AUGUST 2017

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**Product Guide Specification**

Specifier Notes: This product guide specification is written according to the Construction Specifications Institute (CSI) 3-Part Format, based on *MasterFormat 2016* and *The Project Resource Manual—CSI Manual of Practice. The Manufacturer is responsible for technical accuracy.*

The section must be carefully reviewed and edited by the Architect or Engineer to meet the requirements of the project and local building code. Words and sentences within brackets [ ] are choices to include or exclude a particular item or statement. Coordinate this section with other specification sections and the Drawings. Delete all “Specifier Notes” after editing this section.

**Section 28 21 00: Video Surveillance**

**Section 28 21 13: IP Cameras**

**6 MP IR NETWORK PANAMORPH FISHEYE CAMERA**

1. **– GENERAL**
	1. SUMMARY
		1. Section Includes
			1. Section 28 21 17: Video Surveillance – Surveillance Cameras – Camera Housings
			2. Section 28 21 19: Video Surveillance – Surveillance Cameras – Camera Mounts
			3. Section 28 21 21: Video Surveillance – Surveillance Cameras – Illuminators
			4. Section 28 27 00: Video Surveillance – Video Surveillance Sensors
		2. Related Sections
			1. [Section 28 33 15: Security Detection, Alarm and Monitoring – Security Monitoring and Control – Security Monitoring and Control Software].

\*\*\*\*\*\*\*\*\*\*Specifier’s note: Include those standards referenced elsewhere in this SECTION.

* 1. REFERENCES
		1. Federal Communications Commission (FCC) ([www.fcc.gov](http://www.fcc.gov))
			1. FCC Part 15 Subpart B
		2. Underwriters Laboratories, Inc. (UL) (www.ul.com)
			1. UL60950-1
		3. HD standards
			1. Complies with theUHD-1 Standard in:
				1. Resolution: 3840 x 2160
				2. Scan: Progressive
				3. Color representation: complies with ITU-R BT.2020-2
				4. Aspect ratio: 16:9
				5. Frame rate: 25 and 30 frames/s
			2. Complies with the SMPTE 274M-2008 Standard in:
				1. Resolution: 1920x1080
				2. Scan: Progressive
				3. Color representation: complies with ITU-R BT.709
				4. Aspect ratio: 16:9
				5. Frame rate: 25 and 30 frames/s
			3. Complies with the 296M-2001 Standard in:
				1. Resolution: 1280x720
				2. Scan: Progressive
				3. Color representation: complies with ITU-R BT.709
				4. Aspect ratio: 16:9
				5. Frame rate: 25, 30, 50 and 60 frames/s
				6. Interference-Causing Equipment Standards
			4. Complies with SMPTE ST 2036-1:2013 Standard in:
				1. Resolution: 3840 x 2160
				2. Scan: Progressive
				3. Color representation: complies with ITU-R BT.2020 (2012)
				4. Aspect ratio: 16:9
				5. Frame rate: 25 and 30 frames/s
	2. SYSTEM DESCRIPTION
		1. Section Includes
			1. Video Surveillance – Surveillance Cameras – IP Cameras
		2. Performance Requirements
			1. The 6 MP Fisheye camera shall be a full-featured 360° fisheye-lens camera designed for discrete video surveillance applications in indoor and outdoor environments.
			2. The 6 MP Fisheye camera shall incorporate Panamorph technology from ImmerVision Enables®.
			3. The 6 MP Fisheye camera shall provide direct network connection using H.265 and H.264 compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.
			4. The 6 MP Fisheye camera shall offer a mechanical day/night IR cut filter that delivers color images during daylight and automatically switches to a monochrome image as the scene darkens.
			5. The 6 MP Fisheye camera shall offer multiple dewarping modes for different installations and configurations, either with a Dahua XVR, NVR, via the Web interface.
			6. The 6 MP Fisheye camera shall utilize an algorithm that dynamically adjusts the cameras contrast settings to provide usable image quality in scenes affected by fog, smog, mist, smoke or other low contrast scene.
			7. The 6 MP Fisheye camera shall be a high performance 1/1.8-in. STARVIS™ progressive scan day/night CMOS sensor with 6 MP resolution.
			8. The 6 MP Fisheye camera shall support the following dual, redundant power options:
				1. 12 VDC ± 25%
				2. PoE (IEEE 802.3af, class 0)
				3. The 6 MP Fisheye camera shall default to use power from the PoE power supply, if connected.
				4. The 6 MP Fisheye camera shall reboot and switch to the 12 VDC power supply if power from the PoE power supply is lost.
			9. The 6 MP Fisheye camera shall offer a maximum IR LED distance of 10 m (32.81 ft).
			10. The 6 MP Fisheye camera shall offer Digital Wide Dynamic Range for clear images in extreme high-contrast environments.
			11. The 6 MP Fisheye camera shall offer the Intelligent Video System to detect and analyze moving objects for improved video surveillance.
			12. The 6 MP Fisheye camera shall conform to the ONVIF standard to provide interoperability with other conformant systems.
			13. The 6 MP Fisheye camera shall offer three separate and configurable streams with individually configurable HD streams.
			14. The 6 MP Fisheye camera shall have a fixed lens with a focal length of 1.7 mm.
			15. The 6 MP Fisheye camera housing shall conform to the IP67 Ingress Protection standard.
			16. The 6 MP Fisheye camera housing shall conform to the IK10 Vandal Resistance standard.
	3. SUBMITTALS

