

APPENDIX 2 – TECHNICAL SPECIFICATIONS – LOT 1

Lot 1 - Creative Media Video Centre

The successful tenderer shall be responsible for the complete integration, testing, optimisation and commissioning of all equipment supplied under this contract and shall deliver a fully operational Virtual Production Studio ready for teaching, training and professional production activities.

Unless otherwise stated, all supplied hardware shall include a minimum three-year manufacturer warranty covering parts and labour.

The successful tenderer shall demonstrate interoperability between all supplied components and provide evidence that the integrated solution operates as a complete virtual production system prior to final acceptance.

Item No.	Item Description	Quantity
Item 1	Professional Virtual Production LED Volume - Supply, install, commission and integrate a professional virtual production LED Volume wall suitable for film, television, broadcast, commercial production and educational environments. The system shall be appropriate for regular commercial hire and professional studio operation. The solution shall comprise a single LED wall with a maximum overall size of 5m (W) × 3m (H) (approximately 15m ²) and a pixel pitch not exceeding 1.6mm . The system shall provide high-resolution, camera-ready imagery suitable for Unreal Engine workflows, in-camera visual effects (ICVFX), cinematography training and professional virtual production applications.	1

Main LED Wall Requirements

The LED wall shall:

- Utilise **flip-chip LED technology or demonstrably equivalent technology** designed or proven suitable for in-camera virtual production.
- Incorporate a high-contrast, low-reflection LED package with accurate colour reproduction, stable black levels and high pixel uniformity.
- Provide a **minimum refresh rate of 7,680Hz**.
- Provide **minimum 16-bit greyscale processing** and a **scan ratio of 1/10 or better**.
- Provide a **minimum 140° horizontal and vertical viewing angle**.
- Be engineered to minimise reflections, moiré, scan artefacts, flicker and other camera-visible image defects.
- Support professional colour management, calibration, **genlock** and **timecode synchronisation** through the specified LED processing system.

Construction and Serviceability

The installation shall include a robust support structure designed for continuous professional use, including:

- LED panel mounting system and rigging.
- Counterweight and structural support components as required.
- Safe access for maintenance and module replacement.

- Provision of critical spare LED modules and replacement components.
- Manufacturer or integrator support arrangements to minimise operational downtime.

System Integration and Installation

The tendered price shall include all equipment, materials, labour and services necessary to provide a fully operational virtual production LED Volume, including:

- LED modules/panels.
- LED receiver cards, control electronics and associated processing hardware.
- Support structures, rigging and mounting systems.
- Electrical distribution hardware and power infrastructure suitable for a **2-phase 16A supply**.
- Power, video, networking, synchronisation and control cabling.
- Connectors, patch panels and cable management systems.
- Installation, commissioning, alignment and professional calibration.
- Safety fixings, accessories and all associated integration works.

The supplier shall connect and integrate the LED wall with all associated virtual production equipment, ensuring the complete system functions as a single, fully integrated solution.

Performance Verification and Acceptance

The successful supplier shall demonstrate the proposed system using professional cinema or broadcast cameras at representative frame rates, shutter angles and camera-to-wall distances. The system shall demonstrate acceptable performance without objectionable flicker, scan lines, colour instability, moiré, excessive reflections or other camera-visible artefacts.

Final acceptance shall be based on:

1. Compliance with the stated technical specification; and
2. Successful demonstration of real-world virtual production camera performance.

Product Consistency

All LED modules and panels shall be supplied from a **single manufacturer and product range**, ensuring consistent LED technology, optical characteristics, colour performance and calibration across the entire wall. Tenderers shall identify the availability and expected support period for replacement modules and other critical spare components.

Item 1 shall be responsible for the LED wall structure, LED panels, receiver cards integrated within the LED system, mounting systems, power distribution associated with the LED wall and all manufacturer-specific calibration required for operation of the LED display.

