Drafting Knowledge

"*Ceci tuera cela, le dessin tuera l'architecture***."**
["This will kill that; the drawing will kill architecture..."]
—Richard Phenè Spiers

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On an unseasonably chilly London afternoon in May of 1887, architects from around Britain gathered in the galleries of the Royal Institute of British Architects at Conduit Street for the Eighth General Conference of Architects. Several of the papers took issue with drawing as a mediator in the architectural process and as representative of the architect's knowledge and position. Richard Phené Spiers, Master of Architecture at the Royal Academy of Art, shocked his listeners when he boldly declared:

"*Ceci tuera cela, le dessin tuera l'architecture*." "This will kill that; the drawing will kill architecture. … In these days of expert draughtsmanship this [the drawing]…is what we have to fear most."[1]

He criticized the exquisite rendering style of those architects who emulated the Ecole des Beaux Arts, because in their quest for a beautiful drawing, they had become blind to the realities of materials and construction.

Also suspicious of drawings, the architect John Dando Sedding (1838-1891) condemned the increased use of working drawings, claiming that they made architecture a profession of "design," not craft.[2] Pressures from outside the profession had forced architects to adopt the working drawing (and specification) in the nineteenth century as a means of communicating information that previously had been within the realm of the builder or craftsman. Their adoption of the working drawing in turn shaped architectural design and production, creating a feedback loop of change that permeated every aspect of daily practice.

The development of the architectural working drawing in Great Britain paralleled radical transformations happening both within and outside the profession. The population of England and Wales had more than doubled in the second half of the nineteenth century, with London and the industrial cities such as Manchester and Liverpool expanding the most dramatically.[3] This extreme population growth fueled an increase in construction, with the number of new houses also more than doubling in those years, for a total addition of 4,118,000 new homes across Britain. Countless buildings for commerce, manufacturing,

transportation, and leisure were built to serve this burgeoning population.[4] For example, over 500 new schools were constructed in London alone in the years just after the passing of the Education Act of 1870.[5]

All this new construction created an increased demand for workmen across the building trades. Census records show that in the second half of the nineteenth century the number of men listed as working in the construction trades more than doubled, from 203,000 to 497,000 in Great Britain.[6] The increased migration of rural workmen with their range of skill levels to London and the industrial cities complicated the question of local building traditions. The architect George Edmund Street, for example, pointed out the impropriety of the use of rural church details on town churches. In other words, a building tradition from one location was often not suited to another. Working drawings served to unify workmen's skills by prescribing in detail--and often at full scale--how to build each aspect of the building.

Simultaneously, systems and hierarchies of construction management changed. The rise of the general contractor with his legion of unknown subcontractors also concerned the architect, as he might not have the same relationship with them that he would have had with a builder with whom he had an established relationship. These relationships were complicated by changes in how projects were awarded, again forcing the adoption of the working drawing. Increasingly, projects were tendered and awarded to the lowest bidder, with little input by the architect. Drawings and specifications, therefore, not only outlined the project itself but also were integral to establishing its cost and the architect's fee, typically 5%.[7]

The close relationship of architect and builder up until the early nineteenth century can be seen in the deep concern that many architects voiced regarding these changes in contracting. Previously, working drawings had contained less detailed information than those drawn in the 1880s at the time of the conference. The historian Brian Hanson noted Sir John Soane's (1753–1837) concerns regarding the rise of the general contractor and the hiring of unknown subcontractors and workers. Soane believed that the new type of general contractor might request to see all of the architect's drawings "which would lead to the architect's secrets being lost."[8] This notion of the architect's "secrets," tied to both the drawing and to his control over the entire project, was central to the architect's wariness to adopt them. In Soane's experience, it was the architect, not the builder, who held the complete design and understanding of the project, and thus held the power on the job site. Simultaneously, engineers and architects had begun to experiment with new materials and methods of construction that had little connection to those that had been in place for centuries. Working drawings became a way for architects to control these new processes, if the builder or craftsman was unfamiliar with them.