* + 1. Submit under provisions of Section [01 33 00.]
		2. Product Data:
			1. Manufacturer’s data, user and installation manuals for all equipment and software programs including computer equipment and other equipment required for complete video management system.
		3. Dimensional Drawings; include
			1. Overall device dimensions.
			2. Dimensions specific for installation.
		4. Closeout Submittals
			1. User manual.
			2. Parts list.
			3. Maintenance requirements.
	1. QUALITY ASSURANCE
		1. Manufacturer:
			1. Minimum of [10] years of experience in manufacture and design Video Surveillance Devices.
		2. Video Surveillance System:
			1. List certifying bodies (UL, CSA, etc.)
			2. Provide evidence of compliance upon request.
		3. Installer:
			1. Minimum of [5] years of experience installing Video Surveillance System.
	2. DELIVERY, STORAGE AND HANDLING
		1. Comply with requirements of Section 01 60 00.
		2. Deliver materials in manufacture’s original, unopened, undamaged containers; and unharmed original identification labels.
		3. Protect store materials from environmental and temperature conditions following manufacturer’s instructions.
		4. Handle and operate products and systems according to manufacturer’s instructions.
	3. WARRANTY
		1. Provide manufacturer’s warranty covering [2] years for replacement and repair of defective equipment. Warranty varies country to country.
	4. MAINTENANCE
		1. Make ordering of new equipment for expansions, replacements, and spare parts available to dealers and end users.
		2. Provide factory direct technical support via phone and e-mail.
1. **– PRODUCTS**
	1. MANUFACTURERS
		1. [Acceptable Manufacturer:

Dahua Technology USA Inc.

23 Hubble, Irvine, CA 92618

Tel: (949) 679-7777

Fax: (949) 679-5760

Email: sales.usa@global.dahuatech.com]

* + 1. Substitutions: [Not permitted.] [Under provisions of Division 1.]
			1. [All proposed substitutions must be approved by the Architect or Engineer professional.]
			2. [Proposed substitutions must provide a line-by-line compliance documentation.]
	1. 6 MP IR NETWORK PANAMORPH FISHEYE CAMERA N68BR4V

