

SECTION 8

ROOFS

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P1	02/06/14	WA	Preliminary Issue for review
2	19/8/14		Issue to web

8.0 ROOFS

8.1 General

In the case of building renovations, vapour barriers that were disturbed must be reinstated to the required performance standard. Any venting shall be protected to prevent the entry of vermin.

There shall be close collaboration and coordination between the consultants and JCU to ensure effective compliance to this design guideline on a project specific basis.

Consultants will be required to engage in project specific briefing discussions prior to commencing the design documentation phase of the project. This consultation is regarded as a mandatory project milestone and will be validated in the form of a project meeting minute by JCU.

The design of the roof drainage system is to be certified by the Hydraulic Consultant as compliant with these Design Guidelines and with relevant codes.

Special care must be taken with fixing to meet cyclonic conditions and with gutters, downpipes and overflows to meet local conditions. For larger roof catchments, plan to install correspondingly larger diameter downpipes to cope with peak summer rain-flows.

Visual Amenity

By design, roofs adjacent to and overlooked by windows shall be avoided if possible to minimize glare problems. Where unavoidable, protect windows to minimize glare. Metal fascias shall not be used on flat roofs of new buildings. The visible edge of roof sheeting shall be avoided.

Roof Safety

Under the WH&S Act and Regulations, designers have specific legal obligations to design roofs and structures which minimize the risk of falling during both the construction phase and during ongoing maintenance activities. All roof access/safety systems shall be engineer certified.

8.2 Roof Types

All JCU buildings shall have pitched roofs. The minimum pitch shall not be less than the roofing manufacturer's recommendations for the particular materials adopted, however the roof pitch must a minimum of five degrees (5°).

Membrane roofs will not be acceptable except in special circumstances and only with the approval of JCU.

8.3 Roof Deck Materials

Roofs shall generally be metal pan roof decking, manufactured from G550 hi-tensile colour coated (Colorbond) steel in accordance with AS 1397 and AS 2728-Category 3, with a thickness of 0.48mm BMT.

The deck profile shall be equivalent to Stramit 'Speed Deck Ultra' and fixed on concealed clips in accordance with the manufacturer's printed instructions. All sealants, fixings and accessories shall match the colour of the roof.

Ends of sheets must be turned up at ridges, penetrations and abutments, and turned down into gutters using specialist tools.

The colour of the roof sheeting must be approved by JCU; generally light colours preferred.

If vertical linings are required where not exposed to view, they shall be in colour matched profiled steel wall sheeting with a thickness of 0.42mm BMT, equivalent to Stramit 'K-Panel'.

8.4 Roof Flashings

Roof flashings generally shall be designed to minimise the use of sealants and shall be fabricated and installed in accordance with the roof deck manufacturer's recommendations. The plumbing designer shall design and specify flashings necessary for roofing penetrations. Flashings, capping's etc. associated with the roofing shall be 0.55mm BMT, prefinished to match the decking. All fixing types are to be as recommended by the roof deck manufacturer. In no instance shall plastic tap in fixings shall be used on any exposed section of roofing. All caulking and rivets shall match the colour of the roof and flashings.

Roof installations shall be designed to be vermin and bird proof.

Where the ends of the roof sheeting are clearly visible above the eaves gutter, install a Colorbond angle to match the roof colour with the vertical leg positioned downwards and the other leg fixed to the top of the rib, spaced to allow water run-off.

Flashings to penetrations for roof access hatches, skylights and the like shall incorporate a soaker flashing which shall extend to the roof ridge whenever possible. Flashings to all roof penetrations shall be designed to minimise the collection of leaves and debris. "Decktite" flashings are acceptable for penetrations. Where flashings abut walls, a double 'K' flashing (two piece) flashing is required.

On some campuses, 'Decktite' flashings and sealants are subject to damage and removal by birds. Where this is a problem, a Colorbond steel shroud shall be installed to protect the 'Decktite' flashing, and exposed sealants should be protected by Colorbond metal trims.

8.5 Gutters Generally

Consideration shall be given in the design and location of gutters to the problems of leaf accumulation. Eaves gutters shall be used and be of a self-cleaning design. Oversized gutters should be considered. Gutter sizing shall be sized in accordance with AS 3500.3.3.

For architectural applications of stainless steel, including roofing, technical advice can be sought from the Australian Stainless Steel Development Association.

Box gutters **shall not** be installed unless there is no other viable design solution.

Gutter and Valley Materials

All gutters including accessories shall be fabricated from Type 316 stainless steel with a minimum thickness of 0.9mm with a pacified polished finish. All joints shall be riveted and silicone sealed.

Gutter Grades

Gutter Grades shall be nominated on the plans. Minimum uniform fall for eaves gutters - 1 in 300-

Gutter Expansion Joints

Continuous lengths of gutter shall have expansion joints as stated in AS 2180. Expansion joints shall comprise stop ends with a saddle over flashing.

Gutter and Downpipe Sizing

Flooding frequency shall be decided for each project after considering the damage flooding would cause.

Generally the following flooding frequency shall be adopted:

- Box gutter (if permitted) 1 in 100 years
- Eaves gutter 1 in 20 years

Minimum size 300mm wide (clear of roof material x 100mm deep with free board of 50mm

Sumps shall be designed at box gutter outlets (if permitted)

All gutters shall have adequate falls to outlets.

