

Praise for The Architect as Worker

The Architect as Worker is completely relevant to understanding the architect's current professional and political predicament. At once historical, theoretical, practical and clear-eyed, it should start urgent conversations across the design disciplines, not just architecture. **Simon Sadler, University of California, Davis, USA**

Architects, students, academics — workers of all kinds — concerned with the question of how the fragmented, homogenized, financialized, blind field that is architecture can simultaneously exploit and allow us to produce new forms of knowledge, need this book. It represents a point of departure for research and a call to act. **Nick Beech, Oxford Brookes University, UK**

The Architect as Worker

Immaterial Labor, the Creative Class, and the Politics of Design

Edited by
Peggy Deamer

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I would like to dedicate this book to the members of the Architecture Lobby who have supported, enhanced, and focused the thinking that lies behind the assembly of this book. I owe you my ongoing thanks.

Chapter 9

Working globally: The human networks of transnational architectural projects

Mabel O. Wilson, Jordan Carver, and Kadambari Baxi¹

When the *Fédération Internationale de Football Association* (FIFA) named its host city for the 2022 World Cup—the small Gulf nation of Qatar, which had outbid ambitious proposals from the United States, Japan, South Korea, and Australia—the highly anticipated announcement underscored the stratospheric costs (and debt) that these global sporting events place on host countries.² All of the World Cup matches are to be played in or near Doha, Qatar's capital and major city, where the scorching desert sun regularly tops 100 degrees Fahrenheit. Recently, Doha has undergone exponential urban growth fueled by a windfall of revenues from oil and natural gas. This urbanization has been instigated by the Qatari monarchy in part to absorb capital surpluses that help diversify the nation's post-oil economy of education, culture, and leisure.³ (See Figure 9.1.) While Doha has several existing sports facilities and has hosted smaller international sporting events, the demands of hosting the World Cup have necessitated not only investment in the construction of football stadia, but also the construction of hotels, transportation systems, and the various other infrastructures required to support an international event of this magnitude.

Like the Olympics, the quadrennial FIFA World Cup functions as much as a global entertainment spectacle as it does as an international sporting event. The backdrops against which the matches are played are dramatically designed stadia and iconic high-tech facilities often launched into public view via international architectural design competitions and the intense media focus surrounding the development of large-scale sporting events. These large-scale efforts highlight the networked and globalized nature of contemporary architectural practice. Aided by the globalization of the finance market and the media industry, the expanded spheres of design and construction have lured architects

to create uniquely designed and highly prized projects that draw tourist dollars and investment capital to cities—the so-called Bilbao effect.⁴ The building sites for these mega-projects—like the Beijing Olympic “Bird's Nest” (2008) designed by Swiss firm Herzog and de Meuron in consultation with the Chinese artist Ai Weiwei—bring together architects, planners, and engineers with contractors, developers, financial institutions, and thousands of construction workers who erect the showcase structures desired by governments, publics, and architects



Figure 9.1 Aerial view, Doha, Qatar.

Source: Photo by Jordan Carver.

alike. Like their neighbors in Abu Dhabi and Dubai, Qatar's various state-sponsored ministries and investment arms have embarked upon a shopping frenzy for international architectural and engineering firms to craft its global brand of a twenty-first century steel and glass oasis in the desert. The nation is already home to completed buildings or large-scale, in-process projects by a roster of international firms that include OMA, Ateliers Jean Nouvel, Legoretta + Legoretta, Arata Isozaki, I.M. Pei, Santiago Calatrava, Foster + Partners, Woods Bagot, David Adjaye Associates, HOK, Arup Associates, and AECOM to name a few (see Figure 9.2). At the same time these globalized networks of production have also distanced architects from the building sites where their buildings are under construction, deferring the intricacies of construction knowledge to a system of contractors and subcontractors who manage the sequencing of labor (and materials) to and on the site.

One controversy that exemplifies this perceived disconnection between architects and construction workers was set-off by remarks from the London-based architect Zaha Hadid. When questioned by the *Guardian* newspaper in March 2014 about ongoing human rights violations associated with the construction of FIFA projects in Qatar, where her firm has been commissioned to design the



Figure 9.2 Education City Central Library, Doha, Qatar, designed by OMA.

