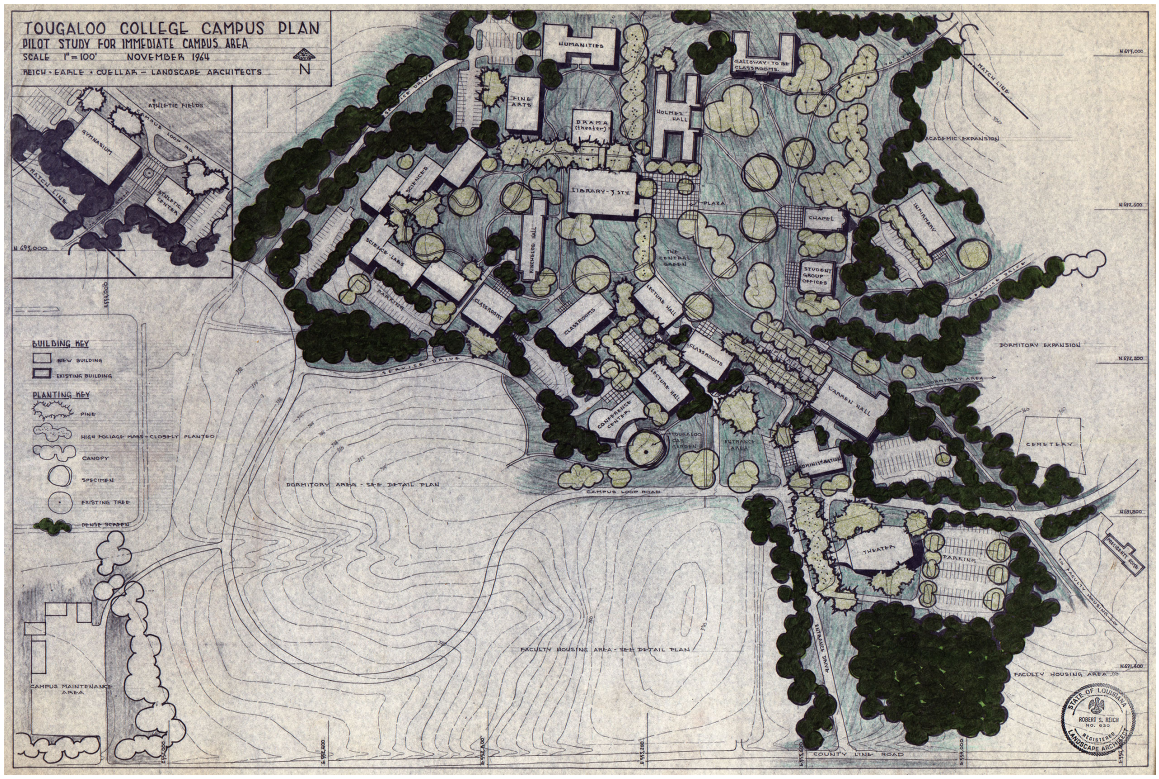


Figure 2.23 Reich Earle Cuellar Landscape Architects, Tougaloo College Campus Plan, Pilot Study for Immediate Campus Area, 1964. Drawer 5, Folder 1, GBA records, BHL.

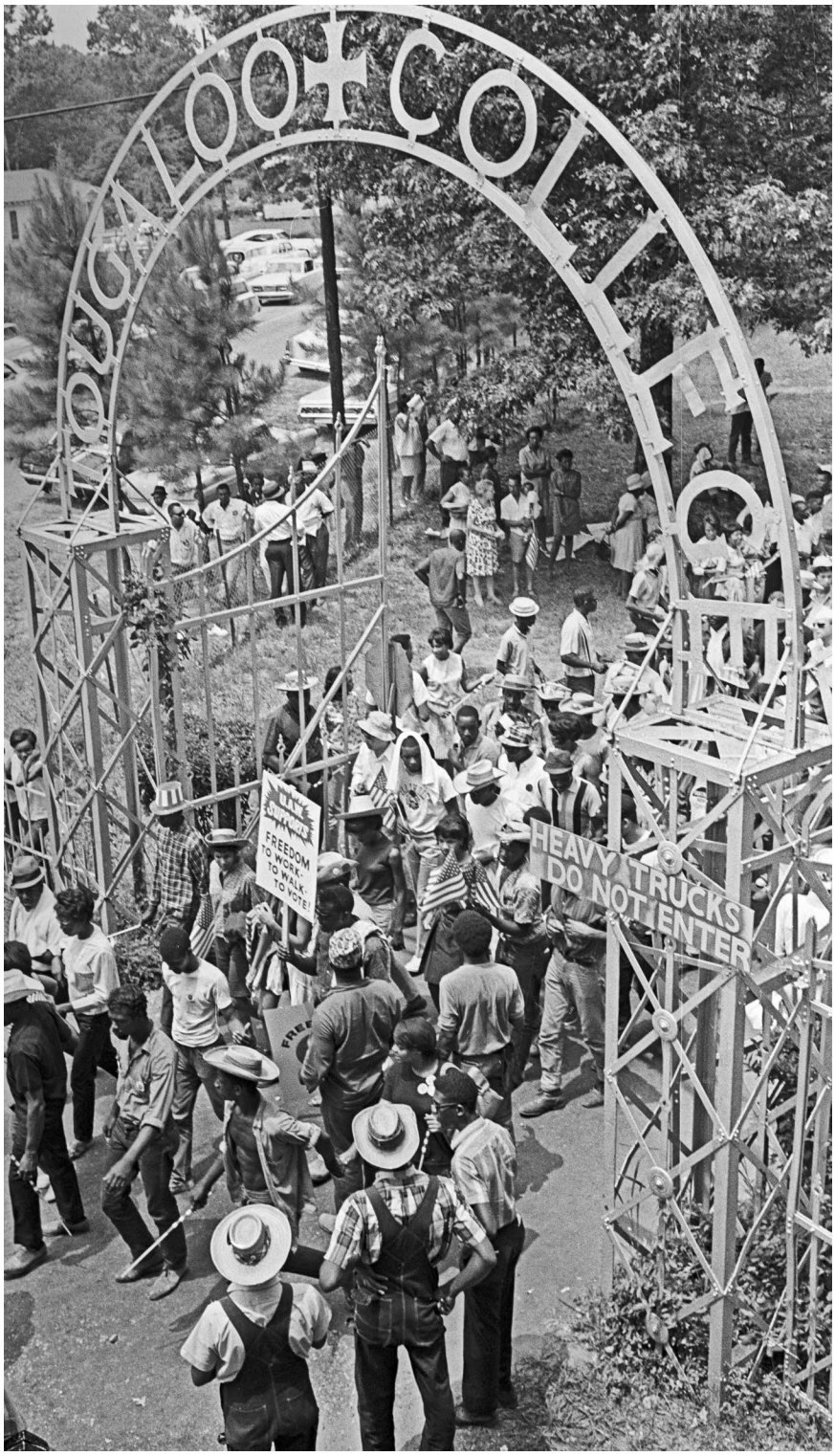


Figure 2.24 Participants in James Meredith's March Against Fear walk through the gates of Tougaloo College, where they had been housed overnight, heading for the Mississippi State Capitol in Jackson, June 26, 1966. Photograph by Bob Fitch © Stanford University.

Figure 2.25 Professor Ernst Borinski leading a Social Science Forum discussion with students at Tougaloo College, ca. 1960. Mississippi Department of Archives and History.

Figure 2.26 NAACP leader Aaron Henry leading a Social Science Forum at Tougaloo College, early 1970s. Ernst Borinski seated in front row at far left. Mississippi Department of Archives and History.

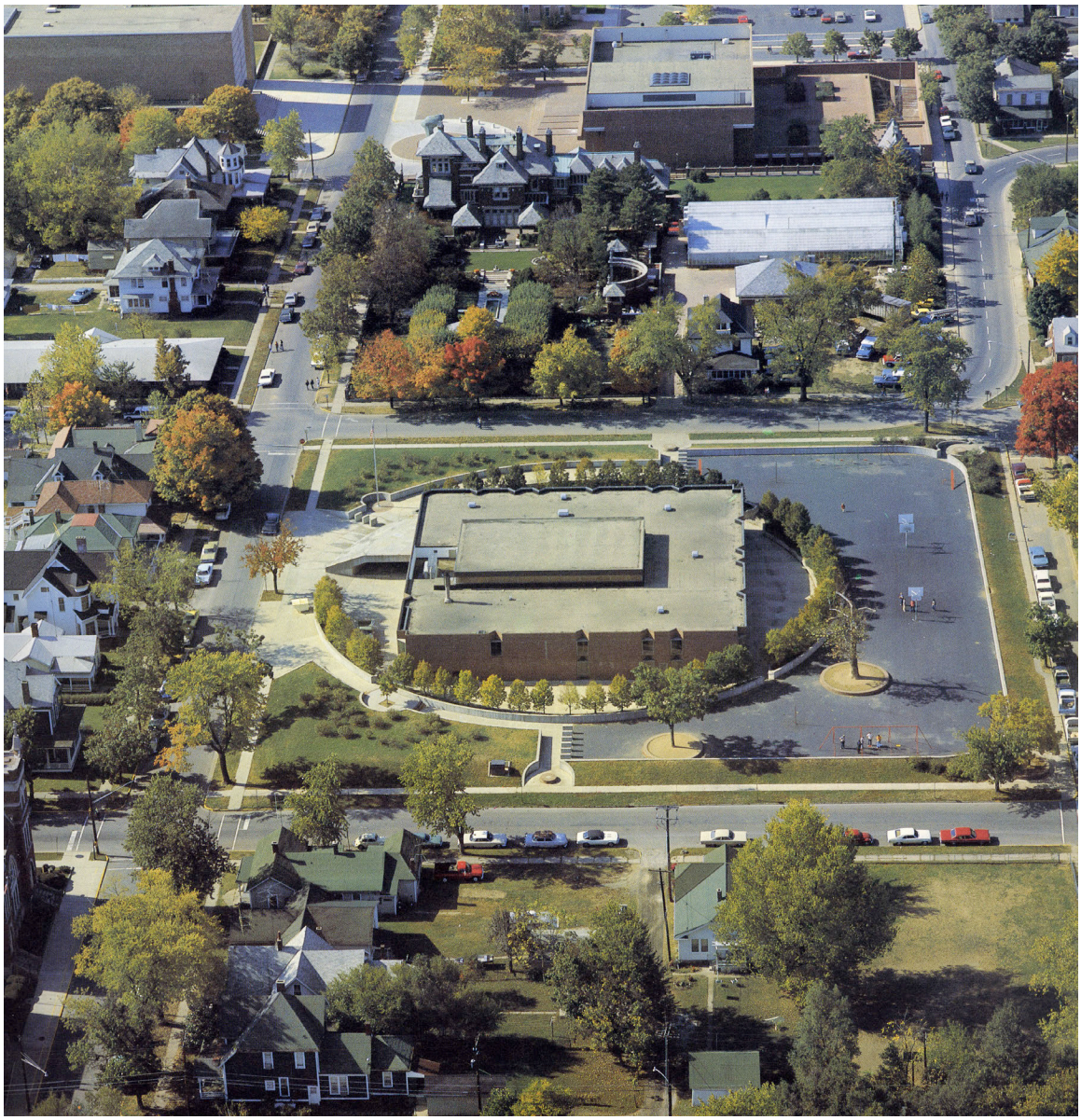


Figure 2.27 GBA, Lincoln Elementary School, Columbus, Indiana, 1965-67. Eliel Saarinen's First Christian Church (1942) visible at top left. Photograph by Yukio Futagawa. From: Marlin and Futagawa, 77.

Figure 2.28 Eero Saarinen and Associates, Concordia Senior College, Ft. Wayne, Indiana, 1953-57. Photograph by the author, 2016.

Figure 2.29 John Carl Warnecke & Associates, campus plan for San Mateo Junior College, San Mateo, California, 1961. From Richard P. Dober, *Campus Planning* (New York: Reinhold, 1963), 294.

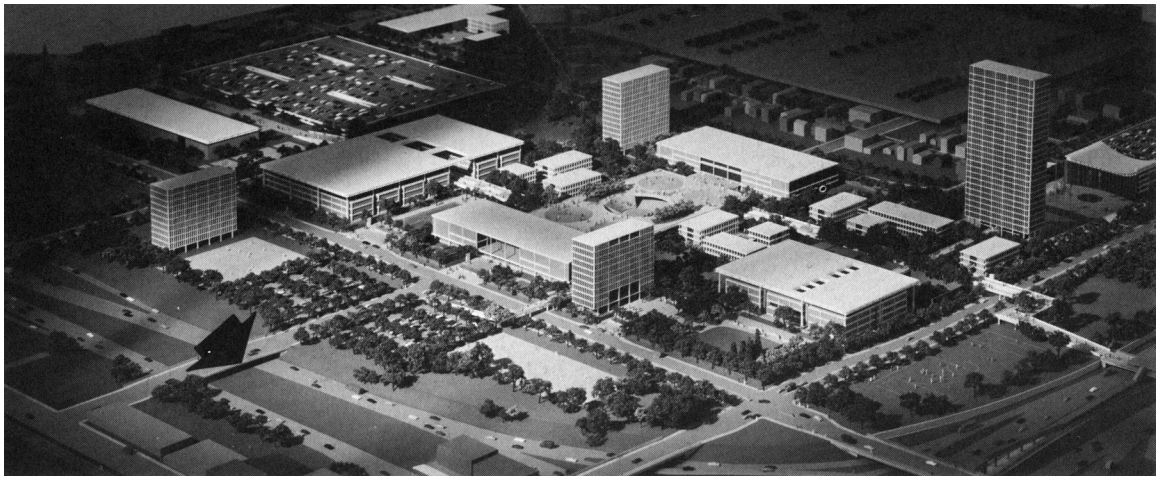


Figure 2.30 Skidmore, Owings, & Merrill, campus plan for University of Illinois at Congress Circle (now University of Illinois at Chicago), Chicago, Illinois, 1962. From Dober, 298.

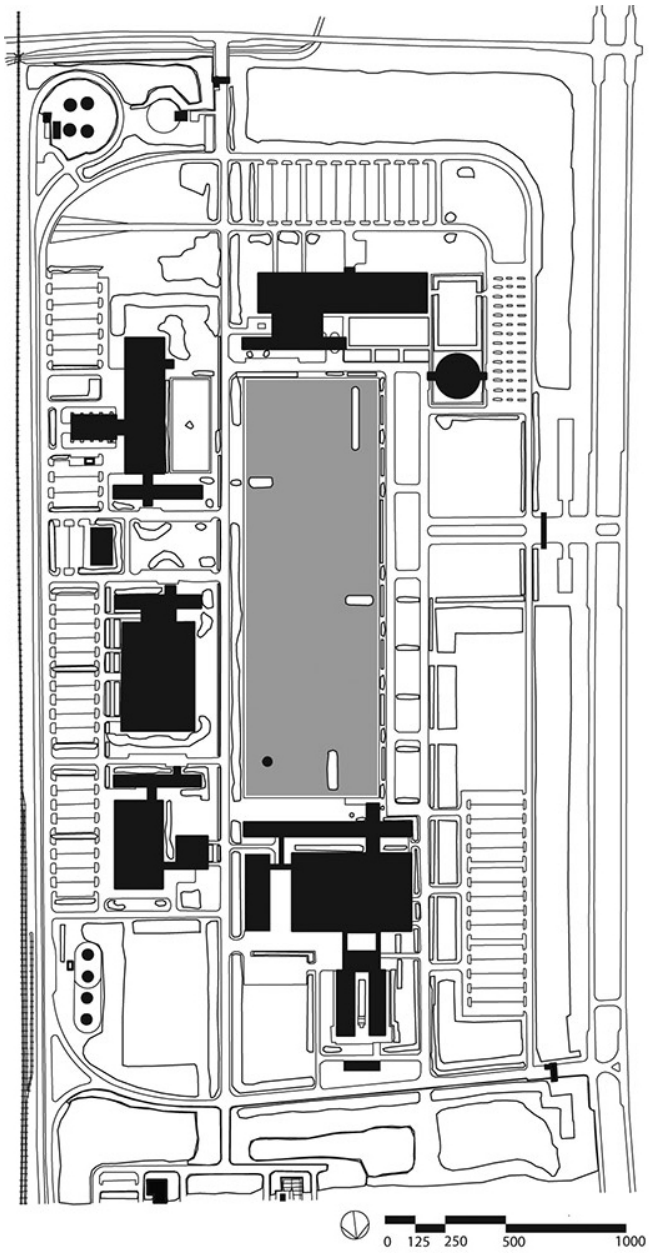


Figure 2.31 Eero Saarinen and Associates, General Motors Technical Center, Warren, Michigan, 1950-56. Site plan redrawn by Laura Tepper. From: Louise Mozingo, *Pastoral Capitalism: A History of Suburban Corporate Landscapes* (Cambridge, Mass.: MIT Press, 2011), 13.

Figure 2.32 Minoru Yamasaki and Associates, Master plan for Wayne State University, Detroit, Michigan, 1959. Arrow indicates location of College of Education building designed by Yamasaki with Birkerts as project architect. From: Dober, 78.

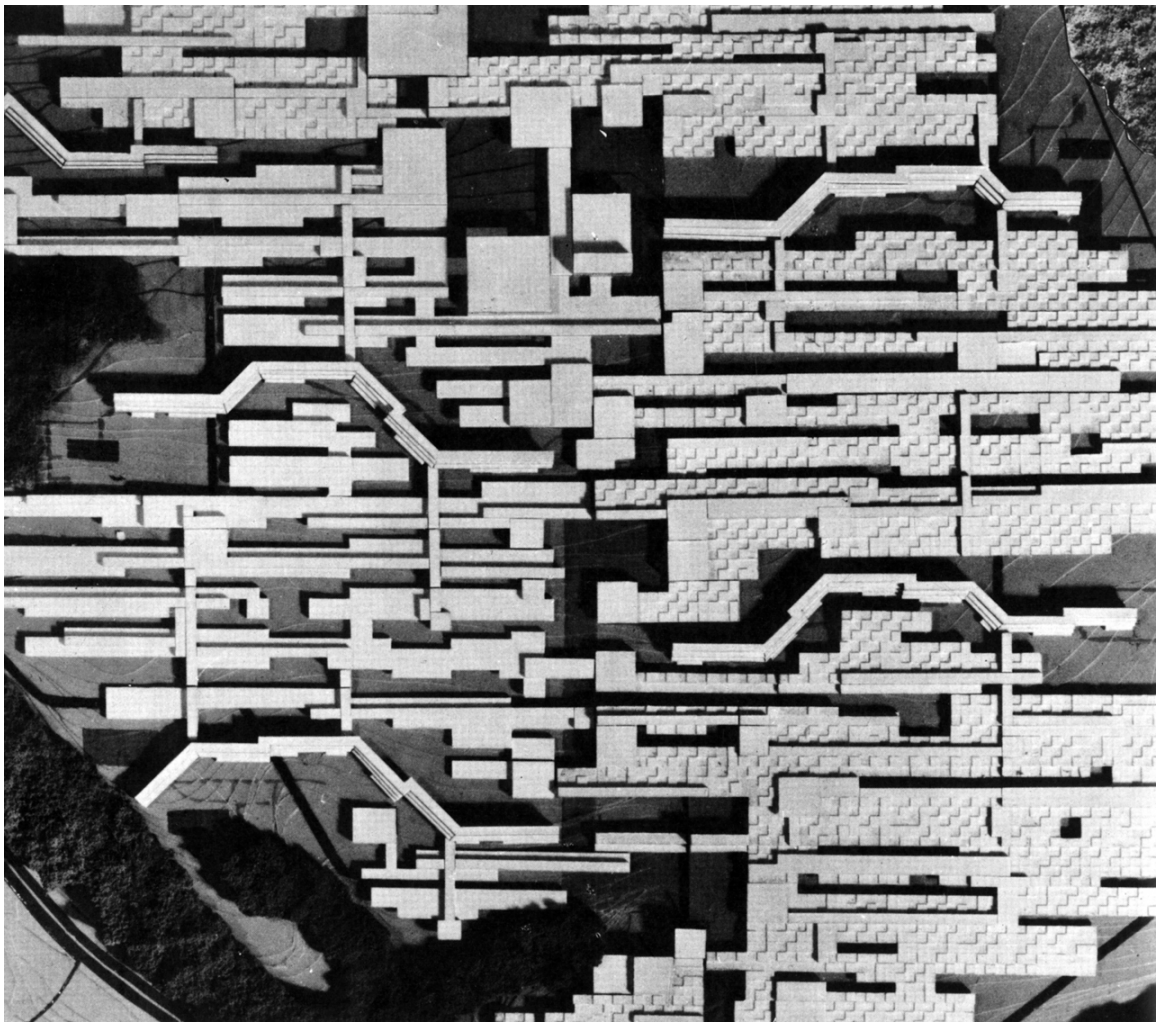


Figure 2.33 Candilis Josic Woods, Competition Entry (Second Prize), Bochum University, Germany, 1962. From: Alison Smithson, ed., "The Work of Team 10," *Architectural Design* 34, no. 8 (August 1964): 373–93.

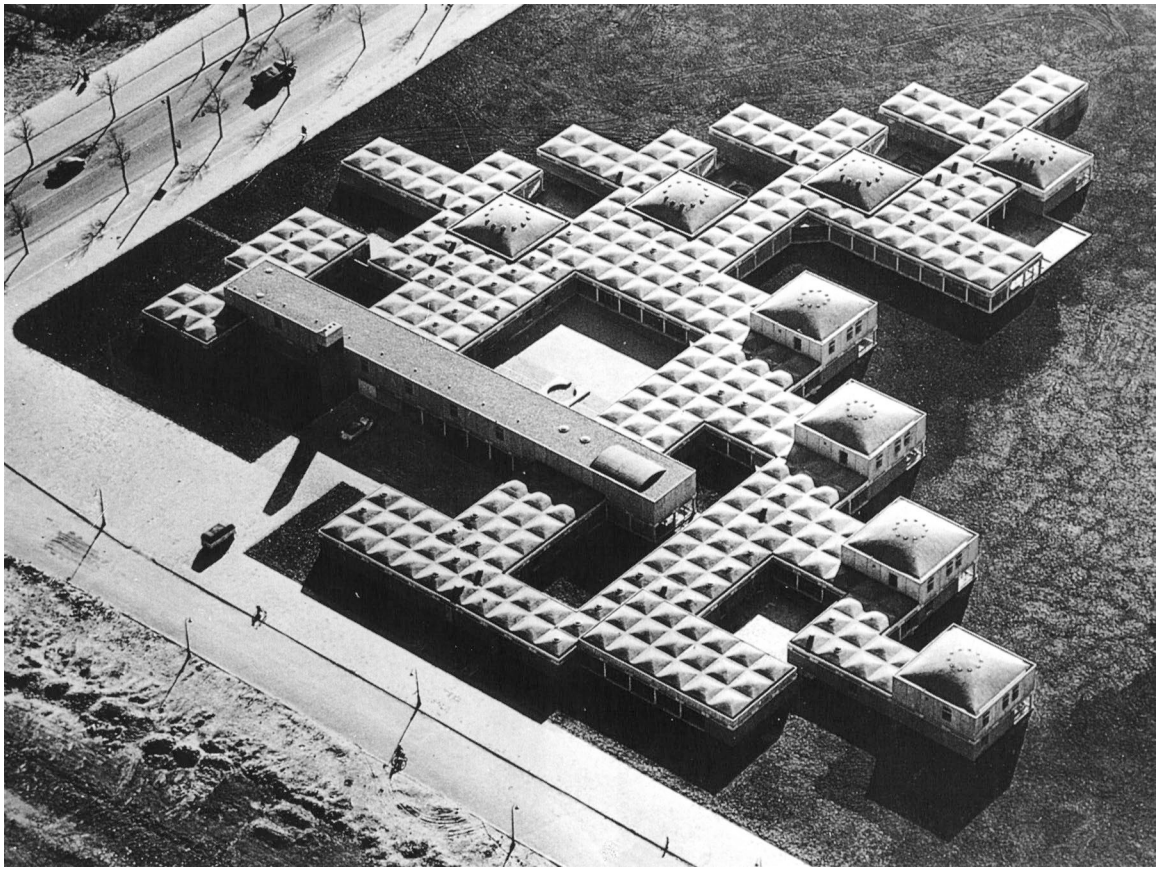


Figure 2.34 Aldo Van Eyck, Orphanage, Amsterdam, Netherlands, 1958-60, Photograph by Aldo Van Eyck. From: Vincent Ligtelijn, ed. *Aldo Van Eyck: Works* (Basel: Birkhäuser, 1999), 91.

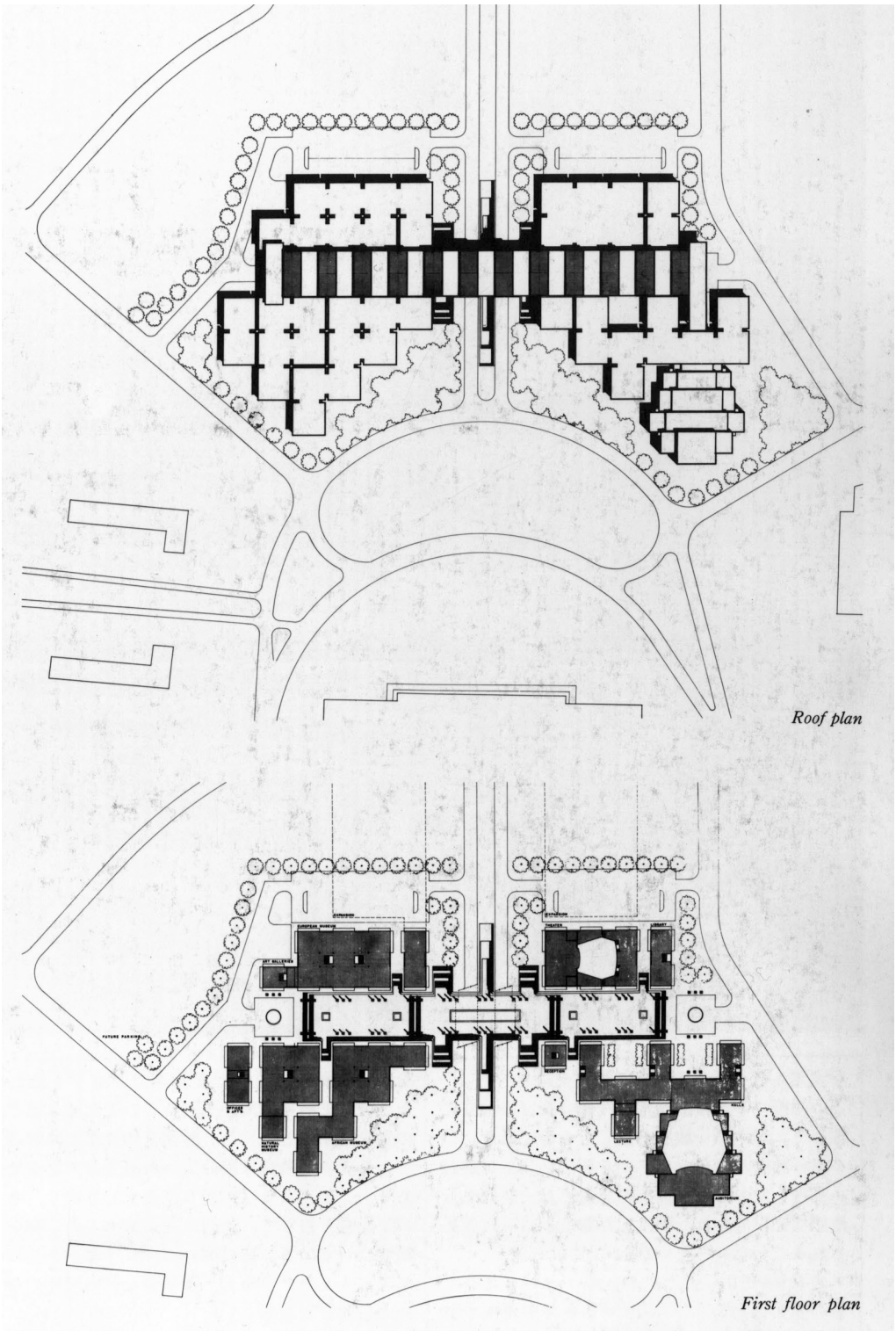


Figure 2.35 Gunnar Birkerts, Astra Zarina, and Douglas Haner, Roof and First floor plans, Competition Entry, Cultural Center, Leopoldville, Belgian Congo (now Kinshasa, Democratic Republic of the Congo), 1958. From: Marlin and Futagawa, 25.

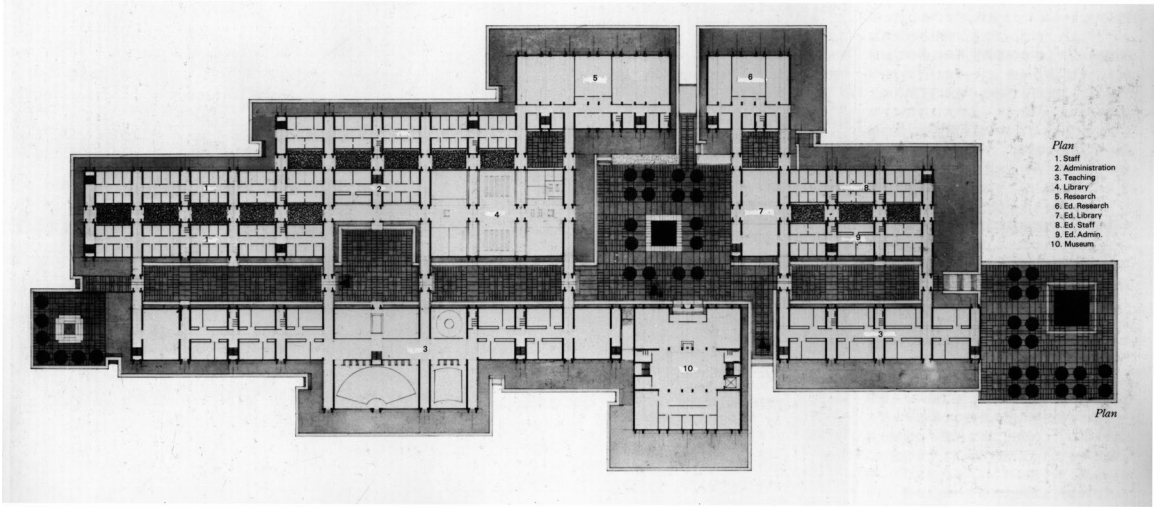


Figure 2.36 Gunnar Birkerts, Astra Zarina, and Jose Teran, Ground floor plan, Competition Entry, Technical University, Ankara, Turkey, 1959. From: Marlin and Futagawa, 29.

Figure 2.37 Gunnar Birkerts, Astra Zarina, and Jose Teran, Competition Entry, Technical University, Ankara, Turkey, 1960. Perspective drawing by Astra Zarina. 35mm slide, Box 84, GBA records, BHL.

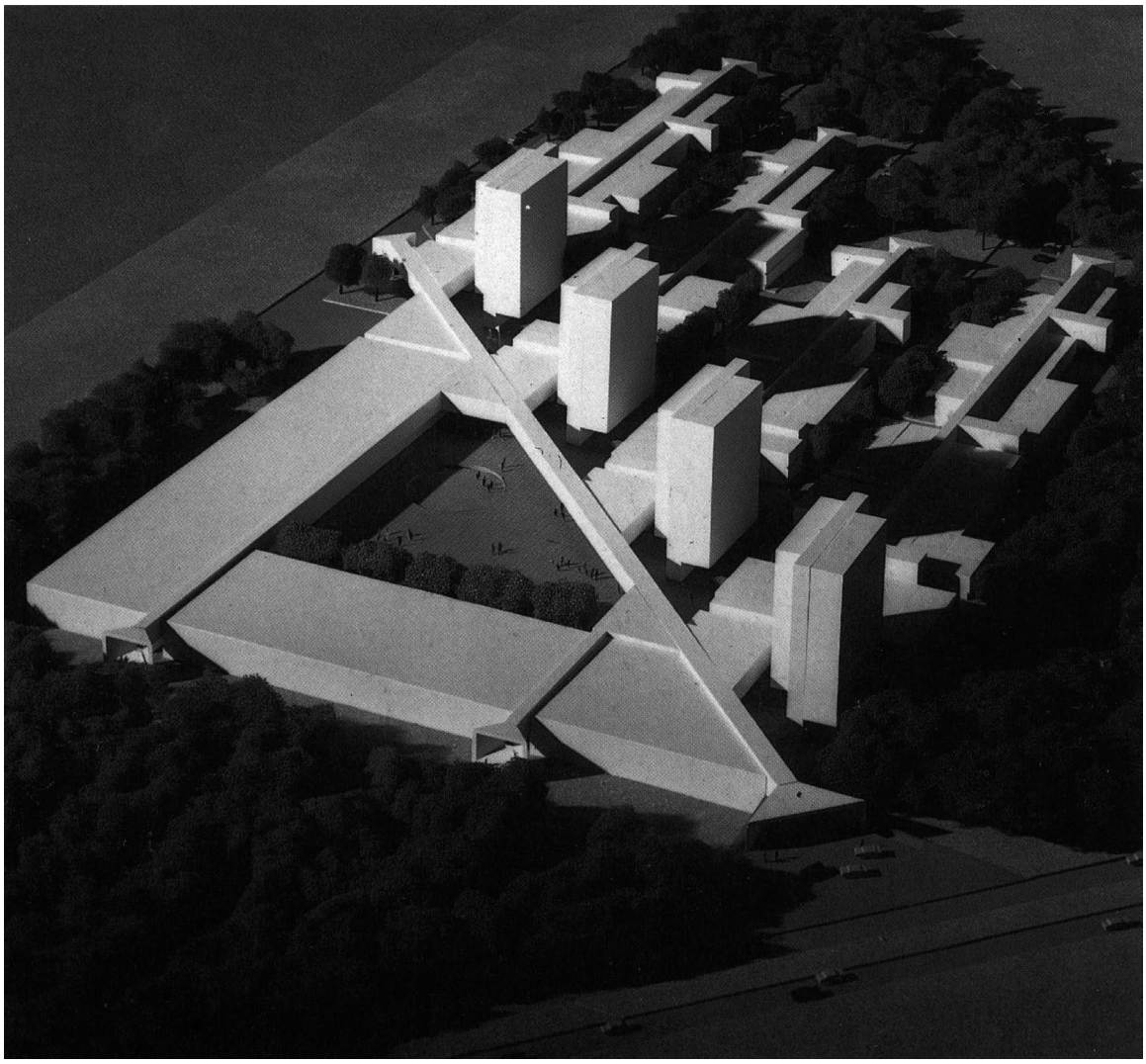


Figure 2.38 GBA, Presentation Model, Master Plan for Vocational Technical Institute, Carbondale, Illinois, 1968. Photograph by Daniel Bartush. From: Marlin and Futagawa, 115.

