

# HSC 2002 – Textiles and Design

## Major Textiles Project

TEXTILE ITEM/S FOCUS AREA: Costume  
Exemplar  
Sample 1



COSTUME



# Design Inspiration

## Relevance to focus area – COSTUME

The initial inspiration for the CONCEPT was novels from the fantasy genre and fantastical theatre/movie productions. Many fantasy books are located in alternate universes in which mythical creatures such as Dragons and humans co-exist. The idea of a half-animal half-human costume is appealing as it has much theatrical scope. The DESIGN inspiration however came mainly from picture books on Dragons and Serpentology. In particular Graeme Base's picture book entitled "The discovery of Dragons". The idea was to recreate the main dragon characteristics in a wearable costume, which would be suitable for a fantastical theatre or movie production set in an alternate universe in the medieval era. For e.g.: Lord of the Rings.

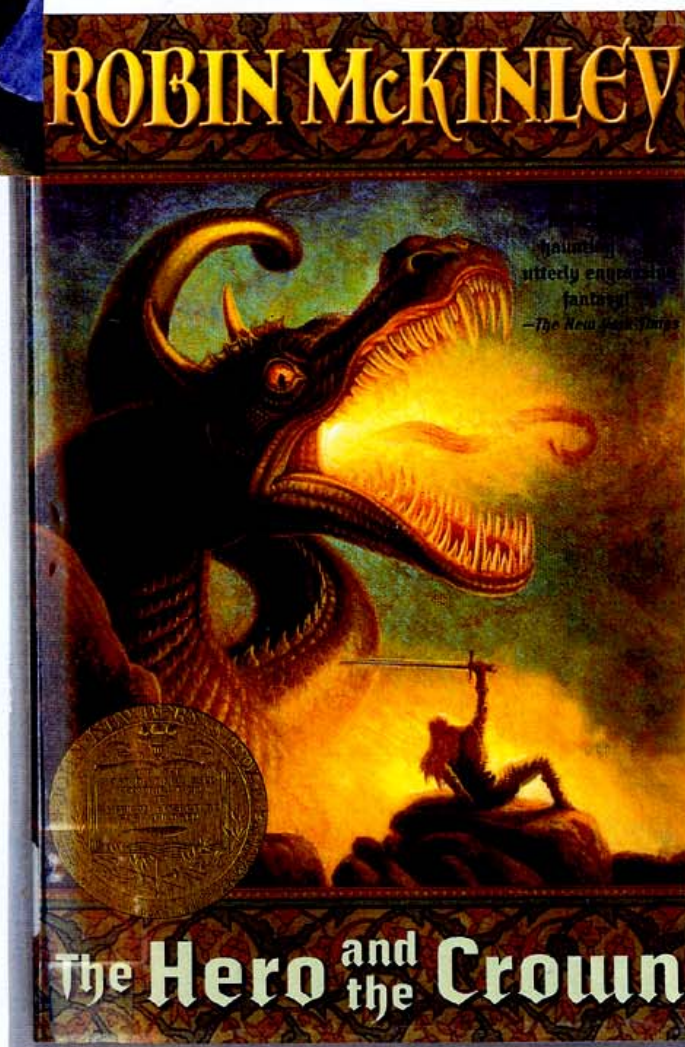
The design "Dragon Lady" is not a pre-existing character from a specific novel, rather a culmination of the major themes of typical fantasy books. For example there is usually an essentially 'good' heroine and a Machiavellian character who is responsible for the misadventures of that 'hero'. The 'dragon lady' design is to be the costume for this malevolent character. She is a culmination of both human and dragon aspects.

"Dragon Lady" is classified as a costume because it is not suitable for everyday wear and its purpose is to transform an actor into a not entirely human character/personality. Most of the scenes in which this character will appear will be set in her castle top lair, a smoky, rocky, mysterious and evil setting. Her followers would most likely surround her, little disfigured horrible creatures and compared to them the Dragon Lady will appear a beautiful but dangerous leader.

DRAGONS

Hero

MYTHS AND LEGEND





# Justification of creative and/or innovative design

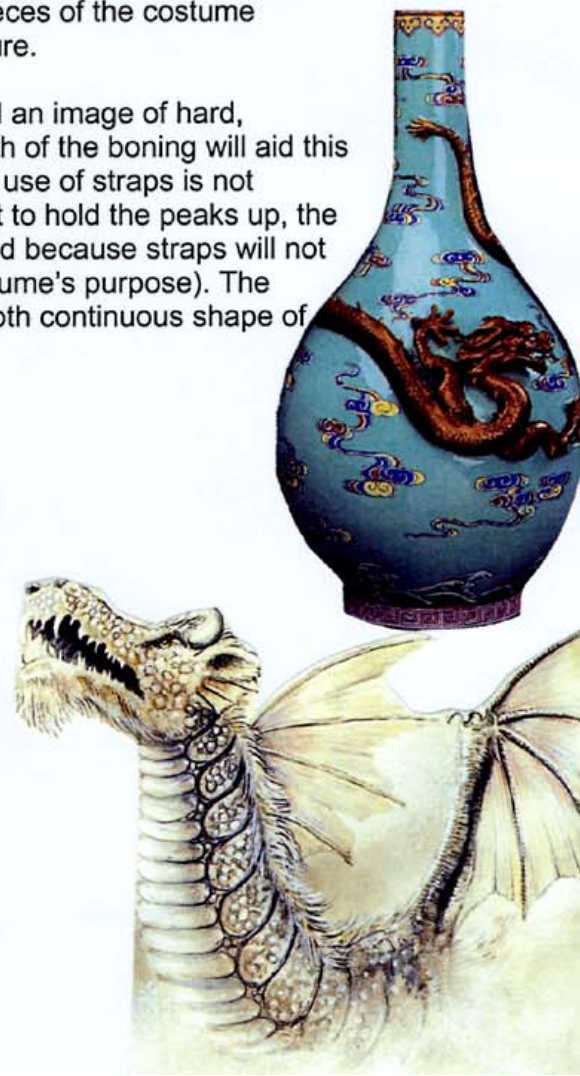
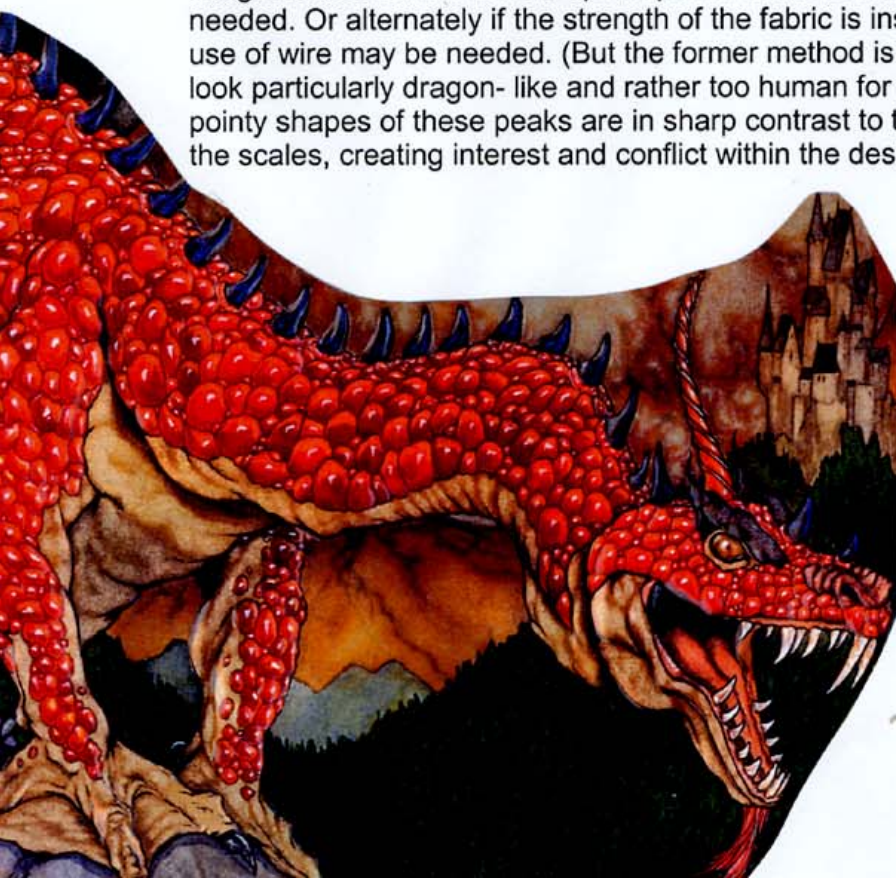
The costume is allowed to be quite elaborate as not much movement is required of the actor due to the fact that her character is an evil leader, therefore she delegates her dirty work to her faithful disciples and is not required to do much moving around herself. This enables the incorporation the full skirt, boned bodice and wings into the "Dragon Lady" design. While in keeping with the Dragon-like appearance these features are used to create a large and ultimately powerful presence on stage.

The full style skirt is characteristic of the medieval era in which the play/ production is set and the size of the skirt will be larger than the costumes of her followers showing her absolute superiority.

A hoop must be used to create the fullness instead of tulle due to the amount of weight it must hold up, (mainly from the scales). The skirt will have a waistband to ensure it sits correctly with the weight of the skirt distributed evenly around the waist; it also looks neat and professional.

The full skirt is an ideal base for the application the main form of decoration 'Dragon scales'. The scales are used to complete the dragon-like look and will become a focus of the costume because the lighting of the character will be from below, with most lighting hitting the skirt, with the head and wings fading into the darkness and smoky setting. It is therefore important that the scales be made from some kind of shimmery, or shiny fabric. This could be in the form of shiny fabric such as satin. Black piping or bias binding will probably be used around the edge of the scales, as it is the easiest way to construct them while creating a professional finish. The colour of the piping will be the same colour as the wings to tie in with the colour scheme and match the pieces of the costume together so as to create the look of a naturally occurring creature.

The boned bodice is used to give strength to the character and an image of hard, unrelenting power. The stance of the character and the strength of the boning will aid this image. It also serves to hold up the peaks of the bodice so the use of straps is not needed. Or alternately if the strength of the fabric is insufficient to hold the peaks up, the use of wire may be needed. (But the former method is preferred because straps will not look particularly dragon-like and rather too human for the costume's purpose). The pointy shapes of these peaks are in sharp contrast to the smooth continuous shape of the scales, creating interest and conflict within the design.





The wings of a dragon are perhaps the most defining features. They project power, and flight. Which is an important aspect of many fantasy novels as to most people the idea of being able to fly is the ultimate fantasy. Therefore because dragons can fly they are 'fantastical creatures'. I wanted to convey this message in my design, so I used the illustrations of dragons and bats in picture books to inspire the shape of my wings. The wings will be mounted on the back of the costume. When angry the Dragon Lady should hold the tips of the wings out to the side, increasing her size and power. As the actor will be lit from below the use of shadows and silhouette will also reinforce this message, adding even more height and grandeur to the character. The idea of using sheer fabric comes mostly from pictures of dragon's wings in books and primary knowledge of the appearance of bat wings, which also are sheer skin and visible thin bones, quite similar to those of a dragon.