Adding to the complex changes within the profession was the public's perception of the architect as a quack and its misunderstanding of his professional responsibilities.[9] As there was no formal certification for British architects until the twentieth century, the Royal Institute of British Architects' Examination, established in 1863, served as professional qualification. Initially optional, the examination became mandatory in 1882, granting membership in the Institute.[10] Like examination, education was another means of establishing credentials, but university education in architecture was slow to appear, with the first full-time degree program established in 1895 at Liverpool University, almost a decade after the conference.[11] Instead, architects trained primarily by apprenticeship to a practicing architect, typically for a period of five to seven years, which young men often supplemented with lectures in university certificate programs or by travel. Pupilage, while often excellent, was dependent on the mentoring abilities of the practitioner and encouraged a more individualized approach to learning the intricacies of architectural practice, including drawing methods and graphic standards. Therefore, early working drawings lacked standardization as each office developed its own methods and graphics, which were then passed down in the office apprentice system.

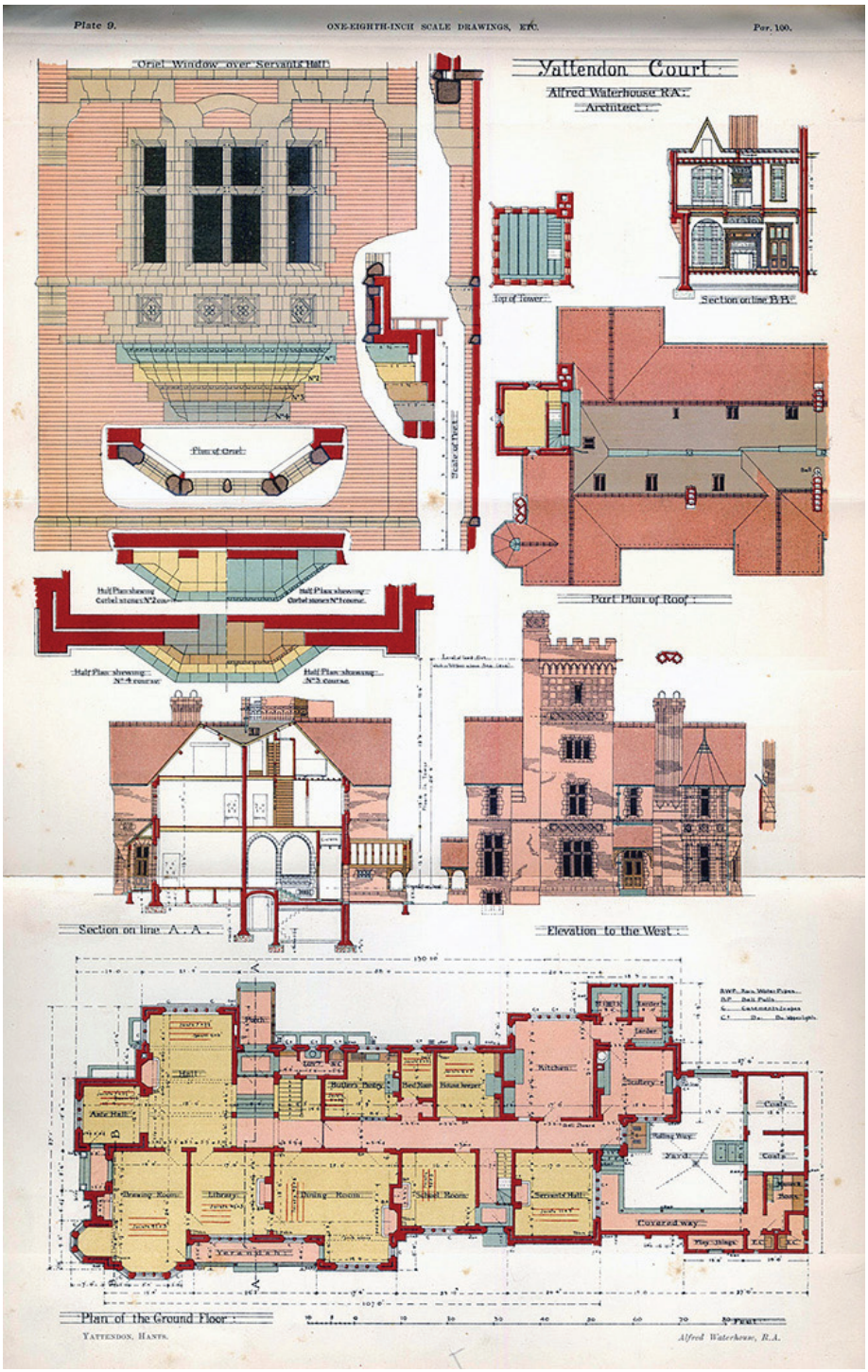

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Figure 1: *Working Drawing of Yattendon Court*, Alfred Waterhouse, as illustrated in Spiers's book.

Perhaps not surprisingly, when Richard Phené Spiers published his book *Architectural Drawing*, in 1887, the same year as the conference, he claimed that his chapter "Office Work" was the first to address the working drawing in the architectural press. While this was not entirely true, because there were several books and guides that touched on the practicalities of the working drawing, Spiers's book was in many ways the first to address it as the typical product of the architectural office. Spiers was, in some respects, the perfect person to have outlined the importance of working drawings, and a surprising figure to debate the shortcomings of Ecole-style rendering. He had studied engineering at King's College London prior

to spending three years in the Paris atelier of Charles Auguste Questel (1807-1888), while he attended lectures at the Ecole des Beaux Arts. This was very unusual for a British architect, as between 1800 and 1870 only seven British students attended the Ecole des Beaux Arts, and only an additional four worked in an Ecole-affiliated ateliers.[12] Spiers returned to London in 1861 and attended classes at the Royal Academy of Art, winning a travel award for his designs, which he used to tour Europe, Palestine, Syria and Egypt, drawing as he went. He then apprenticed in the offices of William Burges and Matthew Digby Wyatt, both excellent draughtsmen, before establishing his own architectural practice in London. In 1870, he became Master of Architecture at the Royal Academy, a position that he held until 1906. Under Spiers, the Royal Academy maintained its focus on architecture as a fine art, and the curriculum included classes on drawing from plaster casts, studies in anatomy, and ink washes of the classical orders or Gothic elements, as well as awards for the best drawings in different levels of the program.[13] In other words, architectural education at the RA was about drawing, even if it did not teach working drawings specifically.