		1. General Characteristics:
			1. The 6 MP Fisheye camera shall be a full-featured 360° fisheye-lens camera designed for discrete video surveillance applications in indoor and outdoor environments.
			2. The 6 MP Fisheye camera shall incorporate Panamorph technology from ImmerVision Enables®.
			3. The 6 MP Fisheye camera shall provide direct network connection using H.265 and H.264 compression and bandwidth throttling to efficiently manage bandwidth and storage requirements while delivering outstanding image quality.
			4. The 6 MP Fisheye camera shall offer a mechanical day/night IR cut filter that delivers color images during daylight and automatically switches to a monochrome image as the scene darkens.
			5. The 6 MP Fisheye camera shall offer multiple dewarping modes for different installations and configurations, either with a Dahua XVR, NVR, via the Web interface.
			6. The 6 MP Fisheye camera shall utilize an algorithm that dynamically adjusts the cameras contrast settings to provide usable image quality in scenes affected by fog, smog, mist, smoke or other low contrast scene.
			7. The 6 MP Fisheye camera shall be a high performance 1/1.8-in. STARVIS™ progressive scan day/night CMOS sensor with 6 MP resolution.
			8. The 6 MP Fisheye camera shall support the following dual, redundant power options:
				1. 12 VDC ±25%
				2. PoE (IEEE 802.3af, class 0)
				3. The 6 MP Fisheye camera shall default to use power from the PoE power supply, if connected.
				4. The 6 MP Fisheye camera shall reboot and switch to the 12 VDC power supply if power from the PoE power supply is lost.
			9. The 6 MP Fisheye camera shall offer a maximum IR LED distance of 10 m (32.81 ft).
			10. The 6 MP Fisheye camera shall offer Digital Wide Dynamic Range for clear images in extreme high-contrast environments.
			11. The 6 MP Fisheye camera shall offer the Intelligent Video System to detect and analyze moving objects for improved video surveillance.
			12. The 6 MP Fisheye camera shall conform to the ONVIF standard to provide interoperability with other conformant systems.
			13. The 6 MP Fisheye camera shall offer three separate and configurable streams with individually configurable HD streams.
			14. The 6 MP Fisheye camera shall have a fixed lens with a focal length of 1.7 mm.
			15. The 6 MP Fisheye camera shall offer an operating temperature range of
			–30 °C to +60 °C (–22 °F to 140 °F).
			16. The 6 MP Fisheye camera housing shall conform to the IP67 Ingress Protection standard.
			17. The 6 MP Fisheye camera housing shall conform to the IK10 Vandal Resistance standard.
		2. Panamorph Technology
			1. The 6 MP Fisheye camera shall incorporate Panamorph technology from ImmerVision Enables®.
			2. Panamorph Technology shall optimize the 360° fisheye image using panamorph optics and viewing functionality.
			3. Panamorph Technology shall offer magnified zones of interest, and remove all added distortion to the 360° fisheye image.
			4. Panamorph Technology shall enable 360° immersive navigation within live or recorded video.
		3. Imaging
			1. The 6 MP Fisheye camera shall offer a 1/1.8-inch STARVIS™ CMOS progressive-scan imager.
			2. The 6 MP Fisheye camera shall offer an effective number of pixels of
			3072 x 2048 (6.0 MP) effective picture elements.
			3. The 6 MP Fisheye camera shall offer a 16:9 aspect ratio.
			4. The 6 MP Fisheye camera shall offer a fixed lens with a focal length of 1.7 mm.
			5. The 6 MP Fisheye camera shall produce a 360° horizontal angle of view.
			6. The 6 MP Fisheye camera shall offer a maximum aperture of F2.0.
			7. The 6 MP Fisheye camera shall produce a color image with a minimum scene illumination of 0.002 lux at F2.0 (1/3 s, 30 IRE), 0.02 lux at F2.0 (1/30 s, 30 IRE) and a monochrome image, when in the night mode, with a minimum illumination of 0 lux at F2.0 when in IR mode.
		4. Illumination
			1. The 6 MP Fisheye camera shall have three (3) integrated LEDs.
			2. The 6 MP Fisheye camera shall offer an IR distance of up to 10.0 m
			(32.81 ft).
			3. The 6 MP Fisheye camera shall use Smart IR technology to adjust the intensity of camera's infrared LEDs to compensate the distance of an object.
		5. Video Characteristics
			1. The 6 MP Fisheye camera shall offer CBR/VBR bit rate control.
			2. The 6 MP Fisheye camera shall offer the following video compression protocols
				1. H.265 (3 Kbps to 9984 Kbps)
				2. H.264 (8 Kbps to 16384 Kbps)
			3. The 6 MP Fisheye camera shall offer BLC, HLC, and Digital WDR modes of backlight compensation.
			4. The 6 MP Fisheye camera shall offer Auto, Natural, Street Lamp, Outdoor, and Manual modes.
			5. The 6 MP Fisheye camera shall offer 3D DNR noise reduction.
			6. The 6 MP Fisheye camera shall offer motion detection (four zones) and region of interest (four zones) controls.
			7. The 6 MP Fisheye camera shall offer four (4) privacy masking areas.
			8. The 6 MP Fisheye camera shall offer 16x digital zoom.
		6. Streaming Capability
			1. The 6 MP Fisheye camera shall generate full 6 MP
			(3072 x 2048 pixels) at 30 fps resolution using H.265 compression.
			2. The 6 MP Fisheye camera shall offer Unicast and Multicast streaming methods.
			3. The 6 MP Fisheye camera shall offer the following resolutions:
				1. 6 MP (3072 x 2048)
				2. 4 MP (2048 x 2048)
				3. 3 MP (2048 x 1536)
				4. UXGA (1600 x 1200)
				5. 1.3 MP (1280 x 960)
				6. D1 (704 x 576)
				7. CIF (352×288)
			4. The 6 MP Fisheye camera shall generate three streams at the following maximum resolutions:
				1. Main Stream: 6 MP at 30 fps
				2. Sub Stream 1: D1 at 30 fps
				3. Sub Stream 2: 1.3 MP at 30 fps
		7. IP Connectivity
			1. The 6 MP Fisheye camera shall allow full camera control and configuration capabilities via a TCP/IP network.
			2. The 6 MP Fisheye camera shall deliver 6 MP video, at rates up to 30 frames per second via TCP/IP over an RJ-45 (100/1000 Base-T) connection.
			3. The 6 MP Fisheye camera shall conform to the ONVIF, PSIA, and the CGI standard.
			4. The 6 MP Fisheye camera shall offer Quality of Service (QoS) configuration options.
			5. The 6 MP Fisheye camera shall support the IPv6 internet-layer protocol for packet switched internetworking across multiple IP networks.
			6. The 6 MP Fisheye camera shall offer local and network storage options that include: MicroSD, Network Attached Storage (NAS), and recording to a local PC for instant recording.
			7. The 6 MP Fisheye camera shall support the following protocols: IPv4/ IPv6, HTTP, HTTPS, SSL, TCP/IP, UDP, UPnP, ICMP, IGMP, SNMP, RTSP, RTP, SMTP, NTP, DHCP, DNS, PPPOE, DDNS, FTP, IP Filter, QoS, Bonjour, and 802.1x.
			8. The 6 MP Fisheye camera shall support the Smart PSS and DSS management software.
			9. The 6 MP Fisheye camera shall support the Android and the IOS mobile operating systems.
		8. Interface
			1. The 6 MP Fisheye camera shall offer one (1) audio input channel and one (1) audio output channel.
			2. The 6 MP Fisheye camera shall offer two (2) alarm input channels and two (2) alarm (relay) output channel.
		9. Intelligent Video System
			1. The 6 MP Fisheye camera offer a built-in Intelligent Video System to provide advanced analytics for any scene.
			2. The Intelligent Video System shall offer intelligent video analytics built-in to The 6 MP Fisheye camera.
			3. The Intelligent Video System shall be capable of processing and analyzing video within the camera itself, with no extra hardware required.
			4. The Intelligent Video System shall trigger an alarm and take a defined action for the following events:
				1. Standard Features