While researching dragons it was discovered that most pictures of them consist mainly of 1 or 2 different monochromatic complimentary colours such as: red or green, as can be seen in the pictures below.

It was decided to incorporate this trend into the Dragon Lady design by using 2 main colours but in varying shades. Either, green and black or brown and black but this decision may change due to fabric availability and further experimentation.

### Relationship to historical, cultural and/or contemporary factors.

The design has a strong link with the late medieval era (1066-1500 C.). The full skirt and tight boned bodice was common of wealthy women of that era. As shown in the examples below, taken from Patricia Cooke's book "English Costume (its history and design)" and John Peacock's book entitled "Costume 1066-1900's".



The reason this style was incorporated into the 'Dragon Lady' design is to be in keeping with the era in which dragons had a huge historical impact.

In films or books that contain dragons one will invariably see also castles, knights, dungeons, kings and queens in lavish costume, these are all things common with the medieval era. Consequently it would compliment the theme to use this style of dress in my costume rather contemporary attire such as a scaled pair of leggings, or a body suit.





The dragon is undoubtedly the most famous of the mythical beasts, but, though Chinese in origin, it has become intimately associated with Japanese mythological culture. For the Chinese, dragons represented the male, yang element (ying being the female opposite) and were a beneficent force of nature, even though they had fiery tempers. The dragon is the emblem for the Chinese emperor and symbolized sunrise (east), spring and fertility. Dragons as seen by the Asian cultures were benevolent spirits associated with happiness, prosperity and were kind to humans. Hence the dragon processions and festivals in spring. Dragons, being associated with water and spring were said to be the bringers of rain and so consequently were coloured blue and green. Another popular colour for Asian dragons was red; red to the Asian culture is said to be the colour of prosperity and good luck.(as can be seen below).

The favourable view of dragons held by Asian cultures is in direct contrast to that held later by the western world (mainly Europe in the medieval era 1066-1500 C.) that saw dragons as revolting demons who needed to be eradicated at all costs. They were said to have destroyed crops, ravaged villages and eaten little boys and girls. The king's best knights were often sent to deal with these destructive nuisances, and if successful were labeled heroes. Thus became the stories of chivalry and heroism common to novels of the fantasy/history genre.

As these books are the main source of inspiration, the costume is related primarily to the European representation of dragons, which was one of demonistic and evil quality, because the character the costume is trying to convey also has these qualities. By doing this one can also draw upon the dress design styles of medieval Europe, the era in which dragons had a huge mythical influence, thus neatly tying the two-themes/inspirations together.

*HUI-NENG (right), the Chinese Buddhist patriarch, persuaded a fierce dragon to shrink so small that it would fit into a tiny rice bowl and was thus able to subdue it. The magic powers of dragons included the ability to make themselves invisible at will and change their shape and size. They could shrink to the size of a silkworm or swell to fill all the space between heaven and earth. (ILLUSTRATION FROM SUPERSTITIONS IN CHINA, 1914.)*



*IMPERIAL DRAGONS (right) represented the "Sun of Heaven", the emperor of China. The legendary emperor Yu, founder of the Xia dynasty, had originally appeared in the form of a winged dragon who emerged from his father's body when it was slashed open. Each succeeding emperor was said to be a reincarnation of Yu. The emperor's accoutrements, often in imperial yellow, were richly embellished with dragons. (CHINESE DRAGON DISH.)*





## Visual design development

### Inspiration, development and evaluation of design ideas

#### Design 1

##### Inspiration

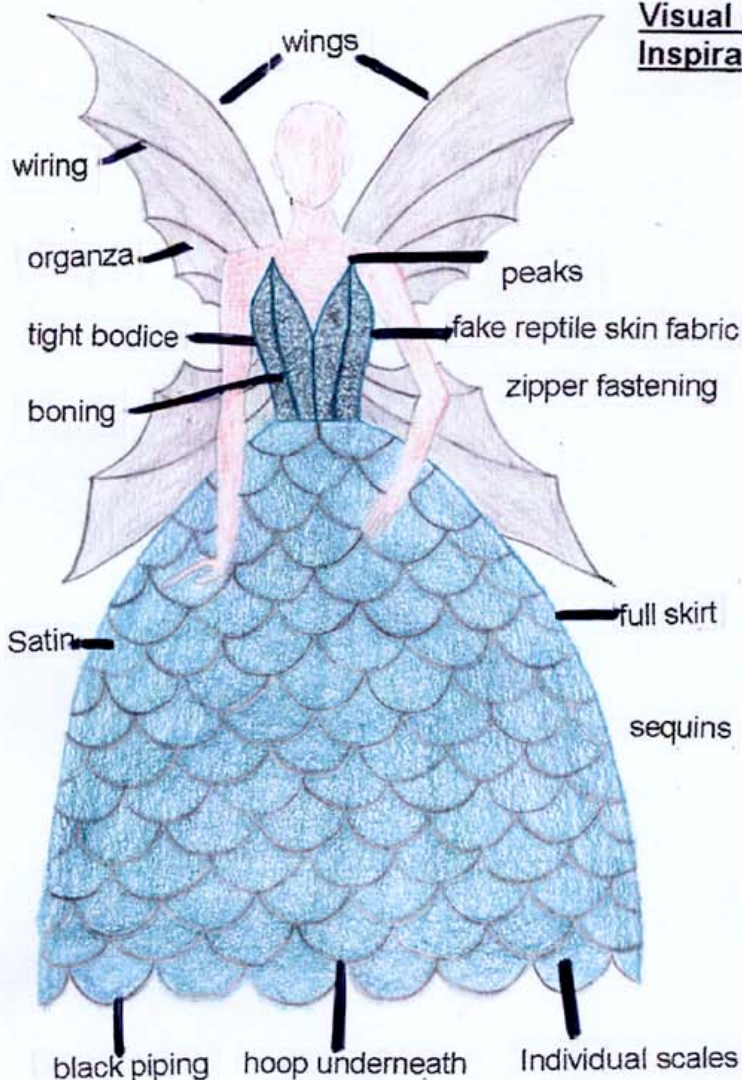
My inspiration was novels from the fantasy genre and picture books on Dragons and Serpentology. Also the dress styles of Medieval Europe inspired the tight bodice and full skirt design.

##### Good points of design 1

- Fits into the focus area of costume clearly
- Full skirt and large wings gives the character a powerful presence on stage
- Design has a lot of theatrical scope
- Is a striking image on paper and hopefully on stage also
- The skills needed for construction of the garment are within my limits
- Will not be too expensive to make
- Have worked with most of the suggested fabrics previously
- Garment is a reasonably high level of difficulty
- Garment has a reasonably high level of creativity and innovation

##### Bad points of design 1

- Will take a long time to complete
- May have difficulty mounting the wings on back of the bodice (due to weight distribution)



#### Design 2

##### Inspiration

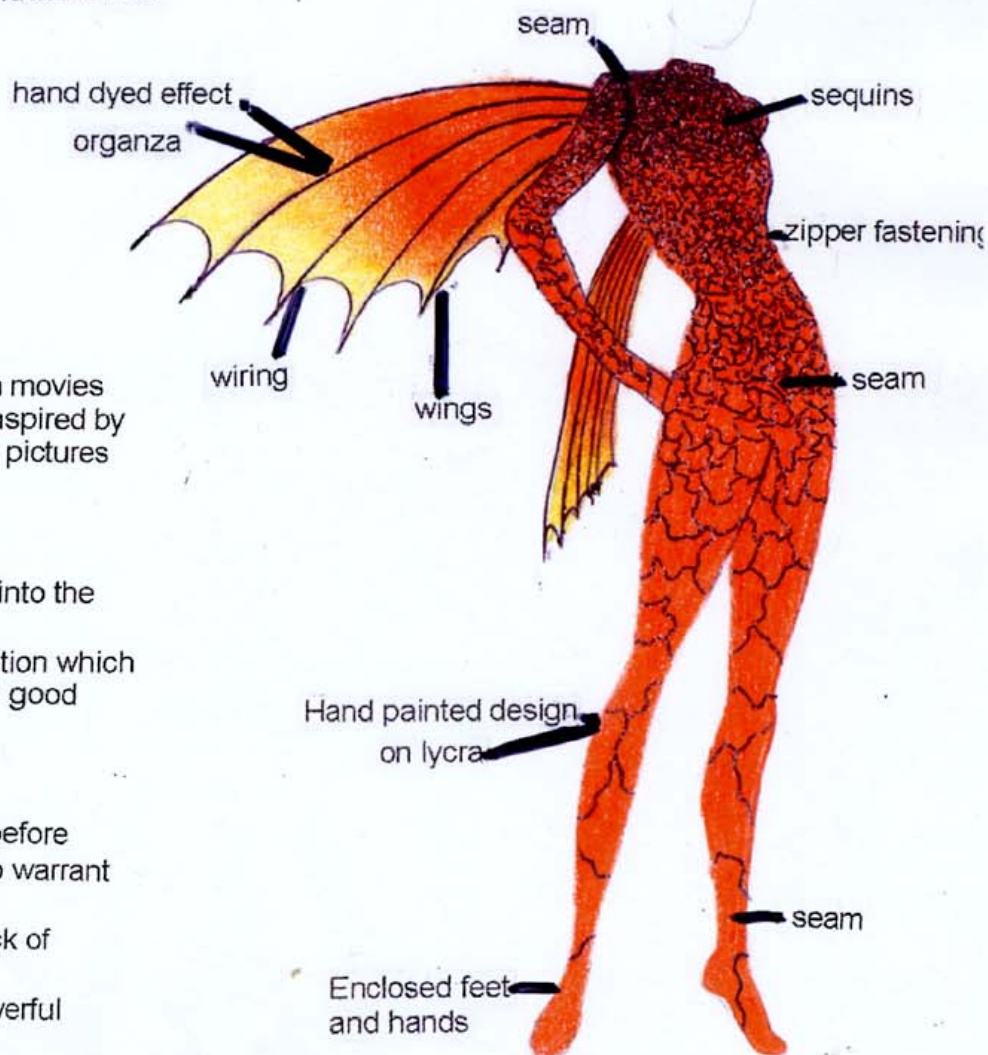
The Cat-woman character from the batman movies inspires the bodysuit, while the wings are inspired by Batman himself and real bat wings, also by pictures of bats in picture books.