Spiers recognized the increased importance of contract and working drawings to the shifting landscape of architectural practice. Pointing out the problems inherent in a lack of standardization among offices, such as in the use of different color washes to describe materials, he took great care to give clear instructions as to how to go about the working drawing and what information should be included. He recognized that while ambiguity was common in early architectural drawings used for construction when things could be worked out on site, in the late 19th century, however, such drawings "would be worse than useless," adding, "No pains, … , should be spared to make every drawing which is sent to the work as clear, accurate, and full as possible."[14] He recommended consolidating drawings onto only a few sheets, because the workmen would be less likely to make a mistake. Likewise, the architect "shouldn't evade the settlement of difficult points" in the drawings as it led to errors in construction.[15]

Spiers outlined three types of working drawings: those done in the office, those done during the work at a large scale (often full size), and those done in process regarding a specific material (what we would now consider shop drawings).[16] Each was important in a different stage of the building's production. Spiers described how each drawing type was to be done, at what scale, and to what level of detail. In other words, drawing dictated every aspect of construction and provided tangible evidence of the architect's expertise. In particular, Spiers praised the architect Alfred Waterhouse (1830–1905) for his working drawings, and he included Waterhouse's drawings of Yattendon Court as examples for draughtsmen to follow (figure 1). In a richly colored foldout, Waterhouse's drawings included a small floor plan, roof plan, elevation, and sections, along with larger scale details of a bay window. The rich colors designated different materials, and the drawings showed a range of information from overall dimensions to details such as the corbeling of the window bay in section. Curiously, Spiers had re-arranged and consolidated drawings from across several sheets of Waterhouse's original set. So if his intention was to show as a "set" of drawings, it is not complete but merely representative. Spiers wanted the drawings to contain as much information as possible graphically, including such information as the bearing direction of the floor joists, so that they would direct the contractor without ambiguity.[17] Spiers saw the working drawing as a critical tool by which the architect could control the construction process by illustrating the graphic standards of working drawings, in particular the use of a variety of scales to show details and washes to indicate materials. His attempts to systematize the process indicated that there was not currently a coherent approach within the profession.