Tampering with the camera.

Error writing to an onboard Micro SD Card.

Error sending or receiving data over the network.

Unauthorized access to the camera.

* + - * 1. Premium Features

Motion: object moves through any part of the scene.

Tripwire: a target crosses a user-defined line.

Intrusion: a target enters or exits a defined perimeter.

Scene Change: a person or object moves the camera to change the scene or covers the camera to obscure the scene.

Abandoned/Missing Object: a target leaves an object in a designated area, or a target removes and object from the same designated area.

* + - * 1. Advanced Features

Heat Map: generates a visual representation of data.

* + 1. Installation Requirements
			1. The 6 MP Fisheye camera shall be capable of operating in an outdoor environment within a temperature range of –30 °C to +60 °C (–22 °F to 140 °F).
			2. The 6 MP Fisheye camera shall accept power, transmit video, and accept control via a TCP/IP connection.
			3. The 6 MP Fisheye camera shall support the following dual, redundant power options:
				1. 12 VDC ± 25%
				2. PoE (IEEE 802.3af, class 0)
				3. The 6 MP Fisheye camera shall default to use power from the PoE power supply, if connected.
				4. The 6 MP Fisheye camera shall reboot and switch to the 12 VDC power supply if power from the PoE power supply is lost.
		2. Housing Options
			1. The 6 MP Fisheye camera shall be offered in a metal housing.
			2. The 6 MP Fisheye camera housing shall conform to the IP67 Ingress Protection standard.
			3. The 6 MP Fisheye camera housing shall conform to the IK10 Ingress Protection standard.
	1. ACCESSORIES
		1. The 6 MP Fisheye camera shall offer the following optional accessories:
			1. [Wall mount.]
			2. [Ceiling mount.]
			3. [Pole mount.]
			4. [Mount adapter.]
1. **– EXECUTION**
	1. EXAMINATION
		1. Examine areas to receive devices and notify adverse conditions affecting installation or subsequent operation.
		2. Do not begin installation until unacceptable conditions are corrected.
	2. PREPARATION
		1. Protect devices from damage during construction.
	3. INSTALLATION
		1. Install devices in accordance with manufacturer’s instruction at locations indicated on the floor drawings plans.
		2. Perform installation with qualified service personnel.
		3. Install devices in accordance with the National Electrical Code or applicable local codes.
		4. Ensure selected location is secure and offers protection from accidental damage.
		5. Location must provide reasonable temperature and humidity conditions, free from sources of electrical and electromagnetic interference.
	4. FIELD QUALITY CONTROL
		1. Test snugness of mounting screws of all installed equipment.
		2. Test proper operation of all video system devices.
		3. Determine and report all problems to the manufacturer’s customer service department.
	5. ADJUSTING
		1. Make proper adjustment to video system devices for correct operation in accordance with manufacturer’s instructions.
		2. Make any adjustment of camera settings to comply with specific customer’s need.
	6. DEMOSTRATION
		1. Demonstrate at final inspection that video management system and devices functions properly.

END OF SECTION