##### Good points of design 2

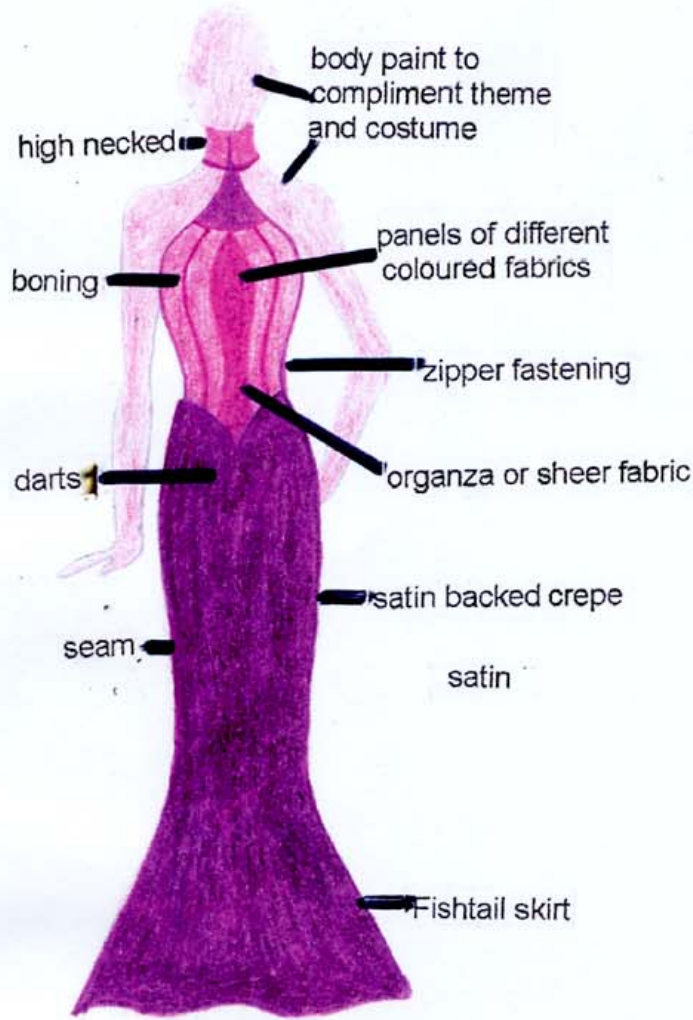
- Colours create a very striking image
- Design is very unique and also fits well into the focus area of costume
- Has a high level of creativity and innovation which is a component of criteria essential for a good practical assessment mark
- Would not be too expensive to make

##### Bad points of design 2

- Have never worked with these fabrics before
- Level of skill required may be too easy to warrant a good practical assess mark
- May be hard to mount the wings on back of costume
- Does not give the character a large powerful presence on stage
- May be hard to find an actor who has an appropriate body shape to wear the costume







### Design 3

#### Inspiration

The inspiration for this design came from the tail of the little mermaid and the silhouette of Morticia from the Addams Family. The colours I used were inspired by the Jetsons, which creates the futuristic look.

#### Good points of design 3

- I like the colours used
- The movement of the tail on stage would be interesting
- Would not cost too much to make
- Easy to make

#### Bad points of design 3

- This outfit would be hard to justify as a costume
- The level of difficulty is quite low and may be insufficient to obtain a high practical mark
- The futuristic theme is not an area I know much about and is not as popular at the moment as the history/fantasy theme
- Costume would be hard to walk in
- Not much alteration of pattern is required which
- Will bring the level of creativity and innovation down
- The design is fairly clichéd and has been done before

### Design 4

#### Inspiration

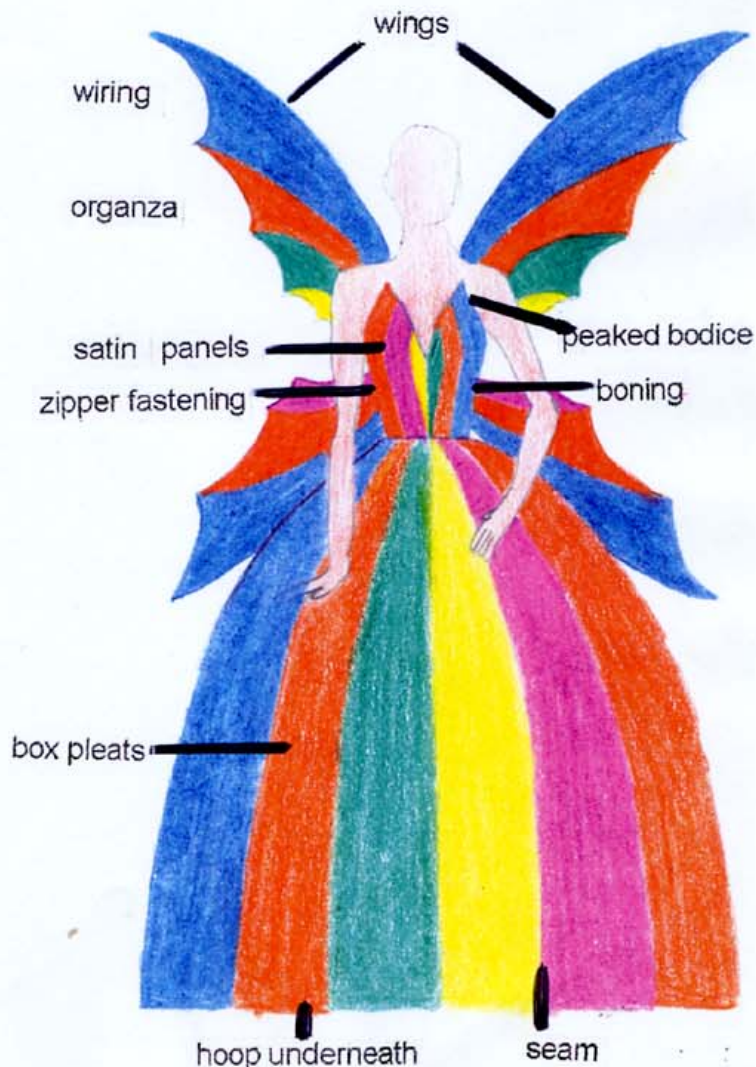
The main inspiration was the colours of the rainbow (ROYGBIV) minus indigo. Also the colourful bright nature of butterflies.

#### Good points of design 4

- Will create a bright large presence on stage
- Fits the costume focus area nicely
- The inspiration is reflected in the costume
- Has a high level of difficulty due to all the panels in its construction

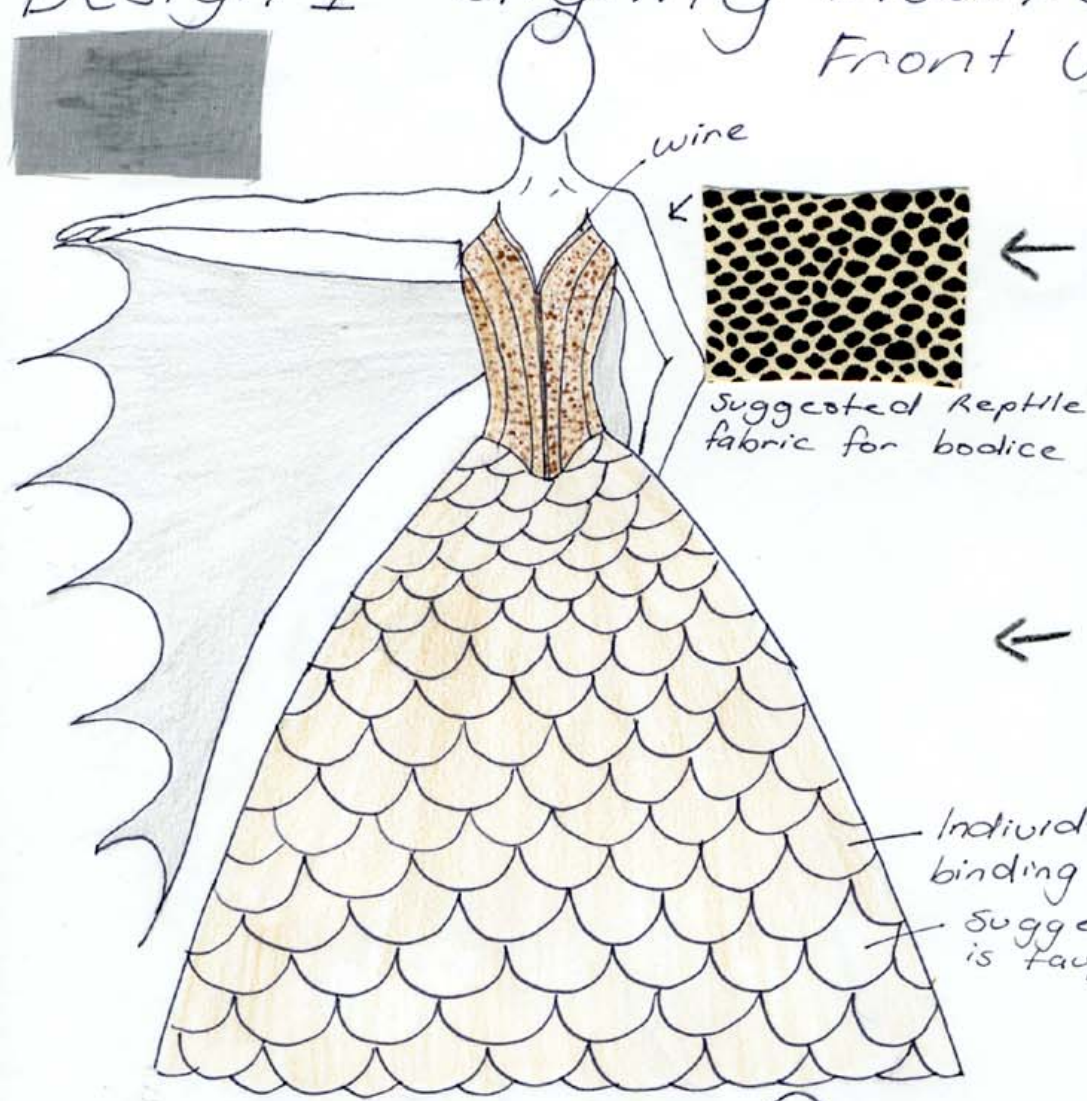
#### Bad points of design 4

- Have not sewn box pleats previously
- The overall look is slightly overdone and clashes
- The character ends up looking like a beachball
- Will take a long time to complete as it consists of many pieces
- The price will rise due to the amounts of different coloured fabrics needed
- There is maybe too much colour and not enough simplicity
- I liked the concept but not the look that resulted from it
- The lighting may change the colours of the costume on stage thus making it look wrong
- The level of skill needed to construct the garment successfully may be too high





