

Zero Waste Design Method: Hollywood Golden Age

Jeremy M. Bernardoni
University of North Texas

The fashion industry is a notorious contributor to environmental damage. Patternmaking often generates wasted fabric as irregular pattern shapes in negative spaces are not used in the garment (Carrico and Kim 2014). Patterns designed to eliminate waste by using the entire dimension of the fabric (zero waste [ZW] pattern design) (Carrico et al. 2022) can aid in the fashion industry's sustainability efforts.

ZW patterns present several obstacles for fitted styles, as pattern pieces are often problematic to sew together due to their irregularity (Rissanen and Mcquillan 2023). Small fabric pieces left from shaped areas must be reintegrated into the design at later stages to achieve ZW (Bernardoni 2022). To solve these problems, machine-knitted panels paired with woven fabrications were integrated to achieve fit (Bernardoni 2022). This was inspired by Vionnet's ingenuity, which avoided traditional dart placements and used geometric shapes (Bryant 1991; Kirke 1998). The current design takes the Hollywood Golden Age's iconic long-flowing silhouette as an aesthetic inspiration.

Triangular shapes were created based on the main fabric dimensions minus a rectangle for the lantern sleeves. Triangles were chosen to produce the gores required by the silhouette and could be cut in alternation from a rectangular or square piece of fabric with ZW. The tops of the triangles were calculated using 1" (two ½" seam allowances). Four triangles cut double were required to encapsulate the dress form, with side panels split in half accommodating the selville edges (Figure 1). The full-scale skirt gores were cut in woven silk crepe de chine and stitched from the hem to the waist, creating the diamond points.

The remaining portion of the dress that required shaping, (e.g., waist curve, armholes) was draped on the full-size dress form using stretch fabric and transferred to a mylar sheet used with the Brother KL-117 Knitleader to produce an accurate machine knitting pattern (figure 2). The knitting was worked on a Brother KH-970 knitting machine with a KR-850E ribber attachment using lace weight (size 0) Italian mohair yarn. Black beads were incorporated in a diamond motif during the knitting process. The knitted and woven pieces were joined with a Juki lockstitch machine to complete the ZW design.

This design builds on a method of ZW pattern design that can be used where a contoured effect is desired but is difficult to achieve with only woven fabrics. Furthermore, this design accomplished the problem-solving portion of typical ZW methods by using simple geometric shapes to reduce complicated construction. Additionally, no irregular pieces had to be reincorporated later into the design. The two-tone design is inclusive and compliments a variety of skin tones. Therefore, this method contributes to the apparel and textile field, and the larger sustainability effort, by adding a technique that blends fully fashioned machine knitting with woven yardage to the scholarship on ZW pattern design and construction.

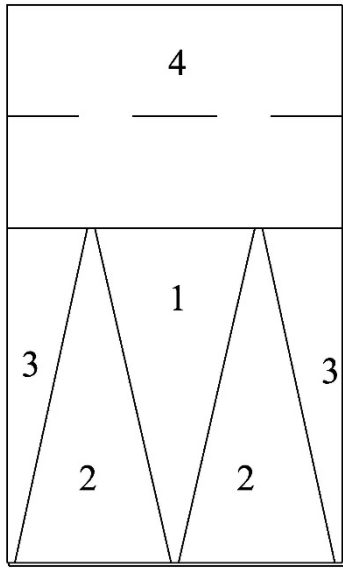


Figure 1: Pattern piece layout and cutting diagram for 100% silk crepe de chine.

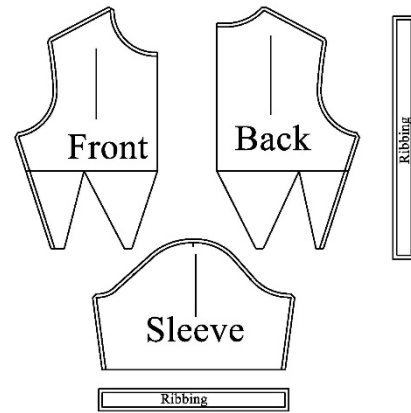


Figure 2: Bodice, sleeves, and ribbing pieces worked in Italian Mohair yarn.



Initial draping trial of woven fabric to determine knitted areas on half-scale dress form and rescaled version to full-size dress form.



Machine knitting the bodice with inserted beading.



Design front



Design back



Design side



Design detail

Bibliography

- Bernardoni, Jeremy M. 2022. "Contouring Method for Zero Waste Design." In *International Textile and Apparel Association Annual Conference Proceedings*, vol. 79, no. 1. Iowa State University Digital Press.
- Bryant, Nancy O. 1991. "The interrelationship between decorative and structural design in Madeleine Vionnet's work." *Costume* 25, no. 1: 73-88.
- Demornex, Jacqueline, and Paola Canino. 1991. *Madeleine Vionnet*. Rizzoli.
- Carrico, Melanie, Sheri L. Dragoo, Ellen McKinney, Casey Stannard, Colleen Moretz, and Ashley Rougeaux-Burnes. 2022. "An Inquiry into Gradable Zero-Waste Apparel Design." *Sustainability* 14, no. 1: 452.
- Carrico, Melanie, and Victoria Kim. 2014. "Expanding zero-waste design practices: A discussion paper." *International Journal of Fashion Design, Technology and Education* 7, no. 1: 58-64.
- Kirke, Betty. 1989. *Madeleine Vionnet*. San Francisco: Chronicle Books LLC.
- Rissanen, Timo, and Holly McQuillan. *Zero waste fashion design*. Bloomsbury Publishing, 2023.