1. GENERAL

1.1. SCOPE
Supply and installation of basketball equipment and supporting structure.

1.2. DEFINITIONS

General
Meanings assigned to words and expressions in the Standard Offer Agreement shall apply to those words and expressions used in the Offer Documents.

Basketball Equipment
The ring, the backboard and the frame.

Supporting Structure
Building structure for wall or ceiling mounted equipment (EN1270 – Types 3, 4 & 5).
Footing for equipment with independent supporting frame (EN1270 – Type 6).

External / Severe Environment
Exposed to wind borne rain or salt laden air (within 1km of the coastline).

Internal / Mild Environment
Protected from wind borne rain and greater than 1km from the coastline.

Free Space
The distance from the face of the backboard to the face of the supporting frame or structure.

Ring Height
The distance from the playing surface to the top of the ring.

Backboard Height
The distance from the playing surface to the underside of the backboard.

RPEQ
Registered Professional Engineer of Queensland, competent in the field of structural engineering or welding of steel structures.

Project Manager
Person nominated in Schedule A

1.3. STANDARD

General
Queensland Building Act
BCA Building Code of Australia
AS/NZS 1170.0 Structural design actions General principles - Australian & New Zealand Standard
AS/NZS 1170.2 Structural design actions Wind actions - Australian & New Zealand Standard
AS 4100 Steel Structures – Australian Standard
AS 1170.0 – 2002 – Structural Design Actions Part 0: General Principles
AS 3990 – Mechanical Equipment – Steelwork
AS 1554.1 – Structural Steel Welding Part 1: Welding of Steel Structures

Functional and safety requirements
Comply with the functional and safety requirements (sections 3 & 4) of EN 1270: 1998+A1:2000

Materials
AS 1163-1991 – Structural steel hollow sections – Australian-Standard
AS 1442 – 1991- Carbon steels and carbon-manganese steels – hot rolled bars and semifinished products
AS 1720 – Timber Structures – Australian-Standard
AS/NZS 2269 – Plywood Structural – Australian & New Zealand Standard
PERFORMANCE REQUIREMENTS

Importance Level
The structure importance level of the equipment and support structure shall be level 1, in accordance with AS/NZS 1170.0:2002, for all free standing outside structures. For internal structures, the importance level of the building takes precedence. This is because the basketball structure is a mechanism attached to the wall and/or roof of the structure and ceases to be a separate structure.

Working Life
The design working life of the equipment frame and support structure shall be 25 years.

Imposed Actions
The equipment and support structure shall be of adequate strength to support the imposed actions specified in Figure 1.

Wind Actions
The equipment and support structure shall be of adequate strength to resist the wind actions defined in AS1170.2.

Load Cycles
The equipment and support structure shall be capable of sustaining 100,000 load cycles of the critical imposed cyclic action.

1.4. ADDITIONAL REQUIREMENTS

Materials
All materials shall be new.
Ring shall be steel with a minimum Grade 300
Backboard shall be:
  - External / Severe Environment
    - Marine grade plywood or Crezwood
  - Internal / Mild Environment
    - Plywood or Crezwood or suitable transparent material
Frame shall be steel with a minimum Grade C250.

Corrosion Protection
The minimum corrosion protection shall be:
  - External / Severe Environment
    - Hot dipped galvanized after fabrication having a minimum nominal coating mass of 390 g/m² for removable equipment and 500 g/m² for sleeves cast-into concrete.
  - Internal / Mild Environment
    - Paint or metallic coating system as defined by AS/NZS 2312 to achieve a life to first maintenance of 25 years in Category B environment (Clause 2.3).

Connection to the Supporting Structure
The equipment shall be removable from the supporting structure.
Equipment must be connected to a supporting structure.
Independently supported equipment shall have a sleeve, with a minimum length of 800mm, cast into the footing of the support structure.
Wall or ceiling mounted equipment shall be bolted to the supporting structure. All welds used on attachment plates that support basketball structures should conform to AS 1554:Part 1 SP
All welds in the basketball structure itself should conform to AS 1554:Part 1 SP
Any fastener must have sufficient preload to prevent fatigue of the joint during operation.
(Locknuts without preload will not prevent fatigue).
A locking device shall prevent the equipment moving during use.