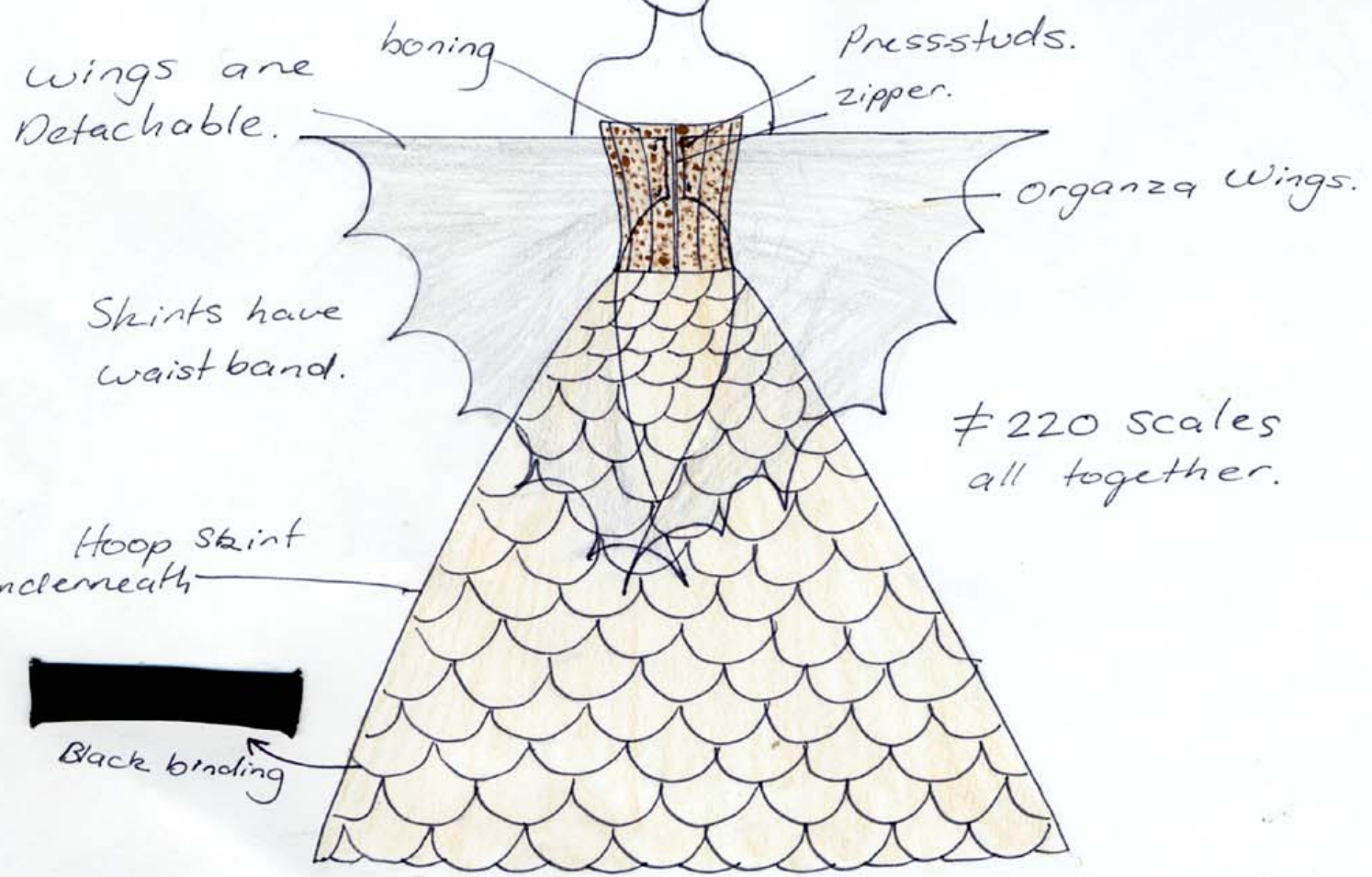
# Design 1 - Slightly modified Front View



Individual scales with black binding around edges.  
Suggested fabric for scales is taupe satin.



## Back View





# Visual Design Development

## Analysis of functional and aesthetic design

### Aesthetic

- The fabric is patterned to create interest
- Modifying the pattern to add a low neckline creates a sexy image which will get the audiences attention
- The peaks above the breasts were added to depict the inspiration and helps to create rhythm with the other peaks in the design
- The exclusion of straps looks better and makes the character (half- human half dragon) seem more realistic
- Top stitching the casing for the boning give the costume a look of order and professionalism
- The elongated curve below navel/abdomen compliments the overall shapes of the bodice
- The peaks going in opposite directions are contrasting creating interest
- The use of numerous panels to construct the bodice creates a sleek, smooth, body hugging fit again complimenting the inspiration of fantasy/dragons by imitating their silhouette
- Panels create horizontal and diagonal lines which elongate the torso and are in direct contrast to the smooth curves of the scales
- The reflective scales on the fabric of the bodice indicates an interesting texture to the audience
- Zipper looks neat and professional
- Lining used to create a sleek professional finish
- Fabric chosen to continue the dragon / reptile theme and make the character seem more realistic
- White fabric, ribbon, waistband, hems used to create a neat professional finish
- Black binding creates a sleek, neat professional finish and highlights the shape of the scale whilst contrasting to the taupe colour, but also tying together the colour scheme of the top
- By sewing on the scales individually, the curve of the skirt circumference could be followed accurately and it also caused them to protrude slightly, enabling the audience to see they are individual and very similar to the reptile/dragon scales, thus reinforcing concept and inspiration
- The configuration of the scales is modeled off reptile skin in order to recreate my theme and create the visual image of the original idea (design 1)
- The gaps, calico, overlocking were covered to create realism of my character that is its real skin (this wouldn't be very convincing if there was a zipper in its scales would it?), also to create a neat finish

### Functional

- Several shaped panels create a tight, body hugging fit
- Having 1.3cm seam allowances in the top allows them to be used as boning casing
- Boning gives the top structure, strength and allows the wings to be mounted on the back
- The shape of each panel is so that when sewn together they allow for hips, waist, breasts and general body shape
- The use of an open ended zipper makes the costume quicker and easier to get on and off, which would be imperative in backstage circumstances
- Lining is used to cover seams and boning casing as well as to reinforce the structure of the top
- Clipping/ snipping corners/curves helps to create less bulk, creates smoother curves therefore a more professional finish
- Ribbon forms casing for the boning
- Seams secure panels, waistband and hold item together
- Ribbon through waistband is used to secure skirt to body
- The 'zipper' opening was left open/ unsecured on purpose so it allows for actresses level of comfort ie how tight they want it and also allows different sized actresses to wear it.
- The hoops purpose are to support the weight of the scale skirt
- overlocked seams to stop fabric unravelling, used non-stretch cotton fabric so the hoops don't stretch it out of shape and it is very strong and resilient



- the calico underskirt is used as a backing to secure the scales on-to, the choice of Calico was very important as it is very strong and would be able to withstand the pushing pulling and manipulation required when attaching rows of scales
- seams, overlocking used to secure garment together and stop garment fraying
- zipper had to be used because of the weight of the garment an open seam would not have been appropriate, used to secure garment over hoop skirt
- waist bant encloses raw edges, stabilises the zipper opening and helps the garment to sit balanced and correctly on waist
- Velcro is used to secure ends of waist band together, was used instead of conventional button because it is quicker to undo in backstage circumstances
- the special configuration of scales and use of press studs was to cover the zipper completely so it is undetectable, this makes the creature character seem more realistic to the audience.
- Binding around edge scales was used to enclose the raw edges as was the overlocking of the top edge
- Scales were graduated in size to keep the 'scale' pattern going as the circumference of the skirt got narrower it became necessary





# Manufacturing Specification Description

## Manufacturing specification

### Written description of items

The tight body-hugging bodice is constructed from 10 panels with peaks above each breast pointing upwards and a curved point below the belly button. It has no straps and is straight across the back. It is fastened with a black 24 cm open ended zipper with small metal teeth. The panels are sewn together with a 1.3cm seam allowance these are then topstitched to create casing for 9mm diameter plastic boning. Stretch knit metallic brown and cream reptile print is the fabric and taupe satin-backed crepe is used for the lining. The two wings are scalloped in shape and made from black organza, edges are finished using a zigzag hem, and they are attached to the bodice by press studs.

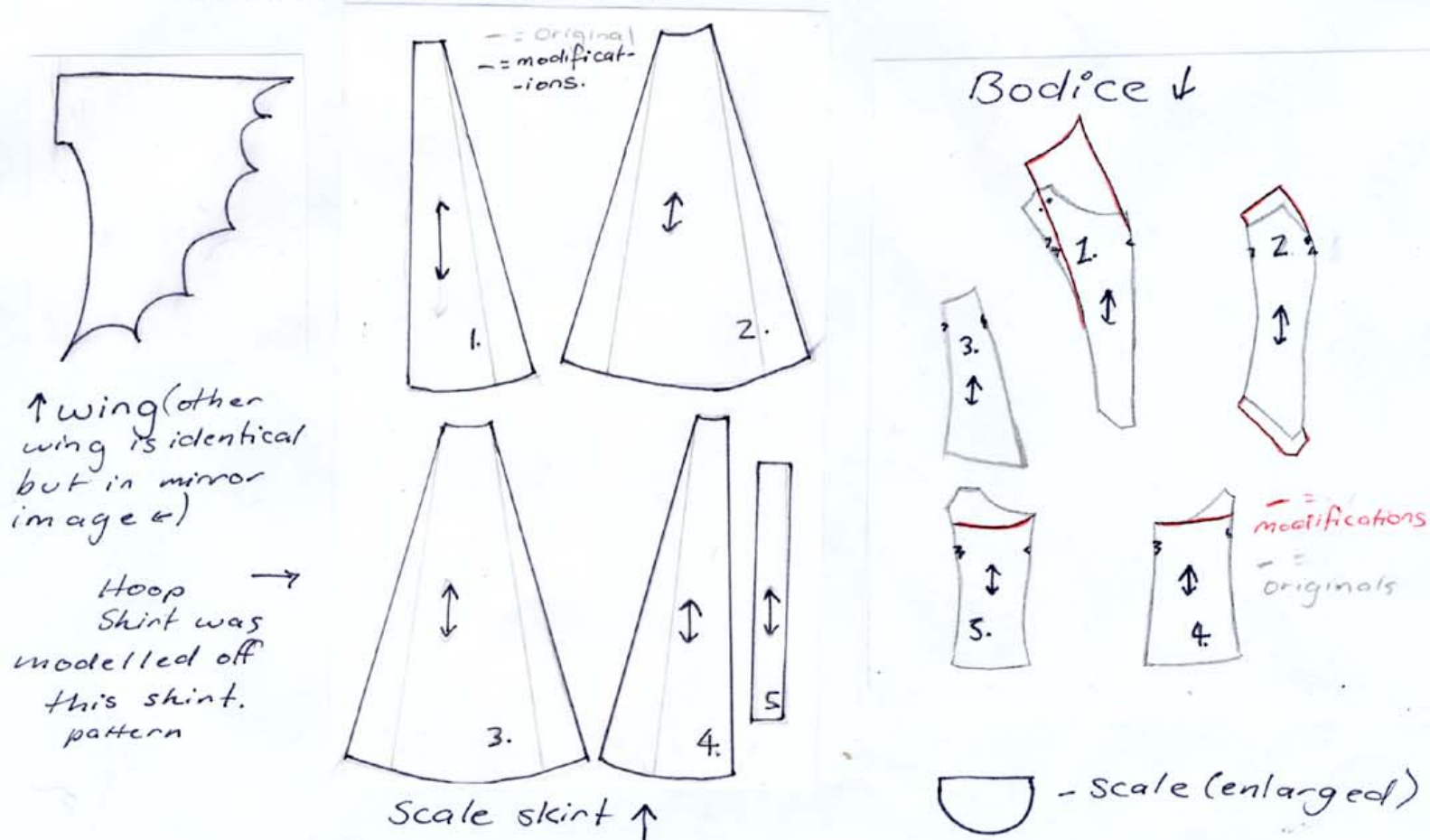
The skirt is made from 6 panels of calico and is covered in "scales". It has a 4cm waistband and a 6" lapped skirt zipper in the centre back seam. Each scale is a double-sided half circle shape, with iron on interfacing on the inside, the edges of the scales are finished using the binding technique. The binding is black satin which contrasts with the taupe satin back crepe of the actual scale, whilst tying in with the black reptile print fabric of the bodice.

