In 1906, the United States Steel Corporation created the city of Gary, Indiana, to support its new works rising on the south shore of Lake Michigan. Social reformers saw the city as a blank slate with “limitless possibilities” and dubbed Gary the “City of the Century.” Workers looking for high-paying jobs in the massive steelworks saw Gary as a mecca for employment, and they flooded into northwest Indiana. Housing construction was unable to keep pace with the rapid influx of workers.

In the same year, Thomas A. Edison patented a metal form and a method for constructing a concrete house in a single pour. Edison hailed his latest invention as a “practically indestructible” and “perfectly sanitary” structure that would allow “even the poorest man . . . to own a home of his own.” Journalists and social reformers celebrated the con-

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1 S. Paul O’Hara, Gary: The Most American of All American Cities (Bloomington, Ind., 2011), 4.
crete house as a fireproof, sanitary, and vermin-free home for the working man and his family.

In response to the Gary housing shortage, the local works of the U.S. Sheet and Tin Plate Company, a U.S. Steel subsidiary, began to build concrete flats and houses for employees relocating from its eastern mills. For Tin Plate mill executives, the experiment promised cheaper, more efficiently built housing. Yet despite the fact that they never met with Edison and that he never set foot in Gary, the popular press quickly labeled the project as the first test of his invention. As a new technology that held the promise of making home ownership affordable to all, and as a process patented and promoted by the nation’s most famous inventor, the concrete houses acquired additional meanings of their own with their appearance in the City of the Century.

This article describes the construction of the tin mill concrete houses and explains their brief role in the national movement to reform working-class housing. Both industrial capitalists and social reformers envisioned similar outcomes for the Gary project: large numbers of concrete houses built at one location and constructed at lower cost than traditionally built houses. However, tin mill executives and housing reformers had different motivations for success. The Gary mill had no reform agenda, but simply desired affordable, quick, and efficiently constructed housing for its mid-level employees. The Gary project also held the prospect of profit from the future sale of the houses. In contrast, housing reformers projected great potential onto the project. Success in Gary, they believed, could spur change across the industrial residential districts of American cities, and perhaps into other residential neighborhoods as well. If the tin mill succeeded, then other industrial communities devastated by the hazards associated with tenement housing could be transformed, as well. Had the reformers’ dreams been realized to their widest extent, early twentieth-century residential neighborhoods of stick-built Craftsman and revival-style cottages could just as easily have been filled with block after city block of concrete homes.

S. Paul O’Hara’s *Gary: The Most American of All American Cities* (2011) provides a useful framework for examining the tin mill dwellings. O’Hara explores the numerous “narratives people [have] read onto Gary” from its 1906 inception through its late-century deindustrialization.3 U.S. Steel, as he explains, positioned itself as separate from

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the city, a separation clearly reflected in a line visibly demarcated by rail lines, the Grand Calumet River, and later the Indiana Toll Road. The company, O’Hara writes, frequently clarified its belief that Gary “was built upon economic and geographic terms, not utopian ideals. Thus the corporation could never be held responsible for the conditions of the town; there were no expectations for the company to meet.” Yet Gary, an industrial city built from scratch, was founded at the zenith of a period of social reform, when Americans’ faith in the possibility of resolving past failures ran high. Because Gary had “no standing traditions of neighborhood, community, separation, or segregation,” reformers from outside the city perceived it as a blank slate with “limitless possibilities.” Thus, to study the construction of Gary’s concrete houses is to study, as well, the multiple narratives and meanings constructed alongside them by groups with disparate hopes and interests.

Scholarship on concrete construction during the early twentieth century—a time when the technology was still gaining broad acceptance—rarely provides detailed accounts of the development of concrete housing. Influential works by Peter Collins (1959), Reyner Banham (1986), and more recently Amy E. Slaton (2001) primarily address how the development of industrial and utilitarian structures—daylight warehouses and regional grain silos—influenced the development of European modernism. Margaret Crawford’s (1995) and David P. Handlin’s (1979) studies of American company towns discuss employer-supplied housing, but only mention Gary as one of several ventures into concrete housing. More recently, Arnold R. Alanen (2008) has provided a comprehensive description of the multi-unit concrete block development at U.S. Steel’s company town of Morgan Park. These houses, however, postdate the start of construction of the monolithic Gary houses by approximately five years. 

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4Ibid., 4.
5Ibid.
Histories of Gary do discuss the challenge of housing the thousands of workers who flocked to the upstart city in search of employment. Raymond A. Mohl and Neil Betten (1986), and James B. Lane (1978) discuss U.S. Steel’s effort to provide housing for its mid-level management employees, as well as the mill’s relative lack of influence in those areas of the city that were settled by common laborers and characterized by vice, tenement houses, and saloons. Ruth Hutchinson Crocker (1992) illustrates the role of the settlement house movement in integrating Gary’s immigrants in such neighborhoods. However, these works overlook the role that the tin mill houses played in the national discussion of housing reform.

O’Hara, too, leaves aside the issue of housing reform. Yet his focus on Gary as a site of multiple “narratives” of American urbanism offers us a means by which to distinguish the tin mill experiment from the numerous attempts to construct industrial, concrete neighborhoods elsewhere, between the time of Edison’s 1906 invention and the end of World War I in 1918. Local sources for this story include the city’s newspapers—the Daily Tribune and the Evening Post—which published a weekly summary of building permits and regularly reported on construction in Gary. Nationally, the trade journal Concrete periodically reported on progress in the houses’ construction, while social reformer Graham Romeyn Taylor’s influential Satellite Cities: A Study of Industrial Suburbs (1915) described the Tin Plate houses in detail.

