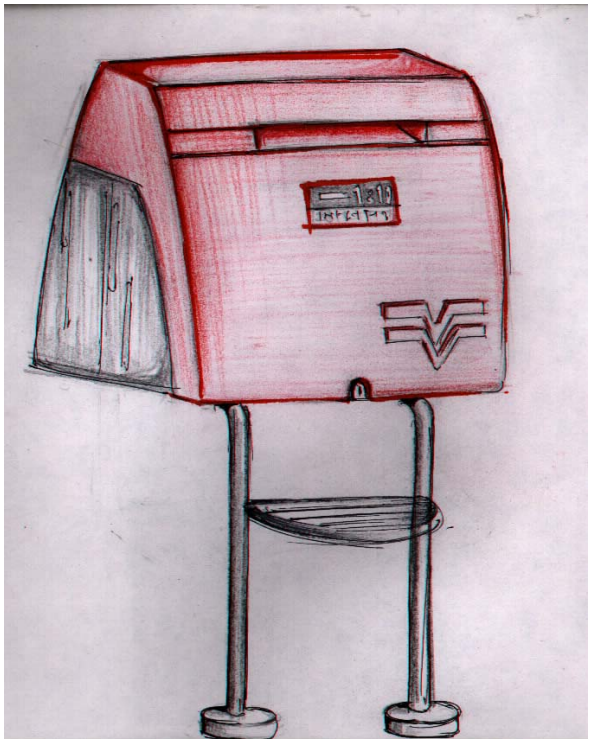
Plastic cap + sheet metal box

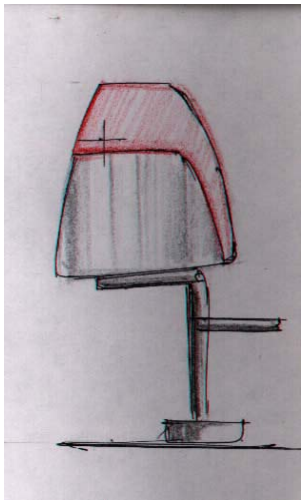
- This concept uses a common plastic cap for both sizes of the letterboxes.
  The cap can be made in envn resistant plastic / FRP
- Boxes will be made in sheet metal SS/MS which will be of different sizes.
- The cap incorporates all the details like next clearance tags space, locks, and letter inlet.
  These complex things done in plastics which otherwise complex for making in sheet metal.
- The plastic cap gives the flexibility of creating complex form that can result in generating a better identity.
- The cap sits on the sheet metal box that protects and covers all the sides and edges which reduces the possibility of water entering inside.



- The plastic cap rests on the top of the sheet metal box, and the full assembly mounts on a pedestal.
- A small bag rest can be provided which will help the process of collecting letters.
- This can also be an identity element.
- In the rainy seasons the postman can perform the operation by one hand and hold umbrella in other hand.

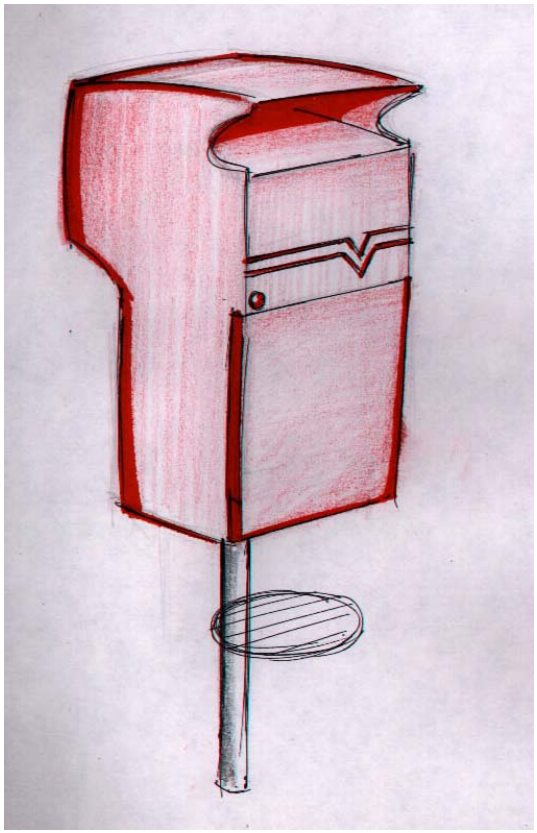
Idea B

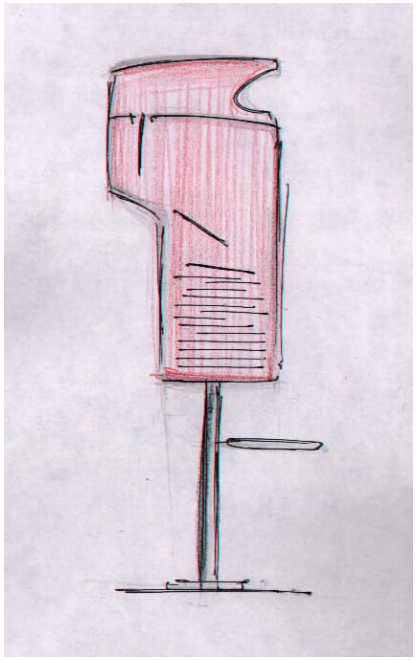




- In this concept, the box opens completely to give easy access to the bottom.
- The box doesn't need all the sides as the letters will stack on the bottom surface. The inlet is at a position from where the letters will fall at central place inside box.
- The cap is made in FRP that is supported and hinged on box sides. The cap integrates the display, inlet and lock.
- The cap covers the lock, hinges and edges.
- The extruded triangular solid shape creates a good identity.

