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Design-build and building efficiency in the early twentieth century United States

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The history of construction management as it evolved over the twentieth century in the United States remains largely unwritten. Instead, contributions to American construction history have concentrated on the organization of skilled and unskilled building labor, the evolution of concrete and certain other building technologies, and on the development of the architectural profession as such. By describing the extent and place of design-build activity in the early twentieth-century American building world, this paper suggests the rich possibilities of a new area of research for historians of both architecture and construction, as well as of business in general.

Design-build is a mode of building procurement combining the tasks of designing and building an edifice under a single responsibility, thus allowing a close integration of the properly architectural and properly constructive work. Thus defined, design-build may seem as old as architectural construction itself, and to hark back to the building cultures of ancient Egypt or Greece. More specifically, however, and as used in this paper, «design-build» refers to a «building delivery method that gives the owner both design and construction services under a single contract» (Wright 1988, 59). It is one of the characteristically twentieth-century ways of organizing the construction enterprise, «a method of project delivery in which a single entity provides to the client all of the services necessary to both design and construct all or a portion of the project» (Twomey 1989, 3).

Design-build has been and continues to be practiced in a more or less similar form in many countries around the world. Its variants include the «bridging method», «novation design and building, «the «package deal», and the «turnkey method» (Sebastyén 1988, 259). The activity of the firm of Perret *frères* (Auguste and Gustave Perret) in Paris provides an especially well known example (Britton 2001, esp. 20, 22). Japan's Takenata Corporation, now a major player in the design-build sector, traces its history as a design-build company back to the seventeenth-century (http://www.takenaka.co.jp/takenaka_e/his/history.htm). Despite both its apparent roots in traditional craft-building and its actual roots in early twentieth-century construction-management practices, (western) design-build is usually considered to be a mid-twentieth-century novelty. This allegedly «new procurement method» (Sebastyén 1988, 259; *cf.* Solomon 1991) is perceived as having been introduced into the United States around 1970 as a challenge to the then dominant mode of divided-responsibility procurement. The notion persists because practically all available studies of building production in the twentieth-century United States (mostly written by architectural or art historians) attribute a normative status to the latter system, which since the late 1800s has been clearly preferred by American architects. These studies consequently marginalize both the products and the proponents of the alternative, single-responsibility system (*cf.* Davis 1999, 126, 336 n. 5).

To begin to correct the imbalance evident in the historiography, the first section of this paper describes some of the numerous design-build firms —both large and small— operated successfully throughout the United States in the first half of the twentieth century. The primary empirical evidence for what is reported here has been drawn from commercial ephemera, city directories, trade magazines, and general-interest periodicals. Considerable secondary evidence has been harvested from the World Wide Web.

Some American Design-Build Companies

Amy Slaton has mentioned some of these firms in her ground-breaking monograph on *Reinforced Concrete and the Modernization of American Building, 1900–1930*. One «functionally integrated engineering/building firm», the Boston-based Aberthaw Construction Company, she considers as a case study (Slaton 2001, 157–166). Slaton calls attention to the competitive advantage enjoyed in the early twentieth-century American market for new industrial buildings by such «firms that included an engineering division able to design factory buildings and a construction division able to erect the buildings from start to finish» (Slaton 2001, 139–140). Quoting an opinion from William Haber's 1930 study of *Industrial Relations in the Building Industry*, she views the design-build firm as especially well positioned to innovate in the construction field of the early 1900s (Slaton 2001, 140). While this view appears to be well founded, Slaton's focus on factories does leave one with an inadequate appreciation of the application of design-build methods to the production of the full range of American building types.

Among the further examples of combined engineering and building firms Slaton cites is Lockwood Greene Engineers, Inc. This company, which remains in business, traces its history to 1832 (Lincoln 1960) and thus can characterize itself as «America's oldest professional services firm in continuous operation for industrial engineering and construction» (http://www.lg.com/about/lg-story.asp). Although the firm has come to specialize in industrial process engineering and related construction, in the early to mid-twentieth century Lockwood Greene did a large business in design-build work of an architectural character. A 1929 publicity booklet included a selected list of clients for such work running to twenty-three names representing fourteen cities, together with illustrations of numerous school, office, commercial, and religious structures (Lockwood Greene Engineers, Inc. 1929).