EDISON AND HOUSING REFORM

Nineteenth-century housing reform arose in an effort to improve living conditions for low-wage, largely immigrant, working-class families in the industrial city. Reformers wanted to stop the spread of disease, the breakdown of the family unit, and the vice and immoralities associated with tenement living. Social historian Roy Lubove summarizes the reformers’ belief that improvements to the physical environment would result in model citizenship: “Improve his housing, it followed, and you

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would influence his character for the better.”⁹ The primary target of reform was the tenement house, a multi-story structure housing numerous apartments and characterized by severe overcrowding, tuberculosis, poor sanitation, and deceitful landlords.¹⁰

Reformers adopted a variety of methods to meet their goals over several decades. Following the Civil War, municipalities began governing the construction and operation of tenement houses through codes and laws administered by local health and building departments. Building codes required fire-resistant materials to slow the spread of flames within a building and between structures. In an effort to reduce sickness and disease, new laws mandated windows, light and air wells, running water, and toilets.¹¹ Large-scale tenement developments began displaying designed features such as common courts with clothes-drying yards, small parks, and playgrounds.¹²

Influenced by the design and planning philosophies of the City Beautiful and Garden Cities movements, late nineteenth-century architects and planners promoted the redesign of industrial metropolises based on aesthetics and rational functionality. Landscape architects such as John Nolen and George Kessler incorporated land-use zoning, transportation systems, public education, and the socially beneficial placement of public parks, playgrounds, and boulevards into existing cities and newly planned suburbs.¹³ Ultimately, reformers concluded that the ideal solution to tenement housing was the “small house” or “workingman’s cottage.” Home ownership promoted stability, good citizenship,
and participation in society. Homes also supported the family unit by providing healthy and private environments. Robert W. De Forest, commissioner of New York’s Tenement House Department, wrote that “homes are quite as much needed to make good citizens as to make good men.”

Yet home ownership remained a dream for most industrial laborers, who earned insufficient wages and whose job security depended on the stability of the national economy. At the turn of the century, the popular press began promoting the unfamiliar and unproved material of concrete as an affordable alternative to wood and brick construction. By 1910 journalists had deemed concrete a “modern” and “progressive” construction material. The New York newspaper *The Independent* heralded that

no product of the twentieth century is more characteristic of our type of civilization and of our progress in the economic arts than concrete, a composition of the cheapest and commonest materials to create the most substantial structures.

The product—a mixture of cement and aggregate, usually sand or stone, mixed with water—was already being used for breakwaters and piers, sidewalks, and house foundations. Concrete was known to perform well in compression, as in a vertical column. However, its broad acceptance as a building material resulted from the addition of reinforcing metal rods that allowed the product to handle the tensile—or stretching—forces of horizontal spans such as floors and roofs.

While the industry focused primarily on concrete’s application to industrial and utilitarian structures, a number of builders and form inventors began to consider concrete’s potential for working-class house construction. In 1910, Grosvenor Atterbury began experimenting with constructing houses with pre-cast concrete panels; a year later, Milton Dana Morrill patented a form that could construct a wall in two-foot increments. In addition to their presumed affordability, concrete houses were considered sanitary, fireproof, and vermin-free. Between 1910

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and 1918, as many as thirty employer-supplied housing developments of concrete block, prefabricated concrete walls, and monolithic concrete construction appeared across the country. 17

The significance of these developments was not lost on the nation’s most celebrated inventor, Thomas A. Edison (1847-1931), who brought a method for producing affordable concrete houses for the working classes to the housing reform movement. Edison sought a technique for quickly and efficiently casting a concrete residence in a single concrete pour. His patent application concisely described his intent:

The object of my invention is to construct a building of a cement mixture by a single molding operation—all its parts, including the sides, roofs, partitions, bath tubs, floors, etc., being formed in an integral mass of a cement mixture. This invention is applicable to buildings of any sort, but I contemplate its use particularly for the construction of dwellings, in which the stairs, mantels,

17 “Concrete and Modern Concrete Construction,” The Outlook, April 4, 1917; Atlas Portland Cement Company, Industrial Houses of Concrete and Stucco (New York, 1918).
ornamental ceilings and other interior decorations and fixtures may be formed in the same molding operation and integral to the house itself. The house thus made is practically indestructible and is perfectly sanitary. The cost of its construction is low and it is feasible to beautify such a house far beyond anything now possible in so cheap a manner.  

Edison had entered the cement production business around 1901, when he began developing improved manufacturing equipment. In 1907, his efforts led to the construction of the nation's fifth-largest cement plant. The inventor's awareness of concrete houses sprang both from his business interest in expanding the cement market, and his social interest in providing affordable worker-owned housing. Edison's colleague and biographer Frank Lewis Dyer wrote that “Edison's ideal house concept had been a broad one from the start.” The inventor hoped, Dyer continued, that “those who care[d] to avail themselves of the privilege may, sooner or later, forsake the crowded apartment or tenement and be comfortably housed in sanitary, substantial, and roomy homes.” Edison proclaimed that he wanted no money from the invention, and that he would give away the rights to reputable builders as long as the design of their houses met his approval. Writing at nearly the same time, the authors of the *Popular Handbook for Cement and Concrete Users* quoted Edison as saying that “the age of concrete has started and I believe I can prove that the most beautiful houses our architects can conceive can be cast in one operation in iron forms at a cost, which by comparison with present methods, will be surprising.” Biographer Randall Stross quotes Edison as asserting further that “social discontent will die out when the working man owns his own home.”