Source: Photo by Jordan Carver.

premier al-Wakrah stadium, Dame Hadid stated, "I have nothing to do with the workers."⁵ Asked to comment on the more than 800 migrant deaths connected to World Cup projects already under way, Hadid—the Pritzker Prize-winning architect, whose office has designed and built hundreds of projects for transnational corporations, cultural institutions, and governments in Europe, Asia, and North and South America—stated that it was the governments commissioning these buildings who were in the best position to address the problem. As she put it: "I cannot do anything about it because I have no power to do anything about it. I think it's a problem anywhere in the world."⁶

Hadid's remarks about Qatar's deadly migrant labor problem attracted the attention, much of it critical, of the architectural community and media. Her statements were interpreted as being tone-deaf to the dire conditions facing the workers. But public commentary also straddled what was identified as a strict professional divide between the diverse scope of services architects provide, including those that fall under the rubric of professional ethics, and what services they are contractually obligated to perform given the legal constraints of liability. Many commenters noted that there is no contractual relationship between architect and contractor because each establishes separate contracts with the owner. Architects and contractors work at the behest of the owner's direction and best interests. In this legal scenario, Hadid, as the architect in this case, is not directly responsible for the construction of the project, since that responsibility falls under the contractor/subcontractor's purview. There exists, in other words, a deliberate separation of powers mediated through the contractual obligations of those parties involved in the building process. Yet this separation of authority and accountability belies and negates fundamental practices in architecture that transmit knowledge about the construction process to the building trades and deliver implicit and explicit instructions to the various teams of workers who assemble her buildings on site. If architects build their reputations based on their intricately detailed building designs, then is there a way that this process might also force a recognition of the value of those workers who construct buildings and the conditions under which they work?

An architect may claim to be powerless, but the question remains: How are architects connected to the workers who erect their buildings? How can architects understand that the problems endured by migrant construction workers—poor worker housing, lack of access to social spaces and civic life in their off-time, and the treacherous route of recruitment—are inherently spatial, and because of this would benefit from design expertise? Why is it a challenge for contemporary architects to comprehend their connection to labor?

Modernity, globality, and the construction industry

In the mid-1920s, architect Walter Gropius, assessing the Bauhaus's position on the relationship of older craft practices to emerging industrial techniques, posited that these differences in building practices had less to do with the types of tools and specified skills deployed in craft or industry and more to do with their respective divisions of labor, which he believed were moving closer together and could be politically unified. Gropius observed that, "the crafts of the past have changed, and the future crafts will be merged in a new productive unity in which they will carry out the experimental work for industrial production."⁷ Industrialization, fed by the expansion of capitalism and modernization, would greatly transform how modern architects practiced and compel them to consider not only how building materials were produced, but also the how industrialized construction influenced methods for erecting buildings. Fellow German architect Ludwig Mies Van der Rohe, in opposition to this, championed industry over craft and believed that if materials were manufactured and buildings assembled through industrial methods then all of the building trades would be forced to adapt to new techniques, radically changing how tradesmen constructed buildings. The son of a master mason reprimanded any nostalgia for the old ways of building by cautioning: "(W)hoever regrets that the house of the future can no longer be constructed by building craftsmen should bear in mind that the motor-car is no longer built by the wheelwright."⁸ The *Congrès International d'Architecture Moderne* (CIAM) La Sarraz Declaration, issued in 1928, declared that "rationalization and standardization" would "act directly on working methods in both modern architecture (conception) and in the building industry (realization)."⁹ Tradesmen would become workers, fully integrated into industrialized manufacturing systems. While Modernists envisioned, in their heroic manifestos and speculative projects, an architecture suitable for a fully industrialized and mechanized civilization international in reach, their early projects were, nevertheless, mostly situated within a European context of local, traditional building practices. For Modernists, an industrial division of labor in construction proved more a concept than a practice.