Item No.	Item Description	Quantity
Item 2	Professional LED Processing System - Supply, install and commission a professional LED processing system designed for broadcast, live production and virtual-production environments. The system shall provide performance equivalent or superior to established high-end virtual-production LED processing platforms and shall support the full native resolution, refresh rate, colour depth and pixel capacity of the specified LED wall without degradation of image quality or frame rate.	1

Minimum Technical Requirements

The LED processor shall provide:

- Minimum **10-bit processing**.
- Support operation of the proposed LED wall at its full specified refresh rate and performance.
- **Low, deterministic processing latency** suitable for in-camera virtual production.
- **Frame synchronisation and external genlock**.
- Accurate frame-rate and timing management for professional cinema and broadcast camera workflows.

Processing and Control

The system shall support:

- Independent canvas/output configuration, scaling and pixel mapping.
- Configuration, monitoring and management of individual or combined LED display canvases.
- Per-panel and per-module calibration.
- Colour uniformity, brightness and gamma management.
- Accurate reproduction of camera-facing LED content.
- Camera-tracking integration and advanced virtual-production workflows.
- Region-of-interest processing, output remapping and real-time image manipulation.

Integration and Capacity

The proposed system shall provide sufficient processing capacity, bandwidth and outputs to support the complete specified LED installation, including provision for future expansion.

The tendered solution shall include all:

- Processor units.
- Input/output and receiving interfaces.
- Software licences and configuration tools.
- Required power, signal and network cabling.
- Installation, configuration, commissioning and integration services.

The system shall be fully integrated with the specified LED displays, receiver cards, virtual-production workstations, genlock/timecode infrastructure and production network.

Documentation

Tenderers shall provide evidence of:

- Maximum pixel capacity.

- Processing bandwidth and performance.
- Input/output capabilities.
- Processing latency.
- Supported refresh rates.
- Colour depth and calibration capabilities.
- Genlock and synchronisation functionality.
- Virtual-production specific features.

Consumer, presentation, digital signage or general-purpose video processors shall not be considered equivalent.

Item 2 shall be responsible for all LED processing equipment, video processing, control software, calibration software and display management systems required to operate the LED wall. Permanent network infrastructure shall be supplied under Item 7.

Item No.	Item Description	Quantity
Item 3	<u>Virtual Production Content Library</u> - The supplier shall provide a professionally curated starter library of virtual-production content suitable for teaching, demonstration, testing and commercial production use on the specified LED wall. The library shall include a representative range of interior, exterior, architectural, urban, natural, atmospheric and driving environments , supplied as appropriate in high-resolution image sequences, video plates and/or Unreal Engine-compatible assets .	1

All content shall:

- Be compatible with the specified LED wall, LED processing system and Unreal Engine/nDisplay workflows.
- Include documentation detailing resolution, frame rate, colour space, aspect ratio and recommended playback method.
- Be tested for professional camera use and minimise flicker, moiré, colour instability, motion artefacts and other camera-visible defects.
- Include licences permitting **educational use, demonstrations, internal productions and commercial productions/hire** without additional licence fees for those uses.

The supplier shall install and configure the content library, provide basic operational training, and ensure the system supports the future addition of appropriately licensed content.

Item 3 shall be responsible solely for the provision, installation and licensing of content and associated training relating to content management and playback.

Item No.	Item Description	Quantity
Item 4	<u>Main Rendering and Control Computer Workstations</u> - Supply, install, configure and commission two identical high-performance professional rendering and control workstations , fully interchangeable and optimised for Unreal Engine 5 virtual production workflows , including nDisplay, Switchboard cluster management, real-time rendering, previs, high-end video editing, offline rendering and synchronised multi-display operation. The systems shall be capable of controlling the specified LED Volume and supporting professional virtual production, visualisation and broadcast workflows.	2

Minimum Technical Requirements

Each workstation shall incorporate:

