MATTER OF MATERIAL LABOR

Eladio Dieste and Ruled Surfaces

The resistant virtues of the structures that we are searching for depend on their form.
It is because of their form that they are stable, not because of an awkward accumulation of matter.[1]

In his essay, Architecture and Construction, Uruguayan engineer Eladio Dieste recalls a conversation in which a former colleague dismissed the work of Catalan architect Antoni Gaudí stating that "his (Gaudi) work has nothing to do with us — in fact, I wouldn't know how to draw one of Gaudí's buildings".[2] This statement highlights what Dieste called the "tyranny of the drawing board" and the resulting technological dominance of planar geometries in most modern and contemporary architecture. This dominance has had an effect on the separation between material knowledge and the conditions that shape the relationship among geometry, material, and labor.

Serious reflection on labor must entail a recognition that buildings begin in both embodied and disembodied - material and immaterial - production, not just in architect's designs but also in bodies on the construction site.3

Innovative tools and digital fabrication workflows give architects the ability to manipulate form and generate ways of reconfiguring the relationship between geometry and material. In many cases this reconfiguration minimizes the role of labor or reinterprets labor through means of automated production, like robotics and programmable assemblies. *Matter of Material Labor* considers how the politics of labor and the structural implications of materiality is fundamental to the authorship of a collective process. This project is part of an ongoing faculty-led collaboration with 15 undergraduate architecture students. The first part of this collaboration focused on designing the construction of a 10'-0" long by 8'-0" tall ruled surface brick wall. The construction of this doubly-curved sinusoidal brick wall was documented over a four week period.

Ruled surfaces are one of the four structural masonry innovations developed by Eladio Dieste and used in buildings such as the *Iglesia del Cristo Obrero in Atántida, Uruguay. Matter of Material Labor* is part of ongoing research that explores the relationship between architectural workflows and the historical role of collaborative labor. The broader agenda of this work is to position brick masonry and the work of Eladio Dieste at the intersection of design and construction workflows.

References

1. Dieste, Eladio. "Architecture and Construction", in Eladio Dieste: Innovation in Structural Art, ed. by Stanford Anderson, (New York: Princeton Architectural Press, 2004), 187.

2. Ibid, 183.

3. Ockman, Joan. "Foreword", in The Architect as Worker: Immaterial Labor, the Creative Class, and the Politics of Design, ed by Peggy Deamer, (New York, Bloomsbury, 2015), xxiv.