Since this time, construction has become an industry—one no longer defined by a local set of centralized relationships between architects and building trades but by logistics and material supply chains whereby labor, goods, and knowledge are sourced according to a logic of globalized material production. Global capitalism has expanded the scope and scale of the building industry to form an expansive supply chain, a vast network of manufacturers, suppliers, and builders whose operations are aided by digital technologies

and facilitated by transportation systems infiltrating most regions of the world. It employs an array of actors linked via legal and professional relationships—architects, construction managers, engineers, contractors, consultants, and construction workers. This has led to the atomization and dispersion of fields related to the design and construction of any built project, and the proliferation of contractual legal ties binding them together. These actors work off and on site to erect the educational, leisure, residential, cultural, commercial, industrial, and governmental projects in major urban hubs. In these scenarios, the design firm might be based in New York City, work with an architectural and engineering services firm based in Germany, and develop designs for a client headquartered in Sydney who has secured financing for a new mall in New Zealand built by construction workers from the Philippines. In addition to being thousands of miles apart and within their own respective nations, economies, socio-cultural milieus, and class statuses, the links between architects, contractors, clients, and construction workers have become mediated by a host of legal proscriptions and financial arrangements. The outcome of this distancing is a decoupling of design from both the labor and the regulations governing architectural and building practices. Moreover, as design and construction processes become more global and building codes and design standards follow suit, the regulations that govern the construction workforce, the construction site, and safety standards are left to local municipalities to enforce or ignore.

The workers

Since the 1970s, the liberalization of economies has propelled the movement of capital and labor to new markets around the world. These globalized connections of production have spawned economic lifelines, as families and home nations depend upon the remittances sent back by legions of migratory workers.¹⁰ As the number of workers seeking employment in other parts of the world has increased exponentially, so has their exploitation and abuse through predatory recruitment networks and unsavory employers seeking to maximize profit by reducing wages and expanding work hours. The construction industry has taken advantage of these labor trends by contracting seasonal and short-term workforces from abroad—a labor procurement practice ideal for the one-time-only, site-specific nature of building projects.¹¹ (See Figure 9.3.) Vulnerable migrant construction workers often face unscrupulous conduct by recruitment firms, subcontractors, and local authorities—each jockeying to extract a bigger cut of the workers' salaries.

