

1. SCOPE

Free TV Australia Operational Practice 33 is a guideline to the minimum requirements for industry standard television coverage of Australian Football League (AFL) games. It outlines infrastructure requirements for a television outside broadcast production using contemporary production techniques which meet current broadcast television presentation requirements, the requirements of the code's controlling body as well as catering for future developments.

This operational practice has been developed by the Free TV Australia Project Group - Outside Broadcasts. Its intention being to maximise television and radio production potential and productivity at venues and the avoidance of costly omissions at planning and construction stages.

TVOB coverage of AFL has progressed with the general availability of both ultra and super slow motion (slo-mo) wireless (RF) and a variety of special effects cameras. These technical developments along with various production enhancements require certain space and infrastructure requirements and impose stringent requirements on lighting specifications for night matches.

2. TYPICAL COVERAGE

2.1 CAMERAS

The configuration of a typical AFL game at an approved venue will be:

Cameras covering the field of play	10 - 12
Cameras for O/B studio	4
Special/POV cameras	8

2.2 CAMERA POSITIONS

2.2.1 Camera platforms

A typical working platform is in the order of 1.8 to 2.0 metres wide for each camera and 2.5 to 3.0 metres deep. TV platforms are to be exclusive of sporting group and venue camera operations.

2.2.2 Main camera platform position.

To accommodate 4 x hard cameras with telephoto lenses -8 metres wide. Positioned on the centre line of the ground at a height of 15 metres above the playing field and 25 metres back from the outer boundary of the playing field.

The location should have a totally unobstructed view of the field inclusive of all boundary lines, with the height above crowd sufficient to clear standing and hand waving patrons in between the camera deck and field of play.

Access to the camera deck should not be restricted by having to access it through spectator seating in adjacent seating areas. Equipment access to the main camera platform should be via a back-of-house lift that connects the OB compound with the television production areas. The access should be flat with approved ramps that connect various floor levels, i.e. no stairs, so that road cases on wheels and trolleys can be used to ferry the equipment.

Space should be allocated to safely store empty equipment cases.

The location should have a totally unobstructed view of the field inclusive of all boundary lines, with a height above the crowd sufficient to clear standing and hand waving patrons in between the camera deck and field of play.

2.2.3 Camera positions

Camera 1 Main camera platform

Camera 2 Main camera platform

Camera 3 Cam left 50m

Positioned left of 50 metre line on the same side of ground as Cameras 1 and 2. Actual position is venue dependent. Either on boundary or at height in stand.

Camera 4 Cam right 50m

Positioned right of 50 metre line on the same side of ground as Cameras 1 and 2. Actual position is venue dependent. Either on boundary or at height in stand.

Camera 5 Cam left behind goal

Positioned directly behind the centre of the camera left goalposts at a height of approx 15 metres above the playing field and approx 25 metres back from the outer boundary of the playing field.

Camera 6 Cam right behind goal

Positioned directly behind the centre of the camera right goalposts at a height of approx 15 metres above the playing field and approx 25 metres back from the outer boundary of the playing field.

Camera 7 Cam Left 25m

Positioned in seating area on the same side of the ground as Cams 1 and 2.

Camera 8 Cam Right 25m

Positioned in seating area on the same side of the ground as Cams 1 and 2.

Camera 9 Reverse

Positioned on opposite side of ground to main camera deck. Minimum 15m above field of play and 25m from boundary

Camera 10 Boundary/Dressing rooms

Cabled portable camera operating on boundary with access to dressing rooms.

Camera RF portable camera

Operates on boundary and field of play as required

Cameras Commentary box/studio/hosting area

Number of hosting cameras dependent on Broadcasters requirements for the match. See Section 2.3 Commentary areas and Studios.

Special/POV cameras

Home and away benches, dressing rooms, coach rooms and interchange area have dedicated POV cameras. These cameras are often remote controlled and are mounted on existing structures or purpose built mounts within the venue. Cabling access requirements for these cameras is outlined in Sect 7.2 Cameras additional to above may be used at major

event matches. These can include camera cranes, rail cameras, helicopters, blimps etc. various cameras (cable cameras) and facilities available for production use require “hard” fixing points to be symmetrically placed around the ground for the installation of cameras and other equipment on catenary type mounts. Suitable points, typically ‘high”, light towers, grandstand roofs etc. around the ground need to be identified and engineering specifications made available. In new or renovated venues these points should be included in the design phase of the project.