But it was this level of control that rankled other architects. At the same conference, John Dando Sedding spoke out against the working drawing, maintaining it was a fallacy to think that "adequate working designs can be expressed on paper," as they neither fully addressed the craft of architecture nor allowed the artisan creative freedom.[18] Before going

into practice with his older brother, Sedding apprenticed in the office of the Gothic Revival architect George Edmund Street. From Street, he inherited his concern for the craft of architecture. He went on to found a school of building arts and supported the Art Workers' Guild, serving as its second master 1886–1887.[19] Sedding thought that working drawings allowed the architect in his "supreme folly and suicidal presumption" to become a "masterful dictator" who enslaved the craftsmen by contractually limiting all work done to the "necessary full-size and detail drawings."[20] Because working drawings were done before the construction began, they denied the moments of artistic innovation that occurred during the building process. Architecture, Sedding argued, "now conducted as an art and profession ... means design not craftsmanship."[21] And design meant drawing.

Referencing the Victorian obsession with séances and spiritualism, Sedding derided the architect a "medium," who conjured up—from nothing—the "abracadabra plans and sections" that the workmen followed.[22] In other words, the architect, like the medium, was a fraud, and drawings, lacking connection to architecture's material past, were merely ghosts of the real job of the architect, the building arts.

Sedding juxtaposed the situation of contemporary architecture with "old architecture," by which he meant primarily English medieval architecture, when the architect was most in sync with the building's creation. Echoing the writings of the critic John Ruskin, Sedding claimed that old architecture had "life." It also had craft and was true to its location through the use of local workmen and materials. The "old" architect was a craftsman who as part of a community of artisans worked directly on the building.

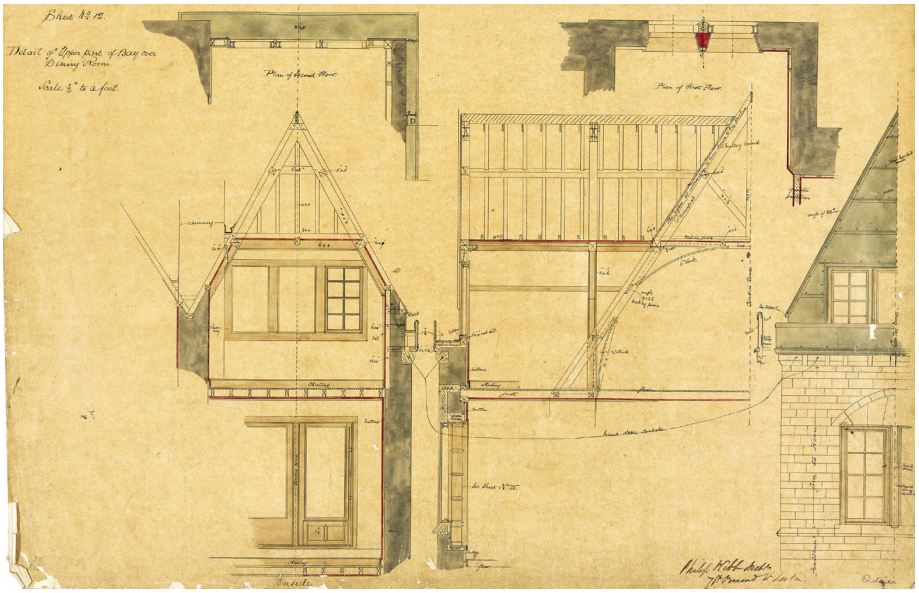
Unlike the "old" architect, Sedding argued, the modern architect had removed himself from the site intellectually as well as physically. He had become a "soft-handed occupant of an office stool," who, lacking real construction experience, was more a gentleman than a tradesman.[23] He sat in an office and drew without really understanding the processes of the labor by which his design was built. The working drawing only exacerbated this distance—intellectual and physical—between the architect and local building traditions. Sedding traced the infiltration of working drawings back to the English Renaissance when architects such as Inigo Jones and Sir Christopher Wren had begun to carry "ominous looking portfolios under their arms."[24] Jones's and Wren's work succeeded despite their use of drawings, because they maintained "entirely pleasant" relations with the workmen.