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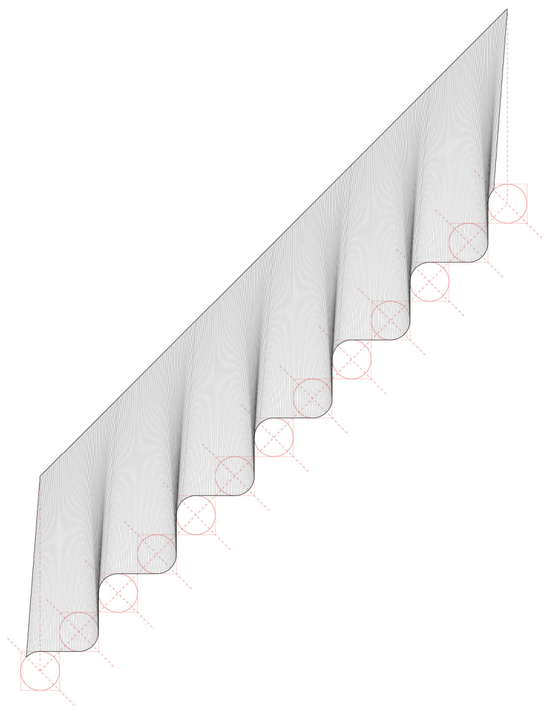
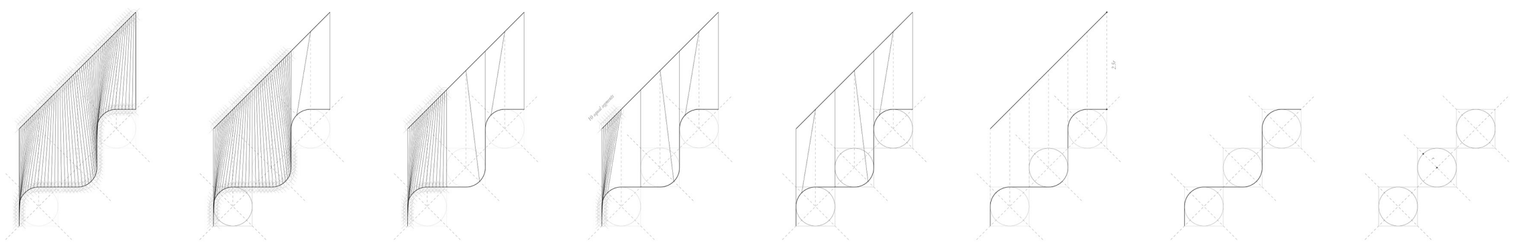
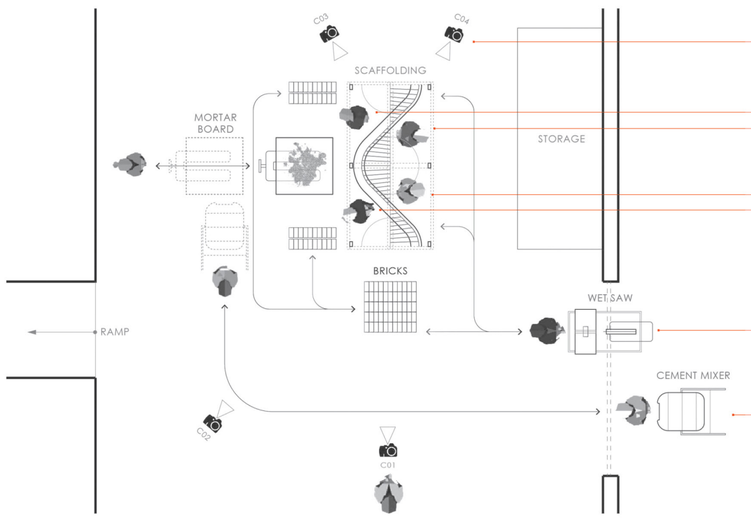
DATE	CREW (INITIALS)	BRICK COURSE	WALL HEIGHT (INCHES)	# FULL BRICKS	# PARTIAL BRICKS	# BRICKS PER COURSE
03.31.16	GGC, JM, NK, RW, GA	1	2.75	15	1	16
03.31.16	GGC, JM, NK, RW, GA	2	5.5	14	2	16
03.31.16	GGC, JM, NK, RW, GA	3	7.25	15	1	16
04.02.16	JM, RG, GGC, JD, NK, LW	4	11.5	14	2	16
04.02.16	JM, RG, GGC, JD, NK, LW	5	14.25	13	2	15
04.02.16	JM, RG, GGC, JD, NK, LW	6	17	14	1	15
04.04.16	ML, KW, JM, SS, NK	7	19.5	14	1	15
04.04.16	ML, KW, JM, SS, NK	8	22.5	13	1	14
04.04.16	ML, KW, JM, SS, NK	9	25.25	13	0	13
04.04.16	ML, KW, JM, SS, NK	10	28	12	2	14
04.07.16	BLDG SHOP CLASS	11	30.75	12	1	13
04.07.16	BLDG SHOP CLASS	12	34.25	12	1	13
04.07.16	BLDG SHOP CLASS	13	37.125	11	2	13
04.09.16	LW, EH, JR, JD, JM, RJ	14	39.75	11	2	13
04.09.16	LW, EH, JR, JD, JM, RJ	15	42.625	11	1	12
04.09.16	LW, EH, JR, JD, JM, RJ	16	45.1875	11	1	12
04.11.16	ML, KW, JM, SS, NK	17	48	10	2	12
04.11.16	ML, KW, JM, SS, NK	18	50.75	10	2	12
04.11.16	ML, KW, JM, SS, NK	19	53.5	10	2	12
04.14.16	BLDG SHOP CLASS	20	56.5	10	2	12
04.14.16	BLDG SHOP CLASS	21	59.25	10	1	11
04.14.16	BLDG SHOP CLASS	22	62.25	10	2	12
04.17.16	RJ, EH, JM, JR, LW	23	65.5	9	2	11
04.17.16	RJ, EH, JM, JR, LW	24	68.5	10	0	10
04.17.16	RJ, EH, JM, JD, JD	25	70.5	9	2	11
04.17.16	RJ, EH, JM, JD, JD	26	73.5	10	0	10
04.17.16	RJ, EH, JM, JD, JD	27	76.5	9	0	9
TOTALS		27	76.5	312	36	348
		BRICK COURSES	WALL HEIGHT (INCHES)	# FULL BRICKS	# PARTIAL BRICKS	TOTAL BRICK PIECES