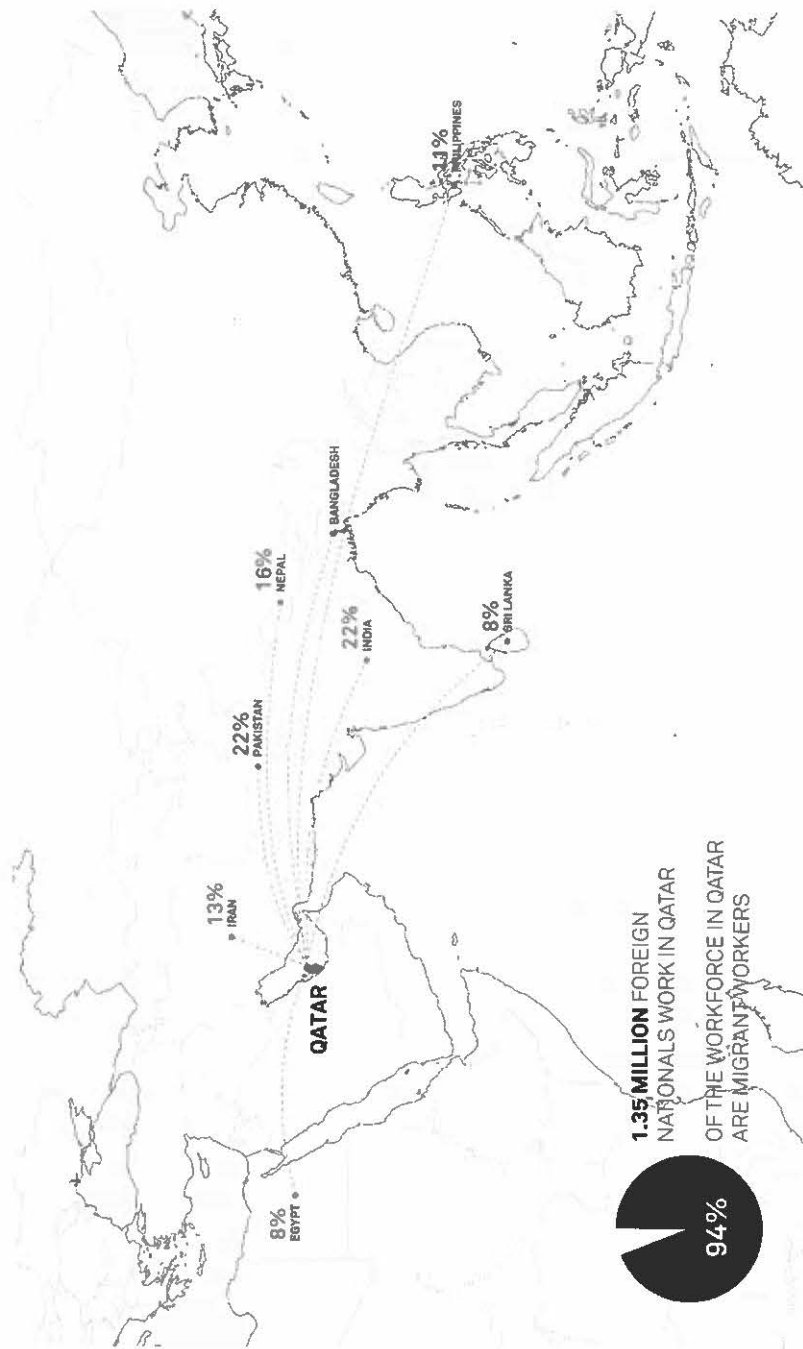


Figure 9.3 Foreign national workers in Qatar. Content for map from Amnesty International *Dark Side of Migration*.

Source: Map by Tiffany Rattray.

Persistent problems with the recruitment process include exorbitant fees exacted from workers to secure a position abroad, as well as fraudulent representation of the type of work and level of compensation. On poorly managed jobsites, migrant workers can be repeatedly exposed to dangerous working conditions. Construction companies and subcontractors seeking to limit expenditures will house thousands of men in poorly maintained, substandard accommodations that lack basic amenities for food preparation and delivery, proper hygiene, and reliable climate control in regions with extreme temperatures. Amnesty International reported a case in Qatar, for example, where workers were required to sleep in shifts due to scarce accommodation.¹² With "worker camps" often built outside the city limits, the migrant worker—shut out of the public spaces that architects and urban theorists claim are vital to a robust urban life—are isolated from the civic and social spheres of local residents. Since migrant workers are not citizens of the nations in which they work, they have very few rights and avenues of recourse to protest their poor treatment.¹³

One incident in Qatar illustrating the breadth of migrant construction worker abuse has been documented by the human rights organization Amnesty International in *The Dark Side of Migration* (2013). In a section that investigates the travails of several Indian, Nepalese, and Sri Lankan construction workers, the report exposes how large-scale building projects link vast networks of professional, skilled, and unskilled workforces around the world. Krantz Engineering, a Qatar-based firm who hired the men in question, had been subcontracted in 2010 to provide mechanical and electrical engineering services for the construction of Ras Laffan Emergency and Safety College (RLESC), located about 100 kilometers north of Doha.¹⁴ The clients, state-owned Qatar Petroleum and Qatar's Ministry of the Interior, were in the midst of building a large campus that would provide regional courses in firefighting, safety, and emergency response—much needed skills on a desert peninsula dotted with Qatar Petroleum's sprawling refineries, energy exporting ports, and off-shore oil rigs.

Amnesty's report narrates how in mid-2012 Krantz encountered cash flow problems, forcing the firm to fall months behind in paying their employees' salaries. As a consequence of delayed compensation, workers could not send monies back to their families to pay rent, mortgages, recruitment fees, and other debts; nor did the men have money for food or other basic needs.¹⁵ Attempts made by the workers to plead their cases to Qatari officials and respective embassies were to no avail. Amnesty's report alleges that Krantz, who had confiscated the workers' passports—a common tactic used by employers to prevent flight—was also unwilling to prepare and submit official paperwork for

the men to return home, including those who were willing to leave Qatar without receiving their back pay. Amnesty documented in detail how the dire situation wrought emotional and financial distress on the workers as well as their families, many of whom were indebted to recruitment companies back home.¹⁶ When half of the seventy stranded workers were finally able to leave Qatar, Amnesty reports that “they had to sign papers stating falsely that they had received their salaries and they had no claim against the company.”¹⁷ Amnesty contacted the primary client, Qatar Petroleum, about the fate of the Krantz workers, their poor treatment, and lost pay. Official responses deflected responsibility to the main contractor and to the subcontractor Krantz for what had happened to the men. Amnesty promptly issued a reminder that the United Nations’ Guiding Principles on Business and Human Rights require that “businesses should seek to prevent, address and mitigate human rights abuses related to their operations—even if they have not contributed to them.”¹⁸