Sedding connected the development of the working drawing to the question of architecture's stylistic development. The "failure" of modern architecture for Sedding had begun in part with the revival of styles.[25] The Gothic Revival had not brought a true return to the "old architecture" as so many architects had hoped. Instead, both the Gothic and Renaissance revivals were, in their "naughty pursuit of style mongering" mere "paper design." They had broken the connection to building traditions, because they required drawings to explain the details and forms to the craftsmen. True development and progression of architecture could only come through "the freedom to adapt and to combine during the processes of making a thing."[26] To instruct a builder to create a building or detail that was not part of his building tradition was to both enslave him to the drawing and hamper the natural progress of architecture.

In daily practice the use of working drawings was much more complicated and nuanced than either Spiers or Sedding presented. For William Lethaby (1857-1931), a follower of Spiers and an advocate of the Arts and Crafts ideology, the practice of architecture was grounded in making. First, the architect must base his knowledge and design on the building crafts. Lethaby pointed out the problems of the architect's separation from the construction process and the "transformation of the builder into a contracting agent."[27] His interest in the medieval architect was in a large part because of the master mason's intimate involvement in the

ENDNOTES

1. Richard Phené Spiers, "The Architecture School of the Royal Academy," *The Builder*, Supplement (May 7,1887), 701.
2. John Dando Sedding, "On the Relation of Art and the Handicrafts" *The Builder*. Supplement (May 7, 1887): 693.
3. C. G. Powell, *An Economic History of the British Building Industry 1815–1979* (New York: Methuen, 1982), 45-6. The population in England and Wales in 1851 was 17,928 thousands, and by 1911 it had increased to 36,070 thousands.
4. Powell, *An Economic History*, 48. See also Chapter 3 "Buildings Upward and Outward: 1851–1911," 42-67.
5. Deborah E. B. Weiner, *Architecture and Social Reform in Late-Victorian London* (Manchester: Manchester University Press, 1994), 6.
6. Christopher Powell, *The British Building Industry Since 1800: An Economic History* (London: E & FN Spon, 1994), 26.
7. Frank Jenkins, *Architect and Patron* (London, Oxford University Press, 1961), 201-2, 215-16.
8. Brian Hanson, *Architects and the 'Building World' from Chambers to Ruskin* (Cambridge: Cambridge University Press, 2003), 49.
9. J.B. Waring, "The Diploma Question," *The Builder*, VII (November 24, 1849), 560.
10. Mark Crinson and Jules Lubbock, *Architecture—Art or Profession?* (Manchester and New York: Manchester University Press, 1994), 184. Parliament passed the Registration Act for architects in 1931, while the U.S. had instituted professional architectural licensure c. 1897.
11. Crinson and Lubbock, 60.
12. Richard Chafee, "The Teaching of Architecture at the Ecole des Beaux-Arts and its Influence in Britain and America" (PhD diss., Courtauld Institute of Art, University of London, 1983), 199.
13. Richard Phené Spiers, proposal to the Royal Academy 1870, Royal Academy Archive RAA/KEE/12/10.
14. Richard Phené Spiers, *Architectural Drawing* (London and New York: Cassell, 1887), 40.
15. Ibid., 39.
16. Ibid., 40–41.
17. Ibid., 41.
18. Sedding, "On the Relation of Art and the Handicrafts," 694.