- Current-generation professional multi-core CPU.
- **Minimum 256GB ECC RAM.**
- **Minimum 4TB high-performance NVMe storage.**
- Professional workstation-class GPU with:
 - **Minimum 96GB ECC GDDR7 dedicated memory.**
 - **Minimum 512-bit memory interface.**
 - **Minimum 1,700GB/s memory bandwidth.**
 - **Minimum 24,000 parallel-processing cores.**
 - Dedicated hardware ray tracing and AI acceleration.
 - **Minimum 120 TFLOPS FP32 performance.**
- Full-performance workstation GPU suitable for sustained professional real-time rendering workloads, not a reduced-power or mobile variant.
- Professional/enterprise graphics drivers.
- PCIe Gen 5 x16 or equivalent high-bandwidth GPU connectivity.
- Dedicated hardware H.264, HEVC and AV1 encoding/decoding, including 4:2:2 processing support.
- **Minimum 25GbE network connectivity.**
- Support for genlock, timecode and integration with the specified LED processing, camera-tracking, Unreal Engine/nDisplay and virtual-production network infrastructure.

System Requirements

- Both workstations shall be **identical in specification and fully interchangeable**, with either system capable of assuming the primary rendering role without reduction in performance.
- Systems shall be supplied fully assembled, tested and commissioned, including appropriate cooling for continuous professional operation.
- Warranty and support suitable for professional virtual production environments shall be included.

Alternative Architectures

Alternative professional CPU and GPU architectures may be proposed where tenderers demonstrate **equal or superior performance** against all specified requirements.

Item 4 shall be responsible for the supply and commissioning of rendering workstations and local workstation connectivity only. Shared storage infrastructure shall be supplied under Item 5 and permanent network infrastructure under Item 7.

Item No.	Item Description	Quantity
Item 5	Shared Production Storage - Supply, install, configure and commission a high-performance shared production storage system providing 60TB usable capacity at commissioning, after RAID/parity protection and system overheads. The system shall be suitable for simultaneous virtual production, Unreal Engine, editing, rendering, previs and high-resolution media workflows.	1

Minimum Requirements

The storage system shall provide:

- **60TB usable storage capacity.**
- RAID-protected, fault-tolerant operation.
- Redundant power supplies.
- Hot-swappable drives and components.
- System monitoring and automated alerts for drive, hardware and system faults.
- High-speed network connectivity suitable for integration with the dedicated Virtual Production network.
- High-performance shared access for the specified workstations and other authorised production systems.
- Shared-production file access, user permissions and access controls.

Expansion and Scalability

The storage platform shall be modular and expandable, with the ability to increase capacity to a **minimum of 120TB usable storage** through the addition of drives and/or manufacturer-supported expansion enclosures.

Tenderers shall identify:

- The proposed expansion method.
- Maximum supported storage capacity.
- Any additional hardware required for expansion.
- Indicative pricing for expansion to 120TB usable capacity.

Installation and Commissioning

The tendered price shall include:

- Complete 60TB usable storage system.
- All required hardware, licences and network interfaces.
- Installation, configuration and commissioning.
- Integration with the Virtual Production network and associated production systems.

Future expansion is not required as part of the initial purchase but shall be supported by the proposed solution.

Item 5 shall be responsible for the shared storage platform, storage networking interfaces and storage configuration. Core network switching and backbone infrastructure shall be supplied under Item 7.

Item No.	Item Description	Quantity
Item 6	<u>Virtual Production Camera Tracking, Synchronisation, Training and Support</u> - Supply, install, configure and commission a fully integrated virtual-production camera tracking and synchronisation system compatible with the specified LED wall, LED processing system, rendering workstations and Unreal Engine/nDisplay workflow. The solution shall be suitable for professional film, television, broadcast, commercial virtual production, educational use and commercial hire.	1

System Integration and Commissioning

The supplier shall provide:

- Installation, integration, calibration, commissioning and performance testing of the complete system.
- Integration with the LED wall, LED processing system, rendering workstations and virtual-production network.
- Verification of tracking accuracy, lens calibration, genlock, timecode synchronisation, network performance and Unreal Engine/nDisplay communication.