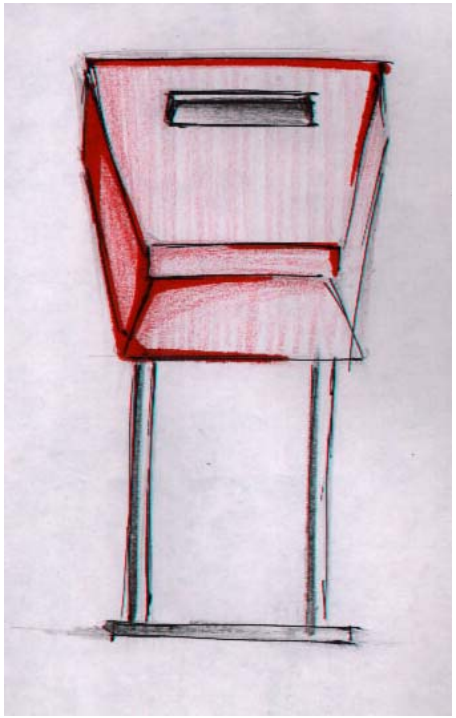
Idea C

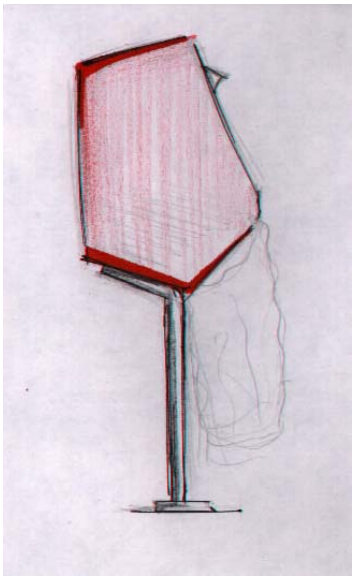


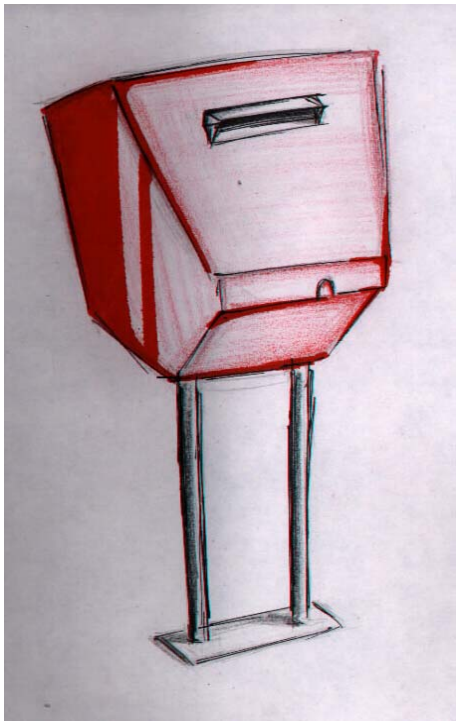


- This concept is derived from cheque collection drop boxes usually seen in banks.
- The letters will be dropped vertically.
- The inclined backside redirects the letters to form a pile of letters arranged systematically.
- A top cover is must to avoid the water entry in the box.
- The postman will directly collect pile of letters from the front door.