These camera requirements shall be negotiated in the lead up to major matches.

2.2.4 Final camera placement

The above camera positions are typical of a standard AFL coverage but final camera placement will always be at the prerogative of the program producer and director.

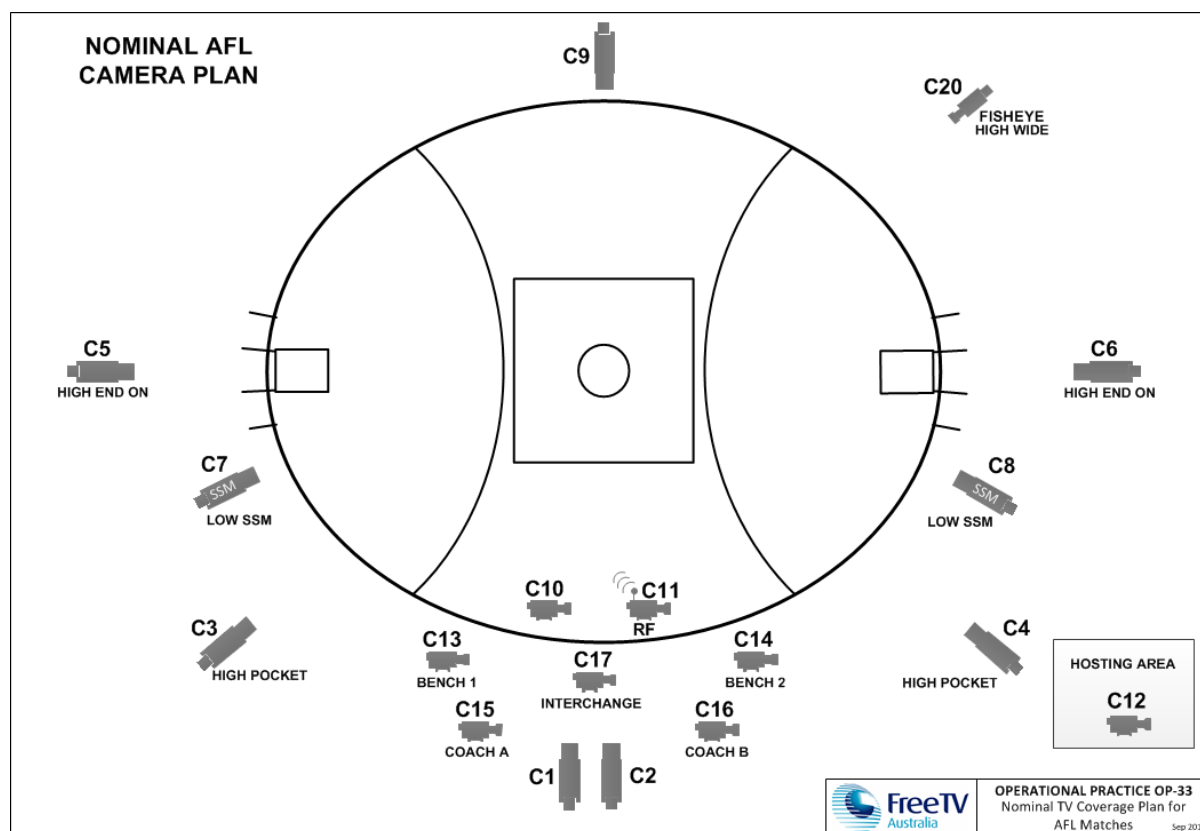


Figure 1 Nominal TV Coverage Plan for AFL Matches

2.3 COMMENTARY AREAS AND STUDIOS

2.3.1 Commentary boxes

The main TV commentary box should be on centre line, nominally at a height of 15 metres above the playing field and 25 metres back from the boundary, with a clear view of the entire field, including the ‘players bench’ and should not be obstructed by the camera platform. The TV commentary box is required to accommodate up to 4 x commentators, TV producer, Associate producer and Statistician, with commentators seated at the front of the box, and production staff on a raised platform to the rear of the commentators.