The Austin Company, incorporated in 1904 in Cleveland, Ohio as the Samuel Austin & Son Company, is another important design-build firm that evolved into a nationwide concern and remains in business today (http://www.theaustin.com). But whereas the origins of Lockwood Greene were in the engineering and construction of large mill buildings, The Austin Company produced architectural, as well as industrial, work from the outset (Greif 1978, 25–53). Although by the late 1910s the company was becoming best known for its prefabricated «Standard Factory Buildings» of various sizes (and combinable into a theoretically endless number of configurations), it continued to design and build architectural work of high quality for a variety of non-industrial purposes (Greif 1978, 54–92). Throughout its history the company's governing principle has been of «undivided responsibility» for both design and construction of buildings for its clients (Greif 1978, 34–35).

Early on, The Austin Company found itself facing a number of local (not to mention regional or national) competitors in the niche market for factory buildings erected quickly under a design-build contract. For instance, the Truscon Steel Company, operating out of Youngstown, Ohio, from the early 1900s to the early 1960s (http://www.royness.com/product_2.html), produced prefabricated steel building modules. These modules could be combined in various ways in accordance with clients' needs as presented to the company's design advisors (*cf.* Truscon Steeel Company 1919). Similarly, Cleveland's Crowell-Lundoff-Little Company offered clients «eleven styles of economy factory buildings fully designed and ready to build,» as well as the building services themselves.[1] In the mid-1920s the Cleveland-based H. K. Ferguson Company, «engineers and builders» offered nine types of standard factory structures, as well as custom design services on either a design-build or design-only basis (H. K. Ferguson Company 1925).

Other competitors, while emphasizing industrial construction, diversified like The Austin Company into

other building types as well. A notable example was the William Steele & Sons Company of Philadelphia. Billed as «Engineers, Constructors» and prominently illustrating factories and warehouses in their advertisements,[2] this firm is perhaps best remembered for producing Philadelphia's historic Shibe Park baseball stadium (erected 1909; demolished 1976) (http://www.ballparks.com/baseball/american/shibep.htm).

In all probability, a large number of early twentieth-century American design-build firms either concentrated on properly architectural work or eschewed industrial construction altogether. Several of them specialized in bank buildings. A. Moorman and Company, which carried on business in St. Paul, Minnesota, from the early 1900s through the late 1970s (http://special.lib.umn.edu/findaid/html/mss/nwaa0075.html), was responsible for numerous smaller bank buildings throughout the American Midwest (*e.g.*, Bank Buildings of Dignified Aspect 1921). Stylistically, their products seem to have been conservative. Although the significance of the firm to architectural history most likely lies in its bringing high-style classicism to many nondescript small towns, it has (rather unfortunately) been remembered by posterity for its involvement in an unsympathetic remodeling in the mid-1950s of Louis Sullivan's bank at Owatonna, Minnesota (Millett 1985, 159–168).

Like the A. Moorman Company, Hoggson Brothers got its start through the decorating business before specializing in banks and then diversifying. Noble Foster Hoggson established himself as a decorating contractor in New York City about 1889; William J. Hoggson joined the company some six years later. By the 1910s the firm's work included small- and large-scale bank buildings, public libraries, houses, churches, hotels, and multistory office towers. Many of them were illustrated in a unique, lavishly produced promotional periodical, *The Hoggson Magazine*. By 1914 Hoggson Brothers had projects under construction across literally the whole height and breadth of the United States.[3] The company's reputation could have been done no good by the involvement of William Hoggson in a financial scandal in 1927–28 (Trial of Big Suit Over Hotel Begins 8 November 1927; Accountants to Tell How Millions Went 20 November 1927; Accountant Tells How Millions Fled 1 December 1927; $525,477 Awarded to Hotel Investors 2 August 1928). Nevertheless, Noble Hoggson remained a prominent figure in American building business and the company received enviable commissions until at least 1930 (Noble F. Hoggson of Building Firm 26 October 1939).