Idea D

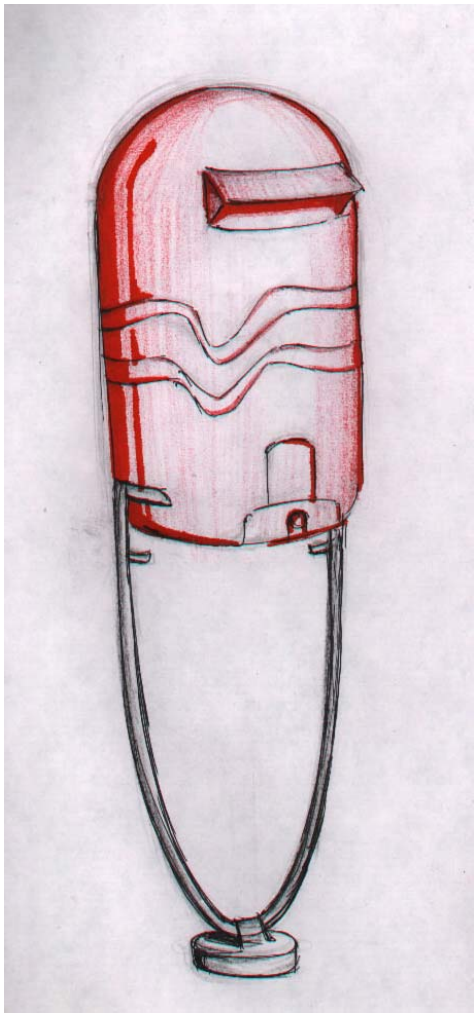


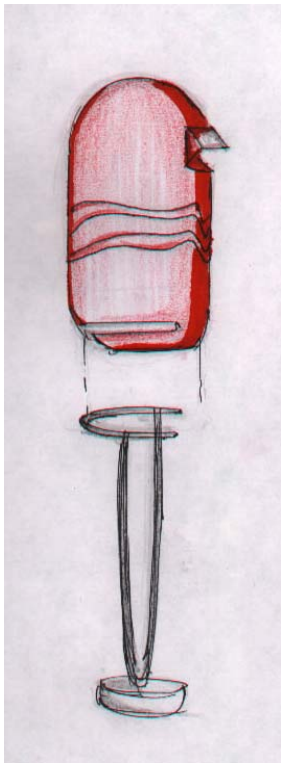


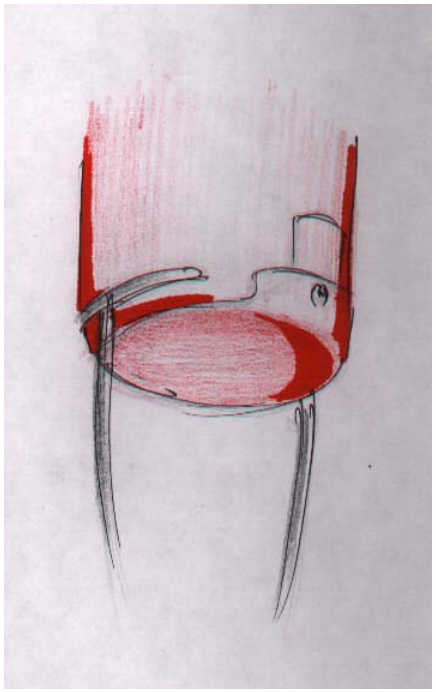


- In this concept, the door and hinges are at the bottom. This will allow collection of the letters from bottom side.
- There is a provision to hang the bag on the hooks
- The door opens downwards and the letters will fall in the bag.
- The shape allows better view and interaction with the letterbox.
- The box is made with sheet metal.

Idea E

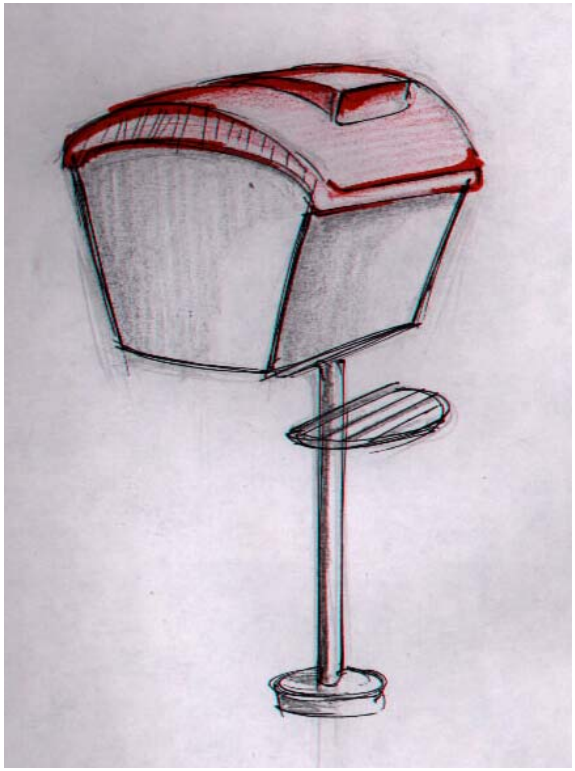


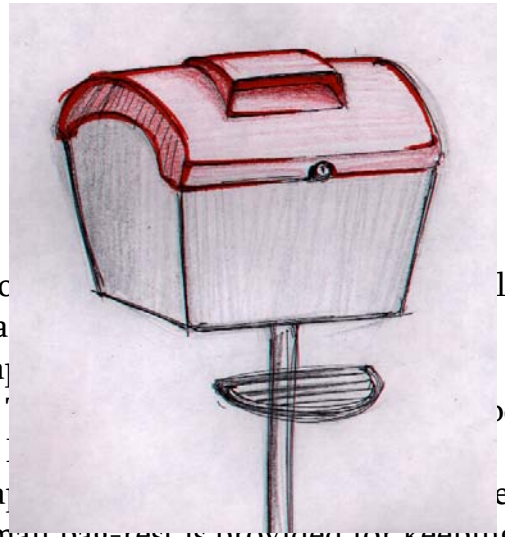




- This concept is manufactured completely in plastics with rotomolding
- Identity of the current boxes is retained with some smart and modern looking treatment.
- No possibility of water going inside (completely enclosed single piece)
- Collection of letters is done from the bottom side.
- The bag is hanged in the bottom and letters are allowed to fall in the bag.