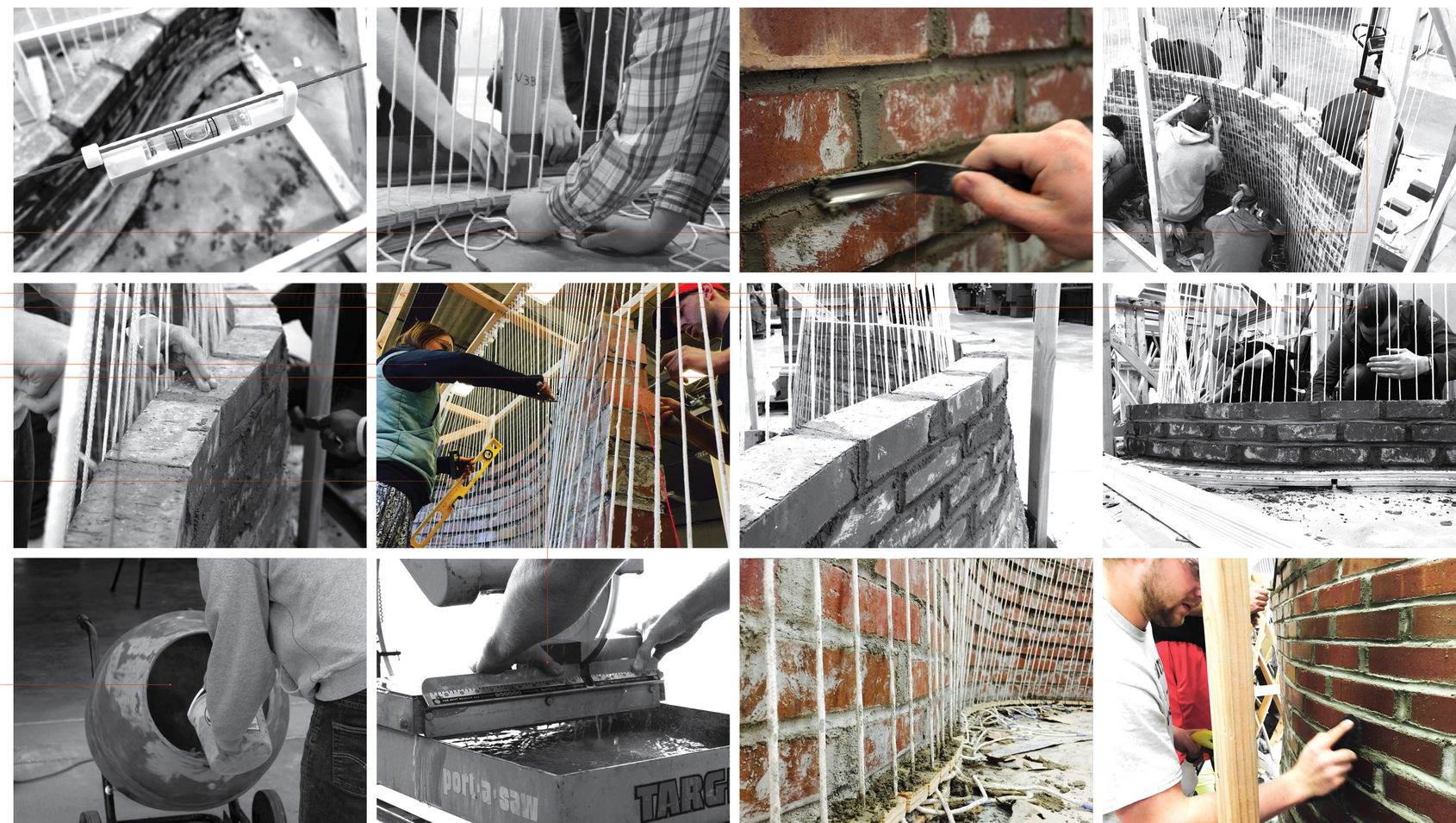
Wall Log / This Ruled Surface brick wall is a learning tool, another model, it is the physical construction of a network of errors that can be evaluated. Through documentation and analysis we can understand when and if this network of errors undermines the geometry of the wall and its structural capacity. A ruled surface geometry allows us to ask, how can we make the wall stronger, thinner, and more imprecise, while reinforcing the complexity of its geometry.





Ruled Surface Geometry / The doubly curved ruled surface is defined through a series of vertical lines. The base geometry of the wall is defined through a sinusoidal curve and the top of the wall is defined by a straight line.





Workflow Diagram / Designing the construction and understanding the implications of organizing labor was a fundamental part of this project. Each person involved in the construction of this wall was asked to participate and reflect on the relationship between material and labor.