The Bank Building & Equipment Corporation of America may have taken up the market niche vacated by the decline of Hoggson Brothers in the 1930s. Founded some time before 1940, by the 1960s it had diversified into the hospitality sector and by the 1970s into the healthcare-facilities field.[4]

Beezer Brothers of Seattle (active 1907–1923) offered integrated design and building services to clients widely scattered along the Pacific coast of the United States (including Alaska). Their quick success has been attributed to the company's management practices. As their practice grew, they focused increasingly on banks and religious structures (Rash 1994, 144–149).

The Walter Butler Company, with offices in St. Paul and Detroit, Michigan, and active in the 1940s, appears to have served a nationwide clientele consisting largely of religious organizations. For these organizations the firm offered «complete architectural, engineering, general contracting, and financing services»[5] to produce schools, hospitals, convents, churches, and other buildings in a variety of both traditional and Modern styles.[6]

The Cincinnati, Ohio-based Ferro-Concrete Construction Company variously built works designed by independent architects or engineers (as in the case of the Parr & Fee's 1907–09 Europe Hotel, Vancouver, British Columbia, Canada) (http://www.stgeorges.bc.ca/marker/main/europehotel/fullreport.htm). It also served as design subcontractors to independent architects (as in the case of the 1902 Ingalls Building in Cincinnati) (http://enr.construction.com/aboutUs/125enrHistory/990201.asp). Additionally, it would offer design-build services directly to project owners (as in the case of the Finch Building, Aberdeen, Washington) (http://www.e-history.com/Site/Site_USA_WA_G.htm).

In contrast to the above firms operating on a national (even international) —or at least regional— scale, the Los Angeles firm of Meyer & Holler concentrated on a local market. Incorporated in 1906, Meyer & Holler developed into one of the largest building firms in Los Angeles before declaring

bankruptcy in 1932 as an indirect result of litigation related to California's architectural registration laws. Apparently founded as a design-build concern, the company at any rate opted definitively for the design-build approach very early in its history. At first emphasizing domestic work of an increasingly important scale, Meyer & Holler switched to an emphasis on commercial work after World War I. Integral to the company's strategy for success was the offering of architectural design services of an unusually high level of quality, which it was able to due as a result of hiring some of the finest architectural design talent available in southern California in the 1910s and 1920s. Only on very rare occasions did it contract to erect projects designed by independent architects (Willis 2000).

Alongside the large firms just described, numerous smaller design-build firms operated in the major and minor cities across America during the first half of the twentieth century. Not surprisingly, many of them reached the peak of their success during the booming 1920s. In most cases, little is known about them beyond the fact of their pursuit of design-build contracting.

Federici Armezzani & Co. were design-builders operating out of Paterseon, New Jersey, in the very early twentieth century, and as such were responsible for the remarkable reinforced-concrete church of Our Lady of Loretto in Brooklyn, New York (Concrete Church with Ornamental Cast Concrete Details 1928). Hans Baer has been recorded as a «designer and builder» active in Newark, New Jersey, in the mid-1920s (When a Builder Builds 1924). Arthur H. Higgins was reportedly an «architect and builder» around the same time in Staten Island, New York (Two Types of Popular House Designs 1924). The Fred F. French Company of New York City, best known as a developer, kept architects on staff and engaged at least occasionally in design-build work (*e.g.*, Two Modern Apartments for City and Country 1918). In Jacksonville, Florida, Henry A. Taylor operated primarily as a builder but sometimes provided architectural services as well to his clients (http://jaxhistory.com/architects.htm). Thomas K. Windham, Inc. of Atlanta, Georgia, promised clients a service that «is complete, from the assembling of the plans to the planting of the shrubbery» (Fistere 1930, 45). The H. E. Hanna Company of Tulsa, Oklahoma, was reported in 1925 to have comprised «seven complete departments — the retail lumber department, the architectural department, the construction department, the decorative department, the electrical department, the planing mill, and the financial department.» This organization clearly indicated a core business devoted to design-build (Handley 1925). On his letterhead of 1932, H. K. Nicewanner of Muncie, Indiana, portrayed himself as a «designer and builder» of houses, factories, and storefronts (Builders Active in Modernizing Drives 1932). The unusually successful John W. Murphey Building Company, designed as well as built numerous residences in and around Tucson, Arizona (Keith 1931, esp. 66–67).