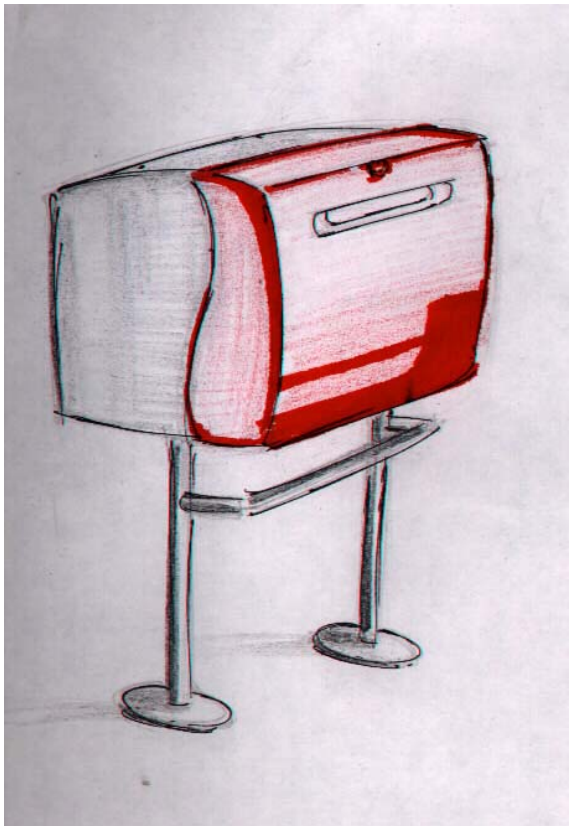
Idea F

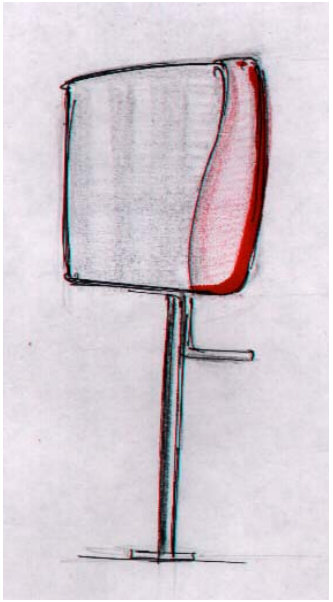


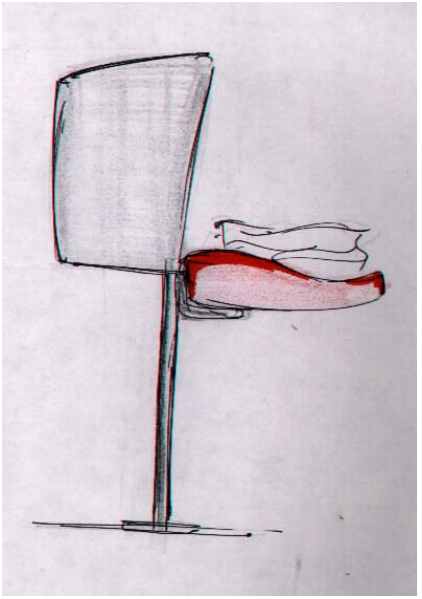


- This cc liminating the door itself.
- The ba
- The ca ock and display integrated.
- The ca es from water.
  The sma bag-rest is provided for keeping the bag.

Idea G







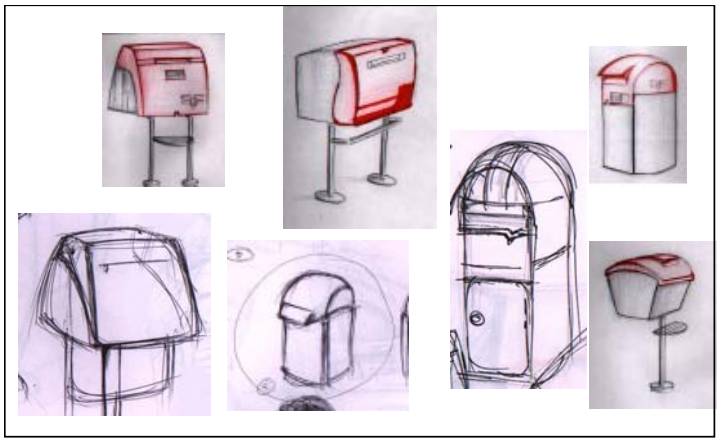
- This concept is a variation of a previous one. Where the cap opens on the front side.
- The cap can be made in envn resistant plastic / FRP
- The cap opens on the front side and also supports the bag as shown above.
- The letters can be conveniently taken and put in the bag.
- The cap incorporates display space, locks and letters inlet.

5.2 Methodology :

The different ideas about different aspects has to be grouped together to come to an integrated solution. The rough ideas in the form of raw sketches and preliminary concepts were grouped in different clusters.
Here the major concern was to come up with a maintenance free solution.
Accordingly, the focus for clustering the ideas was manufacturing processes and material selection.
The ideas were grouped together in three areas.

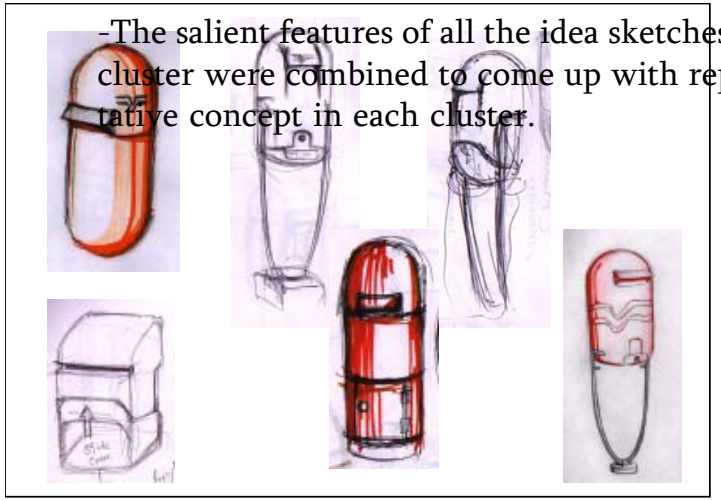
- Total sheet metal construction
- Total plastic/FRP manufacturing
- Combination of both materials