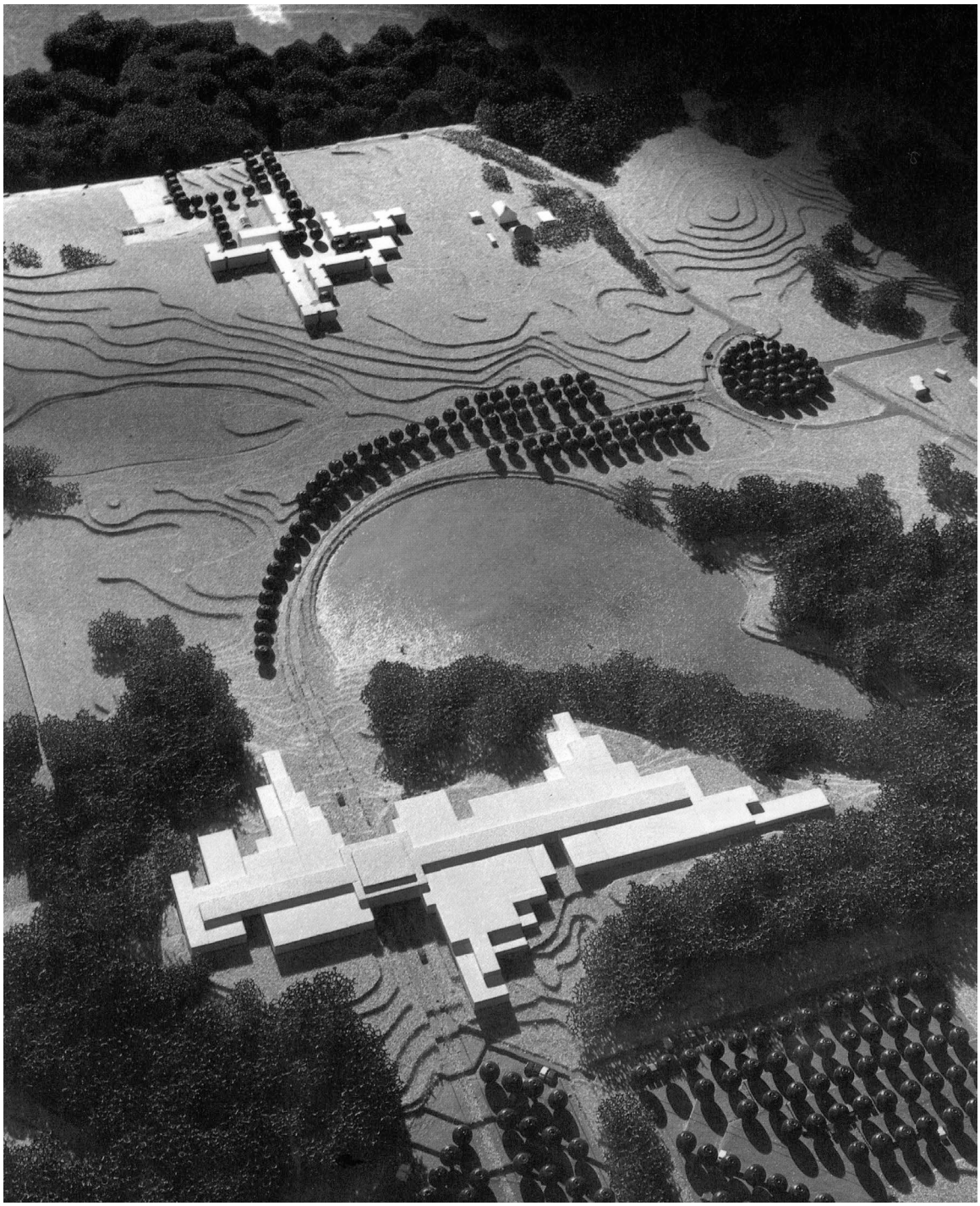


Figure 2.39 GBA, Presentation Model, Master Plan for Glen Oaks Community College, Centreville, Michigan, 1966-71. Photograph by Balthazar Korab. From: Marlin and Futagawa, 102.

Figure 2.40 GBA, Glen Oaks Community College Academic Building, Centreville, Michigan, 1966-71. 35mm slide, Box 84, Gunnar Birkerts and Associates records, Bentley Historical Library, University of Michigan.

Figure 2.41 GBA, Grand stairway at Glen Oaks Community College, Centreville, Michigan, 1966-71. Photograph by Balthazar Korab. From: Marlin and Futagawa, 103.

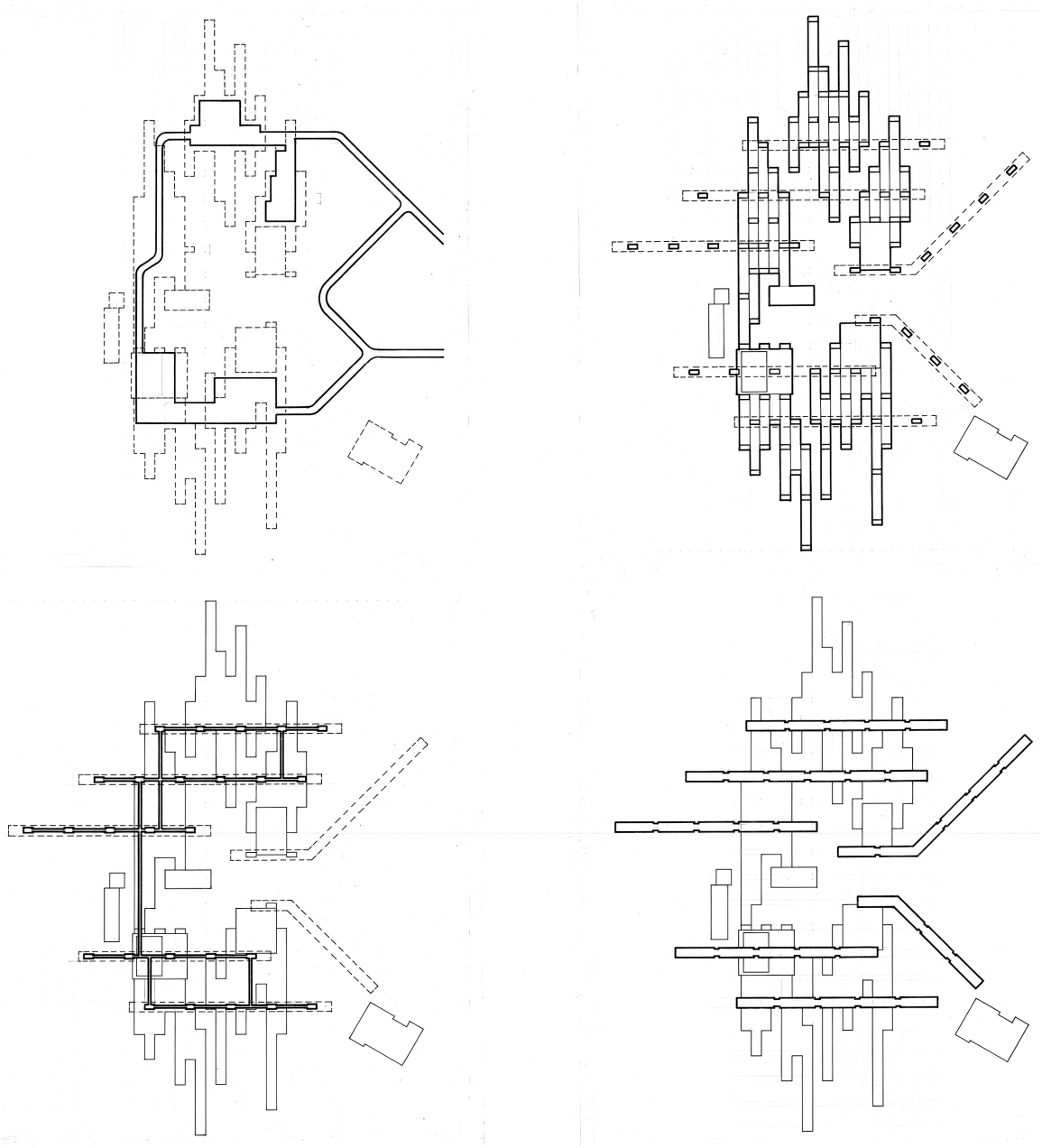


Figure 2.42 GBA, layered circulation drawings, Tougaloo College master plan, ca. 1966. Elevated pedestrian circulation system at bottom left. Drawer 5, Folder 6, GBA records, BHL.

Figure 2.43 Tougaloo College dormitory construction photograph showing positioning of roof panel atop second residential floor. The access walkway is below the first dormitory floor between the structural columns. Box 5, GBA records, BHL.

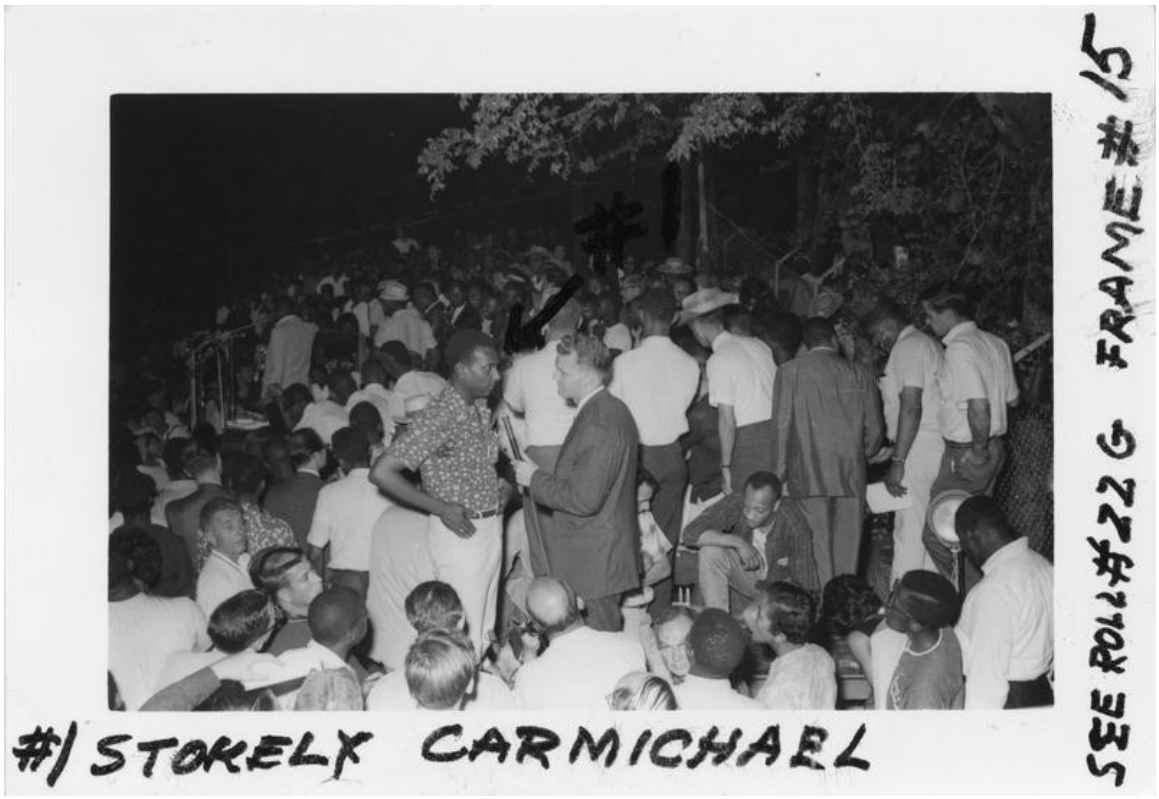


Figure 2.44 Annotated photograph showing Stokely Carmichael being interviewed at a Tougaloo College rally, possibly after his speech on behalf of the Student Nonviolent Coordinating Committee (SNCC) on April 11, 1967. Item 9-37-0-2-40-1-1ph, Mississippi State Sovereignty Commission Records Online, Mississippi Department of Archives and History.

Figure 2.45 Gunnar Birkerts (second from left) presents master plan model to (from left) Tougaloo College President George A. Owens, Harvard College Dean John U. Munro, and Brown University President Barnaby Keeney, April 1966. Photograph by Frank Noone.

Figure 2.46 Owens (second from left) presents master plan model to (from left) Munro, Keeney, and Tougaloo College Board of Trustees Chairman Robert Wilder, April 1966. Photograph by Frank Noone.

CHAPTER 3 (METHODS)

Protocols of Process and Expression: Federal Reserve Bank of Minneapolis, Minnesota, 1967-73

> *To most architects, administrative matters hardly rank high on any priority list of interesting subjects. Administrative ability is commonly looked upon in the same light as sex appeal and a sense of humour: everybody assumes he has it.*
>
> – David H. Scott[1]

> *I have tried to establish the relationship and proportion of these 'other' or artistic realms to the broader base of the building design process. The base is large and what I am calling 'me' is small, or can only emerge out of the external complexities of the base or can only be squeezed through them.*
>
> – Gunnar Birkerts[2]

Federal Reserve Bank of Minneapolis (FRBM) President Hugh D. Galusha, Jr. (Figure 3.01) wrote to Gunnar Birkerts on August 21, 1967, thanking him for his hospitality on Galusha's recent trip to Detroit. He had visited to inspect several of Birkerts's buildings and interview him for the job of designing the Bank's new headquarters. "Your thoughtfulness to us while we were in Detroit was very much appreciated," Galusha wrote, "I know what disruptions in a time schedule can mean to a professional person, and forgive me when I say we are very grateful."[3] In addition to a formal interview at the Gunnar Birkerts and Associates (GBA) office in the northern suburb of Birmingham, Galusha and the architect had together toured several Birkerts-designed buildings

[1] David H Scott, "The Organization of Architects' Offices," *Canadian Architect* 15, no. 1 (January 1970): 35.
[2] Gunnar Birkerts, "Defining a Design Methodology," *Architectural Record* 161, no. 2 (February 1977): 94.
[3] Hugh D. Galusha to Gunnar Birkerts, August 21, 1967, Gunnar Birkerts and Associates Records (GBA), Bentley Historical Library (BHL), Box 13.

including the apartment tower at 1300 Lafayette Avenue (Figure 3.02) and Lillibridge Elementary School (Figure 3.03) in Detroit, along with the University Reformed Church (URC) in Ann Arbor discussed in Chapter I. Galusha was particularly impressed by Birkerts's honesty about the URC's failings, which would have been immediately evident to a relatively informed observer because of the irregular coloration of its exposed concrete exterior.[4] Galusha's letter suggests that Birkerts discussed the building's problems in a way that showed maturity instead of inexperience.

Maturity would have been an important metric for Galusha because Birkerts was by far the least established architect considered for the FRBM commission.[5] Moreover, unlike the others Galusha interviewed—Romaldo Giurgola of Philadelphia, I.M. Pei of New York, Benjamin Thompson of Boston, and Harry Weese of Chicago—Birkerts had only a handful of employees and was based in a relative cultural backwater on the northern edge of Metropolitan Detroit. Birkerts must have sensed that to set himself apart, he needed to be honest and frank with his prospective Midwestern client.

As Galusha's visit makes clear, even large, complex construction projects may begin with personal rapport. But they quickly exceed the abilities (and the schedules) of these individuals. In cases such as this, a historiographical focus on the working

[4] Sven Birkerts and Martin Schwartz, *Gunnar Birkerts: Metaphoric Modernist* (Stuttgart: Edition Axel Menges, 2009), 20. Gunnar Birkerts recalls that when Galusha visited, "I thought the best thing would be to drive out to Ann Arbor where the University Reformed Church was under construction. But unfortunately it was winter and when we got there things looked pretty uninspiring. The poured concrete forms were discolored by the application of pre-heated additives. This was not the image of the building I was hoping to present. I saw this at a glance. There was no point in pretending otherwise. So I was open with Hugh – I explained the situation." Birkerts's recollections are inaccurate on at least three counts. First, correspondence indicates that it was Galusha's secretary who recommended visiting the URC and other buildings rather just the GBA office. Second, Galusha visited Detroit in early August, not wintertime. Third, he visited in 1967, more than three years after the URC building opened in spring 1964. It seems that Birkerts was recalling a different client visit. Nevertheless, based on the above-cited letter, it may indeed have been Birkerts's openness and honesty that impressed Galusha.

[5] To begin the selection process, Galusha had San Francisco-based architect Ellis Kaplan prepare a list of respected American architects that the Bank should interview.

relationship between client and architect would obscure the complexities involved in making the building. When considering the personal relationships involved in architectural production at all, most historical scholarship remains focused on the figurehead architect and, with the kind of large institutions like FRBM which were the predominant architectural clients in the 1960s, the figurehead executive.[6]

What new modes of understanding architecture come into focus when we zoom out to permit a view of other consequential people in the process? What historiographical possibilities might such a wider view allow? Identifying and recovering the work and working methods of subordinate employee-architects and others involved in the process of making the FRBM building, this chapter outlines the difficulties this small firm encountered while adjusting to complex managerial tasks and hierarchies of responsibility even as its principal remained staunchly committed to retaining at least the appearance of total design control.

Gunnar Birkerts and Associates had only six employees at the time of Galusha's visit to their office at 909 Haynes Street in Birmingham during the summer of 1967. These six worked mostly on campus planning projects such as Tougaloo College or suburban institutional buildings such as the Livonia Public Library Branch (Figure 3.04) and the Church of St. Bede in Southfield (Figure 3.05). The firm had designed only two small office buildings: the Marathon Oil Building at the Detroit refinery (Figure 3.06), completed in 1964, and the Fisher Administrative Center at the University of Detroit, Mercy (Figure 3.07), completed in 1966. Neither of these was included on Galusha's tour

[6] A key example of such a figurehead executive is J. Irwin Miller of Cummins Engine, whose architectural patronage was discussed briefly in Chapter II. Another is Thomas Beuchner of Corning Glass, who is discussed in Chapter IV.

itinerary, suggesting that expertise in this particular building type was less important for him than was the general impression he took away from the buildings and their architect.

Birkerts made himself available to spend nearly a full day cultivating a personal rapport with Galusha, something the schedules of architects from larger firms may not have allowed. For Birkerts, this "disruption in [his] time schedule" was more than just an investment in the prospects of his firm—as any architect will admit, building personal relationships with potential clients is a primary determinant of success—because he and Galusha are said to have developed a fast friendship exceeding the bounds of their professional relation.[7] They may have bonded over a shared love of the outdoors, as both men were known to have drawn much pleasure and rejuvenation from time spent engaging with nature.[8]

Their rapport was significant because Galusha's selection criteria not only included assessments of the architects' professional qualifications and buildings, but also the potential of a "warm, direct and personal working relationship."[9] At the time, such qualitative metrics were the only legal criteria available when selecting an architect because the American Institute of Architects (AIA) code of ethics barred its members from competitive bidding. As a result, developing and managing client relationships was considered the province of firm principals whose personalities and biographies, as was

[7] Birkerts and Schwartz, *Metaphoric Modernist*, 20.
[8] Esther McCoy remarked that in her early meetings with Birkerts in 1964, "I sensed in him some absolute need to refresh himself often in the presence of nature—not an American characteristic, and it served to remind me that he was born in Latvia." Esther McCoy, *Gunnar Birkerts & Associates: IBM Information Systems Center, Sterling Forest, New York, 1972; Federal Reserve Bank of Minneapolis, Minnesota, 1973*, ed. Yukio Futagawa, vol. 31, Global Architecture (Tokyo: A. D. A. Edita, 1974), unpaginated. A Montana native, Galusha took frequent trips in the American West, and died tragically on an ill-fated snowmobile trip in 1971, never seeing the FRBM building completed. See Jim Klobuchar, "Ordeal on Beartooth Mountain," *Popular Mechanics* 136, no. 5 (November 1971): 84–89; 194.
[9] Hugh D. Galusha to Senator Walter F. Mondale, October 13, 1967, GBA, BHL, Box 13, 2.

shown in Chapter 1 and will be discussed further in Chapter 4, were an important component of firms' identities.

When Galusha reported his impressions to the Bank's board, the most concrete criteria they considered were the "Caliber of personnel at associate and designer level," and, tellingly, "Current work load of the firm as it might impinge on an early starting date." The board's primary preoccupation seems to have been with the construction schedule. For a six-member firm, it would have been easy to introduce Galusha to the exact associates and designers who would work on the building design. Similarly, the workload of the firm would have been simple to predict (uncertainty regarding Tougaloo College notwithstanding). To these initial questions, Galusha appended, "Would the Federal Reserve building be a challenge and an opportunity to the firm?"[10] For Birkerts's small group, delivering a design for such a large building on schedule and on budget was certainly both.

The challenge was clear as soon as they were awarded the commission, a major boon for Birkerts and GBA, in late September 1967. In his first internal project memorandum on October 3, Birkerts wrote to the employees tasked with managing day-to-day office work, wanting to avoid disrupting his busy client:

> It is essential that we proceed immediately with scheduling of this project as far as possible, since many stages and phases will affect time that will have to be spent by Mr. Galusha and his officers. All meetings should be scheduled reasonably far in advance for their convenience in arranging their schedules.[11]

Indeed, scheduling, that most tiresome of administrative activities, would become one of GBA's central preoccupations and difficulties during the FRBM project. In this and other

[10] Galusha, 2.
[11] Gunnar Birkerts, Memorandum #1, Project 6708: Federal Reserve Bank of Minneapolis (FRBM), October 3, 1967, GBA, BHL, Box 8.

aspects of their work, FRBM was a turning point for both Birkerts and his firm. As discussed in Chapter 1, he distinguished himself from his competitors by cultivating the aura of an artist-architect rather than seeking the esteem afforded to business-oriented professionals. Administrative activities like scheduling were, therefore, not the aspects of architectural practice that most interested him personally; when these became the predominant activities required by a project, his attention often shifted elsewhere. As would have been standard practice at most firms, even relatively small ones, after the FRBM schematic design was completed in March 1968, Birkerts turned the project over almost entirely to a project architect, Charles Fleckenstein, who oversaw it for the next five years until the building's completion in fall 1973.

Fleckenstein, who had been hired at GBA in the mid-1960s, was one of Birkerts's longest-tenured employees and a partner in the firm at the time, but he hadn't yet managed a project anywhere near the FRBM's scale or complexity.[12] Neither had Bruce Wade or Barbara Bos—who eventually headed up the interior design for the building—or anyone else in the firm.[13] Despite employees' best efforts, the project's day-to-day demands proved overwhelming for GBA as it existed prior to the commission. In the end, FRBM was the main impetus behind the growth of Birkerts's employee ranks from six in 1967 to nearly more than 25 by 1973. In addition to Fleckenstein and Birkerts, no less

[12] Fleckenstein was eventually promoted to partner, and remained with GBA until his tragic death at the age of 46 in 1982. He was struck by a car while jogging on vacation in Washington, D.C. and died a few months later. "Obituary: Charles Fleckenstein Jr., 46, architect," *Detroit Free Press* (Saturday August 7, 1982), 9C.

[13] Birkerts himself was perhaps the only exception, given his having designed and completed the 30-story residential tower at 1300 Lafayette in Detroit (Figure 3.02), but this project was completed during his partnership with Frank Straub as Birkerts & Straub. Within that partnership, Birkerts was positioned as the designer and Straub the manager. The projects he managed while with Yamasaki were considerably smaller.

than two-dozen other GBA employees worked on aspects of the FRBM project.[14] As a group, their material output was sizable. All told, the firm archived 1676 drawings, 1009 pages of construction specifications, 163 project bulletins, 702 memos, 63 change orders, and several linear feet of correspondence for FRBM, Project #6705. Despite the importance of artistic authorship for a firm such as GBA, these records of daily work make up the bulk of archival materials they retained. This imbalance indexed the division of labor in the office—although Birkerts's personal involvement may have declined after the schematic design phase, the firm's material output only accelerated.[15]

Because of frequent litigation in large construction projects, GBA documented all communications so that they might prove other parties liable when difficulties arose. This documentation is often mundane and businesslike, but it provides a reliable record of the firm's day-to-day activities, unlike personal recollections. What, therefore, might historians make of this incredible glut of materials? What can we learn about architectural practices and the buildings they produce from the exchanges documented in letters, memos, bulletins, and shop drawings? What new matters of concern emerge in lieu of the building as work of art?

---

[14] Project memoranda mention more than two dozen GBA employees, listed here in their approximate order of appearance: Birkerts, Fleckenstein, William Awodey, John Hilberry, Fred John, Algimantas Bublys, Laverne Greely, Nina Flanders, John Mueller, Anthony Foust, Robert Bodnar, Vytautas Usas, John Schwartz, Richard J. Bos, John Landry, John Sparks, Donald Wenderski, Taher Koita, Bruce Wade, Peter Dobrovolny, Jeffery Crowell, Gunars Ejups, Barbara Bos, Paul Chu Lin, Michael Filipowicz, and Stanley Boles. Also important was Birkerts's personal secretary Mrs. J.E. Heinzerling. Given the propensity of part-time faculty like Birkerts to hire their students on a temporary basis in times of high need, this is likely not a comprehensive list of those who worked on the project.

[15] Dana Cuff graphed the relative involvement of parties outside the firm (clients, consultants, contractor) in the phases of a project by their approximate number of "design interactions," but she did not break down the category of "architect" into its component parts by division of labor. This would perhaps be different in each firm, while Cuff's graph was intended to generalize for all architecture firms. It's unclear how many of these "design interactions" would have the kind of material outcomes that might make their way into archives. See Dana Cuff, *Architecture: The Story of Practice* (Cambridge, Mass.: MIT Press, 1991), 173–75.

Making the most of these documents requires a redefinition of authorial signature to account for the art of administration as well as the art of design. In this view, the "signature" or "voice" of a firm might incorporate its management methods and organizational structure as much as aesthetic commonalities among their designs. Unfortunately, firm principals primarily archive documents that record the development of a design rather than its evolution or construction, and therefore a small firm's *organizational* signature may be as difficult to distill as its principal's artistic signature. The components of a firm's organizational signature might include its typical division of labor, the shape of its project hierarchy, its level of deference to clients and consultants, and its position on other similar administrative matters. Both an organizational and an artistic signature, one might say, are similarly immaterial—it was as rare for relatively small firms to formalize their management structure through materials like organizational charts or employee manuals as it was for architects like Birkerts to discuss their design methods in detail. Aversion to formalized "methods" was reinforced by the ad-hoc nature of GBA project teams and their work. New projects, in other words, often brought together a collective of employees who learned to work and to work together on the fly. Procedures rarely carried over.

Despite its material outputs, architecture is usually understood as a primarily mental and not manual activity. As such, credit for the immaterial labor that went into the FRBM design is generally given to the eponymous firm owner, Gunnar Birkerts. Yet the project archives reveal the everyday material labor of the project manager, designers, drafters, and administrative assistants (not to mention consultants, contractors, and construction workers) that provided the "base" through which Birkerts's authorship

emerged. As our second epigraph reveals, Birkerts was attentive to the "proportion" of this broad base to what he called the "me" or artistic realm of design. As he was more than aware, the distinction between mental and manual labor isn't as clear-cut in architectural practice as it is in industrial production, complicating the steep hierarchy of credit prevalent in architectural practice. This hierarchy was further complicated by the fact that his subordinates carried the very same qualifications he did. What they lacked was not only the aura Birkerts had acquired through pedigree and publications, but also the name recognition that comes with ownership of an eponymous firm. Using this name recognition as a brand for marketing purposes, architects such as Birkerts habitually allow their individual authorial signature to cover over the subordination and delegation necessitated by large projects. Nevertheless, designs like FRBM evolve in formative ways under the numerous individuals to whom aspects of the process are delegated.

Practice conventions established by professional organizations legitimated this ideology of individual branding. Perhaps the most pervasive avenue for the dissemination of these conventions was the AIA's *Architect's Handbook of Professional Practice*. Written and read by AIA members as well as used as a textbook for practice courses in schools of architecture, this text outlines the mainstream self-image carried by architects. Issued in a binder format with interchangeable looseleaf chapters, the *Handbook* was rewritten regularly over the course of the 1960s and 1970s as the professional landscape shifted around it. In 1963 its authors were able to take for granted that most of their readers would be in traditional private practice—architects working directly with individual clients to design and oversee construction on small buildings like houses, offices, or retail shops. Architects were expected to be generalists who didn't specialize

in a particular building type or project phase. By 1980, many of the *Handbook*'s chapters had been adapted or amended to account for new specializations and hierarchies within architectural firms—marketing, communications, programming, practice management, specification writing, et cetera—supplementing the more conventional drawing and model-making specialists. This more diverse conception of private practice should have come as no surprise to US architects because by the 1970s an oversupply of graduates had led many to seek out unconventional employment. The years during which the FRBM project was underway (1967-1973) were an important pivot point in the transformation of architects' collective self-image. As Jay Wickersham has concluded, the ethical framework that had guided practice since the 19th century was dismantled under a powerful deregulatory agenda. Wickersham has characterized this as a move from a conception of architects as "disinterested experts" to conceiving of them as "marketplace competitors."[16]

But this shift in the code of ethics applied primarily to those at the top of the professional pyramid: the firm figureheads, the entrepreneurs to whom the "products" purchased by architectural clients were attributed. Likewise, it applied primarily to the client relations and bidding phases heads of firms often handled themselves. It mattered little whether a project had been competitively bid once those figureheads turned the project over to their subordinates. Adopting the five phases the AIA uses as a guide, one might diagram the process and its participants at small, design-oriented firms like GBA

[16] Jay Wickersham, "From Disinterested Expert to Marketplace Competitor: How Anti-Monopoly Law Transformed the Ethics and Economics of American Architecture in the 1970s," *Architectural Theory Review* 20, no. 2 (2015): 138–58. In a letter responding to Wickersham's article, Peggy Deamer and Phillip G. Bernstein point out that Wickersham's argument chronologically parallels but fails to mention the macro-scale transition toward a Neoliberal ideology of limited regulation and entrepreneurialism. See Peggy Deamer and Phillip G. Bernstein, "Letter," *Architectural Theory Review* 21, no. 1 (2017), 4–6.

as follows: the Schematic Design phase is typically when principals like Birkerts are most involved and the figurehead client is most engaged; once a scheme has been decided, the project enters the Design Development phase, when a principal moves on to more pressing business, project managers like Fleckenstein have most influence over the outcome, a few other senior people are enlisted for their specific expertise, and some lower-level employees are enlisted as researchers or for drafting and model-building; once the design has been finalized, the project enters the production stage, known as Construction Documentation, when the largest number of lower-level employees are involved in producing the drawings while a specialist in specification writing assembles the specs; after the construction documents are released for contractor bidding, the project enters the Construction Administration phase, when, often, the project manager again takes center stage as communication with contractors and other parties increases; upon completion of the project, a principal might again emerge as the design is disseminated through public relations and in the press.

In broad terms, this was the project delivery method for the FRBM. With Birkerts as the unchallenged visionary at the top of the GBA pyramid, his sensibility was expected to validate the design of every project. He therefore reserved most of the schematic design phase for himself in order to maintain a consistent signature in the output of the firm. But an artist-architect's vision can be compromised during the later pre-construction phases and construction itself. Despite a decline in direct involvement, firms' reputation still rests on the successful realization of abstract ideas. This fact is significant in any attempt to challenge the understanding of the architect as individual creative genius. To adjust our conception of "the architect" we should include not only those at the top of the

hierarchy but also those who translate the design into a constructed object—the project managers, spec writers, draftspersons, or interior designers. This would require that one write of architecture as "in formation" and undecided beyond the schematic design phase, as an object that evolves from start to finish.

The FRBM is an opportune project to explore these questions because in the late 1960s, Birkerts's ideas about the design process—which would eventually harden into more than the "principles" he espoused in the mid-1960s—were still gestating, and, as discussed above, the project required a swift leap into unfamiliar territory. Prior to 1967, GBA's office protocols seem to have been quite different from the way Birkerts later explained them (which is discussed in Chapter 4). First, his schematic sketches weren't treated with the same deference they later accrued. Sketches for early projects were either discarded or in some cases misfiled (See Figure 1.20), suggesting that they weren't perceived as valuable records of the creative process leading to a building design. The value architectural drawings acquired with the rise of Postmodernism gave sketches a new importance for Birkerts, because presentation drawings in his own hand were rare.[17] He eventually saw sketches as the key document of a process that took place within his own mind, and kept them close at hand to explain his buildings and projects. But for FRBM, only a few sketches were retained. These were done on ruled paper annotated with numerical calculations and other notes that suggest they were working documents rather than sacred artistic "embryos" (Figures 3.08 & 3.09).[18] Moreover, these sketches

[17] See Jordan Kauffman, *Drawing on Architecture: The Object of Lines, 1970-1990* (Cambridge, Mass.: MIT Press, 2018). This aversion to polished drawing makes Birkerts different from many of his contemporaries. Birkerts didn't create exhibit-worthy drawings with the same proficiency that a Michael Graves or a Peter Eisenman or even a Cesar Pelli did. Birkerts's presentation materials were delegated to others and were thought of as growing organically from the seeds planted by his sketches.
[18] He later used this term to describe the organic origins of his designs. See Birkerts and Schwartz, *Metaphoric Modernist*, 8.

are façade studies rather than capturing the general massing of the building, suggesting that they may have been produced late in the design process.[19]

GBA had, however, adopted relatively conventional organizational principles for project management that Birkerts had perhaps learned while employed by Minoru Yamasaki. While Eero Saarinen often tested multiple employees' schemes against one another in an internal competition among equals, Yamasaki seems to have delegated in a more conventional manner through a clear hierarchy of project and production managers, construction administrators, and other specializations.[20] Like Yamasaki, Birkerts cultivated a cadre of highly motivated and committed young architects to whom he could entrust his visionary schemes.[21] Fleckenstein had been one of the first to join this cadre of trusted associates alongside John Hilberry and Harold Van Dine (Figure 3.10). These associates supervised a rotating cast of lower-level employees who by the late 1980s had totaled more than 150.[22]

The scheme developed by Birkerts, Fleckenstein and others was based on a compartmentalization of the diverse functional needs of the Bank into two parts, one secure and one relatively public.[23] The secure section was laid out horizontally on and

---

[19] Birkerts characterized these not as sketches but as "talking papers," collaborative documents "where Les Robertson and I discussed the structural concept possibilities." William Marlin and Yukio Futagawa, eds., *GA Architect 2: Gunnar Birkerts and Associates* (Tokyo, Japan: A.D.A. Edita, 1982), 124.