All sizing shall be in accordance with AS 3500 Part 3. 3.

8.6 Rain Water Heads

Where necessary, rain water heads shall be in type 316 stainless steel, and shall include overflow spitters. Rainwater heads shall be sealed at the top with a removable lid and may be polished.

8.7 Overflows and Spitters

Overflows/spitters shall be provided to all roofs and gutters at gutter sumps and at rainwater heads as a safeguard against flooding caused by downpipe or drain blockages. Overflows are to discharge clear of building lines and pedestrian bridges or paths. Discharge from overflows shall be No.4 polished 316 stainless steel and be visible. Horizontal outlets shall discharge 150mm from the face of the building. Overflows are to be sized to AS 3500.3.3.

8.8 Leaf / Hail Guards

Leaf and hail guards shall be provided on all sumps. Material shall be stainless steel. All guards shall be removable. Guards shall project above the top of the sump not less than half the depth of the gutter.

8.9 Gutter Guards

On any installations utilising domestic-sized quad style gutters, proprietary plastic mesh gutter guards of approved type shall be fitted along the entire lengths of the gutter.

8.10 Downpipes

Downpipes are to be sized to AS 3500.3.3 with 100mm diameter minimum. All exposed downpipes shall generally be constructed of 316 1.6mm stainless steel with all joints welded or spiral welded tube. Tested U.P.V.C. will be considered as an alternative for particular applications.

All downpipe brackets shall be of stainless steel or stand off extruded aluminium brackets.

Generally, downpipes shall not be built into walls; however, where approved for internal use they must be readily accessible for maintenance purposes. Minimize bends in downpipes. Where offsets are required, angles shall not exceed 45 degrees.

Downpipes shall be disconnected at ground level by means of a storm water sump over which the downpipe discharges. Do not build in downpipes with underground drainage.

All downpipes and all gutters shall be hydrostatically tested and certified by the installer to the maximum head possible.

8.11 Sound Insulation and Condensation

Insulation shall be provided to any internal downpipe where water noise may create an acoustic problem.

Where condensation on the exterior surface of downpipes is likely to occur and cause nuisance, consideration shall be given to insulating downpipes.

8.12 Roof Access

Provide safe roof access from a service area or through room or by means of an internally open able roof hatch or door onto the Roof Safety Zone i.e.: a minimum of 3 metres from the edge of the roof where possible. . A permanent (hot dipped galvanised) steel or aluminium stair ladder should be provided where necessary, preferably located in a plant room or a separately enclosed space.

Ladders shall be provided between changes in roof levels, and between access doors from plant rooms and the roof surface if required. Walkways shall be provided across roofs to provide access to equipment, mechanical fans etc. Walkways which do not require supports that penetrate the roof decking are preferred.

Restrict entry to roof access areas or rooms by provision of locked door with keys available only to authorized maintenance persons.

Roof Equipment & Plant

Positioning of rooftop plant or equipment must be inside the Roof Safety Zone where practicable, to eliminate or minimize the need for plant maintenance or other staff to access or work within 3 metres of the roof edge.

8.13 Roof Insulation

To the whole of the roof area, unless otherwise agreed, provide as a minimum 55mm (R1.5) fibre composite blanket bonded to a reflective foil laminate equal to Bradford Anticon laid over galvanized roof safety mesh support (such as ARC AW1 MZ) to comply with AS2423 and fixed on top of the purlin.

8.14 Compatibility of Materials

Compatibility of materials used for roofing, flashings, guttering and the like must be considered in the architectural detailing.

8.15 Roof Accessories

All plumbing and associated pipework, mechanical fans, cowls and the like on or projecting above roofs shall be finished to match the roof colour, however all metal framing shall be hot dipped galvanized after fabrication and be left unpainted.

8.16 Roof Safety System

Where a person is exposed to the hazard of falling from a building or structure while cleaning or maintenance work is being carried out a work system designed to prevent falls must be used. Where safety line anchorage points are utilised the must be positioned on the building or structure so that a lifeline or safety harness may be attached before proceeding to a point where it may be possible to fall. Anchorage points for the attachment of safety harnesses must comply with AS2626. The installation shall also comply with the relevant Australian Standards:

- QLD WorkCover Authority Worksafe applicable Publications and Guidelines
- Australian Standards AS 1657 Permanent Platforms, Walkways and Stairways

- Australian Standards AS/NZS 4488.1-2: 1997 Industrial Rope Access
- Australian Standards AS/NZS 1891.1-4: 1995 Industrial Fall Arrest Systems and Devices

Preference shall be given to systems where the anchorage points or cable supports are mechanically attached to the roof deck ribs and do not rely on posts penetrating the roof sheeting to attach to the roof framing.

Consultation with JCU is required when selecting the system, to ensure the components of the selected system are compatible with existing systems utilised on other campus buildings.

The system installer must provide all appropriate certification that the system complies with the relevant Standards and regulations.

Supply a minimum of one harness to be located in a lockable steel cabinet at each point of access onto the roof.

Warranty Period

Provide the following Roofing Systems warranties:

- 10 years for workmanship and watertight installation covering all roofing and walling products.
 - 15 years from material manufacturer for corrosion.
 - 12 years from material manufacturer for the Colorbond finish.
 - 10 years from the roof access safety system manufacturer / installer.
 - 10 years for other products.
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