2.3.2 Commentary box dimensions and construction

A “Standard” Commentary Box should have a width to accommodate a team of four across the front bench. Typical size for the main commentary box is in the order of 4 metres frontage x 4 metres deep. The front of the booth should be glazed the whole width. If a mullion is required it should be on the sides not the centre. The glass should be fixed, laminated and mounted perpendicular to the ground. If the glass is angled the angle of any television lights in the commentary box need to take into consideration as reflection may appear on camera in the commentary booth. There should not be any other glass in the commentary booth. Parallel glass in commentary booths, typically used on the front sides of the booth, is the major offender in promoting unwanted acoustic resonance.

The commentary box needs to achieve specific acoustic criteria. Construction materials, construction methods and physical dimensions all play a role in the outcome. Ideally an acoustic engineer / consulting firm with experience building studio facilities would have to be engaged to assist in the design to meet the specifications.

The design objective is to create a space with many acoustic resonances spread evenly across the frequency spectrum. Internal acoustic treatment is required to dampen the liveliness and tame the resonances. Noise entering the broadcast space can be airborne or transmitted through the floor. Impact isolation between floors should be kept to a minimum.

Note: cable paths into the studio / commentary boxes should have removable acoustic isolation such as fire pillows provided to achieve the abovementioned criteria for the room.

The commentary booth needs to be air conditioned with capacity to cope with up to 12 people heat load plus television lighting. Evaporator fans need to be low noise units and achieve <30dB(A) with local thermostat and control for optional shut down during studio on-air segments.

Work lights in the commentary booth should consist of fluorescent batten tube lights or similar high output lights, to be utilised for the bump-in / bump-out. A second stage of lighting focused on the benches should be utilised for on air conditions. This can be down lights or focused batten lighting. Lighting controls should be available in the commentary booth. Special attention should be paid to any glare that is omitted from the commentary booth lighting and any flicker that is introduced by the lamps.

Three 48.4mm scaffold tubes (lighting bars) to be installed 50 mm below ceiling height down the length of the room—one in the centre the other two 400mm in from side walls for the mounting of “television” lighting fixtures. Each bar should be rated to carry in the order of 40Kg. Provision for three phase power (32 Amp) should be available for lighting or other high current requirements.

A scaffold tube should be provided outside, along the front of the commentary box for the mounting of radio mic and other RF antennae. The positioning of the bar has to take into consideration that antennae will be mounted so there are clear sightlines to the field of play and mandatory safety distances from people is required. Final placement to be determined after consultation with TV broadcasters and other RF users at the venue which will take into account safety in regard to access.

Cable access holes are required at the front and sides of the area for cabling to the antenna mounting bar and other media facilities as required. These access ways to be minimum 150mm in diameter.

A front bench should span the entire width of the room and should be 800mm deep for the placement of television monitors, commentary units, computers and the electronic equipment. Typically this bench has video monitors, commentary units, talkback stations,

computers and tablets. Cable access holes are helpful in tidying up the installation and maximizing the bench. The front bench should be easily removed to repurpose the space as a presentation studio.

A 150—300mm riser is required behind the front bench area to house up to 3 production personnel. An 800mm deep bench top is required, with the desk being movable.

Access for equipment to all media areas should be flat with suitably graded ramps used between floor levels. Goods lift or suitably protected passenger lift access is required for these areas.

Any build or refit of broadcast facilities should be made in direct consultation with all rights holders television technical and production representatives.

2.3.3 Studios

The Venue should have a television studio space available. This should be located as close as practically possible to the main commentary box. The dimensions of the television studio should exceed that of the commentary booth in order to accommodate a presentation desk/table suitable for at least four talent and three cameras. Typical dimensions for TV studio are 6 metres x 6 metres with 3.6 metres (minimum) ceiling height and should have a (background) view to the field of play. The window of the studio is to be as “mullion free” as possible and sloped inwards at an angle of 17 degrees to the vertical at the sill (inwards at the head/top of the window).