[20] With this competitive mindset in mind, the Saarinen office is often described as a "stable of thoroughbreds," but for Birkerts, "With so much talent and so many egos in one room it sometimes took on the appearance of a high level "roller-derby." Birkerts, "Autobiographical Notes," in Marlin and Futagawa, 216.

[21] This cadre took the place of his one-time partner Frank Straub, who functioned as the manager for Birkerts & Straub projects between 1960 and 1964.

[22] This estimate is based on the list provided in Kay Kaiser, *The Architecture of Gunnar Birkerts* (Washington, DC: American Institute of Architects Press, 1989), 215. GBA partners and senior associates included Straub, Barbara Bos, Fleckenstein, John Hilberry, Almon Durkee, Vytautas Usas, Harold Van Dine, Gunars Ejups, Anthony Gholz, and Kenneth Rohlfing by 1989.

[23] This suggestion may have come from Secret Service agent Robert Bouck in October 1967. See Charles Fleckenstein, Memorandum #2, Project 6708, October 15, 1967, GBA, BHL, Box 8. Bouck also suggested that "provisions be made to cope with civil disorders," gesturing to recent upheavals during the summer of

under the ground, and the more public section in an office tower perpendicular to it on the southeastern edge of the site (Figure 3.11). Between the two was a sloped plaza more than 200 feet square that continued underneath the office tower (Figure 3.12). To suspend the tower over this plaza, they proposed a catenary suspension system hung from robust piers at the south and east corners of the site. The plaza would serve as a terminus of downtown Minneapolis's primary pedestrian thoroughfare, Nicollet Mall. It was meant to evoke the wide-open expanses of the Federal Reserve's Ninth District, which stretched from Galusha's home state of Montana in the west to Wisconsin in the east. Paved in granite, the plaza was landscaped with a grid of trees in two chevrons pointing toward the center of the space. These trees provided a modicum of sunshade (the plaza faced northwest) and visually concealed secure access ramps on the north and west corners of the site. The Bank's vault and other secure functions were nestled below the plaza, accessible by vehicle ramps and a guarded entrance along Marquette Avenue on the southeast. Because spatial needs in this secure volume were diverse—"cavernous, subterranean … consisting of spaces large and small, high and low," in Birkerts's words—it was imperative that the architects avoid imposing any overall structural grid.[24]

Standing astride the plaza, the office tower served as a monumental symbol of the power and permanence of the Bank, and also its modernity and embrace of progress. These values were embodied in an iconic catenary form that was open to interpretation—in addition to the obvious suspension bridge, it has also been described as a smile and a giant M for Minneapolis or Minnesota. The tower's structural gymnastics arose as a way

---

1967 on the streets of American cities including Detroit, Newark, and Minneapolis itself. Civil unrest in North Minneapolis was one of more than 150 "race riots" during that summer leading to the establishment of the National Advisory Commission on Civil Disturbances (better known as the Kerner Commission).

[24] Marlin and Futagawa, *GA Architect 2*, 125.

to enable both a column-free office space (a common architectural request at the time) and a strict separation between the two functions. The catenary arch then became the building's primary visual expression in what seems to be a flouting of Birkerts's earlier principle of "suppressing the structure."[25] The top level of the tower occupied by a 30' deep truss that resists the inward tug of the catenary on the building's piers. The tower's bronzed-glass curtain wall further emphasized its suspension structure's presence. Below the catenary arch, the glass is set flush with the arch, while above it, it is set back with structural fins that shade the space and stabilize the column-free glass wall. While the Bank's operations are visible and accessible, the tower's dark, mirrored glass and its separation from the ground cause it to feel opaque and aloof.

The tower was pushed to the southwest edge of the site so as to block as little as possible of the view from downtown to the Mississippi River just three blocks to the north. This resulted in a very slender office tower with unusually proportioned floors of about 60 x 200 feet—highly efficient from a daylighting perspective, but necessitating elongated circulation paths. Core functions such as restrooms and stairwells were pushed to the tower's ends, and primary access to the office floors was via a nearly freestanding elevator lobby at the center of the southeast facade. This left the tower's floors free of barriers or interruptions, able to accommodate the variety of different business functions the Bank required.

The main entrance to both the office tower and secure volume was from Marquette Avenue, underneath the edge of the sloped plaza above. The lobby floor and walls were clad in the same warm gray granite as the plaza and piers. This floor

[25] Jan C. Rowan, ed., "A Search for Architectural Principles–Some Thoughts and Works of Gunnar Birkerts," *Progressive Architecture* 45, no. 9 (September 1964): 172–91.

transitioned smoothly into walls with semicircular granite baseboards, lending the space a cave-like quality. This experience underlined the "geological" quality Birkerts hoped the lower levels of the building would evoke—akin to "a granite mountain that has been shaved down."[26] The FRBM was, then, a building design comprised of opposites: heavy, enclosed, and rough below, weightless, open, and reflective above. The catenary suspension structure served as the literal link between these opposites and lent an enduring, distinctive image to the project.

It's likely that this suspension concept—undeniably the design's most defining characteristic—developed not out of an individual moment of inspiration (as might be documented in an "embryonic" sketch) but instead through negotiation of the conflicting programmatic requirements and in conversation with structural engineers Leslie Robertson and John V. Christiansen.[27] Given the collaborative process through which it was produced, just whose "signature" does the building design embody?

It is important to keep in mind that the goal of firm figureheads like Birkerts was not purely to reduce their personal workload by passing tasks on to subordinates—quite the contrary in Birkerts's case, as he, like many architects, valorized the long hours he worked—but instead to reserve for themselves particular categories of tasks, often business development, client relations and schematic design. This attitude reinforces the established definition of "the architect" and the ideology of singular creative artistry, along with the economic structure of entrepreneurial enterprise with which they are

[26] Marlin and Futagawa, *GA Architect 2*, 124.
[27] The catenary arch was a subtheme in late modernism from Eero Saarinen's Gateway Arch in St. Louis (designed in the late 1940s and completed in 1965) to Minoru Yamasaki's Temple Beth El in Bloomfield Hills, Michigan (completed 1973). Additionally, both Saarinen and Yamasaki experimented with reinforced concrete catenary barrel vaults during the 1950s, when Birkerts was employed at their offices. He wrote of their exchange of ideas about concrete vaults in Marlin and Futagawa, 219.

bound up. In narrating a history that exceeds his contributions, my ambition is not to undermine Birkerts's primacy as his firm's key figure, but rather to recover and dignify the work of his subordinates through the material artifacts they produced while investigating a new way of writing the history of architecture. To begin to interpret the various genres of artifacts archived by GBA, one must first describe the network for which these artifacts were produced and within which they were exchanged. Many scholars have broken ground for this type of study. The next section will discuss their most relevant contributions.

The Scholarly Study of Architectural Practice

Perhaps intending to overcome the widely held belief that architecture is a creative endeavor driven by singular artistic minds, most scholars of American architectural practice have tended to adopt social scientific methods. Instead of narrating the actual design decisions or construction processes that took place between parties during architectural projects, they have tended to remain at a higher order and base their conclusions on data collected over long periods of time from an array of firms. This approach enabled a wide-angle view of the profession in the 1970s and 1980s. Sociologists Judith Blau and Robert Gutman set the precedent for this type of study.[28] In her foundational book *Architects and Firms*, Blau emphasized that the wide differences among building projects and the expertise they require may seem to give architectural practice an ad-hoc or makeshift quality, but that the way firms handle a project's

[28] Judith R. Blau, *Architects and Firms: A Sociological Perspective on Architectural Practice* (Cambridge, Mass.: MIT Press, 1984); Robert Gutman, *Architectural Practice: A Critical View* (Princeton: Princeton Architectural Press, 1988); Magali Sarfatti Larson, *The Rise of Professionalism: A Sociological Analysis* (Berkeley: University of California Press, 1977); Magali Sarfatti Larson, *Behind the Postmodern Facade: Architectural Change in Late Twentieth-Century America* (Berkeley: University of California Press, 1993).

inevitable uncertainty is still "governed by a structure of constraints and opportunities that reflect its organizational configuration and economic character."[29] This perhaps suggests that less hierarchical, less specialized small firms may only be able to take on projects of a limited scale.

But Blau's findings were more nuanced than this. On the one hand, she found that the organization of a practice can provide a much-needed link between architects' convictions about buildings, which tend toward progressivism and idealism, and the agendas for firms set by principals, which tend to be pragmatic.[30] Architects, in other words, firmly believe in architecture's beneficial impact but at the same time they need to make a profit, and organize their firms to do so. The link between these realms must be logical in order to be successful, such as when large firms take on specialists and highly prescribed routines so that they can take on more projects. On the other hand, Blau showed that small firms who developed bureaucratic and rationalized methods because of large building projects had an unusually high likelihood of producing award-winning buildings. For small entrepreneurial firms like GBA, in other words, Blau found that uncharacteristic structural changes and risk-taking correlated to architectural merit: "The small numbers of such offices that risk an inappropriate mode of practice—out of character with the normal restrictions of small scale—are unusually capable of doing high-quality work."[31] It was precisely this kind of leap—which Blau calls "The Daedalian Risk"—that characterized GBA's work on the FRBM: the project required a mode of practice inappropriate to their size and working methods, but resulted in a

[29] Blau, *Architects and Firms*, 11–12.
[30] Blau, 88.
[31] Blau, 112.

building that brought the firm a great deal of recognition on the national and international stage.

Blau's conclusion may, on the surface, seem heretical. It seems put the lie to a central belief that many architects held about practice: that increasing specialization and bureaucratization within a firm tended to sap its capacity for creative "voice." Birkerts, for example, did all he could to avoid delegating design authority, even while his firm's employee numbers quadrupled and the FRBM project required taking on new management protocols. Still, in Blau's study, firm leaders and managers inevitably saw their "voice" exceed others despite the "professional ethos of egalitarianism and voluntarism" that pervaded architecture firms.[32] Blau found that one of the most common aspects of successful firms was a capacity for collectivity, as indicated by three factors:

> 1. Total number of positions accompanied with the power of having direct contact with the client.
> 2. Number of individuals who typically (on an average-size project) share responsibility for the project.
> 3. That someone other than the principal can be in charge of a project.[33]

Blau found that a wider distribution of authority and "voice" among employees was highly correlated to a firm's "effectiveness as a professional organization," as measured by several factors including design awards, expert evaluations, repeat clients and referrals, profitability, productivity, and the commitment of its staff.[34] But a major caveat was that "The more individuals who share responsibility for a project, the more likely is the firm to receive few awards."[35] Collective voice, despite the managerial advantage of motivating employees through distributed responsibility, did not necessarily yield

[32] Blau, 44.
[33] Blau, 41–42.
[34] Blau, 42.
[35] Blau, 43.

building designs of high merit. To a certain extent this conclusion confirms the view that individual authors create great architecture, but Blau instead pointed to a foundational dilemma for architectural practice: creating great architecture doesn't necessarily lead to employee satisfaction or a sustainable business.

Blau wrote for a sociological audience and her impact on the profession was therefore limited, but Gutman wrote for the benefit of architects themselves. His frequent essays in architecture journals and his book *Architectural Practice: A Critical View* were based on decades of experience working with and teaching architects. He used this experience to paint a comprehensive picture of the difficulties facing American architects. Gutman identified trends—increased complexity and competition in the business of building, and a changed media environment among them—that were influencing the way architects conducted their business and understood their role in society.

Still, like Blau, he concluded that the most difficult challenge facing architects was how to manage their own firms because, as he notes, echoing Blau, "Design excellence often does result from providing relatively free reign to individual imaginations [and therefore] architects feel some kind of special responsibility to resolve the management dilemma in their firms."[36] The ultimate challenge, Gutman observed, was that firm principals needed to maintain the morale of employees who had their own creative ambitions while motivating them to contribute to the productivity and bottom line of the firm, even as the increasing complexity of practice meant they spent little time actually designing buildings. Administering complex construction projects, Birkerts's employees must likewise have felt a level of alienation from the individual creativity

[36] Gutman, *Architectural Practice*, 109.

fostered by their educations and heightened by the relentless pursuit of recognition through design awards. Some misalignment between practice and pedagogy is inevitable, but how much alienation should architects be expected to tolerate from the aspects of their work, particularly design, that they are conditioned to see as the core of their vocation?

Despite their differing audiences, Blau and Gutman both pointed to a fundamental contrast between the architect's historic ideal of individual artistic signature and the daily reality of delegation and collaboration—what Blau called "collective voice"—that dominated contemporary practice.[37] To obtain a more direct view into collective office work, the authors of other studies have adopted ethnographic research methods. Dana Cuff, for example, brought a decade's worth of interviews, participant observation, and theoretical reflection to bear on the profession's self-image in *Architecture: The Story of Practice*. Like her sociological predecessors, Cuff found that the ideology of the architect and the reality of architectural practice were at odds. In response, she urged architects to reimagine the act of design as a process-based "social art" within which architects operate more often as generalists and managers than as individual authors.[38] As employees, architects play an array of different roles, often only for a short time.[39] This was particularly true of small offices like GBA as it existed prior to FRBM, where specialization was rare and project teams were flexible.

Despite the complexities of practice, Cuff asserted that the array of roles broke down to four general tasks: "getting and keeping work, getting it done, doing it well, and

[37] Blau, *Architects and Firms*, 143; Gutman, *Architectural Practice*, 99–101.
[38] Cuff, *Architecture*.
[39] Paolo Tombesi has likened this temporary roleplaying to the regime of flexible specialization prevalent under late capitalism. See Paolo Tombesi, "The Carriage in the Needle: Building Design and Flexible Specialization Systems," *Journal of Architectural Education* 52, no. 3 (February 1999): 134–42.

maintaining an organization. In organizational parlance, these roles might be management and marketing, technical expertise, quality control, and leadership."[40] These roles certainly exceed the familiar project phases set out in *The Architect's Handbook*—Schematic Design, Design Development, Construction Documents, Construction Administration—but Cuff nonetheless focused her study on the schematic design process while avoiding the often tedious and time-consuming later phases, which in many cases consume the bulk of a project's "billable hours."[41] Billable hours—common parlance for the amount of time spent on a particular project in architecture offices—make up intra-office budgets and are often calculated by attributing a value to the hourly efforts of various members of the project team, with principals or firm figureheads as the most highly valued. This establishes a situation where in order to remain within the internal budget and make a profit, time-intensive production tasks can only be performed by lower-paid employees.

Importantly, however, Cuff realized that architects willingly work together not only for the sake of productivity or efficiency, but also "to establish meaningful worlds for themselves and their actions." The "architect's milieu," according to Cuff, exceeded business demands and allowed architects "to forge and express a coherent professional identity. This milieu is not a static, predetermined social scene; rather, the architects in a firm together create the setting for their actions."[42] The way a firm is organized and the agenda set for it—components of its milieu—can reveal what kind of professional identity, we might say what *signature*, a group seeks to forge and express. For Birkerts, the appearance of total control over the design and construction process, if not quite the

[40] Cuff, *Architecture*, 170.
[41] Cuff, 170–94.
[42] Cuff, 157.

reality, provided support for his claims to individual authorship, and thus had to be maintained throughout the process. This approach was typical for architects at the time; Cuff's idea of a "social art" was far from prevalent.

More recently, Albena Yaneva has used participant-observation studies to argue that buildings must be understood as objects intimately connected to the process of their design. As she puts it, when we think of architecture as a primarily idea-based or reflective practice, "[it] is being remitted to a separate realm, cut off from that vital association with design materials and experiences. This compartmentalization brings about separation of design practice from insight, of imagination from making."[43] In her work, Yaneva attempts to reconnect building designs to the material realities of practice and the "design experiences" of those who labored on the product. And yet, in her focus on the early phases of design, she brackets the less alluring later phases involved in the "making" of a building. Indeed, both Cuff and Yaneva's ethnographic studies concentrate on the early phases of architectural projects, at the expense of the bulk of day-to-day work that is documented in firm archives and may later become available to historians. Their work reinforces the enduring definition of architecture as a practice whose outputs are immaterial and idea-based, and that the key aspects of that output are created in the early stages of a project.

As these examples make clear, most scholarly studies of architectural practice leave off where a firm's principal hands over a project to often-nameless subordinates. Though most of these employees have the same training as their firm's figureheads, their efforts are often hidden behind an authorial signature because of architecture's

[43] Albena Yaneva, *Made by the Office for Metropolitan Architecture: An Ethnography of Design* (Rotterdam: 010, 2009), 99. See also Albena Yaneva, *The Making of a Building: A Pragmatist Approach to Architecture* (New York: Peter Lang, 2009).

spotlighting of art over administration. And yet, as the *Architect's Handbook* astutely pointed out, administration and the documents that accompany it can have a considerable influence on an architect's degree of success and a firm's professional "competence and integrity":

> An Architect should consider his office and the documents it produces as integral parts of his total public relations effort. The appearance, manners, brochures, and presentations of the firm, and the technical and esthetic quality of the contract documents which it produces, have nearly as much to do with illustrating an Architect's competence and integrity as do his completed projects.[44]

As both Gutman and Blau recognized, it has been in management and working methods that the field has changed most since the mid-20th century.[45] Birkerts, for his part, lamented the increasing complexity of practice that he experienced firsthand in the 1950s and 1960s, writing just after the completion of the FRBM that "the architect is expected to assume roles for which he is neither talented nor educated … to be partially a social scientist, economist, speculative builder, developer, construction manager, energy conserver, ecology protector, etc. *No one challenges the artist in the architect*."[46] By this, he meant two things: that the common understanding of the architect's role no longer aligned with their everyday work and employment situation, and that the challenges raised by contemporary architectural work rarely engaged their artistic skills. Self-

[44] "Chapter 8: The Architect and Public Relations," [1971] in *The Architect's Handbook*, 3.
[45] By comparison to sociological and ethnographic accounts, historical treatments of architectural practice are comparatively rare. To date, they have focused on 19th and early 20th century practice and not on the middle or late 20th century. Mary Woods, in her landmark book *From Craft to Profession*, concluded that nineteenth century Americans developed a novel conception of the architect not only as artist and constructor but also *businessman*. This entrepreneurial conception accounted for charismatic figureheads who maintained ateliers and those who grew their practices into large offices. It was among the latter that twentieth-century developments were prefigured. These large offices systematically organized their staffs in order to efficiently produce the increasingly large number of documents required for major buildings and manage the complexities of their construction. Mary N. Woods, *From Craft to Profession: The Practice of Architecture in Nineteenth-Century America* (Berkeley: University of California Press, 1999).
[46] Gunnar Birkerts, "Design: The Critical Years," *The Canadian Architect* 19 (June 1974): 48.

understanding of their status was clouded by an ideology instilled by the profession and its educational system.

Though Birkerts's associates may have had design ambitions of their own, their work required willing subordination to the firm's eponymous owner. Even for buildings as complex as the FRBM, authorship was habitually attributed only to Birkerts, with scant recognition given to project architects like Fleckenstein, let alone the numerous others who contributed. The situation in the profession was such that an increasing number of architects worked not as independent professionals but as employees.[47] As Cuff observed, this meant architects answered more often to their employer than to clients, further alienating architects and their design practices from the public.[48] The situation was shifting architects away from traditional apprenticeship because fewer and fewer of these salaried employees started their own firms after their training (as was the tendency among earlier generations of architects). This was increasingly the case in the postwar decades, as a large new generation of young architects trained in professional schools of architecture came to largely supplant the draftspersons that previously filled subordinate roles in firms.[49] Simultaneously, the barrier between design and realization was blurring as projects moved faster and important decisions were increasingly reserved for later phases.

---

[47] Gutman studied this situation and in 1977 wrote that "More than half of the architects in the United States are wage-earning and salaried workers employed in private architecture and engineering firms. Another 10 percent are employed in government agencies. Both groups have been increasing over the last few decades at a faster rate than self-employed architects." Robert Gutman, "Architecture: The Entrepreneurial Profession [1977]," in *Architecture from the Outside in: Selected Essays*, ed. Dana Cuff and John Wriedt (New York: Princeton Architectural Press, 2010), 37.

[48] Cuff, *Architecture*, 50.

[49] This differs from law, where paralegals and clerks fill many subordinate roles, and medicine, where a bevy of assistants and nurses do so. Gutman found in 1977 that "The same tendency [toward equal qualifications among employees] is visible among doctors and lawyers but it probably is more pronounced among members of the entrepreneurial professions, which in addition to architecture, include engineering and accountancy." Gutman, *Architecture from the Outside in*, 37.

These trends toward salaried employment rather than independent professionalism and the resultant dissolution of design authority were recognized as a sea change. As Gutman observed at the time, they each followed "an underlying social process which accompanies the advance of industrialization known as the 'dequalification of labor.'" Gutman characterized this process as

> [The] historical tendency of work to be broken down into smaller and more limited tasks requiring less sophisticated training and expertise, at the same time elevating the responsibility of a tiny segment of the professional labor force that has the task of coordinating and managing.[50]

Gutman went on to suggest that despite the growing responsibility carried by project managers and production teams, a great deal of authority was nevertheless still vested in the "qualified" labor of firm principals. In the end, this meant that practices like Birkerts's became more bifurcated: firm figureheads pushed to consolidate their traditional territories of personality and design signature for the benefit of their firm's marketing effort, while ever more mundane work by others was required to ensure the accurate realization of their vision. This was the reality of collective effort underwriting individual signature that the employees ratified when they signed on with GBA or similar firms.

Architects like Birkerts could instead have committed themselves, as principals of some large firms did, to providing a more comprehensive and coordinated array of services through specialization. But this would have required setting aside the established definition of the architect as an independent design specialist. Architects like Birkerts, who believed specialization and hierarchy would sap their firms' capacity for creativity, proved unwilling to set this definition aside.

---

[50] Gutman, *Architecture from the Outside In*, 38.

Birkerts's writing shows that he tried to develop his own ideological structure to understand these changes to the profession. As our epigraph illustrates, he saw the primary question of practice as how to balance the proportion between the "base" of material labor and the "superstructure," so to speak, of authorship. Because his role in the process may have seemed more elusive than the very real material output of his employees, he made the artistic synthesis—that which only a gifted creator could contribute to architectural work—preeminent. Privileging the murky "other" realms of architectural practice justified his status in the firm to his employees, and the high cost of his "billable hours" to clients.

Italian political theorist Maurizio Lazzarato has observed that to see one's work as primarily intellectual or immaterial attributes a value to it that greatly exceeds the valuation assigned to manual labor.[51] This valorization has long been prevalent in practices, like architecture, that are concerned primarily with qualitative distinction or taste. But, according to Lazzarato, late capitalism has brought a new conundrum: for knowledge workers like architects "[the] split between conception and execution, fbetween labor and creativity … is simultaneously transcended within the 'labor process' and reimposed as political command within the 'process of valorization.'"[52] Even as the labor process, therefore, imposes an intertwining of mental and manual work (or, for architects, design and realization), creativity is ever more valued and respected while execution declines ever more in prestige and value. It only makes sense that those whose

[51] Maurizio Lazzarato, "Immaterial Labor," in Paolo Virno and Michael Hardt, eds., *Radical Thought in Italy: A Potential Politics*, Theory out of Bounds 7 (Minneapolis: University of Minnesota Press, 1996), 142.
[52] Virno and Hardt, 143.

perceived status as artist-architects was threatened by such intertwining would work to reinforce the preeminence of their singular creativity in response.[53]

Lazzarato has also asserted that professions like architecture require workers who are not only capable of self-regulation but also adept at managing relations with other workers. Their labor requires a social relationship in which "workers are expected to become 'active subjects' in the coordination of the various functions of production," and in which "a collective learning process becomes the heart of productivity". In the writing of architectural history, the arc of this collective learning process can most transparently emerge through a close reading of the firm's archival records. In order to trace it, however, one must first set aside the distorting ideological lenses of professionalism and individual authorship that have caused architects to misunderstand and misrepresent their status. One must instead write, as Paolo Tombesi has called for, a "history of a process" and not merely the story of a building's design or reception.[54] Tombesi's use of "process" is quite different than Birkerts's deployment of the term in the titles of lectures and books.[55] For Birkerts, it is an internal idea-generation process beginning with initial client contact and ending with the finalization of a formal strategy. For Tombesi, this is only the first stage in a much longer process inclusive not only of construction but also of adaptation after a building has been completed. This approach shifts the balance of attention from firm figureheads toward other contributors to the process. A more nuanced acknowledgement of the complexities involved in realization and the evolution of design

[53] This retrenchment in artistry is evidenced most clearly by the rise in status of architectural drawings, the product most directly attributable to individual persons. Birkerts's lukewarm response to this increase in the value of drawings is discussed in Chapter IV. See Emmanuel Petit, *Irony or, the Self-Critical Opacity of Postmodern Architecture* (New Haven: Yale University Press, 2013); Kauffman, *Drawing on Architecture*.
[54] Paolo Tombesi, "Back to the Future: The Pragmatic Classicism of Australia's Parliament House," *Arq: Architecture Research Quarterly* 7, no. 2 (2003): 144.
[55] Gunnar Birkerts, *Process and Expression in Architectural Form* (Norman: University of Oklahoma Press, 1994).

over the course of this process would enrich our understanding of the architecture produced during the late twentieth century.

To pursue this approach, some sense of the makeup of that process is necessary. In this regard, architect Duccio A. Turin's work unpacking the complexities of the construction industry is useful. In his 1967 article "Building as a Process," Turin itemized three categories of change occurring in the making of buildings during the 1960s: "changes in the *nature of the product* … changes in the *functions of the professions* … changes in the *contractual relationships* between the participants."[56] The second two categories in Turin's interpretation are most critical here. Turin found that little attention was being given to building as "an activity concerned with the best possible use of inputs to produce a desired output." This was his rough definition of "process."[57] Critical of the typical "one-off" approach to the formation of project teams, Turin proposed an alternate model of project delivery that would be conscious that "the effective headship of the team moves a long the ladder and passes from the client to the professions, down to the manufacturer and contractor."[58] These various participants in building projects, he concluded, not only "see different things, different purposes, different justifications in the complex of activities with which building is concerned" but also that "the roles of the participants … and the scope and contents of the information flowing between them was closely related to the order in which they were brought into the process in the stages preceding actual construction on site."[59] If GBA were to have followed Turin's

[56] D. A. Turin, "Building as a Process [1967]," *Building Research & Information* 31, no. 2 (2003): 180.
[57] Turin, 181.
[58] Turin, 182.
[59] Turin, 180; 186. Turin's prescription for streamlining this process was similar to that of many in the construction management field: a combined effort among architects, engineers, and consultants within the same company or operating as a project-oriented joint venture.

suggestions, therefore, it would have been critical that they were brought on as architect and that engineering consultants were hired before the involvement of a construction manager. As will be discussed in detail below, this constrained the effectiveness of the CM. Turin's article shows that debate and contestation about project management strategies and the division of labor with construction projects was active at the time.

It's worth revisiting our epigraph from Gunnar Birkerts to bring this literature review to a close. There, Birkerts observes that his artistic contribution, that ineffable 'other' realm, can only exist with the support of "the broader base of the building design process."[60] Bruno Latour echoed Birkerts's premise in his introduction to the analytical method known as Actor-Network-Theory. Latour writes, "Cognitive abilities do not reside in 'you' but are distributed throughout the formatted setting, which is not only made of localizers but also of many competence-building propositions, of many small intellectual technologies."[61] Latour's 'you' echoes the 'me' in our Birkerts epigraph. These small intellectual technologies—"plug-ins" as Latour calls them elsewhere[62]—are ever-present in architectural practice, such as the numerous communication, drawing, and specification genres used by architects. A close reading of the realization process for a complex building like the FRBM can reveal how these plug-ins enable authorial signature to emerge.

[60] Birkerts, "Defining a Design Methodology," 94.
[61] Bruno Latour, *Reassembling the Social: An Introduction to Actor-Network-Theory* (Oxford ; New York: Oxford University Press, 2005), 211. On the one hand his observation may be compatible with Birkerts's, but on the other hand, Latour downplays the importance of hierarchy in favor of a flattened network. His "plug-in" concept is the most useful aspect of Latour's theory in this context.
[62] Latour, 207–8.

Collective Learning Through Correspondence

Though the architectural design process may often begin with a personal rapport between two individuals, architect and client, it all too quickly enlists many other individuals and groups. This was certainly the case with the FRBM, which was commissioned by a client subject to layer after layer of federal and institutional bureaucracy. Hugh Galusha, for example, was only the most visible person acting on behalf of the Bank. Authority over the hiring of the architect and the preliminary approval of the building's program and budget rested not with him alone but with the Bank's Board of Directors. Yet the "client," broadly defined, was an even larger network. Within the FRBM, J.A. MacDonald (at right in Figure 3.01) handled day-to-day correspondence and supervision. He shared decision-making authority with the Building Committee set up by the Board of Directors. This group answered to the Federal Reserve System's national Board of Governors for many financial decisions, and to the Secret Service for approval of all security-related details. Executives of a certain rank had say over the design of their individual offices, and department heads were regularly consulted one the design of their departments' interiors.

Unlike Galusha—whom Birkerts preferred to see as a cultured individual "patron"—this network of boards and functionaries took an instrumental view of architectural production. Even Galusha at times deferred to this view of the project. As he put it in a letter to Minnesota Senator Walter Mondale justifying the bank's decision to hire a non-Minnesotan architect, "the heart of the problem is the reconciliation of the physical security requirements of the structure." Providing an image appropriate to the

Bank's role in the district was secondary.[63] This instrumental view conditioned how the Bank's functionaries answered questions posed by the architects, and how they addressed uncertainties presented by the construction process.[64] After the architect's initial schematic design presentation, for instance, the primary concern expressed by the Board of Governors about the scheme wasn't to do with cost or its unusual structural system, but instead the potential security issues presented by an "exposed vault." By this they meant that because the plaza would also be the roof of the currency storage area, its landscaping would have to be designed, first, to prevent trucks from accessing the vault's roof, and second, to provide clear lines of observation over the entire plaza from guard posts.[65]

The Board's lack of concern with other aspects of the design may have been because Birkerts was effective at communicating the reasoning underlying the design. Indeed, Birkerts saw his role in the process as akin to a teacher—"You have to educate the client," as he put it. He felt that the best way to accomplish this was to involve them in the design process:

> I don't try to save them from going through it. When the clients are included in the process, I usually get much farther than I would have if I had walked in, pulled the wrapper off a built model, and hoped that everyone thought it was wonderful … interaction is vital if you are building something that will have great importance to the community, function as a monument, or be a highly visible building that has a philosophy behind its existence.[66]

This client education and involvement primarily took place during the schematic phase, so Birkerts's personal stake in it was not as overstated as it may seem. Models, however, were an important part of the process of explaining the FRBM design to the Bank's staff

[63] Galusha to Mondale, 2.
[64] Cf. Gutman, *Architectural Practice*, 50–51.
[65] George W. Mitchell to Hugh D. Galusha, Jr., May 31, 1968, GBA, BHL, Box 13, 1.
[66] Birkerts, *Process and Expression*, 48.

and to the public (see, for example, the schematic model depicted in the foreground of Figure 3.01, and the final presentation model in Figures 3.11 & 3.12).

The project's complexities extended from the client's bureaucratic makeup into the composition of the design team itself. GBA did their best to limit their team's complexity, but some decisions they made instead amplified it. The Bank expected them to contract a local architecture firm to prepare working drawings and administer the construction project in Minneapolis.[67] They chose not to do so, as Birkerts believed it would have diluted the control he and Fleckenstein maintained over even the smallest design decisions. They hired their own independent site representative to supervise construction instead. GBA did contract with experienced consultants to reinforce their supervisory authority: namely, the engineers behind Minoru Yamasaki and Associates' World Trade Center in New York, construction for which had begun a year earlier in the summer of 1966.[68] This team included structural engineers Skilling, Helle, Christiansen, Robertson (SHCR)—whose principal Leslie Robertson was somewhat of a celebrity in architectural circles for his audacious structural designs—along with Jaros, Baum & Bolles (JBB) as systems engineers. Additional consultants were eventually brought in to manage audio/visual and kitchen functions for the building.

GBA's inexperience and unusual design presented challenges to these engineering consultants: SHCR was tasked with designing a suspension-style structure, for which, as Robertson stated in a project description, "there [was] no precedent in building

[67] See Galusha to Mondale, 3. Galusha wrote that "In all probability, Birkerts will be associating with a local firm, but this was obviously not a requirement of his engagement. All five firms indicated, though, this was a general practice." This arrangement is today typically called an "executive architect."
[68] Charles Fleckenstein, Memorandum #10, Project 6708: FRBM, GBA, BHL, 3.

construction"[69]; JBB were faced not only with an intricate coordination of the usual building systems, but also with detailed security concerns that added further complexity to the project. The distance between consultants' offices in New York, Chicago, and Seattle, GBA near Detroit, and the construction site in Minneapolis resulted in thousands of communiqués in genres set out by *The Architect's Handbook*: bulletins for clarifying ambiguities in the architect's design, change orders to alter aspects of the design as described in construction documents and specifications, memoranda to record findings during visits or outcomes of meetings, transmittals to accompany information shared between parties. As the *Handbook* advised, "the technical and esthetic quality" of documents like these were not only part of a public relations effort but also "have nearly as much to do with illustrating an Architect's competence and integrity as do his completed projects."[70] Michael Osman has similarly pointed to the importance of paperwork in the regulation of architectural practice. Osman concludes that it is through paperwork that the "signature" of the architect can be solidified despite declining involvement of the firm's figurehead.[71] With a firm's reputation for "competence and integrity" at risk in the work of subordinates, the forms and letters of conventional practice maintain a chain of authorial intention through their distillation of the legal norms of professional expertise.