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The popular press quickly latched onto Edison's idea as salvation for the working classes. The *Boston Daily Globe* predicted that a “large army of wage-earners may yet hail the concrete house as a blessing if all that is claimed for it comes to pass.” Journalist Ada May Krecker counted Edison’s venture among the “Seven Great Wonders of Science and Industry Perfected in 1907,” in a *Chicago Tribune* article that also included the dirigible airship, wireless transatlantic communication, and the *Lusitania*.

Architectural Record doubted “whether Mr. Thomas A. Edison has as yet really perfected a method of building little concrete residential boxes, which can be duplicated ad infinitum at a small cost for the American workingman,” but predicted that in a “few generations from now the majority of urban and suburban residents may well be living in concrete houses of one kind or another—without any fear of fire or of vermin, and without paying for these substantial living accommodations any more than they are paying for their more or less flimsy dwellings.”

Edison held a separate patent for forms he designed to be removed without blemishing cast details. The rectangular molds consisted of metal panels attached to, and reinforced by, a frame constructed of metal angles. Architectural details like moldings and relief were attached to the form’s interior at desired locations. Once the concrete hardened, the forms were removed and “used repeatedly for the construction of an indefinite number of houses,” thus holding construction costs to a minimum. The *Boston Daily Globe* reported that the houses would “not resemble one another, like the peas in a pod, for the molds are adapted to many variations of arrangements, making it possible to change the style of houses with the same set of molds.”

Edison’s invention was not without its critics. In a particularly stinging commentary, the *Washington Post* portrayed the inventor as a...
huckster: “Tom is one of the most successful imitators that ever entertained a willing-to-be-humbugged public for his own profit. He is in a ten-acre lot all by himself and scratches his matches on the coattails of an admiring community.”  

Some skeptics doubted Edison’s $1,200 per house cost estimate. Engineer M. C. Tuttle, a vocal and pragmatic critic of concrete house construction, continued that, from a “contracting engineer’s point of view,” the forms would need to be used several times to recoup manufacturing costs. They would need, as well, to be sufficiently lightweight and portable “to produce the finished surfaces without bending or denting, or misusing them so that they would become unserviceable.” If properly constructed, Tuttle concluded, concrete homes could not cost less than a wood-frame house.

Edison’s concrete prototype, designed by New York architects Mann & MacNeill in 1909, featured a cellar, three stories, and nine rooms. The inventor described it as “roomy, substantial, [and] artistic . . . with all modern conveniences,” and interior concrete “ornamentation” which would be cast at the time of pouring the house. When the Mann & MacNeill design proved too elaborate for efficient construction, Edison had his own draftsmen plan a simpler structure in 1911. The cubic, two-story, hipped-roof structure included a single-story porch and resembled an American Four-Square—a house form with broad national appeal that was well-suited to maximize space in dense urban neighborhoods. Double brackets supported the roof’s deep overhang, and cast panels and ornamentation adorned the walls. While the design surely appealed to promising homeowners, only small-scale promotional models were ever constructed.

In 1911, in a move that opened the inventor to public mockery, Edison announced the availability of concrete furniture. Newlyweds could furnish their concrete house, he proclaimed, for half the cost of traditional furniture. Bedroom sets would cost as little as six dollars,

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32 “Magazines,” Zion’s Herald, June 1, 1910.
33 Jandl, Yesterday’s Houses of Tomorrow, 74.
34 “Furniture of Concrete,” Washington Post, December 9, 1911.
and Edison even constructed a concrete phonograph cabinet. Understandably, these ideas provoked concerns that Edison was promoting self-serving interests over comfort and aesthetics. Poet Florence McLandburgh’s “A Concrete Tale” could not help making light of Edison’s idea:

He prinked himself with care  
In beautiful array,  
Then to her concrete house  
He hid himself away.  

Within her drawing room  
Quite Prominent to view,  
A concrete sofa stood  
A perfect fit for two.  

They talked of vine-clad cots  
And every blissful thing,  
Forth from his pocket then  
He drew a concrete ring.  

She saw no sparkling stone,  
And gave a sudden start,  
And very soon he found  
She had a concrete heart.

Furthering this critique, the New York Times satirically suggested the possibility of concrete dogs to “stand waringly” in the front yard and concrete cats to “purr stonily under a concrete kitchen range.”

The number of accolades and criticisms that Edison received for this new construction method obscures the fact that he was not its sole inventor. By 1900, others were already developing and constructing concrete dwellings similar to those that Edison would soon propose, as well as structures of concrete block and prefabricated concrete walls. Brochures, books, and articles describing floor plans for concrete houses

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were popular prior to Edison’s announcement of his single-pour invention. New York’s Atlas Portland Cement Company published a 1906 catalog, titled *Concrete Country Residences*, which promoted the material’s economy, comfort, and fire-resistance. The catalog contained photographs of built structures and floor plans for several monumental estates, as well as “Workingmen’s Houses” constructed of both monolithic concrete and concrete blocks. In 1907, the publication *Cement Age* printed concrete house plans “of a Moderate Cost” for a competition sponsored by the Association of American Portland Cement Manufacturers.37 In 1912, Oswald C. Hering assembled an “Illustrated Volume for the Laymen,” titled *Concrete and Stucco Houses*. The catch-all book included residential floor plans and methods of concrete construction.38 Despite these earlier examples, however, the inventor’s broad national appeal led the mainstream press to credit Edison’s concept as the original.