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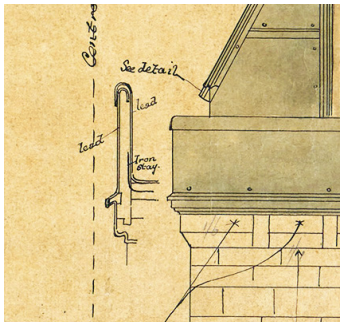

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building's construction.[28] He thought that the architect should give the craftsman as much freedom as possible, recognizing that "No great art is only one man deep."[29]

Lethaby's own drawings were revered and collected by architects in his own day, and they are delightful expressions of his interest in design and nature. In his design for the Church of All Saints, Brockhampton, for example, Lethaby attempted to provide only general working drawings and specifications without too much detail, so that creative freedom could be left up to the craftsmen. There was no general contractor on the project, and Lethaby had to manage the day labor himself. His simultaneous attempt to control the design outcome and to allow creative freedom were in conflict, however, and drove him to the verge of a breakdown when things were not done as he wanted them.[30]

Curiously, other Arts and Crafts architects, such as Philip Webb (1831-1913), whose work Lethaby revered, seemed to draw more, not less. Webb's contract and working drawings are rich with details, notes, and sketches, and the margins of his accompanying specifications include numerous sketched details as well. Webb seems to have worked out every detail in his drawings and specifications for the country house in Arisaig, Scotland, even those that one would think that he would leave to the builder (figures 2, 3, 4). Webb saw the drawing as a tool in the construction process that did not hinder but instead enhanced the craft of architecture. By communicating with the craftsmen through the working drawing, Webb had in essence become a collaborator in the craft of the building.

In addition to its ideological ramifications, the working drawing also had cost implications. Before the invention of the blueprint machine, drawings for the general contractor, subcontractors, surveyors, clients, authorities, etc. all had to be hand copied or, as Spiers recommended, lithographed then hand colored.[31] Thus, the increased number and use of working drawings dramatically expanded the ranks of draftsmen. In her history of the architectural profession in nineteenth-century America, Mary Woods notes that for a major building designed in the 1890s, between 3500 and 5000 copies of drawings were required.[32] Drawing paper thick enough to receive watercolor wash was typically not transparent enough for tracing, so the transfer of information from one sheet to another was tediously time consuming. To copy sets of drawings in the 1890s cost ten times what making blueprints would cost just a few decades later.[33] Therefore, for many architects resisting the use of the working drawing was not only a gesture of aesthetic openness to the craftsman, but it was also a

Figure 2: *Working Drawing*. Arisaig, Philip Webb, RIBA Drawings Collection #97254.

Figure 3: *Flashing Detail*. Arisaig, Philip Webb, RIBA Drawings Collection..

19. Thomas Seccombe, "Sedding, John Dando (1838–1891)," rev. Donald Findlay, in *Oxford Dictionary of National Biography*, ed. H. C. G. Matthew and Brian Harrison (Oxford: OUP, 2004); online ed., Lawrence Goldman, October 2007, http://www.oxforddnb.com/view/article/25004 (accessed September 25, 2015).

20. Sedding, "On the Relation of Art and the Handicrafts," 693.

21. Ibid., 691. Emphasis in original.

22. Ibid.

23. Ibid., 692.

24. Ibid., 691.

25. John Dando Sedding, *Art and Handicraft*, (London: Kegan Paul, Trench, Trübner Co., Ltd., 1893), 140.

26. Ibid., 141

27. W.R. Lethaby, "Education in Building," *Journal of the Royal Institute of British Architects* (June 22, 1901), 393.

28. Ibid., 385.

29. John Brandon Jones, "W.R. Lethaby and the Art Workers' Guild," W.R. Lethaby, 1857–1931: *Architecture, Design and Education*, Sylvia Backmeyer and Theresa Gronberg, eds (London, Lund Humphries, 1984), 24.

30. Godfrey Rubens, "The Theory and Practice of Architecture," W.R. Lethaby, 1857–1931: *Architecture, Design and Education*, Sylvia Backmeyer and Theresa Gronberg, eds (London, Lund Humphries, 1984), 51.

31. Lois Olcott Price, *Line, Shade, and Shadow. The Fabrication and Preservation of Architectural Drawings* (Winterthur, Oak Knoll Press, 2010), 133–36, 198.

32. Mary Woods, *From Craft to Profession: The Practice of Architecture in Nineteenth-Century America* (Berkeley, University of California Press, 1999), 121.

33. Ibid., 140

34. Summerson presents many of these points for the 1860s in his 1973 Walter Neurath Lecture. See John Summerson, The London Building World of the Eighteen-Sixties (London: Thames and Hudson, 1973).