While consultants were hired by and answered to the architect, the conventional project hierarchy was muddled by several niche roles that were unfamiliar to GBA. To control costs, for example, the Bank retained construction consultants McKee-Berger-

[69] Skilling, Helle, Christiansen, Robertson, "Structural Description, Federal Reserve Bank, Minneapolis, Minnesota," GBA, BHL, Box 14, 1.
[70] "Chapter 8: The Architect and Public Relations," [1971] in *The Architect's Handbook*, 3.
[71] Michael Osman, *Modernism's Visible Hand: Architecture and Regulation in America* (Minneapolis: University of Minnesota Press, 2018), 182.

Mansueto, Inc. (MBM) to assist the architects with budgeting and scheduling.[72] MBM's product was contractually established, but their precise responsibility within the project was unclear. They were to produce schedules and cost estimates, but were not at risk if overruns or delays occurred. Like architects, they were merely paid a fee by the client to provide data for use by all of the parties involved in the project. They answered only to the Bank as disinterested professional advisors.

The architects were as perplexed by this redundant business arrangement as they were by MBM's unfamiliar methods. An introductory brochure sent to GBA described MBM as "offering a wide range of services, to assist architects, engineers, contractors, owners and government agencies in the economics and management of construction." MBM was notable for its path-breaking use of the Critical Path Method (CPM), which the firm described as "a method for effectively organizing and carrying out the traditional management operations of planning, scheduling and control" (Figures 3.13 & 3.14).[73] MBM were among a cohort of new businesses offering management and planning services marketed primarily to large corporations and institutions undertaking sizable construction projects. Their disinterested supervisory role was traditionally filled by architects (as with Birkerts's work for Tougaloo College in Chapter 2), but the increasing complexity of the construction industry and the inability or unwillingness of architects to stay abreast of new developments opened a niche for purported experts like MBM.

[72] McKee-Berger-Mansueto is today remembered primarily for their involvement in a pay-to-play scandal regarding the construction of the University of Massachusetts-Boston campus, wherein MBM paid bribes to two Massachusetts state senators and received preferential consideration for the project. See "MBM Scandal," *Wikipedia: The Free Encyclopedia*, https://en.wikipedia.org/wiki/MBM_scandal, Accessed 25 May 2017.
[73] McKee-Berger-Mansueto, Inc., "Critical Path Method," GBA, BHL, Box 13, brochure, unpaginated.

Even with MBM's scheduling and estimating assistance, GBA's abrupt leap in project size required significant adjustment, and CPM was one of several new protocols adopted to manage their adjustment. GBA's inexperience became clear early in the process, when they proved unable to meet the production schedule they themselves had set, causing a delay in construction bidding from December 1968 to April 1969 while the firm completed their working drawings. Planning for the Bank's security needs proved unexpectedly complex, and consultants' response times were longer than GBA had planned. These factors delayed the project, resulted in further hiring at GBA in new positions like Director of Field Administration, and accelerated the production of administrative records including memoranda, which ultimately numbered more than 700.[74]

The emergence of these new fields of specialization and new roles within relatively small firms suggests that changes were nascent in the traditional definition of the architect as a design specialist. Increasing specialization in the construction field sapped the influence architects had over the realization of their designs, even as claims to individual authorship became more important for market competitiveness. While some architects may have objected to this dilution of authority, others, like Birkerts, saw this as a chance to re-center their practices on design.

The misunderstandings that follow architects' subjective design decisions often create the need for more correspondence within architecture firms and exacerbate their relations with contractors. Though such decisions can be difficult to explain, the

[74] Gunars Ejups was hired as Director of Field Operations at GBA in August 1970. He later became a full partner in the firm. See Fleckenstein, Memorandum #259, August 18, 1970, GBA, BHL, Box 8. The 700 excludes memoranda prepared for the interior design, which was organized under a separate project number and is discussed below.

construction documents, both drawings and specifications, are intended to communicate the desired outcomes with adequate precision, without dictating the means. The rise of construction consultants and managers complicated this line of communication because their expertise elevated a realm that architects considered subservient to their authority. Consultants and managers saw their role as providing a check on architects, translating the consequences of design decisions into hard numbers in order to protect the financial interests of the client. Clients were convinced to sign on to this arrangement because construction managers offered quantitative judgments on design decisions that were more easily understood than the qualitative justifications provided by architects. Consultants and CMs, therefore, mediated between architects' aesthetic predilections and what they saw as the "realities" of construction practice.

Knutson Construction Company had an agreement with the Minneapolis urban renewal agency to serve as developer for a broad swath of the downtown area known as the "Gateway Center." The Bank contracted with them to purchase the land for the FRBM building at the start of construction. Knutson then served as construction managers for the project, and were paid a professional fee for this service equal to 5% of the Guaranteed Maximum Cost negotiated just prior to the start of construction—this fee was less than the 8% given to the architect but still a considerable amount. In terms of CM best practices Knutson's involvement in the project came rather late. They reached agreement with the Bank in April 1968, after the building's schematic design had already been decided by GBA, SHCR, and JBB, and with preliminary scheduling and budgeting projections having already been completed by MBM. The CM role, however, wasn't the full extent of Knutson's involvement in the project. As an experienced and well-qualified

construction company in their own right, they were also permitted to bid on the numerous subcontracts for the project, and won several. This meant that at times, Knutson was more or less "managing" itself. Their project manager, Ramon M. Lopez, had to balance the managerial concern for the timely completion of the building with interest in padding his company's bottom line. This inevitably compromised Knutson's role as disinterested managers and made GBA understandably skeptical of their motives throughout the project.

Because no two architectural projects are identical, each one brings together a new group of people who are often serving in unfamiliar roles. In order to work effectively together, the group must negotiate the terms of its own relations. Each project team develops its own protocols, rhythms, and routines to deal with the specific complexities their collaborative work brings about. It is through the exchange of documents that these participants manage complexity, though at times they might instead have produced more complexity. These documents distill decades of professional experience into fill-in-the-blank formats that often prioritize concise and businesslike communication. Among the many documents of this process, memoranda offer the most detailed picture of daily collaboration and collective learning by Fleckenstein and the others involved in the FRBM project. These memoranda are the drumbeat of the project, recording each of the key players' activities over five years. They describe the "arc of collective learning" at its most frustrating and its most rewarding. In the early phases, in which much adjustment was necessary, the architects experienced more of the former than the latter.

Robert Gutman observed that between the 1960s and the 1980s "organization clients" like the Federal Reserve went from dictating, "not simply the services the firm is expected to perform, but [also] the services the firm will be *allowed* to perform."[75] Architects, in other words, increasingly found their "voice" constrained. Despite inheriting deeply ingrained professional knowledge through the formats of the documents they used on a daily basis, GBA had to make sense of unfamiliar management and scheduling protocols like the Critical Path Method, along with a project delivery method that included a Construction Manager whose impartiality was compromised. The architects' negotiation with MBM and Knutson, the purveyors of these protocols, can help us describe the project's arc of collective learning.

CPM: Time and Cost Control

A February 1964 article in the *AIA Journal* proclaimed the importance of the Critical Path Method (CPM) in no uncertain terms, stating, "CPM is the first major breakthrough in project management in twenty-five years."[76] Originally developed in the 1950s by the DuPont Corporation, CPM was used to schedule and estimate costs for projects that require the coordination of many activities. By the 1960s, general contractors, architects, and especially construction managers had begun adopting it as an effective means to schedule and sequence building activities. As one CPM evangelist put it, unlike other management methods, when used to its full potential "it is a dynamic system that can move with the project and at all times reflect the current state of affairs."[77] Best practices for the architect's use of CPM were already well established by the mid-1960s.

[75] Gutman, *Architectural Practice*, 58. His emphasis.
[76] Herbert Berman, "CPM and the Architect," *AIA Journal* 41, no. 2 (February 1964): 55.
[77] Berman, 55.

Guidebooks and how-to articles appeared, some staking the architect's claim to this new system while others placed architects on the outside looking in. The most widely cited guide is an example of the latter, mentioning architects only in passing, offering a show business comparison to describe their role:

> In construction, we constantly find the contractor in the spotlight. The owner, architect, and engineer are like the backer, producer, and director of a Broadway show. Without them, the show can't go on; however, the contractor is the performer who makes or breaks our construction show. The contractor sets the pace of the project.[78]

This sidelining of the architect seemed natural to the author James J. O'Brien—a professional engineer and construction manager—because "In most cases, the architect has backed into the role of project planner and coordinator," and "usually has no real responsibility for timely completion of the project."[79]

Articles in architecture journals viewed things differently, seeing CPM as an opportunity for architects to "apply positive controls" over the construction process, thereby expanding their influence over unruly contractors.[80] O'Brien instead recommended that CPM supersede the architect's work rather than only that of contractors, stating that "The application of CPM in the design and pre-bid phases reduces work interruptions, delays in design decisions and redesign. The time gains involved benefit the owner's project".[81] While architects saw CPM as a way to expand their influence over construction, others saw it as a way to regulate architects' opaque and secretive work.

---

[78] James J. O'Brien, *CPM in Construction Management: Scheduling by the Critical Path Method* (New York: McGraw-Hill, 1965), 1.
[79] O'Brien, 207.
[80] E.R. McCamman, "The Architect in Practice: Critical Path Method of Scheduling," *Architectural Record* 133, no. 1 (January 1963): 155.
[81] James J. O'Brien, "Practical Factors in Project Application of CPM," *AIA Journal* 43, no. 5 (May 1965): 59.

Before CPM's rise, the most common technique used to schedule building projects was the comparatively simple Gantt chart, originally developed during the scientific management movement of the early 20th century. These were simple line charts where one bar represented each job and its expected duration, allowing managers to define a start and end date for each. Weekly updates would keep tabs on which jobs were on track and which may have fallen behind. GBA used Gantt-like charts in the early days of the FRBM project to decide on a reasonable deadline for completion of their working drawings (Figure 3.15). One such chart was prepared in the very early stages of the project in November 1967. In it, the architects projected that they would be able to complete their working drawings in one year, by October 1968. They expected that construction would take only two years, from January 1969 to December 1970.[82] This optimistic projection was prepared prior to MBM's involvement in the project and reveals GBA's relative inexperience with projects as complex as FRBM.

Gantt charts can be effective for relatively simple projects—such as internal scheduling for an architecture firm's preparation of construction drawings—that do not have a large number of concurrent tasks and therefore do not require much coordination. In large construction projects, however, delays in a single key task like site excavation or the structural frame can hold up progress on the entirety of the project. Through graphical means, CPM helped schedulers determine which tasks would be most critical, thus making it easier to assess and respond to delays as they arose. CPM helped predict how much delays in these critical tasks—or unforeseen events such as inclement weather and labor strikes—would set back the project's completion date.

[82] "Project Schedule Chart, November 2, 1967," GBA, BHL, Drawer 8, Folder 3.

The method's primary innovation was a graphical system of task mapping called an "arrow diagram." In addition to each task's time to completion, these drawings show the "logical flow" of a project by mapping which tasks take precedence over others, which can happen concurrently, and which are contingent on the completion of prior tasks. Among those occurring concurrently, an arrow diagram allows a project planner to decide which tasks are critical and which allow scheduling slack. Comparing a sample arrow diagram depicting the internal production schedule for a project within an architectural firm (Figure 3.16) to GBA's Gantt chart, one can see some of CPM's advantages. One of the most challenging planning problems is to accommodate the peaks and valleys created by deadlines and by concurrent work. Arrow diagrams allow project planners to easily visualize the amount of work happening concurrently at any one time, and the number of tasks comprising each deadline.

The eponymous "critical path," traced from one critical task to the next, reveals the total time expected to complete a project. While this kind of arrow diagram for a relatively simple grouping of tasks could be easily drawn and interpreted, more complex projects required computer analysis. Completing this kind of analysis in the 1960s not only required access to a computer but also expertise in programming. Neither of these was commonly available in architecture firms, and this opened a field for specialized firms like MBM. As construction consultants, MBM were involved in the early phases of the FRBM project. First, they prepared a Preliminary CPM Analysis prior to the completion of GBA's schematic design, which was provided as reference material to the architect, the client, the developer/construction manager, and the companies who bid for the various construction subcontracts. Because maintenance of an up-to-date CPM

analysis was one of the contract conditions for these bidders, MBM conducted a workshop for contractors that showed them how to prepare their own arrow diagrams.

In order to prepare the preliminary computer analysis, MBM sent a questionnaire to the architects and their engineering consultants. Initial questions collected basic data about the site and building type as well as information about the expected bidding climate in Minneapolis, the level of demolition required to begin construction, and the anticipated schedule. Other questions requested data about the architect's schematic design, its materials and finishes, and the required mechanical equipment. Unfortunately, the most unusual aspects of the FRBM design—those most likely to cause construction delays—fell through the cracks between these questions. It is unlikely, however, that through proper scheduling MBM would have been able to alleviate the complexities contractors faced assembling the building's steel suspension structure, GBA's wrangling with the Secret Service over complex security provisions, or the delays caused by a 12-week building trades strike beginning in June 1971, let alone the macroeconomic federal decision to delay construction from October 1969 to April 1970 as part of an inflation-control scheme.

MBM used stock IBM network analysis software for their work on the FRBM project (Figure 3.17). This software was based on "precedence logic" that began with an expected duration input for each task, then calculated the earliest and latest start and end dates, yielding the amount of "slack" allowable for each task. It was particularly critical that those tasks without any slack be completed promptly. Sorting the tasks for an "early start" determined which did not have precedents and might begin early. Based on an "early start" sorted output from their computer, MBM's initial project analysis indicated

that a significant amount of construction time would be saved if excavation and site work were allowed to begin prior to the completion of the architect's construction documents. MBM conducted a second, more limited analysis of this "early start" alternative, and GBA were sent an extensive computer printout detailing the duration of each task that would need to be completed to enable this early start (Figure 3.18).[83] Without an arrow diagram, however, MBM's analysis seems to have been bewildering and burdensome to the architects—exasperated redline annotations on the printout's first page point out GBA's critical tasks based on allowable slack, but the remainder of the lengthy document, listing hundreds of construction tasks, remained unmarked.[84] Unable to visualize the project in these undifferentiated lines of text, the architects perhaps saw CPM's usefulness for them waning. (They produced internal scheduling diagrams in an adapted Gantt chart style for the remainder of the project.) Unlike these inscrutable printouts, hand-drawn arrow diagrams can be visually appealing and highly explanatory, not unlike programming diagrams prepared by architects to facilitate design. This also makes them attractive to architects as a visualization tool—more attractive, perhaps, than the numerical information the CPM system produces.

If CPM had outstayed its welcome from a visualization point of view, the architects still saw it as a superior tool when it came to cost estimating. The information it provided made estimates much more accurate than the predominant method described by the *Architect's Handbook*, which was merely based on a building's proposed area or

[83] This is now typical in "fast track" construction projects, which often depend on similar analyses to allow construction to begin before working drawings are fully completed by the architect.
[84] "Architectural and Construction Computer Print-Out Schedule," McKee, Burger, Mansueto, Inc. to Gunnar Birkerts and Associates, October 15, 1968, GBA, BHL, Box 10.

volume multiplied by an estimated cost per square or cubic foot.[85] The relative inaccuracy of this method was illustrated by the difference between the initial project budget of $18.6M (based on the building program and design concept) to the first schematic estimate prepared by MBM after their initial critical path analysis. After the CPM analysis, the "Program and Concept Budget" was revised upward to $22.4M in August 1968, an increase of roughly 20%.[86] In time, however, the budget would rise to more than $28M due to unforeseen construction delays and an unexpectedly high inflation rate over the life of the project. This was despite efforts by the Bank to limit exposure to inflation by delaying construction for six months beginning in October 1969.

Additional complications arose from the fact that Knutson, acting as the developer and construction manager, also had the ability to generate CPM analyses. Using their IBM 1440 computer and a slightly different project model, they offered competing predictions for project cost and completion dates (Figure 3.19).[87] Throughout the project, therefore, Knutson's budget and schedule predictions had to be reconciled with MBM's analyses, and with subcontractors' less robust projections.

Because each task in a CPM network was assigned a single numerical duration rather than a range, it was essential that the network be kept up to date as delays occurred. In accordance with this best practice, Knutson was expected to update their CPM analysis on a monthly basis to keep track of construction progress and revise the schedule. They didn't. According to a letter from GBA field administrator Gunars Ejups analyzing the contractor's various claims for time extensions, Knutson stopped updating

[85] See "Chapter 15: Construction Cost Analysis," [1970] *The Architect's Handbook*, 5-6.
[86] McKee-Berger-Mansueto, Inc., "Summary of Construction Cost History," GBA, BHL, Box 13, 1.
[87] On Knutson's use of CPM and computer, see "Martin B. Thiede of The Knutson Companies, Inc. to Hugh D. Galusha, Jr.," September 27, 1967, GBA, BHL, Box 8. IBM's 1440 model was a low-cost mainframe computer intended for businesses with relatively limited computing needs.

the CPM schedule in March 1972, more than a year before the building was finally completed (Figure 3.20).

For a time, MBM had remained involved in the project as a check on Knutson's scheduling and cost estimates. As late as April 1969 there was a difference of more than $2 million between the cost estimates prepared by MBM ($28.7M) and Knutson ($26.5M). The difference was attributed to "certain items" excluded from the Knutson estimate.[88] MBM attributed its higher estimate to concerns about the cost of exterior wall cladding and glass. Their concerns would prove to be well founded as the project neared completion.

Eventually, MBM's contract expired and GBA was left to contend with Knutson's contradictory positioning as developer, contractor, and construction manager all at once. MBM's involvement ended with the start of construction in 1969, and the client and architect were left without up-to-date calculations about construction cost and completion dates. Knutson seems to have updated CPM analyses only when the data with the architects became necessary to justify time extensions. They updated to measure the delays, for example, resulting from various work stoppages and labor disputes, including, most notably, a seven-week building trades strike in the summer of 1972.

Time and cost controls were precisely the aspects of the building process that were increasingly seen to be the province of construction managers. That this project involved both MBM and Knutson made it doubly complex. Despite MBM's detailed CPM network of the construction project and the additional computing power mobilized by Knutson as CM, the project fell behind and the budget ballooned thanks to inflationary economic trends, labor unrest, and the complexities involved in realizing GBA's design.

[88] Fleckenstein, Memorandum #160, Project 6708, GBA, BHL, Box 8.

Construction Management and Administration

Working with a construction manager was as unfamiliar for GBA as the complex computer analyses of CPM. CMs were at that time employed primarily on large projects for institutional clients, and hadn't yet been involved in any GBA building designs. Construction Management was a relatively new field at the time, the creation of which was spurred in part by the development of new management techniques like CPM. Some architects saw the rise of the CMs as an infringement on the traditional authority of the architect over all phases of building design and construction. At the time, their respective professional territories remained contested. The managing of construction was still seen mostly as a role that could be filled by generalist or specialist architects, general contractors, or clients' representatives, depending on the project. But the CM role was quickly set apart as an independent profession with its own realm of expertise. It seemed from the perspective of architects that their profession was leeching competence and authority to other fields. George T. Heery, among those architects who had embraced the CM role wholesale, defined it as follows:

> Construction management is that group of management services, over and above normal architectural and engineering services, related to a construction program—carried out during the predesign, design and construction phases—that contributes to the control of time and cost in the construction of a new facility.
>
> The professional construction manager, then, is the individual or firm who ties himself to an owner in a professional arrangement and applies the proper combination of management activities to a construction project to achieve time and cost control.[89]

Heery cautioned against projects in which the construction manager and architect had separate contracts with the owner/client. This, in his opinion, was not "likely to be productive and efficient" because

[89] George T. Heery, *Time, Cost, and Architecture* (New York: McGraw-Hill, 1975), 39.

> [It] tends to overlook a fundamental fact: the greatest savings in time and cost in the construction program can be achieved during the design phase. It is during the design phase that the quantity and quality of the building are established, the systems which will affect construction procedures are selected, and the start time for construction is determined. These activities almost invariably have more control over time and cost than management activities not initiated until bid/award or construction phases.[90]

Tacit knowledge of construction realities, underwritten by computing power, enabled CMs to convincingly argue against certain design decisions that might otherwise have gone unquestioned. While architecture could be expensive, construction needn't be, at least from the perspective of CMs. This attitude understandably led to contentious relations between CMs and architects, particularly when each had a separate contract with the owner/client.

This was abundantly clear in the FRBM project. Slow production of construction documents delayed the project considerably, and the unusual nature of the design complicated the construction process. Initially, GBA agreed that all drawings and specifications would be delivered to the Bank by December 31, 1968.[91] The architects petitioned the client for a two-month extension in September 1968, and then one after another more extensions mounted. GBA eventually handed over a full set of documents on April 23, nearly four months later than had been expected. In the meantime, an "early start" analysis of the CPM network switched the project onto a fast track that enabled Knutson to begin excavation and soil boring prior to the full completion of the building design, saving about two months in the overall schedule but still not fully making up for delays resulting from GBA's slow production. This kind of efficiency justified the presence of CMs and turned architects into scapegoats. Heery used examples like this as

[90] Heery, 41–42.
[91] Charles Fleckenstein, Memorandum #9, February 12, 1968, Project 6708, GBA, BHL, Box 8.

an argument for placing the CM in the center of building projects rather than the architect. The organization of the FRBM project, for Heery, fell into an undesirable category: project in which the CM and architect each have their own contract with the owner (Figure 3.21). He instead advocated the formation of joint ventures or "AECM" corporations to avoid the cost overruns that to him and many CMs seemed an unavoidable result of putting design before the realities of building.

From the perspective of architects, it seemed that construction managers had wedged themselves into the narrow space between an architect's project manager or site representative and the contractors who performed the construction tasks. However, under the typical CM arrangement, architects still approved all shop drawings before construction tasks could begin, and still held the ultimate authority over determinations of quality and completion. As *Architectural Record* editor William B. Foxhall stated it, "Let no architect believe that he is less than the constant and essential professional presence from start to finish of every project … unique in its guardianship of *every* aspect of their project's values."[92] Whereas architects saw a project's "values" in broad terms including judgment of aesthetic quality or social benefit, CMs were inclined toward objective and easily understood performance measures like time and cost.[93]

Indeed, one of the primary differences between architect and CM in the construction process has to do with cost. Fees for both are calculated as a percentage of the construction cost, but an architect's estimated Project Construction Cost was never guaranteed while the CM negotiated for a Guaranteed Maximum Cost and had to provide

[92] William B. Foxhall, "Professional Construction Management and Project Administration," *Architectural Record* 149, no. 6 (June 1971): 69.
[93] Hence the now dreaded "value engineering" phase that typically occurs after construction bids have been returned and the budget must be reduced.

detailed accounts for any increase. To oversee such strict budgets, CMs needed expertise in scheduling and management that most general contractors lacked and some architects spurned. CPM was one of the tools that solidified this burgeoning expertise.

At the same moment architects were being pushed into greater marketplace competition, CMs were working to professionalize their trade by isolating themselves from the distorting profit motive that often made relations with general contractors contentious. As engineer and CM James J. O'Brien saw it,

> [The] true key to success … lies in the identification of professional construction managers with their clients, the owners. Adversarial positions and conflicts of interests are set aside. Owners have the advantages of the best advice and information available, while construction managers work on a risk-free basis, able to provide their insight and experience to their clients.[94]

By this measure, Knutson was in an awkward position. Acting as construction manager, developer, and occasionally subcontractor, Knutson's objective professionalism was unavoidably compromised by their inevitable interest in the company's bottom line. This arrangement was allowable in the early years of CM practice, but was by the mid-1970s recognized as a flawed approach too similar to conventional general contracting.

Even in projects where the CM is involved from the outset (though not those organized around a joint venture or AECM corporation), architects still "administer" the construction by reviewing shop drawings prepared by manufacturers or subcontractors—this function was labeled "shop drawings, etc." in Heery's organizational charts (see Figure 3.21). The challenge for GBA in fulfilling this function was their distance from the construction site. Shop drawing review was Fleckenstein's responsibility as project manager. Birkerts and Fleckenstein believed that the expertise and experience provided

[94] James J. O'Brien, "Preface," in Thomas C. Kavanagh, Frank Müller, and James J. O'Brien, *Construction Management: A Professional Approach* (New York: McGraw-Hill, 1978), viii.

by their engineering consultants would help GBA overcome this distance.[95] But response times from SHCR and JBB were longer than they anticipated, and, during the preparation of construction documents, actually made the distance even more difficult to overcome.

The flow of documentation from the jobsite to GBA's office in Birmingham was consistent and rhythmic. Biweekly progress photographs were commissioned from Schwang Studio in black and white, and later there were monthly color photos from George Otis.[96] As mentioned above, GBA chose to hire their own on-site representative instead of contracting with a local architecture firm for construction administration. In addition to general construction recordkeeping and surveillance of work on site, their field representative Laverne Greely regularly mailed GBA paperwork that included: a weekly progress report on construction activities in progress, started, or ended; the weather as it may have impinged on construction progress; and comments on workmanship and specifications. Greely was also responsible for reviewing and making recommendations on Knutson's monthly payment requests, and maintaining a daily project log. Frequent trips by Fleckenstein to Minneapolis, on a roughly monthly basis, enabled him to review progress, meet with Bank executives, and with Knutson's managers. Despite continuing problems overcoming this distance, excavation and foundation work began in the summer of 1969, but the structural frame was delayed for six months while the Bank battled rampant inflation.

The catenary arch was dry-fit without incident on the ground early in 1970 (Figure 3.22) and came together without incident on site in April 1970 (Figures 3.23, 3.24

[95] See Charles Fleckenstein, Memorandum #10, Project 6708, GBA, BHL, Box 8. Justifying the consultant selection, Fleckenstein wrote that "it appears that this selection of consultants will allow working drawings to be prepared by GB&A." (3)

[96] Construction photographs and a 35mm film of the steel structure's topping out were also commissioned from Balthazar Korab, but these were for promotional purposes, not necessarily as documentation.

& 3.25), but because of expansion and contraction cycles it proved challenging to connect the arch to the floor beams it was there to support (Figure 3.26).[97] It then proved difficult to install sections of the steel fins that support the curtain wall because of the extent of lateral movement made possible by the unusual structural design (Figure 3.27). These complications caused additional delays in the completion of the building.[98]

It's indisputable that these delays resulted from the distinctive aspects of the design—aspects for which computerized cost estimates produced through CPM had few ways to account. With CPM, construction tasks were each assigned an expected duration regardless of whether they were routine or unprecedented. Unfortunately for Knutson, aside from delays caused by labor disputes, the Bank's board approved few of their requests for time extensions, which, in consultation with GBA, seem to have been determined to hold the CM to their contractual obligations despite the difficulty of realized GBA's unusual design. Lengthy correspondence shows there were tense and contentious debates over Knutson's requests in 1972 and 1973. Knutson claimed that GBA was the source of many of these delays by setting unreasonable expectations for workmanship, responding slowly to requests for information, issuing a high number of change orders, and crossing lines of communication by giving instructions directly to some subcontractors. Director of Field Administration Gunars Ejups acted as GBA's enforcer with these applications for time extension, writing carefully worded and detailed

[97] Knutson and the steel erection subcontractor eventually discovered that the best time to make these connections was in the early morning, after the catenary had cooled and contracted overnight. That they could not make these connections throughout the remainder of the day delayed the project.

[98] Various work stoppages also affected the construction schedule. First came a 5-week plumbers' strike against mechanical contractors in May-June 1970. The site was picketed for one week in June before they reached a contract. There were numerous strikes by building trades and teamsters during the summer months of 1971 and 1972: sheet metal workers struck in June in solidarity with steel fabricators in Iowa; concrete truck drivers for six weeks from June to July; finally there was a general building trades strike against the general contractors for six weeks in June and July of 1972

letters addressing each of Knutson's reasons for delay. On July 20, 1973, for example, Ejups wrote to Bruce K. MacLaury, Galusha's successor as FRBM President, outlining point-by-point retorts to Knutson's final and most desperate extension claim. His 28-page letter defended GBA from Knutson's claims and added several counter-complaints including,

> Lack of construction management, manifested by late, unchecked, and incomplete shop drawing submittals, sporadic scheduling and reporting, and a tendency to forge ahead, when planning fails, on a "do it now, fix it later" basis, which often has resulted in doubling back and losing efficiency.[99]

For Knutson to completely "lack" construction management—precisely the aspect of the project for which they were paid a professional fee—was a damning assessment. Furthermore, Ejups questioned Knutson's purely language-based justification for delay, stating, "Even those [complaints] that might be valid must be so proven by … showing their effect on the Critical Path."[100] CPM, Ejups recognized, was by this stage only a computerized means for Knutson to justify requests for more time. GBA, in fact, had long since abandoned CPM for their scheduling purposes.

By January 1971, it had seemed to Fleckenstein that all that remained were a few relatively low-risk, low-reward tasks for the architects, and the elaborate scheduling GBA and its consultants conducted at the start of the project had devolved from computerized week-by-week schedules to a few simple indents and underlines (Figure 3.28). The architects were ultimately more interested in the design of charts and graphs to display scheduling information than in holding themselves to the deadlines they contained. As the *Handbook* advised, they saw these documents more as components of a public relations effort and less as tools of management.

---

[99] Gunars Ejups to Bruce K. MacLaury, President, FRBM, July 20,1973, GBA, BHL, Box 16, 2.
[100] Ejups, 2.

A December 9, 1970 article in the *Minneapolis Star* quite literally offered an alternate perspective on the FRBM (Figure 3.29). As the structural frame took shape, columnist Daniel M. Upham interviewed Greely in his makeshift office in Room 304 of the Pick Nicollet Hotel across the street from the jobsite. The article is unusual because it lends importance to a lesser figure in the architectural hierarchy.[101] Unfortunately, this generous journalistic gesture only heightened tensions among those involved in the project. Greely noted in the margin when mailing the clipping to the GBA home office that "Ray [Ramon M. Lopez] is mad – wants to see articles first to make sure Knutson's name in." That Greely considered Lopez "mad" to want assurance that the builder was mentioned in articles about the building points to the reluctance of even the most put-upon employee-architects to give up the steep hierarchy of credit in their profession. Construction workers—even those with supervisory roles and computerized tools like Lopez—were still viewed as an entirely different class.

Interiors

There were many kinds of hierarchy and division within GBA as well. The bottom of Fleckenstein's rudimentary typewritten schedule of January 1971 (see Figure 3.28), for example, reveals that the building's interiors were given a separate project number, 6805, and that this aspect of the building remained far from complete. It was typical for interior design to be set apart as a separate realm within architecture projects of the scale of FRBM, but again, this arrangement was unfamiliar for GBA and Birkerts. They preferred to treat the interiors as integrated with their architecture rather than separate from it. This

[101] Fleckenstein interviewed Greely for the job of field representative on March 17, 1969. He was hired just prior to the start of construction in June 1969, after the construction documents had been sent out to bid. Fleckenstein, Memorandum #138, Project 6708, GBA, BHL, Box XX.

was increasingly challenging as Interior Design became institutionalized as an independent form of expertise with its own training and its own qualifying exam.[102]

Among many architects, interiors were viewed, perhaps even derided, as "women's work," and women were pushed into such marginal roles in architecture firms. In some cases this was the only way for them to accrue more responsibility within projects and move their careers forward. As Gwendolyn Wright put it, women "have had to resort to their own, less conspicuous roles in order to secure a place."[103] GBA associate Barbara Bos may have had this kind of experience in the early 1970s. Trained as an architect in the undergraduate program at UCLA in the late 1960s, Bos was fully qualified to practice in other capacities, but perhaps found that taking charge of GBA's interiors work was her most readily accessible path to design autonomy. Nevertheless, by taking on this role, she eventually became the first female partner in Birkerts's firm.

For FRBM, interiors work was split into six phases and scheduled using a Gantt chart in September, 1968 (Figure 3.30). The first phase of interiors work was to prepare a budget, preferably one that would convince the FRBM to replace its outdated and in some cases functionally or physically obsolete furniture. To do so, GBA prepared extensive numerical, orthographic, and photographic inventories of the furniture in the Bank's existing building. Four budgetary options were prepared in February 1969, with three prices retaining all or most of the furniture, and the fourth replacing all the

[102] As with Construction Management, this process of institutionalization occurred between the early 1960s and the 1980s. The Foundation for Interior Design Education Research (FIDER), for example, was formed in 1970 to review and accredit undergraduate and graduate interior design programs. Similarly, the National Council for Interior Design Qualification (NCIDQ) was formed to develop and administer a national interior design qualification exam. No states passed legislation supporting this exam until Alabama did so in 1982.

[103] Gwendolyn Wright, "On the Fringe of the Profession: Women in American Architecture," in Spiro Kostof, ed., *The Architect: Chapters in the History of the Profession* (New York: Oxford University Press, 1977), 306.

furniture. In the end, GBA was unsuccessful in convincing the Bank to replace it all, and the old furniture was replaced only where it was proven to be functionally obsolete. The next phase, which began in May 1969, was to work with each of the Bank's departments on planning and adjacency issues. These early documentation and design phases were led by GBA associates John Landry and Bruce Wade, with FRBM represented at nearly all meetings by Earl Benson of the facilities department.