The scale skirt is supported by a white hoop skirt. Ribbon is sewn around the skirt and forms the casing for the flat plastic boning (hoops). There are 4 hoops situated 25cm apart. It has a 3.4cm waistband through which a ribbon drawstring is pulled to secure skirt to body.

### Pattern Company and numbers

Bodice - Simplicity 7637(modified) size 10, Skirt - Simplicity 7436 (modified) size 10, Hoop skirt – own design, modeled off skirt pattern, Wings – own design, freehand.

### Pattern modifications- Pattern shapes and markings





# Manufacturing Specification Technical Production plans

## Pattern modifications (continued)

Each piece of the pattern was modified separately, and a mock up of the new design made using calico.

### Bodice

Pattern piece 1: was lengthened and the shape changed by the addition of a point. Which when made will be situated above the breast. The straps were also eliminated and the neckline lowered.

Pattern piece 2: was lengthened to coincide with piece 1

Pattern piece 3: no modifications

Pattern piece 4: a straight across back as there is no longer straps and the back was lowered slightly to fit a zipper length.

### Skirts

When constructing the skirt each panel was altered by splitting it up the middle and sliding the pieces inwards, overlapping the bases, thus reducing the circumference whilst keeping the waist size the same. To make the pattern for the hoop skirt from the scale skirt. Lay the skirt onto paper and trace the outline from this make the panels and the waistband.

The wings were drawn freehand on paper. This was then used as the pattern.

## Quantity of material, notions required and itemised cost.

Item	Quantity	Cost
Calico	5 Metres	Nil
Reptile print fabric	1 Metre of 150cm wide	Nil
Satin Back Crepe – Taupe	12.3 Metres x 114cm wide	\$134.70
Interfacing	12.3 Metres	\$22.14
Satin for Binding – Black	5 Metres	\$30.00
White cotton Poplin	4.5 Metres	Nil
Pattern	2	\$15.20
Thread	8	\$21.20
Boning	8M	\$20.00
Zipper x 24cm	1	\$2.45
Boning without casing 9mm width	3M	\$9.87
White Ribbon 1.3 cm wide	4M	Nil
6" Skirt Zipper	1	\$0.80
Press studs		Nil
<b>TOTAL COST:</b>		<b>\$256.36</b>

## Fabric swatches

Reptile Print Fabric	Satin Back Crepe	Black Satin Binding	Interfacing	
				
White Poplin (underskirt)	Calico	Boning- bodice	Ribbon	Organza
				





4 Stages of a scale ↓

interfaced scale →

Single stitched →

Bound →

overlocked →



Order of construction → Refer to Manufacturing photo's in Justification section

### Bodice

1. Cut out pattern pieces and modify as shown
2. Sticky tape pattern pieces to doubled fabric
3. Cut out pieces
4. Sew panels together with a 1.3 cm seal allowance.
5. Form casings by top-stitching the seam allowance towards the side of the seam
6. Insert boning
7. Repeat steps 2-4 for the lining, clip, trim edges
8. Insert centred open-ended zipper into centre back seam
9. Lay fabric and lining right sides together, sew across the top edge, clip tip of peaks
10. Flip fabric so it is wrong sides together, top stitch the top edge again so it sits flat
11. Sew an extra row of stitching in the 'v' neckline to form the casing for the wire, insert wire
12. Bind the bottom of the top, unpick last few stitches flip raw edges inside binding and hand-stitch ends.

### Scale skirt and Hoop skirt

1. First cut out the pieces of the calico scale skirt and press and overlock the seams. (excluding the waist band for the time being)
2. Then use the skirt to make a two-panel hoop skirt pattern, sew it together, press and overlock the seams.
3. Finish the back opening with an edge foot then attach the waistband.
4. Measured and sew on the 4 rows of ribbon casing
5. Hemmed the bottom with a 1cm hem and insert boning/hoops.
6. Iron interfacing to the taupe satin 'scale' fabric and use a cardboard template and a circular blade to cut out the scales ( the scales decrease in size by 8mm every 2 rows)
7. Single stitch the curved edges of the scales
8. Use a binding foot to bind the curved edges of the double sided scales then overlock the tops
9. Hem calico "scale" skirt and insert a 6" lapped skirt zipper in the centre back seam.
10. Attach the scales to the calico skirt in a set and measured pattern (each scale was overlapped half way across and down the scale below it, each row approx 7 cm above the one below it) by single stitching them across the top. (HINT: measure, cut, bind, and attach scales one row at a time so you can adjust measurements accordingly.)
11. The waistband then was sewn to the "scale" skirt to finish it off and press studs applied to the special scales around the zipper.

### Wings

1. Draw wings freehand on pattern paper, cut them out using a circular blade
2. Use Zigzag stitch to hem all edges
3. Attach to bodice next to zipper using clear press-studs.

### Product labels



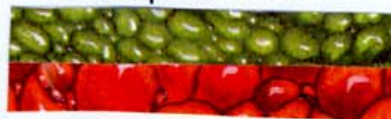
DA  
Costumes®

SIZE 10

Polyester, cotton,  
Hand wash in cold to  
warm water, hang to dry,  
do not wring or tumble  
dry.

Drycleanable  
Made in Australia

### Hoop Skirt ↓



DA  
Costumes®

SIZE 10

100% Cotton,  
Remove hoops for normal  
machine washing, hang to  
dry, do not tumble dry.

Drycleanable.  
May be ironed  
Made in Australia

### Bodice ↓



DA  
Costumes®

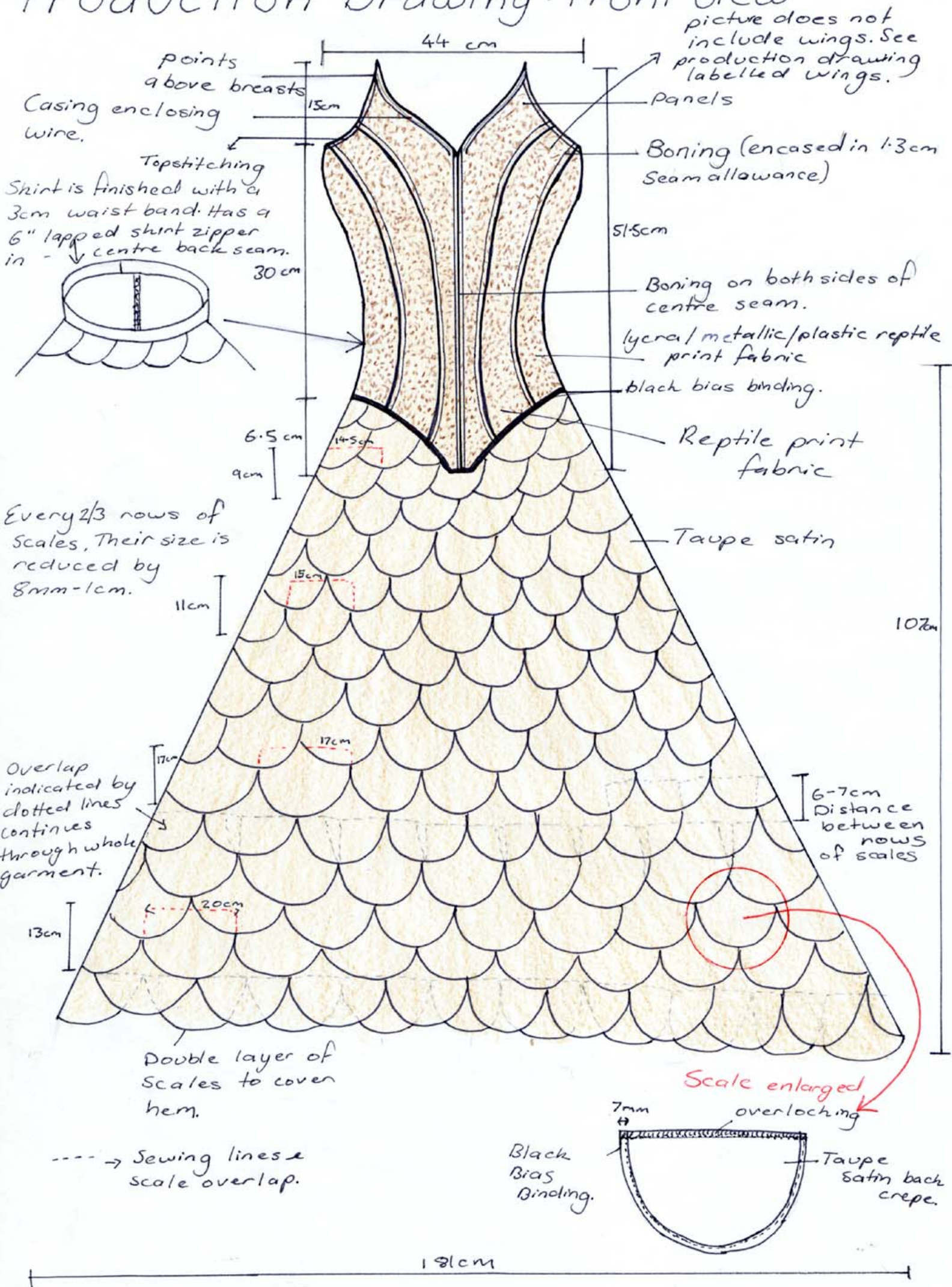
SIZE 10

Polyester/plastic, nylon  
Hand wash in cold to  
warm water, wings may  
be detached for hand  
washing, dry flat in  
shade, do not wring or  
tumble dry.