Camera Tracking System Requirements

The camera tracking system shall provide:

- Professional **6DoF optical/inertial camera tracking** suitable for virtual production and ICVFX.
- Positional accuracy of **<0.1mm**, angular accuracy of **<0.003°** and latency of **≤5ms**.
- Integrated 4K optical sensor, accelerometer and gyroscope.
- Support for handheld, Steadicam, pedestal and crane-mounted cameras.
- Real-time lens tracking, including focus, zoom, lens calibration and absolute lens encoder support.
- Native Unreal Engine integration and FreeD or equivalent industry-standard tracking protocol output.
- Support for genlock, timecode, Black Burst and Tri-Level Sync.
- Dedicated rack-mounted tracking processor with redundant power supply.
- Tracking data recording and export in FBX and XML formats.
- Complete marker kit, mounting hardware and calibration tools.
- Support for one tracked camera, with expansion capability for a second camera without replacement of the core system.

Training

The supplier shall provide practical operator and technical training covering:

- Camera tracking and lens calibration.
- Synchronisation and network operation.
- System configuration and routine calibration.
- Start-up, shutdown and basic fault diagnosis.

Support and Maintenance

The tendered price shall include all hardware, software licences, interfaces, cabling, synchronisation equipment, tracking equipment, network components and accessories required for normal operation.

The supplier shall provide **three years of comprehensive support and maintenance** following commissioning and acceptance, including:

- Technical support and fault diagnosis.
- Remote assistance.
- Applicable software and firmware updates.
- Defined response times, escalation procedures and warranty provisions.

No essential component shall be treated as an optional extra.

Acceptance Testing

Prior to final acceptance, the supplier shall demonstrate:

- Accurate camera and lens tracking.
- Stable genlock and timecode synchronisation.
- Reliable network performance.
- Successful Unreal Engine/nDisplay integration.

Final acceptance shall be based on compliance with the specification and successful demonstration of the required operational performance.

Item 6 shall be responsible for camera-tracking hardware, lens-calibration systems, synchronisation equipment, genlock/timecode distribution associated with the tracking system, operator training and support services. Permanent network infrastructure, switches, transceivers and backbone cabling shall be supplied under Item 7.

Item No.	Item Description	Quantity
Item 7	<u>Dedicated Virtual Production Network</u> - Supply, install, configure and commission a dedicated managed Virtual Production network with a minimum 25GbE switched backbone , including all required 25GbE/SFP28 interfaces, transceivers, cabling and associated network components . The network shall support high-performance virtual production, rendering, tracking, synchronisation and media workflows and shall be integrated with the specified LED wall, processing, rendering and production systems.	1

Minimum Requirements

The network shall provide:

- **Minimum 25GbE switched backbone.**
- Layer 3 switching capability.
- VLAN support.
- Quality of Service (QoS).
- IGMP snooping.
- Jumbo frame support with a **minimum MTU of 9,000 bytes**.
- Low-latency switching suitable for real-time virtual-production workflows.
- Network monitoring and management capabilities.

Network Architecture

The Virtual Production network shall be **physically or logically segregated** from general-purpose institutional networks and configured to ensure reliable, secure and high-performance operation for virtual-production applications.

The tendered solution shall include all required switches, transceivers, interfaces, cabling, configuration, testing and commissioning necessary to provide a fully operational dedicated Virtual Production network.

Item 7 shall be solely responsible for the provision of the dedicated Virtual Production network, including all switches, transceivers, backbone cabling, network management systems, VLAN configuration and associated infrastructure required to interconnect the virtual production environment.

No other item shall include pricing for core network switching infrastructure unless explicitly stated.

Item No.	Item Description	Quantity
Item 8	Staff Training - Provide comprehensive on-site training for designated staff covering the operation, management, maintenance and basic troubleshooting of the complete virtual production studio.	1

Training shall include:

- Safe operation and routine maintenance of the virtual production environment.
- Correct assembly, dismantling, handling and reconfiguration of LED wall structures.
- Operation of LED processing, rendering, tracking and synchronisation systems.
- Management of associated hardware, cabling and supporting infrastructure.
- Routine system checks, fault identification and basic troubleshooting procedures.
- Safe working practices and operational best practice for virtual production environments.