Cluster One : Sheet metal construction



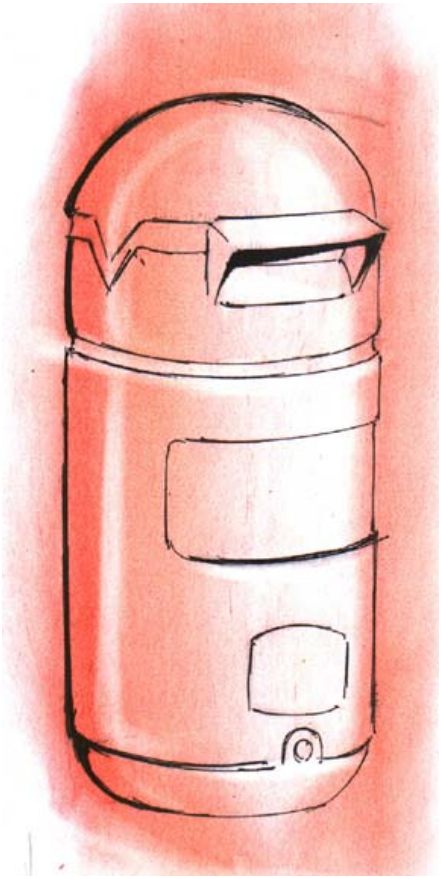
Cluster One : Combination of materials

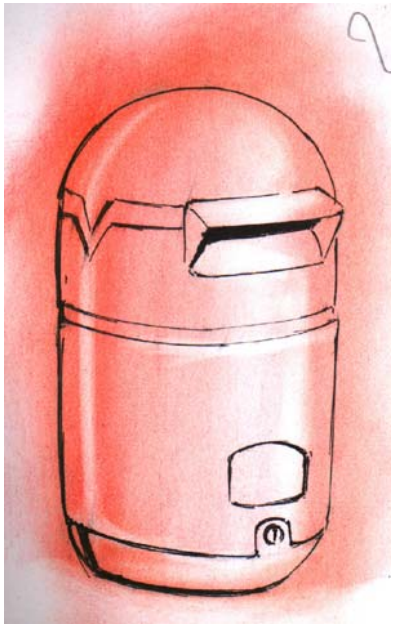
-The salient features of all the idea sketches in each cluster were combined to come up with representative concept in each cluster.

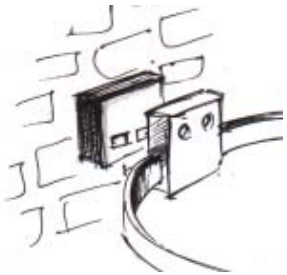


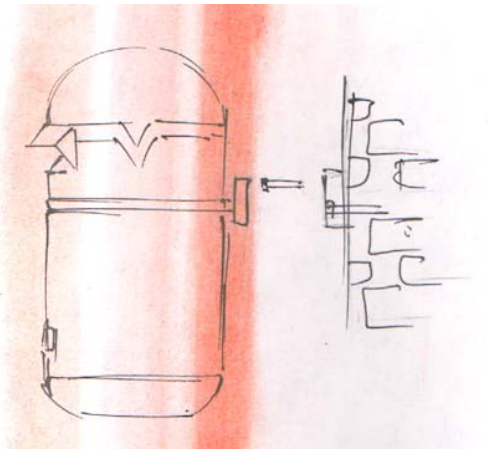
Cluster two : Complete plastic

Concept One A





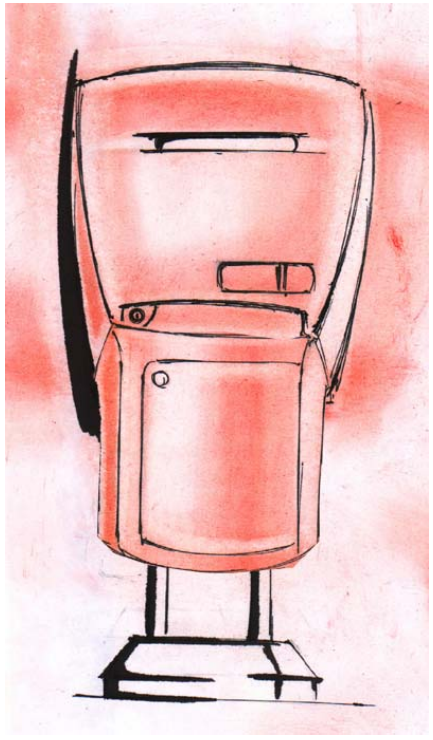


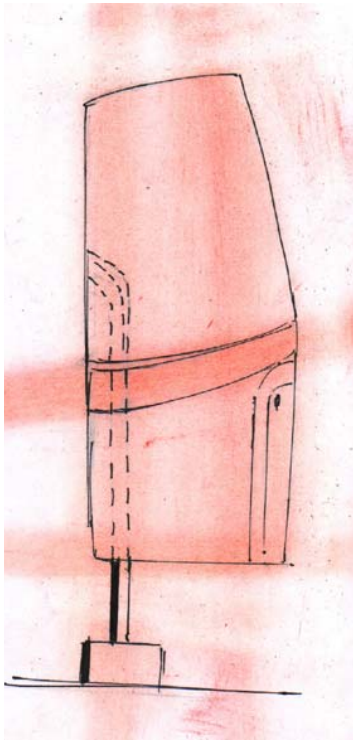


- This concept is made in LLDPE using roto molding
- The identity of the current boxes can be retained while work on contemporary styling.
- Collection of letters is done from the base of the box.
- A common top is used for both sizes.