Do not dry-clean  
DO NOT IRON  
Made in Australia

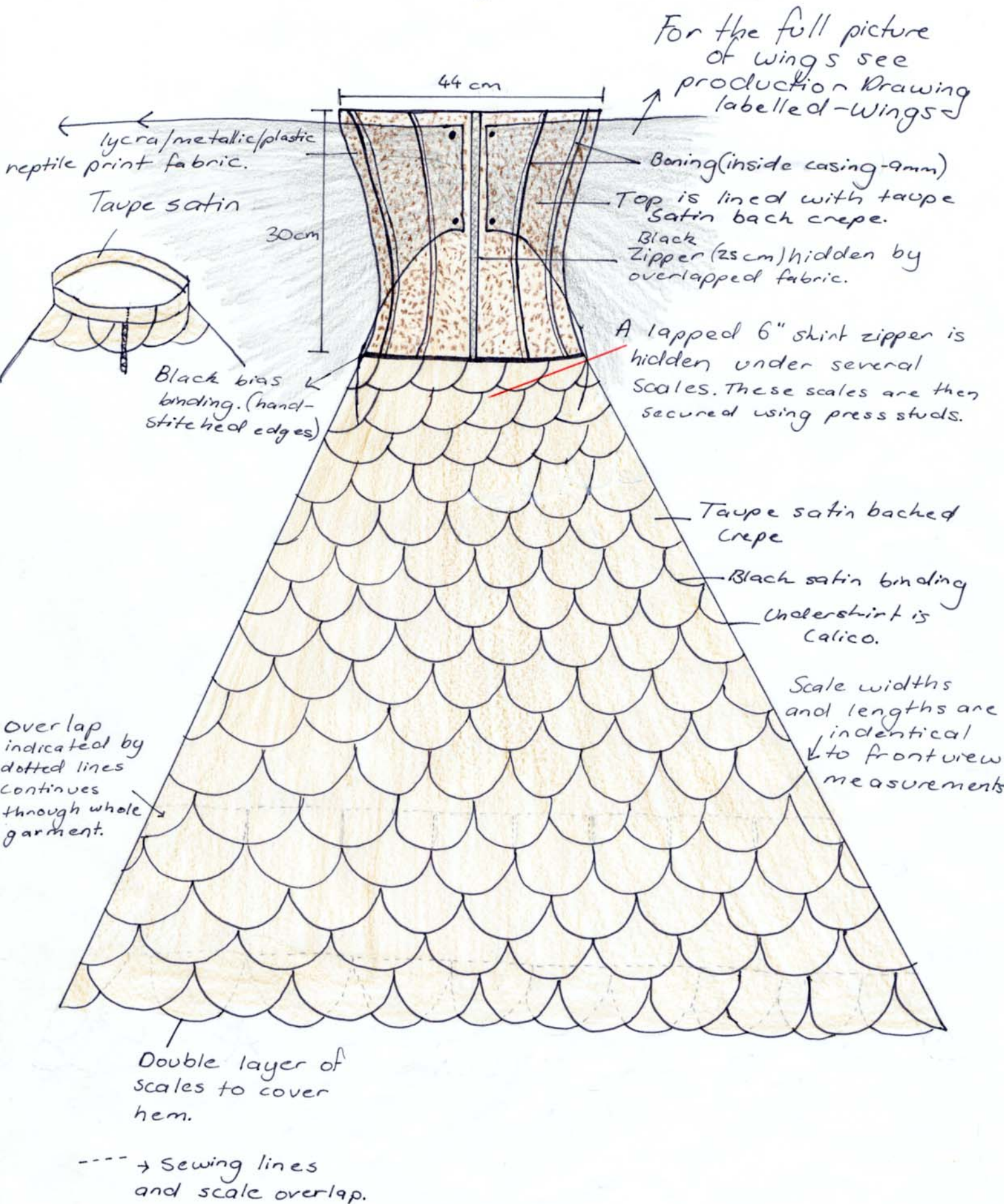


# Production Drawing - Front view





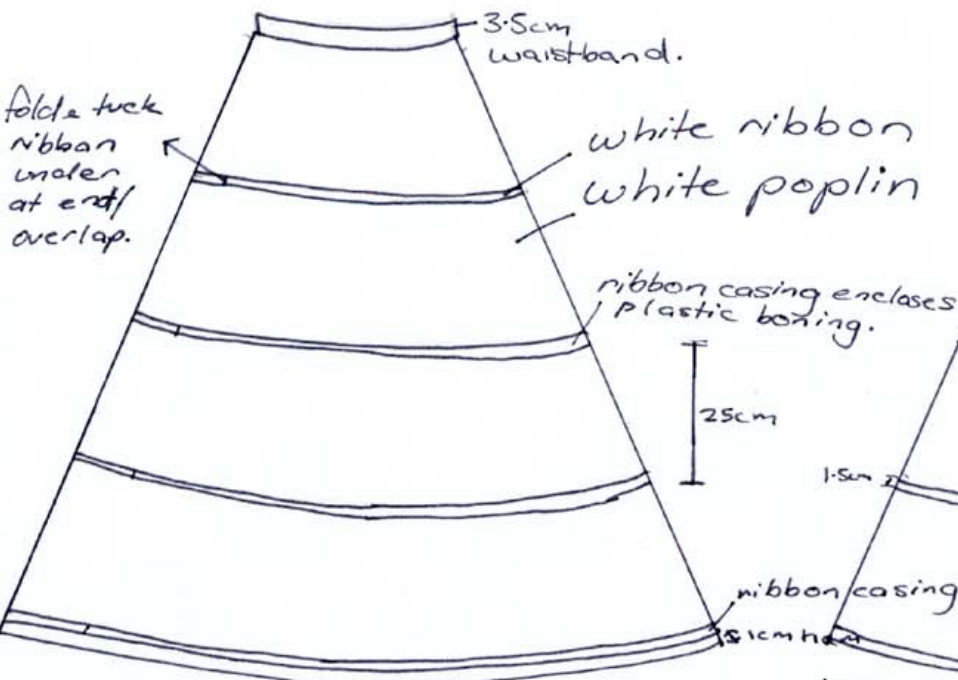
# Production Drawing - Back view.



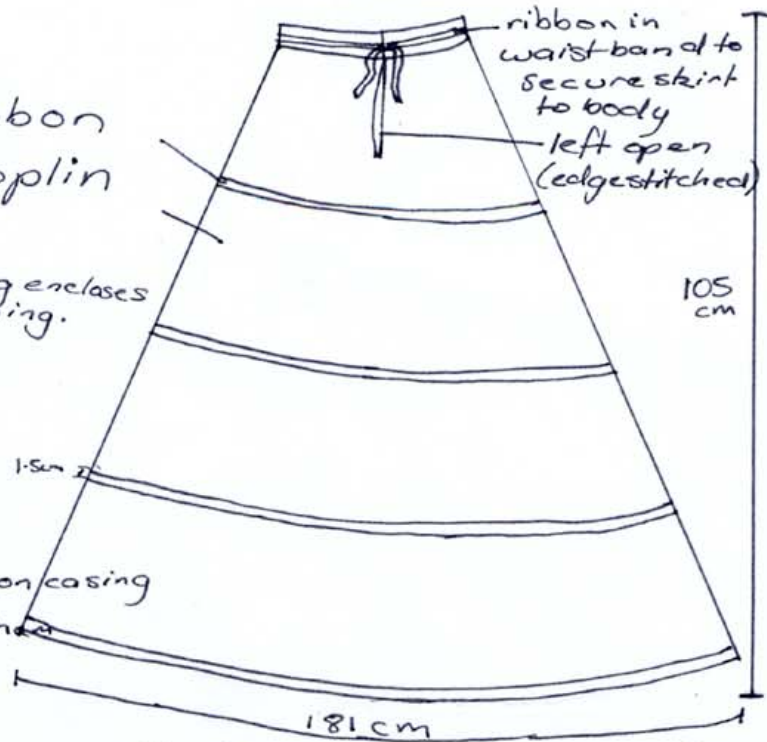


# Production Drawings

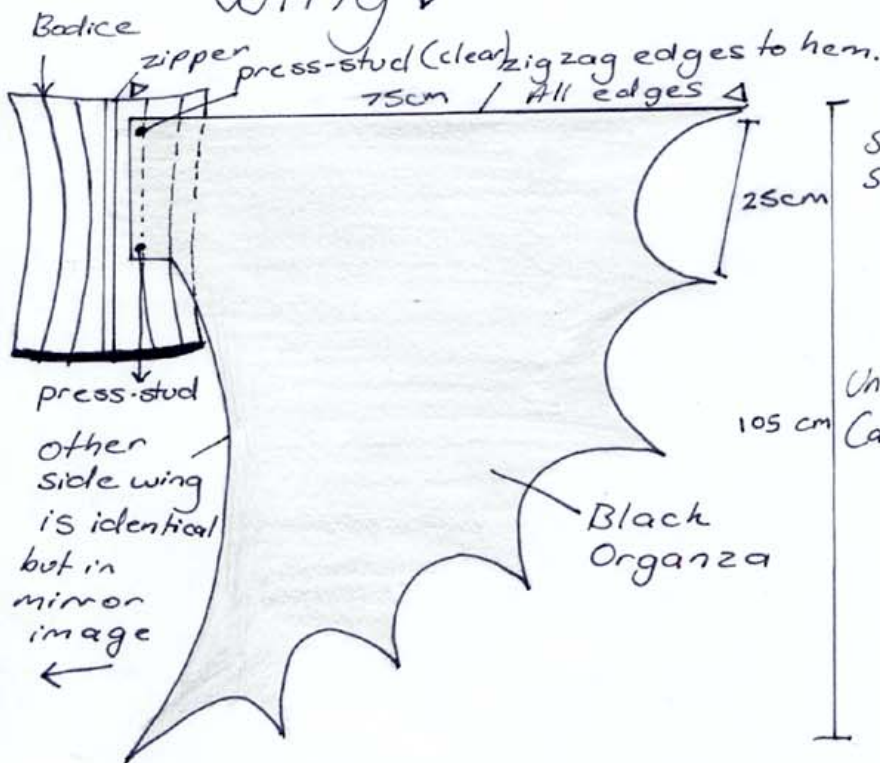
## Hoop Skirt Front.



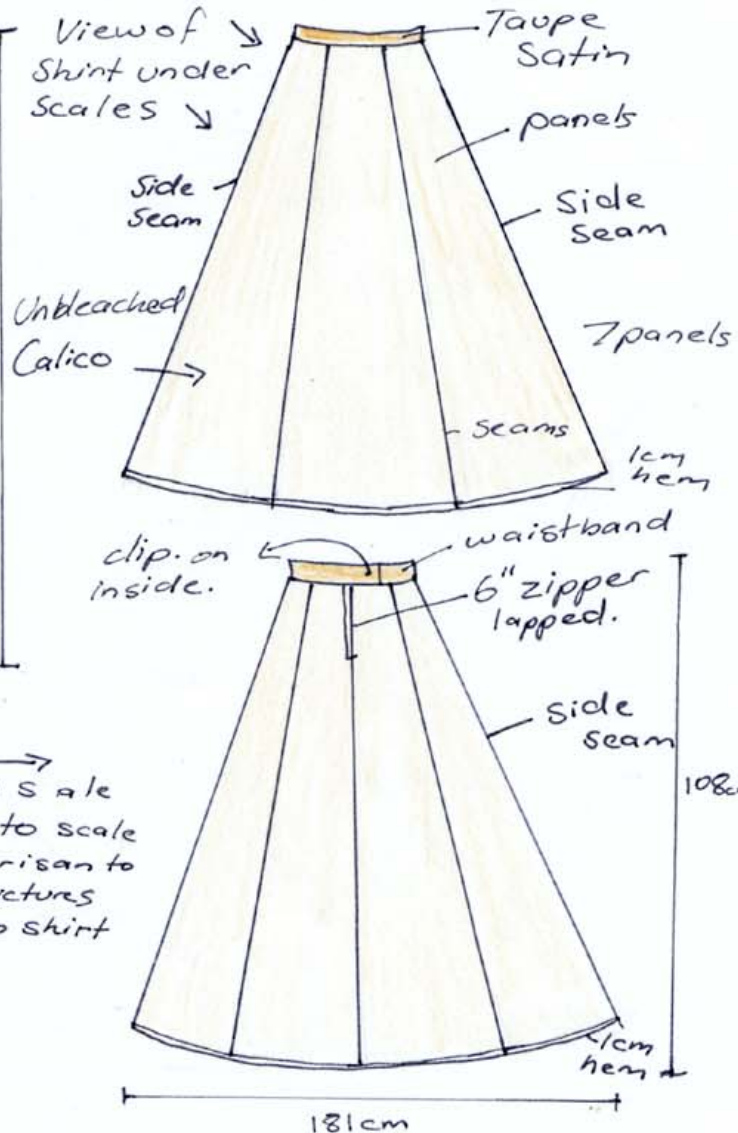
## Hoop Skirt Back.



