

## 5.05 Timber Gutters

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### *gutter types*

Wooden roof gutters are amongst the least recognised aspects of Australian building, because they have almost all disappeared, and because they present no particularly distinctive appearance in illustrations. They were traditionally used in northern Europe, especially in Russia,<sup>1</sup> and were common in England. The earlier ones were simply hollowed-out tree trunks, but later they might be built up out of separate pieces of timber. In the eighteenth century houses of Tidewater Virginia eaves gutters are reported to have been for the most part confined to laundries, where their function was to catch rainwater because it was preferred for washing. They might be hewn from solid logs, or formed of two boards joined in a V-shape.<sup>2</sup> A house prefabricated in Portsmouth, New Hampshire, in 1772, for a customer in Granada, was specified 'To have Spouts all around ... of the best yellow pine ...'<sup>3</sup>

At Cape Town, where many settlers called on their way to Australia, wooden gutters either built up of boards or 'cut out of beams' were a tradition. Originally they were pitched and tarred inside to waterproof them, but after the British occupation a lining of lead or zinc became the norm, or tinned copper was used instead of wood.<sup>4</sup> Wooden gutters survived in use, at least until 1960, at the Moravian settlement, Fairfield, Manchester.<sup>5</sup> Hodgson's *Modern Carpentry*, a popular American text of 1902, illustrates wooden gutters of both the solid and the built-up type.<sup>6</sup> Indeed, although the timber gutter seems such an archaic feature to Australian eyes, elsewhere - at least in the Britain and the United States - it remained fairly common until well into the twentieth century.

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- 1 See the reconstruction of medieval domestic roof construction in Russia by M V Krasovski & B D Grekov in T T Rice, *A Concise History of Russian Art* (London 1963), p 99.
  - 2 P E Buchanan, 'The Eighteenth Century Frame Houses of Tidewater Virginia', in C E Peterson [ed] *Building Early America* (Radnor [Pennsylvania] 1976), p 70.
  - 3 'Portsmouth Prefabs, 1772 and 1849', *Journal of the Society of Architectural Historians*, XXIII, 1 (March 1964), p 43.
  - 4 R B Lewcock, *Early Nineteenth Century Architecture in South Africa* (Cape Town 1963), pp 386, 321.
  - 5 Harry Johnson, 'Fairfield Square, Manchester' [typescript history, 1960], p 8; B B Lewis papers, Manuscripts Collection, State Library of Victoria.
  - 6 F T Hodgson, *Modern Carpentry* (Chicago 1902), pp 91-2.

In Tasmania wooden gutters were reportedly common in the 1850s,<sup>7</sup> and they were more probably of the solid than of the built-up type. The Tasmanian Museum and Art Gallery, Launceston, holds a late nineteenth century photograph of the Girls' High School, the Barracks, which looks as if it dates from the mid-century, and has a concave fabric-roofed verandah, at the front edge of which is what looks like either a wooden gutter or a fascia in front of a gutter, designed integrally with the roof and with mouldings continuing up the spandrel ends. It appears to have had no downpipe, but a small relief pop inside at least one of the corners.<sup>8</sup>

In 1848 Archdeacon J R Wollaston visited the church then under way at Guildford, Western Australia, and expressed concern at the lack of the 'necessary trough for the protection of the walls, recently repaired and replaced'.<sup>9</sup> In 1856 wooden gutters were fitted to the National School at Bulla, Victoria, where the original iron one had decayed within a year or two of construction.<sup>10</sup> The problem in most such cases is to distinguish were solid and which were built-up gutters.

### *monoligneous gutters*

The solid type were still used in England in the early nineteenth century, when they were illustrated by Loudon.<sup>11</sup> The Hertfordshire architect William Wilds described one 'adapted to the humblest cottage as well as to the elegant villa'. It was best made of a solid piece of seasoned fir, generally about 100 mm square, and the trough cut of it could be on a fall, so that the gutter as a whole was still placed horizontally on the building. It should have as few joints as possible, and the angles mitred using a copper tongue and sealed with white lead, and although it required no lining, a 'thorough good painting' should be repeated every three or four years. It had the advantage over 'the old metal troughs', which had to be laid on a slope, were liable to be crushed by ladders laid against them, and tended to sag between supports: moreover, the face could be moulded to the appearance of a classical cornice.<sup>12</sup> C B Allen wrote similarly as if the wooden gutter were something of an innovation.<sup>13</sup> Philip Knobloch's *Good Practice in Construction*, published in New York in 1925, illustrated wood gutters cut from the solid, one rectangular in external profile, and one with a cyma recta face.<sup>14</sup> Holtman's *Wood Construction* of 1929 also illustrates various forms of

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7 'There are ... very many wooden gutters worthy of Kirkcudbright spouts ...': David Cannan to his mother, 30 September, 5 October 1856 &c, no 20 in Cannan Family papers, National Library of Australia, MS 401.