In southern California, an enormous number of smaller operated in the early twentieth century, no doubt providing stiff competition for Meyer & Holler and The Austin Company (*e.g.*, Three Plants to Build 18 November 1923). Here only a tiny fraction can be mentioned. One of the most successful, the Frank Meline Company specialized in houses for the relatively well-to-do, such as the remarkable home of silent-film star Tully Marshall (A Moroccan House in California 1923.). A number of companies specialized in designing and building the more modest bungalows for which southern California became famous: among them, for example, were Pacific Home Builders (*e.g.*, Blending of Chalet and Bungalow 1914) and the Edw[ard] E. Sweet Designing and Building Company. Around 1910–11 this firm became one of the many in California that published so-called «bungalow books» to promote their business (Edw. E. Sweet Designing and Building Co. [1911?]). The brothers Arthur S. and Alfred Heineman are best known for designing and building bungalows, but their extensive record of design-build work in fact covered a range of building types (Winter 1997). John Manley Close specialized in designing and building apartment houses, noted for their exotic styling and mostly built on speculation. «We design —we build— we finance,» stated one of his advertisements in 1924.[7] Franklin Harper was a design-builder remembered for his striking Granada Shops and Studios building (Gleye 1981, 82; Moore, Becker and Campbell 1984, 146–147). Indicative of the proliferation of design-build firms in Los Angeles during the boom years of the 1920s were illustrations of work by three different firms —The Austin Company, the Garden City Company of California,

and Luther T. Mayo, Building Contractor— in a single 1922 issue of the *Los Angeles Times*.[8]

Design-Build as a Phenomenon in American Building History

From the foregoing brief, and necessarily very incomplete, survey, it is obvious that the single-responsibility, design-build procurement system enjoyed a widespread popularity from 1900 onward throughout the United States. Although never the only system in use and probably never even the dominant system, single-responsibility design-build procurement remained viable well beyond the end of World War II. Evidence is found in publications,[9] in expressions of concern about the system by independent architects committed to the divided responsibility contracting (Banister 1954, 27), and of course the survival of such firms as The Austin Company. Both large and small firms were involved. Their products ranged widely in scale and quality, but included many structures meeting extremely high standards of design and structural integrity.

Those firms emerged and flourished in the United States during a time of great (though unsteady) growth in the American construction sector. From the late 1800s into the 1920s, new managerial challenges emerged as contractors adapted their organizations and craftsmen their ways of working to the demands of increasing volume and scale of building in burgeoning urban areas. By necessity those involved in the building trades sought new approaches to meeting those challenges (Clark 1928, 182–223).

One leading such approach, «scientific management,» addressed the challenges of increasing the efficiency with which the actual work of building was carried on. Both of the major proponents and theoreticians of scientific management, Frederick Taylor and Frank Gilbreth, originally applied their seminal work in modern management theory to construction problems. Taylor, though by training a mechanical engineer, worked from 1896 with Sanford E. Thompson on motion studies in the building trades; they co-published two treatises on concrete construction in 1905 and 1912 (Copley [1923] 1993, 1: 411–413). Gilbreth was a general contractor (Gilbreth [1925] 1973, 19–23) whose practical experiences in managing construction work he set forth in his highly influential *Field System* published in 1908 (Gilbreth 1908 [1973]). The influence of Taylor and Gilbreth is clearly evident in Daniel J. Hauer's treatise on *Modern Management Applied to Construction* of 1918. Martin Greif has speculated on the influence of Taylor's theories on the practices of The Austin Company (Greif 1978, 18). Slaton has documented a more direct impact of Taylor and Thompson on those of the Aberthaw organization, which she characterizes as «typical of those of large firms of its day» (Slaton 2001, 158). But the contributions of Taylor and Gilbreth to the development of construction management specifically seldom receive more than a passing mention in the general historical literature (*cf.* Sebastyén 1988, 242; Davis 1999, 134). The pervasion of early twentieth-century American construction scientific management remains to be documented, in part from evidence that can be collected from the periodical literature of the period (*e. g.*, Moulton 1930).