## Wing ↓



## Calico scale Skirt.



## Concept Photo ↓



pictures of calico scale skirt not to scale in comparison to other pictures of hoop skirt



# investigation ,experimentation and evaluation

## Experiment 1 for bodice: Experimenting with materials, equipment

**Aim:** to find out the best temp at which to press my reptile print fabric

**Method:**

1. Cut equal sized squares of fabric. 6cm by 6cm
2. Fold in half right sides together
3. Set iron at the lowest setting / temp. Let iron reach correct temp.
4. Hold iron on wrong side of fabric for 5 secs
5. Turn iron up to next heat setting. Let iron reach correct temp
6. Use another sample, fold in half, iron wrong side of fabric for 5 secs
7. Repeat steps 2-6 for all settings on iron, or until damage is evident

**Variables:** temp of iron, time iron is in contact with sample, size of sample

**Results:** pieces from a larger sample (6 x 6cm)



Control-unironed piece

Minimum	Low	Low-med	Medium	Med-high	High	Very high

**Conclusion:** the setting of low-medium gave the best result, without any damage to the garment. I will use this setting to press my garment.

## Experiment 2 for bodice: Experimenting with manufacturing processes

**Aim:** to see if the peaks above the breasts will stand up by themselves without any reinforcement or whether wire reinforcing is needed.

**Method:**

1. Make a mock up out of a similar or the same material. The mock up has to be pinned on to a model and with movement, check to see if the peaks collapse or don't keep their shape.
2. In this case the peaks did not keep their shape as the fabric was too soft.
3. A casing channel was sewn in the V neck area above the bust and wire strips were cut, smoothed on the ends and shaped, then inserted into the channels.

**Result:**

The wiring held the peaks in the correct position and held the shape of the peaks.

**Conclusion:**

In the real bodice, wiring is essential to create the free standing sharp peaks of the design.

## Experiment 3 for bodice: Experimenting with Materials, Equipment & Manufacturing Processes

**Aim:** To identify the best method of binding the bottom edge of the bodice.

**Method:**

1. Using the mock up bodice – the bottom edge was firstly edge stitched. It was then bound using a 5mm bias binding folding attachment. As this proved to be too narrow a binding it was unpicked.
2. A 7mm bias binding folding attachment was used with wider bias binding tape.

**Result:** The wider bias binding enclosed the raw edges of the bottom of the bodice correctly and gave a professional result.

**Conclusion:** The 7mm binding must be used to obtain the correct result as the 5mm is too narrow for this particular garment.



## Experiment 1 for scales: Experimenting with manufacturing processes and equipment.

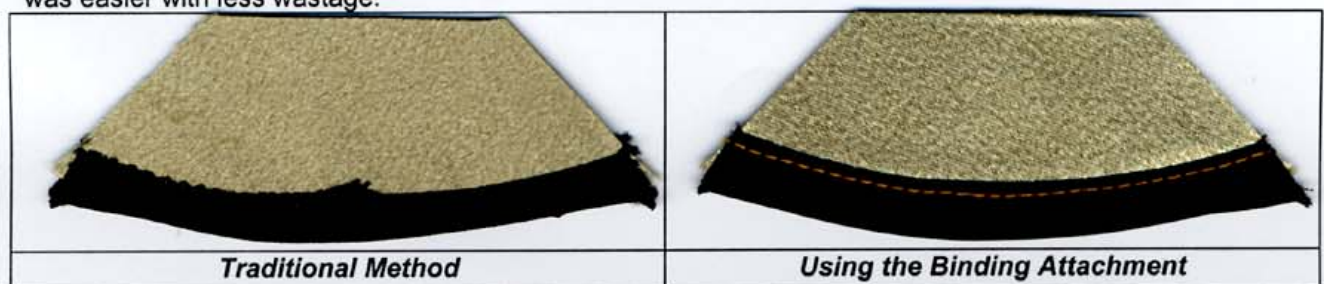
**Aim:** to discover the best method of binding the edges of the scales by comparing the results from the traditional method of binding to the use of a special binding foot to complete the process.

### Method:

1. First complete a sample using the traditional method of binding by first sewing one side, flipping it over and hand stitching the other side.
2. Next make a sample of the same process using the binding foot.
3. Cut strips of binding from black satin on a 45° angle/bias.
4. Attach the binding foot to sewing machine, feed strips of binding into foot.
5. Sew the two curves edges of the scale together. (foot creates the folding and tucking process of the bias binding)

**Variables:** aptitude with which each process is completed (ie. one process is easier)

**Results:** It was found that the process using the binding foot when compared to the traditional method achieved a much more professional finish, was less time consuming, gave a more consistent result, and was easier with less wastage.



**Conclusion:** definitely choose to use the binding foot method to edge/ finish the scales due to the reasons outlined above.

## Experiment 2 for scales: Experimenting with materials

**Aim:** to select the best/most appropriate form of interfacing and for my scales and decide whether to have wadding in the middle.

### Method:

1. Obtain samples of many different types of interfacing
2. Iron each type of interfacing onto the scale fabric (satin backed crepe), also try some wadding in some of the samples
3. Sew the sample scales together using the binding foot
4. Test each type by feeling for handle, texture then do a visual check for drape and desired effect,

**Variables:** ensure fabric and size of sample is the same

**Results:**



**Conclusion:** The medium-fusible interfacing with no wadding was chosen because the softness of this interfacing is just enough to create good drape without being too floppy. It has the best appearance and is also one of the most inexpensive. No wadding will be used because it looks too bulky, is hard to sew, doesn't sit correctly, has poor drape, costs too much and creates more work for an inferior result.



### Experiment 1 for hoop skirt: Experimenting with material

**Aim:** to discover the best material to use for the hoops, ie choosing between the twisted metal cable and flat plastic boning

**Method:**

1. Obtain a piece of each and do some tests
2. Firstly do an approximate strength test by bending with your fingers and seeing which is stronger
3. Check which is water/rust proof by placing in water and leaving for a week.
4. Compare the weight by placing equal lengths of each on a scale
5. Check which is the easiest to insert and remove from the casing

**Variables:** there are many variables in this experiment such as bending each sample with the same amount of strength, this is because these tests are performed by hand but it is not necessary to control them exactly because we only need approximate results.

**Results:** The metal was ultimately stronger but less flexible. The metal became rusty and stuck together whereas the plastic was unaffected. The metal cable was much heavier than the plastic boning- about twice the weight. The plastic was much easier to insert and remove due to its flat smooth shape, while the metal proved difficult because it kept getting stuck in the casing.

**Conclusion:**

It was obvious from the above tests that the most suitable material for the hoops is the thick plastic boning. This conclusion was reached by considering the properties needed for a hoop skirt for theatre wear.

- must be lightweight because the actor has to wear it and walk around
- has to be rustproof because actors often perspire on stage
- has to be strong to support the weight of the overskirt
- the hoops have to be easy to remove for washing after the show

The plastic hoops have all of the above properties

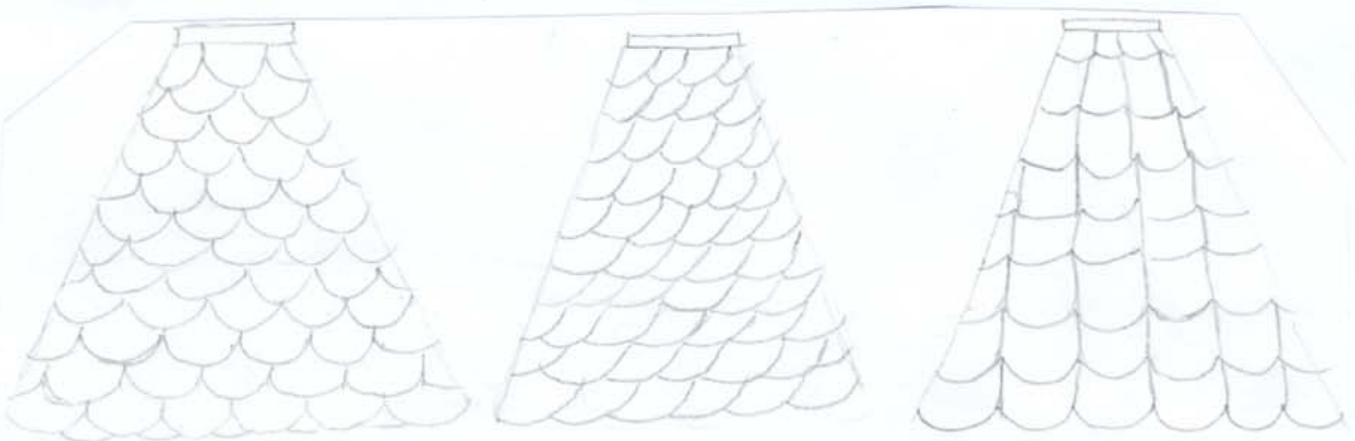
### Experiment 1 for the Scale Skirt: experimenting with manufacturing processes:

**Aim:** to figure out the correct configuration of the scales on the skirt so they were easier to sew on, have the least amount of overlap whilst still covering the calico skirt, and creating the desired Reptilian look.

**Method:**

1. make up some single scales
2. lay the skirt out flat or place over the hoop skirt and pin on the scales in several different layouts as drawn below.

**Results:**



**Conclusion:** The first configuration was chosen because it will be easier to sew, takes up the most room with the least amount of overlap, and because the look is the most Reptilian and helps to reinforce the Dragon inspiration.



**Experimentation 2 for Scale Skirt with manufacturing processes**

**Aim:** To choose between the use of a waistband or bias binding the waist.

**Method:** On completion of the scale skirt –

1. Bias binding was attached to a small section of the waist and turned over by hand. This however was seen to be inappropriate as the weight and thickness of the scale skirt could not be supported/enclosed by the bias binding.
2. A waistband was cut to fit the circumference of the waist. Iron on interfacing was then applied to the wrong side of the fabric. To test this a small section was stitched to the waist of the skirt. This proved to be successful as it was wide enough and strong enough to support the thickness of the top end of the skirt.

**Result/Conclusion:**

A standard/conventional Waistband was used to finish off the skirt

**Experimentation and justification of materials, equipment and manufacturing processes:****Explanation.**

In order to create a problem free and professional scale skirt/ hoop skirt many experiments were undertaken, some of which could not be documented in this portfolio due to a lack of space. The previous experiments outlined previously were the most important in the successful outcome of this MTP.

Several changes resulted from these experiments: - they include:

A change in the way the bodice was sewed due to the discovery that the fabric could not be ironed. The seams had to be sewn to the lining before topstitching the upper edge because the fabric wouldn't sit flat and couldn't be pressed.