- The smaller size boxes can be fixed to the walls or on poles such that it can be only removed by authorized people.

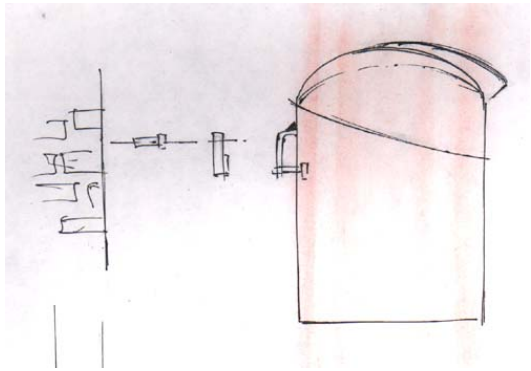
Concept One B



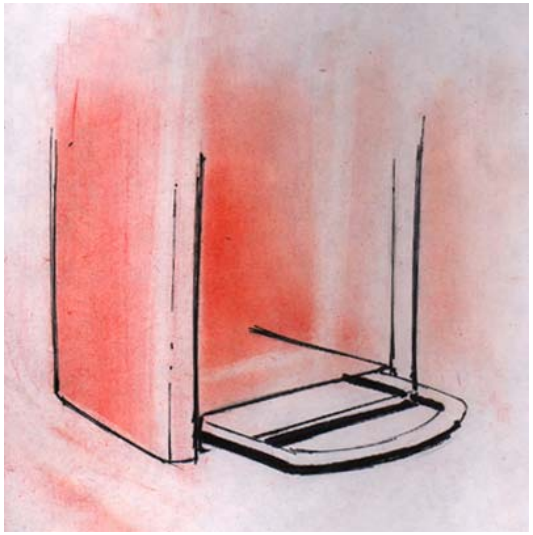


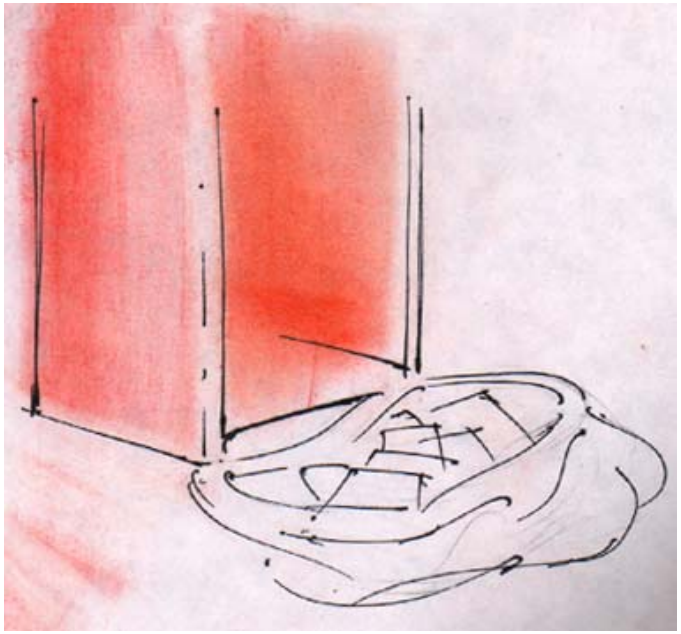
- The second option in same cluster is made in plastic with rotomolding.
- The small box can be converted to large one by attaching an additional box in the bottom.
- The bottom door is removed and the additional box is attached at the place.
- For small box the door is on bottom side and for large box it is on front side.
- Whenever the traffic increases/decreases at particular area the sizes can be easily manipulated without any hassle.

Concept Two



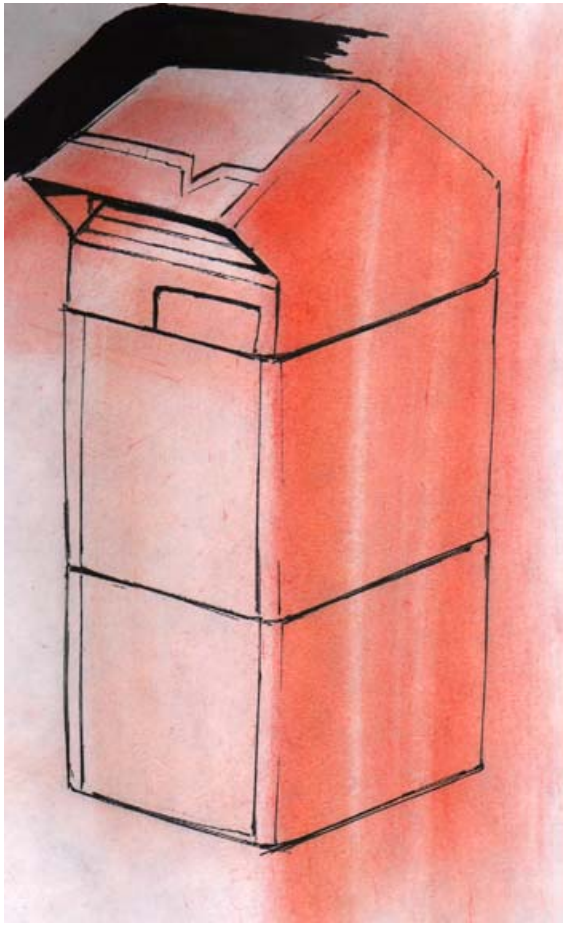
- This c tal base. The base will come i
- The ca P
- Boxes etal (SS/MS)
- The pl nd letter inlet, thus makin .
- The pl y with existing boxes thus h