Besides scientific management itself, other approaches addressed the challenge of increasing the efficiency of the contracting enterprise itself, broadly defined as the procurement of new buildings through the contractually governed cooperation of owners, architects, engineers, contractors, and building workers. The best known (and most permanent) of this class of approaches involved the displacement of procurement by individual contracts by general contracting in the context of a divided-responsibility arrangement wherein an architect positioned himself as an intermediary between a client and the builder (Delhi 1908). Another, intending to reduce costs and delays in construction while giving builders an incentive to keep quality high, was the exploration of various forms of unit-price and cost-plus contracts (Affelder 1924; Tuttle 1931). Exploitation of single-responsibility contracting was a third such approach, intended to reduce inefficiencies perceived as arising in the construction process due to conflicts of interest, or inadequate cooperation, between architects and builders (Bowen 1913).

If the evidence for the existence of single-responsibility, design-build contractors in early twentieth-century America is fairly abundant, the evidence for exactly how they operated is relatively scant. Much of the surviving evidence is provided by the firms' own advertising brochures and published

displays. Combining text, pictures, and diagrams, these advertisements emphasized the efficiency or economy of a design-build approach, while positing its novelty (and, by implication, modernity).

Advertising graphics used by The Austin Company in the 1920s contrasted the simplicity of its «unit responsibility» approach to the complexity inherent in «the old way» of contracting, which exposed the client to the pitfalls of dealing separately with an architect and (potentially) numerous contractors (Austin Company 1925, 42–43; *cf.* Greif 1978, p. 65). As the company had done since at least 1913 (and perhaps as early as 1901), it referred to its «new way» of doing business as «The Austin Method» (Greif 1978, 35). Meanwhile, in a long series of advertisements, The Austin Company had intimately associated its «Austin Method» with low-cost and speedy construction.[10] The overall effect of these coordinated efforts at self-representation was to associate single-responsibility contracting with overall efficiency in the minds of potential clients.

Hoggson Brothers, which promoted their single-responsibility approach to contracting as the «Hoggson Method,» used two telling graphics in some of the firm's earliest national advertising.[11] The first was a diagram purporting to show Hoggson Brothers' organization as a firm «whose business it is to select and supervise every phase of bank building and residence work, from the original plans to the smallest detail of the furnishing and decoration.» In this diagram, «Hoggson Brothers» itself appears at the center of an array of all the tasks to be carried out in a building project, and thus in a position to control all of them simultaneously.[12] The second diagram again has Hoggson Brothers in a central position, but now shown between the Owner and a triumvirate of key personnel within the Hoggson Brothers organization —the architect, the decorator, and the builder— all under the control of the firm's administration. In a 1916 article in the *Hoggson Magazine*, Hoggson Brothers showed through a series of captioned illustrations how a slight variant of that second diagram related to the actual internal organization of the firm. The same article explicitly noted the two main features of the «economical, efficient, and equitable» single-responsibility approach touted as the «Hoggson Building Method» —combining «the functions of the architect and engineer, builder, and decorator, in one comprehensive organization, under a single management,» and guaranteeing «in advance to the prospective building owner the cost of his operation» (Profession of a Business Firm 1916).

It seems likely —even certain— that design-build under single-responsibility contracts resulted in the delivery of numerous efficiently and economically constructed buildings to countless satisfied owners across the United States during the first half of the twentieth century. These buildings, by the way, probably satisfied the aesthetic as well as the financial and practical needs of those owners. While many of these buildings were conservative or even pedestrian in design —and many more were frankly utilitarian— others were no doubt striking or even innovative (Willis 200, 601–602).