The architects and the contractors

The job site at RLESC brought together a host of other construction industry actors (see Figure 9.4). To design the Academic Building at RLESC, Tetra Tech Architects and Engineers, an architecture/engineering firm with offices in the northeastern United States and a subsidiary of Pasadena-based Tetra Tech, was hired. In large AE firms like Tetra Tech, architecture is a small division incorporated into large project teams of allied consultants. Tetra Tech assigned over one hundred employees from their worldwide roster of 350 offices to provide architectural, structural, mechanical, and other engineering services for the design of the Academic Building.¹⁹ Along with SEG, Black Cat Engineering, based in Qatar, served as the other primary contractor. Additional engineering and construction firms headquartered in parts of the United States, Europe, the Middle East, and Asia provided various services and expertise for the construction. Aided by Building Information Modeling (BIM) software, which allows architects, engineers, and managers to coordinate design decisions in real-time even though they may be thousands of miles apart, these firms worked collaboratively to prepare the construction documents that the various subcontracted workforces, like those hired by Krantz, executed on site. Digital technology in this segment of the construction sector connects participants in their respective workplaces and expediently delivers their services to the job site.

Within this complex network of firms and companies—many of which are subsidiaries of giant transnational corporations specializing in mining, logistics, energy extraction, infrastructural development, engineering and