**Sharp or Protruding Objects**
No sharp or protruding object shall be located within a height of 3250mm within the playing court.

(EN1270 Clause 4.1 defines requirements for corners and edges up to a height of 2900mm and the edges of the backboard. EN1270 Clause 4.5 defines requirements for padding. In addition to these requirements components above 2900mm with edges rounded with a radius of at least 3mm and protrude less than 10mm from the face of the member are acceptable along with hexagonal bolt heads and nuts located behind the backboard provided their thread projection is less than 3mm).

**Warning Signs**
Attach two warning signs as shown in Figure 2 to each structure. Attach one on the pole at 1200mm above the ground and the other in the top left corner on the front of the backboard. Each sign shall be the size as shown and shall be clearly visible. The lettering shall be black on a white background. The sign materials including adhesive shall be suitable for external/severe environment.

**1.5. DIMENSIONS**

**Ring**
Internal diameter 450mm +7mm -0mm
Solid steel diameter 20mm +0mm -4mm
Conform to EN1270 (Figure 10).

**Ring Height**
3050mm ± 6mm.

**Backboard**
As specified in Schedule A.
Minimum of 1800mm wide x 1050mm high.
Locate the face of the backboard at 1.2m from the end line.

**Backboard Height**
2900mm ± 30mm

**Free space**
As specified in Schedule A.
Minimum 1.2m.
2. SUPPLY of EQUIPMENT

2.1 General
Equipment supplied shall be marked with manufacturers name, model number and year of manufacture. Equipment shall comply with the project specific requirements detailed in Schedule A.

2.2 Certification
Compliance of the equipment with the requirements of this specification shall be certified by a Registered Professional Engineer of Queensland (RPEQ). The certification shall be supported by prototype testing. All basketball backboard structures of the same model with shorter supporting arms will be deemed to have satisfied this criteria if the variant with the longest supporting arms satisfactorily completes the prototype load testing and fatigue testing regime. Education Queensland reserves the right to nominate a representative engineer and project officers to witness the prototype and/or fatigue testing. Manufacturers need to contact Education Queensland when such testing is to be carried out with sufficient notice to allow the witnessing to occur.

2.2.1 Prototype Load Testing
Equipment shall be prototype load tested for the imposed loads shown in Figure 1. The prototype load test load shall be the imposed load factored by a load factor of 1.5 (this is factored into the 1.8kN) and a test factor of 1.2 giving a load at the backboard of 2.2kN and 1.5kN for the basketball ring. The permanent deformation resulting from prototype testing shall not exceed 10mm. For ease of inspection it is recommended that the testing be carried out on an unpainted structure and that the structure be tested for cracking using the magnetic particle method both prior and following completion of the load testing. The prototype load test shall be supervised, reported and certified by a Registered Professional Engineer of Queensland (RPEQ). The test report shall detail the equipment tested, the test procedure, test loads and performance.

2.2.2 Cyclic Load Testing (Fatigue Testing)
Cyclic testing of the assembly shall be 100,000 load cycles from zero imposed action to the prototype cyclic test load. The prototype cyclic test load is 1.2kN applied downward at the face of the backboard. The equipment is acceptable after test if the permanent deformation is less than 10mm and no cracks are present. For ease of inspection it is recommended that the testing be carried out on an unpainted structure and that the structure be tested for cracking using the magnetic particle method both prior and following completion of the fatigue testing. The cyclic load test shall be supervised, reported and certified by a Registered Professional Engineer of Queensland (RPEQ). The test report shall detail the equipment tested, the test procedure, test loads and performance.
3. INSTALLATION of EQUIPMENT

3.1 General
Equipment shall be installed to comply with the project specific requirements detailed in Schedule A. Steel structures should be erected in accordance with Section C15 of AS 4100 – Sup 1 – 1999. Do not install equipment without written direction from the Project Manager.