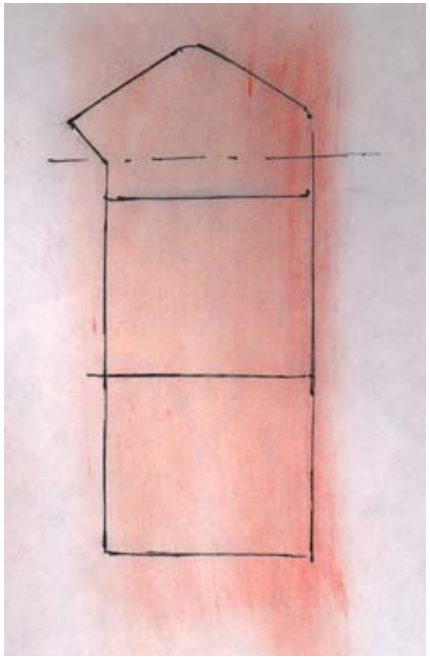




- The base of the box can have a sliding bag-rest.
- Only when the door is opened the simple rod structure can be taken out.
- After taking the letters out, the structure can be put inside and the door can be locked.

Concept Three





- This concept is made complete in sheet metal and hence have the advantage of longevity. The cap is common for both sizes.
- A common cap for both sizes, made in sheet metal
- The sloping cap generates a unique identity.
- The inclined surface can be used as a writing platform and a place for graphics.

Evaluation criteria for the final concept

The criteria for choosing the final concept is based on four areas

1. *Maintenance related issues*
2. *Manufacturing and cost*
3. *User interaction*
4. *Identity*

Longevity of product	- How long the product can sustain, average over all life of the materials and processes
Robust detailing	- How much robust detailing can be possible with the concept
Finish and repainting	- What finish and for how long it can sustain, in case of painting how the repainting can be done.
Modular design	- How well modular/reusable components the design allows
User convenience	- Easy interaction with the post box for postman and user
Cost of product	- Overall cost (including investment cost)
Weather ability (Insulation from envn.)	- Insulation and protection from environment
Unique identity	- Different from surrounding
Perception as letterbox	- Image of letterbox

Final Concept

Materials :

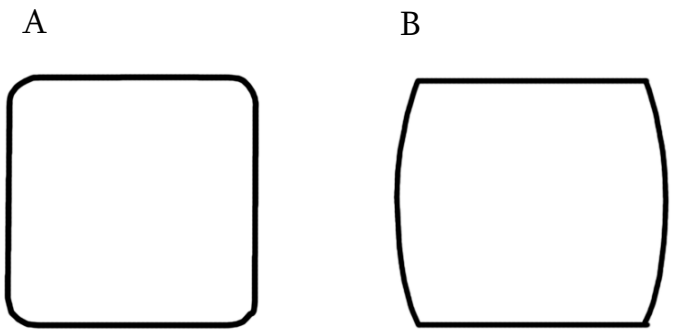
Use of SS or powder coated MS for the basic box construction
Cap can be manufactured by
- Rotomolding
- FRP
- Deep drawing.

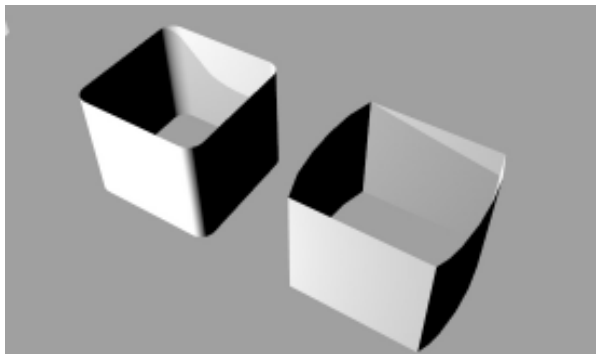
After a comparison of advantages and disadvantages of all the concepts finally this concept is selected out of the five concepts.

8.1 Final Concept : formal exploration

Due to the reasons of longevity, the option of having metal top was kept open.
As vandalism can be a major problem plastic or FRP top may not hold a good option compared to a deep drawn top.
The basic box was fixed to a square size and the dimensions were finalized.

A. To differentiate the square box from other structures. a generous radius is provided at the corners .
B. The Two sides of the boxes are made with of large radius. Giving a sense of protection and care from both sides.





Considering the complexity and matching of the cap with the basic box the square box with corner radius was finalized.

As the basic structure of the box has to be simple, the form of the cap was going to dictate the overall statement of the letterbox.
Different variations of the cap were tried out.