### CONCRETE IN THE STEEL CITY

The United States Steel Company was created in 1901, when Andrew Carnegie and J. P. Morgan merged their steel interests. Already firmly established in the East, the company’s expansion into the Midwest began in 1905. After examining several sites, U.S. Steel officials selected a site along Lake Michigan’s Indiana shoreline for its access both to iron ore freighters and to the country’s rail network. The shoreline’s rolling, marshy dune-and-swale landscape had made it unsuitable for farming and left it undeveloped. On this blank slate, U.S. Steel designed Gary as a company town, hoping to avoid the disasters of previous industrial ventures in town building, of which nearby Pullman, Illinois, served as the principal example.39 In laying out the city, the corporation acquired land between the Lake Michigan shoreline and the Grand Calumet River, leveled dunes, filled seven hundred feet of Lake Michigan, and channeled and relocated the river south. Several U.S. Steel subsidiary companies started up operations adjacent to the main milling works: the American Bridge Company, Universal Concrete Company, National Tube Company, American Locomotive Works, and the United States Sheet

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and Tin Plate Company. The last manufactured corrosion-resistant, tin-plated steel. Its opening was announced in 1909, and the facility became operational in July 1911.

The steel company’s architects planned a pragmatic city whose land could be efficiently divided and sold for home construction. While other Hoosier communities embraced the aesthetic and functional ideals of the City Beautiful, Gary was laid out in a traditional grid pattern. Broadway Avenue was constructed as the primary north-south artery, and Fifth Avenue the east-west. The Gary Land Company, another mill subsidiary, was organized to develop, market, and sell mill-owned property. The First Subdivision—eight hundred acres centered on the corner

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40 Wright, *Building the Dream*, 181; Handlin, *The American Home*, 152. The cities of Indianapolis, Terra Haute, South Bend, and Fort Wayne include park and boulevard system designs by landscape architect George Kessler that are based upon City Beautiful principles.
of Fifth and Broadway—was platted into four thousand residential lots, plus the core business and administrative districts. House lots typically measured 35 by 150 feet, and the Land Company provided paved streets and alleys, concrete sidewalks, street trees, and utilities. To prevent speculation, purchased lots had to be developed within eighteen months.\(^{41}\)

Contrary to the steel company’s expectations, the city’s private developers were unable to keep up with the mill’s enormous housing demands. In place of planned and controlled growth, the opening of the new plants brought an instant population boom of thousands of workers to Gary. The 1911 startup of both the Tin Plate mill and bridge works, for example, saw the immediate influx of three thousand men and their families. The 1912 opening of the Bolt and Screw Company instantly added two thousand more.\(^{42}\) City leaders projected that a mere five years after breaking ground for the new city, twenty-seven thousand workers would be employed at the main works and its subsidiaries. The tin mill’s seven thousand workers were second only to the ten thousand in the steel mill.\(^{43}\)

In 1910, the *Gary Evening Post* concluded there “would be five thousand more people in Gary today than we have, if there were enough houses to supply the demand at responsible and profitable rentals.”\(^{44}\) The newspaper believed that the city’s greatest problem lay not in attracting more industries, but in “housing… the men working in the industries we already have.”\(^{45}\) Gary simply did not have established building contractors, and the few that had set up shop in the upstart city could not supply the thousands of dwellings in demand. These circumstances resulted in a variety of housing conditions. Initially, squatters’ villages of tents and tin shacks housed workers in the First Subdivision and in a rowdy area to its south known as The Patch. For a short time, United States Steel provided small, four-room houses that became overcrowded with immigrant lodgers in a district known as Hungary Row. The Gary Commercial Club proposed advertising the huge demand for

\(^{41}\) Mohland Betten, *Steel City*, 15-17.
\(^{42}\) “The Number Will Be Increased to 20,000 Very Soon,” *Gary Evening Post*, February 21, 1911.
\(^{43}\) “Number of Employees in Industries,” *Gary Evening Post*, January 17, 1911.
\(^{45}\) “Commercial Club Takes Active Step In House Problem,” *Gary Evening Post*, June 12, 1912.
The “Shacks,” and a tenement house, Gary, 1907 and 1915. While executives and skilled workers at U.S. Steel enjoyed comfortable housing, some workers at the lowest end of the pay scale lived in increasingly crowded tenements or in makeshift housing in undeveloped areas.

Courtesy, Calumet Regional Archives, Indiana University Northwest, Gary, Indiana.
houses to regional building contractors to entice distant investors to the city. For citizens of modest means, a substantial district of multistory apartment buildings was established on Fifth Avenue west of Broadway, and the few citizens able to afford First Subdivision building costs erected moderate-sized Craftsman bungalows and cottages. Meanwhile, wealthy citizens constructed grand houses in revival styles. In the mid-1910s, Gary developer Ingwold Moe and insurance executive Wilbur Wynant constructed American System Built Houses, pre-cut kit dwellings designed by Frank Lloyd Wright.

With no prospect of a private market solution to the housing problem, the United States Steel and the American Bridge companies took matters into their own hands by funding the construction of houses to rent to their employees. These Arts and Crafts-style single-family and duplex structures saved the mill money by using a standardized design of conventional wood-frame construction veneered in stucco and brick. As the tin mill neared completion, the company urgently needed to transfer management-level employees and their families from its eastern mills to open the Gary works. To accommodate these mid-level workers, the Tin Plate followed the lead of the steel and bridge companies by also supplying housing for its employees, but opted for the untested process of mass-produced reinforced concrete.