Three 48.4mm scaffold tubes (lighting bars) to be installed 50 mm below ceiling height down the length of the room—one in the centre the other two 400 mm in from side walls for the mounting of “television” lighting fixtures. Each bar should be rated to carry in the order of 40Kg. Provision for three phase power (*32 Amp*) should be available for lighting or other high current requirements.

Acoustic specification, air conditioning, finishing materials and colours, work lights, lighting bars, cable access, equipment access and storage for the television studio should equal or exceed the specification of the commentary booth.

Provision for three phase power (*32 Amp*) should be available in the vicinity for studio lighting.

Provision should be made for a green room, make-up and change facility within the broadcast spaces.

2.3.4 Unilateral broadcaster commentary boxes and studios

Unilateral (television and radio) commentary boxes and studios should be provided for venues / events where unilateral coverage is required. The number required is dependent on the status of the competition / game. These spaces maybe repurposed facilities that can be converted to broadcast facilities when required however the unilateral commentary boxes and studios should be built / fitted to the same specifications as the main commentary box. They should as far as possible be sited close to the main commentary box, with clear sight lines to the field.

2.3.5 Radio Commentary Boxes

Provision needs to be made for Radio broadcast boxes adjacent to the Television box area.

Nominal area for a Radio box is 3.5m X 3.5m with clear sight line to the field of play and to the main scoreboard. These rooms are to be built / fitted to the same acoustic specification as the main television commentary booth.

Each radio broadcaster requires direct two way audio cable connectivity, for commentators / reporters doing live interviews into the commentary radio boxes during broadcasts, to the following areas:

- The side line close to team benches (with good sightlines)
- Each team dressing room
- Main media interview room (and smaller rooms if provided)
(and possibly other locations).

Check with the main radio broadcaster regarding the particular requirements for cabling. General purpose power outlets may also be required. Exposed areas should employ IP rated enclosures for connections.

Radio broadcasters utilise a range of backhaul to connect back to their studio including: ISDN, telephone and internet. Suitable cabling should be allowed from all boxes back to the venue's main communications room to enable direct access to connect to the stadium network, telco and ISP services.

2.3.6 Sideline Commentary position and mixed zone

On field space is to be allocated to TV operations at centre line, western side, for sideline commentator/s. Personnel requiring space, additional to commentator/s are: producer, floor manager, audio assistant.

Space provision also needs to be made for a half equipment rack to house wireless microphones and associated equipment.

3. Radio Frequency (RF) spectrum management

3.1 Wireless microphones

Reference should be made to FREE TV AUSTRALIA OP 27: *Operation of wireless microphones in Australia for matters concerning radio microphones.*

Wireless microphones are extensively used for umpire calls and TV / radio interviewers. Wireless microphone frequency co-ordination is required on a venue by venue basis to avoid interference with TV operations, radio broadcasters, umpires and linesmen, ground announcers, entertainment, and other legitimate users of wireless microphone equipment.

3.2 Radio Frequencies

Extensive use of the RF spectrum is necessary for comprehensive TVOB cover of AFL games.

Allocation of frequency bands is generally as follows:

- 2.0 & 2.2 GHz microwave bands:
 - Portable wireless cameras
 - Specialty POV cameras
 - Camera helicopter down links

For specific information on use and coordination of ENG / TOB in the 2 and 2.2GHz bands refer to:

OP63 Spectrum usage for ENG and TVOB Operations in the Brisbane / Gold Coast / Sunshine Coast Area

OP64 Spectrum usage for ENG and TVOB Operations in the Sydney / Canberra / Newcastle / Illawarra Area

OP65 Spectrum usage for ENG and TVOB Operations in the Melbourne Area

OP66 Spectrum usage for ENG and TVOB Operations in the Adelaide Area

OP67 Spectrum usage for ENG and TVOB Operations in the Hobart Area

OP68 Spectrum usage for ENG and TVOB Operations in the Darwin Area

OP69 Spectrum usage for ENG and TVOB Operations in the Rural and Remote Areas

- 7 / 8 GHz microwave band Medium haul point to point back haul links
- 13 GHz microwave band Short haul point to point back haul and local interconnect links
- 470 – 520 MHz band Duplex Radio Telephone (RT) voice, telemetry and data communications
- 520 - 694, 1790-1800 MHz band Wireless microphone operations
- Aggregate RF systems requirements can be in the order of 12 x 2.5 GHz channels, 4 to 6 x 7 / 8 GHz channels, 4 to 6 x 13 GHz channels, 10 x UHF duplex RT frequencies and 70 to 80 x wireless microphone frequencies for major events.