Cap one on both size of boxes

Cap Two both size of boxes

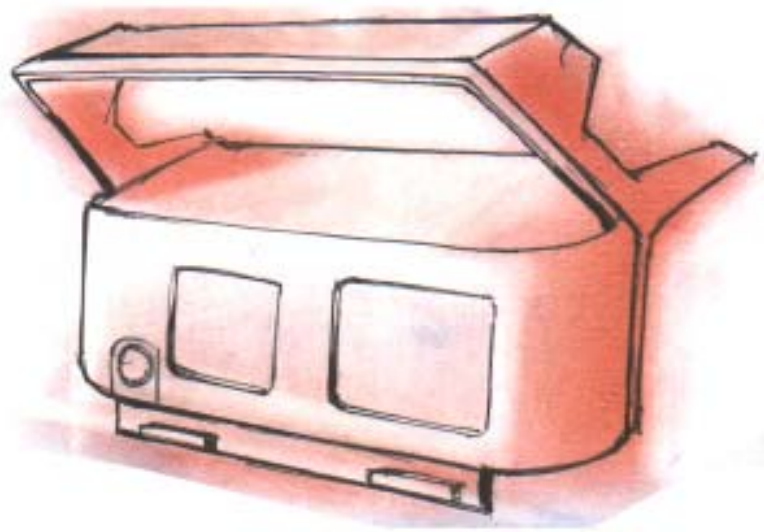
Cap Three on both size of boxes

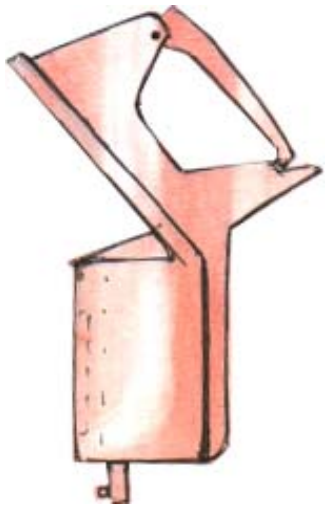
Cap four on both size of boxes

drawing in sheet metal .
st the lock, display area
es will be made in plastic.

The basic form is finalized and finetuning of the form has to be done.

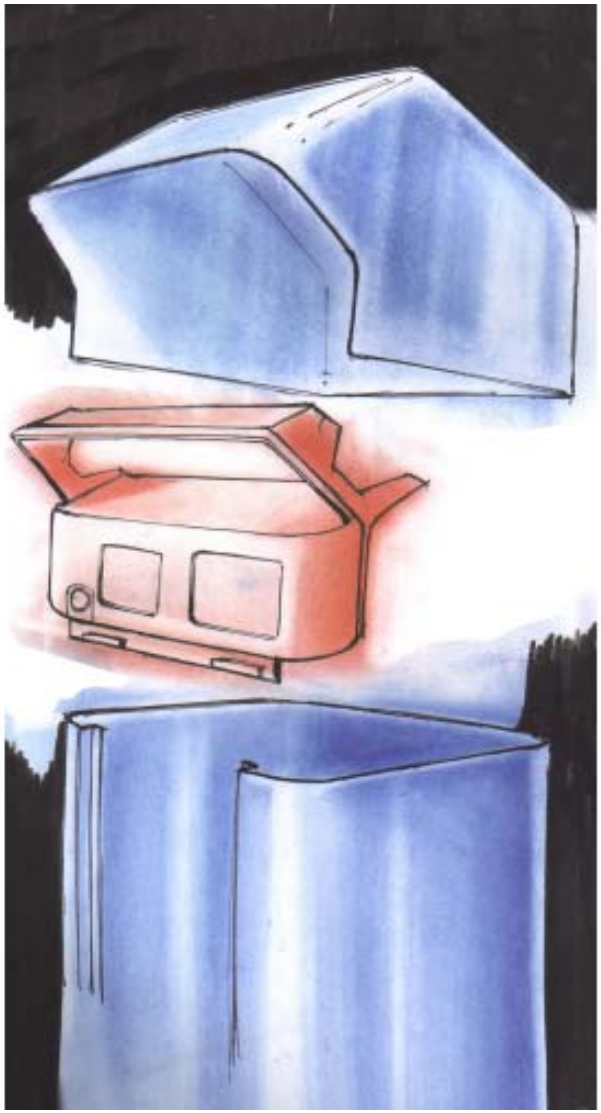
The cap will be made in two parts.
1. The cap will be manufactured by deep drawing in sheet metal
and
2. The front insert to the cap which will have the following features
a. The stationary lock.
b.The space for display.
c.The sheet metal edge protection (which will cover the sharp edges of the cap) .
This part can be made in polycarbonate by injection molding.





The cap insert is made of polycarbonate. The flap will fit from the back and will be fixed n the small grove provided.

The display provided in the front panel will have opening from the bottom accessable only when the bottom door is opened, the transperant cover will also be in polycarbonate.



The plastic front will fit in the cap and together they will fit in sheet metal enclosure
The small and large enclosure will have have the common top.
The enclosures is suggesed to be made of Stainless Steel in Brushed Finish
For Cost Reduction the enclosure can be made of Precoated Sheets or Powder Coated Mild Steel Sheets.
The top Cap will be made of stainless steel

The enclosure will be manufactured using CNC punching and the assembly would be by POP Rivets.

Final form modeled for both sizes.

Information displyed on the box.

Full scale prototype of the smaller box.

Full scale prototype of the Bigger box.

-Conclusion:

As one of the main purposes for the project was to come up with a mainteance free letterbox, stainless steel was chosen which shows good envirnomnetal resistance, good strength properties and finished look.
The front panel with intricate details was made in polycarbonate for easy manufacturing and placed secured in between metal parts,
The top cap was provided with generous slope and big radii to avoid environmental rusting and allow easy drain of water.
The letterbox edges were given ample radii to differentiate the box from other roadside boxes i.e. electricity, telephone boxes.The overall look reflects an aleart, ready to serve, modern letterbox identity.
The information displyed was modified contentwise and was organised on the front panel at easily readable height.

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India post annual report 2002-2003

India post: book of information
Fiberglass reinforced plastics
- sonneborn
production processes