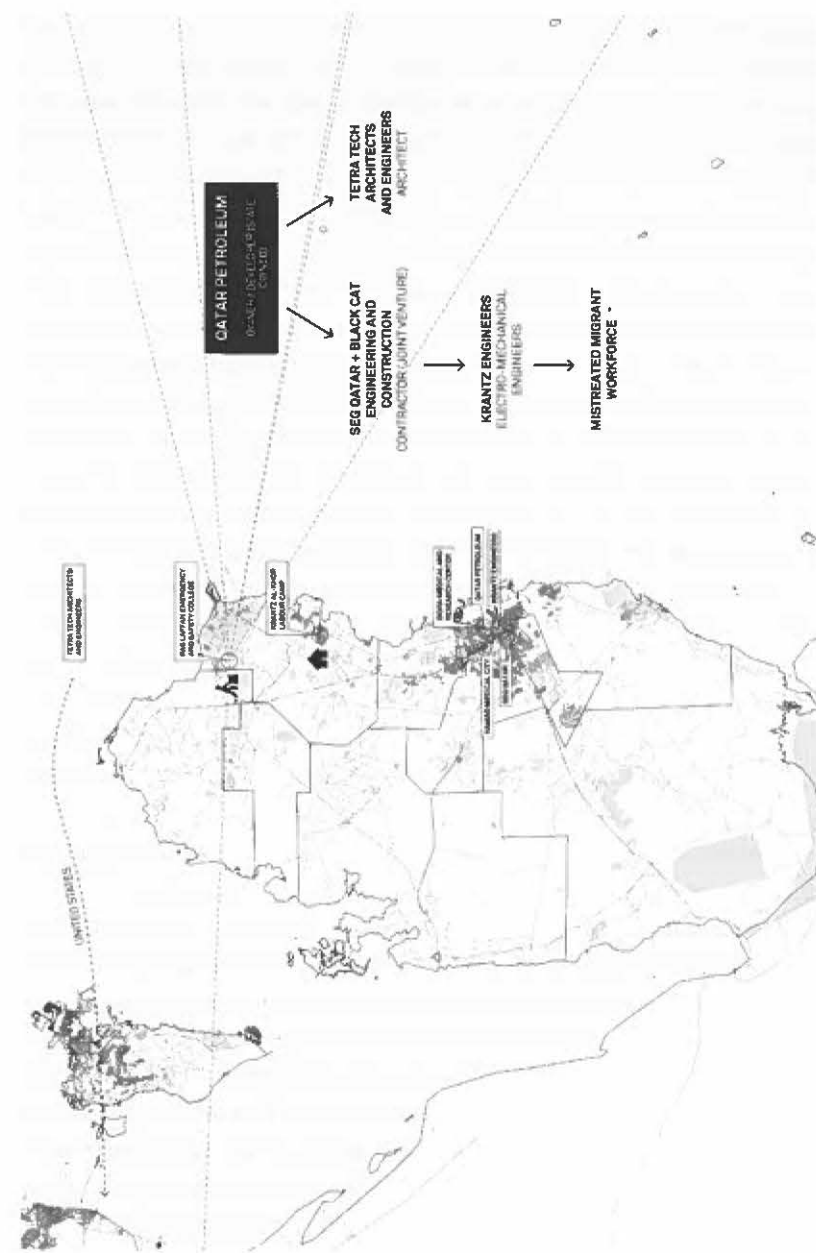


Figure 9.4 Case study Ras Laffan Emergency and Safety College. Content for map from Amnesty International *Dark Side of Migration*. Source: Map by Tiffany Rattray.

architecture—the contractual obligations and chain of accountability can prove daunting to discern if not impossible to access, as the workers employed by Krantz Engineering discovered. Professionals, such as the architects, engineers, and managers who operate in one sector of this global supply chain of labor, may not encounter the same problems as unskilled workers because their education and class privilege necessitate adequate compensation and suitable working conditions. However, professional positions in architecture are not immune to the influence of cheaper labor markets. The increase in subcontracting in architecture firms, observes sociologist Andrew Ross, has “meant that routine design operations—drafting, rendering, modeling—are increasingly assigned to cheaper labor in offshore locations.”²⁰ In some echelons of architectural practice, unpaid labor in the form of internships also exerts downward pressure on wages.²¹ Contractual agreements and the subcontracting process along with physical distances and socio-cultural differences divide architects from construction workers in a labyrinthine division of labor. On the one hand, large global projects benefit from the transnational connectivity of multinational companies and the accessibility to communication technologies that link participants. Yet on the other hand, the complexity of these networks also creates hierarchies and distinctions that separate actors within the system. As a result, timely resolution for the myriad of problems faced by migrant construction workers when they do occur can be elusive inside this black hole of accountability.

The above case of the Krantz workers at RLESC demonstrates how large-scale building sites function as dynamic territories. In his analysis of networks of finance, media, ideology, technology, and migration, cultural theorist Arjun Appadurai affixes the suffix “-scape” to these terms to “indicate that these are not objectively given relations that look the same from every angle of vision but, rather, that they are deeply perspectival constructs ...” Traveling within an “ethnoscape” as a tourist, migrant, or architect, or circulating data and construction information via a “technoscape” can be, according to Appadurai, “inflected by the historical, linguistic, and political situatedness of different sorts of actors ...”²² From the perspective of an American architect working in an office in Rotterdam, for example, a connection via daily virtual BIM modeling sessions at her computer with an Indian engineer in Doha may be forged even as it fosters a disconnection from the migratory Nepalese construction worker hired to execute her detail one year later on the site of Doha’s new national library.

“Building design can be conceived as composed of a host of different tasks,” writes architect Paolo Tombesi, “spread across official project inception and management, professional design, manufacturing and building production

operations.”²³ But the construction documents that come out of this mix are not neutral networks in which tasks operate independently of human intention. Rather, participants at all skill levels act within the construction process to create results that come about through “linkages established between distinct components, the nature and ordering of these linkages, the choices behind their selection and the relationship of power among the actors making these determinations.” Thus, power relations between all actors are implicit within the building construction process as knowledge moves from architects’ conceptualization of a detail through the drawing, to the construction managers, to supervisors, and to workers in the field who execute the assembly and draw upon their own expertise in performing any given task. Tombesi suggests “there is no such thing as ‘a building design’, but rather a bundle of design intentions/briefs that are active and interacting within a socially dynamic framework.”²⁴ It was this socially dynamic framework that allowed ecological sustainability into the system of design and construction as environmental information could be shared amongst actors.²⁵ Labor sustainability can and should be a part of this exchange as well.