The training programme shall ensure staff are capable of safely operating, maintaining and reconfiguring the system in accordance with industry best practice.

Product-specific operational training included within individual lots shall be limited to the supplied equipment.

Item 8 shall provide comprehensive end-user training covering operation of the complete integrated Virtual Production Studio.

Item No.	Item Description	Quantity
Item 9	Delivery and Maintenance Services - Provide delivery, installation support and ongoing preventative maintenance services for the complete virtual production studio. The successful tenderer shall provide two scheduled preventative maintenance visits annually, in June and December , to inspect, test, service and verify the performance of all installed hardware, software, display systems, networking infrastructure, camera tracking systems, processing equipment and associated supporting infrastructure.	1

Maintenance services shall include:

- Inspection and testing of system performance and functionality.
- Preventative maintenance in accordance with manufacturer recommendations.
- Verification of software, firmware and system configurations.
- Identification of faults, wear or performance issues.
- Recommendations for corrective actions where required.

The service shall ensure the continued **safe, reliable and optimum operation** of the virtual production environment throughout the contract period.

Maintenance services under Item 9 shall supplement, and not replace, manufacturer warranty and support obligations provided under individual equipment lots.

Item No.	Item Description	Quantity
Item 10	Ceiling-Mounted Lighting Suspension System - Supply, install and commission a professional ceiling-mounted lighting suspension system suitable for film, television, broadcast and virtual production studio environments. The system shall provide safe, flexible and efficient positioning of lighting fixtures while reducing floor clutter and supporting professional studio workflows.	1

Minimum Requirements

The system shall include:

- a minimum of **two fixed ceiling-mounted rails of approximately 4m length** and **two movable rails of approximately 3m length**, or an equivalent configuration providing comparable studio coverage, operational flexibility and lighting support capacity.
- Pantograph-mounted lighting supports suitable for professional lighting fixtures.
- All mounting hardware, fixings, suspension components and accessories required for a complete installation.

The completed system shall enable the safe positioning, adjustment and reconfiguration of lighting equipment throughout the studio space and shall be suitable for continuous professional and educational use.

Item No.	Item Description	Quantity
Item 11	UV-LED tabletop exposure system - Supply, install and commission a professional UV-LED tabletop exposure system suitable for educational, studio and professional printmaking environments. The system shall support the production of high-quality photo stencils, screens and printing plates for screen-printing, graphic arts, textile printing and fine art applications.	1

Minimum Requirements

The system shall:

- Utilise energy-efficient UV-LED exposure technology.
- Provide programmable exposure controls for accurate and repeatable operation.
- Deliver consistent exposure performance suitable for teaching and professional print production.
- Support the production of high-quality photo stencils, screens and printing plates.
- Be suitable for educational, commercial and studio printmaking workflows.

The tendered solution shall include all equipment, controls, accessories, installation and commissioning required to provide a fully operational UV-LED exposure system.

Item No.	Item Description	Quantity
Item 12	Portable Camera Dolly System - Supply, install and commission a professional portable camera dolly system suitable for cinematography, broadcast, virtual production and educational training environments. The system shall provide smooth, controlled and repeatable camera movement for professional tracking, dolly and motion-based filming workflows.	1

Minimum Requirements

The system shall include:

- A precision wheeled camera carriage designed for professional camera support.
- A portable track system suitable for straight tracking shots and rapid deployment in studio or location environments.
- Tripod, stand-mounted or equivalent support infrastructure for the track system.
- Standard professional camera mounting interfaces suitable for industry-standard fluid heads and camera support systems.
- A modular design allowing flexible track lengths and configurations.
- Smooth-running wheel assemblies suitable for vibration-free camera movement.
- Compatibility with professional film, television, broadcast and virtual production workflows.
- All required track supports, mounting hardware, adapters and accessories necessary for operation.

The completed system shall enable safe, reliable and repeatable camera tracking movements and shall be suitable for continuous professional and educational use. The tendered solution shall be supplied as a complete operational system, including all components required for deployment, setup and commissioning.