Annexure A – Hardware Requirements

1. Video Wall Hardware Specifications

#	Component	Description	Preference
1.	Architecture	System Architecture	The Tiled LCD Monitor Video Wall System shall be made up of a 6x2 video wall - (6) wide by (2) high, 55" direct view LCD monitors (7 total) in an architecture which includes: 1. 6x2 Video Wall LCD Monitor Modules, 2. An Integrated Mounting System, 3. Off-board electronics with power supplies and image processing capabilities with software and applications.
2.		Architecture Main Features	1. LCD monitor displays must not employ fans for cooling. 2. Mounting system must provide 6 axes of adjustment for panel alignment. 3. Mounted depth must be ADA-compliant 4. LCD displays must have option for redundant power supplies 5. The Tiled LCD Monitor Video Wall System must support signal transmission of 330 ft. (100 m) without 6. extenders. 7. The (7) Tiled LCD Monitor Video Wall System shall also consist of Off Board Control Electronics and 8. Display System Power Supplies, with all cabling.

			9. The (7) Tiled LCD Monitor Video Wall System shall allow for 4K input with scaling Input sources of 10. 3840x2160 can be daisy chained and scaled across the entire video wall matrix.
3.	Display	Display Device (OLED/LCD)	LCD
		Screen Size	55”
		Resolution	1920*1080
		Aspect ratio (W:H)	16:9
		Technology	Commercial-grade direct view LCD
		Tiled bezel width (min.)	1.7 mm or better
		Brightness (maximum)	500 candelas or nits minimum or better
		Response time (typical)	8ms or better
		Contrast ratio (full field)	3500:1 or better
		Full viewing angle	178°
		Colours	16.7 million min
		Backlight type	LED
		Backlight life (1/2 brightness)	50,000 Hours or better
		Mounted depth	3.6” from back to front of screen
		Heat load	630 BTU per hour max
		Backlight control	Individual and wall control
		Backlight sensing and reporting	At display level
		Display module position sensing	Auto-sensing integrated

		Power consumption	Approx. 182 watts per panel (Typical)
		Redundancy	1+1 redundant power supply option
		Power supply voltage	100-230V AC ± 10%, 50 to 60 Hz
		Bezel thickness	1.7mm or less
		Power status	Diagnostics LEDs, health monitoring and alerts
		Power status	Diagnostics LEDs, health monitoring and alerts
		Safety regulations	Complies with EN60950, FCC Class A, CISPR22/85, CE, EU RoHS
		Noise	The display must utilize a fan-less design
		Operating Temperature	The display must be able to operate in a 0-40°C (32-104°F) environment.
		Operating Humidity	The display must be able to operate in a 20-90% RH non-condensing environment.
		Commercial Grade LCD Module	The display must be a commercial grade LCD module warranted for 24/7 extended use operation.
		Viewing Angle	The display must have a horizontal and vertical viewing angle of 178°

		Auto Panel Position Discovery	Each LCD module must have sensors built inside the unit to determine where it is in an array and communicate to the other displays where it is. It then must be able to scale an image across the entire array automatically.
		LCD Temperature Monitoring	The LCD module must contain a temperature sensor that can monitor the temperature of the LCD module and through LAN and other RS232 control devices can alert the user of an over-temperature condition.
		Backlight Control	1. The display must have the capability to control the backlight intensity individually or globally across the entire array. 2. No AC Power behind the displays 3. The display must have a native resolution of 1920x1080p 4. An LCD module must be capable of being replaced without changing the power supply module or electronics module on the display itself. 5. AC power behind the displays (in walls) is not required
4.	Integrated Monitor Mounting System	6-Axis Adjustable Mount	The LCD module must include an integrated mounting system that allows for 6- axis of adjustments to achieve a perfectly aligned LCD array.