For Hadid to announce, “I have nothing to do with the workers,” stands in stark contradiction to how today’s globalized design and construction process operates via networks of labor whose participants have unequal access to power and whose movements are influenced by a myriad of political, cultural, and economic factors. The ethical obligation toward construction workers resides within the design process itself and with the architects through their platforms of professional communication and public engagement.

Coda

As this chapter goes into production, architect Frank Gehry has publically announced that he and human rights lawyer Scott Horton have been working with various parties involved in erecting his design for the Guggenheim Museum in Abu Dhabi. Since 2009, Gehry and Horton have been negotiating to ensure the fair treatment of the migrant construction workers who will build the new museum.²⁶ In spite of this, it seems clear that many (most?) architects remain uncertain how to bring pressure to bear to improve working conditions for construction workers.

This chapter is the outcome of the advocacy of work of WBYA? (Who Builds Your Architecture?) whose members are Kadambari Baxi, Jordan Carver, Laura Diamond Dixit, Tiffany Rattray, Beth Stryker, and Mabel O. Wilson. For further information see: <http://whobuilds.org>.

Notes

1. Some of the names identifying architects, architecture firms, and businesses from related industries cited in this essay have been removed due to publisher concerns over litigation. For a full account of the incidents referenced here please refer to the documents cited in the endnotes. In particular, the authors recommend the *Dark Side of Migration* published by Amnesty International and the ongoing investigation reporting from the *Guardian* newspaper that cover detailed human rights abuses on construction sites in Doha, Qatar. This editing explicitly demonstrates the difficulty in exposing the inequalities inherent in the global construction supply chain and the challenge raising questions about ethical practices within the architecture profession.
2. The 2014 final match between Germany and Argentina registered three billion Facebook "interactions" and 672 Twitter messages. Television viewership in the United States set records for World Cup viewing. See: David Bauder, "The World Cup Final was Most Watched Soccer Game in U.S. History," *Associated Press*, 14 July, 2014, http://www.huffingtonpost.com/2014/07/14/world-cup-final-viewers-record_n_5585861.html (accessed 15 July, 2014).
3. Geographer David Harvey has argued that investments of surplus capital have been funneled into building booms in major cities like Dubai, Moscow, and Johannesburg. See: David Harvey, *Rebel Cities: From the Right to the City to the Urban Revolution* (London: Verso, 2013), 12.
4. Named after the model of urban-regeneration by the construction of the Guggenheim Museum in Bilbao, Spain, designed by architect Frank Gehry, that turned a deindustrialized city into a tourist destination and site for urban redevelopment. See: Kurt Forster, *Frank O. Gehry: Museo Guggenheim Bilbao* (Stuttgart: Edition Axel Menges, 1998). However, critics have argued that cultural projects like major "world-class" museums have become the agent for debt-financed redevelopment that does little to assist disenfranchised populations in cities like Bilbao. See: Allan Sekula, "Between the Net and the Deep Blue Sea: Rethinking the Traffic in Photographs," *October* 102 (Autumn, 2002), 3–34, and Andrea Fraser, "Isn't This a Wonderful Place?: A Tour of a Tour of the Guggenheim Bilbao," *Museum Highlights: The Writings of Andrea Fraser* (Cambridge: The MIT Press, 2007), 233–54.
5. James Riach, "Zaha Hadid Defends Qatar World Cup Role Following Migrant Worker Deaths," *Guardian*, 25 February, 2014, <http://www.theguardian.com/world/2014/feb/25/zaha-hadid-qatar-world-cup-migrant-worker-deaths> (accessed 26 February, 2014).
6. Ibid.
7. Walter Gropius, "Principles of Bauhaus Production [Dessau]," *Programs and Manifestoes on 20th Century Architecture*, ed. Ulrich Conrads and trans. Michael Bullock (Cambridge, MA: The MIT Press, 1970), 96.
8. Ludwig Mies Van der Rohe, "Industrialized Building," *Programs and Manifestoes on 20th Century Architecture*, ed. Ulrich Conrads and trans. Michael Bullock (Cambridge, MA: The MIT Press, 1970), 82.