Each FRBM department was given relative autonomy to determine how their needs could be met within the new building. Landry, Wade, and later Barbara Bos conducted numerous meetings with the leadership of each department to gauge their needs and review schematic layouts. The planning strategy that developed for many departments was described as a "modified landscape," which balanced fixed and closed spaces like locker, computer, and conference rooms with more loosely planned open office areas on the tower block's floors. This was seen as a more appropriate, more modulated version of *bürolandschaft* planning, which was a growing trend in the US at that time.[104] Once this planning strategy was accepted by the Bank, Wade made field visits to two corporate offices in April 1970: Eastman Kodak in Rochester, New York, planned by the original developers of the *bürolandschaft* concept, the Quickborner team (Figure 3.31); and the Citizens and Southern National Bank in Atlanta, Georgia, which used Herman Miller's Action Office II furniture system (Figure 3.32). At Kodak, Wade toured an experimental floor meant to test the office landscape concept in real time. He was struck by the nonhierarchical way space was distributed among workers of different status—on this particular floor of the headquarters, executives were treated the same way

[104] For the first mention of this "modified landscape" strategy, see Bruce R. Wade, Interiors Memorandum #6, March 31, 1970, GBA, BHL, Box 18.

as everyone else. As with many early *bürolandschaft* tests, acoustics was a prime concern. Moveable curved screens were initially used to provide acoustical privacy (Figure 3.33), but Wade found that Kodak would be replacing these with 2' wide straight sections that hinged together (Figure 3.34). Kodak eventually supplied 8' of screen per person. Supplementing these screens, a process of trial and error led Kodak to install speakers to provide a low frequency masking sound, covering the sounds of noisy office machines like typewriters and of conversations among coworkers. Wade, however, was offended by the lack of aesthetic cohesion in the Kodak space, stating in a project memo that

> [The] Quickborner planning and the hardware used is in no way aesthetically pleasing. Walking through a floor is not as disturbing as one might think, primarily because the freestanding screens prevent reading of the plan. What is most disturbing is the work space itself and the disorder close at hand. People are surrounded by a collection of furniture "pieces," none of which is coordinated, arranged in a haphazard manner to provide varying degrees of enclosure. Even though the Quickborner rationale is that furniture placement is dictated by function, it seems like it should be possible to create an office environment that is somewhat ordered and visually pleasing without sacrificing function.[105]

Some of Wade's concerns about the office landscape approach seemed to be overcome at Citizens and Southern through the use of the Action Office II system. Wade concluded of the space that "because the wall system and furniture used is the same vocabulary as everyone elses [*sic*], overall consistency is maintained while retaining a sense of openness."[106] Of interest at Citizens and Southern were the two different partition heights used for seated work (62") and conference functions (82"). Wade found that "It is surprising to experience the sense of enclosure and privacy that one feels in an area where the lower partitions are used. When seated you feel very much isolated and

[105] Bruce R. Wade, Memorandum #7, Federal Reserve Bank of Minneapolis - Interiors, April 14, 1970, GBA, BHL, Box 18, 3.
[106] Wade, 4.

enclosed."[107] In concert with acoustical privacy, this sense of relative isolation was reported to have contributed to productivity increases of up to 45% in some Citizens and Southern departments.

In the end, rather than opting for either the Herman Miller system or the mix-and-match Quickborner approach, GBA envisioned its own workstation system that was relatively similar to Action Office II (Figures 3.35 & 3.36), and contracted with the General Fireproofing Company of Youngstown, Ohio (GF) to manufacture their design for FRBM.[108] GF eventually marketed the system in their catalog and promoted it through publications, listing Gunnar Birkerts as designer. A more accurate attribution would have been to GBA or to Wade and Bos, who did nearly all of the work on the design (Figure 3.37).

GBA's building design offered flexible office space on ten nearly identical floors each roughly 60 feet by 250 feet with curtain walls facing southeast and northwest (Figure 3.38). The interiors situated more than a dozen different Bank departments over these floors in relatively open office arrangements, with a few private spaces distributed throughout and the top floor featuring partitioned rooms for various size conferences. Interiors projects are different from conventional architecture projects in that tenant reviews are an essential and integral part of the design process. Based on information in the project memos, Barbara Bos took the lead on interiors coordination starting in May 1971.[109] This meant she was responsible not only for the implementation of the "modified

[107] Wade, 5.
[108] Though largely forgotten today, GF was widely known at the time for its Mode-Maker desk series, which was among the best-selling commercial desks in the US during the 1950s and was designed in collaboration with famed industrial designer Raymond Loewy.
[109] Charles Fleckenstein, Memorandum #46, Federal Reserve Bank of Minneapolis – Interiors, January 28, 1972, GBA, BHL, Box 18. In sum, five GBA employees share credit for the interiors work, as summarized in this memo: "[Anthony] Foust will have the overall job of pulling the information into one convenient

landscape" concept using the furniture developed by Wade with General Fireproofing, and coordinating it with off-the-shelf furniture used in other parts of the building and with reconditioned furniture moved from the Bank's previous building, but also with coordinating the design with the specific departmental needs determined during six months of surveys and interviews that she had conducted beginning in November 1970. As the adapted Gantt-style "Job Chart" prepared for interiors work shows, much work remained after the project was turned over to Bos (Figures 3.39 & 3.40). This was a thankless task—documentation of the final results is scant, and almost no mention is made in press coverage of the building of GBA's extensive work on the office interiors (let alone the custom GF workstation design). Extensive "move-in" drawings were prepared in the summer of 1972, and the furniture was installed onto the columnless office floors beginning that fall (Figures 3.41 & 3.42). While Bos had anticipated that the move-in process would be completed by January 1973, it dragged on for another six months as Knutson finalized the interior finishes and caulking of the exterior granite.

Even after the completion of a building's interiors, furniture and equipment remain in flux. Once the occupants were in place at FRBM, for example, they were immediately unsatisfied with the reconditioned furniture brought over from their previous building. After Bos suggested that the Bank set aside funds for replacement of all of this reconditioned furniture in the 1974 Bank budget, MacDonald expressed concern that as the reconditioned furniture was replaced with new, the clear organizational systems that guided GBA's interiors would be lost or compromised. In response, Bos developed a new "intellectual technology" to guide the clients' replacement and rearrangement of the

---

package. The basic responsibilities such as Al [Bublys]'s color work, Bruce [Wade]'s work station efforts, Barb [Bos]'s furniture selection and Fred [John]'s executive office and counter and cabinet work efforts are unchanged but this work should now all start to be assembled in one orderly manner." (1)

furniture systems without compromising the designers' intent or requiring continued involvement by GBA. These consultancy documents distilled the office space's interior design into a series of simple to understand, easy to follow principles (Figures 3.43, 3.44 & 3.45). Among other instructions, installers were to "Maintain an unobstructed 5'-0" corridor" along the curtain walls, group demountable offices together to share walls, keep these offices away from the elevator lobby, place entrances to offices and workstations away from the main corridors, and, generally, avoid overusing demountable partitions to divide-up the office floors. Bos's concise instruction manual guided inexperienced bureaucrats through the murky process of interior design.

This less heroic form of design was more subject to delegation (sometimes to women architects or even to building occupants) or to routinization. Its influence over the perceived success of a building, however, is sizable. Because they remain involved in designing and selecting the materials and objects that building occupants will interact with on a daily basis, and because they are often involved in negotiation of human needs after the end of building construction, interiors workers can't avoid but be engaged with what David Riesman called "the softness of men" rather than "the hardness of the material."[110] Some architects' chauvinistic attitude about accommodating the needs and wants of occupants into their designs made them ill equipped to participate in such work.[111] GBA's assignment of a separate project number isolated the building design from such compromise through a strict division of labor.

[110] See David Riesman, Nathan Glazer, and Reuel Denney, *The Lonely Crowd: A Study of the Changing American Character*, Abridged and revised edition (New Haven: Yale University Press, 1961), 111–12. Riesman's observation is discussed in detail in Chapter I, for which I adopted his phrase "The Hardness of the Material" as title.

[111] This was more and more true of Birkerts as his ideas about the design process hardened in the 1970s.

There is little documentation of the final results of Bos, Wade and others' interiors work except for the lobby spaces and the several photogenic color-coded conference spaces stocked with Knoll furniture in red, yellow, and blue (Figure 3.46). Among Balthazar Korab's widely published photographs of the building, very few show Bank employee workspaces. One, however, depicts the five-foot-wide walkways along the bottom office floor's perimeter, with Wade and Bos's white GF workstations and demountable partitions breaking up the office landscape on the left hand side, and the bottom of the catenary structure looming in black at right (Figure 3.47). Korab perhaps sensed that the contrast between these two aspects of the building—one intended as flexible, impermanent, human-centered, and "soft," the other abstract, monumental, "hard," and borrowing an image of permanence from bridge-building—could not have been greater.

Conclusion: Appropriateness and Appreciation

Robert H. Masson, President of Knutson, wrote to Fleckenstein on May 15, 1972 announcing that the company had appointed a "Senior Project Manager" for the FRBM project, Richard Ohman, and that all subsequent correspondence would cross his desk for approval. Masson suggested, "It would be most helpful from our point of view … if Gunnar Birkerts would take similar administrative action."[112] The letter requests that a senior member of GBA, preferably Birkerts himself, similarly clarify the hierarchy of responsibility and sign off on all decisions as the project approached "the critical closing, finishing, and punch-listing phases." Masson, it seems, hoped to reconstruct a

[112] Robert H. Masson, President of Knutson Construction Company to Charles Fleckenstein, GBA, May 15, 1972, GBA, BHL, Box 15.

professional relationship that had grown increasingly contentious by calling in higher-level executives to coordinate relatively mundane tasks. His request that GBA adopt a similar arrangement was based on a misunderstanding of the distribution of responsibility within architecture offices like GBA. For Birkerts to reclaim authority from Fleckenstein (or Fleckenstein from Bos) at this late stage would short-circuit the hierarchical production process to which the firm subscribed. As the unabashed face of his firm, however, Birkerts was more than happy to take full credit for the building in the press (Figure 3.48). Though he was careful to use "we" when describing the FRBM's process of design, Birkerts's "me" nonetheless concealed hierarchy behind his cultivated personal image. Because of his detachment from the more pragmatic day-to-day work of realizing this visionary design, Birkerts was able to see the building as an aesthetic statement, autonomous in its abstraction. He viewed the FRBM as his most timeless design and foresaw that its structural gesture might one day be replicated in a network across cities like Minneapolis or Detroit (Figure 3.49).

The conventional process of making buildings often descends into a battle between competing profit motives—with architects, contractors, and consultants all fighting to at least break even—and the result is litigious squabbling over details both minor and major. Artist-architects like Birkerts often default to a kind of chauvinism about construction systems, feeling that they should be as highly customized as the overall building design. Contractors take almost the opposite view—that well vetted systems are not only less expensive to assemble but also likely to withstand the test of time. Negotiation and communication are the only ways to resolve this inherent tension

within the business of building construction. Birkerts was hardly shy about this chauvinism. He later wrote that,

> A particular folklore surrounds my firm in the contracting community. This does not necessarily work in our favor when it comes to having our work bid upon because the contractors know we insist upon specific standards of workmanship and interpretation of our drawings … But you just can't wait around. Sometimes you have to stick your neck out. You could go the old way and just use cotton batting for insulation, but that would stop the advancement of design. From the beginning, my interest was in new materials and new applications.[113]

It was toward this brand of chauvinism that Robert Venturi and Denise Scott Brown aimed some of their strongest critiques of late modernism. Such "misplaced technological zeal," said Venturi and Scott Brown, amounted to "articulation as ornament" or, worse, the "substitution of expression for representation."[114] Late modern architects "constructed decoration" because ornament was anathema to their modernist ideals. The exaggerated results of "technological *machismo*," they concluded, were equivalent to a "duck," a building "Where the architectural systems of space, structure, and program are submerged and distorted by an overall symbolic form … the special building that *is* a symbol."[115] Comparing the quick sketch Venturi and Scott Brown used to illustrate this equivalence to one of Korab's FRBM photographs—showing its exaggeration of the catenary structural system to the level of symbolic image—one can't help but think of the FRBM as a late modernist duck (Figures 3.50 & 3.51).

In the end, the FRBM was a highly distinctive building in two parts: one part a generic office tower with unusually narrow floor plates and the second a semi-submerged base with a close fit to the particulars of the Bank's specific security needs at the moment

[113] Birkerts, *Process and Expression*, 52–53.
[114] Robert Venturi, Denise Scott Brown, and Steven Izenour, *Learning from Las Vegas: The Forgotten Symbolism of Architectural Form*, Revised Edition (Cambridge, Mass.: MIT Press, 1977), 139.
[115] Venturi, Scott Brown, and Izenour, 150; 87.

of its design. As conditions changed, the "appropriateness" of both the base and the office tower declined steeply.[116] The void between them ever more charged (Figure 3.52). The base's mix of paranoiac amenities (a fallout shelter with built-in decontamination chamber and medical facility, guard posts with carefully-calibrated gun slots, a firing range for employees, and a "money destructor" that unleashed a glut of correspondence with the Secret Service and manufacturers) declined in use value as the Cold War came to a close. What once seemed appropriate was later seen as hopelessly obsolete, perhaps more rapidly than the architects could have accounted for in their design.

Maintenance problems compounded the Bank's dissatisfaction with its bespoke "building that smiles" (Figure 3.53). The Bank summarized the building's problems under three headings: asbestos hazards, cramped quarters, and curtain wall repair (Figure 3.54). None of these were impossible to overcome, but the cost was simply too great to justify their continued investment in a building they viewed as being at "the end of its economic life."[117] It was precisely that which Birkerts is said to have contributed to the project—its formal gesture of suspension—that, in the end, made the building expensive to adapt. Expansion and contraction cycles on the curtain wall were exaggerated by its being suspended between two towers and run through with a catenary arch in structural steel. This caused the curtain wall to fail in many places, contributing to the Bank's decision to abandon it to a real estate market that prioritized quantitative income over symbolic value. By 1991, as computerization drastically altered the work of the Bank's employees, it was announced that a new building would be constructed to meet the

[116] "Appropriate Architecture" was a title Birkerts used for some of his academic lectures, and it was "appropriateness" that he used as a criteria to judge the greatness of his architecture.
[117] Recognizing these difficulties, Birkerts reflected later that, "Years ago we jumped on new products quite quickly. Some of the products that were staples in the '60s and '70s are proving that hey were not thoroughly tested." Birkerts, *Process and Expression*, 53.

Bank's needs. Because of its novel appearance and questionable functionality, some authors came to refer to it as a "white elephant."[118]

GBA had been warned in a 1967 Federal Reserve memo that "The building should be designed and placed on the site in a way that will permit any future lateral expansion of [vaults, security courts, and other special-purpose facilities] to enhance rather than compromise the basic design of the total structure."[119] While the design did allow for vertical expansion atop the office block, any expansion of the lower block would have compromised the open plaza's connection to Nicolett Avenue, an absolutely essential aspect of the design (Figure 3.56). The building's new owners deemed the design of the addition too costly, and when the building reopened under new ownership in 2000, more floor space had been added to its Northeast side. The bunker-like lower volume came to be occupied by telecom companies, who made use of its isolation for some of their more sensitive equipment. Even worse, the open plaza beneath the office block had been filled in; for Birkerts, this was a tragedy.[120] Despite knowing that the "base" of the project comprised the efforts of many subordinates and resigned that thinking of architecture as an artistic endeavor whose power resided in the minds of certain singularly creative individuals was naïve, Birkerts nevertheless felt that his place among a certain subset of artist-architects had been cemented by the FRBM. Its heavy-handed renovation sapped the building's most distinctive feature.

---

[118] See Debra Cope, "The Fed's White Elephant," *American Banker*, July 22, 1991.
[119] Board of Governors of the Federal Reserve System, "Guidelines for Federal Reserve Bank Office Building Construction," Draft, August 23, 1967, GBA, BHL, Box 7.
[120] The Bank's new building was designed by HOK, Inc. (originaly Hellmuth, Obata, and Kassabaum), a huge St. Louis-based firm for whom little adjustment was necessary to meet the Bank's performance demands (Figure 3.55). Because of its integrated "AECM" process there was far less need for HOK's experienced project managers, interior designers, and in-house engineers to learn collectively on the fly. Construction was by McGough, Inc. of St. Paul, Minnesota.

Despite positive responses to the building in the press and among critics, a nagging feeling that Birkerts had not maintained his usual level of design control over the FRBM's design seems to have persisted in his mind. As Chapter IV will show, Birkerts thought increasingly carefully about his design method while even more defensively reserving the early stages of the process for himself. In future projects, he asserted his preeminence more directly by funneling design through "embryo" sketches that could be done only by him. Though FRBM was his best-known building, it also proved the most difficult to replicate, perhaps because staff turnover and the always ad-hoc process prevented its lessons from being carried over.

Near the close of the FRBM project, in September 1972, the main GBA office moved from the space at 909 Haynes Street in Birmingham it had occupied since its inception to a larger office space a few blocks northeast at 292 Harmon Street.[121] Despite the short distance, this move inaugurated a new phase for the firm and its figurehead. The timing of the firm's growth was unfortunate. It came during a mid-1970s decline in demand for architectural services resulting from a deep economic recession. That the firm survived at all is a testament to Birkerts's resilience. GBA were a much leaner firm after the recession, and never grew quite so large again.

It was during this recession that Judith Blau conducted the research for her sociological study of architects, *Architects and Firms*. Blau observed that the list of firms who survived and those who failed during the recession did not suggest any correlations. It was, she concluded, "governed by a random process." Paradoxically, those firms who had adapted themselves to the unusual conditions of an economic expansion "are

[121] GBA previously occupied a small rental unit in the office building at 292 Haynes Street as an "annex" office, the need for which was created by the hiring made necessary by the FRBM project.

enfeebled when reliable markets begin to disintegrate." On the other hand, "firms that exhibit the features of professional entrepreneurship … are flexible enough to turn liabilities into assets in abnormal times."[122] In the end, his deliberateness in design was the liability that Birkerts transformed into an asset by the late 1970s.

[122] Blau, *Architects and Firms*, 130–31.

Figure 3.01 Federal Reserve Bank of Minneapolis (FRBM) President Hugh D. Galusha, left, reviews scale model of design for new building by GBA with John A. MacDonald, right, the Bank's construction project manager, Minneapolis, November 1968. Black and white print, 3 x 5 inches. Photographer unknown. Box 21, GBA records, BHL.

Figure 3.02 Birkerts & Straub, 1300 Lafayette Apartments, Detroit, Michigan, 1960-62, with Lafayette Towers Apartments by Mies van der Rohe in distance center and right. Photograph by Balthazar Korab. From: Kaiser, 36.

Figure 3.03 Birkerts & Straub, Lillibridge Elementary School, Detroit, Michigan, 1962-1963. Photograph by Balthazar Korab. From: Birkerts and Schwartz, 79.

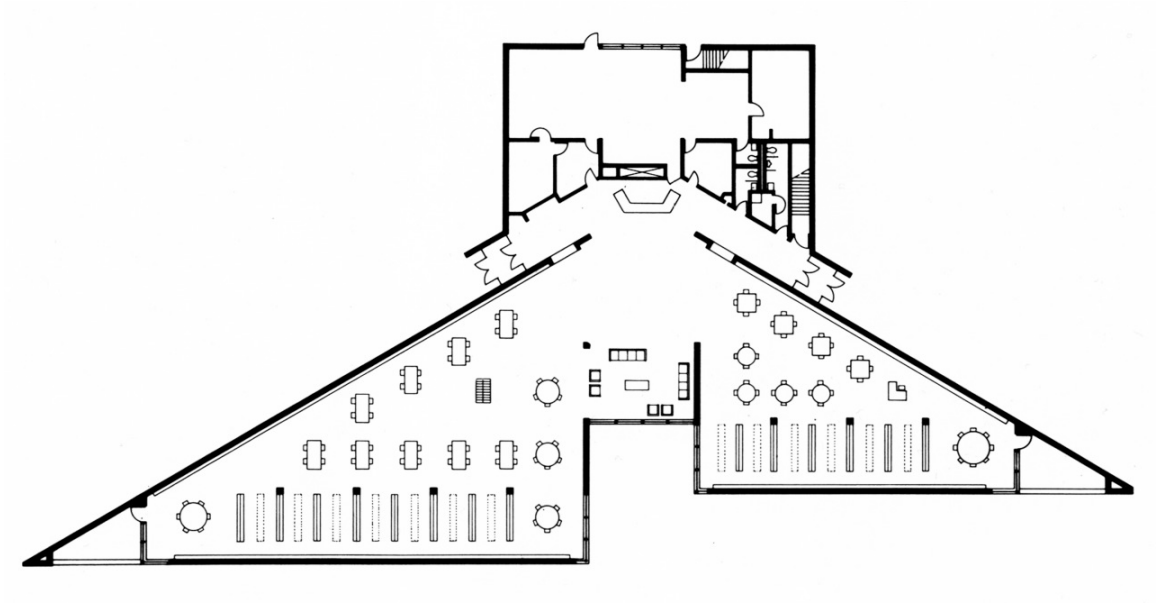
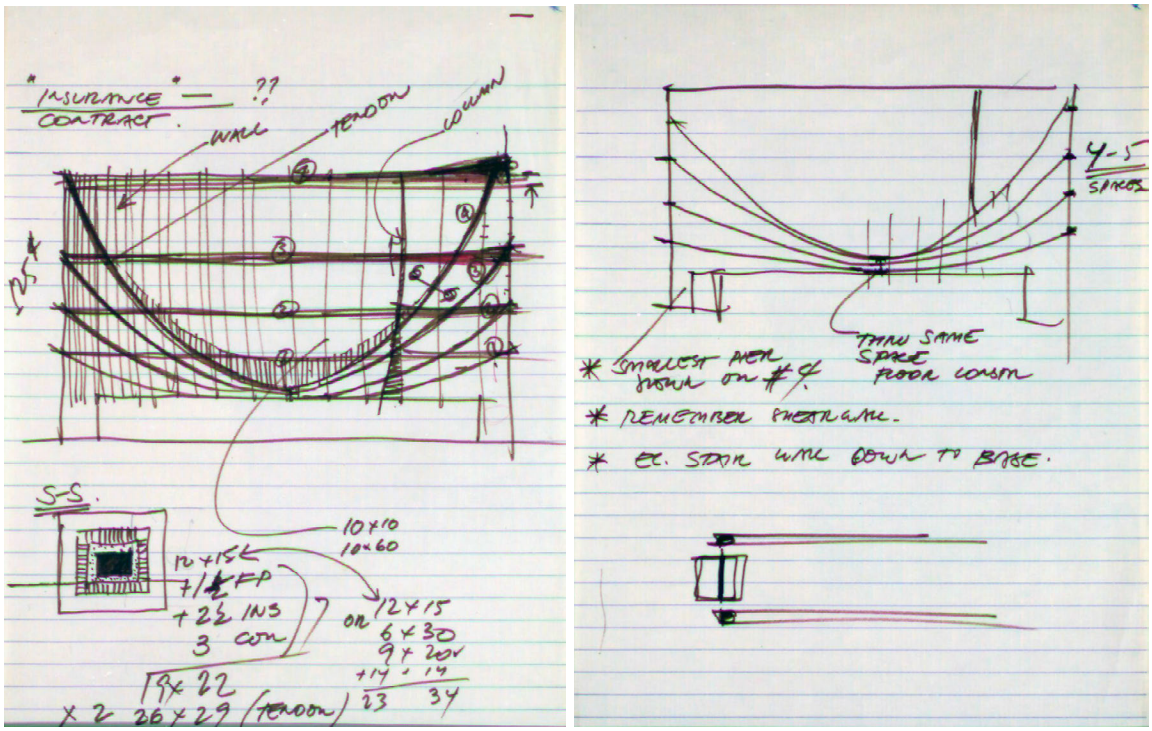


Figure 3.04 GBA, Floor plan, Livonia Public Library, Livonia, Michigan, 1964-67. From: Kaiser, 56.

Figure 3.05 GBA, Church of St. Bede, Southfield, Michigan, 1966-68. Photograph by Toshiharu Kitajima. From: Marlin and Futagawa, 109.

Figure 3.06 Birkerts & Straub, Office Building for Marathon Oil Company, Detroit Refinery, Detroit, Michigan, 1962-1964. Photograph by Balthazar Korab. From: Kaiser, 37.

Figure 3.07 GBA, Fisher Administrative Center, University of Detroit Mercy, Detroit, Michigan, 1964-66. From: Kaiser, 48.



Figures 3.08 & 3.09 FRBM catenary sketches by Gunnar Birkerts, ca. 1968. Bentley Image Bank, © Regents of the University of Michigan.

Figure 3.10 Contact sheet of photographs showing the first employees of GBA surrounding a model of Fisher Administrative Center, ca. 1964. Included are Gunnar Birkerts (vest), Almon J. Durkee (no glasses), Harold Van Dine (tie with glasses), Keith Brown (bowtie). Box 1, GBP, BHL.

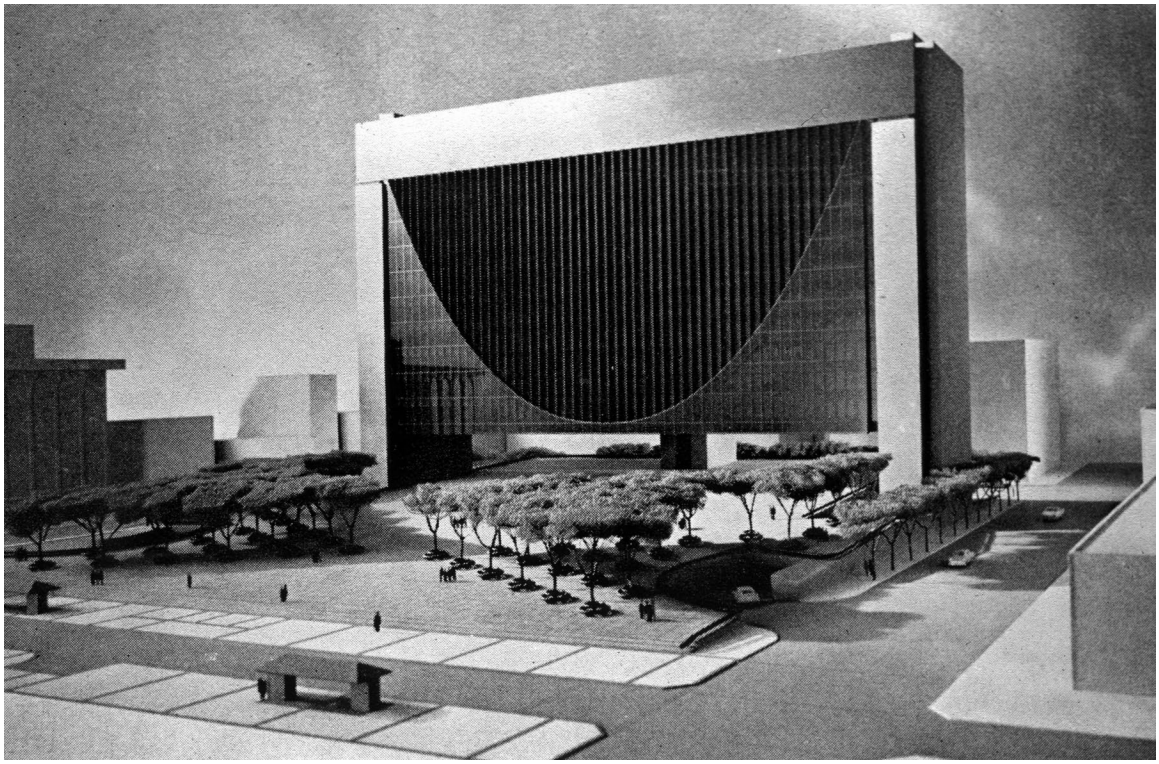


Figure 3.11 GBA, Presentation model of FRBM, ca. 1968. 35mm slide. Imageworks, Art, Architecture and Engineering Library, University of Michigan.

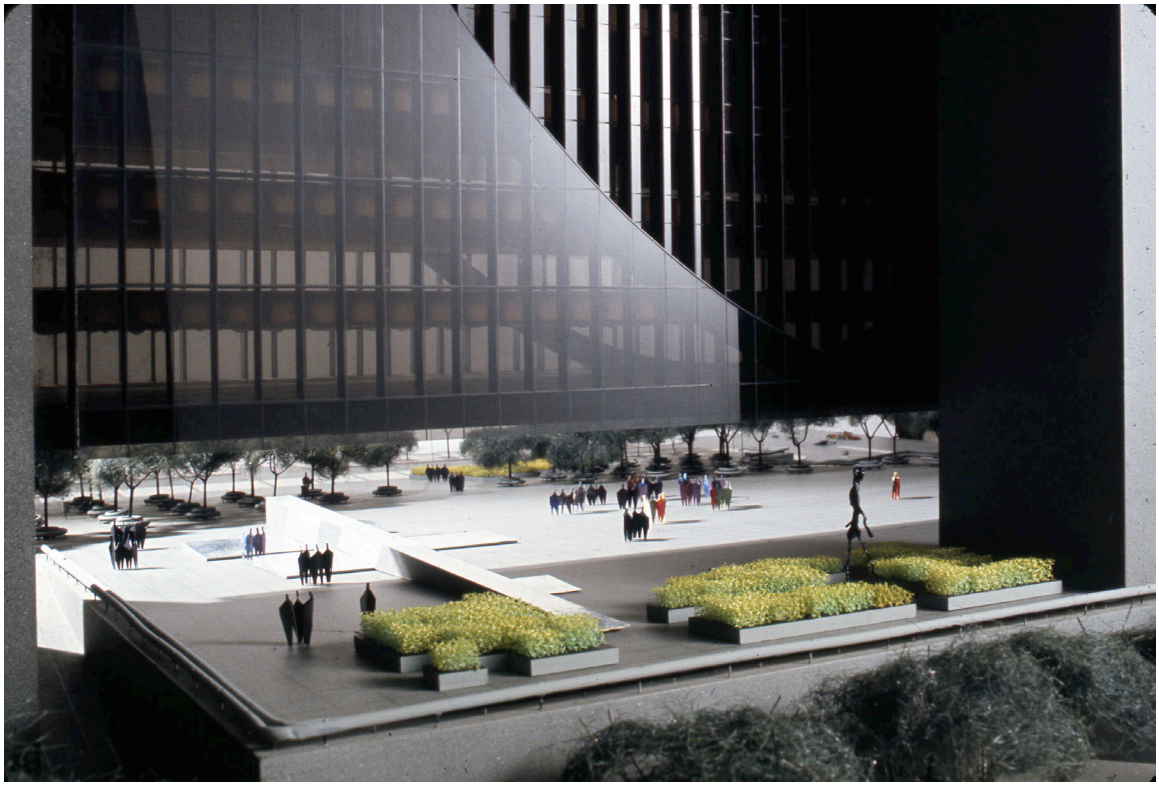


Figure 3.12 Detail of FRBM presentation model. 35mm slide, Photographer unknown. Box 84, GBA records, BHL.

Figure 3.13 Front and back cover of McKee-Berger-Mansueto, Inc. (MBM) promotional booklet. Box 13, GBA records, BHL.

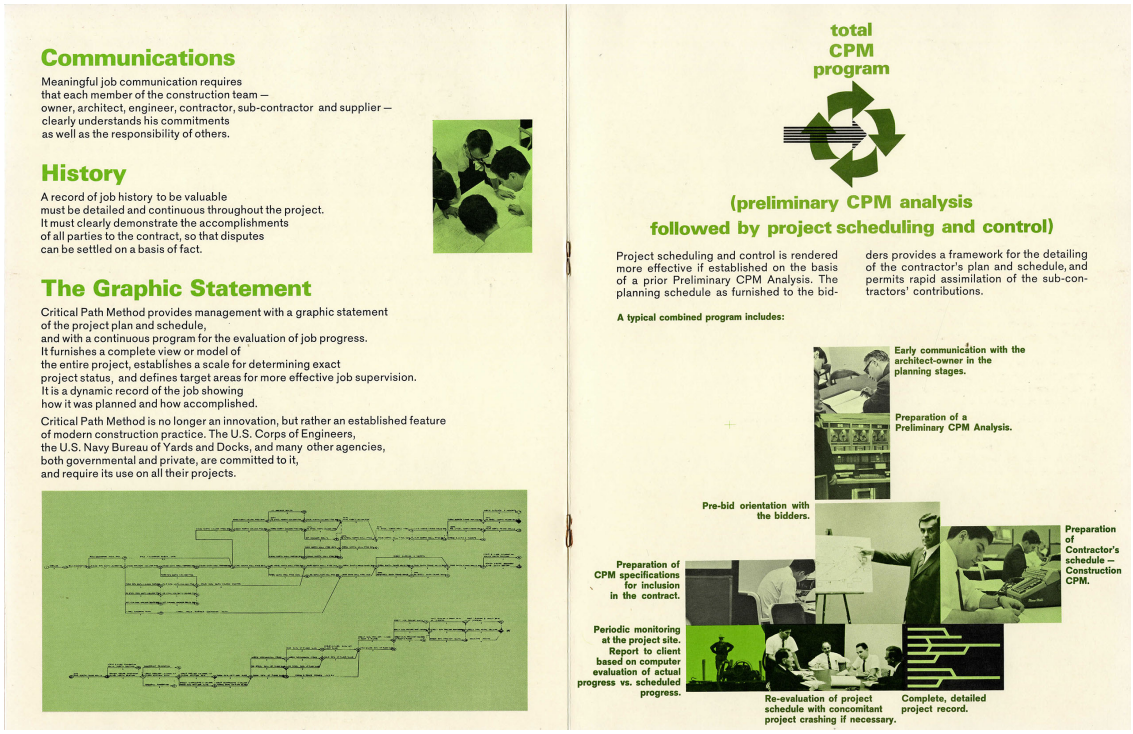


Figure 3.14 Interior spread of MBM promotional booklet. Sample Critical Path Method "arrow diagram" at lower left. Box 13, GBA records, BHL.