8 Reproduced in Julia Clark, *This Southern Outpost: Hobart 1846-1914* (Hobart 1988), p 49.

9 J R Wollaston [ed C A Burton & H U Penn], *Wollaston's Albany Journals (1848-1856)* (Perth 1954), pp 146, 176.

10 [Lawrence Burchell], 'Iron School Houses a Nineteenth Century Experiment in Emergency Accommodation', *Australia and New Zealand History of Education Journal*, April 1973, p 45.

11 J C Loudon, *Encyclopædia of Cottage, Farm and Villa Architecture and Furniture &c* (London 1846 [1833]), § 1756, p 841.

12 Loudon, *Encyclopædia*, § 2452, p 1251.

13 C B Allen, *Rudimentary Treatise on Cottage Building* (London 1854 [1853]), p 47.

14 P G Knobloch, *Good Practice in Construction Part II* (New York 1925), plate 30.

wooden gutters cut from solid sections,<sup>15</sup> as does the American Technical Society's *Architecture, Carpentry, and Building*.<sup>16</sup>

The oldest wooden eaves gutters reported in Australia are of solid section, and one has also been reported in New Zealand. This latter is attached to what is described as an early nineteenth century whaler's house at Kaikoura, and it has a wide flat base and short splayed-out edges, with a segmental channel scooped out of the top.<sup>17</sup> The first Australian example is that of 'Marybank' at Montacute, South Australia, which is claimed to date from 1842, and is made from a hollowed-out tree trunk with mouldings added to give it a classical appearance.<sup>18</sup> At Warwick, in Queensland, in the 1850s a cruder 'round hollow log split in two' was the standard type.<sup>19</sup> At Mills Cottage, Port Fairy, I have found a properly dressed solid section which functions as a combined edge beam and gutter - so rotted that its dual function had previously been unrecognised - along the front of the 1850s verandah.

### *built-up eaves gutters*

S H Brooks illustrates a built-up timber gutter, very similar in form to a slate gutter which he shows elsewhere,<sup>20</sup> while Loudon's *Encyclopaedia* of 1833 regularly illustrates the built-up form of gutter. In Loudon's case it is approximately square in section, but with a false bottom within it laid to a slope. He specifies that one should<sup>21</sup>

put one inch and quarter moulded fascia ... with an inch thick gutter having a false bottom ... to current the water (to slope the bottom, so as to make it run), put together with white lead ...

In one instance one of his published designs had provided for a band of cantilevered stones or 'wall head plinth' cut to gutter shape, which was Scottish practice, and Loudon proposes a timber gutter to replace it, in accord with practice in the vicinity of London.<sup>22</sup> Tarbuck's *Builder's Practical Director* illustrates such a gutter, but recommends cast iron or zinc as preferable.<sup>23</sup> Clive Lucas reports a built-up gutter at a cottage at Heptonstall, Yorkshire, apparently built up out of four parts, a hollowed-out trough-like section, with a base board below it, and pieces at both sides, the front one moulded.<sup>24</sup> *Laxton's Price Book* in the

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15 D F Holtman, *Wood Construction* (New York 1929), p 312.

16 F T Hodgson et al, *Architecture, Carpentry, and Building* (5 vols, Chicago 1925-6 [1910]), I, pp 199-202.

17 Michael Fowler and Robert Van De Poort, *The New Zealand House* (Auckland 1983), p 114.

18 Clive Lucas, *Conservation and Restoration of Buildings: Preservation of Roofs* (Sydney 1979), p 21.

19 Thomas Hill, *The Early History of the Warwick District and Pioneers of the Darling Downs* (Toowoomba [Queensland] 1988 [Toowoomba, no date (?1920s)]) p 96.

20 S H Brooks, *Designs for Cottage and Villa Architecture* (London, no date [c 1839]), pls lxxxiv & liv.

21 Loudon, *Encyclopaedia*, p 35, fig 6 & § 84, p 39.

22 Loudon, *Encyclopaedia*, p 36, fig 40.

23 [J L Tarbuck] *The Builder's Practical Director* (Leipzig, no date [c 1858]), pp 100-101.