Learned how to use a binding foot and changed the way of sewing the scales onto the skirt by the knowledge of a quick binding process that could complete each scale ready to be sewn on.

Originally, wadding was going to be used in the scales but when tested, it was found that this would not work or give the desired finish. Therefore, iron on interfacing was used to create the best finish.

The choice of materials was also altered as originally metal cable was going to be used because it had been used in bridal shops but when tested it was clear that it was not suitable for this particular garment. Mostly, due to the weight factor, so the second choice of plastic boning was chosen.

The design/layout of the scales stayed nearly the same as the original vision but when applied/tested some practical problems were apparent that could only be seen through experimentation, such as an extra row needed at the bottom to cover up the hem.

**Concept Photograph:**



### Justification of use of manufacturing techniques and equipment

(For justification of materials see analysis of functional and aesthetics and evaluation of fibre yarn and fabric sections)

A sewing machine was used for the majority of the sewing process, as it is much quicker and easier than hand sewing. Hand sewing was required in some areas, such as: the sewing on of the waistband of the scale skirt. This is so the stitching didn't come through to the other side. It was also quite difficult by this stage to sew the skirt on the sewing machine as the bulk did not fit in the gap between the foot and machine motor so everything had to be sewn backwards. Hand stitching was again required when finishing off the ends of the binding on the top because the zipper would not fit under specialised foot, also when attached things such as press-studs and pants clips because it was necessary.

The specialised binding attachment was used because of the sheer volume of binding to do, it was a much faster and energy efficient method of binding than the traditional method and enabled the design to come to fruition. If not for this attachment the process of binding each individual scale would have taken too long and the garment would not have been completed in the required time, thus the attachment was necessary. It also created a very professional finish needing only one row of stitching. The attachment required an industrial machine that it could be fitted to thus one was hired to do the job.

An overlocking machine was essential, as most of the fabrics used are prone to fraying it also creates a professional finish.

Most settings on the sewing machines were used to create different finishes, for eg: a wide zigzag stitch had to be used on the edge of the organza because the fabric is too fine and slippery to hem conventionally.

The scales had to be produced individually because the skirt's circumference has a slight curve and if they were joined they would pucker more and more as they got closer to the waistband. The diameter and depth of each scale was calculated for each row, usually reducing it by 16mm all the way round (except the top) every 2-3 rows. The distance between each row also had to be altered to ensure the calico and gaps from the row below it was covered. All these calculations were necessary as the circumference decreased, and to stop excess overlap and puckering.

Hoops were used to support the scales because they are very heavy and the fullness was required to reinforce the powerful image of the character.

### Manufacturing photo's



↑ Binding bottom of top/bodice.



Cutting out Scales



Single stitching edges of Scales



Binding edge of scales

→ Special binding attachment



— Sewing on rows of Scales





## Evaluation of the properties and performance of fabric, yarn and fibres used in MTP

### Polyester Satinback Crepe (Taupe & Black)

FIBRE POLYESTER	YARN MULTIFILAMENT	FABRIC	RELATIONSHIP TO END PURPOSE
Is man-made synthetic fibre, produced in long, smooth filaments through a spinneret, thus are cylindrical and highly light reflective.	Yarn is made from twisting long smooth fibres into a continuous stream, these multifilaments are now smooth and shiny	Has a smooth lustrous surface due to warp floats. A float is a length of warp yarn which passes over 4 weft yarns before being interlaced again	Very important as the costume must reflect stage lights, highlighting the scales and identifying the dragon lady as a protagonist
Strong fibre due to high amount of crystalline regions and its synthetic nature.	Multifilament yarn construction is the strongest of the man-made yarns, out of monofilament and staple yarns, this is due to drawing/stretching process the yarn undergoes when made.	Fabric weave is not especially strong but gains its strength from its fibre and yarn composition.	Does not need to be especially strong as garment will not undergo high wear and tear e.g. sitting, abrasion. Does need sufficient strength to be sewn on and manipulated
Fibres have good elasticity, this coupled with its strength makes it very durable	Yarn construction promotes elasticity as filaments are continuous	Fabric is non-stretch woven thus will not pull out of shape	Finished garment holds it's shape and scales do not pucker
The good elasticity removes most wrinkling that may occur making it very easy care	Medium twist allows fibres to fall back to their original position after being creased	Satin weave allows wrinkles to drop out due to long floats that have some limited movement	Important because garment will be stored between performances, therefore, it must withstand wrinkling
Has the ability to have excellent drape (depends on fabric type).	Medium twist allows for movement/drape	Has excellent drape	Excess drape was combated using interfacing
Is hydrophobic due to high crystalline nature and low amorphous regions	Yarn type is slightly absorbent	Fabric absorbs moisture in between the yarns but not directly into the yarns	Means fabric will dry more quickly as moisture does not hold in the yarns
Smooth surface creates a cool feeling if in contact with the skin	Because yarn is made from long unbroken filaments it has a cool handle	Floats create cool touch	Is comfortable to wear against skin non prickly and cool to the touch
Thermoplastic nature of the fibre is very good		Has permanent press quality	Waistband and scales can be heatset in their permanent position.
Melts when burnt but does not flare up easily		Fabric can be treated with a flame retardant finish	Must be finished with flame retardant as will be used in theatres near lights, machinery and electronics.
Fibres are resilient to all organisms and biological attack because are synthetic			Important as it will be stored with other costumes in storage between shows so must resist attack
Dry cleanable		This type of fabric can withstand dry cleaning	Garment may be dry-cleaning between performances to give a professional finish



### Evaluation of the properties and performance of fabric, yarn and fibres used in MTP Cotton calico and poplin

FIBRE-COTTON	YARN-STAPLE SPUN	FABRIC- CALICO AND POPLIN	RELATIONSHIP TO END PURPOSE
Fibre is convoluted thus if untreated(calico) the fabric can be uneven and dull, lacks light reflection	The staple yarn is made from many short fibres twisted together, thus is not smooth and appears dull. Short fibres sticking out and braking up surface.	Calico (unbleached) shows specks of trash and is uneven and plain, but extremely strong and inexpensive. Poplin is also strong yet has better appearance due to finishes. The plain weave of both fabrics creates more bumps, thus the light reflects in different directions and it appears dull	Appearance of calico is not important as its not seen by the audience. Poplin's strength was chosen to reduce the weight the actress has to carry around. Doesn't matter that they don't reflect light as they are hidden and the stage lights don't directly affect them.
Very strong due to convoluted fibre and high crystalline nature. Convolutions increase inter-fibre friction, this prevents fibres slipping past each other on stretching the fabric thus fabric retains strength as well as shape	High twist of the carded cotton yarn is important in increasing strength, durability and helps fabrics keep their shape.	Again the plain weave is instrumental in the strength property. The over one- under one construction technique is simple and strong thus inexpensive. The firm weave creates a durable surface resilient to snags and yarn breakages	This was the most important factor in the choice of this material due to the weight of the scales and hoops it must hold up without distortion or stretch and the manipulation it underwent during the sewing process.
Poor dimensional stability- prone to shrinkage, can be overcome by finishes	Yarn still undergoes shrinkage especially if it has been stretched during the yarn construction process	Shrinkage can be overcome by buying fabric that has a dimensional stability finish applied or pre-wash fabric yourself before sewing	Had to ensure the fabric was pre-washed as shrinkage would be disastrous if skirt was already covered in scales or had certain sized hoops to fit
Cotton is a good conductor of heat away from the body		Plain weave has porous structure, this permits air to pass through and cool the body	Actresses would get very hot whilst performing and air flow/ heat conductivity would greatly benefit their performance as they would be more comfortable
Poor elasticity	Hard spun yarns do not allow for much stretch	Construction is a plain weave thus non-stretch. The checkerboard pattern allows for no stretch on the straight grain of the fabric	The fabrics used for both skirts had to be non-stretch so the hoops and scales and sewing process did not stretch it out of shape
Good moisture absorbency	When spun into a yarn the fibres convolutions prevent them from packing too closely, thus the tiny air cells can be filled with moisture	The plain weave of this style is tight but does not prevent moisture absorbency, because has a porous surface in which moisture can seep	This is important around the waistbands, as they will be the only parts of the skirts that touch the body. They will absorb perspiration and make the actresses more comfortable
Cellulose fibres burn similar to paper	Yarns also burn and flare.	Calico and poplin can be treated with fire retardant finishes successfully	Again fabric is near lights and machinery plus special effects so actresses must be protected in case of fire.



Does not develop static electricity, due to good absorbency	Inter-fibre friction actually prevents fibre slippage thus reduces static	Tight weave and uneven fabric surface also helps to prevent static	Very important because of multiple layering that occurs
Low resistance to biological attack because is a natural fibre, bacteria and mildew as well as moths attack this fibre, this can be combated by finishes or products eg mothballs or correct storage eg: dry airy conditions		Fabric does not resist biological attack	Must be considered because costume will be stored after performances so it must be allowed to dry (perspiration) so it doesn't get mouldy also should be stored with insect deterrents and checked.

### Polyester Lycra – Reptile skin fabric

FIBRE-POLYESTER	YARN-MULTIFILAMENT	FABRIC- LYCRA WITH PLASTIC/METALLIC SURFACE	RELATIONSHIP TO END PURPOSE
Has good elasticity, durable, strong, wrinkle resistant, smooth.	Long smooth cool handle yarn. Strong construction which promotes elasticity. Yarn appears dull probably due to a delustring agent	Lycra base is stretch knit, which has excellent elasticity and recovery. Appears dull so as not to detract from metallic surface decoration. Has two way stretch. Cannot be ironed due to plastic melting	Stretch is very important for comfort and enables movement and molds to body shape. The metallic design reinforces the dragon theme and makes the creature seem realistic whilst gaining audience attention by reflecting mystical aura from stage lights. Chosen mainly because of thematic links. Have to be very

### Interfacing

This fabric is non-woven and fibres are produced directly into a fabric, this fabric is then bonded using chemicals and in this case a film of glue is sprayed on one side this glue is then allowed to dry. Once set this fusible interfacing is ready to be used, the glue is needed so it is easy to attach to the base fabric (satin). It is non-stretch, if pulled or stretched the fibres will separate and are unable to be joined back together. This inelasticity and stiff handle were the reasons why it was chosen to interface the scales it provided the needed stiffness to combat the excess drape of the satin and produce shapes that appear scale like and realistic thus supporting the theme of a real dragon creature.

### Satin Bias binding

This satin is the same fabric as mentioned earlier therefore has the same properties except is cut on the bias (45°) and into 1cm strips. This was required so it fits into the binding Machine and has the stretch to shape to the curve of the scale. Satin/ polyester was chosen for its shine and to match the taupe satin of the scales.

### Organza

Is made from fine Nylon multifilament yarns with very similar properties to polyester, the fabric is a loose plain weave with fine yarns which cause it to be see through/sheer. This was an essential property because the wings of a Dragon or Bat are sheer and create the evil eerie image that links with the inspiration. Also the fabric is very lightweight which is important as the must be suspended from invisible press-studs through only 1 layer of fabric thus they cannot pull the back of the bodice down with their weight.