3.2 Design Certification
Compliance of the support structure and the fixing of the equipment to the support structure shall be certified by a Registered Professional Engineer of Queensland (RPEQ). Prototype and cyclic testing documentation must be available for perusal by the engineer performing the certification.

All inspection needs to occur prior to certification and all welding performed as part of the installation needs to be in accordance with AS 1554:1 SP.

Magnetic particle or other non-destructive examination of the welds may be required by the engineer to confirm the quality of the welding.

A load test on each attachment point on internal structures should occur.

Submit design drawings and certification to the Project Manager prior to installation.

3.3 Inspections
The construction certifier is to inspect:
- Foundations of independently supported equipment prior to pouring including sleeve;
- Fixing of the equipment to the support structure.
- Welding should be certified in accordance with AS 1554 Part 1 SP.
- Qualifications and experience of the RPEQ must be stated.

3.4 Certification of the Completed Works
Inspection of the completed work, for compliance with the design shall be certified by an RPEQ or Building Surveyor competent in mechanical structures. An inspection of the roof and wall mounting points should be carried out prior to any scaffolding being removed. Submit certification of the completed works to the Project Manager.
Figure 1: Imposed actions [Q]

Notes:
(a) Figure 1 presents imposed actions [Q] in terms of AS1170. The loads are consistent with the rigidity and stability proof test loads specified in EN1270, based upon a load factor of 1.5 incorporated in the 1.8kN force F2A and a prototype load test factor of 1.2 to allow for variability of units. In addition to the requirements of EN1270 forces F1 & F3 may act in either the + or – direction.

(b) For forward roof retractable structures the load F3 shall be applied in a rearward direction and for rearward roof retractable structures the load F3 shall be applied in the forward direction. For all other structures load F3 is applied both forward and rearwards.

(c) For side swinging structures attached to a wall the loads F1 and F3 shall be applied once the structure has been swung to and locked in the playing position.

(d) Ultimate design action shall be determined in accordance with AS1170.0 – Section 4 Clauses 4.2.1 & 4.2.2, with \( \psi_c = 0 \)
WARNING

THIS EQUIPMENT HAS NOT BEEN DESIGNED FOR MISUSE

• NO HANGING FROM THE RING
• NO HOLDING OR GRABBING THE RING
• NO CLIMBING ON THE FRAMEWORK

By Direction
Director-General, Department of Education and Training

Note: April 2017 - Department name updated on sign.

Notes on sign format:
a) Font type: Arial, Bold
b) Font size:
   Line 1 WARNING 36 point
   Line 2 & 3 THIS … 26 point
   Line 4, 5 & 6 NO … 22 point
   Line 7 & 8 By ….. 16 point
c) Sign size: 160mm wide x 120mm high
Schedule A  
PROJECT DESCRIPTION
(To be submitted by the Building Applicant to the Building Surveyor with Schedules B & C)

**Project**

Project No. : ……

School: ..............................................................................................................

Address: ...........................................................................................................

**Court**

<table>
<thead>
<tr>
<th>Court</th>
<th>Location</th>
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<tr>
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</table>

**Equipment Schedule**

<table>
<thead>
<tr>
<th>Court</th>
<th>Equipment Type</th>
<th>Exposure</th>
<th>Backboard Dimensions</th>
<th>Free Space (m)</th>
<th>Number Required</th>
</tr>
</thead>
<tbody>
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<td></td>
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</tbody>
</table>

**NOTES:**

1) Equipment Type:
   Wall or ceiling mounted equipment:
   EN1270 Type 3 - Wall mounted (folding); Type 4 - Wall mounted (fixed); Type 5 - ceiling mounted;
   Independently supported equipment:
   EN1270 Type 6 – Removal from socket in footing
2) Exposure
   External/Severe Environment or Internal/Mild Environment
3) Backboard Dimensions
   Minimum 1800mm wide x 1050mm high
4) Free Space
   Minimum 1.2m; Australian Sports Commission recommend 2.25m (min); FIBA recommend 3.25m (min)
5) Number Required
   Two per court

**Project Manager**
(Person to whom all correspondence is directed and who provides all directions to the supplier/contractor)

Name: ........................................