24 Clive Lucas, *Conservation and Restoration of Buildings: Preservation of Roofs* (Sydney 1979), p 21.

1860s lists costs for one inch and 1<sup>1</sup>/<sub>4</sub> inch 'arris or fillet gutters'.<sup>25</sup> Burnell likewise lists arris and fillet gutters, as well as open trunk gutters and square trunks.<sup>26</sup>

Robert Scott Burn is a major fount of information on timber gutters, beginning with his *Colonist's and Emigrants' Handbook of the Mechanical Arts*, of 1854, which seems to derive from American practice. Here he illustrates two built-up gutters, one of which is three inches [75 mm] square internally and has a small moulding attached to the front edge, while the other gutter is strangely cantilevered from below the top plate of the wall, and carries a large moulding which creates the effect of a complete cornice.<sup>27</sup> Built-up gutters with moulded fronts are also illustrated in R S Burn's *Building Construction* of 1877, together with common box gutters and some intermediate variations.<sup>28</sup> Finally, Burn's *New Guide to Carpentry* illustrates one of the most elaborate of the built-up types, which he calls 'bridged', meaning that it is supported on brackets or cantilevers.<sup>29</sup> These are only his built-up gutters, but he also illustrates other types, which will be discussed below.

Built-up eaves gutters were also used locally, for there survives a specification written by the Geelong architect A J Skene in 1845 for a brick cottage with a 'water rhone' around the eave, and another around the verandah.<sup>30</sup> The word 'rhone' is a puzzle, but Papworth's *Dictionary* gives *rhone* or *roan* as the Scottish word for spout,<sup>31</sup> and W P Buchan's *Plumbing* refers to 'simple half-circle rhones - *i.e.*, half-round eaves gutters made of cast iron'.<sup>32</sup> The English word *rhine*, for an open ditch, is perhaps cognate. There can be no doubt that Skene is referring to a wooden gutter: it was to be 'five inches wide and six inches deep, molded on the upper face, of inch deal, double-bottomed and properly water[-proofed] with a composition of pitch and tar, with a fall of one inch to every ten feet'. A specification for a verandah in 1854 instructed 'frame to roof one inch deal bottom +1<sup>1</sup>/<sub>2</sub> sides to receive iron work inch false bottom, to form current' [ie fall].<sup>33</sup>

On Rottnest Island, Western Australia, some of the buildings (apparently in the 1840s) had 'timber arris gutters' - which R J Ferguson interprets as V-shaped,<sup>34</sup> though it would seem from Laxton's use of the term that they must have been of the conventional box shape. Wooden gutters were used in 1870 at the police station, Emu Plains, New South Wales,<sup>35</sup>

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25 William Laxton, *Laxton's Price Book* (43rd ed, London 1863), p 47.

26 G R Burnell [reviser], *The Builder's and Contractor's Price-Book for 1865* (London 1865), pp 52-3.

27 R S Burn, *The Colonist's and Emigrant's Handbook of the Mechanical Arts* (London 1854), pp 69-70.

28 R S Burn, *Building Construction* (London 1877), pp 63, 65.

29 R S Burn, *The New Guide to Carpentry, General Framing and Joinery* (Glasgow, no date [c 1870]), pp 90-91.

30 A J Skene, 'Specification for the various Works to be executed in the erection of a Brick Cottage for George Russell Esqre at Golf Hill on the River Leigh' (20 November 1845), in P L Brown [ed], *Clyde Company Papers*, III (London 1958), pp 622-625.

31 Wyatt Papworth [ed], *The Dictionary of Architecture* (London 1853-1892), sv Spout.

32 W P Buchan, *Plumbing* (5th ed, London 1889 [1872]), p 3.

33 Russell, Watts & Pritchard, 'Specifications for ... Dwelling houses ... at Elwood .. for Joseph Docker', 13 December 1854, Docker papers, State Library of Victoria, p 14.

34 R J Fergusson, *Rottnest Island: History and Architecture* (Nedlands [Western Australia] 1986), p 21.

35 W W Sharp, *Australia's Early Dwellings and Churches* (Sydney 1983), pp 44-5, quoted in Dale Martin, 'Wooden Pipes and Gutters' (History of Building Construction essay, BBldg, Melbourne University 1995).

but whether they were solid or built-up is unclear. During World War II the shortage of iron was so acute in New Zealand as to cause a revival in the use of timber gutters and downpipes, though this does not seem to have occurred in Australia. T Jackson Grant of Auckland obtained a patent for a built-up gutter in which the ends of each section were rebated so as to fit into each other, and the joint subsequently sealed with bituminous paint.<sup>36</sup>

### *box gutters*

Built-up box gutters have of course been used to the present day along internal valleys of roofs, essentially as an integral part of the roof structure, and it is only when they become separate components that they deserve special notice. Robert Irving reports one at the Female Orphan Institution at Rydalmere, New South Wales, of about 1814. What he describes as a 'lead-lined open drain' passed through the roof space to take water from an internal gutter out to the exterior wall of the building,<sup>37</sup> and this was presumably a built-up section.