RF spectrum usage is strictly controlled, and specific channel allocations are generally licensed to individual commercial entities. Temporary use of multiple frequencies as is required for operations on the major event scale require frequency co-ordination with established license holders and special licensing for the complete RF requirements for the period of the event.

It is essential that a rigid frequency management procedure be implemented on a venue by venue basis to ensure non interference between services within the precinct involved in TVOB origination, including authorised unilateral operators, and for other licensed users (ENG etc.) operating in near proximity to the OB precinct.

Frequency allocation and usage regulations are becoming increasingly rigid and restricted. To this end it would be advantageous to consider making an enclosed venue electronically shielded from areas outside, by incorporating or using materials during construction that would reduce or minimise RF interference. Such infrastructure would need to be considered during the design stages of any new venue or those undergoing large-scale rebuilding programs.

Wireless microphone frequency management is the prerogative of the event promoter and venue management, along with TVOB operators who all need to be fully involved in channel allocations from the early planning stage of a project.

Microwave and UHF frequencies are licensed but may be subject to frequency sharing arrangements. Co-ordination between users, including news services not directly involved in the event telecast, but licensed to operate in proximity of the event precinct is an essential pre-requisite for event RF spectrum planning.

Major events involving multiple operators of RF services require overall coordination to be under statutory authority control of use / misuse of RF spectrum assets.

4. OUTSIDE BROADCAST COMPOUND

4.1 General

A level hardstand area for outside broadcast control units (OB vans) parking is required, it should be situated as close as possible to the camera platform/ TV commentary box area. This area (OB compound) should be securely fenced so as to provide security for television equipment, personnel, TV operations and the safety of the public. This is particularly important on large scale television operations where facilities are setup for many days, weeks and there is the need for only accredited personnel to have access to the compound.

Major outside broadcast vehicles are semi trailer units built to comply with Australian road transport regulations. Venue vehicle access and load bearing capacity needs to comply with maximum vehicle dimension and weight specifications. Typical requirements are 22.0 metres combined trailer and prime mover length, maximum height of 4.3 metres, and 8.5 tonne per axle loading.

Access to and egress from the OB compound needs to cater for the turning circle and overhead clearance requirements of maximum dimension articulated vehicles.

Special attention to overhead obstructions is necessary where ramps or uneven road surfaces are involved along with adequate clearance on the underside of the OB vans

Generator hardstand should be incorporated in the OB compound (see Section 5).

Typical hardstand area is in the order of 500 square metres either 25 metres x 20 metres or 50 metres x 10 metres, rectangular. This area would cater for up to two OB facilitators with more space co-sited with it, should the event have a number of Australian and overseas unilateral broadcasters.

The hardstand area is required to be level to accommodate OB vans with expanding sides with any slope for drainage being kept to a minimum.

Provision is to be made to site a satellite uplink vehicle within the compound, adjacent to the compound or within the venue area with suitable cable/fibre connectivity and local 32A 3 phase power outlets x 3 as a minimum. Clear line of sight to the North-East sky for the majority of Australian broadcasters and to the western sky for a number of international broadcasters is a location requirement.

Should the OB Compound be situated within an enclosed space (underground or under a grandstand for instance) adequate ventilation is to be provided so as to comply with relevant safe work practice regulations as outlined by each State's regulatory body Code of Practice.

Air conditioning units on OB vans and portable sheds give off a considerable amount of heat which needs to be removed from the area and this along with any exhaust fumes from generators and vehicles (buses, delivery vehicles, fork lift trucks etc), needs to be taken into account when designing ventilation systems.