9. "CIAM La Serraz Declaration," *Programs and Manifestoes on 20th Century Architecture*, ed. Ulrich Conrads and trans. Michael Bullock (Cambridge, MA: The MIT Press, 1970), 110.
10. In the mid-1990s, social policy analyst Jill Wells observed that "excess supply of labor in the construction market had the potential to drive down wages and conditions of work for migrant construction workers." See: Jill Wells, "Labour Migration and International Migration," *Habitat International* 20.2 (1996): 295–306.
11. For an in-depth study of neoliberalism, urban development, and the exploitation of migrant construction workers, see: Michelle Buckley, "Locating Neoliberalism in Dubai: Migrant Workers and Class Struggle in the Autocratic City," *Antipode* 45.2 (2013): 256–74.
12. Amnesty International, *The Dark Side of Migration: Spotlight on Qatar's Construction Sector Ahead of the World Cup* (London: Amnesty International Publications, 2013), 47–48.
13. The *Guardian* has published extensive reports on the problems of construction labor exploitation in the Middle East. This reportage relied in part on reports by human rights organizations such as Amnesty International, Human Rights Watch, and the International Trade Union Confederation (ITUC). See: Amnesty International, *The Dark Side of Migration*; Human Rights Watch, *'Island of Happiness' Exploitation of Migrant Workers on Saadiyat Island, Abu Dhabi* (New York: Human Rights Watch, 2009); Human Rights Watch, *'Island of Happiness' Revisited* (New York: Human Rights Watch, 2012).
14. See: Amnesty International, *The Dark Side of Migration*, 17. Run by the nationalized Qatar Petroleum, Ras Laffan Industrial City functions as a major hub for the production of liquefied natural gas. The lucrative oil and natural gas profits have provided the citizenry of Qatar with the highest standard of living in the world. Qatar's approximately 278,000 citizens depend on an additional 1.5 million expatriates to provide the labor necessary to run the country.
15. The Krantz workers were owed three months' back pay when they staged a protest by refusing to go to the job site. In a punitive measure against the work stoppage, Krantz levied additional fines that were to be deducted from their back pay. Amnesty International, *Dark Side of Migration*, 17–19.
16. Krantz had not provided appropriate resident passes and therefore the workers faced additional fines from Qatari authorities. Krantz did not have the financial resources to pay for services; this included electricity and therefore there was no air conditioning in the Krantz camps. During this same period in Spring 2013 food supplies were also periodically disrupted. Amnesty International, *Dark Side of Migration*, 21–4.
17. Amnesty International, *Dark Side of Migration*, 23.
18. Amnesty International, *Dark Side of Migration*, 27–8.
19. See Margaret Frank, "QCD Construction Nearing Completion! Tetra Tech," *Architects and Engineers' Blog*, 17 August, 2012, <http://tetrachae.wordpress.com/2012/08/17/qcd-construction-nearing-completion> (accessed 6 January, 2015).

20. Andrew Ross, "Forward," in *Building (in) the Future: Recasting Labor in Architecture*, eds. Peggy Deamer and Phillip G. Bernstein (New Haven, CT: Yale School of Architecture, 2012), 11.
21. Arjun Appadurai, "Disjuncture and Difference in Global Cultural Economy," *Modernity at Large: Cultural Dimensions of Globalization* (Minneapolis: University of Minnesota Press, 2003), 33.
22. Ibid.
23. Paolo Tombesi, "What Do We Mean by Building Design?," *Digital Workflows in Architecture: Design-Assembly-Industry*, ed. Scott Marble (Basel: Birkhauser, 2012), 188.
24. Ibid.
25. Sustainable development has been incorporated at all levels from the producers of materials to the architects who specify materials, from the contractors and construction workers who install materials to the clients who fund and maintain the building. Advanced technology in climate control is being developed, for example, for the Qatar stadiums to maintain a comfortable environment for spectators while also being energy efficient in its cooling process. However, this same attentiveness is not being given to the workers who toil in the same heat while constructing the stadiums.
26. According to *Architectural Record* Gehry hired attorney Horton shortly after reading the Human Rights Watch report *The Island of Happiness* (2009). See Anna Fixsen, "What is Frank Gehry Doing about Labor Conditions in Abu Dhabi?," *Architectural Record*, 25 September, 2014, <http://archrecord.construction.com/news/2014/09/140922-Frank-Gehry-Works-to-Improve-Worker-Conditions-on-Abu-Dhabi-Site.asp> (accessed 18 October, 2014).

Part IV

The construction of the commons