The Tin Plate announced the idea for concrete houses in August 1910. By 1914, the company had built ninety-two of them: six apartments of four units each, six three-bedroom cottages, and eighty two- and three-bedroom terraced houses. The buildings were located a few blocks from the tin mill in an undeveloped section of the First Subdivision. Although Gary had paved Fourth Avenue to the west, this old dune area was still unfavorably regarded as a “weary stretch” of “sandy waste.” Since the city’s inception, the area had been known as Shacktown. Its hundreds of immigrant squatters were evicted to begin the Tin Plate development.

Architect D. F. Creighton of Ambridge, Pennsylvania, designed the houses. Creighton had already planned wood-framed employee housing for the American Bridge Company, which loaned his services to the Tin Plate. The Daily Tribune lauded Creighton’s plans, writing upon his application for the building permits that, having “abundant opportuni-

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47 “Others Will Be Built As Fast As Work Can Be Done,” Gary Evening Post, January 24, 1911.
ties to show what can be done with this style of construction,” he had not “neglected the opportunities.” The houses were to be “ornamental to the city,” and in “securing artistic effects [he had been] marvelously successful” at making the houses “one of the greatest attractions of the west side.” His plans improved upon “ordinary house construction,” and their varied style ensured “an absence of monotony.” The buildings were to be erected by Pittsburgh contractor W. A. Songer, who had worked with Creighton in Pennsylvania, and had significant experience in concrete construction.

From among the many form inventors in the concrete housing market, the Tin Plate chose Reichert forms for the Gary project. The Augustus F. Reichert family operated a small production shop in Milwaukee, Wisconsin. Reichert's 1905 “Mold For Concrete Walls” patent grant predates Edison's form application by two years, and the company was producing “worker housing” in Milwaukee by 1908. Reichert wall forms were an assemblage of 24-inch square metal panels reinforced on the edges by metal angles. For speed and ease of use—important selling points—the panels were interconnected by a lever reminiscent of the closing hardware on a casement window. The form's interior faces were held together by wood dowels that remained in the concrete. Walls could be poured in 24-inch increments or a story at a time. Company brochures reported that the forms were widely used throughout the United States and in countries like India and South Africa. The Reicherts were probably better known for their round silo forms used for both family farms and mammoth regional granaries throughout the Midwest, but their product was also used for houses, dairies, prisons, and even the famous columns of Frank Lloyd Wright's

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50 Atlas Portland Cement Company, *Concrete Country Residences* (1908; New York, 2003), 146. The company, now known as Metal Forms Corporation, is still in operation.
51 There is no evidence of competition—or any other connection—between Edison and Reichert. In 1910, however, when Milwaukee's Socialist Party government intended to rebuild one of the city's slum districts, Edison offered free use of his form patent and even proposed a funding plan. While the venture's momentum faded with Mayor Emil Seidel's 1912 election loss, the famed inventor had exercised his characteristic knack for self-promotion in offering his yet-unproven process to Reichert's hometown, even as Reichert's own molds were already being used in Gary. “Edison Offers Milwaukee Free Use of Invention for Concrete Building,” *Manila Times*, January 6, 1911; George Allan England, “Milwaukee's Socialist Government,” *The American Review of Reviews: An International Magazine* 42 (October 1910), 451.
Johnson Wax Building in nearby Racine.31

Permits for the first six Gary buildings—four apartments, an office for Songer, and a tool storage building—were secured in August 1910, with hopes of beginning the settlement before cold weather set in.52 Unfortunately, Songer, only forty-five years of age, died on November 30 at his Tolleston, Indiana, home, from a bout of typhoid fever complicated by pneumonia. Prior to Songer’s death, having found his health “precarious,” the Tin Plate mill had appointed Chicago contractor Fred M. Stultz to assist in managing the project, and he assumed full control

upon Songer’s passing.53
With the foundations started in January 1911, work on the walls resumed in late April. Another two months passed before anything resembling a house could be recognized. The Daily Tribune finally announced success on July 2:

Forms were stripped from one of the concrete houses of the American Sheet & Tin Plate company at Fourth Avenue and Harrison Street yesterday for the first time and the officials of the company, who inspected the buildings after the forms were removed, are well pleased with the result of the first experiment. While there was some delay in starting the work, the progress being made now is highly satisfactory and it is believed that the buildings will be rushed to completion within a short time. It was only a week ago that the work got into full swing and remarkable progress has been made since that time.54

Implying that progress had been sluggish, the report also explained that “the remainder of the buildings will go up rapidly,” and that “although the construction [had] seemed slow, when a concrete house is up, it is much nearer completion than a brick or frame building.”55 In a major departure from the all-concrete building method, the tin mill “abandoned” concrete roof and floor construction in July, substituting tin and wood. The change was expected to make a “vast difference” in the time required to complete the houses.56

Contrary to the Edison critics who believed that concrete housing would “become monotonous, when fifty or one hundred buildings are molded in one pattern,” the Gary construction experiment resulted in a variety of apartment, cottage, and terrace housing forms. The four-flat buildings were two-story rectangular blocks with flat roofs and full basements. Each building contained two one-bedroom flats, and two two-bedroom flats arranged around a central entry, hall, and stairwell. Each flat had a kitchen, pantry, bathroom, and living room. Sizable porches were located at both ends of the buildings. Unlike the cottages and ter-

54“Concrete Style is a Big Success,” Gary Daily Tribune, July 2, 1911.
55Ibid.
The apartments displayed subdued architectural ornamentation, such as a bracketed pediment over the front entry and rectangular panels to break the monotony of otherwise characterless walls.