4.2 Personnel Amenities

Adequate personnel services need to be provided in the OB compound. These amenities should include:

- Toilet facilities, separate male and female facilities
- Sewer or self contained connection, town water connection
- Lighting for safe personnel movement
- Drainage contours such as to minimise "ponding" during heavy rainfalls

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- Food preparation area and catering area
 - First Aid facility
 - Regular cleaning and rubbish removal services

5. POWER

5.1 Typical Requirements

Typical power requirement is for 250 Amps per phase three phase (415Volt) supply adjacent to the outside broadcast vehicles hardstand area. Power should be available via powerlock connectors with OB facilitators providing their own distribution equipment as required. Major venues likely to be hosting major international events or those whose compounds service more than one venue should provide 2 or 3 power installations to accommodate multiple broadcasters should specify 400 Amps per phase in construction and rebuilding planning

3 x 15A single phase outlets should be provided adjacent to each power loc installation for overnight use.

5.2 Heavy neutral currents

The high level of use of switch mode power supplies in TVOB technical equipment has resulted in high neutral current drain in three phase mains supplies. High current neutral connections should be specified for mains power installations planned for TVOB compounds.

5.3 Circuit breakers and safety

Where mains power supplies are protected by residual current devices (RCDs) trip current of the source RCD should be adjustable, to be set to a higher trip current level than the main OB van circuit breaker, such that the OB van main circuit breaker serves as the prime safety switch for the TVOB operation.

TVOB mains supplies are to be separately protected from other electrical supplies servicing the rest of the venue.

Power reticulation ex the OB van to operational areas is to be RCD protected in accordance with Work Safety requirements.

5.4 Local and standby generators

Generator hardstand should be incorporated in the OB compound and should be adjacent to the mains power connect point.

Sourcing of generators is generally a TVOB responsibility. Generators are to be silenced to EPA requirements and are to be sited to obviate exhaust fume exposure to TVOB staff and patrons.

For indoor/undercover OB compounds provision needs to be made to extract exhaust fumes. If this is not possible, interconnect cabling specified to full electrical load is required to be installed between the generator site and the OB compound.

Three phase 32 Ampere rated interconnect cables (5 pin connectors) are to be installed between the OB compound and commentary box / studio area, and between the OB compound and sideline for extension of OB van power to main operational areas.

6. AUDIO / VIDEO (A/V) CONNECTIVITY

6.1 Venue Audio / Video (A/V) Connections

The connect panel for venue A/V services should be located in the OB compound, co sited with TVOB cable terminations and Telco services.

TV signals emanating from the OB unit will be HD SDI with embedded audio (minimum stereo audio) supplied on BNC connectors.

The video referee/umpire/TMO should be provided with HD monitoring, with suitable cabling infrastructure supplied to their location

Interface connectors for off-air TV distribution, venue A/V distribution, Pay-TV cable and venue phone should be available at the connect panel.

6.2 Telecommunications services connections

An area within the compound is required for the location of various circuit provider's equipment and services, (fibre interfaces, PSTN, data etc.) This area to have local power as required by the service providers and adequate space for their equipment. Modern equipment has seen the need for small air conditioning plants being used on the equipment housings so facility for water runoff needs to be considered.

7. CABLING

7.1 General

Simple access is required for cabling from the outside broadcast vehicle hardstand to the main camera platform, roof camera platform, main commentary box, unilateral commentary box, studio/on camera position and field, pre/post match presentation area, media press conference area/s.

TV cable installations are site specific and need to be planned on an individual basis, but provision needs to be made for cable routes which provide ease of access, do not compromise venue aesthetics and do not present risk to workers or public.

Cable routes within the venue should allow for obstacle free installation and removal of cables.

Wherever possible, ground level cable paths clear of public traffic areas are preferred.

As a general rule, day cabling allows for full cable install within a 20 man hour rig time, and de-rig within 12 man hours.

Where this cannot be achieved due to either stadium access problems or to the scale of the OB operation, installation of "season cabling" is a preferred option.

Where cables need to be routed below ground level open cable troughs with easily removable and replaceable cover plates are the preferred option.

Where cables need to be routed above traffic areas, open cable trays with cantilever mounting from below allowing for simple cable runs with "lift in" installation without the need for mechanical aids— ladders, scaffolds, elevated work platform/scissor lifts.

Cable conduits are not recommended for temporary cable installs, but where there is no other option conduits should be a minimum 150mm diameter and curves/bends no greater than 30 degrees with draw wire installed. A minimum of 3x conduits should be available in

order to separate signal cables from power cables, and to allow for (inevitable) future expansion.