It seems unlikely that this form of procurement survived from nineteenth-century craft-based master-building, or that it evolved out of that tradition in any simple way. Although leaders of early twentieth-century American design-build firms (like Samuel Austin of the Austin Company) did have experience in the building trades, many others came to design-build contracting from quite alien backgrounds. For example, Noble Hoggson of Hoggson Brothers had an academic background as a graduate of Yale University; William Hoggson brought to the same firm experience in manufacturing (Profession of a Business Firm 1916, 41, 43–44). Mendel Meyer of Meyer & Holler came to contracting from a varied background in retailing, food processing, and stabling.[13] John W. Murphey of Tucson held a university degree in engineering (Keith 931, 68). Rather, single-responsibility design-build procurement more likely developed, alongside the divided-responsibility system and general contracting, out of the particular relations of building production prevailing in America shortly before and after 1900. Its promises of efficiency, simple and square dealing with clients, and fair profits to the contracting firm, responded to contradictions inherent in a building world founded upon the exploitation of wage labor on the one hand and (through the competitive bidding system) the exploitation of owners' instinctive thrift on the other. In this world, the competing interests of contractor, architect, and client could be resolved only by a struggle for power.

Now, it could be cogently argued that architects played a decisive role in reducing the (economic)

efficiency of building operations in the 1920s (Haber 1930, 71; *cf.* Woods 158). Nevertheless, the American architectural profession ultimately proved quite successful in promoting the divided-responsibility system through which it could most easily secure and maintain the power of its own members. That profession did so in part by promoting architectural-registration laws that had the effect of hampering design-build practice.[14] Holding that «a reputable architect must not engage in the business of construction contracting» (Banister 1954, 27) the American Institute of Architects meanwhile exerted strong social pressure on architects to avoid employment by contractors.

Much research remains to be done to reconstruct the history of construction management (as distinct from, though related to, building technology) in the United States. This contribution to such a history has shown that the growing interest in design-build evinced in the United States since the 1970s was not really a novelty. It is better seen as the revival of an approach to building procurement that had known considerable success in the first half of the twentieth century. In both periods it responded to pressures to increase the efficiency of building procurement. These pressures, perceived as imperatives, are practically identical to those still urgent today —decades after the divided-responsibility system achieved unquestioned dominance.

Notes

1. See advertisement appearing in the *Literary Digest* for 9 February 1918, 45.
2. See, *e.g.*, advertisements appearing in the *Literary Digest* for 30 March 1918 (55), 13 April 1918 (49), 11 May 1918 (34), and 6 July 1918 (60).
3. See illustrations in *The Hoggson Magazine* 1 (September 1914); 6, 34.
4. Information kindly supplied by Emily Troxell Jaycox from the records of the Missouri Historical Society. See also a Unit Structures, Inc., advertisement inserted into *Architectural Record* 130 (October 1961) following p. 48.
5. See advertisement appearing in *Church Property Administration* 12 (May-June 1948), 63.
6. See advertisement appearing in *Church Property Administration* 11 (September-October 1947), 48–49.
7. See advertisement in the *Los Angeles Times* 21 September 1924, pt. 5, p. 4, col. 4.
8. See the *Los Angeles Times* 19 November 1922, pt. 5, p. 14, col. 5; p. 16, col. 3; p. 2, col. 6 (advertisement).
9. *E.g.*, an advertisement appearing in the *Architectural Record* 104 (December 1948), p. 229, featured an apartment building attributed to the «E. L. Anderson Company, Chicago, Designers and Builders.»
10. See advertisements placed in the *Literary Digest* between 12 January and 5 October 1918, *passim*.
11. See advertisements in *House Beautiful* for March 1906 (p. 8) and January 1907 (p. 6).
12. This diagram calls to mind the slogan, «Steele Centralized Responsibility,» used slightly later by William Steele & Sons to epitomize its own practice as a design-build contractor (William Steele & Sons Co. 1919).
13. Information extracted from Los Angeles city directories, 1893–1906.
14. Two examples of litigation based on architectural registration laws, having the effect of restraining design-build operations, are: Meyer & Holler *v.* H. D. Bowman (121 *California Appellate Reports* 112) and Arkansas State Board of Architects v. Bank Building & Equipment Corp. of America (286 *South Western Reporter*, 2nd series, 323).

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