		Installed Depth	The installed depth of the LCD module and mounting system must be less than 3.6”/114.3mm.
		In-Wall Servicing	1. The LCD module and mounting system must allow for an LCD to be put into a service position to access components or make cable connections from the front of the video wall. 2. The LCD module and mounting system must allow the removal of an LCD module without completely taking down the LCD modules around it. 3. The components on the back of the LCD module need to be serviceable from the front of the wall when installed.
		Weight	The LCD module and mount combined must weigh less than 27 kg
		Orientation	The display must be capable of being installed in both landscape and portrait orientation.
		Alignment Brackets	The mounting structure must have alignment brackets that automatically space the mounts apart from each other to make up the 6x2 wall configuration.
5.	Off-Board Controls Electronics and Display System Power Supplies	Architecture	The Off-Board Display System Electronics shall consist of power supply module and image controller that controls up 12 monitors in a 6x2 array and can be extended to work with other processors for arrays larger than 6x2 and **6 Spare Outputs**
		Connectivity	The Off-Board Display System Electronics system must have the capability of

			inputting and displaying (4) HDMI inputs and 1 DisplayPort inputs for every 4 monitors
		High Bandwidth Input Capabilities	The Off-Board Display System Electronics system must be able to accept high bandwidth inputs with a pixel-clock up to 330 MHz and spread it across multiple displays.
		Frame Lock	The Off-Board Display System Electronics system must be able to frame lock to an incoming source with vertical frequencies between 49-61 MHz
		Panel Damage Prevention	The Off-Board Display System Electronics system must have a real time clock integrated into the electronics to allow for scheduled Power On and off to prevent long-term damage
		Off-board Electronics and Power Supply modules	The electronics and power supplies for each LCD module must be off board (removed) from the back of the LCD panel and placed in a separate system for rack mounting in location that is conveniently placed for service and installation away from the video wall
		HDCP Compliance	The Off-Board Display System Electronics system must be HDCP compatible and be capable of passing the licensing key to other displays in the array when looping the signal through (daisy-chaining).
		Loop-through Capabilities	The Off-Board Display System Electronics system must be able to distribute any of Its 8 inputs to any one of the LCD modules and any additional controller electronics connected with the loop-through signal.
		IR Remote Control	The Off-Board Display System Electronics system

			must have IR remote control that can control an individual display or an entire array for complete control over all command functions by an on-site operator through an on-screen menu.
		Cabling	All Network cabling will be CAT6 minimum
		Auto Setup Options	The Off-Board Display System Electronics system must be able to automatically detect and sync to any incoming selected source within the specified operating range without user intervention.
		RS-232	The Off-Board Display System Electronics system must be capable of accepting and passing through RS-232 control commands to an array of displays. The display must be capable of setting a unique unit identification number for acceptance of unit specific RS-232 commands and address the array globally.
		Colour Temperature pre-sets	The Off-Board Display System Electronics system must include selectable pre-sets that allows for colour temperature settings of at least 6500, 3200, and native.
		LAN Control	The Off-Board Display System Electronics system must have a built-in option for health monitoring of the display including current status and email alerts over a LAN.
		SNMP	The Off-Board Display System Electronics system must have option for SNMP capability.
		Compatibility Mode Table	The Off-Board Display System Electronics system must be capable of accepting different mode timings and

			syncing without user intervention.
		Diagnostic LED's	The Power supply module and controller electronics shall have front visible diagnostic and status LED's that aid with setup and troubleshooting.
		Scaling Capabilities	The Off-Board Display System Electronics system must be capable of accepting input resolutions of VGA (640x480) to WUXGA (1920x1200) and scaling an image across various sections of an LCD video wall, or the entire LCD video wall up to 6x2 screens.
		Mullion Compensation	The Off-Board Display System Electronics system must have the capability to scale an image across the entire 6x2 array and scale the image to compensate for the physical mullion in the image.
		Internal Cable connections	The Off-Board Display System Electronics system must have locking internal cable connections
		Long Distance Signal transport	The Off-Board Display System Electronics system electronics must incorporate a Cat 6 cable solution that allows the electronics and source to be placed up to 330ft away from the displays with no 3rd party extension devices
		Add/Remove/Change sources	The Off-Board Display System Electronics system must be capable of adding, removing, or changing source inputs without disrupting the LCD video wall.
		Remote Power Module	The Off-Board Display System Electronics system must be powered by a remote power supply module that can operate up to 500 feet away from the LCD monitor array.