7.2 Permanent Cable Install

Cable routes in major stadium complexes may be such as to preclude both DAY and SEASON cable installs.

In such cases permanent installations become the only option.

It should be recognised that TV production techniques change, particularly with equipment innovations. Changes to the types of cables used are becoming less with the SMPTE 311M fibre/copper hybrid cable terminated in SMPTE 304M connectors becoming the industry standard for current cameras.

Implementation of specialised equipment is seeing increased demand for fibre optic cables, precision digital video coaxial cable, and (multi way) fibre optic utility use cables for video, audio, data and communications acquisition and transmission.

Cable types and cable technical specifications alter with advances in technology so cable schedules need to be updated prior to planning any permanent installation.

Permanent cable installations should be planned in consultation with venue management and TV Rights holders, with emphasis on specifications for cables, connectors and locations of outlets.

For multi-purpose venues, the total installation should encompass the highest common requirements of all possible event cabling.

Provision needs to be made for the maintenance, replacement and upgrade of such installations.

Preference is for cantilevered cable trays exclusive to TV cabling. Conduits – if provided – should be free of turns no less than 120 degrees from any change of direction. Where conduits are the only option, 150mm diameter is the minimum specification, and multiple conduits should be available to all operations areas with provision for upgrade and expansion.

8. BACKHAUL

8.1 General

TVOB transmission to studio base can be via Telco circuits, satellite uplink or local microwave radio transmission.

The Telco access point should be adjacent to the OB compound.

Space provision for a satellite uplink vehicle with clear view to North-East sky is required within or adjacent to the OB compound.

8.2 Microwave Link Platform

A 2.0 m x 2.0 m platform is typically required for TVOB backhaul microwave link installation.

The platform is to be sited to allow clear line of sight radio transmission to the TV studios or to a suitable intermediate relay site.

A microwave platform may also be required within the stadium for mounting of RF camera microwave receivers.

The provision of microwave link platforms at the stadium will depend on the surrounding topography and available link paths in and out of the stadium.

Any structures need to comply with relevant Occupational Health & Safety (OH&S) regulations.

9. LIGHTING

(Reference should be made to FREE TV AUSTRALIA OP 31: *Lighting Requirements for Television.*)

A brief summary of lighting standards is as follows:-

9.1 International Standard for TV Venues

Lighting level (Ev) toward main cameras	1400 lux (average)
Lighting level toward other directions	1000 lux
Lighting level toward USM / SSM cameras	1800 lux within defined zones slo mo replay zones (SRZ)
Colour temperature (TK):	4000K to 6500K, but within 500K at individual venues: preferred value 5600K.
Colouring rendering index R_a	≥ 90
Maximum GR for main TV cameras	<40
50 Hz mains flicker	minimise flicker by cross aiming and spreading floodlights equally over the three phases: $\leq 10\%$ flicker for ≤ 600 fps $\leq 3\%$ flicker for $\leq 1,000$ fps

9.2 Professional Standard

E_v toward main cameras	1000 lux (average)
E_v toward other directions	800 lux
Colour temperature	4000 K to 6500 K, but within 500K at individual venues.
Colour rendering index R	Mini mum requirement R_a 85 $R_a > 90$ preferred
Maximum GR for main TV cameras	<40
50 Hz mains flicker:	minimise flicker by cross aiming and spreading floodlights equally over the three phases

Note: Whilst satisfactory picture quality can be achieved at the minimum lighting levels stated, restrictions are placed on full usage of zoom lenses and focusing becomes quite difficult for camera operators on BCU (big close up) camera angles. Super Slo-mo cameras cannot perform satisfactorily below Professional standard lighting.

10. SAFETY

All personnel working on TVOBs are to be familiar with and to comply with relevant OH&S regulations.

A site specific risk assessment is to be undertaken by venue management and TVOB operations management during planning stages of the event.

TVOB personnel are to be inducted as to venue and TVOB safety requirements prior to commencement of duties.

Scaffolding, camera tracks, aerial cabling and other constructions are to be installed by suitably licensed persons.

Camera cranes, scissor lifts, fork lifts and other mobile work platforms are to be operated by licensed persons.