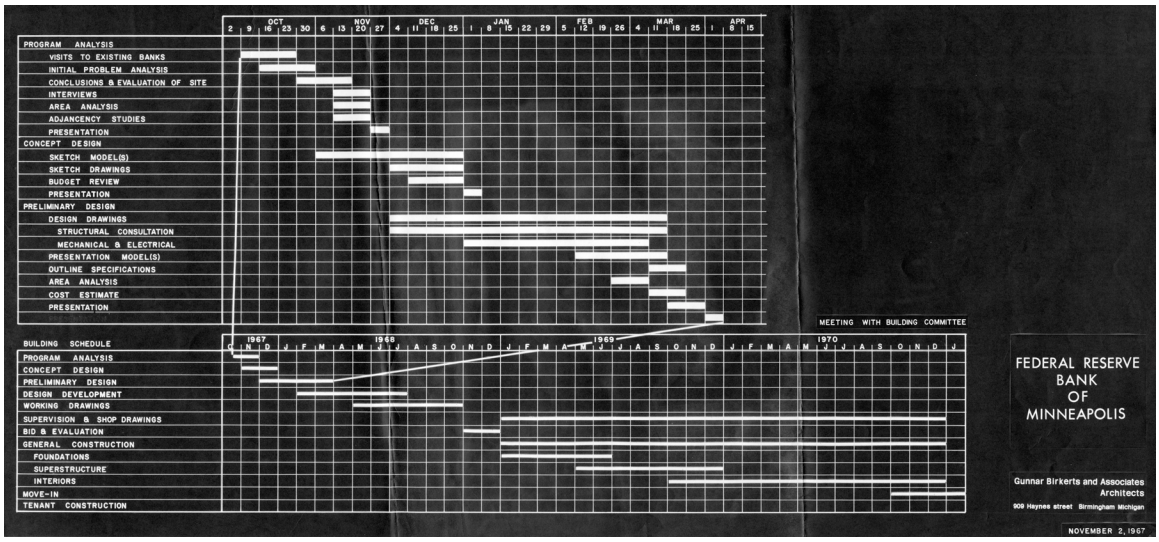


Figure 3.15 Bar chart-style schedule for FRBM prepared by GBA, November 2, 1967. Drawer 8, Folder 3, GBA records, BHL.

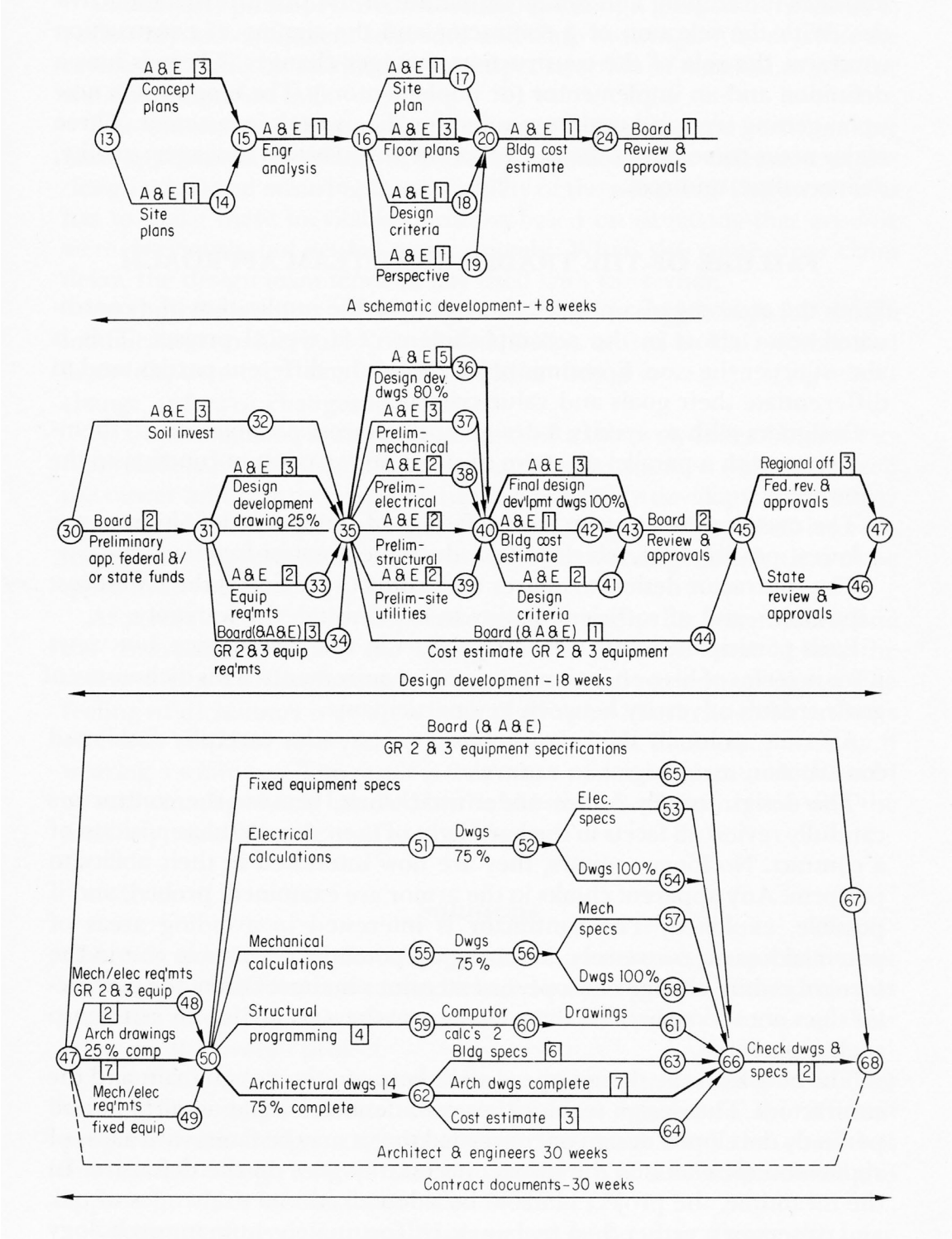


Figure 3.16 Example arrow diagram of production schedule for an architectural project, split into schematic design, design development, and contract documents phases. From: Thomas C. Kavanagh, Frank Müller, and James J. O'Brien, *Construction Management: A Professional Approach* (New York: McGraw-Hill, 1978), 27.

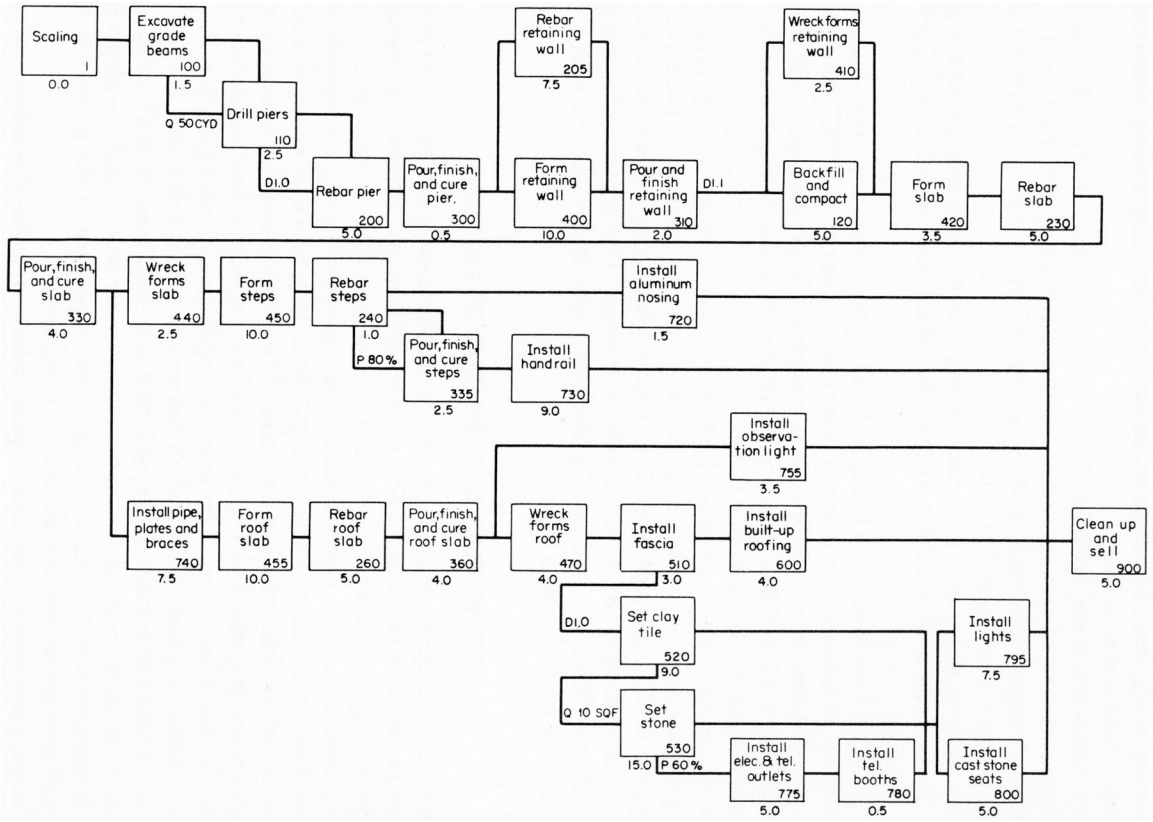
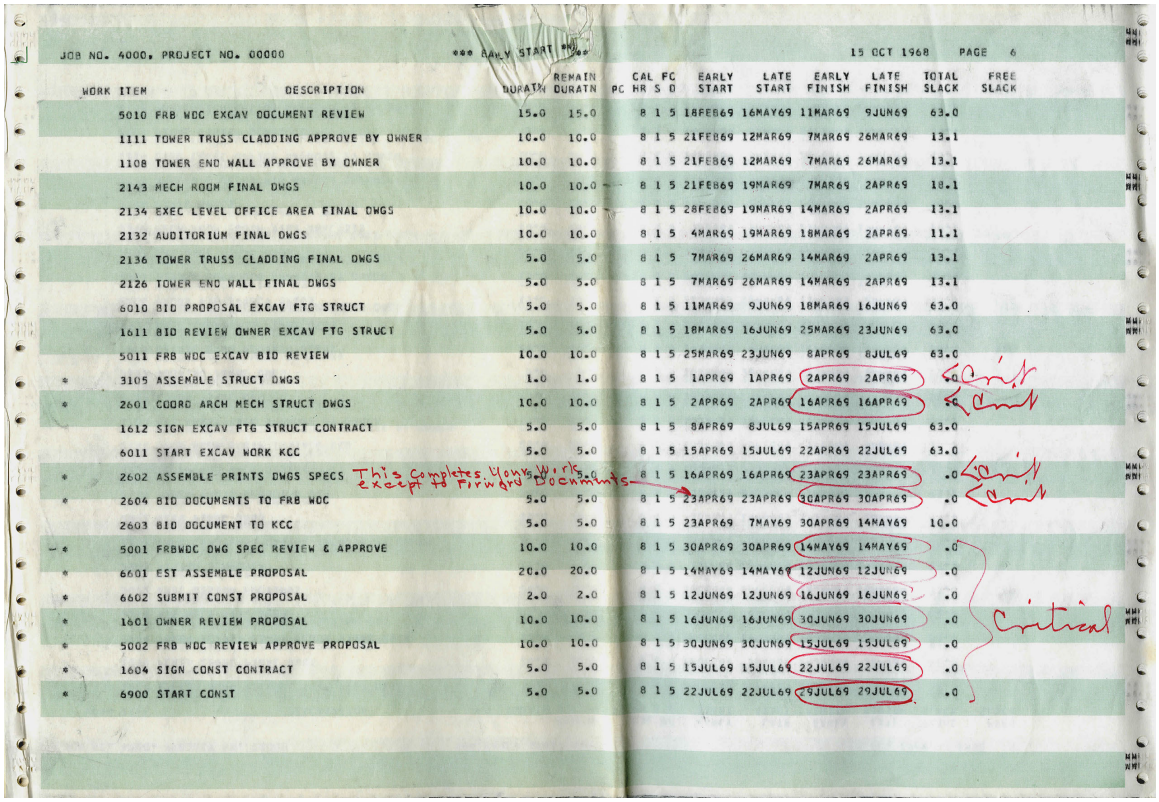


Figure 3.17 Example IBM "precedence network" for use in programming project management software, 1970s. From: Kavanagh, Müller and O'Brien, 309.



JOB NO. 4000, PROJECT NO. 00000 *** EARLY START PLOT *** 15 OCT 1968 PAGE 6

	WORK ITEM	DESCRIPTION	ORIGINAL DURATN	REMAIN DURATN	PC	CAL HR	CAL S	CAL D	EARLY START	LATE START	EARLY FINISH	LATE FINISH	TOTAL SLACK	FREE SLACK
	5010	FRB WDC EXCAV DOCUMENT REVIEW	15.0	15.0		8	1	5	18FEB69	16MAY69	11MAR69	9JUN69	63.0	
	1111	TOWER TRUSS CLADDING APPROVE BY OWNER	10.0	10.0		8	1	5	21FEB69	12MAR69	7MAR69	26MAR69	13.1	
	1108	TOWER END WALL APPROVE BY OWNER	10.0	10.0		8	1	5	21FEB69	12MAR69	7MAR69	26MAR69	13.1	
	2143	MECH ROOM FINAL DWGS	10.0	10.0		8	1	5	21FEB69	19MAR69	7MAR69	2APR69	18.1	
	2134	EXEC LEVEL OFFICE AREA FINAL DWGS	10.0	10.0		8	1	5	28FEB69	19MAR69	14MAR69	2APR69	13.1	
	2132	AUDITORIUM FINAL DWGS	10.0	10.0		8	1	5	4MAR69	19MAR69	18MAR69	2APR69	11.1	
	2136	TOWER TRUSS CLADDING FINAL DWGS	5.0	5.0		8	1	5	7MAR69	26MAR69	14MAR69	2APR69	13.1	
	2126	TOWER END WALL FINAL DWGS	5.0	5.0		8	1	5	7MAR69	26MAR69	14MAR69	2APR69	13.1	
	6010	BID PROPOSAL EXCAV FTG STRUCT	5.0	5.0		8	1	5	11MAR69	9JUN69	18MAR69	16JUN69	63.0	
	1611	BID REVIEW OWNER EXCAV FTG STRUCT	5.0	5.0		8	1	5	18MAR69	16JUN69	25MAR69	23JUN69	63.0	
	5011	FRB WDC EXCAV BID REVIEW	10.0	10.0		8	1	5	25MAR69	23JUN69	8APR69	8JUL69	63.0	
*	3105	ASSEMBLE STRUCT DWGS	1.0	1.0		8	1	5	1APR69	1APR69	2APR69	2APR69	.0	
*	2601	COORD ARCH MECH STRUCT DWGS	10.0	10.0		8	1	5	2APR69	2APR69	16APR69	16APR69	.0	
	1612	SIGN EXCAV FTG STRUCT CONTRACT	5.0	5.0		8	1	5	8APR69	8JUL69	15APR69	15JUL69	63.0	
	6011	START EXCAV WORK KCC	5.0	5.0		8	1	5	15APR69	15JUL69	22APR69	22JUL69	63.0	
*	2602	ASSEMBLE PRINTS DWGS SPECS	5.0	5.0		8	1	5	16APR69	16APR69	23APR69	23APR69	.0	
*	2604	BID DOCUMENTS TO FRB WDC	5.0	5.0		8	1	5	23APR69	23APR69	30APR69	30APR69	.0	
	2603	BID DOCUMENT TO KCC	5.0	5.0		8	1	5	23APR69	7MAY69	30APR69	14MAY69	10.0	
*	5001	FRBWDC DWG SPEC REVIEW & APPROVE	10.0	10.0		8	1	5	30APR69	30APR69	14MAY69	14MAY69	.0	
*	6601	EST ASSEMBLE PROPOSAL	20.0	20.0		8	1	5	14MAY69	14MAY69	12JUN69	12JUN69	.0	
*	6602	SUBMIT CONST PROPOSAL	2.0	2.0		8	1	5	12JUN69	12JUN69	16JUN69	16JUN69	.0	
*	1601	OWNER REVIEW PROPOSAL	10.0	10.0		8	1	5	16JUN69	16JUN69	30JUN69	30JUN69	.0	
*	5002	FRB WDC REVIEW APPROVE PROPOSAL	10.0	10.0		8	1	5	30JUN69	30JUN69	15JUL69	15JUL69	.0	
*	1604	SIGN CONST CONTRACT	5.0	5.0		8	1	5	15JUL69	15JUL69	22JUL69	22JUL69	.0	
*	6900	START CONST	5.0	5.0		8	1	5	22JUL69	22JUL69	29JUL69	29JUL69	.0	

This completes your work except for Firing and Documents

Crit.

Crit.

Crit.

Crit.

Critical

Figure 3.18 Critical Path Method network analysis printout from IBM computer by MBM, red annotations directed to GBA employees. Box 10, GBA records, BHL.

Figure 3.19 Cover of promotional booklet for IBM 1440 Data Processing System, the computer operated by Knutson Construction Company during FRBM project. Printer at left shows output similar to document shown in Figure 3.17 (White Plains, NY: IBM Data Processing Division, 1962).

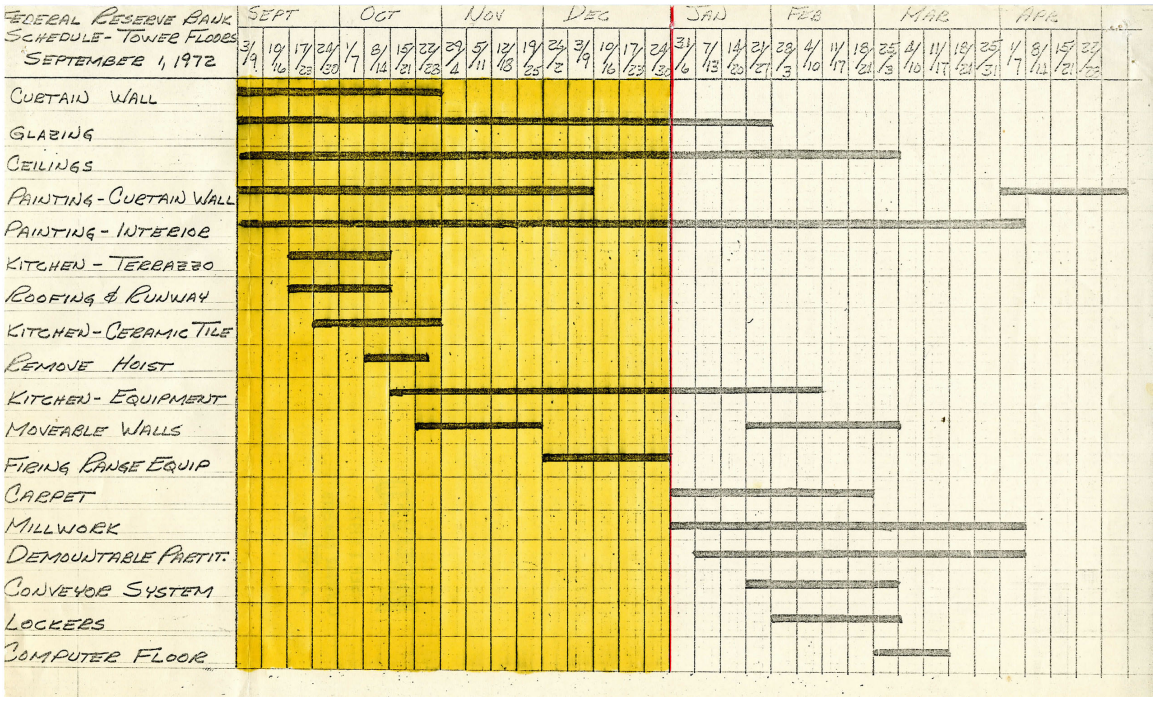


Figure 3.20 Bar chart-style schedule for interior construction, prepared by Ramon M. Lopez of Knutson Construction Company, September 1, 1972. Box 19, GBA records, BHL.

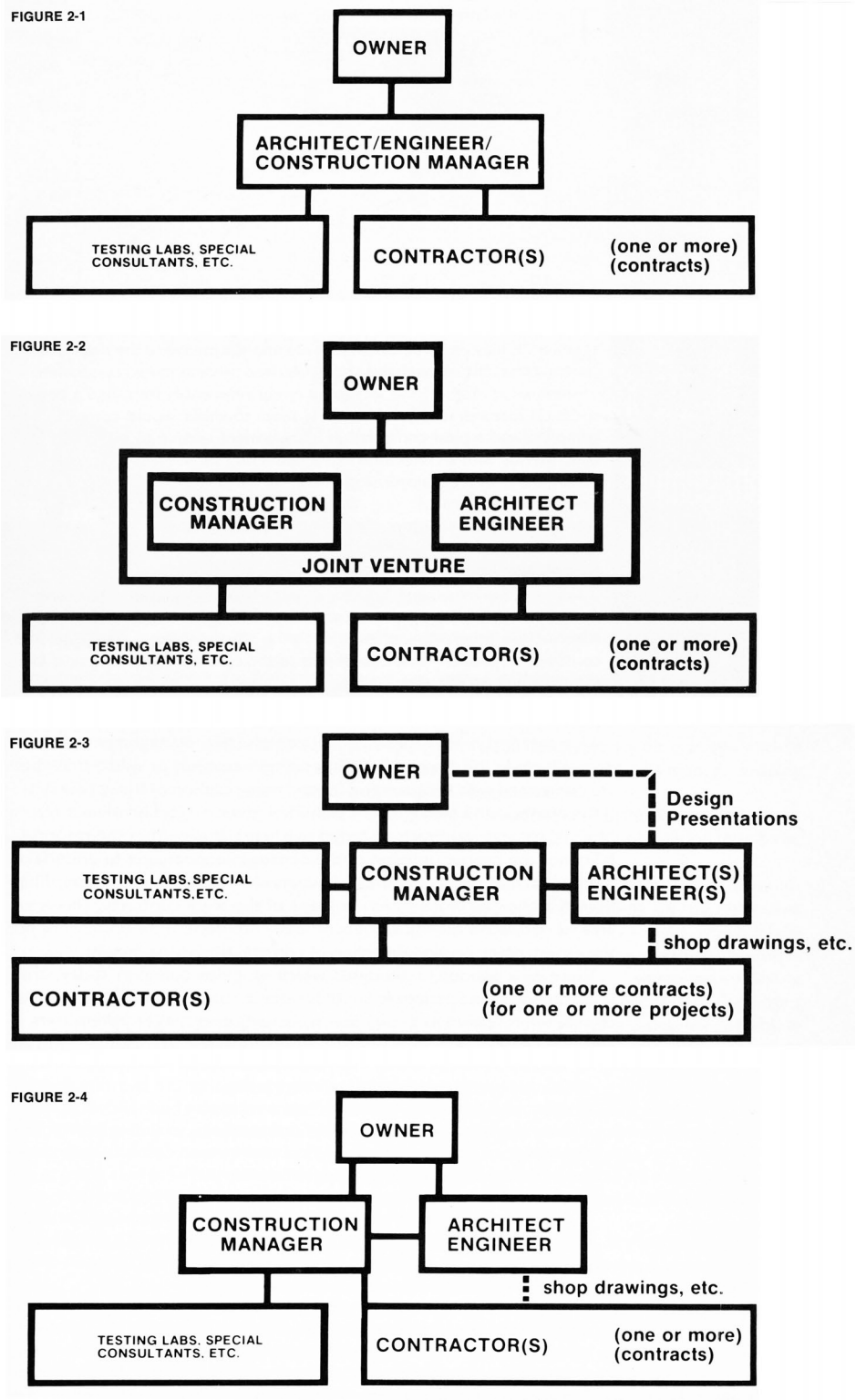


Figure 3.21 Four versions of the organizational chart for a construction project involving a Construction Manager. The arrangement for the FRBM project is most similar to 2–4, which was least recommended by the author. From: George T. Heery, *Time, Cost, and Architecture* (New York: McGraw-Hill, 1975), 40–41.

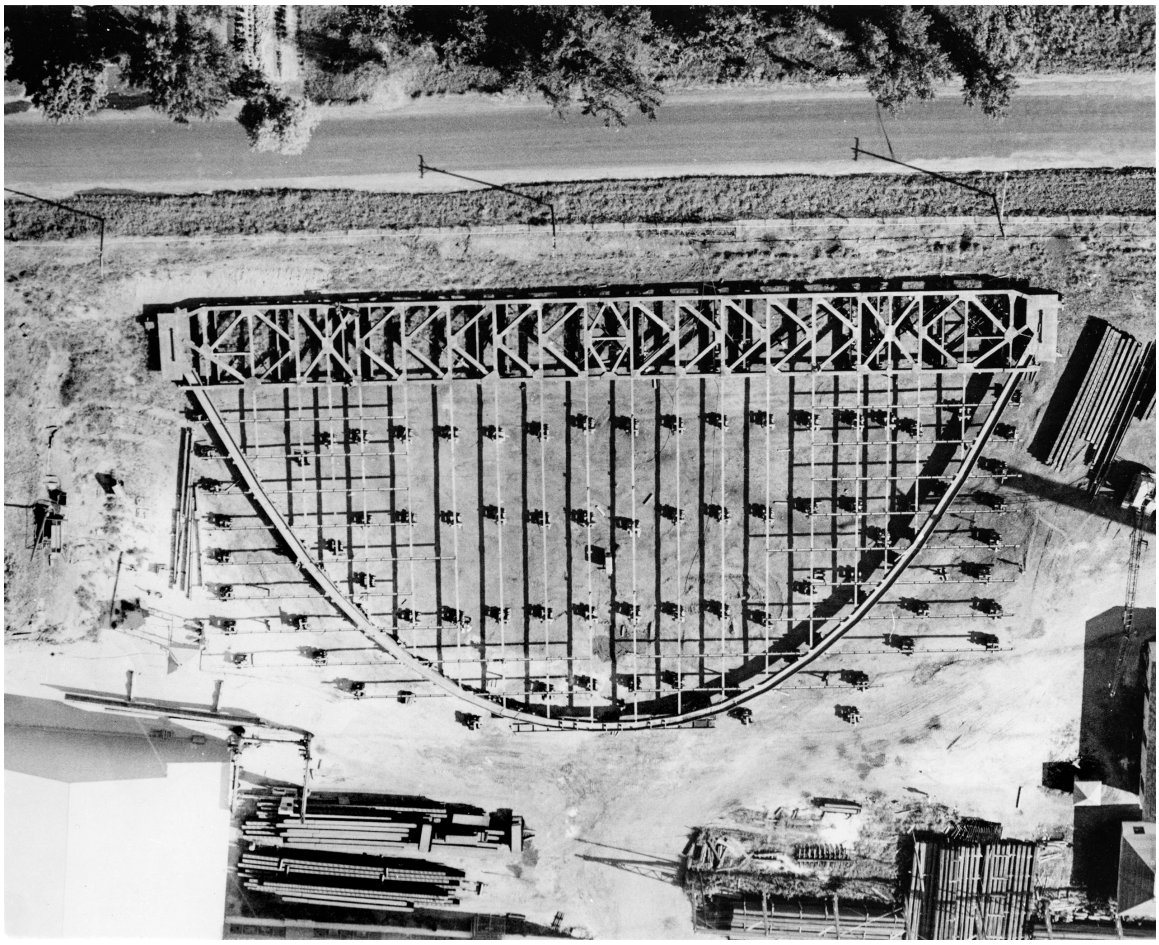


Figure 3.22 Undated photograph of catenary steel structural frame for FRBM provisionally assembled at steelyard for test fitting. Black and white print, 8 x 10 inches. Box 13, GBP, BHL.

Figure 3.23 A steelworker tensions one of the eight suspension cables that support the FRBM office tower, April 1971. From: Federal Reserve Bank Ninth District, "Cablegram: Fact Sheet/The New Federal Reserve Bank," September 7, 1973. Box 17, GBA records, BHL.

Figure 3.24 FRBM construction progress photographs showing preparation of steel suspension structure, April 16, 1971. Seen at left is the Northwestern National Life Building by Minoru Yamasaki and Associates, completed in 1965. Black and white print, 8.75 x 10.75 inches. Photograph by Schwang Studio. Box 21, GBA records, BHL.

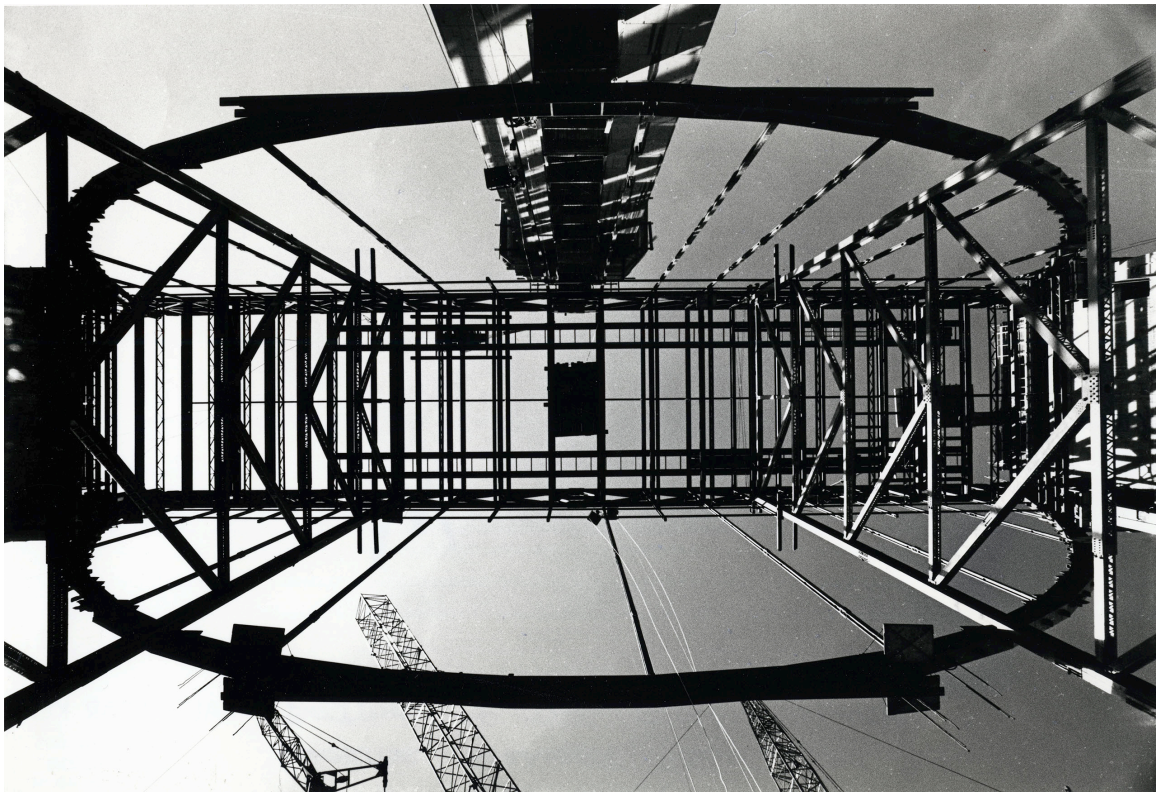


Figure 3.25 FRBM construction progress photograph showing assembly of steel suspension structure, ca. 1971. Black and white print, 8 x10 inches. Photograph by Balthazar Korab. Box 13, GBP, BHL.

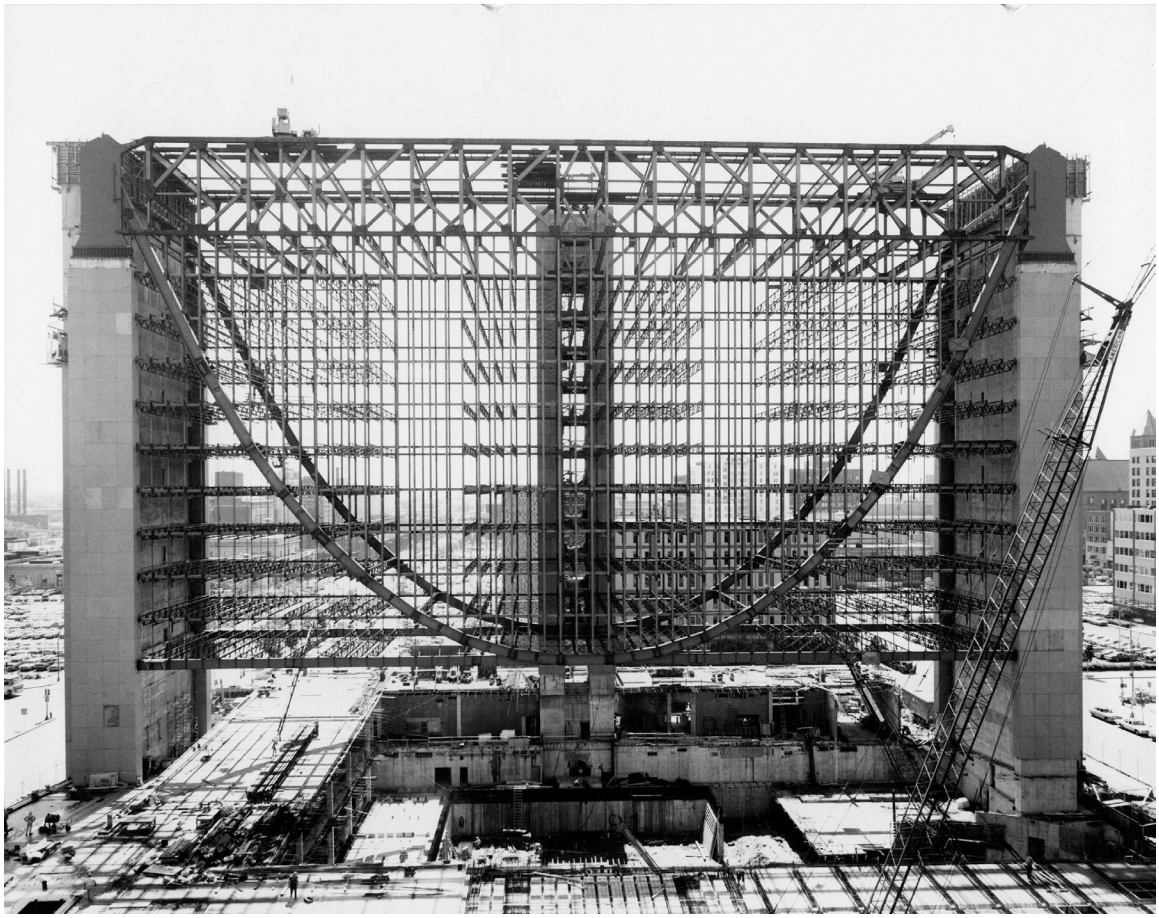


Figure 3.26 FRBM construction progress photograph showing preparation of steel suspension structure, July 13, 1971. Black and white print, 8.75 x 10.75 inches. Photograph by Schwang Studio. Box 21, GBA records, BHL.