Similarly a box-type gutter passes through the roof of a two storey house of the 1850s at 1 Little Provost Street, North Melbourne. Here the house is built to the side boundaries, and up to the street with a transverse gable roof. The only way of removing the water without a downpipe on the street was to take it through the roof, and the timber channel therefore passes straight through the centre.<sup>38</sup> A specification for a terrace house in 1854 refers somewhat vaguely what seems to be such an open gutter, and requires it to be made up of 7 x 1½ inch [175 x 62 mm] deal.<sup>39</sup> The home built by the Little Sisters of the Poor at Northcote in the 1890s had, and still has, a whole series of timber boxed open gutters passing through the attic space to drain the internal roof valleys, notwithstanding that these attics were occupied by the nuns as dormitories.

### *trunks and downpipes*

At Rottneest there were also timber 'trunks' which Ferguson interprets as downpipes, probably correctly, as Papworth defines a trunk as 'a square wood pipe used in cottages and country buildings',<sup>40</sup> and Loudon describes and illustrates 'three-quarters of an inch yellow deal trunks, four inches and a half square (wooden pipes to conduct the water down ...)'.<sup>41</sup> In later years in Australia 'trunk' would still mean an enclosed pipe or square duct, but more commonly running more or less horizontally.

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36 *Building Progress* [Auckland], VII, 6 (June 1943), pp 16-17.

37 Robert Irving, 'The First Australian Architecture' (MArch, University of New South Wales, 1975), p 504.

38 Information from the owner, Mark Maughan, 1993.

39 Russell, Watts & Pritchard, 'Specifications for Dwelling houses at Elwood', p 9.

40 Papworth, *Dictionary*, sv Rain-Water Pipe.

41 Loudon, *Encyclopædia*, § 84, p 39.

In the Quad, which was built on Rottnest Island in 1862-4 to house Aboriginal prisoners, there was a shingled roof behind a parapet, through which the water was discharged by means of what Ian Molyneux calls 'improvised timber gargoyles',<sup>42</sup> which presumably are plain wooden waterspouts. As with gutters, timber downpipes were revived during world War II in New Zealand though not in Australia, because of the shortage of iron.<sup>43</sup>

### *the Philadelphia gutter*

A particularly American form is the Philadelphia gutter, one which is not placed right at the eave but somewhat up the slope of the roof, often directly over the outer wall face. A sophisticated form of this occurred at the Octagon building in Washington, as re-roofed in 1818. The roof was shingled, but a balustrade stood on it some way in from the eave, apparently for architectural effect, though it may also have kept debris or snow from sliding down into the gutter. The gutter was on the down slope side of the balustrade. It was a flat tray of cast lead, tilted to follow the slope of the rafters, and the shingled surface was simply interrupted to accommodate it.<sup>44</sup> A similar gutter was used at Jefferson's 'Monticello'.

A J Downing illustrates a primitive version of the Philadelphia gutter in which a piece of board is nailed along the roof surface at right angles and a piece of sheet metal formed over it. A downpipe is then carried from it straight through the roof eave and down the face of the wall. A more sophisticated type is segmental in section, and actually cut into the top of the rafters so as to set it below the roof surface.<sup>45</sup> Both types are reported by R S Burn in his *Handbook of the Mechanical Arts*,<sup>46</sup> which was specifically designed for colonists, and a likely channel of influence to Australia. In the twentieth century the type with the boards at right angles was apparently still in use in the United States, as it is illustrated in Radford's *Portfolio*, set into a shingle roof, with a half shingle length separating it from the eave. Within it is laid a triangular fillet, tapering to a point at one end, so as to create a downward fall for the water.<sup>47</sup> Something similar is illustrated in the American Technical Society's *Architecture, Carpentry, and Building*.<sup>48</sup>

There is reason to believe that something of the sort was occasionally used in Australia and has simply passed unrecognised. James Kelly's cottage at Beveridge, Victoria, best known as the putative birthplace of the bushranger Ned Kelly, appears to have had no overhanging eave, but the lower part of the roof slope was clad with two lapped palings running lengthwise, or transverse to the slope, while the rest of the roof was of shingles on split pole battens. The depth of the battens meant that there was a significant drop from the surface of the shingles to that of the palings, and it seems likely that this was some sort of gutter collecting water to supply the underground tank at the rear of the building. While it might have been caulked it was far more probably lined with metal, and the outer edge might have been formed with a board or simply by bending the metal upwards.

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42 Ian Molyneux, *Looking Around Perth* (East Fremantle [Western Australia]), p 10.

43 *Building Progress* [Auckland], VII, 6 (June 1943), pp 16-17.

44 Information from John Waite, New York, 1992.

45 A J Downing, *The Architecture of Country Houses* (New York 1850), pp 189-190.

46 Burn, *Handbook of the Mechanical Arts*, p 69.

47 W A Radford, *Radford's Portfolio of Details of Building Construction* (Chicago 1911), p 35, pl 27.

48 Hodgson, *Architecture, Carpentry, and Building*, I, p 203.