The six two-story cottages featured single-story front and rear porches. Variations in the cast details, including battered walls, geometric ornamentation, and parapets of alternating shape and heights, lessened the repetitiveness of their form. A small entry foyer, parlor, dining room, and kitchen occupied the ground floor, while three bedrooms and a bathroom were located upstairs. The terraces, constructed in groups of ten, had flat, stark facades with single-story, flat-roofed porches. As in the cottages, parapets of varying heights and shapes helped to diminish repetition. Each structure also featured unique geometric ornamentation. First floors displayed a living room with a fireplace, a dining room with a small built-in shelf and cabinet, and a small kitchen with a door to the rear yard. The stairwell to the upper stories was located in the living room and illuminated by a skylight. The second and third stories contained two or three bedrooms and a bathroom.57

LIFE IN A CONCRETE HOUSE

In the brief span of fourteen years—1906 to 1920—Gary became the state's fourth most populous city, behind Indianapolis, Fort Wayne, and Evansville. As Mohl and Betten explain, this “city of steel and immigrants” grew rapidly from its 1910 population of almost seventeen thousand to more than one hundred thousand in 1930. Immigrant workers had predominated from the city’s start. In 1910 they comprised 70 percent of the city’s population, and by 1920 they still represented more than 60 percent of the total population. Immigrants came primarily from southern and eastern Europe, and public and charitable institutions assisted, organized, and in some instances helped to acculturate the immigrant population. Froebel School, known as the immigrant school, provided instruction to both children and adults. The Carnegie-funded Bailey Branch Library housed the International Institute in its base-


58Mohl and Betten, Steel City, 28; U.S., Bureau of the Census, Fourteenth Census of the United States: State Compendium Indiana (Washington, D.C., 1924). For comparison, Indiana’s foreign-born population, along with residents with at least one foreign-born parent, was 17.6 percent overall and 24 percent in urban populations.
The Tin Plate mill was to employ between six and seven thousand men, with a sizeable share “coming from the eastern tin plate mills.” Contrary to Edison’s desire to provide housing for tenement-bound workers, the Tin Plate houses were constructed for the “chief workmen” who needed living quarters while they prepared the plant for opening. The local paper described these new occupants as “mainly American” with “pretty wives and lusty babies—lots of them.” They were “skilled working men who receive high wages,” a quality the local papers thought desirable for a city trying to establish local businesses but short on money flow. Since the transplants would not want to live “like ‘hunkies,’ six to a bed” (a reference to Hunkeyville, an immigrant section of Gary notorious for its company-constructed, densely populated tenements), the Tin Plate dwellings were designed to meet the minimum expectations of the mill’s relocated Pennsylvania employees, rather than the city’s majority male and immigrant population. Distinctive features such as parlors, dining rooms, built-in storage cabinets, front porches, and rear yards with plenty of space for vegetable gardens catered to family activities, as did the separate bedrooms for parents and children, modern kitchens, dependable heating, running water, and indoor bathrooms. Window wells provided ample light and air.

Most heads of households living in Gary’s new concrete homes were department foremen, although some were clerks, millwrights, and wage masters. A chef, a chief timekeeper, an accountant, and a chemist were also among the population in 1920. Most lodgers and a few heads of households listed the blue-collar jobs of shearmen, rollers, cutters, heaters, and laborers. None of the wives were employed, though daughters and female lodgers who held jobs listed such occupations as telephone operator, saleslady, and dime store pianist. Nearly every house contained a married couple with children. One-third also housed a lodger, a common practice in industrial settings, and reasonable for a city desperately short of housing. Although Mohland and Betten

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58 “Others Will Be Built As Fast As Work Can Be Done,” Gary Evening Post, January 24, 1911.
60 “Tin Plate Starts July 1,” Gary Evening Post, June 13, 1911.
Concrete terrace houses and cottages under construction in Gary, c. 1911. The cottages display some of the architectural variations that were added to the basic concrete forms.

Courtesy, Metal Forms Corporation, Milwaukee, Wisconsin.
concluded that excessive rents caused families to take in borders to defray costs, tin mill employees may simply have been using the opportunity to improve their own finances to purchase their own house, or to prevent wives from having to work. The Tin Plate workers were culturally diverse. One-third of adults were foreign-born—a number representative of the city’s immigrant population as a whole—with the majority of these immigrants being Greek lodgers. Only 15 percent of the adults were Hoosier-born, and an equal number were native Pennsylvanians, since the mills recruited heavily in U. S. Steel’s home state.

First Subdivision neighborhoods of mill-supplied housing appear to have been safe and desirable locations for employees to raise their families, and far from the more desperate conditions of the city’s Hunkeyville and Patch districts. The poet Carl Sandberg, who captured the darker side of industrial Gary in his 1920 collection of poems titled Smoke and Steel, employed some artistic license in his poem “Jug,” when he drew a parallel between the potter’s monotonous mass production of clay vessels and the construction of these concrete dwellings:

Be good to me, put me down easy on the floors of the new concrete houses;  
I was poured out like a concrete house and baked in the fire too.

HIGHEST HOPES

The Sheet and Tin Plate mill announced its plan to provide concrete homes for its employees four years after Edison made his grand entrance into the concrete housing market. Although other industries and form inventors had constructed concrete houses, no one had yet attempted large-scale mass production.