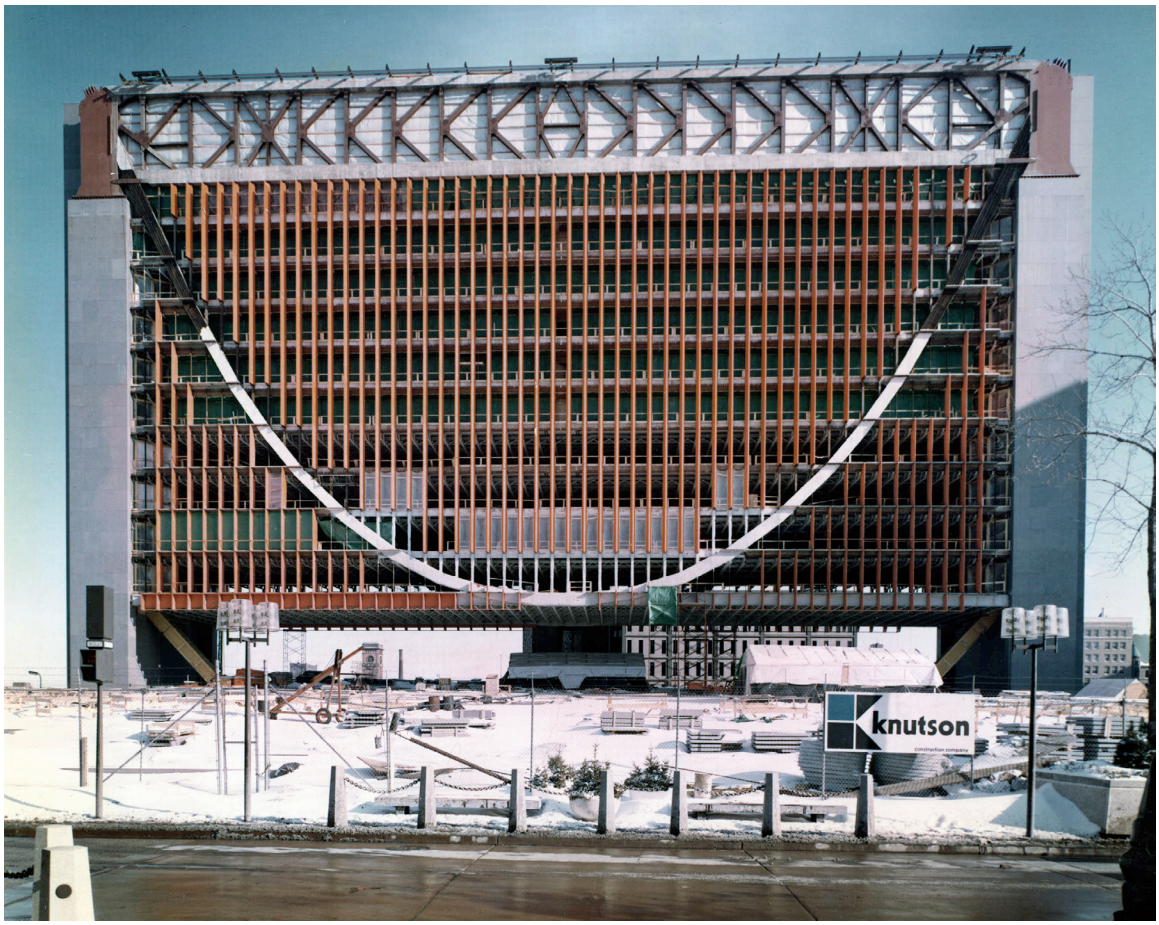


Figure 3.27 FRBM construction progress photograph showing completed floor structure and Knutson Construction Company sign, March 4, 1972. Color print, 8.5 x 11 inches. Photograph by George Otis. Box 21, GBA records, BHL.

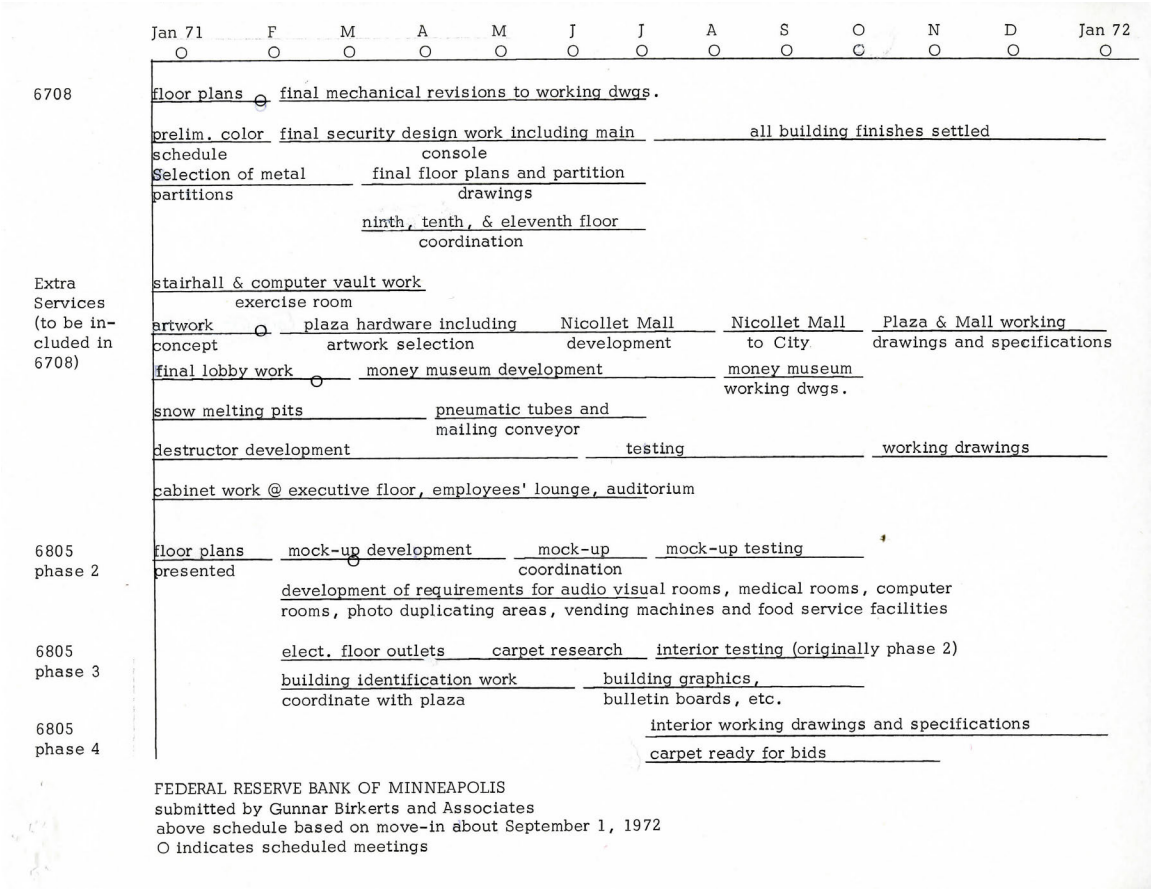


Figure 3.28 FRBM Completion schedule prepared by GBA. Appended to Project 6705 Memorandum #282, January 15, 1971. Box 8, GBA records, BHL.

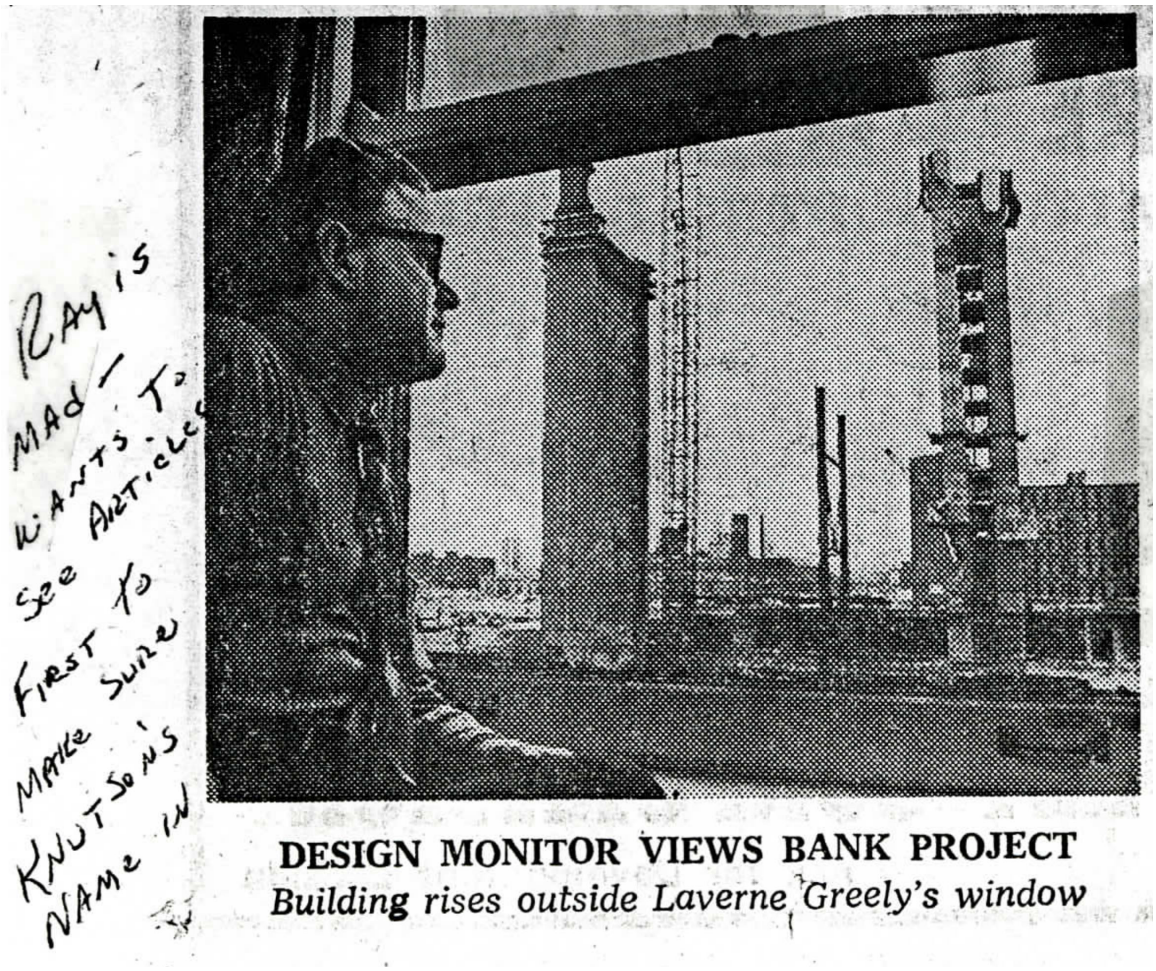


Figure 3.29 Photograph of GBA field representative Laverne Greely published in Daniel M. Upham's "Downtown" column in the *Minneapolis Star*. Annotations at left, presumably by Greely, mention Knutson Construction Company project lead Ramon M. Lopez ("Ray"). Photographer unknown. From: Upham, "Federal Reserve a first in suspension building," *The Minneapolis Star*, December 9, 1970, 26B. Box 17, GBA records, BHL.

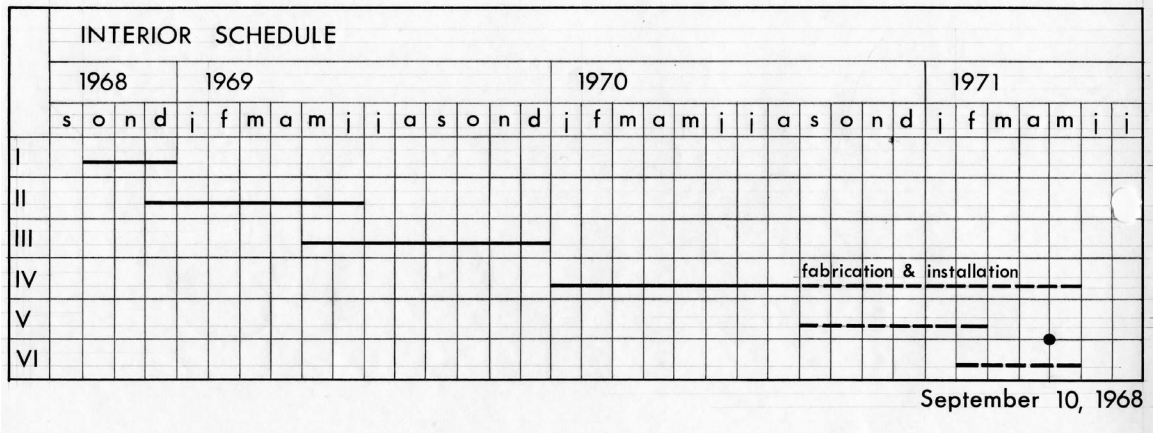


Figure 3.30 Bar chart-style schedule for interior design phases I-VI, prepared by GBA, September 10, 1968. Box 19, GBA records, BHL.

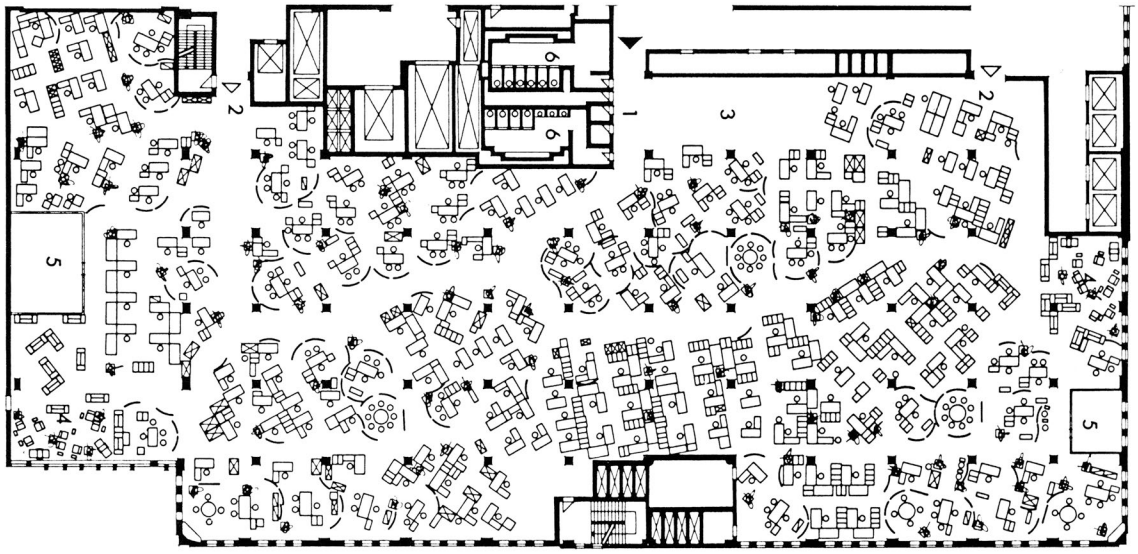


Figure 3.31 Office landscape test layout by the Quickborner Team at Eastman Kodak headquarters, Rochester, New York, 1967. From: John Pile, *Open Office Planning* (New York: Whitney Library of Design, 1978), 163.

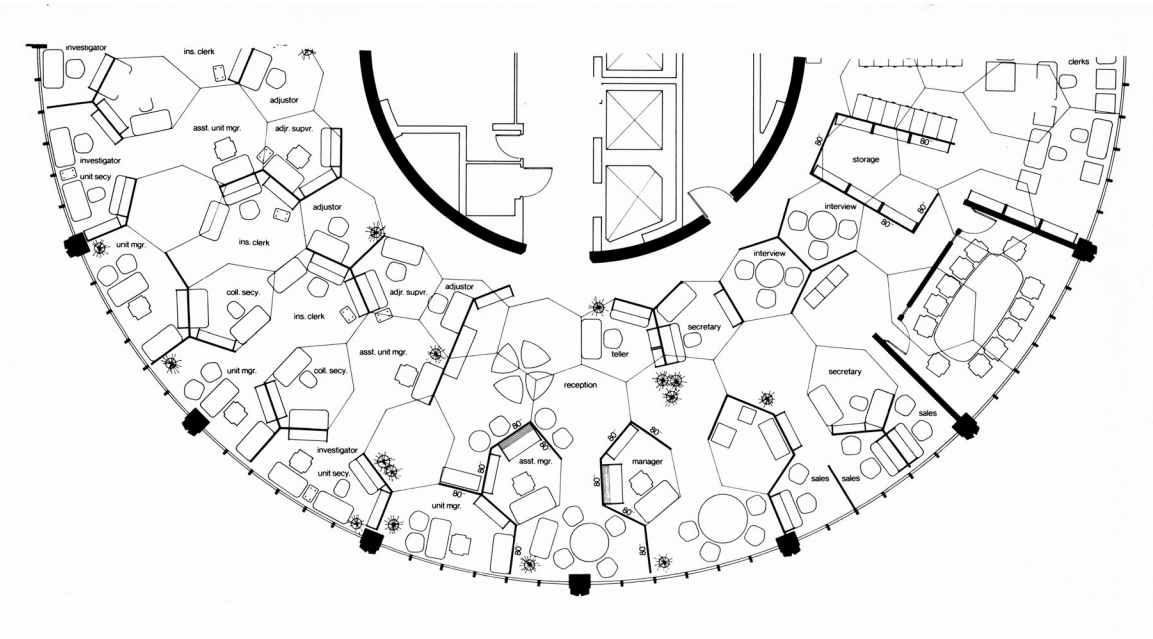


Figure 3.32 Aeck Associates, Inc., Architects, Citizens and Southern National Bank Tower, Atlanta, Georgia, late 1960s. Half of circular typical floor plan showing distorted hexagonal grid used for deployment of Herman Miller's Action Office II furniture system. From: Pile, 169.

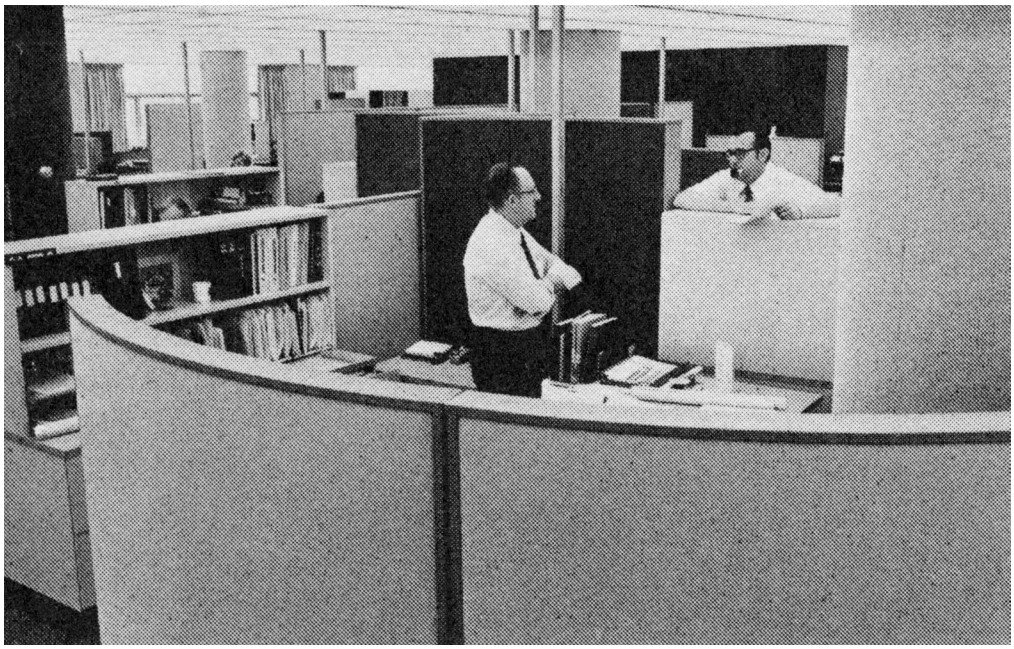


Figure 3.33 View of the Eastman Kodak office landscape test area showing curved acoustical privacy panels, in foreground, Rochester, New York, 1967. From: Pile, 164.

Figure 3.34 View of the Eastman Kodak office landscape test area showing hinged acoustical panels, at left, Rochester, New York, 1967. From: Pile, 164.

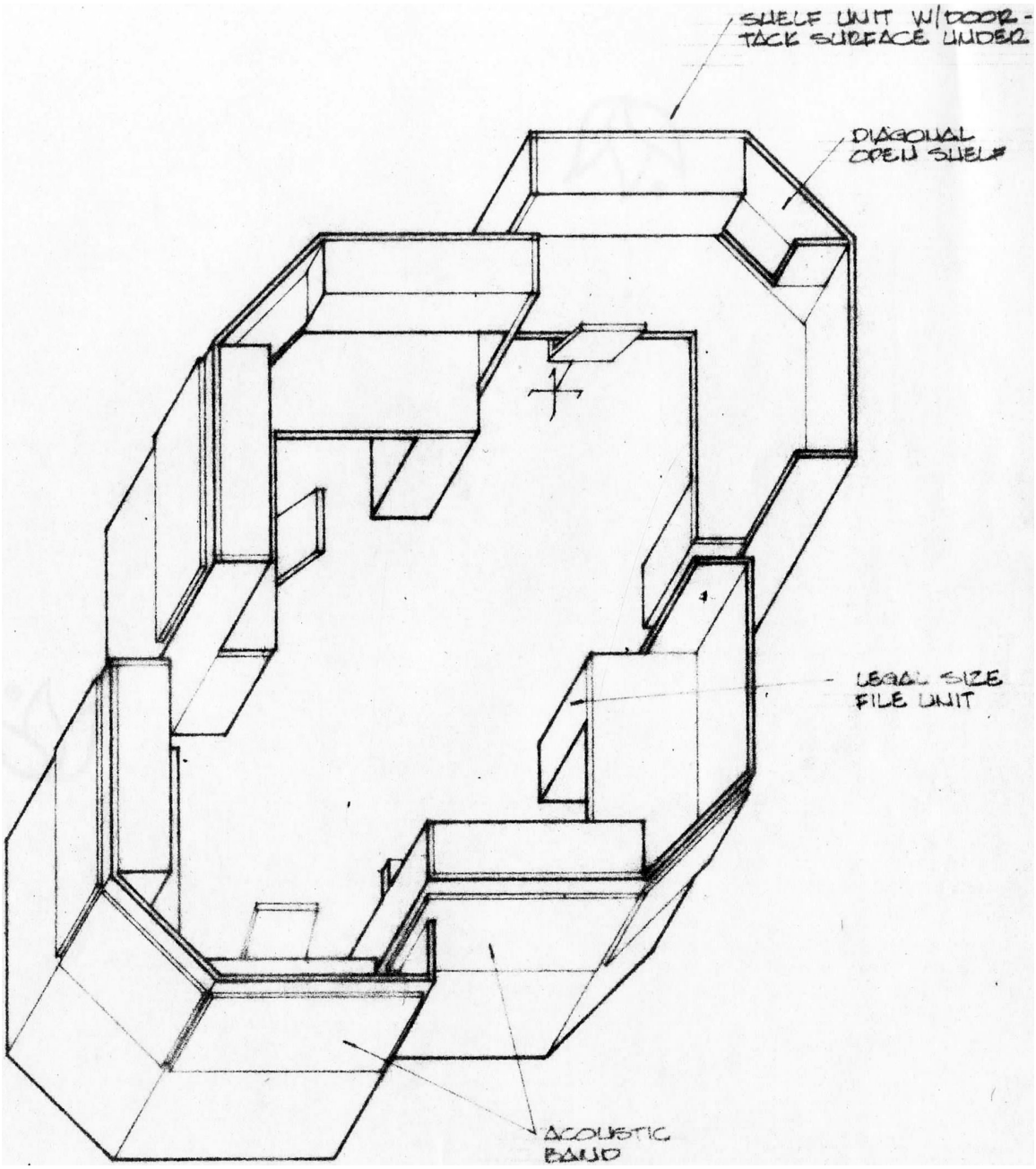


Figure 3.35 Isometric drawing of proposed "modified landscape" workstation system for FRBM, version 1, sent to General Fireproofing Company April 7, 1971. Box 19, GBA records, BHL.

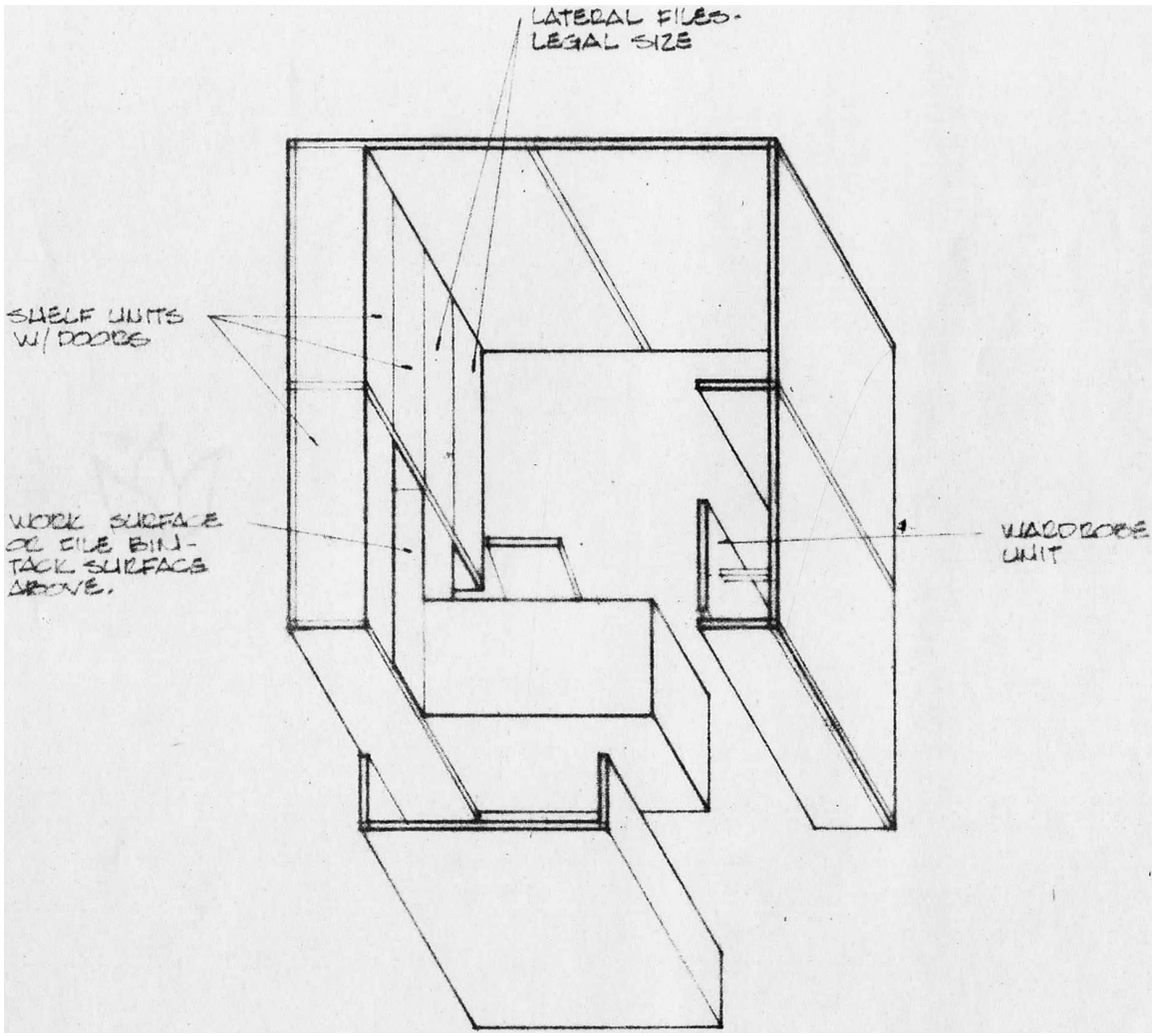
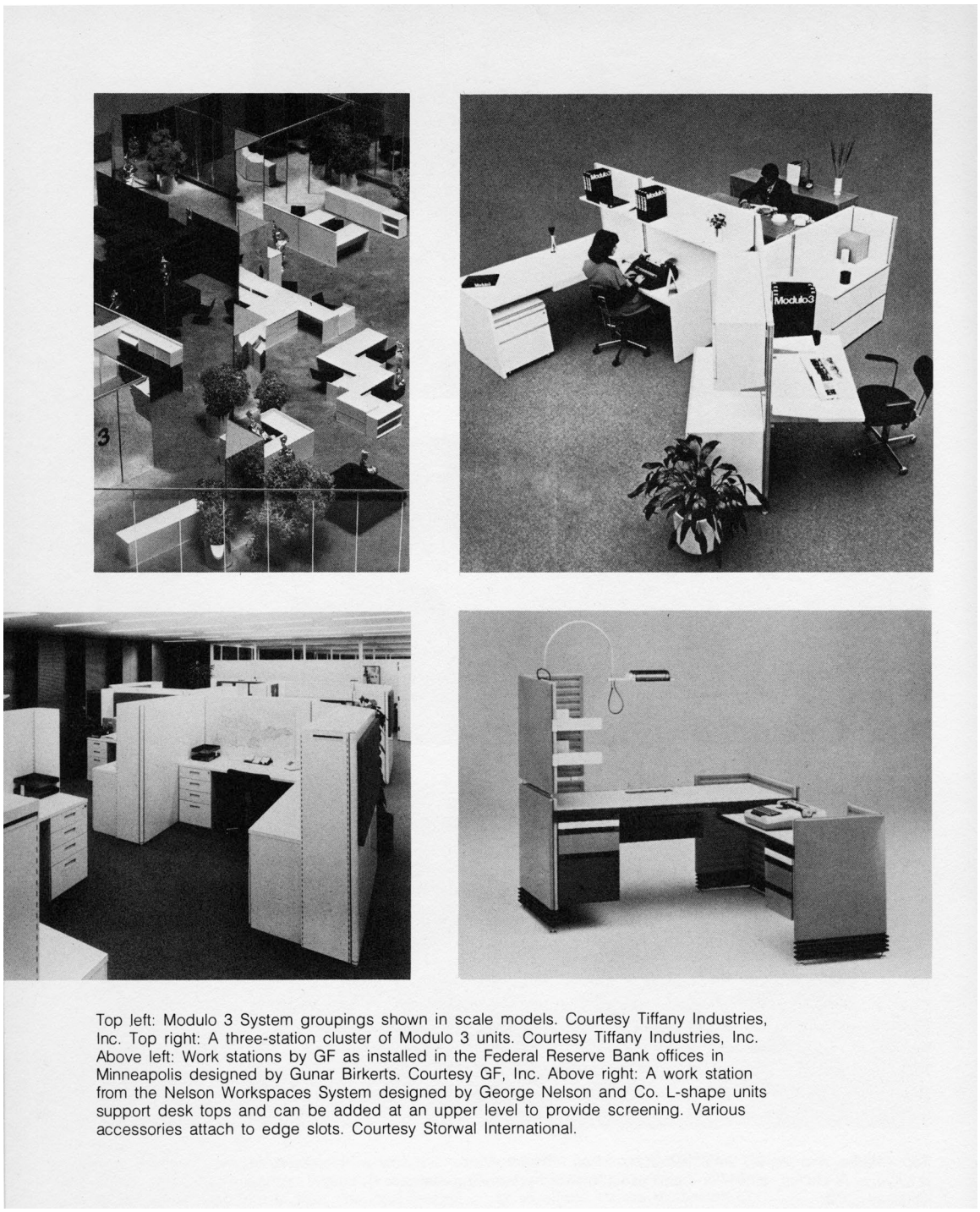


Figure 3.36 Isometric drawing of proposed "modified landscape" workstation system for FRBM, version 2, sent to General Fireproofing Company April 7, 1971. Box 19, GBA records, BHL.



Top left: Modulo 3 System groupings shown in scale models. Courtesy Tiffany Industries, Inc. Top right: A three-station cluster of Modulo 3 units. Courtesy Tiffany Industries, Inc. Above left: Work stations by GF as installed in the Federal Reserve Bank offices in Minneapolis designed by Gunar Birkerts. Courtesy GF, Inc. Above right: A work station from the Nelson Workspaces System designed by George Nelson and Co. L-shape units support desk tops and can be added at an upper level to provide screening. Various accessories attach to edge slots. Courtesy Storwal International.

Figure 3.37 FRBM workstations designed by GBA and manufactured by General Fireproofing Company, published in a selection of office furniture systems, bottom left. From: Pile, 118.