Electrical installations are to be undertaken by licensed persons, and tested and tagged in compliance with statutory regulations.

Temporary TV cable installations are to comply with site hazard reduction policies.

As safety regulations can vary subject to individual state government regulations, applicable requirements need to be determined on a site by site basis.

11. CABLE INSTALLATIONS AT AFL STADIUMS

Implementation of HDTV equipment is impacting on cable installation with increased demand for Fibre optic camera cables, precision digital video coaxial cable, and (multi way) fibre optic cables for utility use.

Co-axial video cable is to be specified for end to end delivery of uncompressed digital video over the installed length of cable.

The following cable listings are typical of requirements for AFL telecasts but intended only for guideline reference. Cable types and cable technical specifications alter with advances in technology so cable schedules need to be updated prior to planning any permanent installation.

Permanent cable installations should be planned in consultation with venue management and TV Rights holders, with emphasis on specifications for cables, connectors and locations of outlets.

Outside Broadcast Compound to Main Camera Platform

6 x SMPTE 311M camera cables SMPTE 304M connectors

2 x 6 pair single mode fibre optic cable terminated with LC connectors.

2 x coaxial video, specified so that it will deliver HD uncompressed video signals (may be downgraded due to length, to SD uncompressed signals, depending on required use).

1x single phase power

3 x CAT 6 cables

1 x 12 way audio multi-mic cable

Outside Broadcast Compound to TV Commentary Box Number 1.

2 x SMPTE 311M camera cables SMPTE 304M connectors

2 x 12 pair single mode fibre optic cable terminated with LC connectors.

6 x coaxial video, specified so that it will deliver HD uncompressed video signals (may be downgraded due to length, to SD uncompressed signals, depending on required use).

1 x 12 way audio multi-mic cable

1 x 20 pair Telco (Audio)

6 x CAT 6 cables

1 x 32 Amp three phase 5 pin power cable

Outside Broadcast Compound to TV studio No. 1

3 x SMPTE 311M camera cables SMPTE 304M connectors

1 x 12 pair single mode fibre optic cable terminated with LC connectors.

1 x 12 way audio multi-mic cable

1 x 32 Amp three phase 5 pin interconnect cable

Depending on location of studio to commentary facility, some sharing of cables may be possible.

Outside Broadcast Compound to Commentary Box 2. (Unilateral)

1 x SMPTE 311M camera cable with SMPTE 304M connector.

2 x 12 pair single mode fibre optic cable terminated with LC connectors.

6 x digital coaxial video, specified so that it will deliver HD uncompressed signals (may be downgraded due to length to SD uncompressed signals depending on the required use).

1 x 12 way audio multi-mic cable

1 x 20 pair Telco (Audio)

6 x CAT 6 cables

Outside Broadcast Compound to Field (sideline centre of venue)

8 x SMPTE 311M camera cables SMPTE 304M connectors

1 x 12 pair single mode fibre optic cable terminated with LC connectors.

6 x coaxial video, specified so that it will deliver HD uncompressed signals (may be downgraded due to length, to SD uncompressed signals, depending on required use).

1 x 12 way audio multi-mic cables

1 x 20 pair Telco

6 x CAT 6 cables

1 x 32 Amp three phase 5 pin interconnect cable

Outside Broadcast Compound to Dressing Room(s)

TV cabling is required to each player activity area of both “home” and “visitors” dressing rooms as follows:

- 2 x SMPTE 311M camera cables
- 4 x single mode fibre optic cable with LC connectors
- 2x CAT 6 cables

Outside Broadcast Compound to VIDEO REFEREE/UMPIRE

- 2 x coaxial video, specified so that it will deliver HD uncompressed signals.
- 4 pair single mode fibre optic cables with LC connectors
- 4 x shielded audio cables
- 4 x Cat 6 cables

Outside Broadcast Compound to venue A/V room/system

- Off-Air TV RF distribution
- Venue A/V distribution
- Venue communications services
- Cat 6 computer cable (for possible access to venue IT services)
- Any additional services as specified by venue A/V service provider

Outside Broadcast Compound to Backhaul microwave platform

- 2 x Microwave equipment specification triax.