While modern Edison biographers are consistent in their presentation of the inventor’s foray into housing reform, none pursue how his
concrete house invention was broadly promoted by the popular press—and thereby linked to the Tin Plate project. Using O’Hara’s view that observers projected great expectations for reform onto the new city, we can see how period journalists and reformers, who considered the Gary houses a test of Edison’s inventions, projected similar expectations onto the Tin Plate homes. Immediately following the announcement that concrete houses would be built in Gary, the national trade journal *Concrete* reported: “The construction in this project—which is the largest of its kind ever attempted in America” will be “similar to that originated several years ago by Thomas Edison.” Reformers believed that “particular interest attaches to them in view of Mr. Edison’s enthusiastic predictions and the general impression that this is the coming method of supplying housing at a low cost for working people, especially when large numbers of houses are built at the same time and place.” Locally, the *Gary Tribune* reported that the idea for concrete houses “first came to be taken seriously when Thomas Edison, the inventor, perfected a concrete house model which he proposed to patent and rent for construction purposes… [but until Gary] no move was made to put the scheme to work on a large scale.”

Aware that the task of constructing concrete houses was somewhat of an exhibition, the press greeted the project with great fanfare. Success in Gary could influence the planning and construction of succeeding industrial housing ventures and improve the living standards for the working classes everywhere. The *Evening Post* proclaimed, “Gary can now appropriately be called the Concrete City as well as the Steel City.” The newspaper explained:

[The city is] certain to be the Mecca of many and varied building concerns in the course of the next few years for the simple reason that Gary will be one of the great building centers in the country. About every concern with a new idea will want to secure an entrance into the local field. By making a real success here its

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67 “Progress Being Made on Concrete Houses for Steel City,” *Concrete* 10, no. 12 (December 1910), 64.


70 “Gary Will Be Concrete City In No Time,” *Gary Evening Post*, August 12, 1910.
national success will be assured for the eyes of the nation are going to be on Gary more in the coming years than they have been in the past. Gary has excited a good deal of interest up to the present simply because it has been regarded as an interesting experiment[,] but as people understand that it has ceased to be in the experimental class, the city is going to bulk much larger in their eyes.71

Success in early twentieth-century concrete house construction can be measured in a variety of ways. From a reformer’s viewpoint, affordable construction techniques, fewer fires, fewer lost work days from improved sanitary conditions, and happy—or at least contented—employees due to healthy and safe living conditions deserved praise. While these variables are difficult to measure a century later, we do know that none of Gary was ever ravaged by fire. Sickness typical of urban poor surely existed in some areas of the city, but there is no way of knowing the health of the Tin Plate residents. We do know that the houses were also operated under the close watch of the tin mill, and in an area of the city tightly controlled by the Gary Land Company.

Realistically, success in Gary, and in industrial housing developments elsewhere, was measured in dollars. The mill turned to concrete simply because it needed accommodations for its upper-level employees moving to Gary. Mill executives never expressed interest in social reform—an attitude perhaps best evidenced by their displacement of the Shacktown squatters at the start of the project—and chose the material because they considered it cheaper than wood. The Universal Portland Cement Company reported that the construction of the houses was “in no sense a philanthropic enterprise on the part of the builders, but rather an effort on their part to make homes which will be available to their employees and which will return a reasonable profit on the investment.”72

Since costs were the deciding factor in the decision to construct a community of concrete houses, the mill enacted a variety of calculated measures to keep expenditures down. To start, the Gary Land Company

provided the mill with residential lots, presumably free, in a newly opened section of the First Subdivision. To maximize density, the houses were constructed straddling property lines, approximately two houses per lot. The terrace form of the concrete row houses was an efficient means of providing maximum housing on minimal real estate. Each terrace contained a row of ten two- or three-story houses designed on the “Philadelphia model” of two rooms deep. Party walls between houses further contributed to time and material savings.\footnote{“Work on Tin Plate Houses to be Resumed This Week,” \textit{Gary Evening Post}, April 10, 1911; Leslie H. Allen, \textit{Industrial Housing Problems} (Boston, 1917), 14.}

In itself, the construction method of mass-produced, formed concrete as an alternative to wood or brick was a calculated effort to save money. The Tin Plate mill had shopped for forms that suited their needs before choosing Reichert. An early Reichert sales brochure claimed that, following an “exhaustive investigation, covering several months,” the Tin Plate had selected the company because its forms combined the “greatest economy of both time and money.”\footnote{Reichert Manufacturing Company, \textit{Reichert Metal Forms: For Monolithic Concrete Construction} (Milwaukee, Wis., c.1911), Metal Forms Corporation Archives, Milwaukee, Wisconsin; Taylor, \textit{Satellite Cities}, 186.} The mill attempted to use forms from another company, but they could not be produced fast enough. Even then, the mill “secured” the use of the Reichert patents and constructed the forms themselves.\footnote{“New Departure in the Tin Plate,” \textit{Gary Daily Tribune}, August 11, 1910.} \textit{Concrete} described how the forms consisted of twenty-eight thousand “separate pieces” constructed at the Tin Plate’s Pittsburgh works, with “minor parts” being assembled in “other eastern cities.”\footnote{“Progress Being Made on Concrete Houses for Steel City,” \textit{Concrete} 10, no. 12 (December 1910), 64.} The mill saved labor costs by hiring non-union craftsmen to construct the houses.\footnote{Taylor, \textit{Satellite Cities}, 184-89; “New Departure in the Tin Plate,” \textit{Gary Daily Tribune}, August 11, 1910; “300 More Houses Will Be Built Under Open Shop,” \textit{Gary Evening Post}, March 15, 1911.}

Construction materials and methods also played a part in offsetting costs. The company used 1,700 railcar loads of materials from U. S. Steel subsidiary Universal Portland Cement Company’s nearby Buffington plant. Each house was to consume “one car of cement, five
cans of crushed stone, and two or three cans of torpedo sand.” 78

Amazingly, dynamite was used in excavating basement foundations, because the explosive “greatly decrease[d] the labor used in the old method of shoveling out the dirt.” Finally, after constructing the concrete flats and a few of the cottages, architect Creighton made a mid-project shift to concrete shells and wood frame interiors. Apparently, the construction of horizontal concrete floors and roofs, a task that Gary carpenters would have learned by trial and error at the job site, was too time consuming and therefore not cost effective. 79 With thousands of workers to accommodate, experimentation had a time limit.