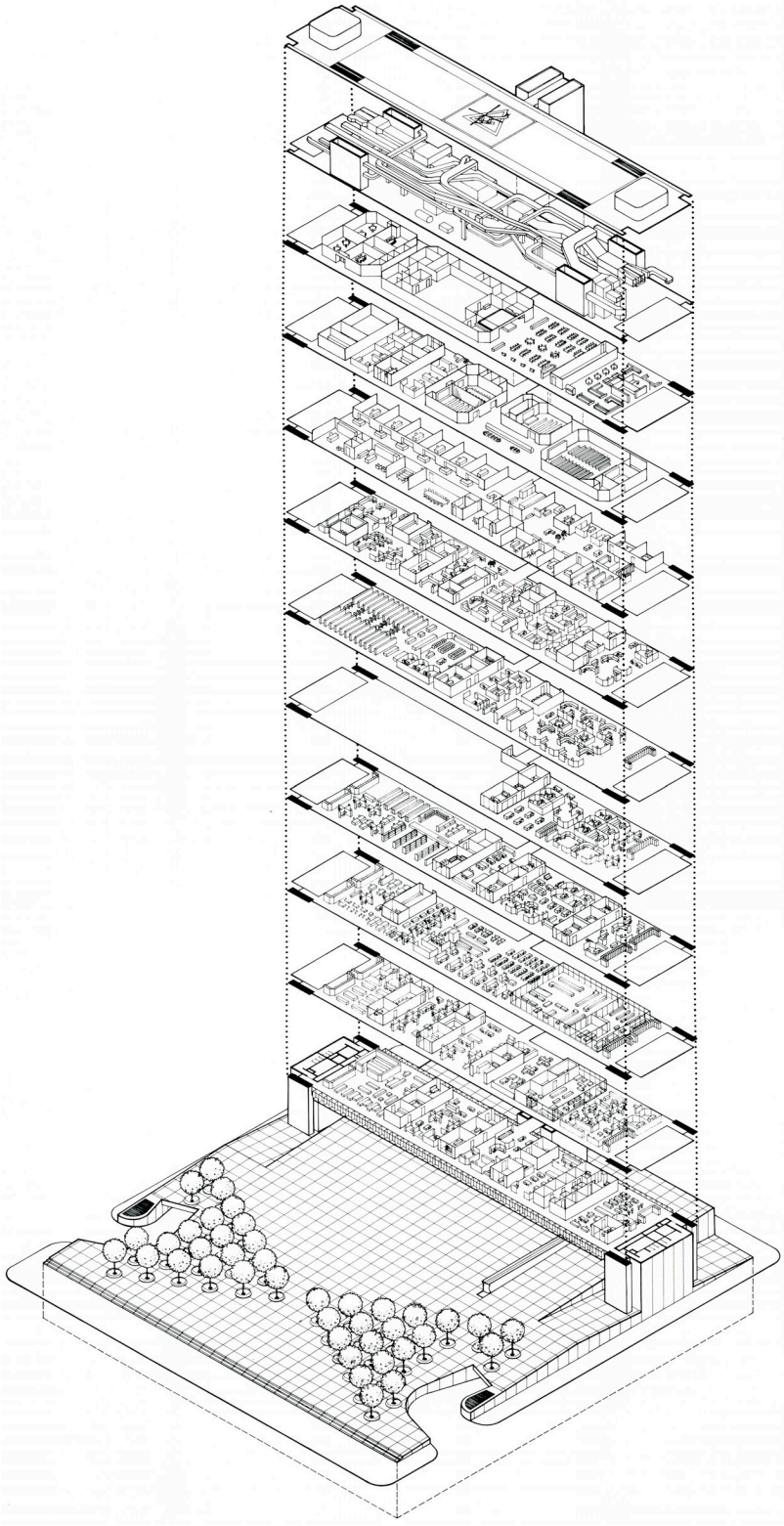


Figure 3.38 Exploded axonometric drawing showing layout of demountable partitions and workstation systems on ten floors of FRBM office tower. Black and white print, 8 x 10 inches. Box 13, GBP, BHL.

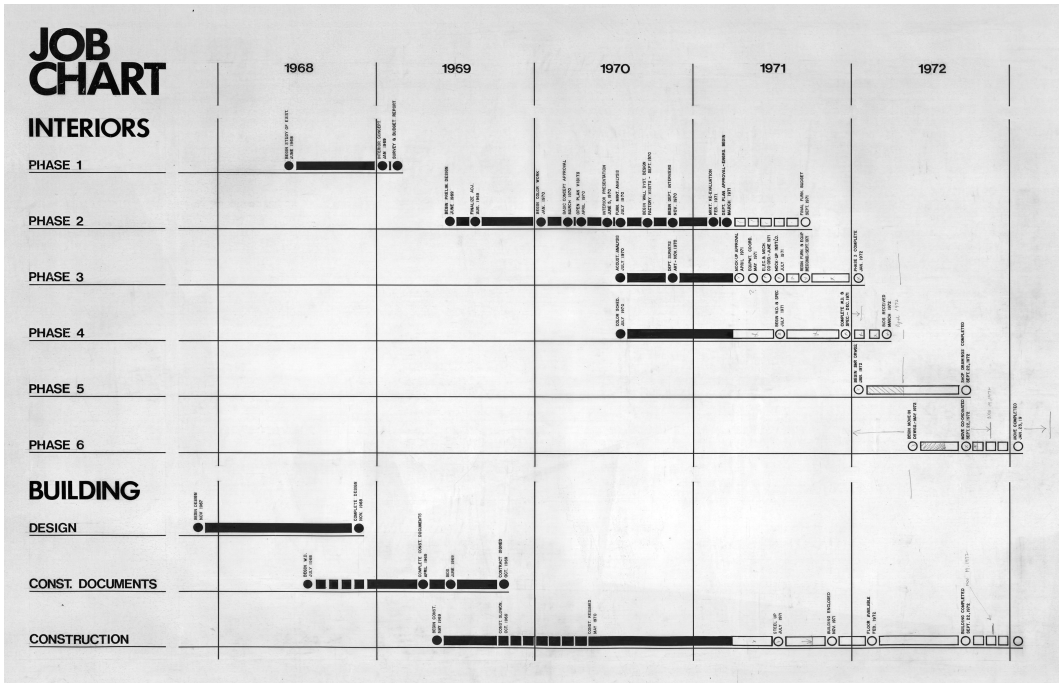


Figure 3.39 Job chart showing interior design phases I-VI alongside general design and construction schedule. Prepared by GBA, March 1971. Ink-on-vellum, 30 x 40 inches. Drawer 14, Folder 82, GBA records, BHL.

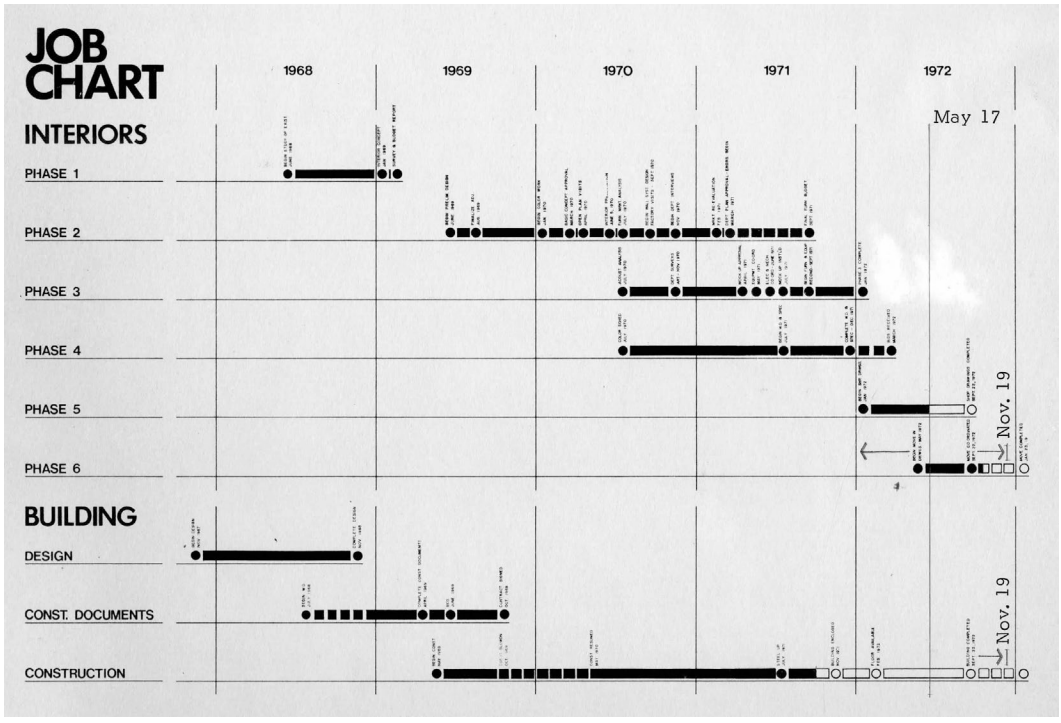


Figure 3.40 Job chart showing interior design phases I-VI alongside general design and construction schedule. Prepared by GBA, May 1972. Photocopy, 8.5 x 11 inches. Box 19, GBA records, BHL.

Figure 3.41 Interior of FRBM prior to installation of furniture systems. Photographer unknown. Box 19, GBA records, BHL.

Figure 3.42 Installation of workstation systems in FRBM. Photographer unknown. Box 19, GBA records, BHL.

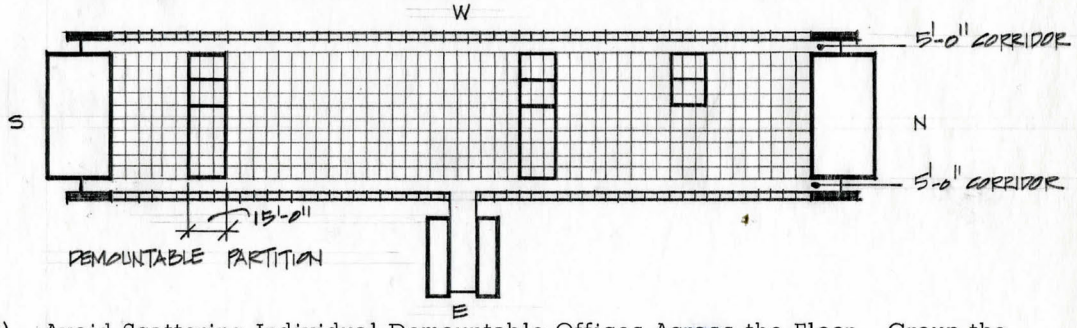
FEDERAL RESERVE BANK OF MINNEAPOLIS
SECOND PHASE INTERIORS
SCOPE OF WORK PROPOSAL

BREAKDOWNS

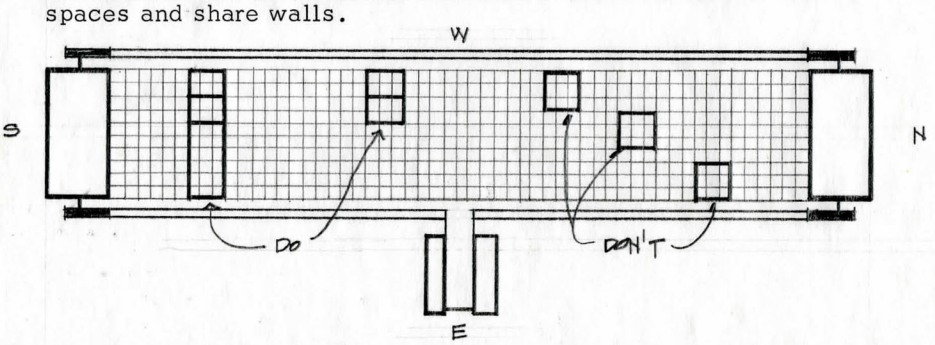
BANK WORK WITH GB&A AS CONSULTANTS
ITEM NO. A1: SPACE PLANNING

DEMOUNTABLE PARTITION GUIDELINES:

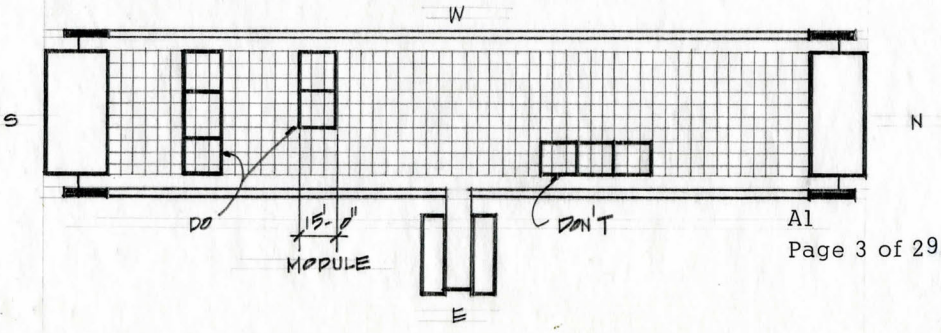
1) Avoid Placing Demountable Partition at the Exterior Glass Wall. Maintain an unobstructed 5'-0" corridor on both the east and west sides of the building.



2) Avoid Scattering Individual Demountable Offices Across the Floor. Group the spaces and share walls.



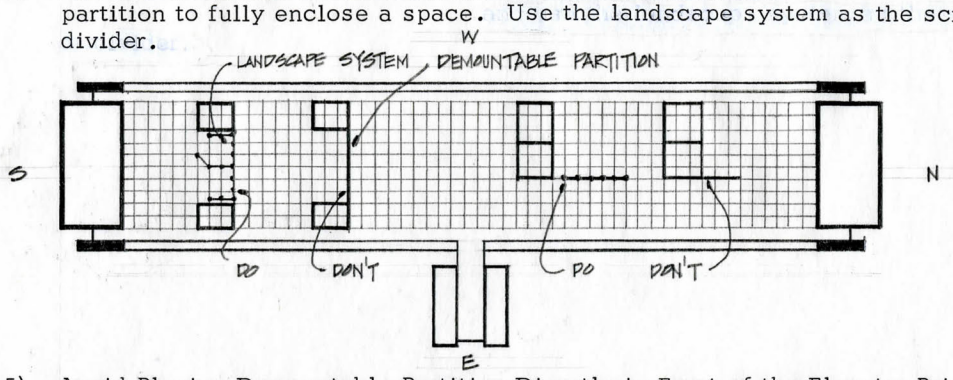
3) Avoid Grouping Demountable Offices in a North-South Direction. Maintain the 15'0" module and group spaces in an east-west "core".



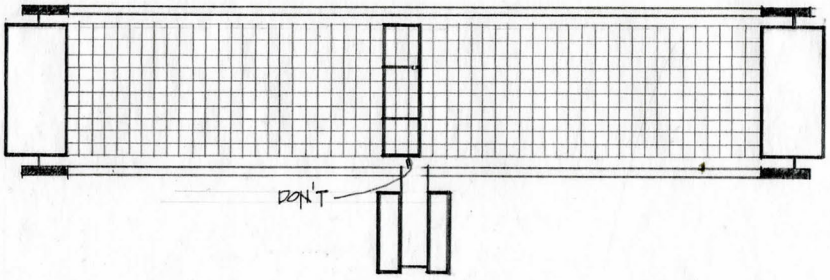
A1
Page 3 of 29

Figure 3.43 Drawings by GBA's Barbara J. Bos, page 3, guidelines for deployment of demountable partitions in FRBM interiors, 1974. Box 19, GBA records, BHL.

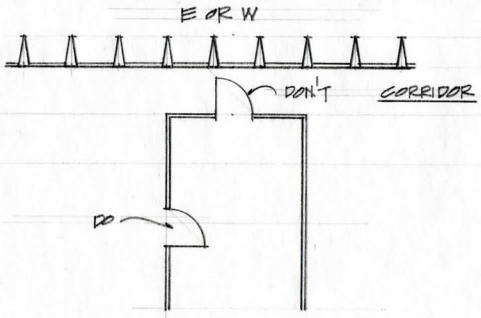
4) Avoid Using Demountable Partition as a Screen or Divider. Use demountable partition to fully enclose a space. Use the landscape system as the screen or divider.



5) Avoid Placing Demountable Partition Directly in Front of the Elevator Bridge.



6) Avoid Placing Entrances to Demountable Office on the Main East and West Corridors.



7) Avoid an over Extensive Use of Demountable Partition. Use only where the function requires audio and visual privacy.

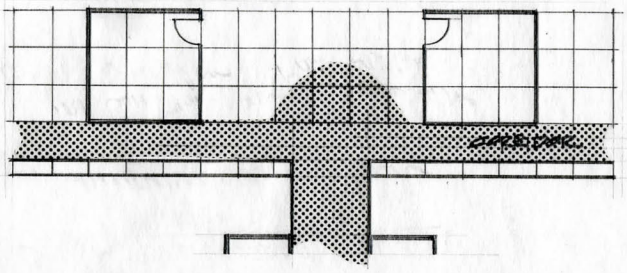
A1
Page 4 of 29

Figure 3.44 Drawings by GBA's Barbara J. Bos, page 4, guidelines for deployment of demountable partitions in FRBM interiors, 1974. Box 19, GBA records, BHL.

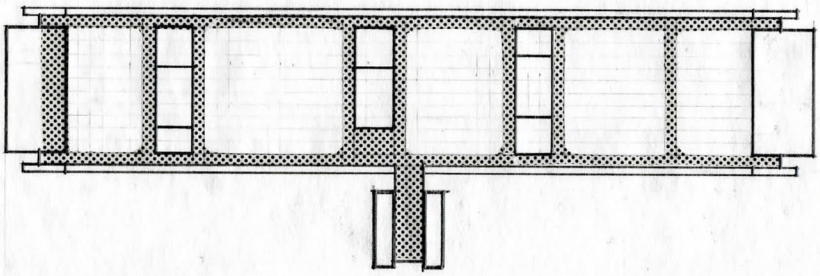
FURNISHINGS GUIDELINES

1) Avoid Placing Landscape or Furniture Along the Elevator Glass Wall. Maintain an ubobstructed 5'-0" corridor on both the east and west sides of the building.

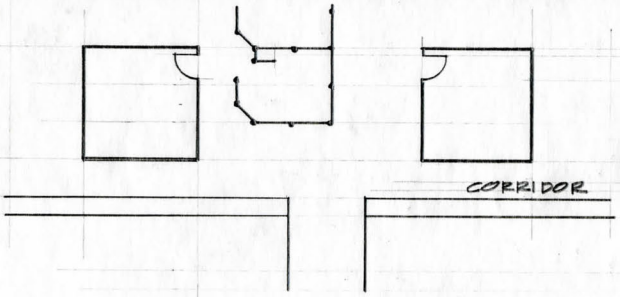
2) Avoid Placing Landscape or Furniture Directly in Front of the Elevator Bridge. Create as much openess as possible.



3) Avoid Placing Landscape or Furniture Against Demountable Partition. Maintain an unobstructed 3'0" to 4'0" corridor around demountable partition.



4) Avoid Placing Entrances to Landscape Units on the Main East and West Corridors.



A1
Page 5 of 29

Figure 3.45 Drawings by Barbara Bos of GBA, page 5, guidelines for deployment of workstations and other furniture in FRBM interiors, 1974. Box 19, GBA records, BHL.

Figure 3.46 Various photographs of completed FRBM interiors, from "Federal Reserve Bank of Minneapolis," public relations booklet published as a supplement to *Commercial West* trade magazine by FRBM Office of Public Information. Box 17, GBA records, BHL. Reformatted by the author to fit this page.

Figure 3.47 Interior of purchasing department on floor 2, FRBM office tower, with General Fireproofing workstations and demountable partitions at left, and bottom of catenary suspension structure at right. Photograph by Balthazar Korab. From: Birkerts and Schwartz, 109.

Figure 3.48 Gunnar Birkerts interviewed on television about the FRBM design in completed "red" conference room on tenth floor of office tower, ca. 1973-74. From: "Federal Reserve Bank of Minneapolis," public relations booklet published as a supplement to *Commercial West* trade magazine by FRBM Office of Public Information. Box 17, GBA records, BHL.

Figure 3.49 FRBM suspension structure as model for urban redevelopment, perspective drawing overlaid on aerial photograph of Detroit, Michigan, 1970s. Black and white print, 8 x 10 inches. Box 13, GBP, BHL.

Figure 3.50 Oblique view, northeast facade of FRBM, ca. 1970s. Black and white print, 8 x 10 inches. Photograph by Balthazar Korab. Box 13, GBP, BHL.

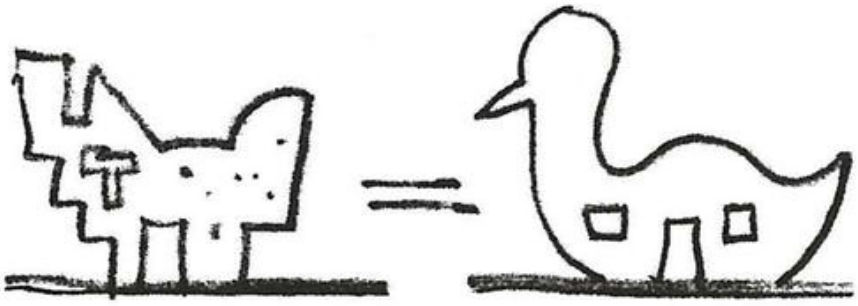


Figure 3.51 "Minimegastructures are mostly ducks," sketch by Robert Venturi and Denise Scott Brown from: Venturi, Scott Brown, and Izenour, *Learning From Las Vegas*, Second edition, 160.

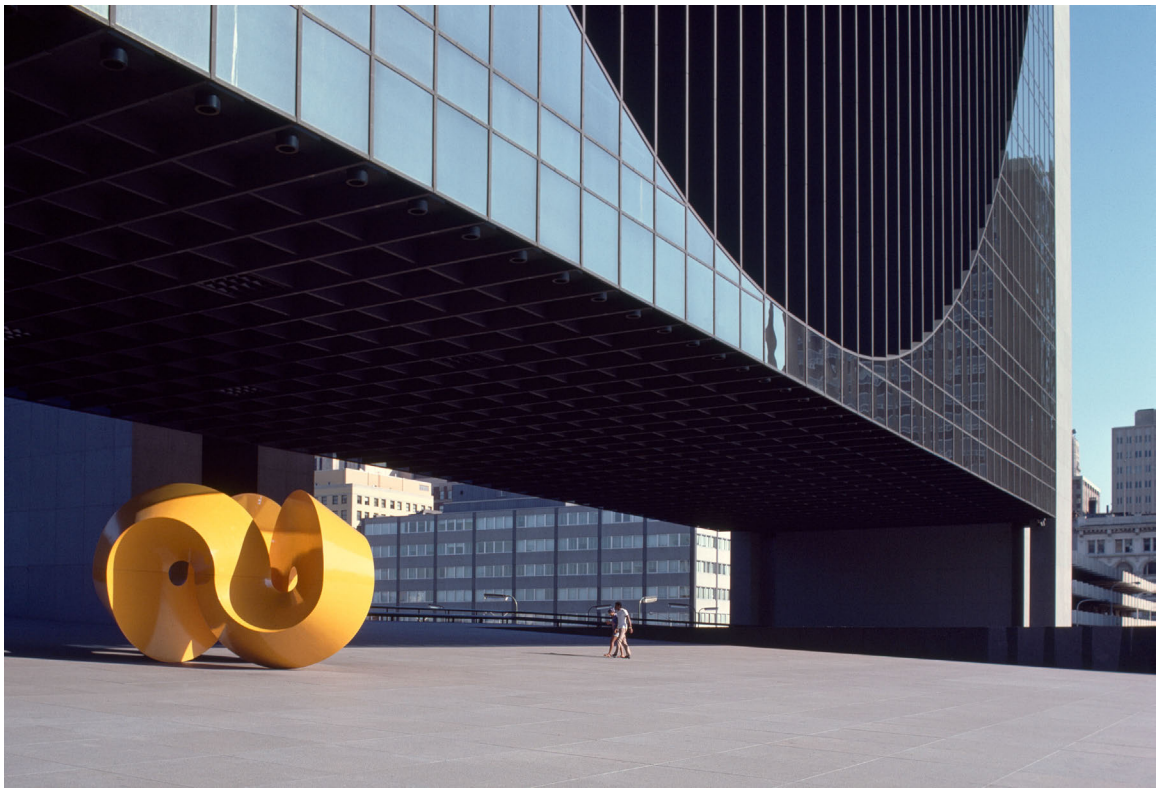


Figure 3.52 FRBM plaza, ca. 1974. Sculpture at left by Charles O. Perry. 35mm slide. Photograph by G.E. Kidder Smith. (c) Massachusetts Institute of Technology.

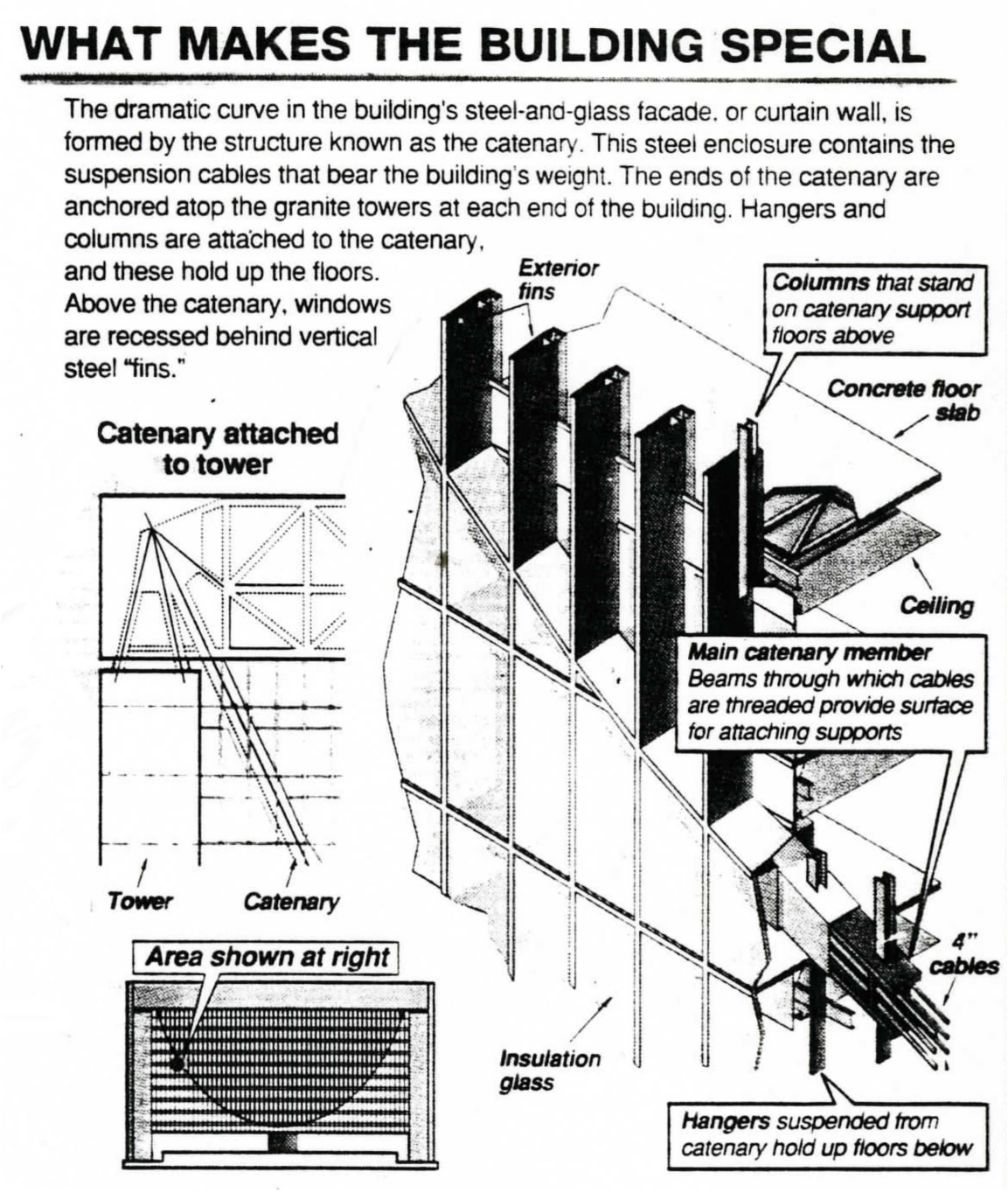


Figure 3.53 Drawings illustrating problems with the FRBM building from *Minneapolis Star Tribune* article "Fed bank's landmark building faces probable doom," (June 23, 1991), 1A. Box 17, GBA records, BHL.

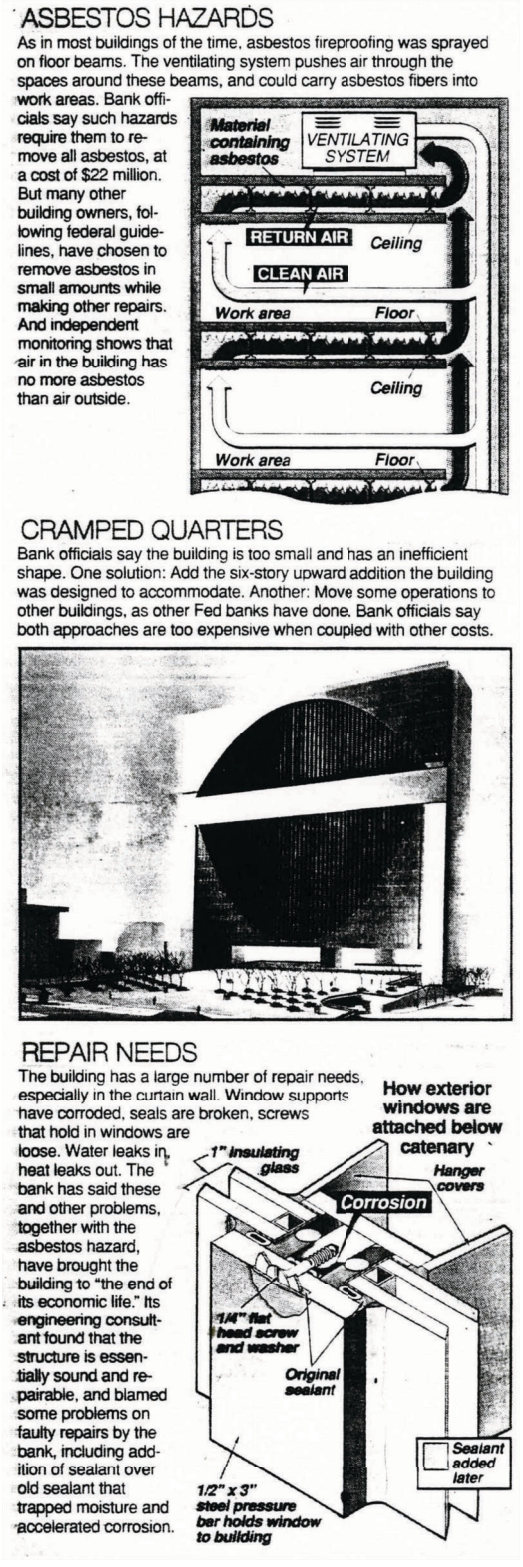


Figure 3.54 Drawings illustrating problems with the FRBM building from *Minneapolis Star Tribune* article "Fed bank's landmark building faces probable doom," (June 23, 1991), 1A. Box 17, GBA records, BHL. Reformatted by the author to fit this page.

Figure 3.55 HOK, Federal Reserve Bank of Minneapolis, Minneapolis, Minnesota, 1997-99. Photograph by Pete Sieger. From: https://www.siegerarchphoto.com/federal-reserve-bank (Accessed October 13, 2018).

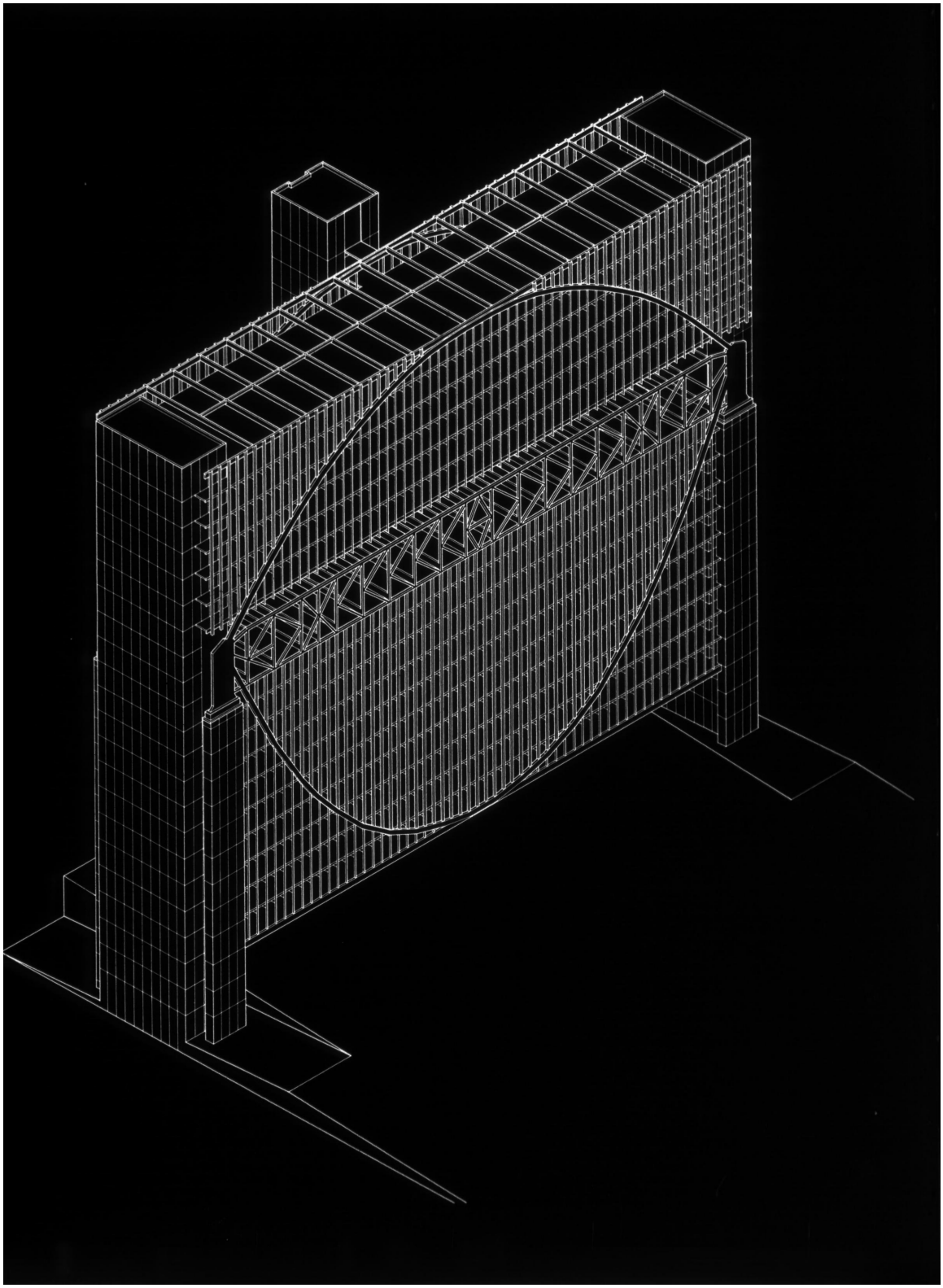


Figure 3.56 GBA, structural diagram showing unrealized addition atop FRBM office tower. 35mm slide. Imageworks, Art, Architecture and Engineering Library, University of Michigan.