		Power Supply	The power supply must have an in-rush current rating that is 10% over the maximum current draw.
		No AC Power behind the displays	The Off-Board Display System Electronics shall eliminate the need for AC power behind the LCD monitor displays.
		Redundant Power Supply	The LCD modules must have a redundant power supply module built in, which will allow for continuous operation in the case of a power supply failure.
		Diagnostic LED's	The Power supply module and controller electronics shall have front visible diagnostic and status LED's that aid with setup and troubleshooting.
6.	Video Wall Controller	Input / Output Display Wall Processor	A video wall processor designed to capture, display and manage multiple sources on the video wall which shall be provided with the video wall to include picture-in-picture. The processor system shall be equipped with collection of comprehensive software tools to easily set-up, use and maintain connected content and the display wall. The video wall processor shall be supplied with a network based GIU client software application that allows a user to control the video from anywhere on the network.
		Type/Size	Type: Qty=2, 1U rack-mounted controller for 9 Full HD (1920x1080) displays size: 19" 1U Rack Unit.
		Control Software	Standard Network Based Control software supplied by manufacturer.
		Sync	Mini BNC in / Out
		Network Ports	2 Network Ports

		Control Status	Diagnostic LEDs, health monitoring and alerts

2. Digital Signage Hardware Requirements

#	Component	Description	Preference
1.	Display	Display Device (OLED/LCD)	LCD
		Screen Size	55”
		Resolution	1920*1080
		Panel Type	RGB
		BLU Type	Direct
2.	Video (Picture Quality)	True Motion/Refresh Rate	TM100/50Hz - /50Hz
		Colour Master Engine	Yes
		Upscaler	Resolution Upscaler
		HEVC Decoder	2K@60P, 10Bit
		VP9 Decoder	2K@60P, 8Bit
3.	Audio	Audio Output	20W
		Speaker System(ch)	2.0ch
		Surround Mode	Virtual Surround Plus
		DTS Decoder	Yes
		Audio Codec	✓ AC3(Dolby Digital) ✓ EAC3 ✓ HE-AAC ✓ ACC ✓ MP2 ✓ MP3 ✓ PCM ✓ DTS ✓ DTS-HD ✓ DTS Express ✓ WMA
4.	Broadcasting System	Digital TV Reception (Terrestrial, Cable, Satellite)	T-: DVB-T/T2
		DVB: Data Broadcasting (Country Spec)	Differs by country (MHEG: Republic of South Africa)

5.	Connectivity	HDMI	2
		ARC (Audio Return Channel)	Yes (Side HDMI1)
		USB	1
		LAN	Yes
		Component/Composite in	1
		Composite In (AV)	1
		RF In	T/T2:1, T2/C/S2:2
		Wi-Fi (802.11.ac or 802.11.n)	802.11ac(only)
		Digital Audio Out (Optical)	Yes
6.	TV – Rear (Jack Type)	RF In	T/T2:1, T2/C/S2:2
		Component In	(Y,Pb,Pr + Audio):5 1
		Composite In	(CVBS + Audio):3 1
		Digital Audio Out (Optical)	Yes
		LAN	Yes
7.	TV – Side (Jack Type)	HDMI(6G/3G)	2ea
		ARC (Audio Return Channel)	Yes (HDMI1)
		USB (3.0/2.0)	2.0: 1ea
		CI Slot	T/T2: -, T2/C/S2: Yes
		Design	C/Top