No official announcement explains why, after 1914, the tin mill chose to stop constructing concrete houses in Gary. Nationally, building materials were being diverted to the pending war effort and the national economy would contract for nearly two years. In Gary, this slowdown resulted in layoffs and an exodus of workers to the armed services and other job opportunities, and consequently, a relief in housing demand. In 1916, the Gary Land Company began selling the more than nine hundred houses it had constructed since the city’s inception, an indication that the demand for housing had become less intense. 80

It appears that, at least in Gary, formed concrete was not a financially viable replacement for wood and brick. A preconstruction account by the journal Concrete and Taylor’s post-construction description support this conclusion. Concrete’s December 1910 article had outlined the risks that the mill undertook in pursuing the project. The Gary experiment was to be “one of the most interesting features of modern construction,” with cost the greatest item of interest, “for upon cost will depend many similar undertakings in the same line of construction.” Should the project meet “expectations” (meaning budget), the mill “may want to erect 200 or 300 more houses.” An additional three hundred houses planned for construction by the Gary works of the American Bridge Company, the journal reported, would be built of concrete instead of brick and wood. 81 Gary would be the test, and if the process proved feasible, it would be safe to begin large-scale national develop-

78 “Others Will Be Built As Fast As Work Can Be Done,” Gary Evening Post, January 24, 1911.
80 “Progress Being Made on Concrete Houses for Steel City,” Concrete 10, no. 12 (December 1910), 65.
Concrete explained how the Tin Plate expected to produce an average of three houses a week beginning in the spring of 1911. Construction of the projected one hundred houses would take approximately thirty-three weeks, or be completed within the roughly thirty-seven warm weather weeks between March and October. However, after a series of fits and starts that included—as we have noted—the untimely death of the project superintendent and a major alteration in the method of construction, the forms for the first house were not stripped until July 2. In all, the production of the Gary houses lasted until 1914—two years over schedule.

In 1915, Taylor communicated a dim post-construction account that never mentioned budgets, labor, timelines, or construction methods, but indicated that results had fallen short of expectations. "Experience with concrete houses has thus far not measured up to the highest hopes entertained at the outset," he wrote, "but it is perhaps still too soon to pass final judgment on the experiment." It is easy, then, to conclude that if the Tin Plate mill, with all of the financial advantages offered by its economies of land acquisition, architectural designs, and supplies could not make monolithic concrete housing viable, neither capitalist nor philanthropic housing reform efforts beyond Gary could expect to succeed. That many of the century-old houses are still occupied is a testament to their design and quality of construction, and further evidence that costs were their downfall. Of the ninety-two structures built, seventy-two remain. Some are dependable houses neatly maintained in a decaying urban pocket of Gary. Others have been abandoned, and only their shells remain. Large percentages are managed by a not-for-profit corporation, fittingly supplying affordable housing.

While no evidence suggests that the city was the model for other concrete house ventures nor that the Reichert form became a model for other types, three smaller but notable developments postdate the Gary experiment. In 1911, forty employee houses were built using forms invented by Milton Dana Morrill for the anthracite mine at Nanticoke, Pennsylvania. The development was abandoned by 1924. In 1915, industrialist Eli Hull used forms invented by Edison’s friend Frank Lambie to construct eleven concrete houses to rent to his employees in

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82Taylor, Satellite Cities, 187.
Newark, Ohio. In 1917, in partnership with C. H. Ingersoll, Lambie attempted to mass produce employee housing for the Ingersoll & Brothers watch company at Union, New Jersey. Known as Ingersoll Terrace, the houses typically receive accolades for achieving Edison’s vision due to their direct connection with the inventor. However, only eleven of the forty planned houses were built.83 U. S. Steel did not completely abandon concrete as a viable material for its employee housing. Starting in 1913, more than three hundred housing units were constructed from concrete block at its Morgan Park development in Duluth, Minnesota.

The Tin Plate mill houses embody the leap from Edison’s theory of constructing a working-class dwelling in a single pour, to its real-world application. For the mill, concrete housing promised a fast, affordable means of housing its transplanted employees and their families. If the construction of the houses was in any way an experiment, then it was a calculated test of the affordability of replacing traditional construction methods with concrete. Since the company’s additional projected poured concrete developments never materialized, it appears that the experiment failed.

By contrast, social reformers embracing Edison’s grand expectations interpreted the construction of concrete houses as a reform effort instituted by the tin mill, and saw in Gary a new city providing a new means for housing the working classes. Arguably, no form patent or housing project—anywhere—fully realized Edison’s ambitious vision. In Gary, however, one company—the U.S. Sheet and Tin Plate Company—constructed ninety-two form-built, reinforced concrete dwellings, using a reusable metal form, for rental to its employees. Following through on the small-scale experiments and projects undertaken by Edison and others, the company proved that the vision could be accomplished, although in a modified form. With its houses targeted for mid-level employees, the Tin Plate mill never truly tested the virtues of reform in the steel city.

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83Jandl, *Yesterday’s Houses of Tomorrow*, 78. Ingersoll Terrace has never been examined in the context of the Gary houses.