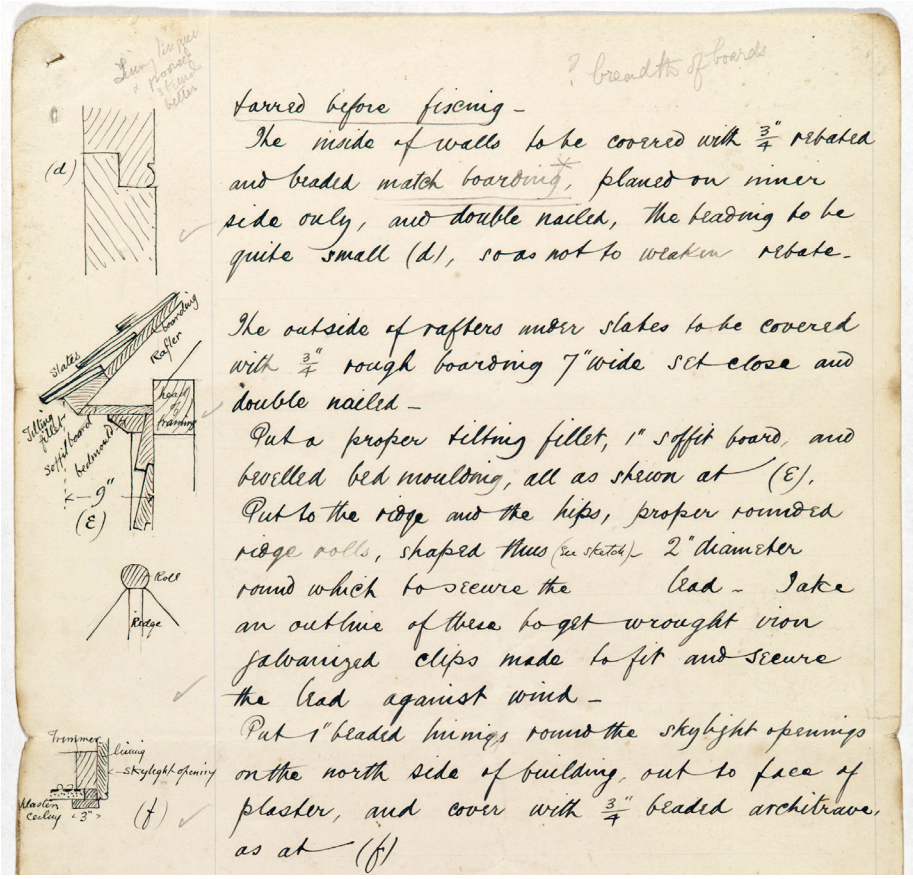

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Figure 4: *Specifications*. Arisaig, Philip Webb, RIBA Drawings Collection..

significant financial savings.

Concurrent with these issues was the question of who owned the drawings that the architect prepared once the project had been completed. Again, this came down to knowledge and control. Architects felt that unscrupulous builders (or clients) could use the drawings to construct additional work without paying the architect. It was not until the early twentieth century that this issue was resolved with the architect gaining the copyright of the design and the client holding a copy of the drawings for his own use.[34]

At the heart of the working drawing controversy was the image of the architect and the issue of professionalism. Architecture was no longer only an art or a craft or even a dalliance, but a profession and a business, and it was this point that the debates around drawing highlighted. There were many different ways to incorporate drawings into practice. Was the architect an artist who lovingly made drawings to convey his design to the craftsman, or was he a craftsman who did few drawings but had a knowledge of the building trades and was inextricable from the building site? Was he a businessman-professional who drew working drawings to explain every aspect of a project, or was the architect a "designer" overseeing a herd of young draughtsmen who churned out the requisite working drawings to "enslave" the workmen?

The rise of the working drawing revealed the architect's knowledge of architecture as more than final product but also as process of materials, methods, and the labor of men. The drawing allowed the architect to maintain control over the project as he jockeyed for importance with the new role of the general contractor. The working drawing, and its stepsister the specification, became the product of the architect's time, education, and experience. They became his new "secret."