Position: .....................................

Contact Details: Telephone .................

Facsimile .................................

Email .................................
<table>
<thead>
<tr>
<th>Schedule B</th>
<th>DESIGN DOCUMENTATION</th>
</tr>
</thead>
<tbody>
<tr>
<td>(To be submitted by the Building Applicant to the Building Surveyor for approval to construct)</td>
<td></td>
</tr>
<tr>
<td>(To be completed for each combination of equipment type/exposure/backboard/free space)</td>
<td></td>
</tr>
</tbody>
</table>

**Project**  
Project No. ........

**School:** .................................................................

**Address:** .................................................................

**Court(s):** .................................................................

**Equipment** (attach manufacturers description)

**Manufacturer:** .................................................. ABN .................

**Model No:** ..................

**Number to be supplied:** ........

**Backboard Dimensions:** .......mm wide x .......mm high

**Free Space:** ...................mm

**Equipment Certification** (attach certificate)

Equipment design and testing certification by:.................................

**Date of certification** ................. RPEQ # .................

**Installation Contractor**

**Company:** .................................................. ABN.................

**QBSA** .........................

**Contact Details:**  
Name: ..................................................

**Position:** ..................................................

**Telephone** .........................

**Facsimile** .........................

**Email** .........................

**Supporting Structure Design Certification** (attach certificate)

Installation design certification by:.................................

**Date of certification** ................. RPEQ # .................
Schedule C
CONSTRUCTION DOCUMENTATION
(To be submitted by the Building Applicant to the Building Surveyor for Building Act Compliance)

Project

School: ........................................................................................................

Address: ...................................................................................................

Court(s): ..........................................

Installation Certification (attach certificate)

Installation design certification by .................................

Date of certification ......................... RPEQ # ......................(as applicable)
USER INSTRUCTIONS

1. This specification incorporates the requirements of the Building Code of Australia and the European Standard for Basketball Equipment, but does not incorporate all of the requirements for basketball equipment to comply with the International Basketball Federation (FIBA) standard\(^1\).

2. The Queensland Government Department of Local Government Planning Sport & Recreation and the Australian Sports Commission support the recommendations for the dimensions for playing areas published by the Western Australia Ministry for Sport and Recreation\(^2\).

3. Free space is dependent on the space available for the court. FIBA specifies 3.25m (minimum) and the Australian Sports Commission recommends 2.25m (minimum).

4. The procurement procedure is summarised as:
   4.1.1 Project Manager completes Schedule A
   4.1.2 Project Manager invites quotations from equipment suppliers/installer based upon the specification with Schedule A completed.
   4.1.3 Project Manager reviews the quotations, obtains financial approval.
   4.1.4 Project Manager awards a contract in writing for supply/installation.
   4.1.5 Equipment suppliers/installers to complete Schedule B and submit to the Project Manager.
   4.1.6 Project Manager submits a copy of the specification with completed schedule A & B with supporting documentation to the Building Surveyor for approval to construct.
   4.1.7 Upon receipt of the approval to construct from the Building Surveyor the Project Manager directs in writing the installer to install the equipment.
   4.1.8 Construction certifier is to inspect the construction and certify.
   4.1.9 Equipment installer is to complete Schedule C and submit to the Project Manager.
   4.1.10 The Project Manager is to submit Schedule C along with a copy of the design approval to the Building Surveyor for Building Act Compliance.
   4.1.11 The equipment may be used following receipt of the Building Act Compliance.

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